

**A Political Economy of Electric Power  
Market Restructuring: Introduction to  
Issues and Expectations**

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This paper presents the issues that are to be addressed in the individual case studies within PESD's study on the political economy of power sector reform. As the study progressed, the issues were refined and clarified; the final version will be chapter 1 in *The Political Economy of Power Sector Reform: The Experiences of Five Major Developing Countries* (David G. Victor and Thomas C. Heller, editors).

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# A Political Economy of Electric Power Market Restructuring: Introduction to Issues and Expectations

*Thomas C. Heller and David G. Victor<sup>1</sup>*

Over the last three decades a wave of reform has spread nearly every aspect of modern economic activity. Reformers have sought to replace state control with markets in air transportation, telecommunications, banking, ports, railroads, food service, and sundry other activities. Even Russian vodka is the product, today, of markets rather than a state behemoth. The experience with reform has underscored that markets do not arise or function spontaneously. They require institutions, such as law courts, securities markets and regulatory agencies, to deliver on their promise. Yet the political and practical challenges in creating this institutional footing explain, often, why actual practice remains distant from the economist's theoretical optimum for market reform.

While the experience with reform has been uneven, a toolbox of lessons have emboldened efforts to introduce markets in what is perhaps the trickiest of all industries—electric power. The network effects of large power grids, along with the massive economies of scale in modern central power stations, create high barriers to entry that (until recently) had made electricity the epitome of natural monopoly. In other parts of the economy, such as in telecommunications, technological innovations have eased the task of creating competitive niches that are often essential to success in introducing market forces—wireless telephones and digital switches, for example, allowed wholly new services that old state-owned telecommunications firms could not nimbly deliver. By contrast, no such technological revolution has transformed the basic business of distributing electricity to users. Indeed, the prohibitive cost of storing electricity requires that the all power systems be managed literally at the speed of light—a characteristic of systems that typically require central management and are not prone to the luxury of distributed control through markets.

Despite these challenges, starting in around 1980 a new textbook for organizing power markets arose. Based in part on a new logic that recognized that not every aspect of the power business was intrinsically monopolistic, as well as practical experience in Chile, England & Wales and a few other jurisdictions, awareness of this new textbook model has spread worldwide. By the early 1990s nearly every major economy had a program in place to introduce market reforms in the electric power sector. The results from these reforms matter. Electric services are a lifeblood of modern industrial economies; the importance and centralized characteristics of power systems make them synonymous with the concept of a “public utility.” Reforms in this sector are crucial tests for governments, who find that the price and quality of electric services are often a key measure of state performance. These reforms are also key tests

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<sup>1</sup> Draft 21 December 2003. We plan one or two further revisions of this draft, after completion of the conclusion, to ensure that all elements of the book are tied together, and to add citations where appropriate.

for the theory of market reform, and the results deserve attention not only from experts on power systems but also in the wider group of lawyers, economists and political scientists who probe the role of institutions in modern political and economic organization.

Power reformers have been guided, in nearly all the countries studied here, by what we call the “standard textbook model,” consisting typically of three major elements. First, the government would “unbundle” the functions of generating, transmitting, distributing and marketing electricity. The fundamental insight of the new textbook was that generation and final marketing of electricity were not intrinsically monopolistic and could be efficiently supplied by private, competitive firms. Generators, for example, could compete on price and availability—some would supply “baseload” power at all hours while other, typically smaller and more nimble plants, might generate just for the premium peak periods. In contrast, transmitting electricity via high voltage power grids as well as distributing it on lower voltage feeder lines to the final user were replete with network effects and barriers to entry that made them prone to monopoly. Second, the standard textbook model envisioned private ownership of those parts of the power system that could be competitive. Private entities, rather than the state, could better allocate capital and assure efficient operations. Indeed, the allure of private control was so strong that many countries sought private owners for parts of the monopolistic system as well, especially where governments thought they could introduce performance contracts and other devices that would keep monopolies in check while attracting the capital and efficiency of private ownership. Third, the standard model required creating powerful new institutions—notably, independent regulators. Markets for power are fragile, and despite the neat theoretical division between competitive and monopolistic elements of the business, in practice the boundary lines are blurred. An authority is needed to oversee conduct in the industry and, crucially, to regulate the monopoly-prone parts of the business. Failure to set fair fees and procedures for transmitting power could, for example, deter all private activity for fear that even an efficient generator might not be able to get his product (electrons) to market. In practice, few have implemented the standard model, but the vision of the model and experience particularly in England and Wales illustrated the great potential for reform—a shining city on the hill that has inspired reformers worldwide and offered a ready model for markets.

Actual application of the standard textbook model has been highly erratic. In the developing world, especially, the experience with power market reform seems to have gone terribly wrong. In the late 1980s and early 1990s, all of the largest developing countries, along with many of the smaller developing countries and nations in transition in the midst of rapid economic growth, announced plans to restructure their power systems. In the years since, most actually attempted some market-inspired restructuring—drawing, in most cases, on elements of the standard model. Yet the electric power systems that are in place today bear little resemblance to the theoretical market-oriented ideal. With few exceptions—principally, Argentina (until 2001), Chile and The Philippines—market forces operate only at the margins of a system that remains dominated by the state. Experts attribute this yawning gap between theory and practice to “politics,” poor “rule of law” and other “weak institutions” that are needed to put the state on the sideline and to give the space for markets to operate. Yet, so far, nearly all scholarship has treated them as a residual category. Studies that have given attention to these factors are usually anecdotal and suffused, typically, with view that politics, law and institutions are barriers to be cleared before launching the real work of designing markets in accord with the

standard model—obstacles on the path to the shining city. The lack of rigorous attention to these factors is particularly strange since political, legal and institutional forces are hardly transient. Indeed, these factors appear to be the dominant ones in explaining the actual pace and character of market reforms in the electric power system in developing countries.

This study is an effort to remedy the imbalance. We test and generate key hypotheses about how these factors affect actual outcomes in the process of market reform. We focus in the developing world as these countries have sought to implement market reforms in weak institutional environments—where complementary reforms such as in the legal and banking systems are most immature and where critical functions, such as the empowerment of independent regulators, are often particularly difficult to satisfy. The task of reform, as we will show, often entails politically challenging tasks of altering tariffs—often increasing the charges for politically powerful groups. The pathways of influence for political, legal and institutional factors are most likely to be revealed for these countries. (Elsewhere in this introduction we give closer attention to our selection of cases; in the conclusions we speculate on where the results from this study may have more general application.)

We focus on five countries—Brazil, China, India, Mexico and South Africa. These developing nations have the largest populations and the largest economies in their regions. In their sheer size they are intrinsically important. In the 1990s these nations alone added 240 gigawatts (GW) of generating capacity—nearly half of the world’s total increase in generating capacity. By 2001, China alone had in place 338 GW of generating capacity—the world’s second largest electric power system (behind only the U.S.). For their own economies and societies, how these countries structure their electric power systems matters. Average power consumption in these five countries is only 1830 kwh per capita, or barely one-tenth the U.S. level. As these power systems grow, the consequences will be felt in the world capital markets and in mankind’s footprint on the environment—already, these five countries account for more than one-fifth of the world’s emissions of greenhouse gases.

For each country, we have enlisted leading social scientists to explain the origins of the power system and focus on the “political economy” of attempts to reform that system through the introduction of market forces. By “political economy” we mean the way that interests and institutions surrounding the power system affect the process of reform. In the tradition of political economy research on many other aspects of economic history, we treat policy not as a detached process in which outside experts make decisions merely to advance their vision of public good—in this case, mere application of the standard textbook model for reform. Rather, political economy views policy as endogenous to the economy and its institutions. The task of these studies is to unravel how that endogenous process actually works.

In each of these five countries the modern power system evolved from similar origins in the late 19<sup>th</sup> century. Private for-profit ventures and franchises were the key investors—in most cases, foreign firms with a specialty in electricity whose business model was built around colonial-style ties. These firms served major cities and industrial areas, supplying electricity for illumination to wealthy urbanites and to industrial firms that sought to tap the special flexibilities of electric energy. As these power systems expanded and became integral to modern modes of industrial organization, the state increasingly intervened to regulate and eventually assume the

functions of power supply—first through regulation and then, often, by starving the power system of private capital while allowing state-controlled firms access to state capital either directly or through state-owned banks. Throughout the 1950s and 1960s, as demand for power exploded dramatically, state-owned enterprises (SOEs) solidified their control of the system; indeed, state ownership fit well with the Soviet-style theories of economic development, which emphasized national self-sufficiency and state control of strategic resources. Only the state, it was thought, could control the passions of the monopolists. Even in countries where the state did not assume ownership of the power system, as in the U.S. and Hong Kong, tight regulation of behavior and financial return transformed the power system into a function of government. Whatever inefficiencies arose because of state control were typically offset (and then some) by the ever-increasing economies of scale in the power sector, which lowered costs and also confirmed the expectation of the time—that electricity was a natural monopoly that required state ownership and control.

In all five of these countries, managers of the power system expanded their infrastructures to meet the exponential growth in demand by tapping the fuel that was locally most abundant and least costly to deploy—coal in China, India and South Africa; hydroelectricity in Brazil; and oil in Mexico. Thus each of these five case studies gives attention to the co-evolution of fuel systems (and water law, in the case of Brazil) and power sector. Declining costs, liberal state financing, and exponential growth in demand continually reinforced the state's role in the sector. Even as troubles arose—with unique origins in each country—the institutions that became entrenched around power made it easier to perpetuate the system rather than contemplate reform.

In most cases, the impetus for reform arose from a crisis that created unavoidable problems as well as the political context for reformers to advance their agenda. In every country but South Africa, that crisis arose in the financing of the system—as economies of scale no longer delivered reductions in cost and as the inefficiencies of state control and financing mounted, the lights literally went out on the old model and presented an urgent need for change. In the face of these financial crises, even the shell game accounting and soft budgets that had been used to prop up the system could not be sustained. In South Africa, where the state enterprise was the best managed of all those we consider in this book, excess power capacity delayed the onset of crisis—even there, a decade later than the rest, demand is outstripping available electric supply and the pressure for reform has reached a fever pitch.

These studies focus on the many efforts at reform. They are rich histories that are valuable in their own right. The rest of this introduction outlines what we have done to facilitate comparison across the five case studies, so that this project yields insights of more general value. The study is built on a foundation with four corners—key concepts that, in turn, suggest important hypotheses that we test in the studies as well as areas where this work spawns new hypotheses for further research.

First, we examine the nature of the beast to be reformed—the state-owned enterprise (SOE). We argue that SOEs are difficult to reform because they are constructed of many interlocking elements. For example, it is commonly known that SOEs operate with “soft” budget constraints—that is, state financing—and that the central role of the state extends typically to

political control over key appointments. Reformers typically aim to rectify this problem by transforming the SOE into a corporation (even if wholly owned by the state) and imposing a hard budget constraint. In practice, such reforms can be neutered by the lack of complementary reform in accounting standards and corporate governance—the SOE simply reproduces in the “corporate” mode rather than the “state” mode the same conflicts of interest and lack of attention to performance that were pervasive.

In some cases, reformers have been able to introduce elements of corporate efficiency without taking on all the interlocking elements of the SOE system. For example, many countries have created opportunities for independent power producers (IPPs) to generate electricity alongside the existing state enterprises, and the experience with IPPs has been highly variable. Often the IPPs merely perpetuate, with different nameplates, the state-dominated system; on occasion, they create benchmarks for performance and even niches from which wider private influence on the power system can evolve. Each of the studies explores in detail how the incumbent SOEs operate and how reformers, with what effect, have sought to cut the Gordian knots. In every country, the case studies show that the result of reform efforts is to create what we call a “hybrid market”—part state and part private. In the conclusion we return to this concept and outline in detail the functioning of hybrid markets, their origins, and their implications for the future of reform.

Second, each case study examines the key motivations that reformers cite as their inspiration. In some cases the ideology of markets has played a contributing role, and in a few instances the multilateral development banks—notably the World Bank—have offered substantial financial and intellectual resources to key states, provinces and whole countries only on condition that they adopt market-oriented reforms. In all five studies, however, the principal driving force for reform has been financial. Even in cases where reformers have held the reins of power, substantial reform has rarely followed until the state-dominated system is bankrupt and the lights are dimming. The studies explore how the financial motivation for reform affects outcomes—leading, for example, to a preference for the relatively easy goal of attracting IPPs while delaying the more sensitive task of unbundling the bureaucracy and inter-locking functions of SOEs that would be needed to apply reforms that are closer to the standard textbook model. Of course, the financial health of the IPPs nonetheless depended critically on the yet incomplete broader reforms. What is truly extraordinary is that investors proved willing in the 1990s to pour billions of dollars into these markets with the faith that those delayed reforms would be favorable to their interests—despite the decades of earlier experience and careful scholarship on expropriation and squeezing of foreign investment on infrastructure projects such as power plants. Where relevant, each study explores how the investors thought they would avoid these problems, and a new study at Stanford is exploring these issues with in-depth studies of many of the key IPP projects.

Because finance is a driving force for reform, each chapter gives attention to the financial health of the sector, including analyses of the relationship between tariffs and costs. Each of the five country studies shows that a key task for reformers is to raise tariffs. New fuels (notably gas) and technologies are typically more costly than the incumbents—in part because the incumbents were financed on soft budgets, in part because fuel markets often had subsidized prices (which reformers, too, are seeking to unravel), and in part because the power sector is

facing new demands such as pollution control. An additional need for lifting tariffs is the long history of politicizing tariffs—in democratic countries, especially, politically powerful groups have been able to grasp the levers that control tariffs. When economies of scale kept costs in decline and when electrification was not widespread these inefficiencies were not rampant; from the 1970s, however, both factors have largely evaporated—success in electrification and the end of the ever-larger-and-ever-cheaper massive power plants have conspired to create a huge gap between revenues and costs. Each study documents the patterns in electrification and the gaps between tariffs and costs, showing exactly which groups have gained and why.

The third core aspect of this study is institutions—in particular, the institutions that must be created if the market (rather than the state) is allowed to determine prices and patterns of investment. We give particular attention to regulators. Just two decades ago, not one of these five countries had an independent regulatory authority. Today, regulators with formal independent powers exist in all five. Each study outlines the legal and institutional origins of the regulatory authorities and focuses on the factors that explain whether and how regulators have true influence—the personnel who staff these authorities, the powers for decision making, and the powers for gaining information. Whereas much of the effort through regulatory assistance programs has focused on creating the fabled “independent regulator,” our studies suggest that the formal conditions for independence are at best a necessary but not sufficient condition. Particularly absent in these new regulatory authorities are the powers needed to gather information that, in turn, is the keystone to effective tariff orders and market oversight.

Fourth, we examine how states handle the consequences of reform for a wide array of social missions—what we call the “social contract” of the electric power industry. In the old state-dominated system a wide array of public pressures and social mandates were built into the power system—tasks such as supplying electricity to low-income users, investing in research and development, and protecting the environment. The massive changes implied by reform could threaten this “social contract;” indeed, many consumer and development groups have opposed reforms precisely because they fear this outcome. In the advanced industrialized countries there is considerable evidence that at least some of those fears have been realized—spending on R&D, for example, appears to have declined precipitously with the onset of market forces. Spending on environmental protection and social programs, too, have been exposed to greater transparency and exposure to market forces. Each of these five studies examines how the social contract has been constructed and then re-constructed as the power sector is reformed to allow a greater role for market forces. With a few exceptions, the studies find little evidence of these countries making much investment in R&D, either before or after reform. In the areas of electrifying the poor and protecting the environment, market reforms are correlated with better performance on the social contract and there is little evidence that reform has undermined the contract. In many cases, where reform seems to yield power systems that are financially more sustainable the reform process may actually make possible a much greater investment in this social contract.

In the rest of this introduction we examine these four fundamental issues in greater depth—the nature of the enterprises (SOEs) that are to be reformed; the motivations for reform; the institutions that are keystones to reform; and some broader consequences of reform. Having introduced those fundamental issues we briefly explain our selection of cases. These five developing countries, we argue, are not only important in their own right, but also display a wide

range of experiences in the key political, legal and institutional factors that, we anticipate, will explain alternative outcomes. These countries are representative of the varied conditions that are likely to prevail across much of the developing world, and the sample allows for some cautious generalization of our findings to other national settings.

## I. THE NATURES OF STATE-OWNED ENTERPRISES

In all five of these countries, the pre-reform electric power system was owned and controlled by the state. In all five cases, the process of reform has involved either reforming the *core* of the state-controlled system—such as through privatization—or allowing new entrants to operate at the periphery with the hope that competition would induce change in the state-owned system. Here we put the spotlight on the SOEs themselves—how they operate, and some propositions about how they might respond to reform efforts.

To aid in formulating hypotheses about the process of reform, we develop stylized descriptions of two alternative forms: “state-centered systems” and “market-centered systems.” We focus on four clusters of attributes: governance, finance, industrial organization and policy. Having set that scene, we suggest several key propositions that the case studies will be able to test.

*Governance.* A state-owned enterprise is governed by insiders who are either in government or acquire their authority from government, often through appointment by personnel agencies or the ruling party. The firm is not viewed as an independent enterprise with the principal or sole objective of maximizing profits under the constraint of careful attention to the opportunity costs of investment. Rather, the state firm is better understood as a social unit with managerial behavior directly monitored by line ministries, usually with sectoral supervisory responsibilities. Managerial incentives are regularly oriented to a portfolio of policy goals, historically dominated by the expansion of gross output and employment. Prices, inputs, production levels and other operational practices of the SOE are administratively determined or negotiated. The activities of the firm are viewed in technical terms—key managers are usually trained in engineering and the natural sciences, rather than finance, law, management or economics. Internal accounting is poor or idiosyncratic and transparency to outsiders is, at most, opaque. Labor supplies are managed by state or state firm personnel departments, with union responsibilities and powers a function more of coordination than confrontation and more of national political structures than enterprise level organization.

In market-centered systems, the firm and the state are distinct entities. Corporate governance reflects the legal relationships that emerge from the nexus of complex contracts between private providers of capital and labor who dedicate their resources to the firm. In the normal case, shareholders, including protected minority investors, decide on senior appointments and oversee (through key firm managers) the operation of the firm. Monitoring of managerial performance is enabled by requirements of extensive disclosure, transparency, independent audits and analysis of prospects by institutional investors, financial media, securities brokers and rating agencies. Senior managers are socialized in business schools to a norm of profit maximization. Production organization, goods and services offered, and pricing strategies are

conditioned by market opportunities. Similarly, decisions about the composition of factors of production are subject to market constraints. Managerial deployment of capital reflects its opportunity costs as valued on competing capital markets. Finally, since it cannot be assumed that the interests of labor and management are cooperative, workers are allowed (often encouraged) to organize collectively within relatively open labor markets to ensure that firm choices about the quantity and quality of labor are in line with real resource costs.

*Finance.* In a state-centered system, both investment approval and the requisite capital for new projects comes from the state itself. The state can supply resources directly or, more often, indirectly. Loans from state-controlled banks are offered, usually at rates below what commercial markets would charge. The banks are themselves state-owned enterprises with incentives to maximize throughput. Their own books make little distinction between loans that carry the expectation of repayment and loans that are basically capital grants. Firm managers then typically work with “soft budgets” wherein, if costs exceed expected returns, the state stands ready to supply the difference. Project evaluation and budgeting, as well as the resultant investment profile, will reflect the effective aggregate cost of capital as actually charged and repayable. The state financial system, in turn, is organized to facilitate selective allocations of credit influenced by political priorities (industrial policy). The state often represses consumer spending and alternative savings opportunities (e.g. offshore banking or public securities markets), although it offers only below market interest on state bank accounts. Aggregate savings are (artificially) high, undercompensated, and implicitly taxed, by exclusive state bank intermediation of capital flows, to keep uneconomic firms afloat and speed the expansion of politically favored sectors. Wherever possible, the national state also acts as agent in negotiating concessionary loans from multilateral development banks to complement domestic financial resources.

In market-centered systems financing simply reflects the (risk-adjusted) cost of capital in diversified markets. Capital is potentially available through bank loans, public securities issues, or private equity markets, with average capital costs determined by competitive project evaluation across these several competing sources. Managers work with a hard budget constraint because any failure to meet targets for capital repayment, interest or dividend expectations threatens their control of the firm or requires persuading the capital markets to afford another round of scrutiny and financing. In addition, while in some state-centered systems substantial internal capital may come from retained earnings that result from state-created monopoly franchises, competitive or independently regulated returns in more market based economies are more likely to limit this source of financing. Consequently, when investment projects tend to be evaluated individually in autonomous capital markets, clusters of large projects, like sectoral nuclear or hydroelectric infrastructure expansion, with high initial capital requirements and long-term returns may be disfavored (especially for debt financing) because prospective revenue streams are so uncertain.

*Industrial Organization.* States (or their subordinate political jurisdictions) rarely create multiple enterprises that perform the same function in the same market. Because the philosophy that underpins most state-centered systems is that the state firm’s interests are identical to the public interest, competition between state-controlled firms is wasteful. Large capital-intensive industries, including network industries that have characteristics of natural monopoly, are the

jewels in the crown of an non-competitive political economy. Even where the nature of the goods and services provided by the industry do not bear the hallmarks of a natural monopoly, polities erect barriers to entry such as exclusive franchises and tariff walls. Where the state allows other firms to provide a similar service to an SOE, those firms are frequently small and incorporated into state chartered industrial groups or associations in which the dominant (state-controlled) firm leads on price and market organization. Where products are nominally allowed to compete in final markets, administratively imposed or sanctioned technical standards and other conduct restrictions may technical rules and other restrictions tilt the market to assure dominance of the state-controlled firms' production. Prices and quantities that set the scope and nature of competition are also the joint products of political authority and market factors.

In market-centered systems, the state does not disappear from the scene. However, it does change its role and mode of operations relative to those of state-centered systems. Although the normal rules of market organization guarantee free entry and exit and curtail restrictions on trade flows, even in competitive industries firm conduct is monitored by both government (e.g., antitrust regulation) and other market actors (e.g., private law suits and remedies). In the absence of collusion, it is assumed that prices and business strategies will emerge from market forces. Business associations, networks and corporate groups are voluntary, rather than state organized, and carefully watched as likely forums for illegally coordinated conduct. Alternatively, in industries prone to natural monopoly, like electricity, the state must foster independent institutions that monitor behavior and adjudicate disputes between producer, consumer, political, and environmental interests suspicious of one another's motives. Whereas in state-centered systems the institutional organization of monopoly firms is integrated with that of the state, in market-centered systems the state creates regulatory authorities that regulate their prices and behavior—ideally in ways that expose the firm to incentives for performance that mirror incentives and outcomes that would exist in a competitive market.

*Policy.* Because the firm in a state-centered system shares in the functions and identity of the state, the policy process in state-centered systems is heavily embedded within the firm. The firm supplies a wide array of social services, in the extreme child care, education, housing, “safety nets,” shopping and even restaurants. The state and civil society (themselves conceived as an integrated unit) focus on the firm in both the policy making and policy implementation processes. Social objectives, often extensive, blend goals like employment of idle workers, protection of the environment, and provision of energy services to poor areas into the daily production decisions of the firm. As with all SOE behavior, these varied policy goals may be negotiated through the continual interaction of firm management, government officials, and, in some cases, other state organized actors such as labor or consumer associations. Outsiders can play little role in judging enterprise compliance with public policies because policy outcomes are neither transparent nor stated in independent norms of conduct. They are known only to insiders and directly monitored by administrative or industrial peer supervision. And because policy implementation through state firms is generally compensated by political privilege like selective finance, market protection or regulatory offsets, policy practice in state-centered systems exposes the public delivery of social functions to the risks arising from the SOE's organizational interest in increasing the rents it can capture.

In state-centered systems, the social contract resides inside the unitary organizational complex of enterprise/administration. Where single firms dominate each industry, the target of any policy is already known and negotiations of a wide range of policy outcomes between a few core actors is feasible. In contrast, in market-centered systems, the policy domain is more often restricted in scale and externalized from the firm. First, in competitive markets, the effective formulation and implementation of any policy decision rarely devolves upon a particular firm or closed roster of state chartered interest groups. Second, unlike state-centered systems where the executive branch of government is pervasive, in market-centered systems, separately elected legislators play a larger role in policy setting. Finally, where the basic social contract resides and is codified primarily in private market decisions between autonomous producers and consumers, supplemental and exceptional policies must be institutionalized outside the invisible routines of an integrated state-firm network. Like the markets for capital, labor and goods, the policy process is a competition in which key players (e.g., firms, NGOs) are comprised of voluntary members; transparency and independent accounting are held at a premium, and independent regulators and judges adjudicate contested outcomes. Policy outcomes must be formulated in participatory processes, expressed as general and widely accessible norms, and implemented subject to public review. Even in highly regulated sectors like electricity, both popular normative expectations and legally mandated independent structures for policy intervention restrict the interdependent production between state and firm of policy internalized to enterprise conduct (regulatory capture) that is the normal practice in state-centered systems.

These characterizations—ideal types—are stylized and incomplete. Real systems have characteristics of both market and state-centered systems. We remain mindful that even where these categories can usefully describe attributes of political economic systems in different countries, the differences between countries and systems remain enormous. The Chinese Communist Party, the PRI in Mexico, or the Congress Party in India are not the same organization, although each has presided over a state-centered system with some similar attributes. Nor, obviously, are market-centered systems identical to one another, as both Americans and Englishmen are constantly pointing out.

However, this characterization is useful for spotlighting key issues that, we expect, will arise as societies attempt to restructure SOEs in the electric power business. In particular, we anticipate that the deep integration of the “firm” and the “state”—in fact, the two are not separable institutions—poses extreme difficulties for reformers. We expect that the process of reform will often proceed slowly because there are so many interlinked dimensions to reform—labor markets, finance, corporate governance, etc.—that the system evolves slowly. Disintegrating large state-dominated enterprises and reassembling them in different, more market-based forms is not an overnight process. In terms of the contest for control, the losers from reforms are already organized within the firm and the state and have direct access to decision-making. Reformers must build a coalition for reform on many fronts simultaneously—a multi-level game of chess.

The network effects of these many interlocking functions would appear to reinforce the dominance of the state-centered system—especially if reform efforts focus on the firm itself. Recasting the firm’s methods of financing or labor purchasing decisions is difficult without broader reforms in capital and labor markets. The practical difficulties of reform also appear to

be enormous since the alternative market-based methods of industrial organization require sophisticated institutions for monitoring and enforcing market rules—a particularly subtle task for the generation, transmission and distribution of electricity even in societies that have established highly capable regulatory systems. Where it is politically convenient to break up SOEs in name and pretend to create competition, the integrated state-centered system is often able to do that. The nameplates on the doors may change, but the basic organization proves much more durable and resistant to change.

Given these interlocking effects, we must look closely at the motivations for reform and examine whether some motivations are more likely to generate reform than others. We must also look at the institutions that would be needed to fill the space that the state had occupied—as regulator and as policy maker—and finally we must look at how systems that are shifting to markets would perform the wide array of social functions (e.g., environmental protection) that are critical to the social contract and yet organized quite differently in state-centered and market-centered systems. We turn to each of three tasks—motivations for reform, institutions for markets, and re-constituting the social contract.

## II. MOTIVATIONS FOR REFORM

Through extensive interviews with experts on electricity systems as well as key players in each of these five countries, we have identified five motivations that have been cited for reform. Each case study explores the particular motivations for reform, and here we outline some expectations of the character of the reforms that would follow from the different motivations.

First, reform might be driven by the desire to improve the economic efficiency of the enterprise. This is the standard reason cited in most literature on the economics of electric power markets. Given the hurdles to be cleared in restructuring the power system—and the interlocking functions of state-owned enterprises—we would expect that efficiency alone is not going to be a strong factor driving restructuring. In cases where there is strong evidence that the system is extremely inefficient—sometimes evident in high costs of electricity production—then the political coalition for reform may be strong enough to push for restructuring. But many of the firms that are largest users of electricity are, themselves, SOEs like steel plants, mining operations, and heavy manufacturing. In their world, the solution to high prices is to negotiate through the state system to lower the prices of their inputs through central command rather than to break up the entire system. Lower electricity prices would make it harder for electric power utilities to stay afloat, which in turn would create the need for additional transfers and other state-based financing—the soft budget constraint.

Second, reform might be driven by a crisis in supply. In state-centered systems, where prices are typically regulated, problems of poor supply are often reflected in blackouts and other quality failures rather than high prices. Where electricity quantities are inadequate, a useful barometer of political power is found by looking at who bears the brunt of blackouts. When the state-centered system operates by plan, forecasts of inadequate supply—often created by economic growth that accelerates the demand for electricity—generate only additional state financing (with its attendant inflation or increased implicit taxes on household savings) through

the soft budget system. New plants are built and the “problem” is said to be rectified. We expect, however, that a breakdown in the state financing system would trigger crises in supply and thus motivate reform.

What types of reform might follow a crisis in supply? One approach would be to restructure the entire industry. We expect, however, that the first attempts will focus on patching the holes rather than tearing down and rebuilding the whole system. Patching implies new financing arrangements—for example, partial floating of minority shares of SOEs on stock markets, redoubled efforts to raise funds from multilateral development banks, or new rules to allow brownfield joint ventures with foreign investors. While the state-dominated system might reach for all these (and other) levers, the main observed responses to crises in supply are two. In one response, the state takes the lead and opens the market to independent power producers (IPPs). Many IPPs are discrete units that can be attractive to foreign and domestic investors who are formally outside the state-dominated electric power system. (Some IPPs are more like reshuffled state enterprises better able to tap or mobilize unconventional or innovative sources of public finance.) In the other, major users of electricity take matters into their own hands and generate their own electricity—captive supply. We expect that in cases where the state-centered system remains intact that the main response will be IPPs because the power system remains an integral unit and the state system predominantly favors large, central power stations and grid systems rather than small, often inefficient, decentralized stations beyond easy control.

Third, restructuring might be pursued as part of a broad-based restructuring of a nation’s economy. Such restructuring efforts usually include attempts by the state to exit a wide array of industries such as heavy manufacturing, ports, airlines, communications and natural resources. We expect that electricity would be among the last industries restructured as part of a comprehensive restructuring strategy simply because introducing market forces into electricity is among the most complicated tasks. The physics of AC electricity make it difficult to proceed with restructuring on a piecemeal basis, and often the sources of greatest dysfunction in the power system are those parts—transmission and distribution—that have natural monopoly elements. Even telecommunications—another area of traditional state ownership with complicated and difficult tasks in transition to market-based institutions—is probably marked by an easier transition to markets. Rapid technological change, especially in wireless communications, and the ability to isolate highly competitive parts of the market (e.g., bulk users of wired services) from the elements that retain characteristics of monopoly, creates an opening for competition.

To some degree, restructuring of particular industries is likely to spillover into restructuring of their down or upstream neighbors. Attempts to restructure industries that supply primary fuels will achieve fuller results if those firms are able to sell to multiple buyers—rather than just one state-controlled entity—in the electric power sector and in other industries that use primary fuels. However, we expect that attempts to restructure the financial sector—state banks, in particular, because they are typically the main source of soft budget financing for the electric power sector—are most likely to trigger reforms in the electric power sector. Such power reforms will appear to be motivated by a capacity shortfall, but their roots are in reform of financing.

Fourth, reform may be launched by political entrepreneurs in an attempt to re-allocate assets. In a state-owned system, talented and politically connected entrepreneurs will usually work within the state system to redirect rents. But for political forces that are outside the system—or if the system has ossified around a particular set of interests—restructuring may be viewed as the best strategy for shifting the ownership of firms to different state or private interest groups. We would expect to view this as a driver for reform only in cases where there is a high degree of asymmetry between control over electric power assets and those who have the power to implement a full scale reform.

Fifth, reform efforts may be launched because reform is a trend. Perhaps, from the vantage point of the long history of social organization, markets for power are a fad. A whole sociology of development theory has arisen around the fact the developing nations tend to copy the formal symbols of modernity from airport designs to educational curricula to human rights treaties, regardless of their actual implementation, to register their membership as advancing societies. As a practical matter, policy makers always face pressures and policy challenges, and their attempts to provide a remedy often entail reaching for tools that are readily available. The success, especially in the U.K., with market reform has created an industry of experts and consultants on electricity market reform—many inspired by the U.K. model. Transnational consulting companies appear to have been particularly active in writing reports on market restructuring, although it is unclear whether these follow or lead the herd—whether they reflect or shape the interests of their clients. We expect that the interlocking systems that maintain SOEs are so strong that fads alone are unlikely to dislodge them. However, the availability of a ready model may explain the convergence to markets in at least two respects. First, when problems with the state-centered system arise—in particular, we suggest that it is likely that the problems will be manifest in capacity shortages and difficulties in financing new capacity—a suite of market-centered solutions are the ones most readily available as the solution. Second, the rhetoric of reform is highly likely to reflect the doctrines of reform—even where the economic textbooks are not actually followed during reform—because that is today’s conventional wisdom about the best solution.

The five possible motivations for reform are a reflection of the reasons that have been cited for restructuring electric power systems. For each, we have indicated the ways that the nature of the SOEs that are to be reformed may affect the types of reforms actually adopted, the pace and structure of reform, and the language used. Nonetheless, these are not crisp predictions because in any given situation there may be multiple forces at work and reform is a complicated process. In an effort to outline our expectations more clearly, we focus for a moment on one key factor—economic growth—that is readily observable and linked to many of the forces that we think should be related to reform efforts. Does economic growth spawn efforts at reform?

Low economic growth, we expect, will not directly spur efforts at reform—especially where the capacity built up in the state-dominated electric power system is adequate and thus capacity shortages do not loom on the horizon. Where low rates of growth do spur reform, the reforms will begin not with capacity shortages but with reform in the financial markets (and perhaps other factor markets), which, in turn, will potentially expose the electric power sector to the need for reforms in order to attract capital and skilled labor when demand picks up once more.

Rapid economic growth should induce direct efforts at reform insofar as rapid growth is likely to spawn shortages in capacity. But whether rapid growth actually creates the need for reform will depend on whether the soft financing, complementary macroeconomic policies and social capital of the state-centered system is able to hold together and grow at the same rate as the rising demand for electric power services.

### III. INSTITUTIONS FOR MARKETS

An integral part of the process of reform toward a market-centered system is the creation of new institutions that will ensure the proper functioning of markets. The attributes of those institutions and of the market-oriented system has been a subject of extensive analysis. In each case study, in instances where markets exist, the authors describe the key institutions—their influence and functions, as well as the political forces that create and sustain those institutions.

In a fully functioning electric power market, the full range of functions of the market are numerous and complicated. They include wholesale power markets, dispatching of generators, management of the grid and provision of other “ancillary services”, and retail competition. None of these cases has arrived at this end state and thus the issues that would be the bulk of the story when examining full blown cases of successful market transformation still remain on the sidelines. Functions such as planning investment in the grid remain largely the province of the same SOEs that are the target of reform.

We focus here on two key aspects of the institutions. One is the creation of an independent regulator—widely regarded as the linchpin for a properly functioning (depoliticized) electric power market. The other is the often central task of regulators—setting and reviewing tariffs.

#### *Independent Regulator*

The keystone for market-oriented reforms is an independent regulator. Even in well-designed markets there may be collusion between firms that will require oversight by a regulator. Electricity markets in transition, where important production segments retain characteristics of natural monopoly, are especially demanding of regulators because incumbents usually retain some control over critical infrastructures. Establishing efficient markets where one or more of the principal competitors are former, if reconstituted, state monopolists has proven everywhere to require subtle yet firm regulation of price and access.

Each country case study examines the origins and operation of regulatory authorities. We draw particular attention to two issues. First, how do regulators derive their authority? The conventional answer to this question is that authority stems from the regulators’ independence from political overseers. We also explore, however, the legal foundation for regulatory authorities. Inevitably, regulators will make decisions that harm certain interests and will be challenged, either politically or in court. When the challenges come, are regulators able to hold

their ground? What are the attitudes and behaviors of reviewing judges who gain the legal power to review regulatory decisions previously invisible within the operations of state enterprises? Do these courts have the doctrinal or experiential grounds to complement competent regulatory practice?

Second, while the question of enforcement authority has attracted much attention—in part because of high profile challenges to regulators—the *capacity* of regulators to monitor markets has not been the subject of in-depth, comparative analysis such as we undertake in this study. Capacity includes not only manpower and talent but also, perhaps crucially, the ability to gather information needed to monitor markets and behavior. When regulating SOEs—or enterprises that until recently had been SOEs—the informational requirements are severe because there is typically no history of independent accounting. The firm managers themselves often do not know their behavior and accounts. Moreover, technically capable personnel may not be available outside the state enterprise itself. We expect that one of the key dimensions of SOE reform is its impact on the incentives to gather information inside the firm and, in turn, the ability of regulators (assuming they have the authority to requisition available information) to perform monitoring functions.

### *Tariff setting*

Even in the midst of restructuring electric power markets, the function of setting tariffs persists as a key job of government for at least two reasons. One is that many (perhaps most) final users of electricity still purchase their electrons from a system that has characteristics of a natural monopoly. Retail competition is relatively rare in the advanced industrialized world and almost nonexistent in developing countries. (None of the five cases we consider has retail competition, though several envision such competition in their blue sky plans for restructuring.) The other reason that tariffs remain regulated is that electricity is widely seen as a vital social good too sensitive to abandon to market forces. Thus the question for analysts of the political economy of electric power market restructuring is not whether tariffs remain regulated but, rather, how political forces are arrayed to determine the allocation of tariffs.

We would expect that, as with any political competition, the outcome of tariff decisions should reflect the balance of political power. Tariff-setting authorities—the electric utilities themselves or political bureaus with general price setting powers in state-centered systems, and external regulators in market-centered systems—respond to the interests of those who control their resources. In countries where tariff decisions are controlled by institutions that are responsive to industrial interests, tariffs for major industrial users should be relatively low whereas tariffs for less well connected users (often small businesses and households) should be higher. In countries where political parties and democratic logrolling determines the allocation of political resources, tariffs should reflect those interests—such as agricultural interests where farmer parties are strong, rural interests where large numbers of politically organized people are in rural areas, and urban interests where urban elite parties control resources. (In all these cases, we ask the authors to investigate the tariff structure with an eye to differences relative to cost of service, not absolute differences.)

These hypotheses about tariffs are crude because they assume a frictionless political competition. In advanced industrialized countries, the tariff setting process is constrained by rules that limit (often forbid) discriminatory tariffs—except in special cases such as “lifeline” tariffs for low-income users. Do the same rules or expectations influence the tariff setting process in the five countries examined here?

#### **IV. RE-CONSTITUTING THE SOCIAL CONTRACT.**

Finally, the studies make it possible to examine how societies create new contracts between capital, labor and civil society—entities that are integrated into one unit (the SOE) in state-centered systems. Key political and practical difficulties accompany the task of dismantling SOEs that serve not just the functions of production but also a wide array of other key social functions. The list of elements of the social contract is extremely long; to aid in comparison across the cases, we focus on just three that are particularly vital in the electric power system.

First, power systems impose large costs on the environment. In state-centered systems environmental policy is internal to the enterprise. If the enterprise is directed—or directs itself—to incorporate environmental norms it can redirect its capital investment and operational decisions. If the new ventures are costly it can rely on specialized capital allocations or the soft budget constraint to provide room for maneuver. As the firm begins to operate independently of the state, however, it becomes aware of the contest between environment and cost and, at the same, time, highly sensitive to costs. The standard remedy for this problem in market-centered systems is for an outside regulator to apply a tax or other mandate that forces the firm to internalize these environmental costs. But for firms in transition the information needed to construct an environmental policy is lacking.

In each study, we explore how states deal with this problem. Do they set aside issues related to the complementary functions of the firm while they sort out the core tasks of reforming SOEs? That strategy may often produce no apparent decline in environmental quality if new market-oriented firms are more efficient than the state enterprises they supplant and if these new firms use gas instead of dirtier alternatives, notably coal. Or, do regulators address these informational problems by designing regulatory instruments that are much easier to monitor and enforce—such as fuel and technology mandates—but which might reverse much of the improvement in efficiency that could be expected from the shift to markets?

Second, we examine how each country addresses one of the key social benefits of electric power systems: access to electric services. In the advanced industrialized countries, active programs in the first half of the 20<sup>th</sup> century connected nearly every village and household to the grid. These programs were supported by governments, often acting through the state-controlled enterprises that delivered electric services, as well as rules that encouraged the creation of local electrification cooperatives. Today, all the largest developing countries face a similar set of tasks. If, at the same time, they are restructuring SOEs, who will pay for and perform the tasks of electrification?

We expect that SOEs in the midst of restructuring will be increasingly uninterested in providing electric services that are not economic. Indeed, most rural extensions of the grid to low-income users cost more than they return in revenue. In state-centered systems, we would expect that the service of uneconomic electrification would be performed by the SOE itself—with compensation through higher tariffs on other users, soft loans or through some indirect means. In market-centered systems, the firm will demand transparent compensation directly for the service that it would not otherwise supply. We expect that states will either supply these compensations or invent regulatory rules that force the firm to provide electric services. We also expect that the locus of policy-making about electrification to shift away from the SOE itself and into the arena of openly contested politics. In countries where there are powerful forces in favor of electrification programs—for example, rural and farmer dominated parties—a spotlight on the political process of electrification will require transparent decisions about minimum acceptable access to electric services and minimum acceptable quantities of electricity. Those politics are unlikely to accept inequalities and thus seem poised to generate simple answers: complete electrification, and escalating “minimal” amounts. (These “minimal acceptable” amounts can be measured, for example, by looking at “lifeline” tariffs and other concessionary schemes.)

Third, we ask how industries in the midst of restructuring invest in their own future. In state-centered systems, the acquisition of new ideas and technologies is integrated into the state system of research, development and technology transfer. State-centered systems can (in theory) optimize the entire nation’s policies so as to pursue a long-term innovation strategy. In countries where the base of research and technology is low, the government may focus its strategy on acquiring new ideas and technologies from firms overseas—for example, by making access to (even unrelated) domestic markets contingent upon technology transfers. The government can also support large domestic R&D laboratories independent of the electricity industry as well, although those laboratories may reflect broader social missions, such as employment, and perform poorly in creating new useful technologies without the profit incentive available for selecting superior innovations.

The transition to market-centered systems poses great problems for this mode of innovation. In the advanced industrialized countries the evidence suggests that the turmoil of a shift to markets creates uncertainty about the future and induces firms to focus on near-term objectives. As a result, firms and governments alike reduce sharply their investment in alternative technologies. Disintegration of utilities leaves no single entity responsible for the entire system, allowing markets to efficiently work off the surplus in the power system yet ignore the future potentials. We expect to observe similar tensions in these developing countries as market-oriented reforms focus firms on narrower niches, the short term, and easily realized profits. We also expect that state-centered strategies for technology transfer will become less effective as the state relaxes its grip on the power sector and a diversity of firms pursues varied strategies.

## V. SELECTION OF CASES AND OUTLINES OF THE STUDIES.

The case studies focus on the five developing countries that are largest in each region. As indicated already, these countries are important in their own right—due to their sheer population, size of their economies and magnitude of their power supplies, as shown in table 1.

Table 1: Key Indicators for the year 2000. Fuel shares are percent of total generation; “new fuel” is the most commonly cited alternative to the dominant fuel and, in all five cases, government has actively considered policies to promote the new fuel for the sake of fuel diversity. Total power supply data are for 1999; the rest for 2000. Sources: World Bank *World Development Report* (2002); Energy Information Administration.

Country	Population	Income (GDP/cap \$, PPP)	GDP (billion US\$)	Power Supply (Twh)	Generating Capacity (Gw)	Dominant Fuel	New fuel
Brazil	170m	7625	595	332	69	Hydro (88%)	Gas (0.2%)
China	1262m	3976	1079	1240	294	Coal (78%)	Gas (0.4%)
India	1016m	2358	456	527	108	Coal (75%)	Gas (6%)
Mexico	98m	9023	575	192	39	Oil (47%)	Gas (18%)
South Africa	43m	9401	126	200	40	Coal (93%)	Gas (0%)

This selection of countries also facilitates comparisons that, with caveats, will allow application of the findings from this study to other countries in similar settings. First, the conditions in these countries are similar to most others in the developing world that might contemplate restructuring of the electric power system. In the late 1980s the electric power systems in all five of these countries were typical of state-centered systems. They were integrated utilities operating within soft budget constraints; the energy policy of the country was internal to the enterprises themselves; the state and enterprise were one. During the 1990s all of these countries attempted market reforms, but none of them reformed the market completely. None was able to create the full set of institutions needed to oversee a market. None was able to unbundle completely the functions of generation, transmission and distribution. For most of the developing world, these five countries illustrate the basic conditions—in particular, the difficulty of disentangling the SOE from the state and creating the institutions to oversee the new markets and provide functions that previously were internal to the firm.

Our selection of countries includes variation on many dimensions. One, in particular, is primary fuel. The cases selected include all the major primary fuels—hydro, oil, and coal—that are currently dominate electricity generation in most of the world. In each case the “new” fuel envisioned by most policy makers is gas—as in most of the world—allowing us to observe different competitions as natural gas rises as a world fuel.

Primary fuel matters because the systems for supplying primary fuels are organized very differently, and each case study will outline the operation of those fuel systems. Coal requires an elaborate mining and transportation network (usually railroads, but barges in some cases)—itself often owned by the state. Hydro systems require massive capital expenditure and demand integrated management of whole river basins that corresponds well with a single, state-dominated system of utilities. The operating costs of hydro systems are low and thus it is particularly difficult for alternative fuels—with higher marginal costs—to unseat the incumbent. Oil power has high opportunity cost—the oil could be exported, earning high revenue—which should favor less costly fuels where they are available. The high cost of oil may also ease the entrance of gas-fired electricity, which in most of the world is the new fuel of choice. Comparisons across these cases allow us to investigate whether these differences in the structure of fuel markets matter. We would expect that markets that require elaborate organization would tend to reinforce the role of the state and make it difficult to disentangle the many different functions of the firm. However, systems that require massive capital investment may be more prone to trigger financing crises that, we expect, will be the main catalysts for restructuring.

Like all studies that make use of new, in-depth case studies we face the need to balance comprehensiveness and practicality. Our selection of cases, while spanning a range of relevant experiences, is vulnerable to the critique that we over-represent failed outcomes. In none of these five countries has the reform process, for whatever reason, implemented the standard textbook model (or anything close to that model). Yet there are examples in the advanced industrialized world—England & Wales, the PJM interconnection in the US, parts of Australia, and presently most of the European Union—where the standard model has been put into practice. Our reply to that criticism is that our study is limited to the attempts at reform in weak institutional environments—where the rule of law is highly imperfect, truly independent and powerful regulators are extremely difficult to create, and it is very difficult to establish institutions in which rules rather than solely political interests determine outcomes. The results from our study do not apply to the advanced industrialized countries—and perhaps a few developing countries, such as Singapore—where it has proved feasible to establish law-based institutions for markets. For about four-fifths of humanity, however, the results from this study probably have considerable relevance.

A potentially more damaging critique is found in our omission of textbook reform examples from the developing world—notably, the most often cited cases of Chile and Argentina. Chile is a special case for at least two reasons. First, reformers operated within the power of a military state, which allowed nearly simultaneous and broad-based reforms that have not been evident in any other developing country. Second, and more importantly, Chile has not implemented the standard textbook model. The power system in Chile is dominated by a few firms, raising serious questions about market power. Chile’s regulatory authority is seen as a model in the region; yet in-depth studies show that the monopoly aspects of the business still

earn extraordinary returns (approaching 30% annually), far above what would be justified by Chile's relatively low-risk investment climate. This suggests that Chilean regulators have never been able to perform their central task—to set tariffs in the public interest. Argentina is a potentially more damaging case. There, technocratic reforms under President Carlos Menem seem to illustrate that in a typical major developing country the textbook can be applied—albeit under reform-minded leadership with a political mandate for reform. The problem with the Argentine example is that the very compromises that were needed to sustain the reform appear, in the end, to have undermined the achievements of reform. The financial crisis of 2001 has exposed foreign investors in the power sector to a dramatic devaluation, while keeping in place their hard currency-denominated debts. At this writing, the process of undoing the reforms in the power sector seem likely to recast the power system more in the model of the “hybrid market” that we examine in this book—however, at present, it is too early to make a robust assessment. As in Brazil, in hard times the power regulators have been undermined in Argentina as the political need to keep electricity rates from following a true market-based solution has, for the moment, put markets in the background as the state assumes center stage. We revisit these issues in the conclusion as we probe whether and where we are able to apply our findings more generally.

## VI. CONCLUSION

For long, the political, legal and institutional dimensions of market reforms have been viewed as “barriers” to be cleared. With enough political will, an entrepreneurial leader, and credible policies these barriers can be overcome and reform can proceed. An ideal model is known and with enough effort mustered the existing system can be shocked into a form that approaches that ideal.

We argue that that approach is much too simplistic. The difficulty of reform stems from the nature of state-centered systems—their financing, the many ancillary social functions that are performed by SOEs, and their systems of governance and control. Those attributes, we suggest, lead to predictable patterns of behavior in the reform process. We suggest that they will explain why efficiency alone is unlikely to be an adequate motivator for reform. They also suggest that the process of reform is likely to become intertwined with reforms in other aspects of the economy, such as fuel markets, as well as reforms in financial markets, accounting practices and corporate governance. Financing, in particular, appears to be the key variable.

In a concluding chapter we revisit the main questions and expectations from this chapter, and we focus on the outcome that is strikingly common across all the cases. There is no wholesale application of the “standard textbook model” but, rather, a reform that yields hybrid markets—part state, part market. In the conclusion we outline some attributes of hybrid markets and their implications for regulators, investors, and the managers of the incumbent SOEs. We also explore the political and economic dynamics of electricity reform in the context of the energy policies of these leading developing nations whose actions are critical to the global future of both development and environment.