

# Taking Stock of the Political Economy of Power Sector Reforms in Developing Countries

## A Literature Review

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## Abstract

The power sector reform experiences of developing countries vary greatly. To help explain this from a political economy perspective, this paper reviews several dozen statistical analyses, multi-country case studies, and development practice publications. The frame of reference is the model of market-oriented reforms that became a global norm in the 1990s. Findings are organized in terms of the history, theory, motives, processes and outcomes of reforms. Market orientation emerged around the 1980s as part of a shift in economic theory and policy away from state control, and was expected to improve efficiency and investments. Reform advocates never took political economy issues into full consideration. Yet, policy makers have had sociopolitical as well as technical motives for reform, such as crisis response. International norms and competition for foreign investment and trade pulled governments to model reforms, while development partners pushed them as a condition of aid. Reform implementation has been characterized by strong tensions among different public and private interests. Concretely, 1990s model reforms were based on a logic of

depoliticizing pricing and investment decisions; often placing policy makers in a conflict of interest situation. Thus, the political costs and risks of reform have often exceeded the benefits perceived by local decision makers, especially as reforms did not generally result in immediate benefits for citizens. In practice, incremental, inclusive processes may be better than quick and stealthy reforms that sidestep stakeholders' concerns. While there was limited evidence of efficacy at the time the reforms were implemented, ex post the outcomes of reforms are ambiguous, as improvements in some areas have been offset by negative results elsewhere. For increasing access to electricity and clean energy, 1990s model reforms may help, but they are neither necessary nor sufficient, nor did they focus on these objectives. In conclusion, the success or failure of policy prescriptions such as 1990s model reforms are contingent on dynamic, context-specific institutions as well as factors beyond the sector. More work is needed on integrated, flexible approaches to think and work politically in the sector, and to account for new technology and diverse sector development objectives.

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# Taking stock of the political economy of power sector reforms in developing countries: A literature review

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*“Power market reform is an inherently political process... often an arena of conflict between competing interests that are of fundamental importance to society”.*  
*Besant-Jones (2006: 14)*

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# 1. Introduction

## 1.1 Objectives

**This paper reviews literature on the political economy of the electric power sector of developing countries, with a focus on the 1990s model of market-oriented reforms.** It is part of a World Bank knowledge program that aims to update the frame of reference for institutional pathways and market models to improve energy sector outcomes in developing countries, with special attention to goals of universal access and clean energy.<sup>1</sup> The departure point is the model of market-oriented power sector reforms that became an international norm in the 1990s. These reforms aimed to improve economic efficiency and attract private investment, among other objectives. To understand 1990s model reforms through a political economy lens, this paper also examines their history and theory in the context of broader energy sector and development issues.

**Many countries have pursued at least one element of 1990s model reforms, but there are frequent gaps between policy and implementation, and cases of reform reversal.** Core reform elements include: separating utilities for generation, transmission and distribution; maximizing private ownership and competition; and establishing an independent regulator, especially to ensure that prices reflect costs. Between 1995 and 2015, only a small minority of developing countries adopted all of these reforms (Foster & others 2017), not to mention other elements that may be considered part of the 1990s model. While most developing countries have implemented some element of reform, the sequence and package of reforms in many countries has been at odds with the supposed logic.

**A sizeable and growing literature attempts to explain these diverse country experiences in technical, economic and socio-political terms.** In this literature, there is a broad consensus that ‘politics matters’ to successes and failures of market reform. However, not many publications review reform experiences from an explicit political economy perspective. The topic is important for at least two reasons. First, some actors continue to advocate 1990s model reform elements. Clearly, political economy factors should be carefully considered in this regard. Second, a better appreciation of the political economy of market-oriented reforms may help inform broader energy sector policy interventions, especially as the sector context changes.

**Evolving policy concerns and disruptive technologies affect the power sector’s political economy.** In 2015, the United Nations’ 17 Sustainable Development Goals (SDGs), and Paris Agreement on Climate Change, were made. These reflect an unprecedented articulation of global concerns relevant to the sector. SDG 7 is to ensure access to affordable, reliable, sustainable and modern energy for all. The Paris Agreement embodies a shared expectation that all countries will increase efforts over time to achieve global net zero carbon emissions by the end of this century, through nationally-determined contributions.

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<sup>1</sup> The *Rethinking Power Sector Reform* program is organized around six interlinking themes: cost recovery; utility governance and restructuring; power markets; regulation; political economy; and technological change. Outputs, besides this paper, include Foster & others (2017), Huenteler & others (2017), Bacon (2018), Rodríguez Pardina & Schiro (2018), and Rudnick & Velasquez (2018).

Meanwhile, rapidly advancing technologies are disrupting the status quo of power sector economics and institutions. This context presents a challenge for any global prescriptions of sector institutions.

**The paper aims to answer several questions on the political economy of power sector reforms.** The questions are addressed in corresponding sections of the paper, as follows.

- *Section 2 concerns the history and theory of market-oriented reforms in the power sector.* What are the origins of these reform ideas? What problems have the reforms tried to solve, including market failures and governance risks? How have political economy concerns been addressed by reformers and advocates, including development partners?
- *Section 3 examines 1990s model reforms in practice.* What interests and ideas have driven key actors to pursue or question reforms? Were these ideas aligned with the theoretical benefits of reform? What factors have shaped how resulting institutions and policies address the market failures and governance risks?
- *Section 4 discusses development outcomes following 1990s model reforms.* What have model reforms achieved in technical, financial, and socio-economic terms? Are model reforms compatible with broader socio-economic goals, especially expanding electricity access for low-income households, and reducing negative environmental impacts? Do new technologies and global development priorities change the outlook on these questions?
- *Section 5 concludes with a synthesis of key findings from preceding sections.* Are 1990s model reforms still relevant? What future work could help relevant actors better ‘think and work politically’ to address ongoing sector challenges?

The remainder of Section 1 introduces the concept of political economy, and the sources and methods of the literature review.

## 1.2 Defining political economy

**In simple terms, ‘political economy’ is politics and economics considered together.** There are several ways to explain and analyze political economy, with common elements but no standard formulation in the literature. Many scholars regard politics and economics as interrelated topics that cannot be understood in isolation.<sup>2</sup> Indeed, past practice of economics has been criticized for “purely theoretical and often highly ideological speculation, at the expense of historical research and collaboration with other social sciences” (Piketty 2014: 36), particularly in the mid-twentieth century in the United States of America (US).<sup>3</sup> This

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<sup>2</sup> World Bank (2008: 4) defines political economy as “analysis that studies the linkages between politics and economics, drawing on theories of economics, law as well as political and social sciences”. O’Hara (2009: 853) considers political economy, and economics, both at base “attempts to understand how societies provide for their members and how goods and services are distributed”. Economics is integral to Leftwich’s (2007: 3) definition of politics as “all the activities of cooperation, conflict and negotiation involved in decisions about the use, production and distribution of resources”.

<sup>3</sup> When the term first appeared, in 18<sup>th</sup> century English, ‘political economy’ meant the *conditions of production organization in nation-states*, including political aspects. The same subject became known simply as ‘economics’ from the late 19<sup>th</sup> century (World Bank 2008: 4). However, in the second half of the 20<sup>th</sup> century, dissatisfaction with an increasing “narrowness of economic analysis” led to revival of ‘political economy’ as a now distinct term in recognition of the “psychological, sociological and political forces that affect individual behavior and economic performance” (O’Hara 2009: 853).

history is important to note given that market-oriented reforms were heavily influenced by teachings of University of Chicago economists from the 1950s to '70s, concurrent with a view that economics can or should be 'non-political'.<sup>4</sup> More recent efforts to broaden the scope and methods of economics to integrate insights from other disciplines include 'new institutional economics' (North 1990, Ostrom 2005, Acemoglu & Robinson 2016), behavioral economics (World Bank 2014), and analysis of power relations and governance in development (World Bank 2016).

**Key elements of political economy include how people as individuals and groups interact to pursue specific interests given different ideas, means of influence, and use of institutions in a given context.**

These concepts can be elaborated as follows, not as a definitive formulation, but to introduce them as understood for this review, and to explain their relevance to the power sector.

- *Actors.* These are individuals and groups, including formal and informal organizations and coalitions. Actors in the power sector cover: users—households, industry, and government, etc.; suppliers—owners, managers and employees of public or private generation, transmission, distribution, and retail utilities; the state—political parties, legislators, the executive branch, regulatory bodies, and the judiciary; and all those engaged in the sector through finance, information or other means—taxpayers, investors and shareholders, development partners, media, civil society organizations, trade unions, and industry associations.<sup>5</sup>
- *Interests and ideas.* These are actors' motives, needs, mental models, world views, ideologies, incentives, and responsibilities. Archetypal interests in the energy sector span the gamut of human needs. For example, electricity can facilitate access to basic services of water, food, heat, light, personal security, and transport. Financial security is boosted by buying electricity at an affordable price, selling it at profit, or securing work in the sector. Environmental security depends in part on choices about energy technologies. More abstractly, involvement in the sector can provide belonging and esteem for individuals: sector professionals identify with norms among peers, and politicians who vie for positions of public office. At a macro-level, sector assets are often critical to public safety and the basic functioning of the economy. The sector thus also concerns national security. Ideologies can profoundly shape attitudes to forms of ownership and control of energy assets (Hansmann 2009: 7).
- *Influence and interactions.* This refers to the power or ability of an actor to affect the behavior or choice of actions available to others. It may be formal (*de jure*) or actual (*de facto*) (Acemoglu & Robinson 2009). Areas of influence in the power sector include planning and procuring new electricity supply infrastructure, making and enforcing environmental standards, setting prices, choosing suppliers, voting in elections, and appointing individuals to office. Influence depends on availability of information, and cognitive capacities, which may differ across actors (Bhattacharyya 2011: 691). Each action may involve cooperation, competition, conflict, coercion, and exclusion.

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<sup>4</sup> Notably, the World Bank's Articles of Agreement (IBRD 1945: Article III, Section 5) treat economics and politics as mutually exclusive matters, and prohibit "political or other non-economic influences or considerations" in its activities. Historical reasons for this include prevailing 'functionalist' ideas that development could be achieved through technical solutions (Cissé 2011: 60-61). Later legal interpretation of the Articles acknowledges that "politics and economics are often two sides of the same coin" (Leroy 2012: 9), such that it is appropriate for the World Bank to "consider political issues that have implications for economic development (Khemani & others 2016: 237), so long as "partisan politics or ideological disputes" are not involved (Leroy 2012: 9). See Section 2.1 for further context on the World Bank and its leading role in 1990s market reforms.

<sup>5</sup> We prefer the term 'actor' to 'stakeholder' or 'agent'. The latter two terms imply a relationship to a specific issue, whereas sector reforms involve various issues, dynamic relationships. Individuals and groups may also belong to multiple categories at once.

- *Institutions.* In general terms, institutions are rules governing human interaction (North 1990). These comprise formal rules such as laws, and informal social norms such as stigma against corruption. Institutions shape incentives and means of influence, and are a target of reforms, but they can also shape the process and feasibility of reform.
- *Context.* This is the social, economic, and physical environments in which actors operate, at local, regional, and global levels. Aspects that constitute context include demographics, income levels, drivers of social exclusion, industry structure, technologies, pollution levels, geography, and natural resources. Context shapes actions, and actions can also shape context over time.

**In political economy analyses, it is important to acknowledge that analysts and their audiences are also actors with ideas and interests, who may seek to influence others.** A boundary between normative and descriptive study of political economy can be unclear (O'Hara 2009). In other words, no analyst or audience is ever entirely disinterested. Even the most scientific analysis of an issue might be construed as intentionally or unintentionally serving some agenda. International development partners may analyze political economy in a country while also seeking to influence that country's development in some direction. The political economy of development partners is a key strand of literature, discussed in sections 2 and 3. The introspective nature of political economy analysis is no reason to shy away from the topic, but there is value in self-reflection and careful communication of intent. Our approach to political economy for this paper is outlined further below.

**Features of the power sector that shape its political economy include the dual public-private nature of electricity services, the multiple market failures, and governance risks.** The power sector comprises the infrastructure, goods, services and institutions that facilitate generation, transmission, distribution and sale of electricity. Economic benefits of electric power infrastructure and services straddle the categories of a public good, private good, club good, and commons resource.<sup>6</sup> Each of these categories implies a different role for governments and markets, with associated risks. Monopoly characteristics arise from economies of scale across the supply chain, and grid network effects (Bhattacharyya 2011). The sector's long supply chain leads to split incentives (e.g. an individual generator earns more money if a user wastes electricity). Many forms of power generation also involve negative externalities of pollution. These justify regulation to prevent inefficient or exploitative practices. In addition, risks of outages in transmission and large generation assets present a system-level negative externality, which warrants collective management for security. On the other hand, large capital expenses, procurement and employment opportunities, regulation, and price-setting all create avenues for rent-seeking and patronage. This is especially the case with state-owned enterprises (SOEs). Each market or government failure implies the need for institutions to provide incentives for the desired outcomes. In sum, every decision about a power system "generates

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<sup>6</sup> These four categories derive from whether the good or service is excludable (i.e. whether an actor can easily exclude another actor from using it), and rivalrous (i.e. whether an actor's use of it reduces the potential of others to use it at the same time), or not (Scott & Seth 2013). For example, utilities can exclude users by denying a connection, disconnecting service, or shedding load in contingency events. Yet informal or illegal connections can circumvent the utility's authority to exclude users. Use of the grid is rivalrous in peak conditions, and non-rivalrous off-peak, at each level of transmission and distribution. On the supply side, system operators can exclude plants from supplying the grid through dispatch or curtailment orders, but some sources (e.g. distributed solar) may be difficult to exclude. Opposite to power use, power generation is rivalrous in off-peak conditions.



political benefits and costs that are often as critical as the technical and economic factors that dominate project plans and official discourse” (Min 2015: 163).

**A central purpose for power sector policies and institutions is to find a balance of roles for public and private actors, where model reforms are one of many possible approaches.** If ‘reform’, in general, is about improving some institution or practice,<sup>7</sup> then different actors can understandably have different ideas about what constitutes ‘improvement’. In this respect, all reforms have a political economy dimension. By moving from one set of institutions and incentive structures to another, reforms create winners and losers (Trebilcock 2014). Reform thus also changes the sector’s political economy. The feedback loop of political economy shaping reform and vice versa makes the process and outcomes somewhat uncertain. The challenge becomes even greater when reform involve steps over time in contexts subject to rapid change, as is the case for power sector reforms in most developing countries. As bargaining accompanies the process of reform, actors may exploit uncertainties to serve their own self-interest, motive and perceptions about the reality, with a “danger of derailment at every stage” (Bhattacharyya 2011: 690-3). For all these reasons, political economy issues are integral to analysis of countries’ reform experiences.

### 1.3 Sources and method

**There is a substantial literature on power sector institutions and market models, some of which implicitly addresses political economy concepts and dynamics, while a small but increasing share addresses them explicitly.** Available works cover a spectrum from qualitative case studies and historical narratives of individual countries, to statistical analyses of cross-country data for various parameters. Between these two extremes, some studies employ a mixed method: combining quantitative and qualitative analyses of several countries. The literature also varies in whether a work upholds or critiques market-orientation as a norm to follow, and whether it aims to merely inform or rather to influence an audience. Guidance for policy makers and development partners on power sector reform is naturally prescriptive, including publications by development partners themselves. There are also academic critiques of these prescriptions and of development practice in the sector.

**Very few publications review literature on the political economy of the power sector in developing countries.** While Victor & Heller (2007) contains a literature review with similar focus to this paper, it misses over 10 years of more recent scholarship. Other reviews of related literature have a different scope to this paper. Erdogdu (2014a, 2013) catalogs studies on power sector reforms in general. Eberhard & Godinho (2017) provide an overview of empirical research on market reform experiences in developing countries. Jamasb & others (2015), Sen & others (2016), and Urpelainen & others (2017) review theoretical and empirical literature on the relationship between reforms and sector outcomes. More specific reviews of literature on political economy in the power sector focus variously on electricity distribution in developing countries (Scott & Seth 2013), aid for power sector reform (McCulloch & others 2017), subsidy reform (Kojima & others 2014, Inchauste & Victor 2017), and electricity access (Barnett & others 2018).

**This paper builds on these recent efforts by taking a more expansive approach to bring together key findings on the political economy of power sector reforms in developing countries in recent decades.** The present review covers several dozen statistical analyses, multi-country case studies, and development practice publications. This literature includes works from peer-reviewed journals and diverse other sources.

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<sup>7</sup> *Oxford Dictionaries*, “reform,” accessed April 2018, <https://en.oxforddictionaries.com/definition/reform>

The review is selective rather than exhaustive. Only literature in English was included, identified through desk-review, and consultation with several experts. Table 4 and Table 5, in Appendix A, list the primary statistical analyses and country case studies reviewed, and key parameters thereof. Literature authors acknowledge limitations of their studies, especially of statistical analyses. Reform measures interrelate with “a vector of political, economic and institutional factors that are difficult to quantify” (Jamasb & others 2015: 39). Moreover, lack of random treatments means that where studies identify associations among parameters, it is impossible to prove causation. Explanations for statistical observations are thus largely speculative, while some are supported by case study findings.

**The literature includes various emerging approaches to the analysis and treatment of different elements of power sector reform.** Some scholars have proposed frameworks for cross-country comparison, while others are rooted in case studies in a single country. A selection of different approaches is summarized as follows. Their emphases vary, but many ideas overlap.<sup>8</sup>

- *Market and government failures.* Vickers & Yarrow (1991) frame sector challenges in terms of the risk that welfare objectives diverge from profit objectives in private firms, or from political or bureaucratic objectives in SOEs, due to market and government failures respectively. ‘Monitoring failure’ also results from divergent objectives of enterprise managers and their principals. The effects of reform depend on the “relative magnitudes of these imperfections” (p.130).
- *Governance and social behavior.* The World Bank (2003) distinguishes different paths of accountability that are important to ensure services reach the poor. The ‘short route’ is directly between users and service providers, versus the ‘long route’ via government. Dixit & others (2007) provide a ‘toolkit’ to assess four basic elements of ‘good governance’ in the power sector: public participation; transparency; accountability; and capacity. Their 65 indicators measure the extent to which these principles apply in policy (institutions, policy formulation, and implementation), regulation (structure, decision-making processes, and operations), and environmental and social concerns. Other authors employ a ‘rational-choice’ approach, focusing on the challenge of making credible commitments, especially to enforce contracts (Schiffer & Weder 2000; Zelner & Henisz 2000; Kessides 2004).
- *National and sectoral structures.* Victor & Heller (2007) argue that stalled reform efforts, and hybrid state-market outcomes, are due to structural forces rooted in country factors. They focus on four attributes to explain sector outcomes: primary energy source (e.g. coal, hydro); supply adequacy (over- or underinvestment); reform strategy (sequence of focus on distribution versus generation, and variation in regulatory practice); and national government structure (federal versus centralized). Scott & Seth (2013) explore sector characteristics that affect outcomes in electricity distribution services, in particular different types of economic good, market failure, supply tasks, and consumption. They also map underlying governance dynamics and features of the broader political system. Dubash & others (2018) analyze the relation of politics and electricity outcomes in Indian states with reference to four attributes: public demand for electricity access and service quality; public demand for electricity subsidies; cost of electricity supply; and availability of public finance for governments to subsidize the sector. These factors interact with broader ‘state political economy’ and reform attempts.

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<sup>8</sup> The examples listed here pertain specifically to electric power or other infrastructure sectors. See Section 2.3 for further discussion of evolving approaches to broader political economy analysis.

- *Multi-factor frameworks.* Eberhard & Godinho (forthcoming) identify 40 ‘focus areas’ which they map to some 30 relevant authors or theories, and group under five ‘political economy components’, as a step toward a framework to analyze the political economy of power sector reforms, rooted in the breadth of relevant theory. The five components are: national structural characteristics (e.g. macro-economy, demographics); political and economic institutions (beyond the sector); sector analysis (including actors, policy, and the reform ‘arena’); policy and reform process; and situational or temporary factors.

**We organize the review in terms of the history, theory, motives, processes and outcomes of 1990s model reforms, through a political economy lens.** To conduct this review, we take 1990s model reforms as the frame of reference. We describe and discuss model reforms and associated studies in terms of political economy elements as identified in Section 1.2 (actors, ideas, interests, interactions, influence, institutions, and context). To organize the paper, we examine four intuitive aspects of the reforms, in turn: (i) *history and theory*—the origins and evolution of the 1990s reform prescriptions; (ii) *motives*—the interests of actors to pursue reform, perceptions of the expected impacts and feasibility of reform; (iii) *processes*—the interactions of key actors, and use of means of influence, and of institutions in the implementation of reform; and (iv) *outcomes*—changes associated with reform, which may or may not serve key actors’ motives. These aspects apply to the set of questions posed in Section 1.1. Given the volume of material covered in Sections 2 to 4, each sub-section in these begins with select key messages. Table 2 (page 37) summarizes findings on process and outcomes according to key elements of 1990s model reforms. Section 5 revisits the above questions to consider implications for future work.

## 2. History and theory of 1990s market-oriented reforms: Why reform and how?

### 2.1 Sector reforms were part of a swing away from prior norms of state control

- *The power sector has gone through historical phases of norms from markets to government intervention and back, in line with broader economic, political, and technological changes.*
- *Reform experiments in the 1970s and ‘80s, based on free-market ideas from Western thought-leaders, spread to developing countries for geopolitical and other reasons, often through development finance.*
- *Changing technologies and policy priorities since the 2000s suggest new roles for governments and markets, but this is not accompanied by a new global norm on sector institutions.*

**In the early days from the 1870s to 1920s, electric power services were largely unregulated, elite, and private.** Bhattacharyya (2011: 684) considers this the first of four ‘phases’ of institutional norms in the power sector to date. In most countries, supply began as a fragmented market of local power providers owned by decentralized private companies or municipal governments (Besant-Jones 2006). Beyond public street lighting, private users of electricity were mostly firms and privileged households.

**From the 1920s onwards, as electricity became a mass public good, governments took increasing control over the sector, and utilities grew from oligopolies to monopolies.** To meet growing demand for electricity, larger integrated supply systems captured economies of scale and of scope, which allowed cost and prices to decline. Many governments came to consider the entire sector as a natural monopoly, whereby integration would minimize the costs of coordination between supply chain functions and finance (IEA

1999). States could also capture economies of scale by funding large projects with high capital costs, which were less easily financed by private investors. State control in the sector was thus justified on grounds of economic efficiency, in addition to public policy objectives of consumer welfare, national security and industrial growth (Besant-Jones 2006, Brown & Mobarak 2009). To avoid the monopoly's negative outcomes, such as excessive profits, solutions included public ownership or regulation. This 'second phase' continued through the twentieth century.

**From the 1940s to '60s, developing countries established state-owned monopoly utilities in a wave of consolidation and nationalization.** These efforts received external support including from the World Bank.<sup>9</sup> Public monopolies in the power sector were considered "generally satisfactory in most developing countries, in an environment of low inflation and low debt levels, and with governments allowing utilities a significant degree of managerial autonomy" (World Bank 1993: 34). More broadly, public investment in infrastructure, and management of markets for economic stability, were consistent with 'Keynesian' economics that dominated many developed countries from the 1940s to '70s (Jahan & others 2014).<sup>10</sup> In parallel, public monopolies aligned with socialist and nationalist ideologies that prevailed in the many newly-independent developing countries. The US' own model of regulated private investor-owned monopoly utilities was "widely admired and exported abroad in postwar years, though few developing countries had the capacity to duplicate the public-private checks and balances inherent in the American system" (Williams & Dubash 2004: 415).

**In the 1970s and '80s, various economic and political factors aligned to trigger a paradigm shift away from state control.** Countries exhausted economies of scale and scope in the power sector at different times based on fuel, technology, and legacy of prior policies (Victor & Heller 2007: 263). The 1970s' oil crises made countries aware of their vulnerability to fuel imports. This contributed to growing consciousness of the benefits of energy conservation, especially in the US, where nuclear problems also eroded trust in the utilities. The oil crises also contributed to global economic recession, and Latin America's debt crisis in the 1980s. Indebted countries turned to the International Monetary Fund (IMF) and other foreign sources for finance. Newly-developed combined cycle gas turbine (CCGT) power plants were more efficient than existing fossil fuel power plants, at a smaller scale. This dramatically reduced the capital requirements as well as the marginal cost of power generated from new plants. Advances in information and communication technology (ICT) made it easier to coordinate grid operation and integrate independent plants. But these gains were offset by several challenges. Average costs of power generation reflected sunk capital for older assets that became uneconomic before the end of their expected life. As high-income countries' demand growth slowed, their power companies expanded business to developing country markets. Subsequent poorly-managed international capital flows contributed to the 1997 Asian Financial Crisis, prompting further support from the IMF and World Bank.<sup>11</sup>

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<sup>9</sup> The World Bank's history and political economy context are important to note given its later leading role in sector reforms. Established at the end of World War II, its Articles of Agreement enshrine the US as its largest shareholder, followed by the United Kingdom of Great Britain and Northern Ireland (UK). The Union of Soviet Socialist Republics (USSR), originally scheduled to be its third largest shareholder, never joined. See Kapur & others (2011) for a fascinating account of the World Bank's history, and Collier (1984) for its early, prominent support to the power sector of developing countries.

<sup>10</sup> The school of thought, named after British economist John Maynard Keynes, was considered 'revolutionary' in the 1930s (Dostaler 1998). Keynes, representing the UK, was also instrumental in drafting the World Bank Articles of Agreement.

<sup>11</sup> See also Hunt (2002: 26-27), Victor & Heller (2007: 3), Gratwick & Eberhard (2008: 3949), Williams & Dubash (2004: 421).

**Market-oriented power sector reforms began as experiments based on economic theory, taken up by political leaders.** Beginning in 1978, Chile was the first country to pursue comprehensive market reforms in its power sector (Bacon 1995). Chile fused different elements of existing arrangements in England, Belgium, and France (Pollitt 2004). But the ideological foundations can be traced to the US, in particular Milton Friedman and Friedrich Hayek at the University of Chicago. A generation of Chileans known as the “Chicago Boys” studied economics there from the 1950s. When Augusto Pinochet took rule of Chile in 1975, he empowered newly-appointed officials from this group to pursue a ‘revolutionary market society’, including in the power sector (Clark 2017). Friedman had already asserted the success of free-market ideas by the late 1960s, as a ‘counter-revolution’ to Keynesian economics.<sup>12</sup> The influence of these ideas reached new heights when UK Prime Minister Margaret Thatcher and US President Ronald Reagan took office in 1979 and 1981, respectively. Thatcher’s pursuit of economy-wide market reforms included enactment of full reform in the power sector by 1989, with a wholesale market of unprecedented complexity (Erdogdu 2014b). The US 1978 ‘Public Utilities Regulatory Policy Act’ allowed relatively efficient independent power producers (IPPs) to serve the grid and so conserve energy in response to the oil crises. Yet by facilitating competition with incumbent monopolies, the Act paved the way for subsequent broader ‘restructuring’ in line with the liberal economic agenda of Reagan and his successor, George H. W. Bush.

**By the 1990s, market-oriented reforms in the power sector had crystallized into a global norm, albeit with alternative formulations.** Early reformers’ market-oriented experiences involved a loose set of different ideas. The reform literature brought these together into what was subsequently called a “blueprint for action” (Bacon 1995: 124), a “standard model” (Littlechild 2001: 1), “standard prescription” (Hunt, 2002: 8), “textbook architecture” (Joskow 2008: 11), and Bhattacharyya’s (2011) ‘third phase’ of sector norms. However, this apparent commonality disguises many different ways to describe model market power sector reforms in detail. Table 1 summarizes how eight publications retrospectively define model reform elements and their objectives. The definitions of ESMAP (1999), Conway & Nicoletti (2006), and EBRD (2010) are normative. Others are descriptive studies of countries.

**Depending on the level of detail considered, model reforms may have seven or more elements.** These include: (1) legislation to institute subsequent elements; (2) establishment of an independent regulator; (3) separation or ‘unbundling’ of utilities, both ‘vertically’ (e.g. to separate generation from transmission and distribution) and ‘horizontally’ (e.g. to separate different generation companies or distribution service areas);<sup>13</sup> (4) corporatization and commercialization of utilities; (5) private sector participation through IPPs which may or may not be competitively selected, and through ownership of utilities; (6) market liberalization through open access to the grid for new providers, and through competition at wholesale and retail levels;<sup>14</sup> and (7) efficient pricing, which would result from competition, or in its absence, from

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<sup>12</sup> See Dostaler (1998) for analysis of how Keynes’ and Friedman’s theories are grounded in their respective political views. See Springer & others (2016: 3) for belief in markets as ideal institutions not only for economic efficiency but on moral and political grounds, and for critical discussion of the term ‘neoliberalism’ in associated literature.

<sup>13</sup> It may also be structural (by divesting) or functional (by isolating business units within a company).

<sup>14</sup> Markets can be for energy (i.e. power generated for a period of time), as well as capacity (i.e. potential to generate power on demand) and various other ‘ancillary services’. While energy markets receive more attention in the literature, other services—with or without markets—are critical for grid stability and security, especially in systems with high variability, such as where hydropower, solar photovoltaics, or wind constitute a significant share of installed capacity.

regulation.<sup>15</sup> Joskow's (2008) theoretical description of model reforms include additional elements.<sup>16</sup> However, no available comparative study uses more than those shown in Table 1, and many focus on a narrower subset. Bacon (2018: 57) puts this down to lack of data, as well as the small number of developing countries that pursued more than a few elements, even though all elements are "identified as necessary to obtain the maximum benefits". The objectives and variations of model reforms are discussed in Section 2.2, followed by concurrent critiques in Section 2.3. First, however, to complete the historical perspective, it is worth noting factors that contributed to the reforms becoming a norm, and subsequent sector developments.

**Table 1: Summary of power sector market-oriented reform elements as measured in eight comparative studies**

Reform element	Implied state with no reform	Implied state with full reform	Number of studies to measure it	Reform element objectives
(1) Legislation	No law provides for regulator, unbundling, etc.	Law provides for regulator, etc.	3	Pave way for other reform elements. Greater certainty.
(2) Independent Regulator	Government (which may own utilities) directly provides all regulatory functions.	Regulator separate from other government bodies and from utilities	6	Hold utilities accountable. Set prices (absent competition). Less political intervention. Greater certainty.
(3) Commercial, corporate utilities	Utilities run as government agencies (few commercial freedoms or pressures).	Utilities are corporations, and operate on a commercial basis.	4	Better management. Use profit to incent efficiency. Less political intervention. Facilitate unbundling and privatization.
(4) Separate utilities	Single entity for generation, transmission, distribution, and retail.	Separate entities for generation, transmission, distribution, and retail.	8	Remove conflicts of interest across supply chain. Improve management. Pave way for competition.
(5) Private sector participation	All power is generated by state-owned utilities. All utilities are state-owned.	Power is generated through IPPs. Utilities are privately owned.	8	Incent efficiency and private investment. Reduce need for public capital. Allocate risk efficiently.
(6) Market competition	Only one supplier (and its customers) can access the grid. Each utility is a monopoly.	New 'third-party' suppliers can access the grid. Competition in wholesale and retail markets.	7	Incent efficiency and innovation. Downward pressure on prices.
(7) Efficient Pricing	Electricity prices (set by government) do not reflect costs nor incent efficiency.	Electricity prices (set by regulator or market) reflect costs and incent efficiency	2	Efficient supply and use of power. Attract private investment. Less subsidy burden.

Source: Original based on ESMAP 1999; Rufin 2003; Conway & Nicoletti 2006; Nagayama 2009; EBRD 2010; Erdogdu 2011; Sen & others 2016; Foster & others 2017. For details see Table 3 in Appendix A.

**From the 1980s to '90s, with the culmination of the Cold War, the promotion of market ideas took on strong geopolitical dimensions.** The fall of the Berlin Wall in 1989, and Soviet Union's collapse in 1991, represented a critical juncture for countries in Eastern Europe and Central Asia to reconsider their approach to markets. In 1990, Western governments established the European Bank of Reconstruction and Development (EBRD) with the explicit mandate to support multiparty democracies and market economies in Central and Eastern Europe. Former-Soviet states, including the Russian Federation, also joined the IMF and World Bank around this time. Most 'transition economies' already had near-universal electricity access and adequate or excess capacity, but their average electricity prices were generally well below costs (Bacon

<sup>15</sup> This order of elements does not indicate relative importance or implementation sequence, which vary as discussed in Section 2.2.

<sup>16</sup> Joskow (2008) includes: horizontal integration of transmission facilities and network operations; active 'demand-side' institutions that help customers respond to market signals; mandates for distribution companies to supply households and small businesses where retail competition is unavailable; and 'transition mechanisms' to help move from the old system to the new.

2018). For some, the prospect of joining the European Union (EU) gave a strong incentive to follow EU power sector norms.

**International financial institutions were instrumental in diffusing market ideas to other countries.**

Reflecting the “new wave in neoclassical economic orthodoxy”, a 1981 study on Sub-Saharan Africa marked the World Bank’s “de facto desertion of the...doctrine that strengthening the market and the quality of management, not private versus public ownership, was the dominant industry policy consideration” (Kapur & others 2001: 21-23). In addition, the World Bank came under “strong pressures from the US Treasury [under the Reagan Administration]...to become more market and private sector oriented” (p.28). A notable feature of World Bank and IMF lending in the 1980s was structural and sectoral ‘adjustment’ programs based on market-oriented macroeconomic and fiscal policies (Jayarajah & Branson 1995). The term ‘Washington Consensus’ was coined in 1989 to describe 10 such policies supported by the US, IMF, and World Bank. Among these policies, two in particular are relevant to the power sector: privatization of SOEs; and abolition of regulations that restrict competition.<sup>17</sup> World Bank (1993) explicitly recommended enforcing conditions to make governments commit to power sector market reforms. Other multilateral development banks and bilateral donors adopted similar approaches (Williams & Ghanadan 2006).

**For reform elements to become a global norm, messengers can be as important as the message.** During the 1980s and ‘90s, the World Bank was “the single most important external source of ideas and advice to developing-country policymakers” (Gavin & Rodrik 1995: 332). This can be attributed to the scale and reach of its lending, publications, and training programs, as well as high demand from borrowing countries. Endorsement from influential institutions lends reform ideas significant credibility, such that actors more readily accept them at face-value. However, this ‘institutional rationality’ (Meyer & Rowan 1977) comes with the risk that reformers may pay less attention to how well a norm suits the specific needs of different developing countries’ electricity sectors. In the extreme, a reform ‘story’ takes on qualities of a ‘myth’ (Xu 2006).

**In the 2000s, government intervention in the power sector has re-emerged in response to perceived limitations of model market-oriented reforms, and evolving policy concerns.** Bhattacharyya (2011: 684, 720) identifies a current ‘fourth phase’ with a “new debate...about the need for intervention in the market”. One concern behind this is security of supply including in high-income countries such as the UK, as old plants reach the end of their life and need replacing. California’s 2000-2001 electricity crisis involved striking failures of both the market and sector regulation (Hunt 2002). While these failures are not intrinsic to model reforms, the crisis nevertheless contributed to broad concern over the risks of private actors’ influence in the sector, and to a global slowdown in the pace of subsequent market reforms (Bhattacharyya 2011: 718). More recently, international concern over universal access, and clean energy, have reached new heights as reflected in the SDGs and Paris Agreement. These set a global policy agenda for the energy sector likely to continue for decades. Concurrently, technology is rapidly advancing in solar photovoltaics, wind turbines, energy storage, microgrids and distributed resources, electric vehicles, and associated ICT.

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<sup>17</sup> Another of the 10 policies was public expenditure on infrastructure. This is obviously relevant to the power sector, but is absent from how scholars define power sector market reforms. While 1990s power-sector reforms have also been called a ‘Washington Consensus’ (Foster & others 2017), here we use ‘model’ as a more neutral term, without presuming the presence or absence of consensus. See Williamson (2005) for discussion of the original and subsequent, contested uses of ‘Washington Consensus’.

These technologies are showing signs of disrupting sector economics, politics and institutions, with the potential for new kinds of markets and for new government interventions (discussed further in Section 4).

**1990s model reforms are yet to be succeeded by a new global norm on the role of governments and markets in the power sector.** Various authors have attempted to rethink sector prescriptions in light of concerns with market reforms. Many of these emphasize quality of governance, links to public benefits, and broader development objectives (e.g. Dubash 2002, ADB & others 2005, Williams & Ghanadan 2006, Gómez-Ibáñez 2007, Ljung 2007, Bhattacharyya 2011).<sup>18</sup> In a similar spirit, EBRD (2017) recently revised how it assesses countries’ “transition to a market economy”. It admits its approach from 1994 to 2016 was “fairly simplistic” and “somewhat rudimentary” in the focus on reducing the role of the state (p.115). Now, EBRD (2017) includes market reforms in the context of social, environment, and governance outcomes.<sup>19</sup> However, none of the above examples provide a fundamentally different model for power sector institutions. Indeed, ADB & others (2005: xxix) argue that “addressing the political challenge has little to do with whether the public or private sectors deliver infrastructure”. On this basis it would be unreasonable to expect any narrow prescription of government and market roles in the power sector to address bigger political economy issues.

## 2.2 1990s model reforms aim to improve sector performance in part by depoliticizing key decisions

- *1990s model reforms broadly aim to improve efficiency and attract investment, though the ‘theory of change’ depends on critical assumptions.*
- *Political leaders face competing interests in pursuing reforms to ‘depoliticize’ key decisions, especially as 1990s model reforms on their own do not generally lead to immediate, large benefits to citizens.*
- *During the global diffusion of model reforms, broad prior evidence was not available for the impacts of reforms, nor for the political feasibility of their implementation.*

**Model reforms involve a spectrum of options, of which full competition is the most complex and ‘radical’ endpoint.** Studies vary in which elements are included, the number of degrees distinguished for each element, and how each is weighed toward a single metric of overall reform. All studies summarized in Table 1 include unbundling, and IPPs or utility privatization or both. Given the critical importance of pricing to the theory of reform, it is striking that only two of the eight studies include pricing as an explicit reform element. This may reflect a view that efficient pricing was a corollary rather than a direct object of

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<sup>18</sup> Dubash (2002) recommends to: frame reform around sector goals; structure financing around reform goals (rather than vice versa); support reform processes with a system of sound governance; and build political strategies to support attention to public benefits. ADB & others (2005) propose a ‘new framework’ for infrastructure delivery based on: inclusive development; coordination; accountability; and risk management. Williams & Ghanadan (2006: 839) propose six elements of an ‘improved approach’ to reforms: ‘reality-based’ reform; stronger public enterprise; emphasis on service; effective regulation; public benefits; and social legitimacy. Gómez-Ibáñez (2007) suggests changing the political-economy of SOEs by strengthening involvement of citizens, industrial users, and private investors. Bhattacharyya (2011: 716) identifies six conditions that a power sector reform must satisfy to be considered sustainable, noting that some conditions can conflict with others. The reform must be: politically acceptable; financially viable; economically efficient; socially desirable; environmentally benign; and implementable as a project.

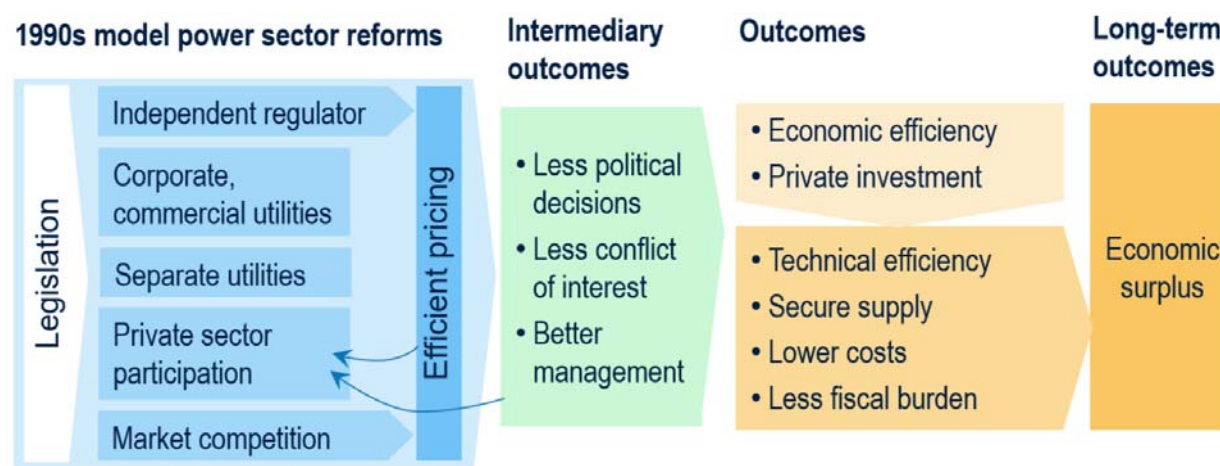
<sup>19</sup> EBRD (2017) includes market-oriented sector reform elements among others that contribute to ‘resilience’ as one of “six qualities of a sustainable market economy”. For a summary of relevant indicators from their framework, see Table 6 in Appendix A.



reform. Some studies, for simplicity, define prototypical states equivalent to a ‘yes or no’ measure of reform, as described in Table 1, and illustrated by Figure 2 in Appendix A. However, within and across each element there are the range of values that represent “a rich menu of choices” (World Bank 1993: 55). The various degrees of competition can even be considered alternative ‘models’ (Ljung 2007: 14, Bhattacharyya 2011: 699). Each option has advantages and disadvantages, as the more complex reform elements are theoretically the most effective, where full customer choice is the most ‘radical’ extreme.

**1990s model reforms can be linked to both economic and political objectives, contingent on critical assumptions.** Figure 1 below shows a general ‘theory of change’ or causal pathway from reform elements to broader outcomes, inferred from the literature as follows. Some scholars describe the primary objective of model reforms simply as ‘economic efficiency’.<sup>20</sup> Many publications elaborate other objectives, especially for developing countries (Williams & Ghanadan 2006). Financial objectives include to make utilities turn a profit, attract private investment, and thus keep costs down and reduce the need for public finance and subsidies (World Bank 1993). Technical objectives include to ensure generation capacity keeps up with demand, to reduce energy losses, and to improve service quality and coverage.<sup>21</sup> Some literature also emphasizes secondary objectives as specific as reducing pollution (World Bank 1993) or as broad as ‘sustainable development’ (Jayarajah & Branson 1995: 222). Ultimately, reforms should “maximize total economic surplus and transfer surplus to consumers” (Sen & others 2016: 6).

*Figure 1: Inferred simple ‘theory of change’ of 1990s model sector reforms leading to various outcomes*



Note: Select key assumptions include that: (1) benefits of reform outweigh the costs; and (2) governments and utilities yield influence over the sector to the regulator and markets.

Source: Original drawing on Bacon (1995), World Bank (1993), IEG (2016a) and others cited in accompanying text.

<sup>20</sup> See for example Jayarajah & Branson (1995: 222) and Hunt (2002). Economic efficiency may be understood in terms of technical production of electricity at least cost, and optimal allocation of resources across the economy (IEA 1999: 9), among other definitions. Most works reviewed for this paper that refer to efficiency do not explicitly define it.

<sup>21</sup> Jamasb & others (2015: 6) suggest that for developed countries the main financial objective is to reduce costs, and the main technical objective is to reduce excess capacity. Excess capacity can also be a problem for developing countries: see Section 4.1.

**Institutional objectives include to improve the quality of management and certainty of decisions, and to ‘depoliticize’ the sector.** Reform advocates attributed declining sector performance to state ownership and conflicts between government’s roles as utility owner and operator (Bacon 1995: 120, Ljung 2007).<sup>22</sup> Depoliticization would thus occur through establishing a regulator, corporatization, and unbundling. The government would still decide overarching policy and plans. Pricing, operational and investment decisions would be variously delegated to a combination of the market, regulator, and independent system operator. In this way, the design of model reforms at least partly responds to problems raised by the political economy of the sector. In the prototypical monopoly model, utilities are accountable to users via ‘long’ routes of the government, and bureaucratic monitoring (World Bank 2003, Vickers & Yarrow 1991). Full 1990s model market competition is supposed to provide shorter routes of accountability. These different paths of accountability are illustrated in Figure 2 in Appendix A. However, as presented, 1990s model reforms do not consider the potential need for broader mechanisms of sector accountability. Such mechanisms may be especially important in those developing countries where social or political accountability is fragile.

**The logic of 1990s model reforms is complicated by diverse ways to sequence and package reform elements, and the many possible ‘exit’ points prior to full competition.** There is an implicit natural progression from some elements to others, such as legislation that provides for subsequent reforms. But there are many possible ways to package and sequence most elements (Foster & others 2017). Some countries have allowed IPPs and utility privatization without prior corporatization or unbundling, contrary to the sequence expected by ESMAP (1999). Sen & others (2016: 27) note “a major lesson drawn from past reform experience” is that corporatization should precede distribution privatization and retail competition, to overcome failures of management and information.<sup>23</sup> Liu & others (2016) distinguish ‘textbook’ elements of privatization and competition from other, less ambitious ‘hybrid’ elements, to explain why the former are relatively rare among countries.<sup>24</sup> Overall, there is “no widely accepted typology of reform strategies” (Victor & Heller 2007: 15).

**The theory of market reforms rests on critical assumptions, without specified measures to assess and manage risks.** Among several assumptions that early and subsequent literature identify, two stand out in particular (as noted in Figure 1). The first assumption is that the benefits of reforms outweigh the costs. In early advocacy, the World Bank (1993: 15) concluded that “concerns about political interference and corruption hampering the effectiveness of the process...should not delay necessary actions...[because] the benefits of moving away from current inefficient practices far outweigh the costs”. Measuring and weighing up the benefits and costs of reform, however, is difficult in economic terms, let alone political terms. Vagliasindi & Besant-Jones (2013: 2) describe a “theoretical ambiguity in the economic literature” on the effectiveness of market reforms in a network industry such as the power sector. For such reforms to add value, any gains must more than compensate for the higher transaction costs associated with regulating

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<sup>22</sup> In a key reference point for development finance institutions in the 1990s, World Bank (1993: 23, 35) argued the “fundamental problem is the closed command-and-control management approach” under which “it is difficult to make unpopular tariff decisions, and resist the temptation to meddle in sector investment and management decisions, to use the utility as a vehicle for political patronage, to invest in the new rather than the old, to divert funds, to ignore bothersome environmental issues”.

<sup>23</sup> In Odisha (India), understated transmission and distribution losses contributed to failed utility privatization, which took place with no prior restructuring or corporatization that may have improved transparency and discipline.

<sup>24</sup> The ‘textbook’ elements allow private capital, thus “dismantling the system of public ownership” (Liu & others 2016: 7). In contrast, the ‘hybrid’ elements of establishing a regulator, unbundling, corporatization, and IPPs “retain the notion of government control over a natural monopoly, and yet they try to improve [management]...by reducing direct political interference” (p.6).

disparate utilities. Reform literature of the 1990s does not explicitly or systematically identify reform's costs and benefits. Over time, scholarship has pointed to contingencies, as discussed in Sections 3 and 4. For example, economic costs may exceed benefits if there are insufficient market participants, or if there are insufficient capable staff to fulfil increased regulatory functions. A more fundamental, political question is what *distribution* of reform benefits and costs among actors is likely or desirable. On this, the literature advocating 1990s model reforms is basically silent.

**In political terms, 1990s model reforms may reduce benefits to some special interest groups, without immediate visible benefits to citizens.** Reforms were expected to ultimately benefit citizens by improving sector performance over time. In the short run, however, citizens may not perceive large, direct benefits from reforms. Indeed, initial impacts may involve a rise in electricity prices to recover costs. In some situations, reforms may benefit special interest groups, such as investors who profit from IPPs. For other special interest groups, reforms could also diminish benefits, such as when competition reduces profit margins for SOEs. There is thus no intuitive reason why model reforms would fit the theoretically stable 'win-win' situation when citizens and special interest groups both receive large benefits.<sup>25</sup> For Borenstein & Bushnell (2000: 46), an important lesson from early sector reform experiences is that "the short-run benefits are likely to be small or nonexistent, and the long-run benefits, while compellingly supported in theory, may be very difficult to document in practice".

**A second critical assumption of reforms—that government and utilities must yield influence to the regulator and markets—gives rise to conflicts of interest toward reform.** Government actors, as "the fundamental agents of reform" (Bacon 1995: 140), face an intrinsic tension between their interest to maintain control over the sector, versus their interest in handing over key decisions to a regulator and utilities that do not follow minister orders. As such, the policies meant to depoliticize the sector are in fact highly political, all the more so given that reforms can create a range of 'winners' and 'losers' as mentioned above. Dubash & others (2018) note the market reforms can evoke a backlash response by some politicians who subsequently seek to 're-politicize' the sector.

**Model reforms may thus not lead to stable short-term outcomes, implying a need for bold action followed by sustained efforts to keep interests aligned.** To address the conflict of interest inherent in *state-led market-oriented* reforms, reform champions thus face a tactical choice on a spectrum between two extremes. One extreme is 'quick and stealthy' coercive reform that sidesteps potential opponents, assuming early results will attract enough support to prevent backlash or reversal. The other extreme is 'slow and open' consultative reform to generate advance support, assuming the process will not be derailed by other interests at any step on the way.<sup>26</sup> Judging the risks inherent in any approach depends on knowing who would benefit from reforms and when. The balance and distribution of benefits and costs are particularly dynamic in countries undergoing rapid development and those vulnerable to political or economic shocks. As such, changes resulting from reform are less predictable and less easy to manage than in the relative stability of industrialized countries. In other words, there are structural reasons why model reforms may be more difficult to apply in developing countries (Dubash & others 2018).

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<sup>25</sup> This idea draws on the framework of type and size of benefits from Inchauste & Victor (2017).

<sup>26</sup> The description of reforms as 'quick and stealthy' comes from Dubash (2002: 160), noting that reformers justified this approach given "a perception that the sector has been prey to political capture in the past," such as for price setting and allocation of contracts.

**For all the above reasons, countries have lacked a broad evidence base to predict the feasibility and impact of reforms.** In an early discussion of reforms, Bacon (1995) observes that Chile’s reform was followed by greater productivity and profitability in the power sector, though the impact could not be isolated to one reform element or another. A key outstanding concern was whether increased profits go to companies or are returned to users, noting “few developing countries are likely to want to undertake a major restructuring that requires skills so unfamiliar for the sake of as yet largely unproven benefits” (p.141). Power sector market reforms were subsequently pursued by countries from the 1990s to early 2000s (Foster & others 2017). Yet relatively few countries implemented full market reforms, and reforms that did occur took years to implement. Furthermore, it is only years after implementation that impacts become known (IEA 1999, Cubbin & Stern 2005: 6). Even now with decades of observations, the association of model reforms with specific sector outcomes is complicated. Model reforms have achieved some but by no means all their objectives in all cases (see Section 4). This knowledge, however, cannot be presumed to be widely-held among sector professionals, let alone other stakeholders in developing countries. This highlights the importance of understanding why various actors have advocated and pursued reforms despite significant uncertainty, as discussed in subsequent sections.

## 2.3 Early reform efforts only partly addressed political economy concerns

- *Early approaches to model reforms did not fully anticipate and address political economy factors.*
- *Critical evaluations of early reform approaches have led to a disparate but growing body of analysis on the political economy of power sector reform.*
- *Development partners have approached the political economy of sector reform efforts with increasing introspection.*

**Early guidance on 1990s model reforms acknowledged political economy considerations and risks to a limited extent.** Vickers & Yarrow (1991: 130) note that privatization should reduce the impact of government failure but comes “at the risk of increasing market failures, and of changing monitoring arrangements”. Reform effects would depend on the “complex interactions among ownership, market structure, regulatory, and political variables,” which were challenging to understand completely (p.130). As a leading early advocate of model reforms, the World Bank (1993: 56) recognized “there can be no one standard approach...for all countries”. Rather, “individual countries should be encouraged to review and select the options, mechanisms, and pace of reform most appropriate to their needs and circumstances” (p.22). Bacon (1995: 132) anticipated that many countries would focus on allowing IPPs rather than privatizing incumbent utilities, as the latter can be “difficult and undesirable”. Bacon & Besant-Jones (2001: 333) note that “two essential conditions must be met before reform is attempted: (a) it should be generally perceived in the country that reform is desirable and (b) carrying out the reform agenda should be politically feasible”.

**Nevertheless, initial scholarship on reform was primarily process-oriented and prescriptive, based on the experience of pioneering countries.** Some authors challenged the applicability of model reforms to developing countries where initial conditions were different from those in industrialized reform pioneers. For example, reform experiences led to problems such as consumer anger over higher tariffs with no improved service (Wamukonya 2003: 1285, Williams & Ghanadan 2006: 836, Xu 2006: 821). Some proponents of model reforms attributed these problems encountered during implementation to the simple

absence of ‘political will’ (Ljung 2007: 137) or “inconvenient obstacles” including poor rule of law and other weak institutions that ought to be “cleared” (Victor & Heller 2007: 8-9).

**Over time, less than ideal outcomes among countries that had embarked on model reforms prompted more introspection on political and institutional factors.** Political economy issues have become increasingly salient in explaining why model reform processes had varying outcomes. Studies such as Yarrow (1999) point out that the political, legal, and institutional issues were not merely transient barriers, but dominant factors explaining the pace and character of reforms in developing countries. In particular, they may explain the prevalence of ‘hybrid power markets’ or ‘dual-market’ models in most developing countries, where incumbent state-owned utilities coexist with IPPs (Victor & Heller 2007: 11; Gratwick & Eberhard 2008: 3948). Besant-Jones (2006: 14) reflects that early reform proponents “underestimated the importance of managing [complex issues for] stakeholders...relative to techno-economic design and implementation issues”. Subsequent analyses address this issue with increasing depth and sophistication (e.g. Vagliasindi & Besant-Jones 2013, Andrés & others 2013, Fritz & others 2014).

**Concurrently, from the early 2000s, broad experiences of interventions beyond the energy sector led to a parallel, multi-disciplinary body of literature on the political economy of development processes and outcomes.** This body of work emerged in academic and policy circles building on a rich political economy tradition within political science, ‘new institutional economics’, and ‘new political economy’ approaches.<sup>27</sup> The literature on political economy analyses (PEA) has evolved through two ‘generations’ according to Fisher & Marquette (2014). The first-generation studies focused on country-level (macro, structural and political) drivers of institutional performance and change processes in societies (DFID 2004, Fisher & Marquette 2014: 5-6). A second generation focuses on local, sector-level and procedural political drivers of behavior.<sup>28</sup> Some power sector political economy analyses, as listed in Section 1.3, can be considered part of this second generation.

**This evolution in PEA occurred alongside strong critiques reflecting both the inadequacy of these frameworks and the challenges of their practical application.** Several critiques question the purpose and utility of development partner approaches to political economy analysis. Fisher & Marquette (2014: 4) regard current practice of PEA as an overly discrete problem-solving ‘trademark’ product, rather than a thought process integrated into client engagement. While development partners recognize the salience of ‘thinking politically’, their skill sets, incentives and approach to PEA do not always align with this objective. Hout (2015) argues that donors use PEA as rhetoric for background briefs, and not to support reform coalitions that could displease incumbent elites. On this point, the World Bank Group’s Independent Evaluation Group (IEG 2016b) notes the potential for trade-off between reforming and financing elements of budget support if the World Bank’s and clients’ priorities are not aligned. Structural and internal

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<sup>27</sup> On ‘new institutional economics’ see Williamson (1985), North (1990), Klein (2000), and Acemoglu & Robinson (2012). ‘New political economy’ recognizes the need “to weigh problems of government failure against those of market failure” (Besley 2007: 571). See also the work of Leftwich (1995, 2005 & 2007) and Khan (2010). Networks of practitioners and academics, who advocate more adaptive, locally-owned approaches to development, include ‘Doing Development Differently’ ([odi.org/projects/2857-doing-development-differently](http://odi.org/projects/2857-doing-development-differently)), and the Thinking and Working Politically Community of Practice ([twpcommunity.org](http://twpcommunity.org)).

<sup>28</sup> This also includes the US Agency for International Development’s Democracy and Governance Assessments, German Technical Cooperation Agency 2004 Governance Questionnaire, and Dutch Foreign Ministry’s mid-2000s Strategic Governance and Corruption Analysis. Related research clusters include the Development Leadership Program supported by Australian Aid and others, the University of Birmingham Governance and Social Research Development Centre (McLoughlin 2014), and Overseas Development Institute (Moncrieffe & Luttrell 2005).

operational constraints also contribute to the difficulty of incorporating PEA into development interventions. These factors would help explain why PEA may remain somewhat theoretical and unconnected to project operations. McCulloch & others (2017) find that donor staff pursue reform optimistically, even when evidence suggests a proposal is likely to fail. Technical specialists can also find it challenging to adopt nonorthodox approaches or to ‘abandon the perfect in favor of the good enough’ (Bain & others 2016: 40, Fritz & others 2014: 26; World Bank 2017). Yet what is ‘good enough’ in terms of power sector reforms for different developing countries is far from clear.

**There are nevertheless examples of practical application of PEA to sector interventions.** Lal (2006) describes how recommendations about prospects for reform informed a change of direction for the energy sector team in India and the World Bank’s energy strategy more broadly, towards an incremental rather than radical approach. This included demonstrating the link between the reform program and benefits for the poor and promoting better management and flow of power supply before pushing for tariff increases. Levy (2014) documents a ‘with-the-grain’ approach to reform in Zambia, which involved engaging the largest energy user, a mining company, as a partner to the utility. IEG (2016a) identifies successful examples of political economy being addressed in World Bank-supported interventions for sector reform in Turkey and Brazil. The programs were rooted in a medium- to long-term strategy strongly owned by the government, supported by non-government actors. In addition, there were multiple, recurring ‘pressure points’ and budget support commensurate with political risks.

**Recommendations for making PEA a more practical tool range from building reform coalitions, and realignment of donor staff incentives, to an overhaul of PEA tools.** McCulloch & others (2017) recommend further research to assess (i) how different political settlements (i.e. the distribution of power in society) make sector reform more or less likely; (ii) the relative effectiveness of different donor approaches to incorporate political analysis into operations; and (iii) political economy factors that enable successful sector reform. Fisher & Marquette (2014: 4) call for a ‘third generation’ of PEA that does “something completely different” to help local reform coalitions open ‘windows of opportunity’, to mainstream PEA among technical staff, and for technical staff to use intuitive frameworks to analyze political economy jointly with clients.

**These debates are informing more refined iterations of PEA among development agencies, with more work needed to apply them directly to actual development policies.** Within the World Bank for example, numerous studies attribute the mixed reform outcomes across a range of sectors to variations in social, political and economic context and starting conditions in client countries. Most recently, the World Development Report 2017 on governance and law finds that the most effective policies are not those which align with international best practices, but those which are a good fit for the society, the context and the challenges in question. In contrast to early research papers, which mainly highlighted the importance of political economy, more recent guidance notes address how to ‘think and work politically’. These are also found among bilateral donors such as the UK, Sweden, and Australia, and non-governmental organizations such as the Overseas Development Institute (ODI). Increasing attention is paid to infrastructure and service delivery sectors, where the confluence of stakeholders and countervailing interests seems to be particularly salient. This includes mining and extractives, water, health and nutrition, and public sector governance

among others.<sup>29</sup> Innovations to integrate governance and transparency objectives into the design of power sector reforms programs are ongoing (e.g. World Bank 2018).

### 3. Model reforms in practice: Why have some countries reformed more than others?

#### 3.1 Motives for model reforms extend beyond improving sector performance

- *Beyond efficiency, other motives for reforming the power sector include norms, ‘pulled’ by competition for trade and foreign direct investment, and ‘pushed’ by conditional aid.*
- *Such motives make state actors more willing to pursue reforms despite potential costs and risks, especially in response to crisis.*
- *They also help explain the wave-like pattern of reforms in clusters of countries.*

**Reforms have often been a response to crises of power supply and sector finances, though not all such crises lead to market-oriented reforms.** Several case studies point to crises as a motive for model reforms in many countries.<sup>30</sup> As mentioned in Section 2.1, many governments around the world faced debt crises in the 1980s which contributed to financial stress in the 1990s, and made it difficult to fund shortfalls in power sector finances. In this context, the benefits of pursuing reform options such as privatizing state enterprises came to outweigh political costs and risks (Victor & Heller 2007). ‘Prospect theory’ may explain why reforms occur more during crises.<sup>31</sup> A period of stress or a ‘critical juncture’ can predispose actors to view potentially risky reforms more positively than they would ordinarily. Importantly, this effect may only be temporary, as suggested by cases of energy subsidy reforms begun during crises and reversed after the crisis passed (Kojima 2016). Furthermore, a response to crisis may involve reversals of model reforms, such as renationalization of utilities as have occurred in the Dominican Republic, Odisha (India), and Senegal.

**Crises, therefore, can only ever partly explain a country’s motive to pursue market reforms.** Dubash (2002) speculates that financial stress in the 1980s and ‘90s contributed to an emphasis on the financial objectives of model reforms, at the expense of a more balanced approach to other sector objectives. Financial stress would also make countries more willing to accept conditions associated with finance from

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<sup>29</sup> On mining and extractives in Ghana see Ayee & others (2011), on natural resources see Kishor & others (2015), on water in Africa see Tront & others (2017), on governance and decentralization see Eaton & others (2011) and Bunse & Fritz (2012), and on food and nutrition security see Reich & Balarajan (2012). Country-specific analyses of underlying political, social and institutional contexts include public sector decentralization in Bangladesh (Rudra & Sardesai 2009), social accountability in Nepal (Tamang & Malena 2011), and governance in Nigeria (Lewis & Watts 2015).

<sup>30</sup> Power sector reform in Chile was in part a response to high fuel prices, inflation, and controls on final prices that led to large financial losses and under-investment in the 1970s (Pollitt 2004: 3). Williams and Ghanadan (2006) identify macroeconomic crisis as an impetus for sector reforms in Latin America and Asia. See also Cheng & others (2016), and Fritz & others (2014).

<sup>31</sup> Prospect theory states that the level of ‘pain’ an actor perceives on losing a unit of something is greater than the level of ‘joy’ the actor perceives on gaining an equivalent unit (Kahneman & Tversky 1984). By this logic, an actor takes more risk in a crisis, to return the situation to normal, than the same actor would take in a normal situation to improve conditions by an equivalent degree. See also Weyland (2002).

international development partners, as discussed below. The analysis of power sector reform and crises for any large set of countries is, however, a gap in the literature.

**Model reforms in the power sector have occurred alongside other economic reforms, across both ‘left’ and ‘right’-wing governments around the world.** There is no doubt that power sector reforms have been “part of a broader process of economic liberalization and integration into the global economy” (Dubash 2002: 157), which began in the 1980s. Consistent with this, Erdogdu (2013) finds that model power sector reforms have been more extensive in countries with more investment freedom.<sup>32</sup> In this context, it would be intuitive to expect model reforms to be more extensive under economically liberal governments that prefer less state control of the economy. However, available studies are limited and do not support this hypothesis in developing countries at large. Erdogdu (2014b) finds no association with ‘left’- or ‘right’-wing governments for any reform element in the power sector among countries that are not members of the Organisation for Economic Co-operation and Development (OECD).<sup>33</sup> Case studies highlight that ideology can nevertheless be a very important factor in some countries (e.g. Tanzania), if not others.<sup>34</sup> Zelner & others (2009) observe no global trend in sentiment toward private enterprise within their media analysis period of 1989 to 2001, which suggests that this was not a key factor in the 1990s global wave of market reforms.

**Several studies find that power sector reform elements spread across clusters of countries linked by geography or trade.** Foster & others (2017) find pronounced difference by geographic region especially for restructuring and competition, suggesting a “bandwagon” or “domino” effect. Cluster patterns of reform diffusion can also be found among sub-national jurisdictions, such as in Russia (Wengle 2015) and India (Cheng & others 2016). In a global analysis from 1982 to 2008, Urpelainen & others (2017) find that the degree of model reforms in one country correlates with the average degree among immediate neighbor countries, and other countries in its general region. This correlation holds for their measure of aggregate reform, and for privatization, and wholesale or retail competition as individual reform elements. Similarly, Urpelainen & Yang (2016) find a correlation among neighbor countries regarding legislation that allows unbundling or privatization, and the introduction of IPPs.

**Regulatory competition is one explanation for clustering of reforms.** Regulatory competition is when one country mimics reform in competitor countries to maintain its place in regional or global capital markets. Urpelainen & others (2017) and Urpelainen & Yang (2016) cite this theory to explain the observed

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<sup>32</sup> In contrast, Chang & Berdiev (2011) find that market reforms are greater in OECD countries with higher ‘political globalization’ (defined in terms of number of embassies, multilateral organization memberships, treaties, and so on), but not social or economic globalization. Similar research is unavailable for low- to middle-income countries.

<sup>33</sup> Erdogdu’s (2014b) typology of ideology is from Keefer (2010: 6) who codes ‘right’ for parties defined as “conservative, Christian democratic, or right-wing”, ‘left’ for parties defined as “communist, socialist, social democratic, or left-wing”, and center for “parties defined as centrist or when party position can best be described as centrist (e.g. party advocates strengthening private enterprise in a social-liberal context)”. For OECD countries Chang & Berdiev (2011) find ideology to be important in power sector reforms. Yet Erdogdu (2014b) finds counterintuitive patterns for OECD countries: vertical integration is lower under ruling parties with either ‘left’ or ‘right’ orientation, while ‘left’ parties actually go further to reduce entry barriers.

<sup>34</sup> Gore & others’ (2018) find that in Uganda, Tanzania, and Ghana, citizen expectations for the state to provide electricity were a significant factor that constrained 1990s model reforms. For 20 Indian states, Cheng & others (2016) find that power sector reforms are not associated with ideological differences between parties, as other factors dominate party politics for the power sector.



clustering of power sector market reforms.<sup>35</sup> Henisz & others (2005) find that the establishment of power sector regulators, and their effective autonomy, are each substantially correlated among trade competitors. The same study found no correlation of trade competition with private participation in the sector. Trade competition does, however, correlate with whether countries have renegotiated IPPs during their implementation, according to Zelner & others (2009). They suppose anti-liberalization advocates can more easily argue that renegotiating IPPs will not threaten investment, if a trade competitor has already done so.

**Social norms can also help explain the clustering of reforms.** Governments converge on international norms because they are sensitive to how many others have adopted a policy (Elkins & Simmons 2005). In other words, reform motives can be socio-political. In analysis of European and Latin American countries, Gilardi & others (2006) identify that ‘networks of expertise’ are important in diffusion of market reforms in electricity and other sectors.<sup>36</sup> Indeed, individuals and consulting firms involved in reforms in Chile, Argentina, and UK later became advisors for subsequent sector reforms in Latin America, as well as Africa and Asia (Gratwick and Eberhard 2008: 3949). Some studies test ‘normative isomorphism’ using trade partnerships as a proxy for social relations, with mixed results. Zelner & others (2009) find that IPP renegotiation is more common among trading partners. In contrast, Henisz & others (2005) find no association of bilateral trading with power sector regulator autonomy, or with private participation.

**International donors have strongly influenced reforms, in different ways, and with important limitations.** Aid conditional on market reforms was widespread in the 1990s, as introduced in Section 2.1, and country governments motivated by the need for finance are more likely to follow the norms of their financiers. Zelner & others (2009: 387) describe conditional aid as “coercive isomorphism”, as governments facing financial hardship could not borrow through conventional financial channels. In a study of 55 countries, Erdogdu (2014b) finds that 1990s model reforms are greater the more foreign financial aid the country received. More specifically, Henisz & others (2005) find that countries with a high share of World Bank and IMF debt are more likely to have established regulators and privatized utilities. They find no correlation of foreign debt with regulators who are independent in practice, nor with liberalization (defined as ‘private generation for sale’). They suggest this is because regulator establishment and privatization are relatively easy to observe and enforce, compared to independent regulatory practice and liberalization, and thus are more tractable as targets of foreign aid (p.889). Case studies highlight the influence donors have in particular studies.<sup>37</sup> Gore & others (2018: 15) emphasize that aid reliance is by itself insufficient to spur policy change: independent, local decisions based on domestic political dynamics also matter.

**For bilateral donors, national interests may also come into play.** Slowing demand growth and energy deregulation in OECD countries led companies there to look for investment opportunities abroad (Jamashb & others 2015). This has led to real and perceived conflicts of bilateral donor governments’ interest in

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<sup>35</sup> Neither study, however, accounts for variation in how much each country needs foreign capital, nor how much each country competes in global markets, which would affect incentives for regulatory competition.

<sup>36</sup> Gilardi & others (2006) suggest that regulators develop a common professional identity and an individual reputation among peers in other jurisdictions, as they interact in networks. This provides some incentive for regulators to preserve their autonomy from their government and the market. However, the study does not assess this against incentives for experts to align with other actors.

<sup>37</sup> Cheng & others (2016) find no overall correlation of foreign aid with sector unbundling or corporatization across 20 Indian states, though development partners clearly influenced certain states, notably Odisha (McCulloch & others 2017). Gore & others (2018) find that uptake of sector market reforms in Ghana, Tanzania, and Uganda was strongly contingent on each country’s reliance on World Bank aid.

having specific projects awarded to a company from their country, versus their support for reforms that open the market to unbiased competition (Dubash 2002).

**A fundamental question is how well donors and borrowers work within countries' circumstances, given different ideas of what is in a country's interests.** Externally-driven policies may not be fit for purpose if the experts who devise them face a pressure to conform with international expectations. In response to the prevalence of conditional aid in the 1990s, among other factors, the international community committed to greater “country ownership” in the 2005 Paris Declaration on Aid Effectiveness and the 2008 Accra Agenda for Action. Yet the idea of country ownership is open to divergent interpretations (Watson-Grant & others 2016). One concern is that by receiving foreign aid, government agencies may increase their influence relative to other actors in the country, and thereby reduce accountability. This increases the stakes for any conditions associated with aid to be both credible as well as aligned with the expectations of country stakeholders beyond the government. Managing the tension of enforcement versus flexibility of conditions is a long-standing challenge in development partnerships. Evaluations of World Bank operations, for example, find mixed results of programs specifically designed to support power sector reforms.<sup>38</sup> These issues go well beyond the power sector and are the subject of broader literature on the political economy of development, as touched on in Section 2.3.

### 3.2 The process of reforms involves a delicate balancing of competing interests

- *Structural factors such as small power systems and low income levels may reduce the feasibility of reforms, due to the high transaction costs of regulating separate utilities and market competition.*
- *Implementation of reforms depends on institutions that balance public and private interests and address corruption, but does not generally correlate with political freedoms, or political leaders' length of tenure.*
- *Incremental and inclusive processes involving various stakeholders may be better than 'quick and stealthy' reforms that sidestep important actors' concerns.*

**In countries with small systems or low per capita income, the transaction costs of establishing regulators, unbundling utilities, and creating markets, may exceed potential benefits.** Foster & others (2017) observe that a regulator, unbundling, competition, and private sector participation, are each significantly correlated with income level. Each of these elements, except establishing a regulator, is also more prevalent in countries with large power systems.<sup>39</sup> Domah & others (2002) find that lower-income countries face high fixed costs relative to market size in establishing independent regulatory agencies. One explanation is technical: other things being equal, small systems would have fewer plants to compete. In

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<sup>38</sup> IEG (2016a) note that short time horizons for expected results from donor assistance do not always match the time frame of reforms, which can take 5 to 10 years to occur. Even so, long-term government commitment to reform is “often fragile and can be eroded by...changes in government, macroeconomic crises and external shocks, or an abating sense of urgency after a severe crisis was weathered, and after having acquired sizable financial support from the Bank” (p.55). A long program series in Vietnam was “essentially ineffective in preventing a serious, recent deterioration of sector finances” in part because “the World Bank often took too accommodating a stance on noncompliance with the commitments for improving financial performance” (p.23). An equivalent criticism, from independent evaluation of World Bank power sector operations in the 1960s and ‘70s, is what motivated increased use of conditional aid in the 1990s (World Bank 1993).

<sup>39</sup> This is consistent with Besant-Jones (2006), and Erdogdu's (2013) findings that the extent of 1990s model reforms generally correlates with electricity consumption, population size, and income. A factor that deserves greater consideration on this point is whether system size is small due to population, or unmet demand including from low access rates.

future, low-cost distributed generation systems may allow market reforms to become more feasible for small countries.

**Lower-income countries have less resources and fewer qualified candidates to fill technical positions in regulatory agencies and perform regulatory functions.** In Domah & others' (2002) study, regulators in the median developing country had 30 to 34 staff compared to 53 in the median developed country, despite having three times the number of electricity users and three rather than two sectors to regulate. As such, available staff would have little choice but to take on wider responsibilities than in higher-income countries. Unbundling and market competition increase the number of autonomous decision-makers and the interactions among them. This increases the required regulatory functions, and exacerbates the challenge for regulators who may struggle to gather all the information needed from utilities, let alone to process and act on the information. Nagayama (2009: 466) estimates that a vertically integrated monopoly requires 12 regulatory functions, compared to 28 for wholesale and retail competition. Countries with many customers can offset the cost of regulation by exploiting economies of scale in the power system. Countries with smaller systems and low-income customers have less means to do so. However, small installed capacity and low-income need not be a binding constraint, as individual countries' cases show.<sup>40</sup> Further research would be required to systematically identify how structural factors impose transaction costs, and how to overcome them.

**Market reforms have a complex and multidirectional relationship with private agenda, rent-seeking, and political interventions.** Benitez & others (2010: 23) assess that, intuitively, most model reform elements are not especially exposed to manipulation by private agenda. Corruption nevertheless significantly reduces the feasibility of market reforms. Erdogdu (2013) finds that globally, countries with less corruption have more extensive 1990s model reforms.<sup>41</sup> On the other hand, implementation of market reforms can create new channels for populism, patronage, and industry-bias. The potential negative consequences of these 'private political agenda' include: political intervention in regulatory decisions and enforcement; manipulation of procurement; and 'privatization' of market power to maximize rents shared between politicians and firms (Benitez & others 2010). For example, Zelner & others (2009) observe from media analysis that governments renegotiated 1 in 5 purchase power agreements of 974 IPPs in low- to high-income countries from 1989 to 2001. In all cases of renegotiation investors' revenue was reduced, and the government benefited politically, either by subsidizing certain users, expanding social welfare spending during economic slumps, or assisting owners or particular producers.<sup>42</sup>

**The process of reducing the possible impact of private agendas in infrastructure governance may itself create added transaction and coordination costs.** For example, solutions designed to withstand political interference may not be flexible enough to adjust quickly to an unexpected change of framework conditions. Benitez & others (2010) argue this is acceptable only if the costs of inflexibility are compensated by significantly improved sector performance. Rudnick & Velasquez (2018) find that abuses of market

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<sup>40</sup> For example, Uganda fully unbundled its electric power sector despite having low installed capacity and gross domestic product (GDP) per capita, well below the thresholds of feasibility identified by Besant-Jones (2006). Key factors to Uganda's success include perceptions that the poor state of infrastructure in the 1980s was due to lack of competition, and the careful engagement of interest groups by reform champions with centralized authority.

<sup>41</sup> Cheng & others (2016) draw a similar conclusion for Indian states.

<sup>42</sup> In 70% of renegotiations there was a change in pricing. In 15% of cases, the government reallocated resources previously committed to investors. In the remaining 15%, governments intervened in operations such as to require use of a different fuel.

power are a common flaw in the early stages of creating power markets, and this requires specific regulatory oversight to identify and address. Further research may be useful to distinguish between various private agenda and their differential impacts on the process of reforms.

**Case studies show how strong courts can bolster legislated reforms, while reforms can also occur in countries with weak courts when political backing is strong.** Multi-country statistical studies by Rufin (2003) and Foster & others (2017) find no significant correlation between market reforms and judicial independence or rule of law. Victor & Heller (2007) contrast China where both courts and the power sector regulator are weak, to India where courts are famously independent and electricity sector regulators have relatively great authority. India's Supreme Court upheld the authority of regulators in a case in 2002, showing how courts can reinforce the credibility of regulators' decisions. In Mexico and Brazil, as cases where support from the courts is uncertain, government support for regulators has been politically opportunistic. In both countries the governments variously upheld or undermined the regulator's authority depending on how well the regulators' decisions served the governments' interests of the day (Victor & Heller 2007). Latin American case studies led Rufin (2003) to conclude that judicial independence can support institutional change with regards to property rights, but not necessarily competition. In Bolivia, politicized courts and weak property rights led suppliers to resolve competition disputes by directly lobbying the government. In Argentina, despite a weak court system, extensive private ownership and competition was achieved due to a strong ideological commitment (Rufin 2003).

**There is mixed evidence that model reforms are greater under a government with concentrated political power.** Given potential controversy around reforms, one might expect they are more feasible under governments with concentrated power i.e. where the country has one 'pole' of political power across the legislature and executive, and long tenures (Bhattacharyya 2011: 690). However, studies have found mixed results. Foster & others (2017) find no statistically significant association between competitive political systems and reform elements in developing countries. Erdogdu (2014b) finds no association of model reforms with concentration of power in non-OECD countries.<sup>43</sup> Zelner & others (2009) find that low-to high-income governments renegotiate more IPPs when domestic political conflict is high. To explain this, the authors cite 'breakdown theories' that "protest groups are more likely to be accommodated during periods of elite disunity or upheaval" (p.384), assuming that protest groups generally oppose IPPs. At the same time, IPP agreements are more stable in countries where there are less veto points in the policy-making process. Zelner & others (2009) explain this counterintuitive observation by suggesting that veto powers give competing actors a high-profile way to contest government decisions, with the effect that government decisions are more likely to change over time. Further research would be required to test this proposed explanation. Considering another perspective, Wengle (2015) argues market reforms have actually enabled a concentration of power in Russia.<sup>44</sup> This demonstrates how "markets and political authority co-evolve and continuously redefine each other", in contrast to 'neoliberal' theory that pits markets and government as opposing forces (p.248).

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<sup>43</sup> For OECD countries, in contrast, Erdogdu (2014b) confirms a finding of Chang & Berdiev (2011) that single-party governments compared to coalitions go further to privatize ownership and unbundle utilities in the power sector.

<sup>44</sup> Centralization of authority under President Vladimir Putin enabled liberal power sector reforms that in turn "solidified the centralization by sidelining [other state-oriented] actors that had critically undermined the sovereign authority of the federal government" (Wengle 2015: 248).

**Model reforms are not associated with the length of tenure for political leaders, but they may go further under ministers new to the sector.** Erdogdu (2013) finds that market reforms went further when the minister in office at the outset of reforms had no previous experience in the power sector. To explain this, he supposes that ministers from the sector may be “too responsive to the demands of bureaucrats... who usually oppose reforms (especially privatization) to keep their privileged positions in tact” (p.249). No correlation is observed of model reforms in non-OECD countries with how long a leader has been in office (Erdogdu 2014b), nor with the length of tenure (Erdogdu 2013). Further research would be required to identify if there is any pattern to countries where bold reforms have occurred under well-established leaders.

**Political freedoms allow interest groups to lobby more publicly, both for and against reforms.** Studies have found different patterns of reform associated with various types of political regimes. Liu & others (2016) find evidence that sector reforms are associated with democracies more than non-democracies, though this lacks a compelling explanation.<sup>45</sup> In contrast, Erdogdu (2014b) suggests the degree of democracy does not explain the extent of power sector reforms across non-OECD countries. In a study of Asian developing countries, Sen & others (2016) observe that fewer distribution utilities are privatized in those with greater political rights and individual civil liberties. The authors note “strong evidence of political and populist opposition to electricity privatization in developing countries, due to its association with governance failures, political suppression, and regional and ethnic conflicts and inability to deliver for the poor” (p.24).<sup>46</sup> Factors that give particular stakeholders large influence in a country can extend well beyond the power sector and have little to do with political freedoms.<sup>47</sup> Furthermore, political freedoms do not necessarily guarantee that decision-makers engage other stakeholders in the process, as discussed below.

**Incremental and inclusive processes involving various stakeholders may be better than ‘quick and stealthy’ reforms which sidestep stakeholder concerns.** Case studies observe the importance of building positive perceptions among citizens, as a precondition of support for reforms that actors may otherwise perceive as costly or risky. In many countries reformers did not disclose key decisions or reports to the public. In six middle-income country case studies, Dubash (2002) observes that pro-reform technocrats deliberately restricted consultation to energy and finance ministries, to the exclusion of environment and rural development ministries, civil society organizations, and industry groups. Nakhlooda & others (2007) conclude that opportunities for public participation in past electricity policy processes were limited in India, Indonesia, the Philippines, and Thailand. In these countries, civil society also lacked capacity to engage in the reform process, including to interpret technical information. The obvious risk is that external advice risks being out of touch with local concerns. Conversely, an enabled and informed civil society can be a positive force for sector reform. Civil society actors would be instrumental in establishing a ‘social contract’ with utilities and the government, and they can actively contribute to the transparency and accountability

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<sup>45</sup> Liu & others (2016) measure reform using Erdogdu’s (2011) score for 158 countries for 1990 to 2011, and democracy based on Cheibub & others (2010). They posit that democratic leaders have stronger incentives to provide public goods to citizens. Yet this idea could only explain why democracies pursue sector reforms if citizens perceive such reforms as good, which is a moot point. No research is available on whether perceptions of reform vary in association with level of democracy.

<sup>46</sup> Gore & others (2018) find reforms among three African countries were less extensive in democracies with stronger civil society.

<sup>47</sup> For example, Kale (2015) finds model sector reforms are less prevalent in Indian states where farmers have a dominant political role, which stem from rural development programs that included electricity subsidies in the 1960s to ‘80s. By the 1990s, such farmers were well-positioned to resist proposals to unbundle and privatize utilities, to avoid ending their subsidies.

that is the implicit foundation of 1990s model reforms. Importantly, balancing interests happen not just at the point of reform, but over time as actors learn to work with, around and against it.

## 4. Efficiency and other sector outcomes: How do model reforms help?

### 4.1 The outcomes of 1990s model reforms are ambiguous at a global level

- *Model reforms can improve sector performance by some measures, but this appears to be conditional on macroeconomic, budgetary, and other structural and sectoral factors.*
- *Efficient electricity pricing rests on effective regulation and competition as well as a broad social compact with users.*
- *Legislation, transparency, and positive public sentiment toward private enterprise, can help overcome risks to successfully attract and scale-up private investment.*

#### **1990s model reforms are associated with improved sector performance in some areas but not others.**

It is important to understand what the literature says about the technical outcomes of 1990s model reforms, in order to consider political economy aspects thereof. Bacon (2018: 38) concludes that “reform can improve the efficiency of the sector, although none of these results could by itself indicate that consumers had benefited as a result”. Specifically, private sector participation is associated with improved sector performance and firms’ internal performance indicators. Such indicators are not, however, associated with establishment of a regulator. Rodríguez Pardina & Schiro (2018) find that the impact of regulation in developing countries is limited by the fact that much of it is directed towards prevailing SOEs.

**Findings of technical outcomes associated with market reforms are mixed.** Urpelainen & others (2017) find that among 184 countries from 1982 to 2008, generation capacity increases up to 5% for each of eight elements of power sector reform, and 40% for ‘full reform’, even when reforms do not extend to privatization or free competition. In contrast, Sen & others’ (2016) conclude that model reforms have no association with total installed generating capacity in Asian developing countries. Few studies measure ‘optimal’ reserve margin, which is important since too much generation capacity can be inefficient and unsustainable.<sup>48</sup> Urpelainen & others (2017) find that market reform elements are strongly associated with reduced transmission and distribution (T&D) losses. However, this contradicts Erdogdu’s (2011) finding for 92 countries globally that reform correlates with greater T&D losses.<sup>49</sup> Urpelainen & others (2017) find

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<sup>48</sup> ‘Reserve margin’ is the amount by which total installed capacity exceeds peak demand. Erdogdu (2014a) finds that the reserve margin increases by 13 percentage points on average under full liberalization. Excess capacity has occurred as a legacy of overinvestment in post-Soviet countries (Bacon 1995: 124), lower than expected demand as in the Philippines following the Asian Financial Crisis (Dubash 2002: 80), and corrupt IPPs as in Indonesia (p.79), for example. Erdogdu (2011) finds proximity to optimal reserve margin correlates with model reforms in a global sample of countries, and with plant load factor in developing countries of Asia and Oceania, but not in Eurasian developing countries.

<sup>49</sup> Erdogdu (2011) suggests this may be due to reformed markets having high plant load factors and plants developed with less regard to transmission interconnection. Resolving these divergent findings would require more research. Imam & others (2018) find that T&D loss per capita improves for reform elements in Sub-Saharan African countries.

that standard reform elements do not correlate with trade in electricity.<sup>50</sup> Studies on specific elements of reform and broader sector outcomes reveal further nuances, as discussed below.

**Economic efficiency and financial viability of the sector are shaped by macroeconomic shocks, budgetary constraints and other sectoral and structural factors beyond model reforms.** Woodhouse (2006) concludes that structural factors, especially macroeconomic shock, often determine the outcomes of IPPs, even as factors within the control of contractual parties can explain how projects have weathered such shocks with a wide variety of outcomes. Countries vulnerable to macroeconomic shock may introduce IPPs to just a small share of the sector at first, giving the country flexibility on how to finance future power investment.<sup>51</sup> Looking at large middle-income countries, Victor & Heller (2007) argue that broader government budgetary and capital market reforms have been more important to power sector performance than market reforms. The power sector has generally become more economically efficient when states have imposed hard budget constraints (for state-owned utilities), and when firms face greater competition in capital markets. This would seem integral to the effectiveness of commercialization and corporatization. Dubash & others (2018) conclude that different Indian states have positively or negatively linked politics and electricity outcomes in relationships and pathways unique to each state, which often revolve around available budget resources.

**Regulators improve sector performance, especially when there are mechanisms to curtail political influence, but these are rare even in high-income countries with strong institutions.** Most developing countries have a regulator (Foster & others 2017), but their degree of independence varies significantly. The OECD (2016) examined elements that contribute to independence among 48 regulators in energy and other sectors in middle- to high-income countries. The most common practices expose regulators to politically-motivated appointments, ‘revolving doors’ with industry, and short-term thinking. In low- and middle-income Asian countries, Sen & others (2016: 31) note that regulators have similarly “tended to be explicit extensions of government bureaucracy, or else quasi-government organizations open to government interference”.<sup>52</sup> Andrés & others (2013: 90) find “significant improvement in utility performance occurs as a result of a regulatory agency, even in SOEs”, especially when accounting for the experience and governance of the regulatory agency.<sup>53</sup>

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<sup>50</sup> This is unsurprising given countries’ willingness to trade depends more on bilateral geopolitics, though it is conceivable that investors’ ties to neighbor governments may be a concern. For Asia, Sen & others (2016) find that countries perceived as less corrupt trade more electricity with each other. Study of the political economy of market structures and institutions for power trade is otherwise a gap in available literature.

<sup>51</sup> Woodhouse (2006: 216) points to the Arab Republic of Egypt as the best example of this, while the Philippines is “an outlier for its ability to manage IPP shocks despite a large fraction of the sector in IPPs”.

<sup>52</sup> Sen & others (2016) suggest that lack of independent regulation constrains the effectiveness of distribution privatization, to explain why distribution privatization on its own correlates positively with GDP, but has a negative correlation with GDP when combined with presence of a regulator, in developing Asian countries. This would require further research to confirm.

<sup>53</sup> This confirms Cubbin & Stern’s (2006) finding for low- to middle-income countries that generation capacity per person was higher in those with an electricity regulatory law, and where regulators are nominally autonomous, funded from fees rather than government budget, and free to set staff pay at levels other than those for civil service staff. It also aligns with Sen & others’ (2016) finding that installed capacity is negatively correlated with corruption. Vagliasindi & Besant-Jones (2013), even without measuring degrees of autonomy, find associations between a regulator and several measures of performance, including cost recovery. In contrast, Eberhard & others (2008) in Sub-Saharan African countries found no association between a regulator and key measures of sector performance, including cost recovery.

**Model reforms involve complex interactions with electricity prices.** Theory suggests that, without reform, electricity tends to be priced above costs in developed countries and priced below costs in developing countries. An important caveat is that costs may be inefficiently high due to overstaffing or T&D losses (Huenteler & others 2017). Nagayama (2009) finds that greater competition is followed by lower electricity prices for industry in Asian developing countries, but by higher prices for all users in developed countries. While there are many reasons why model reforms may not result in downward pressures on prices, applying these to explain price variations would require further research.<sup>54</sup> As noted in Section 2.2, efficient electricity price adjustments are expected to result from regulation or competition, and they are a foundation for commercialization and privatization. In this respect, it is difficult to establish a linear causal pathway between prices and other reform elements that occur together. The politics of pricing is further complicated by wide-ranging factors that affect whether users perceive electricity prices to be fair.<sup>55</sup> Further research is needed to understand what informs user perceptions in developing countries.

**In the absence of effective regulation or competition, prices are likely to be politically motivated and not recover costs.** The limited progress with reforms in many countries has undermined the financial viability of utilities and competition in the sector, which would allow market forces to set prices. Huenteler & others (2017) find that sector reform is conducive to cost recovery and financial viability. Yet the aggregate level of cost recovery and financial viability in the power sector of developing countries has “hardly improved between the late 1980s and the early 2010s” (p.37). In a large share of low- and middle-income countries, prices are below cost. IEG (2016a) attribute a similar finding in large part to fragile government commitment to let prices adjust towards cost-recovery levels. Inchauste & Victor (2017) attribute the difficulty of subsidy reform to the absence of visible, large benefits to either citizens or elite interest groups. This would also help explain why regulators are rarely independent. According to the 1990s model, competition is essential to put downward pressure on costs and prices. Yet, as of 2015, only 15 percent of developing countries have competition all the way down to the retail level, and 30 percent have no competition at all (Foster & others 2017). In such contexts, regulation and other broad social accountability mechanisms may be more critical to improve sector financial viability. Dubash & Singh (2005) note that the benefits of competition for small electricity consumers have been much less than the benefits for large consumers; a result that has political costs.

**Uncertainty around the impacts and sustainability of reforms help explain their low uptake and their limited results attracting private investment.** Many governments plateau or ‘exit’ reforms at the single-buyer model, without advancing to wholesale markets (Foster & others 2017). Technical improvements may be apparent, but not necessarily with long-term financial viability for the sector (Huenteler & others 2017). Erdogdu (2014a) observes a striking decline in private investments in developing countries with more open electricity markets: every point increase on a seven-point scale of model reforms was

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<sup>54</sup> Nagayama (2009) offers two theories: (i) liberalization gives incumbent firms scope to exercise market power until new firms enter to compete with them; (ii) greater regulation comes with costs of its own, such as coordinating the collection of information from separated utilities. But the latter would only hold for prices designed to recover regulatory costs, which is not always the case.

<sup>55</sup> Fiorio & Florio (2011) find that more users consider electricity prices fair in European countries with public ownership in the power sector, and with retail competition, than in countries with private ownership or retail monopolies. It may be that users like the retail choice that comes from horizontal unbundling, but see private providers as relatively unaccountable.



accompanied by an average of around 200 million US dollars less private investment in the sector. The author speculates that private investors prefer situations where governments guarantee a certain return, rather than where they must compete for uncertain profit.<sup>56</sup> This explanation would be consistent with the complex impact of model reforms on prices.

**IPPs have been a popular way for government to secure new generation investments, but investors face high risks.** Woodhouse (2006) attributes the risks to sector characteristics that lead to a history of politicization. He notes an intrinsic tension between a government's short-term goal to secure high-quality investment by promising stable, favorable terms for IPPs, versus a longer-term goal to introduce more competition in the sector. The single-buyer system in particular has allowed countries to "maximize returns from individual IPPs or small sets of projects, but only with extensive risk assumption by the host government or consumers that would not be sustainable if replicated on a large scale" (p.216). An implication of this finding is that renegotiation of IPPs may be necessary for further market reforms in some cases. In the Philippines, for example, a review of 35 'emergency' IPPs, mandated by the 2001 Electric Power Industry Reform Act, led to renegotiation of 20 as a vital step to further reforms (Dubash 2002).

**IPPs may succeed when accompanied by transparency, and positive public sentiment toward private enterprise.** From a survey of 34 IPPs in 13 low- to middle-income countries from 1995 to 2004, Woodhouse (2006) finds that transparent selection and allocation of projects, and competitive bidding, have been among the most important factors for success. In contrast, 'risk engineering' tools to bind government officials' behaviors often performed poorly due to ineffective institutions. Yet Urpelainen & Yang (2016) find that even in countries with few constraints on executive power, legislation to enable introduction of IPPs and other market reforms is highly effective at attracting private investment from domestic and foreign sources.<sup>57</sup> This contrasts with conventional wisdom that constraints on executive power are important for credible commitments to attract private investors, especially from overseas. Consistent with other findings of donor influence (Section 3.1), Zelner & others (2009: 387) observe that countries with higher multilateral debt renegotiated fewer IPP contracts. Moreover, governments renegotiated more IPPs during periods when there is negative public sentiment toward private enterprise.<sup>58</sup> Public perceptions clearly need to be closely monitored and understood.

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<sup>56</sup> Erdogdu (2014b: 31) suggests "industrial consumers prefer guaranteed, subsidized prices in a closed market to the possibility of future reduced prices in a liberal market". This would explain why model reforms have been less in countries where industry's share of GDP is larger.

<sup>57</sup> Urpelainen & Yang (2016) cite Thailand as an example of a country that has become more authoritarian over the past two decades with no observable effect on investment in new capacity. However, their conclusion should be read with care since passage of legislation is a one-off event, whereas the government's track record over time may be equally as important if not more so.

<sup>58</sup> Zelner & others (2009) did not find substantially different results for alternative specifications with democracy, or political ideology. Among 94 countries that had liberalized the power sector by 2001, eleven faced domestic opposition "sufficient to prevent any multinational private investor from entering the electricity generation industry", while in 31 other countries private investors entered IPP agreements that subsequently underwent renegotiation (p.388).

## 4.2 Without effective institutions and active efforts, social benefits will not accompany model reforms

- *Committed governments can attain high rates of access to electricity without model reforms, though improved financial efficiency certainly helps.*
- *Scaling up access to energy requires policies and institutions that actively address social equity concerns.*
- *Electrifying low-income rural households can conflict with sector efficiency objectives, unless accompanied by measures that compensate for lower short-term profits.*

**Electricity access and other social impacts of the power sector have political dimensions that are largely independent of 1990s model reforms.** Achieving universal access—part of SDG 7—is an important objective of power sector development in developing countries. Understanding the political dimensions of electricity access is thus vital. While literature on the broader political economy of energy access is beyond the scope of this paper, select studies are summarized in Appendix B.<sup>59</sup> As discussed in Section 2.2, the core objective of model reforms was to address financial and technical underperformance of state monopolies, rather than to increase access. Indeed, many countries have achieved high rates of access to electricity well before embarking on model reforms, such as in Latin American (Dubash 2002), the former USSR (Bacon 2018), and Vietnam (Gencer & others 2011). Evidently, 1990s reform models have not directly addressed institutional requirements for expanding access. Jamasb & others (2015: 21) find that in general market reforms “do not necessarily accelerate energy access”. Imam & others (2018: 24) confirm this finding for private sector participation and access rates in Sub-Saharan Africa.

**However, rural electrification may conflict with a narrow efficiency objective, unless accompanied by measures that reduce the financial costs of providing access or increase revenue.** Financial efficiency puts utilities in a stronger position to invest in connecting new customers, but this does not automatically translate to access for the poor. Indeed, increasing electricity access to low-income, rural households may reduce profit margins for utilities unless compensated by measures that cut costs or increase revenue. On the demand side, average rural customers often consume low volumes of electricity. For new customers, the establishment of productive high loads such as light manufacturing machinery or electric water pumps can also be constrained by financing, equipment supply and maintenance services, and socio-behavioral factors.<sup>60</sup>

**The potential tension between electrification and sector profitability is exacerbated by pricing structures that subsidize low-consumption or rural users.** In many countries, low-income or rural customers are cross-subsidized by higher-income consumers as a kind of social policy. Such cross-subsidization may be at odds with profit-maximization for unbundled distribution and retail companies. In the absence of additional policies, these social objectives of affordable electricity access for low-income

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<sup>59</sup> For an overarching literature review on the political economy of electricity access, see Barnett & others (2018).

<sup>60</sup> On the supply side, rural electrification can involve higher average costs of connection and of maintenance per customer, and higher technical distribution losses due to longer line lengths, compared to electrification in towns. This is notwithstanding relatively low-cost technical options for rural electrification such as single-phase supply and single-wire earth-return.

households and their accompanying subsidies may be undermined by model reforms.<sup>61</sup> Jamasb & others (2015: 21) find that improvements in regulatory quality and overall institutional reforms in Latin American countries led to significantly improved coverage. They find a consensus in the literature that the framework and nature of regulation is “crucial in balancing the tension between economic efficiency and equity impacts of reforms” (p.42).<sup>62</sup> Electrification can also shape stakeholder groups who can subsequently support or oppose reforms as noted in Section 3.2.

**In some cases, it may make sense to increase access before considering market reforms.** Many countries have achieved high if not universal rates of electricity access well before model reforms were even conceived. Chile, Russia, China, and Vietnam are all examples, not to mentioned most industrialized countries. Given the constraints facing countries with small power systems, especially in low-income countries, as described in Section 3.2, expanding access to increase system size and revenue may well make sense to prioritize before attempting market reforms. This is an area that warrants further close attention for countries with low access rates, such as in Sub-Saharan Africa and Myanmar. It is notable that a recent framework to assess institutions for energy access does not emphasize 1990s model reform elements (Banerjee & others 2017). Some measures, such as utility creditworthiness, could be facilitated by market reforms, while others such as consumer affordability of electricity may not, for reasons previously described.

### 4.3 Clean energy needs a deeper rethink of the role of governments and markets in the sector

- *Though there are weak links between 1990s model reforms and clean energy, model reforms can enable clean energy through incentives for efficient supply and demand, fuel-choice, and technologies.*
- *1990s model reforms may lead governments to prefer different types of clean energy policy and regulatory arrangements, as model reforms may be prerequisites for some clean energy policies, but not others.*
- *Regulation and governance in the sector consistently lag behind technological innovations and thus clean energy goals, pressing the need to rethink government and market roles beyond the 1990s model.*

**Clean energy has emerged as an important concern for many countries, with its own political economy, and large body of literature, especially as linked to climate change.** Clean energy concerns intersect with development in several respects. Pollution from energy causes millions of deaths each year (IEA 2016). Anthropogenic climate change is “the biggest market failure in history” (Stern 2007). Greenhouse gas emissions are not just a negative externality but a global security threat (Grubb 2014), and obstacle to sustained eradication of poverty (Hallegatte & others 2016). Electricity, especially from coal, is one of the largest emissions sources globally and for many middle-income countries. But the diversity of potential sources and uses of electricity make it central to solutions for avoiding dangerous climate change and local pollution, across many sectors. All low-carbon development pathways require action on four fronts: decarbonization of electricity; mass electrification of services and a switch to cleaner fuels;

<sup>61</sup> See also Dubash (2001 & 2002), Goldemberg (2004) and López-Calva & Rosellón (2002), cited in Victor & Heller (2007: 7).

<sup>62</sup> Sen & others (2016) observe that the establishment of a regulator correlates with improved income equality, for low- to middle-income countries in Asia from 1990 to 2013. Whether this is due to regulated price caps, or the transfer of benefits of lower system costs to consumers via other means, or even reverse causal pathways, is unclear. Victor & Heller (2007) find that subsidy programs or tax incentives for social services have sustained or even expanded over the course of power sector market reforms in Brazil, China, India, Mexico, and South Africa.

improved efficiency and less waste in all sectors; and improved carbon sinks such as plants and soil, which has implications for bioenergy (Fay & others 2015). As Arent & others (2017: 9) note, the political economy of clean energy transitions in developing countries presents “some of the thorniest and most important challenges”, as they involve “the full economic system with implications for competitiveness and economic growth”.

**Scaling up clean energy transitions to meet global goals thus relies on policies and institutions which address concerns far beyond the understood objectives of 1990s model power sector reforms.** As may be the case for any reform, each of the four low-carbon development pathways suggested by Fay & others (2015) also risk getting captured by vested interests. It is beyond the scope of this paper to review the large body of literature on this topic. However, at a high-level, political economy solutions include: applying standards to new (rather than existing) capital; and designing institutions predictable enough to encourage long-term investment but flexible enough to adjust to new information, with clear criteria for when to end public support to low-carbon technologies or industries (Fay & others 2015: 18-20). This is in addition to more general citizen engagement measures, not specific to climate change.<sup>63</sup> Banerjee & others’ (2017) regulatory indicators for energy efficiency and renewable energy include only three that explicitly involve 1990s model elements.<sup>64</sup> The remainder of this section highlights select literature on direct and indirect links of clean energy with model sector reforms.

**Statistical studies find limited correlations between model reforms and clean energy.** Erdogdu (2014a) finds that carbon dioxide emissions per unit of power are lower when model reforms are more extensive in high-income countries, but there is no such association in low- to middle-income countries. Vagliasindi & Besant-Jones (2013) find more nuances for different reform elements and diverse groups of countries. Emissions intensity is worse with privatization (despite increased labor productivity, possibly due to lax enforcement of emissions standards), but better with competition in generation (despite no significant general correlation between competition and productivity).<sup>65</sup> Unfortunately, there are no clear explanations for these observations. Despite suggestions that establishing a regulator can increase accountability to community environmental concerns such as pollution reduction (World Bank 1993), the above studies demonstrate only a tentative relationship between clean energy and power sector regulation in past decades. In any case, analysis of past circumstances may be a poor guide for the future given the large gap between current carbon-intensity of energy and global clean energy goals.

**Through incentives for efficiency, and fuel and technologies, model reforms may indirectly enable or hinder clean energy outcomes.** Improved economic efficiency directly supports clean energy—and energy efficiency—to the extent that the cost of power generation correlates with emissions intensity, and that price signals affect behavior. This is likely to be the case when power is priced at the marginal cost (which is greater for fossil fuels than hydropower, for example), but not necessarily at average cost, which dominates

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<sup>63</sup> For example, ensuring that the public benefit from policies (rather than focusing on firms), including through social protection and compensation schemes, and communication campaigns sensitive to stakeholder perceptions (Fay & others 2015: 18-20).

<sup>64</sup> These relate to renewable energy, and are: ‘legal private ownership of generation’; ‘guaranteed access to the grid’; and ‘rules that allow customers to purchase power directly from a third party’. As another example, the World Economic Forum Energy Transition Indicators make no reference to market reform elements.

<sup>65</sup> The pattern is more complex with regulators and unbundling. Emission intensity is better with a regulator than without in small, low-income countries, but worse in large, middle- to high-income countries. Emissions intensity is worse with vertical unbundling in small, low-income countries, but better in large, middle- to high-income countries (Vagliasindi & Besant-Jones 2013).

pricing regulation in developing countries without competitive markets (Huenteler & others 2017). At low penetration levels, the absence of model reforms and marginal cost pricing is a critical barrier to clean energy in countries where renewables are curtailed in place of coal, notably in China (Kahrl & others 2013).

**In the long-run, market reforms may shift the relative attractiveness of capital-intensive low-carbon energy compared to those with high operating costs, in one direction or another.** To accommodate high penetration of variable renewables, new mechanisms must be designed to capture fixed costs, and to adequately compensate conventional technologies and new storage systems for capacity and system reliability services. Without such mechanisms to efficiently allocate associated average costs, the 1990s model of markets actually constrains high penetration of variable renewables by clearing the market at the otherwise unsustainably low, short-term marginal costs (Blazquez & others 2018). On the demand side, model reforms could hinder efficiency if they introduce “additional transaction costs and obscure price and other signals to customers” (Dubash 2002: 3). However, competition could “spur retailers to distinguish themselves by marketing end-use efficiency services” (p.3).

**Different degrees of market reforms may shape the policy options available to governments to promote clean energy.** Policies for energy efficiency, renewable energy, and emissions reductions, may vary in their use of market-oriented mechanisms. Adoption of non-market-oriented policies, such as standards, a fixed carbon tax, and fixed feed-in tariff (FIT) for renewables,<sup>66</sup> does not intrinsically depend on any 1990s model market reforms. Yet Liu & others (2016) observe that FITs have been more prevalent in countries that have undergone model reforms. They suggest that governments who want new renewables may need an FIT to do so when model reforms have reduced their ability to directly control the sector.<sup>67</sup> On the other hand, trading schemes and auctions, as market-oriented policies, logically work best when many participants compete, and therefore depend on a degree of model reforms, including an effective regulator. Market schemes have huge technical potential to reduce emissions at least cost when they link multiple sectors and countries, though the political and institutional barriers to such schemes are significant (World Bank & others 2017). Attempts to ‘network’ disparate carbon market mechanisms across sectors and countries are a work in progress.<sup>68</sup> Further research would be required to see how other clean energy policies and model reforms relate.

**More generally, clean energy goals, and technology developments, press the need and opportunity to rethink the role of governments, markets and civil society beyond 1990s model reforms.** On one hand, increased dependence on utility-scale renewable energy sources could lead to increased energy transmission and regional trade, which depends on high-voltage systems and coordinated grid operations that are traditionally managed as a public good. Economies of scale are also far from exhausted on centralized sources of clean energy undergoing technological advances, including concentrated solar thermal,

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<sup>66</sup> A feed-in tariff is a policy to incent distributed power generation (usually household solar photovoltaic systems) by making utilities pay a certain price for power ‘fed in’ to the grid.

<sup>67</sup> In particular, allowing IPPs, and establishing an independent regulator, each correlate with introduction of FITs. For example, China and Malaysia adopted FITs soon after reforms to partially open generation. In addition, Liu & others (2016) find that FITs are more prevalent in democratic than authoritarian regimes with integrated monopolies. They suggest elected governments respond more than authoritarians to pressure from constituencies who benefit from new renewables.

<sup>68</sup> For work on networked carbon markets see: [worldbank.org/en/topic/climatechange/brief/globally-networked-carbon-markets](http://worldbank.org/en/topic/climatechange/brief/globally-networked-carbon-markets)

geothermal, and carbon capture and storage for combustion of fossil fuels or biomass. On the other hand, modular solar photovoltaic panels, coupled with advances in energy storage and ICT, are enabling distributed systems of energy ‘prosumage’.<sup>69</sup> In some places this is becoming a viable alternative to the provider–customer relationship at the center of traditional models of business and regulation. Internet-based demand-response solutions are also growing, such as phasing air-conditioner use to reduce peak demand, and integration of electric vehicle charging as batteries connected to the grid. Dense load areas away from grids could “leapfrog the need for some of the cumbersome and difficult-to-finance infrastructure investments associated with traditional power systems” (Arent & others 2017: 8). For all these reasons, new energy technologies are disrupting the sector’s political economy.

**Regulation and governance in the sector consistently lag behind technological innovations.** Existing institutional arrangements in a given country may enable or hinder the uptake of changing technology described in the prior paragraph. For example, different institutional settings can result in dramatically different costs of solar energy in countries that have otherwise technically equivalent conditions (Dobrotkova & others 2017). In addition, changing technologies are prompting the need for new institutional functions. For example, distributed energy systems affect, among other aspects, the design and regulation of mechanisms for electricity pricing, network access, and system reliability. Broader changes in digital technology, automation, and social media are also affecting the dynamics of accountability among governments, corporations and civil society (World Bank 2016). Distributed ledger or ‘blockchain’ technology provides institutional functions of coordination and commitment, without the need for a human central administrator. Their potential applications range from distributed prosumage networks to global networks of carbon markets (World Bank 2017). Such ICT may have profound implications for coalition formation, citizen engagement, transparency, and accountability. Arent & others (2017) conclude that market reforms remain an important factor in national clean energy strategies, alongside other policies and regulation, private sector engagement, and analytical tools and data, to achieve economic and equitable clean energy systems.

**With these changes underway, it is difficult to imagine any single standard model emerging for sector market institutions.** Indeed, Urpelainen (2018) argues that no sector policies should be evaluated against a uniform global benchmark of best practice. Instead, analysts should consider which policies are a ‘good fit’ for a specific context, especially taking account of state capacity. Evolving approaches to sector political economy analysis (Sections 1.2 and 2.3) may prove useful to this end.

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<sup>69</sup> Prosumage refers to production, consumption and storage of electric power by a single actor, including distributed systems connected to a grid (e.g. Schill & others 2017).

**Table 2: Summary of political economy findings on key 1990s model reform elements**

<b>Element</b>	<b>Process of reform</b>	<b>Outcome of reform</b>
(1) Legislation	Evidence is mixed as to whether strong courts and rule of law are instrumental to the effectiveness of legislation to enable market reforms. In many country cases the influence of the executive branch seems more important.	One study suggests legislation can effectively attract private investment such as IPPs, even in the absence of institutional constraints on executive power.
(2) Independent Regulator	Market reforms require increasingly sophisticated regulatory functions. This increases regulatory risks and the need for resources to manage them. Low-income countries can thus struggle to ensure regulators have adequate resources and staff for extensive reforms to be feasible. Establishment of a regulator, but not their effective independence, correlates with foreign aid.	Regulators improve sector performance, especially the more regulators are protected from political influence, but mechanisms to ensure this are rare. Regulation of pricing is particularly prone to being taken out of regulator's effective authority.
(3) Commercial, corporate utilities	Findings in the political economy of the process of power utility corporatization and commercialization are a gap in available literature. Several studies nevertheless include in aggregate measures of market reforms that exhibit general correlations as described elsewhere.	Sector efficiency improves when states impose hard budget constraints for state-owned utilities, and firms face greater competition in capital markets. This goes beyond commercialization and corporatization, but would directly complement them.
(4) Separate utilities	In countries with small systems or low per capita income, the potential benefits of unbundling utilities may be lower than the transaction costs. This is in part because unbundling increases the number of autonomous actors and the need for coordination. Unbundling is correlated with foreign aid.	Findings on the political economy of outcomes of unbundling power utilities are a gap in available literature.
(5) Private sector participation	<p>IPPs create new channels for rent-seeking and political intervention. IPPs with unreasonable costs and allocation of risks may need to be renegotiated for further reform to be possible. Governments have renegotiated a significant minority of IPPs for these and other political reasons. Renegotiation is more common when political conflict is high and public sentiment toward private enterprise is negative.</p> <p>On utility privatization, one study finds fewer distribution utilities are privatized in Asian developing countries with greater political freedoms and civil liberties, which is attributed to wide public mistrust of disco privatization.</p>	<p>IPPs around the world have proven successful at expanding private generation capacity, mostly without being renegotiated. Meanwhile, structural factors, especially macroeconomic shock, often determine the outcomes of IPPs.</p> <p>More broader, findings on the political economy of outcomes of privatizing utilities are a gap in available literature.</p>
(6) Market competition	Competition greatly increases the burden on regulators. New mechanisms are needed to identify and address design flaws as power markets evolve, especially abuses of market power,	Markets often mostly benefit large customers. If poorly managed they can have a disproportionate negative impact on the poor.
(7) Efficient pricing	Governments rarely yield all control over prices to a regulator or markets. Political interventions to keep prices below costs are common. This can be attributed to the immediate impact of price changes on both the political elite and all users of grid electricity.	Any sustainable pricing regime relies on an implicit or explicit social compact with users. Independent regulators can improve the recovery of costs from prices. But absolute impacts and relative perceptions are complex.

Note: Shaded cells indicate gaps in available literature. Outcomes here are focused on technical and economic aspects per the basic objectives of model reforms as described in Section 2.2, rather than access to electricity or clean energy.

## 5. Conclusions

**This paper has examined the political economy of power sector institutions and market models by reviewing available literature with a focus on the 1990s model of market-oriented reforms.** The aim is to help understand why the experiences and results of sector reforms since the 1980s have varied across developing countries, with frequent gaps between policy and implementation, and cases of reform reversals. A political economy perspective of these issues is helpful to inform ongoing consideration of reform options, and of energy sector development issues more broadly.

**We have defined political economy most simply as politics and economics considered together.** This includes considering how people as individuals and groups interact to pursue specific interests, given different ideas, means of influence, and use of institutions in a given context. Certain features of the power sector that shape its political economy include the dual public-private character of electricity services, the multiple market failures, and governance risks. We summarize definitions of the 1990s model of reforms in terms of seven elements which cover a spectrum of possibilities for increasing market orientation: legislation as a means to institute other reform elements; establishment of an independent regulator; unbundling of utilities; corporatization and commercialization of utilities; private sector participation; market liberalization; and pricing that reflects costs on the basis of competition or regulation. Most developing countries have pursued at least one of these elements, but few have pursued full competition as the most ‘radical’ and complex endgame.

**To organize the review, we explored questions on the history and theory, motives, process, and outcomes of power sector reforms.** On history and theory, what is the origin of reform prescriptions and what problems have they tried to address? On motives and process, what interests and ideas drove influential actors to pursue or question reforms? How have model reforms balanced the role of governments and markets and through what policies and institutions? On outcomes, what have model reforms achieved, and is the model compatible with socio-economic and environment goals of expanding and decarbonizing energy systems? Do new technologies and global policy objectives change the outlook on these questions?

**In history we find distinct phases of global norms on sector institutions that reflect changes in technology, ideology, and other economic and political circumstances.** The 1990s model evolved as a shift away from a norm of state intervention around the 1960s, when the sector in many countries was treated as a monopoly. While 1990s model reforms are still frequently advocated today, the period from the 2000s to the present constitutes a new phase of re-emergent government interventions. Ongoing technology and policy changes have not been accompanied by a new global norm on sector institutions, and such a global norm may not even be desirable. However, critical evaluations of reform approaches over time have led to a disparate but growing body of analysis on the political economy of power sector reform.

**In theory, the 1990s model aimed to improve sector efficiency and attract investment in part by ‘depoliticizing’ key decisions.** This was a key distinction of the 1990s model in comparison to the 1960s monopoly structure, even as both aimed to improve sector performance, including economic efficiency, in different ways. Yet reform advocates, including development partners such as the World Bank, did not adequately foresee and address the political economy challenges of 1990s reforms. As such, political leaders of various countries have faced a conflict of interest to pursue reforms that in some ways handed their political power over the sector to private actors and regulators, while altering benefits for special



interests without providing immediate large benefits to citizens. Moreover, the global diffusion of model reforms from the 1990s to 2000s was not accompanied by broad prior evidence on their efficiency impacts or the political feasibility of their implementation.

**Geopolitical factors have made policymakers more willing to pursue reforms despite risks and costs, especially in response to crisis.** The 1990s model became a norm ‘pulled’ by competition for foreign direct investment and trade, ‘pushed’ as a condition of development aid, especially by the World Bank. Aid appears to have been most influential for relatively discrete reform elements of establishing a regulator and privatization. These factors also help explain why model reforms spread in a wave-like pattern across clusters of countries, which can be described as mimicry. Contrary to expectations, there is no consistent correlation of model sector reforms with ruling party ideology. That is, reforms have occurred under both ‘left’- and ‘right’-leaning governments, though these categories hide complex politics in many countries.

**Regarding the implementation of reforms, this often involves a precarious balancing of competing public and private interests of various stakeholders.** This happens not just at the point of reform, but over time as actors learn to work with, around and against reforms. Achieving and maintaining a balance depends on dynamic and highly context-specific institutions and factors that go beyond the power sector. Incremental and inclusive processes involving various stakeholders may be better than ‘quick and stealthy’ reforms, which sidestep concerns of important actors. This is especially important given individual reform elements have distinct features. Regulators have to fulfil increasingly sophisticated functions for advanced levels of market reforms. This requires adequate resources and staff that may be a struggle for lower-income countries. IPPs create new channels for rent-seeking and political intervention, which in extreme cases can lead to unsustainable generation capacity expansion. Electricity pricing is particularly prone to political influence.

**In terms of outcomes, the technical impact of model reforms is ambiguous at a global level.** Reforms can improve sector performance in terms of economic efficiency and financial viability by some measures but not others. The positive impacts of reforms observed in Latin America are not so clear in other regions. For example, generation capacity does not correlate with reforms in Asian developing countries. Some global studies even find negative association of market reforms with investment and T&D losses. The impacts of reforms on pricing are particularly complex. Outcomes seem, rather, to be conditional on other sectoral factors, such as the quality of regulatory governance, and structural factors such as budgetary constraints and macroeconomic shocks.

**We also find that with concerted efforts and effective institutions, social benefits accompany model reforms and clean energy in particular needs a deeper rethink of the role of governments, markets and civil society in the sector.** Committed governments can attain high rates of access to electricity without model market-oriented reforms, but improved financial efficiency certainly helps. For instance, financially viable utilities are in a stronger position to invest in connecting new customers, but this does not automatically translate to access for the poor. Abuse of market power also disproportionately impacts the poor. There are weak links between model reforms and clean energy objectives, but the former could indirectly enable the latter through incentives for efficiency, fuel and technologies. The tendency is thus for conflict between equity concerns and sector efficiency unless actively mitigated, such as by measures to reduce the costs of electricity access for low-income households. Such tension is exacerbated by pricing structures which subsidize low-consumption or rural users. Scaling up clean energy requires policies and

institutions which address equity concerns beyond the efficiency objectives of power sector reforms. Lastly, regulation and governance in the sector consistently lag behind technological innovations. Clean energy goals press the need and opportunity to rethink actors' roles in sector reforms. This includes not just government and the private sector, but also civil society, which is instrumental in the 'social contracts' necessary to keep governments and utilities accountable to all policy objectives.

**The weight of evidence suggests that prescriptions as specific and contingent as the 1990s power sector reform model cannot have global application.** Model market reforms entail significant political costs and risks, which in many circumstances have exceeded the benefits as perceived by influential local actors. At a higher level, it is possible to imagine some common principles for power sector institutions, as a complement to the common objectives of SDG 7. For example, one such principle may be to ensure broad concurrence on sector objectives among key government, private sector and civil society actors, before and during reform design and implementation. Such principles, like the SDGs, would still involve implicit tensions between government and market roles that cannot be resolved simply with a universal fix. At country levels, policy makers and reform champions must therefore continuously assess and adapt measures to manage risks in line with local circumstances, notwithstanding opportunities to learn from other countries' experiences and to innovate.

**There are several important areas for future work to address key gaps in the available literature.** The literature reviewed does not provide definitive answers to all the questions asked in this paper. Important areas meriting further research include the following.<sup>70</sup>

1. *Scope of reform.* The literature lacks systematic analysis on the political economy of power sector reform in at least four areas, which interrelate.
  - a. *Reform motives and outcomes.* Most literature focus on reform processes. More work is needed to understand and distinguish the motives for reform from factors that enable or constrain the process and outcomes.
  - b. *Actors.* There is insufficient attention to the role of actors and their perceptions of reforms, including in the context of changing circumstances such as crises. We also need to better understand what methods are effective for inclusion, engagement and building consensus with citizens, reformers, development partners, and other stakeholders.
  - c. *Costs, benefits, and risks.* On the process of reforms, an area that merits further research is to more systematically identify and assess the costs, benefits, and risks of specific reform elements, including how they vary based on structural factors.
  - d. *Private agenda.* Another area would be to distinguish between corruption and other forms of rent-seeking and political interference, to understand more finely how different types of private agenda affect reforms.
2. *Method.* The predominant focus of statistical analyses on reform processes is in part due to limitations of methodology. Furthermore, many statistical studies' findings appear to conflict with others, and to be inconsistent with respect to different elements of model reforms, or to different groups of countries. For example, on motives, mixed findings include correlations of: reform with ideology in high- but not lower-income countries; trade competition with establishment of

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<sup>70</sup> See also "Power Dynamics" (2018) for a proposed research agenda on the political economy of the power sector.

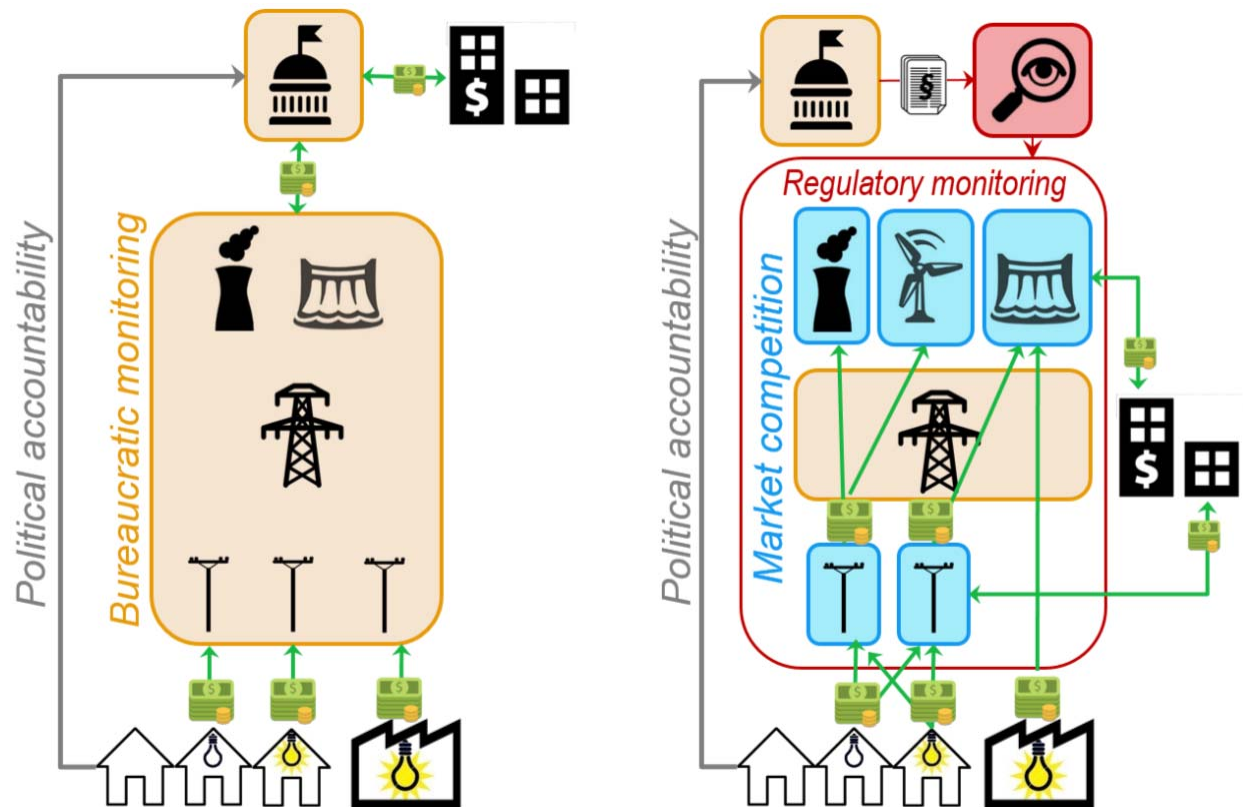
regulators and with stable IPPs, but not with privatization; trade partnership with stable IPPs, but not private sector participation. On process, there are mixed findings of correlations of reform with respect to concentration of political power, and to democratic political freedoms. More research is needed to evaluate the methods and data of different studies to explain inconsistent findings. While case studies on political economy of sector reforms are richer in scope and depth of analysis, their findings are not easy to generalize across time and space. Analyses that integrate case studies with cross-country comparisons offer the best of both worlds, but these are still rare.

3. *Integrated sector objectives.* While there is a growing body of literature on the political economy of energy access, clean energy, and disruptive technology, scholarship is yet to fully integrate these issues with considerations of market models and institutions. The need for integrated but flexible approaches is pressing given the rapid pace of change underway in the sector.
4. *Practical guidance.* There would be value in practical guidance on how to think and work politically on power sector challenges, to help design, implement and evaluate sector options for a country over time. This should inform ‘theories of change’ for interventions, with explicit assumptions and consideration of measures to manage political and economic risks. Such guidance should cover when and where ‘best practice’ is indeed a reasonable goal, and what market institution and policy options may otherwise be a ‘good’ fit for a given case. Importantly, it should also consider how to align political outcomes with sector outcomes, to foster ‘productive politics’. While abundant guidance for development practitioners to think and work politically does not relate specifically to the power sector, there are promising advances by some scholars to fill this gap.
5. *Development partners.* Development partners can more conscientiously recognize their own role as actors within the political economy of the sector. More research is needed in fully understanding their capabilities, influence and constraints to achieve stated goals vis-à-vis ongoing changes in the sector. This should enable energy specialists to engage with political economy ideas in their work, and thus better connect the *other* ‘power grid’.

## Appendix A: Supplementary figures and tables

**Figure 2: Simplified diagram of power sector institutions without versus with key 1990s model reform elements**

(a) Integrated public monopoly with no regulator      (b) 1990s model with full competition



Note: In the prototypical public model (left-side of the figure), the monopoly utility is financed, owned, and managed by the government. The utility is accountable to end users of electricity via 'long' routes of political accountability and bureaucratic monitoring. In the prototypical 1990s model (right-side of the figure) generation and distribution utilities are financed, owned, and managed by independent private actors. Transmission may remain publicly financed but is operated as an independent entity. Regulatory monitoring is instituted in law. Market competition is supposed to provide shorter routes of accountability. The regulator may also have means to directly engage users, though scholarly definitions of the 1990s model generally do not stipulate this.

Source: Original, drawing on Vickers & Yarrow (1991), Hunt (2002), World Bank (2003), and Nagayama (2009).

**Table 3: Measures of aggregate market-oriented power sector reforms in eight statistical studies**

Reform element	ESMAP 1999	Rufin 2003	Conway & Nicoletti 2006	Nagayama 2009	EBRD 2010	Erdogdu 2011	Sen & others 2016	Foster & others 2017
1. Legislation	<i>Law allows unbundling or privatization</i>	-	-	-	<i>Adequate legal framework</i> 12%	<i>Law for sector 'liberalization'</i>	-	-
2. Independent regulator	<i>Separate regulator has started work</i>	<i>Independent regulator; Judicial recourse counted in 'Ownership Score'</i>	-	-	<i>Establishment of independent regulator</i> 24%	<i>Establishment of regulator</i>	<i>Regulator</i>	<i>Regulator with some decision-making autonomy</i> 25%
3. Separate utilities	<i>Core state utility is restructured</i>	<i>Vertical integration, horizontal market structure counted in 'Competition Score'</i>	<i>Overall vertical integration; Separate G &amp; T</i> 33%	<i>Separate G &amp; T counted as single-buyer model</i>	<i>Unbundling (legal, financial, operational)</i> 13.3%	<i>Unbundling</i>	<i>Unbundling</i>	<i>Unbundling (four stages)</i> 25%
4. Corporate, commercial utilities	<i>Corporate or commercial</i>	-	-	-	<i>Corporatization</i>	<i>Corporatization</i>	<i>Corporatization</i>	-
5.a. Private generation	<i>Private greenfield investment</i>	-	-	<i>IPP counted as single-buyer model</i>	(Not clear if included in private sector participation in G, below)	<i>Any IPPs</i>	<i>Any IPPs</i>	<i>Private sector participation (50% weighted index for G &amp; D)</i> 25%
5.b. Private utilities	<i>Any private ownership</i>	<i>'Ownership score' aggregates 10 indicators including two on regulation</i>	<i>Private ownership</i> 33%	-	<i>Private sector participation in G or D</i> 13.3%	<i>Any private ownership</i>	<i>Privatization in D</i>	
6.a. Market access	-	<i>Market access counted in 'Competition score'</i>	<i>3rd-party access</i> 33%	-	<i>3rd-party access</i> 13.3%	-	<i>3rd-party access.</i>	<i>Competition (five stages)</i> 25%
6.b. Market competition		<i>'Competition score' aggregates indicators including G &amp; retail competition</i>	<i>Wholesale market</i>	<i>Wholesale or retail competition</i>	<i>G &amp; D competition</i>	<i>Wholesale market</i>	-	
			<i>Consumer choice</i>		<i>Consumer choice:</i>	<i>Consumer choice.</i>	-	
7. Efficient pricing	-	<i>'Yardstick' price regulation counted in 'Competition Score'</i>	-	-	<i>Tariff reform</i> 24%	-	-	-
Degrees measured for each reform element	Binary	Non-binary	Non-binary	Binary	Non-binary	Binary	Binary	Non-binary
Aggregate measure	7 degrees [0,6]	'Competition' and 'ownership' scores-	Continuous [0,6]	4 degrees [1,4]	10 degrees [0,"4+"]	9 degrees [0,8]	7 degrees [0,6]	Continuous [0,100]

Note: Percentages indicate elements' weights toward 'total' reform. Studies that measure total reform with no percentage shown give equal weight to each element measured. EBRD (2010) assesses each element on a continuous scale. G = generation. T = transmission. D = distribution.

**Table 4: Key statistical studies' findings relevant to the political economy of electric power sector reform**

Study	Results	Place	Time	Reform indicator
Bacon & Besant-Jones (2001)	<ul style="list-style-type: none"> <li>Reform does not vary significantly with income per capita. Reform does not vary significantly with dependency on aid, independent of other variables that already incorporate the effect of aid dependency. Reform is greater in countries with lower political risk, and with stronger institutions and public policy.<sup>71</sup></li> </ul>	115 developing countries	1998	Bacon's (1999) score for energy reform
Chang & Berdiev (2011)	<ul style="list-style-type: none"> <li>Reform is greater in countries with greater 'political globalization' (embassies, membership of multilateral organizations, treaties).</li> <li>Reform is greater under center or right-wing governments (than left-wing), legislatures with fewer parties sharing power, and greater institutional constraints.</li> <li>Reform is not correlated with length of tenure.</li> </ul>	23 OECD countries	1975-2007	Conway & Nicoletti's (2006) anti-competitive regulation indicators for energy
Cheng & others (2016)	<ul style="list-style-type: none"> <li>Reform is greater among geographical neighbors. No significant correlation with foreign loans.</li> <li>Reform is greater in states with less corruption. Reform is not associated with difference in politics between parties.</li> <li>Reform is greater in states with inadequate electricity generation capacity, and states with poor financial performance of utilities. Reform greater where leaders face pressure to avoid adjustment costs (electoral opportunism) and where interest groups (labor and agricultural) mobilize to oppose reform.</li> </ul>	20 largest states of India	1991-2012	Cheng & others' (2016) indicators of reform outcome success
Cubbin & Stern (2006)	<ul style="list-style-type: none"> <li>Generation capacity per capita is higher in countries with an electricity regulatory law, and in countries with higher quality regulator governance</li> </ul>	28 middle and low income countries, most in Latin America	1980-2001	Domah & others' (2002) four variables for regulation; Henisz & others' (2004) two indicators for private participation and liberalization
Domah & others (2002)	<ul style="list-style-type: none"> <li>Developing countries face high fixed costs relative to market size in establishing independent regulatory agencies. Regulators in the median developing country has less staff (30-34) than in the median developed country (53), despite having three times the number of electricity users and three rather than two sectors to regulate.</li> </ul>	34 developed and 26 developing country regulators	2000-2001	Domah & others' (2002) own devised indicators for regulation of electric utilities
Erdogdu (2011)	<ul style="list-style-type: none"> <li>Income level and other country specific features are more important determinants of industry efficiency than the reform process</li> <li>Greater reform correlates with higher plant load factor in developed countries and in developing countries of Asia and Oceania, but not in Eurasian developing countries. Reform correlates with closer proximity to optimal reserve margin, but higher T&amp;D losses.</li> </ul>	92 countries, global sample	1982-2008	Erdogdu's (2011) own electricity market reform score

<sup>71</sup> The 'Country Policy and Institutional Assessment' combined twenty indicators of "macroeconomic management and sustainability of reforms, policies for sustainable and equitable growth, policies for reducing inequalities, and public sector management". 'Country risk' included nine indicators including political risk with a 25% weighting (Bacon & Besant-Jones 2001: 344).

Study	Results	Place	Time	Reform indicator
Erdogdu (2013)	<ul style="list-style-type: none"> <li>• Reform greater in countries with higher levels of incomes, population, population density, educational level, investment freedom, imports of goods and services (as share of GDP), and electricity consumption.</li> <li>• Reform greater where corruption is lower, but reform is less in countries with stronger civil liberties. No correlation of reform with degree of democracy, nor with political rights.</li> <li>• Reform greater under ministers with an educational background in business or economics, and if a minister had no previous experience in the electricity industry (except in the US and Canada where leaders' background was unimportant).</li> </ul>	53 countries, global sample; sub-national data for the US and Canada	2010-2011	Erdogdu's (2011) electricity market reform score
Erdogdu (2014a)	<ul style="list-style-type: none"> <li>• Reform is greater in countries with self-sufficient electricity supply.</li> <li>• Reform leads to a lower private investment in developing countries (every increase in 6-point scale openness index results in a decrease of \$205 million investment). Emissions are lower where reform is more extensive, especially among developed countries, independent of political regime.</li> <li>• Democracies generate electricity with lower level of carbon dioxide emissions than autocracies.</li> </ul>	55 countries, global sample	1975-2010	Erdogdu's (2014a) own electricity market openness index combining Conway & Nicoletti's (2006) anti-competitiveness regulation indicators for energy in OECD, and EBRD Transition Indicators for developing countries.
Erdogdu (2014b)	<ul style="list-style-type: none"> <li>• Reform is greater in countries with smaller industry sectors, and in countries that receive more foreign financial aid.</li> <li>• Reform is greater in less democratic countries within the OECD. Reform is uncorrelated with democracy in non-OECD countries. Single-party governments (compared to coalitions) go further to privatize ownership and vertically unbundle the sector, within the OECD. Parties with 'centrist' ideologies do less to unbundle the sector during their terms in office, within the OECD.</li> <li>• Reform is greater in OECD countries where the chief executive had been in office for fewer years, and where leaders were entrepreneurs rather than economists or scientists.</li> </ul>	55 countries of diverse regions	1975-2010	Electricity market openness index as per Erdogdu (2014a)
Fiorio & Fiorio (2011)	<ul style="list-style-type: none"> <li>• More consumers consider electricity prices fair in countries with greater public ownership in the sector, and countries with greater retail choice of supplier (average price and other parameters equal).</li> <li>• Educated consumers, and those with moderate political views, consider electricity prices to be fair more than people who stopped studying before age of 15, and people with left-wing or right-wing views. Consumer satisfaction correlates positively with consumer price index, indicating that relative prices are significant.</li> </ul>	15 European countries	1999-2004	Conway & Nicoletti's (2006) anti-competitiveness regulation indicators, treating exploration of public ownership, and degree of consumer choice of provider, as independent variables
Henisz & others (2005)	<ul style="list-style-type: none"> <li>• Independent regulators are more likely in countries that compete in global trade. Countries with a high share of World Bank and IMF debt are more likely to have privatized utilities and separate regulators, but not independent regulators nor liberalization ('private generation for sale').</li> </ul>	71 countries & territories	1977-1999	Henisz & others (2005) own indicators of market-oriented reform elements
Imam & others (2018)	<ul style="list-style-type: none"> <li>• Corruption is associated with greater T&amp;D losses per capita, lower rates of access, and lower national income. However, these adverse effects are reduced where regulator are established and privatization is implemented.</li> </ul>	47 Sub-Saharan African countries	2002-2013	Establishment of regulators, and private sector participation, from various sources.

Study	Results	Place	Time	Reform indicator
Liu & others (2016)	<ul style="list-style-type: none"> <li>Reform is greater in democracies than autocracies.</li> <li>Renewable energy feed-in tariffs are more common in countries that have undergone power sector reform, especially authoritarian regimes, and in particular in countries with independent power producers and an independent regulator.</li> </ul>	158 countries	1990-2011	Erdogdu's (2011) electricity market reform score
Nagayama (2009)	<ul style="list-style-type: none"> <li>Reform is greater after high electric prices (assuming a two year lag of reform after high prices) in Asian developing countries, former Soviet Union and Eastern Europe.</li> <li>Reforms are followed by lower prices for industry in Asian developing countries, but by higher prices for all users in developed countries.</li> </ul>	73 countries; global sample	1985-2003	Nagayama's (2009) own liberalization model code
Rufin (2003)	<ul style="list-style-type: none"> <li>Private ownership and competition are greater in countries with greater economic freedoms. Competition is greater in countries with less distributional conflict.</li> </ul>	75 countries, global sample	1998	Rufin (2003) for ownership and competition; Bacon (1999) for overall reform.
Sen & others (2016)	<ul style="list-style-type: none"> <li>Reform of distribution utilities correlates with political freedoms, political reform and civil liberties.</li> <li>Countries perceived as less corrupt trade more electricity with each other.</li> <li>Distribution privatization without a regulator correlates with positive GDP growth, but with regulator does not. Countries with a regulator improved income equality more than countries without a regulator.</li> </ul>	17 developing Asian economies	1990-2013	Sen & others' (2016) own reform index with six dummy variables
Urpelainen & Yang (2016)	<ul style="list-style-type: none"> <li>A country is more likely to reform to the extent that its regional neighbors have reformed.</li> <li>Market reform legislation and introduction of IPPs are highly effective at attracting private investment, even in countries with few constraints on executive power. They attract more domestic than international investment.</li> </ul>	177 non-OECD countries	1982-2008	Erdogdu's (2011) electricity market reform score
Urpelainen & others (2017)	<ul style="list-style-type: none"> <li>A country is more likely to reform when its regional neighbors have reformed.</li> <li>Reform increases generation capacity (by up to 5% for each reform; 40% for full reform) especially in developing countries, even with hybrid reforms (i.e. with no privatization or free competition). Reform decreases T&amp;D losses (up to 2 percentage points for each reform; 11 points for full reform). Reforms benefit countries with poor bureaucracies and authoritarian regimes more than countries with good bureaucracies or democratic regimes, as the latter already had relatively good sector performance before reform and therefore had less to gain.</li> <li>T&amp;D losses are lower in countries with democratic political institutions.</li> </ul>	184 countries	1982-2008	Erdogdu's (2011) electricity market reform score
Zelner & others (2009)	<ul style="list-style-type: none"> <li>Governments renegotiate more IPPs when the country's trading partners have too. Renegotiation occurs less in countries with higher multilateral debt.</li> <li>Governments renegotiate more IPPs when there is political conflict, and during periods when public sentiment toward private enterprise is negative (measured by coding sentiment in news articles). Governments selectively renegotiated the terms of private investment in roughly 20 percent of private power generation projects in countries that liberalized.</li> </ul>	974 private generation projects in 62 countries globally (excluding US and Canada), of which 20% of projects were renegotiated	1989-2001	Zelner & others' (2009) own concept of 'retrenchment' defined as the number of private electricity generation projects whose formal terms were changed by the government so as to reduce project investors' net revenue stream, severe enough to warrant press coverage, but without formal repeal of a liberalization policy (p.388-9)



**Table 5: Select multi-country case studies on political economy of power sector reform, by country**

	Country	Dubash (2002)	Rufin (2003)	Williams & Dubash (2004)	Williams & Ghanadan (2006)	Woodhouse (2006)	Victor & Heller (2007)	Nakhooda & others (2007)	Andrés & others (2013)	Vagliasindi & Besant-Jones (2013)	Fritz & others (2014)	Foster & others (2017)	Gore & others (2018)
Latin America & Caribbean	Argentina	•	•			•			26 countries	•			
	Barbados									•			
	Bolivia		•		•								
	Brazil		•			•	•			•			
	Chile		•							•			
	Colombia											•	
	Dominican Republic										•	•	
	Mexico					•	•						
	Peru									•		•	
Sub-Saharan Africa	Botswana									•			
	Ghana	•			•								•
	Kenya					•				•		•	
	Senegal											•	
	South Africa	•	•				•			•			
	Tanzania					•				•		•	
	Uganda									•		•	•
Middle East & North Africa	Zambia									•	•		•
	Egypt					•				•		•	
	Jordan									•			
Europe & Central Asia	Morocco											•	
	Bulgaria	•											
	Cyprus									•			
	Czech Republic									•			
	Poland				•	•							
	Tajikistan											•	
	Turkey					•				•			
South Asia	Ukraine											•	
	India	•		•	•	•	•	•		•		•	
East Asia & Pacific	Pakistan											•	
	China			•		•	•						
	Indonesia	•						•		•			
	Korea, Rep.			•						•			
	Malaysia					•							
	Philippines					•		•				•	
	Thailand			•	•	•		•					
	Vietnam									•		•	

Note: Mixed qualitative and quantitative analyses include Rufin (2003), Vagliasindi & Besant-Jones (2013), and Cheng & others (2016) for Indian states.

Select, notable single case studies on single countries include on: China (Tsai 2011, 2014); Russia (Wengle 2015); India (Dubash & others 2018, Cheng & others 2016, Kale 2015, Deloitte 2004); Kazakhstan (Aldayarov & others 2017); and Palestine (Shamir 2013).

**Table 6: EBRD qualities of a ‘sustainable market economy’ and select indicators relevant to energy**

Quality	Component		Select indicators relevant to energy (shaded)*
Competitive	Market structures for competition and incentives for sound decision-making [53%]		General (e.g. Entry of new firms)
	Capacity to add value and Innovate [47%]		General (e.g. Credit to private sector/GDP)
Well-governed	National-level governance (quality, integrity and control of corruption, rule of law) [60%]		General (e.g. Regulatory quality, transparency of policy-making, regulatory burden)
	Corporate-level governance (frameworks and practices, integrity and business standards) [40%]		General (e.g. structure and functioning of Board, stakeholders and institutions)
Green	Climate change mitigation [35%]		<ul style="list-style-type: none"> <li>• Electricity share from renewables and hydro</li> <li>• Power (electricity &amp; heat) consumed per unit of carbon dioxide emissions</li> <li>• Renewable energy legislation (existence and degree of enforcement)</li> <li>• Rating of nationally-determined contribution to Paris Agreement goals</li> <li>• Carbon pricing</li> <li>• Fossil fuel subsidies</li> </ul>
	Climate change adaptation [35%]		General (e.g. disaster risk)
	Other environmental areas [30%]		<ul style="list-style-type: none"> <li>• Population exposed to levels of PM2.5 exceeding World Health Organisation guideline</li> </ul>
Inclusive	Gender equality		General (e.g. female firm ownership)
	Opportunities for youth		General (e.g. labor market structure)
	Regional disparities		<ul style="list-style-type: none"> <li>• Access to heating</li> <li>• Access to gas</li> <li>• Household perception of electricity service satisfaction</li> </ul>
Resilient	Financial stability [70%]		General (e.g. banking sector health)
	Energy sector resilience [30%]	Liberalization & market liquidity [33%]	<ul style="list-style-type: none"> <li>• Sector restructuring, corporatization, unbundling</li> <li>• Fostering private sector participation</li> <li>• Tariff reform</li> </ul>
		System connectivity [33%]	<ul style="list-style-type: none"> <li>• Domestic connectivity</li> <li>• Inter-country connectivity</li> </ul>
		Regulation and legal framework [33%]	<ul style="list-style-type: none"> <li>• Adequate legal framework</li> <li>• Independent energy regulator</li> </ul>
Integrated	Trade [50%]		General (e.g. foreign-direct investment)
	Infrastructure		<ul style="list-style-type: none"> <li>• Quality of electricity supply</li> <li>• Losses due to electric outages</li> </ul>

\*Note: 1990s model reform elements are shaded more darkly. Source: Adapted from EBRD (2017).

## Appendix B: Political economy of energy access

This appendix summarizes select studies on the broader political economy of energy access, further to the discussion in Section 4.2 with reference to the political economy of 1990s market reforms. For an overarching literature review on the political economy of electricity access, see Barnett & others (2018).

**Understanding the political dimensions of electricity access is vital to achieving universal access.** A fifth of the world's population, or some 1.3 billion people, lack access to electricity.<sup>72</sup> A significant body of literature shows how decisions about grid and off-grid services have long been the subject of politics, as much an active tool of politics, wielded for one cause or another. Political leaders can take advantage of electricity's mixed public-private characteristics, with what Min (2015) describes as a 'veneer of universalism'. On one hand, the public may support a politician's proposal to connect more communities to electricity. In practice, the same politician might prioritize connections to some users over others, based on a political agenda. Shamir (2013) documents how early electrification efforts can often widen the gap between rich and poor, and between urban and rural. For example, electricity added to the privilege of white settlers to the exclusion of Africans in colonial Rhodesia (now Zimbabwe). In UK-ruled Palestine in the 1920s, electrification created and maintained social, political and economic differences between Arabs and Jews. In the Madras Presidency of colonial India, language-based political boundaries led to the creation of two separate grids. In other words, the electricity grid is a "maker of groups and a generator of political and economic difference among groups and individuals" (Shamir 2013: 6).

**Robust evidence shows electricity access is greater under democratic forms of governance, though high access rates are possible under committed non-democratic governments.** Min (2015) finds a country with a long history of democracy provides electricity to 10% more citizens than a comparable country with a long history of non-democracy. The spatial distribution of electricity in poor parts of developing democracies "appears to reflect a conscious effort to target areas with many voters" (Min 2015: 13). In China, despite near universal electricity access, electricity provision to the poor is worse than in India when measured by *infant mortality rates*, but slightly better in China than India when measured by *per capita income*. On this basis, Min (p.109) suggests that India has done "as well, and maybe even better, than China, at providing electricity to its poorest citizens".<sup>73</sup> These recent studies confirm Brown & Mobarak's (2009) finding that households' share of electricity consumption increases relative to industrial consumers in poor countries that become more democratic. They found that households are charged less for electricity relative to industry in democracies than in non-democracies. To explain this, they contend that democracy compels politicians to favor wide segments of the population at the expense of narrower interests, even those with more financial 'clout'.

**Examples of access reversal highlight the political costs of infrastructure maintenance, with ties to electoral cycles.** In India's most populous state, Uttar Pradesh, Min (2015) observes that dark villages light

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<sup>72</sup> See [www.se4all.org](http://www.se4all.org)

<sup>73</sup> Min's (2015) analysis of the relationship between access and regime type is based on two decades of high-resolution global nighttime satellite imagery to village level, alongside other country data. He provides compelling evidence that satellite imagery reliably reveals spatial distribution of electricity access and use. The correlation results hold across countries with different income levels, population densities, and levels of state capacity. Trotter (2016) finds a similarly strong association between democracy and rural electrification, including greater equality between rural and urban electrification, in Sub-Saharan Africa.

up around election cycles, especially in places where the political opportunity and capacity for change is highest, such as areas represented by a low-caste party with an interest in serving the poor. Unfortunately, many impoverished areas also *return* to darkness after elections. This pattern highlights the real financial and political costs of maintaining electricity supply over time (especially in a context where peak loads may outgrow supply), but also of maintaining delivery infrastructure. Further research would be required to compare the above with observed correlations between democracy and market reforms, in light of potential trade-offs between access and reform objectives.

**Available research poses questions for the political economy of donor influence on electricity access.**

Trotter (2016) finds some, if weak, evidence that countries in Sub-Saharan Africa with *lower* levels of foreign aid have greater rural electrification. The explanation is that (untargeted) aid is a form of rent that makes governments “less accountable to their citizens and under less pressure to maintain popular legitimacy”, compared to providing concessions for rural infrastructure, and in direct opposition to the positive effect of democracy on rural electrification (p.114). Although foreign aid constitutes 6% of financial resources for power infrastructure in Sub-Saharan Africa, Trotter (2016) suggests that associated policy conditions have an outsized influence and can make it more difficult for governments to pursue subsidy-based interventions as proved successful in Thailand or Republic of Korea. On the other hand, aid could target electrification as an objective, however the study did not control for this. Briggs (2012) finds that an incumbent political party in Ghana allocated aid for electrification with explicitly political criteria. This case shows that governments can allocate aid strategically to secure votes, even under the best-case scenario of strict donor monitoring in an established democracy.

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## Acronyms

CCGT	combined-cycle gas turbine
DFID	Department for International Development (UK)
EBRD	European Bank for Reconstruction and Development
ESMAP	Energy Sector Management Assistance Program
EU	European Union
FIT	feed-in tariff
GDP	Gross Domestic Product
IBRD	International Bank for Reconstruction and Development (World Bank)
ICT	information and communication technology
IDA	International Development Agency (World Bank)
IEA	International Energy Agency
IEG	Independent Evaluation Group (World Bank Group)
IMF	International Monetary Fund
IPP	independent power producer
ODI	Overseas Development Institute
OECD	Organisation for Economic Cooperation and Development
PEA	political economy analysis
SDG	Sustainable Development Goal(s)
SOE	state-owned enterprise
T&D	transmission and distribution
TWP	Thinking and Working Politically Community of Practice
UK	United Kingdom of Great Britain and Northern Ireland
UN	United Nations
US	United States of America
USSR	Union of Soviet Socialist Republics