



ESCAPING THE ENERGY POVERTY TRAP

**When and How
Governments Power
the Lives of the Poor**

**Michaël Aclin, Patrick Bayer, S.P. Harish,
and Johannes Urpelainen**

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Preface

This book is the result of a project that began in New York in March 2012. The four of us met at a bar next to the New York University campus, where Michaël and Harish were graduate students at the time, to discuss new ways to study environmental politics. Our starting point was that a lot had been written about environmental issues in wealthy countries but we knew less about the sustainability challenge in emerging and developing countries.

This meeting led to a research program that took us to three continents. From Brazil to India to Tanzania, we tried to understand the nature and causes of unsustainable economic growth. In doing so, we soon learned how difficult it would be to disentangle environmental degradation from the broader challenge of economic development.

In this context, our work began to prioritize the problem of energy poverty. Billions of people lead lives without electricity at home or access to clean cooking fuels. These people's lack of access to modern energy often makes life cumbersome and unproductive. Moreover, to talk about sustainable development when billions have no access to affordable and abundant energy is, and will remain, a political nonstarter in the countries we studied.

Solving the problem of energy poverty is not enough for sustainable development, but it is necessary. As we wrote *Escaping the Energy Poverty Trap*, we began to understand how important government policies, and the messy politics surrounding them, would be for ending energy poverty. This book is our attempt to understand why governments sometimes succeed in improving energy access, why they sometimes fail, and how they could do better in the future.

As we have written this book, we have accumulated the usual authors' debts. We are immensely grateful to all our collaborators and partners across the world. Arunabha Ghosh, who leads the Council on Energy,

Environment and Water, a dynamic research institute located in New Delhi, India, invited Johannes to visit India in October 2012. That visit gave rise to our field research on rural energy access. Rustam Sengupta, who at that time led Boond Engineering & Development, a social enterprise focused on energy access in India, has collaborated with us extensively for the last several years. Beth Clevenger at the MIT Press, who had worked with Michaël and Johannes before, did a terrific job at guiding us through the publishing process. Douglas Barnes, Sunila Kale, and Brian Min gave excellent comments on different chapters of the manuscript. Most importantly, we are grateful to the people who generously gave their time to participate in our surveys and experiments in the field—they taught us most of what we know about energy poverty.

—The authors

Much of this book was written in fairly turbulent personal times: our son Emil was born in 2015, my wife Carolina and I were on the job market, and we moved from the US to Scotland. During these times of change, it was my wife's enduring support and love that made everything easy and joyful. I would also like to thank my now three-year-old son Emil for showing me every day that answering the seemingly easy questions is the most difficult part of our lives—both personally and academically. They are the loves of my life.

—Patrick

Academia is enriching in many ways, but it imposes unusual constraints. I am grateful to Sarah, my spouse, for her extraordinary support. To write a book like this requires the occasional midnight phone call while on vacation. Being supportive in these circumstances is a form of true love. Thank you.

—Michaël

1 Introduction

In today's industrialized world, almost everything we do requires huge amounts of energy. We use natural gas to heat our homes and cook our food. Electricity powers our fridges, freezers, mobile phones, tablets, computers, and televisions. Our malls, restaurants, offices, and streets are well lit by countless electric lights. Nuclear power stations, natural gas turbines, coal power plants, and huge dams churn out more power than ever before, and as we buy larger houses and use new electric appliances, we become more and more dependent on abundant and affordable energy. If we suddenly lost our ability to produce copious amounts of energy, our industrial economies would come to a standstill. Our survival, lifestyle, and identity depend on energy.

Elsewhere in the world, many lead lives impoverished by a lack of modern energy. More than 1 billion people do not have any electricity at home, and almost 3 billion people still use traditional fuels like biomass for cooking (IEA 2017). Much of the convenience and comfort that even the poorest people in industrialized countries take for granted is beyond the grasp of the billions who are among the world's energy poor. Energy poverty has tragic consequences for their lives. Without access to modern energy, the aspirations of the energy poor of the world are bound to be frustrated. Lack of electricity prevents the use of bright lighting for reading and studying (Khandker, Barnes, and Samad 2009). Without refrigerators, households cannot store perishable food or lifesaving medicine; absent electric power, small businesses are difficult to run (Cabraal, Barnes, and Agarwal 2005). Without a fan, oppressive heat in the tropics is a major threat to public health and productivity. Indoor air pollution from cooking with traditional stoves using firewood or other traditional biomass is a major health hazard for families (Ellegard 1996; Wickramasinghe 2011). Women and children

spend hours upon hours to collect the same firewood that later spoils their lungs (Foell et al. 2011). If households had access to modern cooking fuels such as liquefied petroleum gas (LPG), these problems could be easily avoided.

How can the world's energy-poor gain access to abundant energy? Why have some countries, even among the least developed, left energy poverty behind? Why do others struggle to provide their people with energy? What can governments do to provide the poorest of the poor with access to modern energy? Unfortunately, the answers to these questions remain elusive. Scholars have identified energy resources, geography, and economic development as fundamental drivers of energy poverty. And yet these three factors can hardly explain patterns of energy poverty in the world. Against all odds, a gigantic country such as China made rapid progress in rural electrification during the first decade after the communist revolution. Vietnam's rural electrification program in the aftermath of total destruction from war is the envy of the world. In Brazil, the transformation from traditional biomass to LPG began almost a century ago. Yet even resource-rich countries such as Nigeria can struggle to provide energy to its citizens. Resources, geography, and economic development are not sufficient on their own to explain energy poverty.

Drawing on years of field research and data analysis, this book is our effort to solve the conundrum of energy poverty. Focusing on household electrification and access to modern cooking fuels, we show that a political economy approach to energy poverty can explain the varied outcomes across the developing world. Even after accounting for existing explanations, large differences across countries and over time remain, and these differences can be largely attributed to political factors. The three building blocks of our argument are government interest, institutional capacity, and local accountability.

Fundamentally, both political and economic factors determine the degree of a *government's interest* in eradicating energy poverty. Some governments expect economic gains from acting to erase energy poverty, while others do not. Nevertheless, governments of all stripes, both democratic and autocratic, are interested in the political benefits of eradicating energy poverty. In some circumstances, the energy-poor can shape the fates of political elites, be it through elections or protest, and these circumstances encourage progress toward eradicating energy poverty in a world of self-interested politicians.

Government interest is a necessary condition for successful policies to mitigate energy poverty, yet it is by no means sufficient. Among interested governments, two factors turn out to be decisive: *institutional capacity* and *local accountability*. Institutional capacity determines the ability of the government to enact and implement coherent, effective, and affordable policies that eradicate energy poverty over time. Local accountability ensures that national policies are properly implemented in energy-poor communities in terms of both information transmission and the incentives of local officials. In other words, local accountability ensures that policies reflect the specific needs and demands of the people.

The previously neglected political economy dimension is important for energy poverty from analytical and practical perspectives. It explains to a large extent the puzzling variation in energy poverty. Furthermore, because political economy focuses on government behavior and effective policy, the result implies much room for improvement in the future. Our findings provide ample reason for social scientists to focus on energy poverty, as social science can generate knowledge about strategies to induce governments to act effectively to end the tragedy of energy poverty. Furthermore, much in the domain of energy poverty will be of interest to the broad community of scholars working on political economy and development, such as the importance of distinguishing between the practical challenges of providing various types of public goods and services.

Importantly, this political economy approach can be used to understand the role of rapidly evolving technology in the eradication of energy poverty. Today, improvements in energy technology, such as ultraefficient LED lights and inexpensive solar panels, promise new opportunities for dealing with energy poverty. As we show, however, the ability of new technologies to eradicate energy poverty depends on government interest, institutional capacity, and local accountability. New technologies open new opportunities for both government-led and private initiatives, such as the creation of bottom-of-the-pyramid energy markets (Prahalad 2006; Shukla and Bairaganjan 2011), but their ability to make a difference depends on the same fundamental political economy factors that determine improvements in energy access more generally.

The remainder of this introduction has five goals, and each warrants a section of its own. The first goal is to describe variation in energy poverty, explain why we all should care, and motivate our political economy

approach. The second is to summarize our argument, and the third is to describe our data and research methodology. Fourth, we discuss the implications of our findings and summarize the contributions of this book. As is often the case, the chapter ends with an outline of the book.

Energy Poverty and Human Development

Energy is a necessity for modern economic activity and lifestyle. Today, industrialized economies use vast amounts of energy to produce goods and services. We use electricity for lighting, to power appliances, and to run factories. For cooking and heating, we use both electricity and alternatives such as natural gas and LPG. We also use energy for transportation, and today's mechanized agriculture is dependent on large quantities of it. According to IEA statistics, in 2015 the average American used energy amounting to that released from burning 6,801 kilograms of oil.¹

The majority of the world's population, however, has to survive with much less energy. The same IEA statistics tell us that in 2014, the average person consumed less than the equivalent of 1,920 kilograms of oil. In sub-Saharan Africa, the number was only 687 kilograms, and in South Sudan, where energy consumption per capita is the lowest in the world, this number was only 61 kilograms—or less than 1 kilogram for every 100 kilograms in the United States. The inequalities in energy consumption across countries are stark: some people have access to abundant energy, and others suffer from extreme deprivation.

If anything, other statistics tell an even clearer story. The IEA (2017) maintains a comprehensive database on household energy access in more than a hundred countries in the world. According to this database, 1.1 billion people in the world in 2016 remained without any access to electricity at home, and virtually all of these people were found in sub-Saharan Africa or the developing countries of Asia. Their children do not study at night using bright electric lights; they cannot charge their mobile phones at home or turn on the fan in the oppressive heat. Simple pleasures that we take for granted, such as watching television, are not available to them (Bernard 2010; Sagar 2005; World Bank 2008; Khandker, Barnes, and Sama 2013).

According to this 2017 IEA report, 2.8 billion people still lack access to modern cooking fuels and must rely on traditional biomass and other

solid cooking fuels for their primary cooking needs. The large population of Asian developing countries leaves 1.65 billion (43 percent of the regional population) without access to modern cooking fuels; in sub-Saharan Africa, 780 million (80 percent of regional population) are in the same situation. Because most of this traditional biomass is firewood used for cooking, people living in these households spend a lot of time collecting their fuel (Arnold, Köhlin, and Persson 2006). Furthermore, indoor air pollution from firewood is a major cause of illness and death from respiratory diseases in the developing world (Kandpal, Maheshwari, and Kandpal 1995; Ellegard 1996; Mishra, Retherford, and Smith 1999; Goldemberg et al. 2004; Schei et al. 2004). As the director of the US National Institutes of Health, Francis S. Collins, said at the launch of the Global Alliance for Clean Cookstoves, “Indoor cookstoves are a serious health concern in developing countries. The toxic emissions from these cooking fires cause low birth weights, pneumonia in young children, and heart and lung problems in adults, and kill nearly 2 million people each year, mostly women and children.”²

Our goal in this book is to understand and explain the phenomenon of energy poverty in rural households, for the evidence is clear: energy poverty is mostly an affliction outside urban areas. We also focus on two specific facets of energy poverty: (1) access to electricity and (2) access to modern cooking fuels and technology. These aspects of energy poverty make people poor and sick and warrant particular attention. While energy poverty cannot be reduced to these two dimensions—for instance, modern energy allows people to travel at unprecedented speed across long distances—we believe that electricity access and cooking are the two most pressing problems related to energy poverty, and thus our focus. Indeed, the UN Sustainable Development Goals include “affordable and clean energy.”³

Some countries, such as Ghana and Vietnam, made early and rapid progress in the eradication of energy poverty despite their low levels of income and infrastructural development. Others, such as Nigeria and Bangladesh, have achieved much less despite similar circumstances and, if anything, more favorable conditions. How can we explain this variation? Why have some governments acted decisively and effectively to provide people with basic energy access and beyond, while others remain passive or are failing in their efforts?

Now is the time to answer these questions. The United Nations first declared the year 2012 the year of Sustainable Energy for All (SE4ALL) and

then honored the years 2014 to 2024 with the same designation. For President Barack Obama, the Power Africa program was a foreign policy priority. From Pakistan and India to East Africa, governments continue to invest staggering amounts in grid extension and new power plants, while ambitious entrepreneurs are innovating with off-grid renewable power generation and technologically advanced cookstoves. Energy poverty remains a vexing problem, but there has never before been as much interest in the topic as there is today in international fora and among young entrepreneurs. The stakes for solving the problem are high too. For example, the latest IEA *World Energy Outlook* suggests that obtaining full energy access by 2030 would avoid about 1.8 million premature deaths from indoor air pollution alone (IEA 2017, 72).

The policy recommendations on ending energy poverty are decidedly controversial and embattled. Climate policy advocates and environmentalists are enthusiastic about the use of renewable resources, such as solar power, for rural electrification, but they worry about the negative effects of coal power plants on the global environment (Alstone, Gershenson, and Kammen 2015; ODI 2016). Many development specialists point to the tragic consequences of energy poverty for billions in the least developed countries (BTI 2014). These debates become particularly heated when concrete policies are at stake. From the World Bank to the US Overseas Private Investment Corporation, governments of industrializing countries have placed restrictions on investment into fossil fuels (Moss, Pielke, and Bazilian 2014). IEA's *World Energy Outlook* (2017) points in the right direction by developing a "Sustainable Development Scenario" that seeks to address decarbonization, energy access, and air pollution all in one.

Given this debate, a comprehensive analysis of the political economy of energy poverty is of much value. For researchers, the analysis of energy poverty is a new frontier that can shed light on deep questions about development more generally. For policymakers and practitioners, a thorough understanding of the political incentives and constraints that guide governments in energy-poor countries is absolutely critical for productive engagement. Programs such as SE4ALL are ultimately dependent on the participating governments, and these governments face political pressures as they make decisions about investments in energy access. Investments are key as an estimated US\$52 billion would be needed annually to make energy for all a reality by 2030 (IEA 2017, 13).

The Political Economy of Energy Poverty

To explain patterns of energy poverty and solve these puzzles, we begin with existing explanations from the literature. Throughout, we focus on the contemporary problem of providing access to modern energy to a large number of poor people in developing countries. As fundamental factors, authors from different disciplines have emphasized the availability of domestic energy resources (Madureira 2008; Bhutto and Karim 2007), geography (Deichmann et al. 2011; Kemmler 2007; Onyeji, Bazilian, and Nussbaumer 2012), and the level of economic development (Foley 1992; Barnes 2011; Golumbeanu and Barnes 2013; Khandker, Barnes, and Samad 2012). While the availability of energy and favorable geographies makes the eradication of energy poverty easier, they cannot account for slow progress in a country such as Nigeria, which enjoys abundant energy wealth and has a very high population density. Economic development is a fundamental driver of energy access, yet countries such as China and Vietnam moved forward in leaps and bounds decades ago when they were still among the poorest in the world.

Others attribute variation in energy poverty to political institutions, such as the autocracy-democracy difference (Brown and Mobarak 2008) or emphasize the importance of effective policy (Haanyika 2006; Barnes 2007; Mawhood and Gross 2014; Nygaard 2010). But some autocracies, including China and Vietnam, have made great progress in eradicating energy poverty. So did Eastern European communist regimes under the yoke of the Soviet Union. What is more, effective policy is a tautological argument, as it fails to answer why all governments do not enact and implement effective policies.

There is no doubt that these factors go a long way toward explaining energy poverty. For example, while having coal or being a small country makes the problem easier to solve, such advantages do not automatically solve the problem nor does their absence mean that all hope is lost. The fundamentals of resources, wealth, and geography are neither necessary nor sufficient for mitigating energy poverty.

What is missing from the large body of literature on energy poverty is a systematic account of the political economy behind it. We argue that little progress is to be expected in the absence of decisive political action. By “political economy,” we refer to the analytical tradition that emphasizes

societal interests and their aggregation through political institutions into policy. In this line of reasoning, the focus is on government behavior. Governments are assumed to pay close attention to the prospect of political survival through the maximization of political support in the society. Consequently, governments enact and implement policies that cater to politically powerful groups. These policies may or may not be good for the energy-poor, but most of the time they are good for the government itself.

From a political economy perspective, the first factor that we consider is *government interest* in eradicating energy poverty, that is, the constellation of factors that encourage a government to invest resources into improving energy access and mitigating energy poverty. These factors can be economic or political. If measures that combat energy poverty also generate direct economic benefits, any government—no matter how self-interested—sees value in action. For example, rural electrification offers proceed in tandem with efforts to electrify irrigation pumps in the countryside for greater economic productivity. What is more, the energy-poor are sometimes in a position to influence the policymaking process because of their political power. For example, if the energy-poor live in areas that are pivotal in elections, the government has an incentive to combat their plight. We mostly focus on national governments, as key energy access policies are formulated at this level in most countries, but in some cases, we also consider the provincial level. In India, for example, the constitution gives states substantial powers over the distribution of electricity to users.

Nevertheless, government interest itself is not a guarantee of success. Historically, many governments have expressed genuine interest in mitigating energy poverty but failed to achieve their goals. Therefore, we must dig deeper into the political economy of energy poverty to understand why governments sometimes fail to realize their commendable goals. Without government interest, it is clear that a policy solution to the problem of energy poverty is not possible. Conditional on sufficient government interest, we must shift our attention to factors that determine success or failure in policy effort. Accordingly, the two other pieces of the puzzle that we highlight are *institutional capacity* and *local accountability*. Improvements in each factor are conducive to the mitigation of energy poverty.

By “institutional capacity,” we refer to the government’s access to an administrative apparatus that is capable of implementing policies in a competent and cost-effective manner (Bekker et al. 2008). Consider the

following examples. Some governments have well-managed electric utilities and competent rural electrification agencies, whereas others must do with fiscally insolvent utilities and rural electrification agencies that do not have any actual capacity to implement policy across the country. Some governments have distribution networks for LPG to remote rural communities, while others cannot reach these communities at an acceptable cost. Whatever the government plans to do, institutional capacity determines the quality and cost of implementation.

Local accountability is equally important. Although governments can, in principle, enact and implement policies in a top-down manner, experience suggests that local participation is essential to success. While the notion of government interest, as defined in this book, focuses on higher levels of the political system, we identify a specific role for local politics and governance. Although local bodies rarely have influence over key energy access policies, they often play an important role in the implementation of higher-level policies on the ground. Thus, the local accountability of government officials is critical. By this, we refer to the extent that the community is able to voice its concerns and hold the local government accountable for their policies, successes, and failures (Paul 1992; Fox 2015). Even a government with a strong political or economic interest in removing energy poverty benefits from municipal or other local officials who can support the required public service delivery. Local accountability mechanisms improve information transmission from the grassroots level upward in the political machinery and ensure that the local government is rewarded for success and punished for failure. Therefore, local accountability mechanisms facilitate the eradication of energy poverty.

Without delving into any particular national circumstances, we can already make one prediction that turns out to be essential for understanding the mitigation of energy poverty: government policy is more effective at improving rural electrification than at providing modern cooking fuels to people who rely on traditional biomass. The reason is that rural electrification provides different governments with many opportunities to reap direct economic gains, whereas the provision of modern cooking fuels does not, despite clear environmental and public health benefits in the long run. This expectation is consistent with differential progress in rural electrification and the provision of clean cooking fuels. While the number of people with electricity access across the globe fell from 1.7 billion in 2000

by about 600,000 by 2016, the number of people lacking access to modern cooking fuels stagnated at around 2.8 billion over the same time period (IEA 2017, 11).

The theory is also relevant to understanding, predicting, and improving the role of rapidly evolving energy technology in the eradication of energy poverty. Given today's innovative dynamism in the energy sector, no theory of energy poverty can avoid commenting on technology. We do not expect technological progress, such as the reduced cost of off-grid solar systems, to fundamentally change the political economy logic we have outlined, but better technology does reduce the cost of government policy in all circumstances and therefore creates new opportunities for the eradication of energy poverty. Where the alignment of political economy factors is conducive to good policy, new energy technology can increase the pace of progress in the provision of universal energy access. But where governments lack the interest or ability to enact effective policies, new technology will not make a large difference in efforts to expand energy access.

Research Methods

Energy poverty is a relatively novel topic for political scientists. While there is a large body of literature by energy engineers and economists (Revelle 1976; Pachauri and Spreng 2004; Pachauri and Jiang 2008; Samad et al. 2013), political scientists have, with few exceptions (examples are Aklin et al. 2014b; Min and Golden 2014; Min 2015), not examined the political origins of the problem. Due to the limited availability of prior research, we experiment with our research design and methodological approaches. Given the complexity of the topic, we opt for the mixed-methods approach (Seawright and Gerring 2008). For this, we use a variety of qualitative methods, ranging from a detailed case study (Gerring 2004), to a subnational comparative analysis, to a series of structured and focused comparisons, in order to gain deeper insights into causal mechanisms and processes (George 1979; King, Keohane, and Verba 1994; Sekhon 2004).

Our first challenge is to provide a proper description of energy poverty across the world today. We conduct one major national case study—India—to gain a deep understanding of the political economy of energy poverty and eleven less comprehensive case studies for the purposes of comparative hypothesis testing. Focusing on India is ideal for a comprehensive

case study for four reasons. First, it has a long history of efforts to reduce energy poverty, with considerable variation across regions and over time. Second, data availability for India is excellent, allowing us to measure our explanatory and dependent variables with precision. Third, India's federal political structure allows us to explore variation across states within one national context. Finally, we have done much of our own fieldwork in this country.

Following the Indian case study, we conduct eleven smaller case studies across the world. We choose countries at different income levels, from different continents, and with different geographies and resource endowments. We also consider a priori information about variation in the explanatory variables of interest for our theory. Through this case selection process, we ensure that we have a diverse set of countries under investigation and can make broadly applicable claims about our theory. While our case selection is primarily informed by explanatory and control variables, we have found cases with considerable variation in the outcome. We also choose one case, Senegal, that initially presents a puzzle and a possible anomaly for our theory: the government's progress has been much faster in improving access to modern cooking fuels than in rural electrification.

We study each case in a structured manner, focusing on evaluating the values of the explanatory and dependent variables, along with some process tracing to check causal pathways and mechanisms. We emphasize that the primary goal of our qualitative analysis is not to correlate explanatory and dependent variables but to examine the ability of our theory to explain variation and outcomes within each case. Given the considerable differences in national circumstances across countries, we believe that the strongest evidence for or against our theory comes from a careful evaluation of the processes that have, or have not, led to the eradication of energy poverty over time.

This combination of methods inevitably leaves any one of them vulnerable to criticism. Our hope is that the methodological triangulation allows us to provide a totality of evidence that is compelling to scholars and practitioners with various backgrounds. The strength of the national case studies is their focus on the important decisions taken at the federal level, whereas the advantage of the subnational cases is their attention to detail and flexibility in the interpretation of processes, mechanisms, and junctures.

Implications

The large body of literature on energy poverty has so far had little to say about the politics of the problem (Thompson and Bazilian 2014). While the debate on effective policy has been intense (Barnes 2007; Reddy, Balachandra, and Nathan 2009; Nygaard 2010; Rehman et al. 2012; Coelho and Goldemberg 2013; Balachandra 2011b), this literature does not develop or test hypotheses about the political incentives that shape government policy. Stated bluntly, our study shows that much of the debate overlooks the root cause of bad policy.

On the one hand, governments with limited interest in reducing energy poverty would not act even if they knew exactly which policies would be effective, sustainable, and affordable. When studies investigate the policies of these governments and declare them ineffective based on poor outcomes (Gaunt 2005; Barnes 2011; Bazilian et al. 2012; Bhattacharyya and Ohiare 2012; Andadari, Mulder, and Rietveld 2014; Coelho and Goldemberg 2013), the research risks conflating the intrinsic *de jure* qualities of the policy with the government's indifference to competent implementation. Our findings show that the formalities of policy design are hardly relevant in the absence of strong government interest. Consequently, only cases that can demonstrate strong government interest are of use for policy analysis. Most studies to date ignore this basic point, and our analysis reveals the perils of this approach.

On the other hand, government interest is not itself a sufficient condition for success. Among governments with an interest in eradicating energy poverty, variations in institutional capacity and local accountability are important predictors of success and failure. When studies focusing on government interest (Min 2015) reveal a robust correlation between political incentives and the eradication of energy poverty, they point to a clear difference between countries with and without committed, interested governments. However, they do not explain why some countries with a high level of government interest make great progress in reducing energy access while others, despite an equally high interest, achieve little or nothing.

While the relationship between institutional capacity and policy quality is itself obvious, emphasizing institutional capacity is critical because a focus on policy quality masks the fundamental origin of the quality. Energy

access policies can change rapidly, but they do not come out of the blue. The government's ability to formulate effective policies to end energy poverty depends on adequate institutional capacity, and such capacity cannot be built overnight. Government agencies evolve slowly over time, and often in a path-dependent manner.

Local accountability is a factor that most country-level case studies and cross-country analyses simply ignore. And yet, as Thompson and Bazilian (2014, 130) write, there are good reasons to consider local accountability essential for eradicating energy poverty: "A careful alignment of the various access points for determining energy policy with the broader more comprehensive contours of a nation's political geography would find that the strengthening of local institutions could provide the foundational seeds for broader national reform efforts—both in democratization and energy service provision." The identification of local accountability as a central factor in the eradication of energy poverty, both theoretically and empirically, thus adds a new dimension to the problem, breaking new ground and creating opportunities for future research.

In combination with the fundamental factors of energy resources, geography, and economic development, our analytical framework lays a solid foundation for energy access policy. Government interest, institutional capacity, and local accountability allow policymakers to identify the systematic causes of bad and good policy. Where the absence of these factors discourages effective energy access policy, the first priority is not to worry about the details of policy but to consider ways to increase government interest, build institutional capacity, and invest in local accountability. The identification of these systematic causes also opens a better opportunity to understand the effect of policy design on outcomes. That is, while energy resources, geography, and economic development are useful alternatives to explain energy poverty, they are insufficient for a complete explanation of the problem as there is considerable variation even after accounting for these factors. By accounting for the conditions that influence success and failure, scholars can identify the importance of policy design choices, all else constant.

Indeed, our analysis also offers a message of hope for the eradication of energy poverty. We show that after accounting for the fundamentals, governments' behavior and policies play an important role in determining progress in the eradication of energy poverty. Our analysis confirms that

the increased interest in energy poverty among social scientists holds high promise for first identifying and then removing fundamental institutional barriers to progress. We show that otherwise similar countries have seen clearly diverging outcomes in mitigating energy poverty because of variation in the political context. Deterministic thinking about energy resources, geography, or economic development fails to explain much of the variation in energy poverty today.

Moving beyond the case of energy access, our results also have notable implications for the study of the provision of public goods and public service delivery in general. In comparative politics and comparative political economy, the literature on this topic is vast (Lake and Baum 2001; Adserà, Boix, and Payne 2003; Besley et al. 2004; Banerjee and Somanathan 2007; Besley, Pande, and Rao 2012; Tsai, 2007). While this research generates much knowledge and offers many valuable lessons about the topic, the studies typically fail to distinguish between different types of public goods and services. This generic, abstract approach is appealing from the perspective of theory building and external validity, but the downside of this appeal is the risk of obscuring important differences (Batley and McLoughlin 2015). At worst, the lack of thorough comparative analysis of services may result in faulty inferences. As Kramon and Posner (2013) note in their review of studies of ethnic favoritism in public service provision, “Nearly all of them are vulnerable to a common and potentially devastating criticism: namely, that the pattern of favoritism that has been identified with respect to the outcome in question may be counterbalanced by a quite different, even opposite, pattern of favoritism with respect to other outcomes that are not being measured” (462).

We have shown the clear difference between government incentives to act on rural electrification and modern cooking fuels. While we have been able to apply the same theory to both issues, the outcomes are impossible to understand without careful attention to the technical details of the differing operational challenges, such as the network nature of the electric grid (Hughes 1993; Kale 2014a). The same distinctions probably apply to other public goods as well, ranging from road infrastructure to sanitation and the establishment of local health centers. By investigating these distinctions, we offer a solution to the question that Kramon and Posner (2013) raise for scholars of the politics of public services and public goods: If studies of distributive politics generate different results depending on the

outcome one studies, how can scholars accumulate knowledge? We show that the solution lies not with aggregating results from various outcomes but in theorizing about how the intrinsic characteristics of different public services shape the politics of their provision. Aggregation of outcomes leaves scholars with a vague understanding of general tendencies, whereas comparisons of multiple goods and services allow genuine theoretical progress with precise testable implications.

In a broader sense, these findings suggest that there is merit to narrowing the range of social science theory and paying more attention to detail. While broad generalizations about factors such as regime type and all types of public goods can be elegant and profound, they can also hide important variation and, more important, stand between social science and actual efforts to improve policy. As the famed development economists Abhijit Banerjee and Esther Duflo (2014) put it in their advocacy of randomized controlled trials, "In the end, the choice facing the field of political economy is very simple. It can embrace grand theories that will offer us the satisfaction of strong and simple answers. Or it can try to be useful" (37). While we do not advocate for any particular method here or even criticize macrotheoretical analysis, we do agree with the importance of focusing on detail and not letting the pursuit of generality obscure important issues or stand between research and policy. This is important not only for development economists but also for political scientists, whose discipline is at the forefront of identifying and solving problems related to bad political incentives.

This discussion brings us to the importance of technology. With some exceptions (Cohen and Noll 1991; Skolnikoff 1993; Kim and Urpelainen 2013, 2014), scholars of political science have not given new technology the central role it should have in theory development and empirical research. Technological change is probably the most fundamental force that has shaped the evolution of human civilization over centuries (Basalla 1988), and the war on energy poverty is no exception. As we will see in many cases, such as Kenya and Bangladesh, new technology has both allowed governments to overcome their limitations and private entrepreneurs to substitute for uninterested or incapable governments. Had we not explicitly built technology into our analytical framework, we would have missed these important developments and failed to account for the surprising level of success in mitigation of energy poverty in these cases.

Finally, our combination of national and subnational case studies is itself noteworthy. We have reached beyond the typical approach of combining paired case studies at the national level. Specifically, one case study is a deep, longitudinal analysis of India's energy access from a political economy perspective; the other is a structured comparative analysis of eleven cases. We believe such triangulation is essential for studies that seek to tackle a new and technically complex topic.

Chapters of the Book

This book has seven chapters. Chapter 2 expands on the concept and reality of energy poverty. We provide precise analytical definitions of energy poverty and delineate the scope of our analysis, emphasizing that our focus here is on access to modern energy among the rural poor. We also review the history and contemporary situation of energy poverty at the global level, collating and summarizing the most recent data available. We provide a concise summary of the arguments found in the fragmented literature on energy poverty, emphasizing explanations for variation in the ability of countries to escape the energy poverty trap. Finally, we address the raging debates of the day, such as the relationship between energy poverty and climate change, providing concrete guidelines for dealing with the ethical dilemmas that efforts to make energy poverty history raise. In chapter 3, we present a general theory of energy poverty and variation in government efforts to combat it. The chapter explains how government interest, institutional capacity, and local accountability together allow countries to make rapid progress in alleviating energy poverty. We begin with a summary of our key assumptions and then proceed to derive empirical implications from them. Throughout the chapter, we illustrate the logic of the argument with examples, descriptive statistics, and narratives. The chapter also considers the role of new technology as an enabler of progress and contrasts the challenges of rural electrification and provision of modern cooking fuels.

Since much of our own fieldwork focuses on India, chapter 4 provides a detailed narrative of India's energy poverty trap and efforts to escape it. We show that India's national trajectory and differing rates of progress across states are both consistent with our theory. Since India's declaration of independence in August 1947, government interest has determined the broad pattern of rural electrification and progress in clean cooking fuels,

but institutional capacity and local accountability have determined the rate of progress. The use of detailed household data on energy access shows that much of the variation in progress across Indian states can be attributed to these factors after we control for economic wealth, energy resources, geography, and other conventional explanations.

In chapters 5 and 6, we conduct eleven additional country case studies.⁴ These case studies all follow the same research design and logic of inquiry, but they are not as detailed as the case of India. We chose countries from all continents, across a wide variety of wealth levels, and representative of various geographic contexts and resource endowments. We examine in detail the national processes that have resulted in success or failure of policy to eradicate energy poverty in terms of rural electrification and access to modern cooking fuels. These chapters complement the detailed but geographically restricted analysis of India's efforts to reduce energy poverty. Chapter 7 offers a concluding discussion in which we summarize our argument and explain its implications for the study of energy poverty and political economy more generally. We finish the chapter with a discussion of the implications of our findings for policy, emphasizing that our results highlight the centrality of policy for progress in rural electrification and provision of access to modern cooking fuels. The concluding chapter breaks new ground for research and practice on energy poverty as a policy problem, with an emphasis on previously neglected political economy considerations.

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