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ISSUE BRIEF

KEYS TO ACHIEVING UNIVERSAL ENERGY ACCESS SERIES | BRIEF 2 OF 3

CLEAN ENERGY ACCESS IN DEVELOPING COUNTRIES: PERSPECTIVES ON POLICY AND REGULATION

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EXECUTIVE SUMMARY

Several ambitious international initiatives that aim to deliver access to clean, modern energy services to underserved populations in developing countries have recently taken root, including the UN Sustainable Energy for All initiative, the Energy+ Partnership, and Power Africa. The scale of the challenge is great: today, 1.3 billion people lack access to electricity, yet extending the electrical grid is not a cost-effective solution in many rural, low-income areas. The International Energy Agency estimates that to achieve universal access to electricity by 2030, more than 50 percent of new electricity connections will be through distributed energy solutions—from solar home systems with several watts of capacity to kilowatt-scale biomass minigrids that serve entire communities—and 90 percent of those will use renewable energy sources.

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Technological advances and innovative business and financial models are enabling a host of distributed clean energy enterprises to offer affordable clean energy solutions in support of these initiatives. However, many of these enterprises are nascent and need to scale up the delivery of clean energy services rapidly in order to meet these ambitious energy access goals. While market volume for solar off-grid lighting solutions has been estimated at \$200 million for 2013,¹ IEA estimates that to achieve universal electricity access,² \$20 billion of investment annually could be required through 2030 to scale up distributed renewable energy solutions.

To succeed, these efforts require (a) enabling policy and regulatory conditions at the national and subnational levels; (b) close coordination with national and local governments to design effective policy and regulatory interventions that scale up energy access; and (c) careful attention to the priority challenges and potential solutions perceived by distributed renewable energy enterprises. This publication is the second in the “Keys to Achieving Universal Energy Access” series. It builds on the first in the series, which focused on four common core business strategies employed by the enterprises and gives examples of how these strategies were implemented. It explores the policy and regulatory conditions that can facilitate scaled-up distributed renewable energy in low-income rural areas—through the lens of the enterprises working to deliver distributed renewable energy services on the ground.

The research is rooted primarily in interviews with ten enterprises in Bangladesh, India, Indonesia, and Kenya conducted by the World Resources Institute (WRI). It also draws on desk research and two earlier workshops held by WRI and the DOEN Foundation. This report thus brings together the experiences of dozens of socially oriented energy enterprises, several civil society groups, and investors, who collectively understand the energy needs of low-income consumers in select developing countries.

Four broad categories of policy and regulatory barriers emerged from the research: (1) lack of enterprise participation in policy and regulatory processes; (2) unsupportive

financial sector policy and regulation for investment in distributed renewable energy; (3) unfavorable fiscal policy affecting distributed renewable energy products; and (4) weak institutional arrangements and capacity among government agencies and ministries.

In exploring the barriers and opportunities perceived by enterprises, two potential suites of national and subnational policy and regulatory solutions emerged that would benefit from support by international initiatives and international finance:

Platforms for enhanced participation. Distributed renewable energy enterprises, among other stakeholders, need platforms for enhanced participation in policy, regulatory, and energy planning processes. A platform connotes more than a network that exists primarily as a means of exchanging ideas and experiences. National governments should actively engage these enterprises and NGOs on policy and regulatory issues affecting energy planning and financing. At the regional or global level, a platform could facilitate exchanges between enterprises and large institutions and international processes, including, for example, Sustainable Energy for All or Norway Energy+. In either case, this sector-wide platform might resemble an industry association for distributed renewable energy enterprises—even those using different technologies and business models—that would encourage collaboration, advancement of shared policy and regulatory priorities, and development of industry standards of practice.

The voices of enterprises need to be heard. Future financing and investments to help meet access to clean energy goals therefore should ensure adequate support for participation and consultation of enterprises and other stakeholders in both international processes and national regulatory and policy decision making processes relevant to the distributed renewable energy sector.

Enhancing access to finance.

To help unlock commercial finance, a host of policy and regulatory issues could be addressed as part of a package that also supports awareness and capacity building among local financial institutions. Depending on the national context, this could include:

- *Shifting the focus from capital cost subsidies to interest rate subsidies.* Although not appropriate in all cases, shifting toward interest rate subsidies will often help catalyze more overall investment in distributed renewable energy than capital cost subsidies. It will help familiarize domestic financial institutions with distributed renewable energy market characteristics, which can help reduce risk perception and can permanently reduce financing costs in the longer term.
- *Support for central bank lending guidelines.* Where appropriate, such guidelines could include distributed renewable energy as a priority sector, accompanied by specific lending targets.
- *Streamlining the lending process.* Ensure that financial regulations and guidelines

allow for embedding distributed renewable energy lending in other development-related loans; for example, bundling a solar water pump as part of a larger agricultural loan. Encouraging a “piggyback” approach could help reduce transaction costs and make the ticket size of loans more attractive to a wider range of lenders.

- *Building institutional awareness.* Increase awareness of lenders about distributed renewable energy opportunities and develop targeted guidance on how to evaluate such projects and enterprises.
- *Enhancing access to finance.* Support for changes to the banking system to enhance access to finance; for example, leveraging existing mandates of rural and development banks, and extending financial infrastructure.
- *Promoting microfinance.* Where appropriate, enhance regulations to empower micro-

finance institutions to engage in more distributed renewable energy lending.

- *Reducing risk.* Deploy risk mitigation tools to buy down risk perception of lenders and familiarize them with the types of enterprises, assets, and risk profiles involved in distributed renewable energy lending, including loan guarantees that support the entry of new lenders into this space.

WRI hopes this issue brief will help international initiatives focused on energy access, target policy and regulatory barriers that matter to enterprises, and take advantage of the collective experience of enterprises involved in delivering affordable, renewable energy to underserved rural communities. Together, through collaboration and with the support of targeted interventions in policy and regulation, these enterprises can be better positioned to help provide access to reliable, affordable, renewable energy.

The voices of enterprises need to be heard. Future financing and investments to help meet access to clean energy goals therefore should ensure adequate support for participation and consultation of enterprises and other stakeholders.

This is the second in a series of three briefs. These studies are based on interviews and desk research, as well as two workshops held by the World Resources Institute (WRI) and the DOEN Foundation in March 2012 and November 2013. By leveraging the experiences of socially oriented energy enterprises, civil society groups, and investors focused on energy access in developing countries, these publications use the collective knowledge of these stakeholders to help accelerate the scale-up of distributed renewable energy services in developing countries. The first brief—“Implementation Strategies for Renewable Energy Services in Low-Income, Rural Areas” (2013)—describes four common core business strategies employed by the enterprises and gives examples of how these strategies were implemented. This issue brief analyzes the challenges these organizations faced in delivering services, discusses how they have overcome these hurdles, and examines the enabling conditions that support their set-up, start-up, and scale-up. The third publication will focus on specific end-user financing strategies to overcome risks and various financial instruments for expanding delivery of renewable energy products and services. It will contain case studies and lessons learned from a variety of successful approaches.

INTRODUCTION, CONTEXT-SETTING, AND PROBLEM STATEMENT

Meeting energy access challenge

Of the more than 1.3 billion people who lack access to electricity,³ approximately 85 percent live in low-income, rural areas in developing countries.⁴ While policy and regulatory frameworks still largely focus on delivering electricity by expanding centralized power generation and extending the grid, the International Energy Agency (IEA) estimates that to achieve universal energy access by 2030, 55 percent of all new connections between 2013 and 2030 would be facilitated through distributed energy services,⁵ and that 90 percent of those would be from renewable energy sources.⁶ Providing access to reliable, affordable, and renewable energy is crucial for sustainably meeting the development needs of these underserved communities.

The costs of technologies to deliver distributed renewable energy⁷ have declined sharply in recent years.⁸ This has enhanced the competitiveness of these technologies in expanding access to underserved rural areas, and helped drive a surge of energy enterprises catering to this market.⁹ In Sub-Saharan Africa, off-grid solar lighting is growing at a breakneck pace, with 90–95 percent annual sales growth since 2009, equating to roughly 4.4 million cumulative solar lighting products sold by the end of 2012.¹⁰ In Bangladesh alone, 3.49 million solar home systems (SHS) have been installed over a decade, as of March 2015.¹¹

To match the magnitude of the electricity access need, distributed renewable energy enterprises (see Box 1) will need to scale up rapidly, both as individual enterprises and as a sector. To achieve universal electricity access,¹² IEA estimates that \$20 billion of investment annually will be required through

2030 to scale up distributed renewable energy solutions, while market volume for solar off-grid lighting solutions has been estimated at \$200 million for 2013.¹³ Unlocking these volumes of finance will require the transformation of policy and regulatory environments that encourage distributed renewable energy enterprises to grow.

A number of ambitious international initiatives aiming to deliver access to clean, modern energy services to underserved populations in developing countries have recently taken root. Among others, these include:

- *The UN Sustainable Energy for All initiative*, which brings together leaders from government, business, and civil society to work together toward transformation of the world’s energy system,

BOX 1

WHAT ARE DISTRIBUTED RENEWABLE ENERGY ENTERPRISES?

Socially oriented distributed clean energy enterprises or organizations promote the social, economic, and environmental benefits of delivering renewable energy services to low-income individuals and communities that are not well-served by traditional providers. They focus on clean, affordable, accessible, and scalable energy solutions that match the economic, social, and geographic characteristics of low-income consumers. They include private enterprises, community cooperatives, and nongovernmental organizations.

with three linked objectives: (1) providing universal access to modern energy services; (2) doubling the global rate of improvement in energy efficiency; and (3) doubling the share of renewable energy in the global energy mix.¹⁴

- *The Energy+ Partnership*, an international partnership of countries and organizations that aims to support international action to both “increase access to sustainable energy services and reduce or avoid greenhouse gas emissions.”¹⁵
- *Power Africa*, a US-led initiative with an objective of doubling electricity access in Sub-Saharan Africa, including a “Beyond the Grid” initiative with a focus on off-grid and small-scale energy.¹⁶
- *Lighting Global (including Lighting Africa)*, the World Bank Group’s international platform to support the international off-grid lighting market.¹⁷

Some of these initiatives include financial support for clean energy access. But what enabling policy and regulatory conditions are needed to set the stage for these efforts to succeed, and how might these initiatives help foster such enabling conditions, beyond investments in individual projects or enterprises?

Many distributed renewable energy enterprises indicate that existing policy and regulatory enabling environments are hindering the rapid scale-up in delivery of clean energy services,¹⁸ and think policymakers see them as marginal contributors to solving the energy access challenge. In consultations on the Sustainable

Energy for All initiative, civil society actors have also called for creation of enabling conditions to support the scale up of distributed renewable energy enterprises focused on serving the poor.¹⁹

Listening to the voices of enterprises across geographical areas can provide valuable insights into which enabling policies and regulatory measures might facilitate increased investment in distributed renewable energy. Collecting the perspectives of entrepreneurs, and connecting them to policy and regulatory interventions—both by national and subnational governments, as well as by international financial institutions or energy access initiatives—can help ensure that their activities align with the needs of enterprises, as well as the needs of end users.

Better understanding solutions that work for enterprises

While considerable research has been devoted to exploring the policy and regulatory interventions that would enhance the deployment of renewable energy in general,^{20, 21, 22, 23} distributed renewable energy solutions face a unique subset of policy and regulatory challenges and opportunities in developing countries. Distributed renewable energy enterprises face a distinctive set of policy and regulatory challenges. Among other things, ownership structures of distributed renewable energy projects differ from ownership models for conventional energy infrastructure. Often, the end user finances, or owns outright, the distributed renewable energy source. Additionally, one-size-fits-all frameworks don’t address the range of distributed renewable energy options. Distrib-

uted renewable energy covers a wide range of technologies and business models, from solar home systems with several watts of capacity to kilowatt-scale biomass minigrids that serve entire communities.

Few analyses have focused on the perspectives and experiences of enterprises working on the front lines to scale up distributed renewable energy. One recent analysis, which explored policy measures to achieve sustainable energy for all with a focus on the Energy+ initiative, did include an evaluation of the relative merits of different policy measures for off-grid electricity services.²⁴ This kind of overview is helpful, but there remains a gap in fully understanding the challenges that are facing enterprises on the ground and in specific countries, and the institutions and processes—rather than just the policy mechanisms—that can help (and have already helped) them overcome policy and regulatory challenges. This brief focuses on the perspectives of enterprises—rather than a broader spectrum of actors, regulators, policy makers, and utilities—for a better understanding of the key policy and regulatory priorities from the vantage point of distributed renewable energy enterprises. To date, their voices have often been absent from discussions on the policy and regulatory mechanisms that are intended to support their efforts. Our findings further emphasize the gaps between policy and regulatory decision making and how those decisions affect the priorities of distributed renewable energy enterprises.

Method

This issue brief aggregates the observations of a set of enterprises on policy and regulatory barriers

and opportunities in the developing countries in which they operate. Enterprises were selected based on the length of their operational track record, on whether their business models and approaches might engender particular policy and regulatory challenges, and on referrals by enterprise incubators. The brief then presents insights through the voices of these enterprises. It then assesses the barriers commonly faced by these enterprises, explores case studies of enterprises overcoming these barriers, and presents some perspectives of enterprises on the elements needed to develop an enabling policy and regulatory environment for the distributed renewable energy sector. It is not intended to be a comprehensive or balanced survey of the entire energy access landscape. Many of these enterprises are important actors in their jurisdictions, but continue to be seen as marginal to the solution of the energy access challenge; hence, this research intends to provide a spotlight on their perceptions of the challenges to deployment of distributed renewable energy in developing markets.

This issue brief focuses on countries in Sub-Saharan Africa and developing Asia, where more than 95 percent of people who lack access to modern energy services reside.²⁵

This brief was informed by five sources of information:

- i. The first issue brief in this series, *Implementation Strategies for Renewable Energy Services in Low-Income, Rural Areas*.²⁶
- ii. Discussions with enterprises at a brief workshop during the 2013 Asia Clean Energy Forum.

- iii. In-depth phone interviews with a few key enterprises in countries facing acute energy poverty, selected with guidance from local small and medium enterprise incubators and chain referral. The interviews were semi-structured. The interview guide questions are appended in Annex I. The ten in-depth interviews were conducted with representatives of enterprises operating in four countries across Sub-Saharan Africa and developing Asia. The enterprises interviewed are listed and described in Annex II.
- iv. The testing of initial findings with enterprises and investors at a workshop convened by WRI and the DOEN Foundation in November 2013.²⁷
- v. A desk review of literature and further research, focusing on the four key geographical areas.

This research approach is sensitive to the fact that policy and regulatory barriers to distributed renewable energy are unique to each country's context. Even within countries, considerable differences in policy and regulatory environments can exist between regions. Added to this is the heterogeneity between business models and technologies employed by distributed renewable energy enterprises. Therefore, none of the findings in this paper should be understood to apply to all country contexts, nor do they represent the perspectives of all distributed renewable energy enterprises. Despite these limitations, the interviews and discussions with enterprises provide some insight into the policy and regulatory challenges and opportunities for distributed renewable energy, and explore these issues through the

voices of enterprises who engage with them directly. Many recommendations arising from the enterprises' perspectives are technology-neutral and apply broadly across distributed renewable energy types, from stand-alone off-grid solar home systems of only a few dozen watts, to microgrids and minigrids of several hundred watts and up to several megawatts MW in capacity.

CATEGORIES OF POLICY AND REGULATORY OPPORTUNITIES

Policy and regulatory opportunities that arose in the course of our research can be divided into four categories, which are illustrated in Table 1.

- Electricity policy and regulatory processes
- Financial sector policy and regulation
- Fiscal policy
- Institutional arrangements and capacity

While we consider the range of challenges cited by enterprises in our research, the contents and organization of this paper focus primarily on issues that were (1) identified by enterprises across geographies, and (2) have been relatively less rigorously explored to date. For example, fossil fuel subsidies have received significant attention in extant literature as a major barrier to distributed renewable energy and many mechanisms to overcome this policy challenge have been discussed.^{28, 29, 30} We focus on issues that have received relatively less attention, such as the lack of opportunity for entrepreneurs to participate in policy and regulatory processes.

CATEGORIES OF POLICY OPPORTUNITIES AND BARRIERS PERCEIVED BY ENTERPRISES

Category of policy/regulatory issue	Description of policy/regulatory issue
ELECTRICITY POLICY AND REGULATORY PROCESSES	
Power system planning	Transparency about plans to extend the grid to provide electricity is important to enterprises, investors, consumers, and civil society. Without transparent electrification plans and participatory planning processes, barriers to distributed renewable energy can arise: for example, unexpected grid extension risks undermining investments in distributed renewable energy. Plans should be informed by a diversity of views—including the needs of end users—in order to effectively enhance access to reliable, affordable, and appropriate energy services.
Design and implementation of support mechanisms for renewable energy and rural electrification	The design of support mechanisms for renewable energy and rural electrification—such as an interest subsidy—can influence the eligibility of different technologies, how much flexibility enterprises have in designing their products or business models to meet the needs of end users, and whether a self-sustaining market will develop over time or, conversely, whether the market will collapse upon phaseout or withdrawal of the support mechanism. Support mechanisms should reflect the reality of beyond-the-grid markets; simply copying solutions that have worked for on-grid markets is unlikely to be adequate.
Permitting, licensing, and clear regulatory frameworks for minigrids	While some off-grid solutions do not require permitting or licensing, others—particularly minigrids—may be subject to them. Processes that are not fit-for-purpose, and designed without stakeholder participation as one-size-fits-all approaches, can disadvantage new market entrants and the sustainability of business models. Because minigrids and pay-as-you-go systems share some characteristics with utilities, they can attract similar attention from regulators. For example, if minigrids were required to charge the national electricity tariff and were not granted flexibility to set different tariffs—or there is not some other provision for cross-subsidy to support distributed energy services in remote areas—this can impair their ability to recover costs or compete on an even footing with alternatives such as diesel gensets. A clear legal and regulatory framework for minigrids can boost enterprise and investor certainty, reduce transaction costs, and enhance quality of service for end users.
FINANCIAL SECTOR POLICY AND REGULATION	
Financial infrastructure (including awareness and capacity among lenders, and central bank guidelines)	The availability, accessibility, and affordability of domestic financing, from banks or non-banking financial institutions, often depends to some degree on financial policy and regulation, which can impact how aware and informed lenders are about distributed renewable energy, as well as the internal lending guidelines and policies used by financial institutions. A specific issue in this regard is the role of central or reserve bank guidelines on lending to specific activities or sectors, which have the potential to influence lenders greatly in some jurisdictions.
Financial regulation	Regulations that constrain foreign investment or preclude some financial exit strategies (such as initial public offerings) can limit the types of finance that enterprises are able to access.
Mobile money tariffs and regulation	The rapid growth of pay-as-you-go models in distributed renewable energy has brought with it an increasing reliance on mobile money technology, which can enable micropayments for clean energy services. Business models enabled by mobile money can be sensitive to changes in policy and regulation, like changes in mobile money tariffs, changes in minimum amounts to mobile money payment, or other regulations related to mobile money. For example, a high minimum transfer amount can thwart business models predicated on micropayments tailored to user income streams.

FISCAL POLICY	
Subsidized fossil fuel-based energy services	Fossil fuel subsidies (for example, consumer subsidies for kerosene) can undermine the competitiveness of clean energy services, particularly if equivalent support for clean energy is not provided.
Taxes on distributed renewable energy products	Taxes and duties can affect the competitiveness of distributed renewable energy technologies by increasing or decreasing costs for the end user.
INSTITUTIONAL ARRANGEMENTS AND CAPACITY	
Clarity of mandates and institutional arrangements among government agencies	Conflicting regulations from government agencies that have overlapping regulatory mandates can create a highly complex regulatory environment that functions as a barrier to entry for enterprises. In many jurisdictions, different government ministries are responsible for renewable energy, rural electrification, and regulatory processes related to electricity. Aside from regulatory complexity, this can also lead to a leadership vacuum if mandates are not clearly defined and there is no lead agency that deals with distributed renewable energy.
Training and skills development infrastructure	To grow quickly, many enterprises require skilled installers and technicians. Training these technicians requires significant resources. Whether systems are in place that support development of human resources, such as targeted courses at technical institutes, can affect the ability of enterprises to grow.
Standards and import control	Maintaining product standards helps prevent the market from being spoiled by low-quality products that turn consumers away from distributed renewable energy options. Enterprises voiced strong support for robust product standards. At the same time, enterprises noted that capacity and governance issues in standards and import control bodies can create bottlenecks and lengthy delays for reasons that are not clearly articulated, and that sometimes relate to lack of capacity, or corruption.

Key policy and regulatory barriers and opportunities across geographies

A summary of the policy and regulatory challenges highlighted by enterprises is provided in Figure 1. The criteria were derived from patterns observed in interview responses, with responses coded based on how frequently an issue was mentioned and how strongly enterprises indicated that it represented a challenge

to the scale-up of distributed renewable energy. The figure represents a combination of these two dimensions. Issues mentioned frequently and ascribed high importance by enterprises are darkly shaded. Those mentioned frequently and ascribed low to moderate importance, or mentioned in frequently but ascribed high importance, are lightly shaded. Those mentioned infrequently (or not at all) and ascribed low importance are unshaded.

The remainder of this report explores the policy and regulatory challenges and opportunities noted by enterprises in further detail, providing specific examples of challenges enterprises have faced, and solutions they have devised or implemented to help overcome them.

FIGURE 1

RELATIVE IMPORTANCE ASCRIBED TO KEY ISSUES BY ENTERPRISES (RESPONSES BY COUNTRY)

	Enterprises in India	Enterprises in Indonesia	Enterprises in Kenya	Enterprises in Bangladesh
Electricity policy and regulatory processes				
Power system planning	Light Blue	Dark Blue	Dark Blue	White
Design/implementation of renewable energy support mechanisms	Dark Blue	Dark Blue	White	Dark Blue
Permitting and licensing, including clear regulatory framework for minigrids	White	Dark Blue	White	White
Financial sector policy and regulation				
Financial awareness and capacity (among lenders)	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Financial infrastructure (central bank guidelines)	Dark Blue	Dark Blue	Light Blue	White
Financial regulations (foreign investment and exit)	Light Blue	Light Blue	White	White
Mobile money tariffs and regulation	White	White	Light Blue	White
Fiscal policy				
Subsidized fossil fuel-based energy services	Dark Blue	Light Blue	White	White
Taxes on distributed RE products	White	White	Dark Blue	Light Blue
Institutional arrangements and capacity				
Clear mandates and institutional arrangements	Dark Blue	Dark Blue	Light Blue	Light Blue
Training and skills development infrastructure	Light Blue	White	White	Light Blue
Standards and import control	White	White	Light Blue	Dark Blue

Legend:

- = issue occurring with a high degree of importance and frequency.
- = issue either occurring with a high degree of frequency and moderate to low importance, or a high degree of importance but with moderate or low frequency.
- = issue mentioned infrequently (or not at all) and assigned relatively less importance by enterprises interviewed.

POLICY AND REGULATORY CHALLENGES AND OPPORTUNITIES

The following section explores each of the categories of regulatory challenge and opportunity presented in Table 1.

Each subsection is organized by first explaining the issue and then delving into potential ways forward identified by enterprises or from the other sources of information described in Section 2.

Electricity policy and regulatory processes

Enterprises cited a lack of consultation and opportunities to participate in policy and regulatory processes, both nationally and at the subnational level. The issue of participation cuts across sectors, but enterprises highlighted two areas where it has caused particular problems: (1) in the electricity system planning processes, and (2) in the design of support mechanisms and subsidies intended to support renewable energy and energy access.

Electricity system planning

The issue. Transparency regarding plans to extend the grid to provide electricity is important to enterprises and investors. Without transparent electrification plans and participatory planning processes, unexpected grid extension risks undermining investments in distributed renewable energy.³¹ Box 2 provides a detailed example.

Enterprises highlighted the lack of participation and consultation

in regulatory decision making regarding electricity system planning. Barefoot Power emphasized that existing policy frameworks in Kenya focus on centralized, grid-based delivery of electricity, and do not fully consider input from consumers, civil society, or distributed renewable energy enterprises: “It’s only really interest groups of a certain size—particularly larger power generators and oil companies—that have influence in the policy and regulatory process.” Other enterprises in Kenya felt that the Kenya Ministry of Energy focuses on large-scale opportunities in geothermal electricity and oil development at the expense of other options. The approach represents an emphasis on megawatts of electricity produced, and not the energy services being delivered to end users, and particularly the poorest end users.

Ways forward. One entrepreneur cited Uganda’s Rural Electrification Agency as an institution that had provided a useful link between officials and the sector, but there is no comparable institution in Kenya. Another entrepreneur pointed to the existence of a Sustainable Energy Access Forum in Uganda, an effort to bring energy players together with government and focus on a particular district as part of a multi-stakeholder dialogue. The enterprise indicated that even within this forum, the government has made relatively weak contributions, and additional or strengthened avenues for participation were necessary. The Sustainable Energy Access Forum is described in more detail in Box 2.³²

BOX 2

UGANDA’S SUSTAINABLE ENERGY ACCESS FORUM

Convened by WWF Uganda, the Sustainable Energy Access Forum is described as a consortium that brings together different stakeholders to address energy access challenges in East and Southern Africa. The consortium currently includes World Wide Fund for Nature (WWF), United Nations Development Programme (UNDP), Practical Action, Barefoot Power, GVEP International (the Global Village Partnership), SNV Netherlands, and Tanzania Renewable Energy Association (TAREA). It anticipates more partners from civil society, the private sector, and government agencies involved in sustainable energy access initiatives across the region.

Enterprises in Kenya described the need for some sort of platform for collaboration or participation, where enterprises could devise strategy jointly and provide input on government and regulator decision making. There was no agreement among enterprises on what form such a platform should take. Enterprises also suggested a multi-stakeholder process for energy and electricity planning more broadly where enterprises were empowered to share their perspectives. Another suggested a more enterprise-led process, such as an industry association, but with a more diverse membership.

Another potential solution was the development of higher-resolution power system plans by multiple stakeholder partnerships. Such plans would provide greater certainty for enterprises and investors. It would also provide some legal assurance that, if investment is undermined in contravention of a previously agreed plan, the agency responsible for contravening that plan or agreement would pay compensation to affected parties. Argentina, for example, has used the practice of exclusive concession contracts to advance rural electrification.³³ Without exclusivity being assured, a risk of highly subsidized grid electricity undercutting the project may be too great for investors and developers to commit to distributed renewables.

Design and implementation of supportive policy

The issue. As an example of lack of participation and consultation in regulatory processes, Indian enterprises pointed to the first phase of the Jawaharlal Nehru National Solar Mission (NSM)—the flagship national solar energy initiative. NSM has several design elements that some distributed renewable energy enterprises have described as problematic, including narrow technology specifications that curbed innovation; reliance on capital subsidies instead of interest subsidies, alongside high margin requirements on loans; and inadequate institutional arrangements to manage subsidy disbursement.³⁴ SELCO noted: “Of all the challenges our enterprise faces, lack of support from financial institutions affects us the most—but from a policy perspective, we’ve been most affected by the Ministry of New

and Renewable Energy (MNRE) guidelines for the National Solar Mission, which were developed without adequate consultation of enterprises.” Some civil society groups have also noted the lack of stakeholder participation in the design of the first phase of the NSM, as well as its lack of attention to distributed renewable energy opportunities.³⁵

Enterprises indicated that although subsidies for solar accompanied the National Solar Mission, they were not designed with the input of enterprises, and so were limited in their contribution to scaling up distributed renewable energy access. The subsidy—pegged to a benchmark cost in Indian rupees per watt of capacity installed (₹/W)—was designed with grid-connected solar photovoltaics in mind, which constrained innovative distributed renewable energy business models, and did not allow enterprises to be responsive to user needs.³⁶ Enterprises also highlighted relatively complicated procedures to access the subsidy, which enterprises described as involving several intermediary tiers of a financial institution, and eligibility requirements including qualification and certification from numerous agencies.

This example illustrates that even subsidies intended to support renewable energy can have a limited impact on energy access if they are not designed with distributed renewable energy in mind, or if they are not well-targeted.

A recent report on lessons from the first phase of the NSM supports

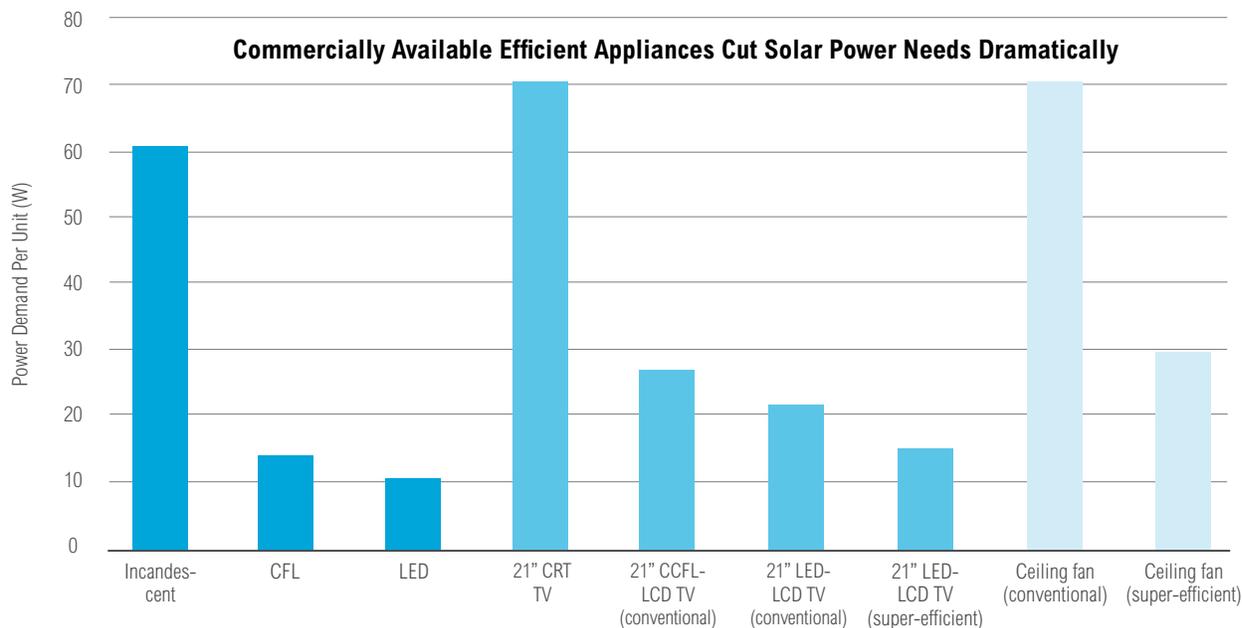
the view that, despite an objective to promote off-grid solar as a means of rural electrification, distributed solar applications have not progressed much through the implementation of the policy.³⁷

Ways forward. Enterprises indicated that rather than capital subsidies to reduce the up-front cost of products, the focus of both subnational- and national-level support should be subsidies that make financing more affordable and accessible to end users, whether through local commercial banks, local development banks, or microfinance institutions, both standalone and those vertically integrated into distributed renewable energy enterprises.

Transforming capital subsidies into affordable loans for distributed renewable energy companies and end users encourages commercial banks to lend, leveraging more resources to support deployment than capital subsidies by effectively reducing the risk in commercial bank lending. Because the cost of solar products has declined so precipitously, and because smaller system sizes can deliver the same or greater energy services due to the emergence of more efficient appliances,³⁸ capital subsidies for end users are no longer as crucial as they once were in many markets, as illustrated in Figure 2. Reorienting capital subsidies to support interest rate subsidies can help leverage more private sector resources in delivering clean energy services, with the impact of creating more affordable loans, as illustrated in Figure 3.

FIGURE 2

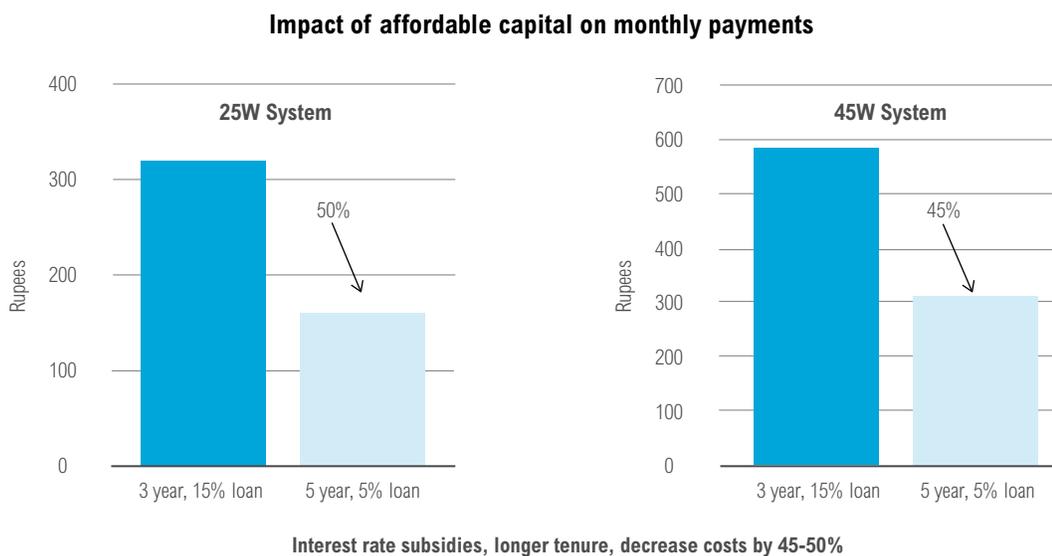
REDUCED SOLAR CAPACITY REQUIRED DUE TO APPLIANCE EFFICIENCY IMPROVEMENTS³⁹



Source: Lawrence Berkeley National Lab International Energy Studies Group

FIGURE 3

IMPACT OF INTEREST RATE SUBSIDIES ON MONTHLY SOLAR HOME SYSTEM PAYMENTS⁴⁰



Source: Industry Data

For example, in Bangladesh’s IDCOL model, a capital subsidy—phased out over time—and an interest rate subsidy have been instrumental in scaling up deployment of solar home systems. Capital subsidies decrease the up-front cost of distributed renewable energy products such as a solar home system, while interest rate subsidies can allow for lower interest rates, and/or can spread interest payments over a longer loan period. While some markets may still need both capital and interest subsidies to develop, especially in early stages, subsidizing interest rates rather than capital can be less market-distorting, less susceptible to fraud, and can help decrease monthly installments over time so that they better match the cash-flow of low-income households.⁴¹ In India, at the national level, MNRE guidelines indicated that Phase II of the NSM intends a shift from capital subsidies to interest subsidies as a result of lessons learned in the first phase,⁴² although capital subsidies have continued to be utilized in Phase II.⁴³ During the development of this issue brief, enterprises made progress in achieving changes to the National Solar Mission in Phase II, including larger systems being eligible for subsidy, inclusion of cooperative banks at the state level as financing channels accessible to enterprises, and new differentiated benchmarks that privilege high-efficiency systems providing more energy services for fewer watts of capacity, among other changes.⁴⁴

In the context of the first phase of India’s NSM, respondents said setting more realistic benchmark costs that include maintenance and allow for innovation would improve the quality and scale of deployment. These subsidies were recently revised

to reflect more realistic benchmark costs.⁴⁵ Enterprises also stressed that to avoid bottlenecks in subsidies delivery, the financial intermediaries that are chosen to manage subsidies should have adequate capacity to manage a solar lending portfolio, and that subsidy provision should be as much of a “one stop shop” model as possible to reduce transaction costs of various subsidy elements being managed by different intermediaries.

One respondent also suggested that, because of the wide range of circumstances within India, both in resource availability and socioeconomically, it was important for enabling policy and regulation to be tailored to specific geographical areas—to the state and district level. Enterprises interviewed suggested that, to ensure that programs and policies are implementable, policymakers need to institutionalize consideration of local viewpoints—not just of enterprises and energy users, but also managers and staff of local financial institutions. Understanding in detail the needs of local financial sector staff can ensure that interventions are designed to meaningfully enhance access to finance for distributed renewable energy, and to reduce financing costs by addressing the biggest risks perceived by local lenders.

In contrast, enterprises also pointed to the Bangladesh experience with IDCOL (see Box 1) as an example of an institutional arrangement that, while more centralized at the national level, has enabled the different players, including enterprises, to provide input on program and policy design. The entities delivering clean energy services on the ground as IDCOL partner organizations are highly decentralized, and the groundwork for the IDCOL SHS pro-

gram was laid in large part by early investment and market development efforts of these partner organizations. However, the IDCOL arrangement provides a more centralized framework that allows international finance to flow through a national institution to these enterprises, and also provides an important platform that acts as a gatekeeper of technical standards and other issues that cut across providers of clean energy access solutions. Enterprises suggested that government could engage with enterprises working on these issues through such a platform to better understand their needs.

Enterprises also pointed to similar examples in Ghana, where the ARB Apex Bank has acted as a small central bank to pass through concessional resources for solar home system loans and capital subsidies. However, to date, the scale of that solar home system program, and other similar programs, has been much smaller than in the IDCOL SHS program example, suggesting that this arrangement is not a one-size-fits all solution, and is not of itself a sufficient condition to achieve scaled-up deployment.⁴⁶

Financial sector policy and regulation

Financial awareness and capacity: lenders

The issue. Enterprises cited high-collateral, high-interest domestic lending environments as a barrier at the level of finance for enterprises, with collateral requirements of 100 percent or more of the value of a loan, which makes it difficult or impossible to secure working capital, particularly for enterprises with business models that focus on distribution.

Barriers to financing end users adds another layer of financial challenge. Lenders generally do not see villagers who need distributed energy services as bankable end users, and so are reluctant to finance projects and products that serve them.

While these barriers are financial, respondents ascribed an important role to policy and regulation in overcoming them.

The unfavorable commercial lending environment persists in part due to a lack of awareness and understanding of distributed renewable energy opportunities by lenders, a challenge that becomes even more acute against the backdrop of a lack of supportive policy to build appropriate financial infrastructure that serves the rural poor.⁴⁷

SELCO noted: “Our experience in speaking with bankers—even those who are very interested in renewable energy—is that they aren’t aware of technologies that exist and what criteria can be used to evaluate a good solar player. They don’t know if wind or picohydro are viable technologies for financing; they may or may not have heard about minigrids. They don’t know, even broadly, what’s bankable.” Other enterprises indicated that very few banks understand project financing for renewable energy, and a lack

of awareness of how to evaluate the business case for distributed renewable energy hampers lending.

Enterprises suggested that lenders may have higher risk perception regarding distributed renewable energy investments compared to more familiar, long-standing lending products—for example, loans for agricultural inputs.

“Our experience in speaking with bankers—even those who are very interested in renewable energy—is that they aren’t aware of technologies that exist and what criteria can be used to evaluate a good solar player.”

Even in Bangladesh, despite the extensive progress in installing more than 3.3 million solar home systems under the IDCOL program and a long track record for the sector, enterprises indicated that interest rates and collateral requirements from commercial banks remain very high, and awareness of distributed renewable energy lending opportunities remains low.

Ways forward. Enterprises stressed the need for policy and regulatory measures that enhance access to local finance by building capacity and awareness among lenders, including asset refinance programs (such as the IDCOL SHS program) and loan guarantees.

For example, loan guarantees have supported the entry of new lenders into this space, building their capacity and awareness of opportunities in distributed renewable energy lending. In many cases, SELCO has guaranteed an initial set of loans themselves to help familiarize lenders with the market,⁴⁸ but governments and international finance can also play this de-risking role at a bigger scale, in a way that absolves enterprises of the burden of having to play this role, which can tie up their balance sheets and put them at risk.

In Bangladesh, enterprises indicated that above and beyond IDCOL, public efforts to build awareness and capacity at commercial banks could aid sustainability of the sector.

The IDCOL financing model (see Figure 4) has enabled scaled-up deployment of solar home systems in Bangladesh, helping overcome some working capital constraints by offering subsidized loans to project developers that also offer loans to end users purchasing solar home systems. Along with this interest subsidy, donor contributions channeled through IDCOL also helped to

loans for “green” products, including solar and biogas projects,⁵¹ although limited data is available on the performance of these funds to date.

Enterprises agreed that policy approaches must recognize banks as key players in distributed renewable energy support programs. Practically, they suggested that alongside interest subsidies, governments should find ways to empower banks to do more lending related to energy services in key areas. Some enterprises pointed to SELCO’s success in partly overcoming this barrier (see Box 3). One way governments and international finance can help overcome this barrier is to utilize

BOX 3

SELCO’S EFFORTS TO OVERCOME ACCESS TO LOCAL FINANCE IN INDIA

In Karnataka, India, the state where SELCO has been operating the longest, rural lenders have become more familiar with distributed renewable energy as a result of SELCO’s efforts to develop relationships with lenders and to build awareness over more than a decade. An Indian entrepreneur noted how SELCO’s long-term capacity building efforts have helped other enterprises: “Regional rural banks, created in India to provide access to banking services and credit for rural sectors, have been spearheading finance to clean energy services in Karnataka. If you go to a bank manager of a regional rural bank in Karnataka, they are likely to be much more supportive than any other state in the country.”

concessional funds to lessen the risk of commercial loans to distributed renewable energy enterprises, increasing the comfort of banks with the sector, and reducing risk perception over time. This approach has helped unlock commercial bank lending in energy efficiency in other countries.⁵² In India, INFUSE Ventures helped leverage first-loss capital provided by India’s MNRE to crowd in other investment in sustainable development and clean technology solutions.⁵³

Research by Bloomberg New Energy Finance suggests that “local commercial banks have the potential to significantly increase access to low-cost debt,” and “expanding the capacity of local commercial banks through training programs is key.”⁵⁴ Strengthening the capacity of local financial institutions to evaluate renewable energy lending also has been a key enabler of renewable energy deployment elsewhere, including Thailand, the Philippines, and Tanzania. Hands-on training from experts, ideally in the course of an actual evaluation of a lending decision, can help ensure that capacity is developed along the decision making chain, while workshops may only reach certain types of bank staff. Respondents indicated that publicly supported activities alongside policy and regulatory reform, such as technical assistance to build lender capacity and increase awareness in other parts of the country, could help these lenders determine when end users are good candidates for lending. For example, if they see energy services-related products such as solar home systems as asset-backed products they can collateralize, and were enabled by financial regulations to consider these assets as

collateral, this would allow for much more rapid growth in access to clean energy services.

One approach could be to provide means for enterprises with sound projects to secure loans on the basis of receivables from customers, using existing repayment data. Using India as an example, this kind of financing could be facilitated directly through development banks, such as the Small Industries Development Bank of India (SIDBI) or the National Bank for Agriculture and Rural Development (NABARD), or channeled through those institutions to smaller local banks as intermediaries. Enterprises were split as to whether direct access to funds at the level of national development finance institutions would be preferable to the funds being channeled through smaller, local financial institutions.

Another specific area whereby credit extension could be enhanced is in linking energy services components into the loan component or subsidy component of existing programs—for example, a solar lighting system for a dairy farmer’s cattle shed might also be packaged with loans of other value-added products and services for that farmer, such as insurance.⁵⁵ If incentive policies and programs could find linkages between solar loans and loans for other economic development and livelihood activities, and could standardize a loan package, it could become easier for lenders by reducing transaction costs and increasing the ticket size of loans.

Another approach could be to develop standardized, robust criteria for the financial sector to evaluate

distributed renewable energy projects. This is an example of the kind of enabling activity that could fall under the auspices of an effort like the Jawaharlal Nehru National Solar Mission: “Things like developing standard criteria to help lenders are the types of things that should be undertaken in creating a large mission like this. We need to do more legwork to get banks interested in giving out loans,” said one respondent. This approach is already being undertaken for utility-scale solar photovoltaics in the Asia-Pacific region through convening of financial institutions by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and consulting firm Mott MacDonald, although development of these model renewable energy lending guidelines is still in the early stages and the results are not yet clear. While such guidelines are important, other enterprises indicated that they should be used as guidelines rather than hard-and-fast rules to encourage lenders to be flexible and allow for investment in new models.

Aside from the domestic financial institutions, enterprises also indicated that policy in foreign countries that are sources of international finance also play an important role in helping increase access to finance for distributed renewable energy. This is discussed in more detail in Box 4.

Enterprises indicated that domestic finance—both equity and debt—is difficult to access, and international finance without a local intermediary can have very high transaction costs, limiting access to this finance to a select few enterprises. Domestic financing, on terms accessible to

BOX 4

POLICIES IN COUNTRIES THAT HOST SOURCES OF INTERNATIONAL FINANCE

Investments in distributed renewable energy can be driven by policy outside of a country where the distributed renewable energy is being developed. Since international finance is a major source of funding for rural electrification, ensuring that finance is targeted at effective solutions that serve the poor can have implications for the availability of finance for distributed renewable energy.

In the case of the U.S. Overseas Private Investment Corporation (OPIC), a coalition of civil society groups and U.S. cities filed a lawsuit in 2002 to force OPIC and the Export-Import Bank of the United States (ExIm) to consider the implications of their investments for greenhouse gas emissions and climate change. A settlement resulting from this lawsuit was reached in 2009, which helped drive the establishment of a low-carbon policy at ExIm, as well as a cap on greenhouse gases for OPIC investments, which was later further developed through appropriations legislation. The greenhouse gas cap has helped shift OPIC’s investments toward renewable energy, growing from a level of \$10 million in 2008 to more than \$1.2 billion in 2013. These investments include some in distributed renewable energy enterprises, such as Husk Power.

enterprises and amenable to end users, is needed to move beyond a select few enterprises. By pooling international resources and channeling them through national institutions, governments may be able to more effectively blend different types of concessional and non-concessional resources to maximize the volume of funds available, while also making the finance more accessible to enterprises and reducing transaction costs, as the IDCOL SHS model demonstrates.

Central bank lending guidelines

The issue. Enterprises pointed to lending guidelines and regulations of central banks as an important determinant of access to finance for distributed renewable energy enterprises. While this issue has been discussed to some degree in India,^{56,57} enterprises indicated that

similar challenges were preventing the scale-up of distributed renewable energy elsewhere.

For India, enterprises viewed the Reserve Bank of India (RBI)—India’s central banking institution—as a critical institution in determining which sectors and activities state development banks, and even commercial banks, will determine are eligible for lending. Without explicit reference to distributed renewable energy in RBI lending guidelines, rural lenders were reluctant to extend credit for clean energy enterprises. However, this significant barrier was overcome as a result of changes to guidelines advocated by enterprises, including SELCO, as explained in Box 5. Enterprises also highlighted a remaining challenge: the lack of a specific target for the distributed

PRACTITIONERS PERSUADE RESERVE BANK OF INDIA TO CHANGE GUIDELINES AND UNLOCK DISTRIBUTED CLEAN ENERGY FINANCE

The Reserve Bank of India (RBI) lending guidelines require banks in India to devote a certain percentage of their lending to priority sectors. These sectors are identified on a prescribed list kept by the RBI, and include sectors such as agriculture and microenterprise. As a result of enterprises (led by SELCO, in particular) discussing guidelines with the RBI, off-grid solar and other off-grid renewable systems were included in the list of priority sectors for 2013–14. This is expected to significantly enhance access to financing for off-grid renewable energy systems.

renewable energy sector under the RBI lending guidelines. One respondent linked this challenge to a lack of voice within policy design processes: “The Ministry of New and Renewable Energy, which is responsible for the National Solar Mission, does not really talk to the Reserve Bank of India, so these targets aren’t set. Maybe creating a sub-target for decentralized energy is not a priority for them, but for us as an enterprise, we feel it’s as important as anything else—it creates the ability to provide credit for rural customers.”

This is an issue beyond India. One Indonesian entrepreneur observed: “If you want to lease a diesel generator, that’s fine. Leasing a car? That’s fine. Leasing a solar power system or solar diesel hybrid—and this even applies to commercial banks—it can’t be done, because it’s not on the central bank checklist.” This makes it difficult for enterprises to secure any kind of domestic financing for distributed renewable energy.

Ways forward. Enterprises suggested that the central bank lending guidelines could be modified to explicitly encourage lending for distributed renewable energy projects. They indicated that further institutionalization of central bank guidelines—for example, setting specific numerical lending targets in the case of RBI in India—would further enable the distributed renewable energy sector.

While India has seen leadership from RBI in establishing banking facilities for the poor, and in the use of a diverse array of fiscal tools to promote access to finance in key development sectors, this type of approach may not be as prevalent in some African countries. For example, enterprises indicated that central banks in East Africa did not have priority sector lending guidelines, but that this type of leadership could improve access to finance for clean energy access and other pro-poor goods and services.

Regional banks, which, depending on the national context, may receive public support, can be well-positioned to provide support for distributed renewable energy to promote rural energy access. For

example, enterprises in Indonesia pointed to Bank Rakyat Indonesia, which is 70 percent government-owned and specializes in small-scale financing and microcredit programs that could help communities and enterprises forge partnerships on distributed renewable energy projects.

Financial regulations

The issue. Enterprises indicated that certain financial regulations constrained access to some types of finance, or had a significant impact on their business model. For example, mobile money⁵⁸ regulations can affect the viability of pay-as-you-go⁵⁹ business models, an issue elaborated in Box 6. For other enterprises, restrictive foreign investment regulations were a greater concern.

Enterprises noted the need for shifts in microfinance regulation across much of Sub-Saharan Africa to truly empower existing microfinance institutions as partners in distributed renewable energy lending. This is a persistent challenge. As early as 2007, an ArcFinance report noted: “There is a need for the governments of East Africa to review the policies that thwart increased use of small-scale energy technologies and reform financial sector regulation reform and support public-private financing partnerships that support microfinance mechanisms.”⁶⁰

Another issue raised by enterprises was that, in some cases, financial regulations are not supportive of small infrastructure such as distributed renewable energy projects, or leasing for distributed renewable energy systems such as solar home systems. In the case of Indonesia, one entrepreneur noted: “The entry

MOBILE MONEY TARIFFS AND REGULATIONS, AND THEIR IMPACT ON DISTRIBUTED CLEAN ENERGY ENTERPRISES

Practitioners noted that pay-as-you-go business models are increasingly enabled by mobile money, which allows a consumer to use their phone to make small payments to access energy services as needed. This system often aligns better with the cash flow of the poor compared to large monthly lump-sum payments, and reduces the need for rural consumers to make frequent long trips to banks or other central hubs to pay for energy services. It also reduces payment collection costs for enterprises. The rise of mobile money in distributed clean energy has increased the influence that mobile money regulations have on the sector. For example, practitioners pointed out that decisions such as the minimum amount that can be sent in a single mobile money transfer can make a major difference: in Tanzania there is a \$1 minimum floor for transfers, while in Kenya the floor is only 10 cents. This can have a major impact if a business model is designed to make micropayments aligned with the way people earn their incomes—some can afford to pay only 10 cents at a time, and the business model can fall apart if enterprises must rely on end users to save \$1 and pay it as a lump sum as a result of the minimum.

New tariffs on mobile money were introduced in Kenya in February of 2013. Safaricom, Kenya's telecom operator, increased tariffs for transactions above a threshold of KES 101 by 10 percent; this was a knock-on effect of the Finance Act of 2012, "which introduced a 10 percent excise duty on transaction fees for all money transfer services provided by mobile phone providers, banks, money transfer agencies, and other financial service providers."

of foreign venture capital or private equity investment into small project investments is very limited because of the high transaction cost brought on by the complex financial regulations." Some foreign investment rules are intended to protect local technologies and enterprises, including local content requirements for most distributed renewable energy projects. For example, local content requirements can help build domestic manufacturing capacity, but if not coupled with broader support for quality assurance, quality issues can arise and can impede financing for distributed renewable energy: "Too many projects with Indonesian products are failing because of poor quality materials driven by

this [40 percent local components per system] requirement," said one entrepreneur.

Ways forward. A few enterprises felt that if the national government continues to mandate local content requirements for the electricity sector, including renewable energy projects, it should also develop a requirement that local products must meet international standards—such as those promoted by Lighting Africa or other generally accepted standards—in order to boost product quality and enhance project bankability.

National financial institutions also can help to solve certain financial regulation issues if broader regula-

tory change proves difficult. For example, Ethiopia's foreign exchange regulations at one point constrained importers of solar lanterns. However, the Development Bank of Ethiopia established a U.S. dollar-denominated credit line for importers of solar lanterns, which led to a rapid increase in the imports and distribution of these products.⁶¹

Fiscal policy

Taxes on renewable energy products

The issue. Enterprises noted that incentives related to tax policies, including value-added taxes (VAT) or import tariffs and duties, can enhance the affordability of distributed renewable energy technologies for end users. The issue of taxes on renewable energy products varies widely across jurisdictions.

Enterprises in Kenya emphasized that the phase-in of a value-added tax on imported renewable energy products in 2013 made it more difficult for enterprises to deliver energy services at affordable rates. Previously, distributed renewable energy enterprises in Kenya had been operating under VAT exemptions. Enterprises indicated that some socially oriented enterprises operate on very small margins, because they prefer impact over profit. Enterprises suggested the VAT phase-in had the potential to greatly impact the viability of these enterprises, particularly given the limited ability of low-income consumers to absorb the additional costs.⁶² However, the VAT on imported solar products was again lifted in May 2014, with at least one enterprise reducing the cost of their product by more than 15 percent in response to the VAT rollback.⁶³ VAT exemptions can, however,

also penalize local products if not designed carefully. In Bangladesh, enterprises indicated that import taxes on renewable energy materials could limit the ability of the sector to scale up production of locally produced panels; local panel producers have to pay 4 percent tax to import raw materials alongside income tax paid in advance, while imported finished solar products have no import duty. In contrast with local content requirements such as those in Indonesia, this can have the effect of disadvantaging locally assembled products in favor of imported products.

Ways forward. Most enterprises felt that, where relevant, rolling back taxes, duties, and tariffs for distributed renewable energy equipment would help increase the pace of distributed renewable energy deployment, and that tax, duty, and tariff exemptions are justifiable because of the development benefits of increased access to energy. At the same time, these revenue tools can be a source of resources for governments to advance development priorities. One enterprise suggested that VAT or other tax exemptions could be linked to product quality, and pointed to the example of requirements for product tax exemption in Ethiopia. To be exempted from import tax in Ethiopia, a product must be certified by Lighting Africa based on established quality standards. While this is the policy in Ethiopia, other research has indicated that it may not always be evenly applied to all distributed solar product imports.⁶⁴

Subsidized fossil fuel-based energy services

The issue. A substantial body of literature supports the contention that many existing kerosene subsidies act as a disincentive for adoption of renewable energy.^{65, 66, 67, 68, 69} Enterprises noted that, where they exist, subsidies for fossil fuels—particularly kerosene and diesel—continue to have a negative influence on the scale-up of distributed renewable energy.

In addition, research suggests that many fossil fuel consumption subsidies, including kerosene subsidies, have been inefficient in practice, because they are not well-targeted to the poorest who are the intended recipients.⁷⁰ Enterprises in Indonesia indicated particularly strong concern with several issues relating to lopsided subsidies (Box 7).

Ways forward. Enterprises stressed that government should phase out

“lopsided fossil fuel subsidies” to scale up distributed renewable energy, and in the case of Indonesia, aggressively enforce regulations already in place that prevent use of subsidized fossil fuels for electricity production. Indeed, enterprises in Kenya cited relatively few consumer subsidies for fossil fuels as a leading contributor to the attractiveness of the distributed renewable energy market in the country (Box 8). Several solutions to this issue are discussed in the literature, including direct cash transfers to recipients rather than subsidizing kerosene sales, giving consumers more choices on how to spend the subsidy cost, and reducing the likelihood of major civil unrest as a result of phasing out subsidies.^{71, 72} This solution is being piloted in the Alwar district of Rajasthan in India, and this approach is being explored as a means to curb fossil fuel subsidies across India.⁷³

BOX 7

ENTERPRISES WORRY INDONESIA'S FOSSIL FUEL SUBSIDIES UNDERMINE DISTRIBUTED RENEWABLE ENERGY

Entrepreneurs in Indonesia indicated that fossil fuel subsidies are one of the biggest obstacles to scaling up distributed renewable energy. Despite existing regulations that prohibit the use of subsidized fuel for electricity generation, enterprises indicated that people and businesses do buy and use subsidized fuel for electricity generation, and the regulations are not enforced. One enterprise also indicated that the current subsidy for bio-oil—which is synthesized from organic source material such as surplus non-food-grade palm oil, and can be used as a substitute for or in conjunction with diesel in existing generators—is less than the subsidy for fossil fuels, which undermines the economic viability of bio-oil.

LACK OF FOSSIL FUEL SUBSIDIES IN KENYA SEEN AS ATTRACTIVE POLICY FRAMEWORK BY PRACTITIONERS

Practitioners indicated that while they do not feel the policy environment in Kenya is particularly supportive of distributed clean energy, it is relatively neutral in that it also does not provide substantial end-user subsidies for fossil fuels. In contrast to some neighboring jurisdictions, the lack of subsidies for kerosene in Kenya was considered to be an important feature of the existing policy framework that enabled business models of distributed clean energy enterprises.

Institutional arrangements and capacity

Clear mandates and institutional arrangements among government agencies

The issue. Enterprises indicated that regulations and policy from different government agencies often conflict, and that agencies may have overlapping mandates, resulting in complex or confusing policy and regulatory environments. Lack of coordination in policy and regulatory design for distributed renewable energy can act as a barrier to scaled-up energy access.

In India, for example, enterprises saw the Ministry of New and Renewable Energy's (MNRE) mandate as subsidiary to, and sometimes overlapping with, that of the Ministry of

Power (MoP). This often resulted in an emphasis on centralized generation and grid extension as a solution for delivery of rural energy services, even where distributed renewable energy might be more cost-effective. They also noted that many state renewable energy agencies have a narrow mandate related to distributed energy. For example, while the state-level agency in Karnataka, the Karnataka Renewable Energy Development Agency, has taken a more proactive role in helping to create guidelines for grid-connected rooftop solar systems, in the case of off-grid solar energy services, they act only as an intermediary for the subsidy from the national MNRE to project developers.

Ways forward. Enterprises suggested that agencies, both nationally and at the state level, should work together to develop a clear framework for distributed renewable energy. They also indicated that giving renewable energy-focused agencies more decision making power, or embedding distributed renewable energy as a priority in agencies with a development mandate, could enhance the enabling environment for the delivery of clean energy services.

At the state and local level, respondents indicated that renewable energy agencies could be empowered to do more, as they are well-positioned to better understand regional circumstances compared to national agencies. Research on institutional models for rural electrification also makes the case for better institutional coordination and clearer delineation of mandates for different institutional actors involved in electrification and energy services.⁷⁴ For example, enterprises in India

noted that relative to other agencies, Ladakh's Renewable Energy Development Agency has played a more proactive role in decentralized clean energy through involvement in quality control of products, which has helped build consumer confidence.

Enterprises suggested that one way to enhance communication and regulatory frameworks is to create interagency planning boards with representatives from key institutions. In Indonesia, four key institutions—the Ministry of Energy and Mineral Resources (MEMR), the renewables department under this ministry, the state utility Perusahaan Listrik Negara (PLN), and regional utility companies along with regional governments—all have some responsibility for energy and electrification policy. Enterprises suggested that such an interagency board could include participation by enterprises, end users, and other stakeholders. Enterprises also suggested that there should be one-stop shops for regulatory and permitting processes related to distributed renewable energy and especially minigrids.

Bangladesh provides another example of where the need has been acutely felt for a more coordinated approach to distributed renewables among government agencies, and this need has found expression in a number of ways (Box 9).

Permitting, licensing, and a clear regulatory framework for minigrids

The issue. Enterprises noted challenges in obtaining explicit permits or licenses to operate, particularly in the case of minigrid development. Enterprises' level of concern with permitting and licensing processes varied greatly depending on the

COORDINATING RENEWABLE ENERGY AGENCIES IN BANGLADESH

In Bangladesh, some enterprises have called for the development of a Renewable Energy Development Agency. Legislation to create the Sustainable and Renewable Energy Development Authority passed in the National Parliament in 2012, and while this body has been established, it is still becoming operational. In Bangladesh, some of the functions of a distributed renewable energy coordinating body have already sprung up through IDCOL's Solar Home System program. Although primarily functioning as a financial intermediary, enterprises indicated that IDCOL has also served as an avenue for strong engagement among enterprises, investors, government, and civil society to work on issues facing the distributed renewable energy sector. Enterprises indicated that IDCOL's technical and standards committee also had provided a constructive way for them to provide input into minimum design standards for distributed renewable energy products eligible for IDCOL financing support.

technology and national context. Enterprises in Indonesia observed that permitting and licensing had caused them great difficulty, asserting that despite favorable tax laws, permitting is so complicated that implementing distributed renewable energy projects is very difficult, and there are no resources that provide consistent guidance on permitting procedures. These enterprises

indicated that this lack of clarity on permitting processes leads to divergent interpretation of regulations and procedures, even within the same government agency.

Terms of contracts for procurement were cited as a challenge: enterprises in Indonesia noted that in the limited cases where renewable energy enterprises can sell electricity back to the state electricity company, the regional departments of the company only supply contracts with one-year terms. This, enterprises indicated, is where the problem lies: no bank or investor will lend against a one-year supply contract. Enterprises suggested that the underlying issue may be a lack of capacity within the regional utility to structure the kind of longer-term agreements that would match the time horizons of distributed renewable energy investments, and a lack of familiarity among the regional utilities with distributed renewable energy business models.

Minigrids face unique challenges from a permitting and licensing perspective. Enterprises expressed concern that the lack of a clear policy framework for minigrids and pay-as-you-go business models caused uncertainty about how they might be regulated in the future.⁷⁵ In Kenya, enterprises felt that regulatory uncertainty about whether distributed technologies will be subject to the type of regulation and standards typically associated with utilities may impede further scale-up of the sector in Kenya. This perspective was voiced by several enterprises in a workshop, and Angaza Design noted: "Pay-as-you-go involves essentially setting up a clean energy microutility. While we are not seeing much

backlash at the moment, we expect to see more barriers to pay-as-you-go models as they become more popular." Such barriers could arise because of concern from investors and enterprises that these models will be seen as a utility and attract a higher standard of regulation.

Ways forward. With regard to minigrid permitting and licensing, enterprises stressed that government can proactively set clear and appropriate regulation for minigrids and pay-as-you-go systems to remove uncertainty for enterprises and investors.⁷⁶ Designing appropriate regulations that acknowledge the different roles for, and benefits and challenges of, different scales and sources of energy services is critical to scaling up energy access. A one-size-fits-all approach can lead to regulation that works for large, centralized generators being inappropriately applied to much smaller scale distributed generators. For example, many minigrids might not be viable if forced to charge a levelized national tariff for electricity, which is frequently below the cost of electricity delivered through renewable minigrids, without some framework in place to otherwise recover costs. One option is applying a different tariff setting process for minigrids that acknowledges their role in extending energy access to remote places that would otherwise only be connected to the grid at great expense. Another is developing a tariff framework that charges consumers a uniform price, but provides additional payments or incentives to energy service providers operating in underserved, difficult-to-reach areas. There are numerous other tariff options for minigrids,^{77, 78} but the key is that a clear regulatory framework

is established to enable minigrid development where appropriate.

Mali is currently piloting an approach—with the support of the World Bank’s Lighting Africa platform—that provides periodic performance-based payments to households connected to microgrid or minigrid systems, generating a revenue stream similar to a feed-in tariff for grid-connected renewable energy systems. In contrast to feed-in tariffs, this approach pays a fixed rate based on the connection delivering energy services, not per kilowatt-hour as with most feed-in tariffs.

In some markets, in the absence of flexibility in tariff-setting for residential users, enterprises have sometimes found it more efficient to develop distributed renewable energy products in partnership with particular industries—such as the mining, oil and gas, aquaculture, and telecom sectors—to avoid the regulatory complexity associated with selling energy services solely to the public. These industries tend to operate in remote areas. Working directly with them to design inside-the-fence electricity supply is simpler than working through the central government, while some of the excess power can then be sold to residential customers.

Innovative power provision arrangements that link to existing business models also can help distributed renewable energy enterprises expand, by taking advantage of favorable tax situations that don’t require changes to tax law. One entrepreneur cited the example of working with shrimp farming companies, where each shrimp pond

is managed by a villager. Each pond is metered to account for the electricity consumed by the pond’s pumping and aeration systems. When the villagers managing the pond sell the shrimp to the shrimp farm owner who supplies the electricity, the cost of the electricity is deducted from the total paid to the villagers for the shrimp. In this way, the enterprise has already accounted for producing electricity as an operating expense, but they get paid back and don’t have to pay taxes on it, because it is not considered taxable revenue. Reducing the regulatory complexity and uncertainty involved in selling electricity to the public in Indonesia could help enterprises avoid this kind of workaround.

Robust and timely standards and import control processes

The issue. Enterprises indicated that quality standards for distributed renewable energy products are very important to avoid spoiling consumer confidence through the sale of poor-quality products, and indicated that internationally supported efforts like Lighting Global, Lighting Africa, and Lighting Asia had helped to enhance product quality.

However, enterprises also indicated that at the national level, import controls and standards processes can be burdensome, especially if processes lack transparency. Enterprises in East Africa reported that approval processes for imported products from standards bureaus are inefficient and prone to delays, which have a negative influence on their ability to grow quickly as a startup. One entrepreneur cited delays in releasing products under inspection of up to several months by the standards

bureau, sometimes imposed with no clear reason, when identical products had been approved for import previously. They described this as the biggest policy and regulatory issue facing their business. Enterprises cited corruption as generally problematic across government agencies they interacted with, but the most problematic specific examples related to standards bodies, which could delay shipments without providing a cause for the delay, with payment expected for release of the shipments.

On the other end of the spectrum, in Bangladesh, while quality and technical standards exist for distributed renewable energy products within the IDCOL SHS program, some enterprises said a lack of standards and enforcement outside of that program have led to a profusion of poor quality products on the market that have eroded consumer confidence. This issue recently found expression in the remarks of National Board of Revenue Chairman Ghulam Hussain, who said he wanted to use rooftop solar panels for his own home to serve as a demonstration of the benefits of renewable energy, “[b]ut the things went opposite. It put me in troubles. I needed to pay technicians repeatedly to repair and found that costs turned higher than the grid-line power.”⁷⁹

Ways forward. Enterprises indicated that clear and transparent application of existing quality standards on imported distributed renewable energy products would be an important step in increasing investor confidence and allowing enterprises to scale up more rapidly with fewer delays in the product supply chain.

For product standards, enterprises indicated that the government needs to provide better quality control, particularly for imported products. Strengthening and enforcing existing standards could help build consumer confidence in the ability of distributed renewable energy technologies to provide reliable energy services. Several made reference to the effectiveness of Lighting Africa, which has tested 135 solar products against global quality standards, passing 91 of these products, while sales of certified products are increasing rapidly. Kenya has even adopted the product standard as a national law to prevent spoilage of the market by low-quality products.⁸⁰

While there is a potential tension between ensuring high product quality standards and reasonable inspection times, there is no reason that these objectives need be at odds if rigorous standards are also accompanied by institutional strengthening for standards and import control bodies.

Lack of human resources / skills development facilities

The issue. Respondents pointed to a skills gap as a major limitation in rapidly scaling up distributed renewable energy. Finding skilled local installers and technicians is a key challenge for many enterprises, and there is limited formal government support for developing the human resources required by rural enterprises.⁸¹

Key findings from the 2012 International Off-Grid Renewable Energy Conference noted: “National policies should support technical capacity building and training to meet the skills demand from a growing market.”⁸² This finding was reiterated

in the 2014 edition of the conference.⁸³ Additionally, the IDCOL SHS program also has highlighted the importance of training end users to perform minor maintenance on distributed renewable energy systems.

Ways forward. Enterprises suggested that public support for skills development in renewable energy could help address the shortfall in skilled labor for clean energy projects. In particular, enterprises advocated for the integration of renewable energy training programs into existing technical training institutes.

In India, enterprises noted that while the MNRE has taken some formal steps to support the broader ecosystem for the distributed renewable energy sector, such as supporting solar energy courses in industrial training institutes (ITIs), that implementation has been inconsistent, a sentiment shared by other enterprises.⁸⁴ Respondents indicated that institutionalizing standardized, targeted training programs at technical institutes—and specifically in the case of India, industrial training institutes—was an important policy opportunity.

Grameen Shakti noted that they had begun to overcome the lack of skills training in Bangladesh by establishing forty-six Grameen technology centers to provide training on installation and maintenance of distributed renewable energy technologies, and to enhance local production of accessories for solar home systems. More than 5,000 women have been trained in sustainable energy technology installation and maintenance, helping Grameen Shakti to scale up its deployment and service efforts. Additional policy support for these types of initiatives could help them expand.

RECOMMENDATIONS TO OVERCOME POLICY AND REGULATORY BARRIERS TO UNIVERSAL ACCESS TO CLEAN ENERGY

Section 3 above described four broad areas related to policy and regulation of distributed renewable energy: (1) electricity policy and regulatory processes, (2) financial sector policy and regulation, (3) fiscal policy, and (4) institutional arrangements and capacity.

These four areas converged in two recommendations arising from the insights of enterprises.

A number of these challenges cited by enterprises—such as fossil fuel subsidies (both direct and indirect)—are deeply entrenched systemic issues that have already been thoroughly studied.^{85, 86, 87, 88, 89} Others are being addressed by in-depth research efforts—such as the Mini-Grid Policy Toolkit (published by RECP, REN21, and the Alliance for Rural Electrification), which aims to unpack the policy and regulatory issues affecting minigrid development.⁹⁰

These two issues were among those most frequently cited by enterprises. They were described as the most critical policy and regulatory issues for distributed renewable energy. They also reflect concerns most cited by private sector respondents; for example, a survey with 423 participants identified these issues as being among the top concerns of enterprises.⁹¹ They also align with two categories of proposed solutions articulated by enterprises and demonstrated through their existing

experience. In Section 4, we build on enterprises' perspectives and experiences to discuss two potential areas of focus where support could be targeted to enhance policy and regulatory conditions for distributed renewable energy—including international financial support to strengthen these conditions.

Two recommendations flow out of these converging insights from enterprises:

Recommendation 1: Create and support platforms for enterprises—and other stakeholders—to participate in energy policy and regulatory decision making

Almost all distributed renewable energy enterprises we engaged with through this research, excepting those in Bangladesh, indicated they haven't had a voice in policy and regulatory decision making processes.

Enterprises felt they lacked access to policy making and regulatory processes for the power sector more broadly, and pointed to the fact that these processes are often dominated by large incumbent electric utilities.^{92, 93} This is a continuing and pervasive challenge: a 2012 IRENA workshop on off-grid renewable energy that convened enterprises, policymakers, and civil society concluded that “the policy-making process should involve all stakeholders in the rural electrification value chain,”⁹⁴ while WRI's experience and research has demonstrated that participation in policy and regulatory processes is critical to ensuring effective and efficient delivery of energy services.⁹⁵ To address this gap, relevant stake-

holders—including enterprises, civil society organizations, and end users of energy services—need a voice and a seat at the table.

Broadly, governments and international initiatives should support enhanced processes for consultation and engagement with enterprises, civil society, end users, and domestic financial actors. This will require both governments and their development partners and their private sector counterparts to create paths forward that institutionalize robust consultation processes in the design of new policies, regulations, or support mechanisms that impact distributed renewable energy.

Beyond new processes for engagement, one other proposal focuses on ensuring this diversity of voices has a better chance of being heard in policy and regulatory discussions to enable distributed renewable energy and better outcomes for energy end users.

A host of policy and regulatory issues could be addressed through a platform that amplifies enterprises' and other stakeholders' perspectives. In the case of India, a meeting supported by USAID India and ten organizations⁹⁶ working on energy access identified the development of a national network of enterprises and other stakeholders as an important priority to advance energy access.^{97, 98} That network is now taking shape in the form of the Clean Energy Access Network (CLEAN). Box 10 describes CLEAN's objectives and structure. Enterprises in geographical areas beyond India suggest that such a platform might have an impact on breaking down some of the barriers they face, illustrated in Figure 5.

National, regional, or global platform. Practitioner-led platforms could function either at the national, regional, or global level.

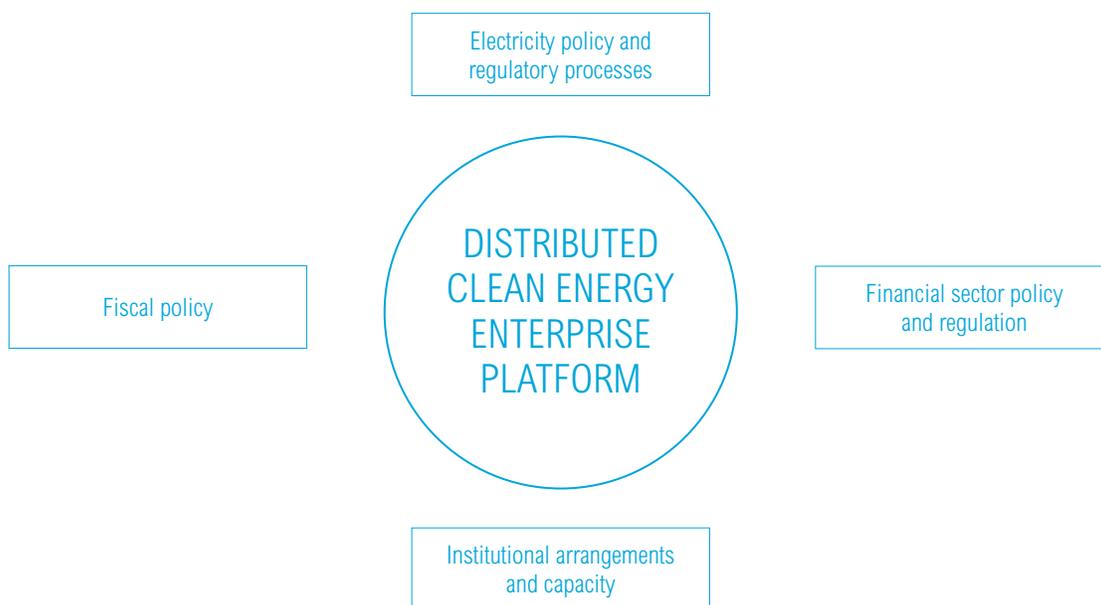
A platform connotes more than a network that exists primarily as a means of exchanging ideas and experiences. At the national level, a platform could emphasize engagement in critical local policy and regulatory issues affecting distributed renewable energy development. At the regional or global level, a platform could facilitate exchanges between enterprises and large institutions and international processes, including, for example, Sustainable

BOX 10

LEGITIMIZING CLEAN ENERGY ACCESS ENTERPRISES IN INDIA.

“CLEAN is a new alliance of businesses, not-for-profit organizations, and government to strengthen India's ecosystem for market-driven approaches to energy access. The network is intended to deliver a range of services to reduce the transaction costs of participating in the off-grid market, help reduce operational barriers, provide a platform for policy dialogue, help mobilize finance, and accelerate innovation. CLEAN aims to operate as a demand-driven program. It delivers services in five areas: (1) information and networking; (2) technology development, testing, and certification; (3) skills training, and capacity building; (4) policy advocacy; and (5) access to finance.”

BARRIERS AND OPPORTUNITIES RELEVANT TO DISTRIBUTED RENEWABLE ENERGY ENTERPRISE PLATFORM



Energy for All or Norway Energy+. In either case, this sector-wide platform might resemble an industry association for distributed renewable energy enterprises—even those using different technologies and business models—that would encourage collaboration, advancement of shared policy and regulatory priorities, and development of industry standards of practice.

National, regional, or global platforms could have several advantages in addressing myriad challenges identified by enterprises in this issue brief. These could include:

i. *Overcoming fragmentation of enterprises’ voices by bringing coherence to one voice for distributed renewable energy enterprises, and empowering*

that voice with adequate capacity to meaningfully engage in international or national processes. In this respect, it could advocate for and raise the profile of distributed renewable energy in (either or both) global and local policy agendas. For example, a platform could allow enterprises to quickly respond to dynamic issues affecting the sector, such as the rollback of the VAT exemption for solar products in Kenya highlighted by enterprises. In addition, it could provide constructive input into regulatory processes such as power system planning. In Thailand, the inclusion of voices of small power producers and very small power producers in power development planning processes helped lead to a more formal

role for distributed renewable energy in the electricity system, leading to a substantial scale-up in deployment.⁹⁹ Now, the Thai Solar Roadmap Initiative—a multistakeholder platform including experts from academia, civil society, the private sector, and civil service—has helped inform long-term planning for renewable energy development in Thailand.¹⁰⁰

ii. *Providing a single window of engagement with government ministries, which often have overlapping mandates or conflicting regulation and policy. Beyond providing a unified voice for enterprises, a platform could help identify the best point of engagement among government agencies or ministries to address*

a particular issue, which could avoid different government ministries or agencies “passing the buck.” In the other direction, the platform could serve as an accessible way for government to initiate interaction with enterprises, proactively seeking input from or disseminating information to these actors on plans, policies, and programs.

- iii. *Working across multiple sectors where policy and regulation is relevant to enterprises.* As observed in the diversity of policy and regulatory challenges perceived by enterprises, issues affecting distributed renewable energy enterprises often cut across sectors and a diversity of government ministries or agencies beyond those focused only on energy. For example, many pay-as-you-go and microgrid business models are fundamentally reliant on mobile technology to collect payments, monitor services (see Box 6 earlier in this issue brief), collect user data, and more.
- iv. *Crafting and advocating for win-win solutions to energy access challenges based on enterprises’ experience, data, and market research.* For example, centralizing market intelligence and increasing its accessibility for all stakeholders could also help prioritize public investment in those areas with the most potential.
- v. *Serving other needs beyond shaping policy and regulation, like helping match sources of finance with projects and enterprises.* From a financial

risk perspective, a well-designed platform could help aggregate investment opportunities using standardized due diligence processes, and reduce some of the financial risk and transaction costs for investors and enterprises. Platforms also could serve as a central clearinghouse to match investors with enterprises, and could play a useful role in knowledge management.

To ensure effective platforms, at least two key principles could be observed, in line with observations from enterprises collected through interviews:

1. *Facilitate integration of existing platforms or avenues of engagement for entrepreneurs.* While the distributed renewable energy space is heterogenous and may demand multiple platforms in a country differentiated by technology or other factors, in some cases the existence of multiple platforms can fragment practitioners’ voices. In these cases, developing a platform that focuses on unifying goals—such as participation of practitioners in planning or policy design—can still serve a useful purpose. India’s forthcoming Clean Energy Access Network is an example of an effort designed to bring together the threads of several emerging networks to avoid duplication of effort and further fragmentation, and to provide a common voice on certain unifying issues.¹⁰¹
2. *New platforms should avoid fragmenting already-fragmented landscapes further.* Where effective institutions exist, they should be strengthened and enhanced instead of undermined

through the creation of new institutions.

3. *Build inclusive partnerships that encompass more than just enterprises.* Multistakeholder platforms can help to not only strengthen the voice of the platform, but to ensure buy-in and a sense of ownership from a broader set of partners, including consumer groups, civil society organizations, and more. While distributed renewable energy enterprises would not be able to control the direction of more inclusive partnerships, the rewards are a stronger and more thoughtful, practical solutions that serve the needs of multiple constituencies. Even a platform comprised only of distributed renewable energy enterprises could still emphasize building strong partnerships that create the space for them to participate in policy and regulatory processes.

The role of national vs. global and regional platforms

Global, regional, and national platforms are not mutually exclusive, but each has different relative merits.

National platforms have the benefit of being more narrowly focused. Because policy and regulatory contexts at the national level differ greatly from country to country and decision making happens at a national level, such platforms allow for focused and context-specific problem solving. The required degree of focus to effect change in policy and regulation might be beyond the ability of a more diffuse global or regional platform.

For example, enterprises in India cited renewable energy subsidies repeatedly as an area where more participatory decision making could remove barriers to the scale-up of distributed renewable energy. A national platform could act as a magnet for distributed renewable energy enterprises working within a country. Several enterprises noted that despite their activities in their country, they did not communicate with other enterprises, which they later found had been facing many challenges similar to their own.

A limitation of a national platform is the risk of losing the strength of many voices speaking together. Given that distributed renewable energy is a nascent industry in many countries, there may not be a critical mass of voices within a country to contribute the capacity necessary to make a national platform effective.

Efforts at coordination among distributed renewable energy enterprises at the national level to date have been mostly ad hoc, although some exceptions exist. Ashden Award winners in India came together to form the Ashden India Renewable Energy Collective, which has advocated for changes to central bank guidelines, as well as policy and regulation related to energy access. India is also home to CLEAN—described in Box 9 above—which is a nascent effort to bring enterprises together with other actors in India, including civil society and research organizations, to give a voice to distributed renewable energy interests in the country.

In East Africa, enterprises pointed to a platform called the Sustain-

able Energy Access Forum (see Box 2),¹⁰² which is bringing enterprises together with stakeholders from government agencies, utilities, and civil society. While it is too early to determine the success of this platform, the effort allows enterprises and civil society to have a direct dialogue with policy makers on an energy access policy agenda at the sub-national level.

In Bangladesh, enterprises cited IDCOL as an example of a national platform that has allowed some limited input from enterprises into decision making related to distributed renewable energy, mostly in relation to minimum technical standards for products to be eligible for financial support.

Global or regional platforms may have a bigger voice than a national platform and would be more likely to be seen as legitimate in engaging with international processes such as SE4All or Energy+. Regional platforms could focus on shared geographic priorities—for example, an African platform would be well-positioned to engage on issues related to Power Africa, a U.S. government initiative aiming to “double the number of people with access to power in Sub-Saharan Africa.”¹⁰³ However, a global or regional platform may not be well-equipped to address national-level issues that are specific to the political economy of that particular country—for example, the circumstances regarding the sudden VAT phase-in in Kenya.

A global platform for off-grid lighting exists in the form of the Global Off-Grid Lighting Association

(GOGLA), formed in 2012, but the perceived policy and regulatory needs of enterprises extend beyond the current mission of GOGLA, especially according to some enterprises with micro- and minigridd interests. The Alliance for Rural Electrification (ARE), established in 2006, aims to work “toward the integration of renewables into rural electrification markets in developing and emerging countries.”¹⁰⁴ These global platforms could be strengthened, and an entrepreneur-led platform could be housed in an existing institution (for example GOGLA, ARE, Lighting Africa, or the UN Foundation’s Energy Access Entrepreneur Network) to minimize the transaction costs of establishing a completely new institution. Care should be taken to support and enhance the coordination of these existing global networks and to avoid fragmentation.

In order to address some of the most persistent and problematic policy and regulatory barriers, the voices of enterprises need to be heard. Future financing and investments to help meet access to clean energy goals therefore should ensure adequate support for participation and consultation of enterprises and other stakeholders in both international processes and national regulatory and policy decision making processes relevant to the distributed renewable energy sector.

Alongside the need for greater participation of enterprises in policy and regulatory deliberation, enterprises identified the need for policy reform to unlock access to finance as a key priority.

Recommendation 2: Policy and regulatory reform to unlock domestic commercial financing

International initiatives, as well as governments, could help the sector develop by introducing a suite of policy and regulatory measures aimed at unlocking domestic commercial financing for distributed renewable energy.

Principles for effective policy and regulatory reform to unlock domestic commercial financing

1. *Focus on the whole of the financial ecosystem.* Consider all of the aspects of the financial ecosystem for distributed renewable energy and how they work together (or how they don't). For example, a credit support program could help increase deployment of distributed renewable energy, but without a capacity building or technical assistance component, might not create a lasting source of finance. This approach should consider finance at the level of enterprises as well as finance for end users.
2. *Tailor the reforms to the existing financial infrastructure.* For example, in parts of Sub-Saharan Africa, access to banks and other financial institutions may be much lower than in much of South Asia; the microfinance and development-focused banking ecosystem in South Asia is more mature than in Sub-Saharan Africa. Thus, an approach tailored to the existing financial infrastructure is crucial.

These types of changes are important for a number of reasons.

While the IDCOL financing model for solar home systems in Bangladesh is a widely known success in scaling up off-grid renewable energy, it is not the only financial pathway to scale. Increasing domestic commercial financing, rather than relying primarily on international public finance as the IDCOL model has to date, can be another route to scaling up distributed renewable energy. Even in Bangladesh, often held up as the success story in financing for distributed renewable energy,¹⁰⁵ enterprises indicated that domestic commercial finance is not engaging with distributed renewable energy enterprises and does not view the rural poor—who represent the bulk of end users of distributed renewable energy services in the country—as bankable clients. While international public finance and microfinance institutions have stepped in to help finance end users, enterprises said they still have difficulty securing the volume of working capital that could help their organizations grow rapidly.

Tapping this pool of domestic commercial finance is no easy task: enterprises consistently noted that a lack of awareness and capacity in the financial sector, combined with certain financial regulations and guidelines, has constrained domestic financing for distributed renewable energy, and has also limited the channels through which international finance can be effectively disbursed. This is the case for finance both at the level of working capital to help enterprises expand, and at the level of end-user finance to enable

users to tap into affordable financing for distributed renewable energy products and services.

Research on mobilizing climate finance more generally also has pointed to the role for local financial institutions, noting that “strengthening [...] financial sector capacity can unlock investment.”¹⁰⁶

In the long term, improving access to domestic finance for the distributed renewable energy sector will be an important determinant of whether the sector is able to scale up rapidly. Enhancing the means for distributed renewable energy to develop a credible track record—particularly a track record with lenders in the countries in which they operate—has the potential to unlock a large volume of debt that would help propel the sector's growth.

While issues related to financing distributed renewable energy will be dealt with at length in the third publication in this series (see box “About this series”), research for this issue brief highlighted several important policy and regulatory dimensions to creating the right enabling environment for scaled-up financing of distributed renewable energy enterprises.

Many existing policy interventions to boost distributed renewable energy focus on capital subsidies, but there are fewer examples of policy interventions targeted at longer-term development of the finance infrastructure that could lead to a more sustainable sector. Many enterprises also emphasized the merits of a financial approach to supporting distributed renewable energy:

- If projects are able to access commercial finance, they have a much larger potential pool of working capital and can replicate and scale up much more rapidly than if they are limited to capital subsidies.
- Enterprises also indicated that securing financing for projects, rather than relying on capital subsidies, can enhance the financial sustainability of the sector, reducing the likelihood of a short-lived boom in distributed renewable energy that turns to a bust after the subsidy dries up. For projects to secure financing, it is likely they will have been through some degree of due diligence to ensure their financial sustainability. A recent report that explores lessons from the first phase of India’s Jawaharlal Nehru Solar Mission noted that rather than

focus on capital subsidies or viability gap financing, lessons from Solar Mission indicate that “[i]t is more desirable for public funding to address structural impediments to such financing, so that the sector transits to nonrecourse-based financing.”¹⁰⁷

To help unlock commercial finance, a host of policy and regulatory issues could be addressed as part of a package that also supports awareness and capacity building among local financial institutions. Existing literature and enterprises suggest that such a package might have a positive influence on several barriers, as illustrated in Figure 6.

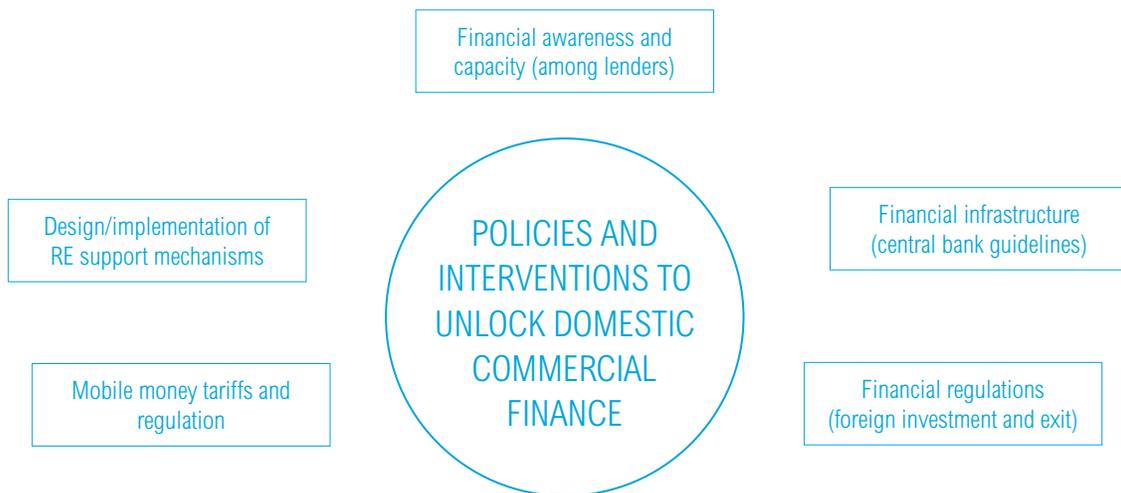
Measures to unlock domestic commercial finance for distributed renewable energy

The policy and regulatory measures that enhance the commercial finance

ecosystem will vary depending on the existing policy environment and financial infrastructure in each country. However, based in part on successful examples described by enterprises, national governments and international initiatives that look to expand access to finance for distributed renewable energy—such as Sustainable Energy for All, Energy+, and Power Africa—might choose to focus on some or all of the following:

- Shifting their focus from capital cost subsidies to interest rate subsidies or risk mitigants. Although not appropriate in all cases, shifting toward interest rate subsidies will often help catalyze more overall investment in distributed renewable energy than capital cost subsidies, and will help familiarize domestic financial institutions with dis-

FIGURE 6 BARRIERS AND OPPORTUNITIES RELEVANT TO UNLOCKING DOMESTIC COMMERCIAL FINANCE



tributed renewable energy market characteristics, which can help reduce risk perception and can permanently reduce financing costs in the longer term.

- Strengthening capacity building and awareness programs to educate relevant lenders about distributed renewable energy opportunities, and develop targeted guidance in the evaluation of such projects and enterprises. This has been done successfully as a component of numerous successful energy efficiency lending programs, including the IFC and GEF-supported China Utility Energy Efficiency project.¹⁰⁸ The United Nations Environment Programme’s Indian Solar Loan Program, building on SELCO’s model, endeavored to expand the involvement of banks in solar financing in India. This modest but effective program, launched in 2003, provides insight into how growing the role of local commercial banks can catalyze distributed renewable energy finance. Specific lessons from the project—such as which tools are effective at guiding lenders—remain relevant several years after the completion of the project.¹⁰⁹
- Promoting development of central bank lending guidelines that do not discriminate against renewable energy lending. Where some sectors are incentivized, distributed renewable energy should be among the supported sectors. Where central banks identify priority lending sectors—a circumstance limited to only a few countries, including India—these should be in line with

and supported by a well-defined role for distributed generation in the planning process, including deployment targets that could link to lending targets. Also, support for central bank regulations that allow banks to lend for distributed renewable energy, even where collateral may be limited, may be appropriate in some contexts, as central bank regulations have previously impeded distributed renewable energy lending to enterprises.¹¹⁰

- Ensuring that financial regulations and guidelines allow for embedding distributed renewable energy lending in other development-related loans. For example, support for building an energy access loan component into larger loans for housing, as SELCO has done in partnership with local financial institutions, could be a successful approach.¹¹¹
- Supporting changes to the banking system to enhance access to finance overall. For example, India’s regional rural banks have a central bank-coordinated development mandate to support finance for rural sector activities, including agricultural activities and distributed renewable energy, but equivalents do not exist in many other jurisdictions, including many East African countries.
- In the case of microfinance, where appropriate, shifting regulations to empower microfinance institutions to engage in more distributed renewable energy lending. In Uganda, for

example, the ability of microfinance institutions to sell products, such as solar home systems, at the same time as providing financing to the end users is limited by regulation.

- Deploying risk mitigation tools to buy down risk perception of lenders and familiarize them with the types of enterprises, assets, and risk profiles involved in distributed renewable energy lending, including appropriately structured loan guarantees—along with capacity building at local banks to ensure these guarantees can be taken up. This could help support the entry of new domestic lenders into this space.
- Designing funds that provide financing at the terms and scale required by distributed renewable energy enterprises, and leveraging national distribution channels where relevant to ensure resources reach enterprises on the ground. One example is the credit enhancement model facilitated by IDCOL in Bangladesh.

The recent inclusion of the distributed renewable energy sector in the lending guidelines of the Reserve Bank of India,¹¹² a change successfully advocated by the Ashden India Renewable Energy Network, provides one example of how financial sector policy, regulation, and awareness can change in ways that help unlock access to finance for clean energy access (see Box 5), and help the sector to scale up energy access.

CONCLUSIONS

This issue brief has aimed to give voice to distributed renewable energy enterprises on policy and regulatory issues that matter to them. It has identified and explored policy and regulatory challenges and prospective solutions from their perspectives, across financial sector policy and regulation, participation and consultation in regulatory and policy design, fiscal policy, and institutional capacity.

The research indicates that despite the availability of new and innovative business models for delivering clean energy services, and improvements and reduction in costs of many distributed renewable energy technologies, many policy and regulatory challenges can still delay implementation and scale-up of solutions that provide distributed renewable energy access.

Therefore, as described in the preceding section, we highlight two potential avenues for addressing some of the policy and regulatory challenges enterprises see as most important in scaling up their efforts:

- i. Establishing multistakeholder platforms—whether nationally or regionally/globally—or entrepreneur-led industry associations that give voice to enterprises in policy and regulatory issues, and allow them to engage across government ministries and agencies with a unified voice on planning for and defining the role of distributed renewable energy on the national level.
- ii. Supporting more holistic packages of policy and regulatory changes focused on domestic financial infrastructure.

We highlight these examples in the hopes that those financial institutions engaging in the energy access space—including bilateral financial institutions, multilateral financial institutions, and philanthropy or private foundations—and those designing clean energy policy and regulatory interventions—including national and subnational governments—might find them useful guideposts in designing effective support and interventions for distributed renewable energy to scale up energy access where it is needed most.

These interventions beyond direct project finance can help reshape the policy and regulatory environment for distributed renewable energy, and will be necessary for these energy access solutions to scale up rapidly over the longer term.

ANNEX I. PARTICIPATING ENTERPRISES

India

- **SELCO Foundation** [Surabhi Rajagopal, Principal Analyst]
 - SELCO Foundation is an offshoot of SELCO India, which offers solar lighting, solar home systems, and solar streetlights. It operates primarily in Karnataka, Gujarat, Maharashtra, Bihar, and Tamil Nadu. SELCO Foundation uses soft funding and flexible capital to develop robust and field-proven technological and financial models in the field of energy and sustainability. It aims to generate public awareness about these models, while also building the ecosystem for the creation and delivery of such solutions.

- **Boond** [Rustam Sengupta, Founder and Chief Executive Officer]
 - Boond offers a range of solar home systems, as well as solar water pumps and solar street-lighting, and operates primarily in Uttar Pradesh and Rajasthan.

Kenya

- **Angaza Design** [Lesley Marincola, Founder and CEO]
 - Angaza Design provides an integrated pay-as-you-go platform that enables mobile money payments for energy services, as well as a pay-as-you-go ready solar lantern and charging solutions.
- **Barefoot Power** [Blodewijn Sloet, Africa Managing Director]
 - Barefoot Power and its Kenyan subsidiary Smart Solar provide affordable solar lighting and phone charging products, and solar home systems, from design and manufacture of the products to distribution, sales, and after-sales service.
- **Azuri Technologies** [Ntumwa Edward Lubega, East Africa Sales Director]
 - Azuri technologies develops, manufactures, and sells Indigo, a pay-as-you-go technology platform using scratch cards (similar to mobile phone air-time recharge cards) to enable customers to prepay for energy services quickly and easily on a weekly basis.

Along with the interviews and desk research, this section was informed by a workshop held in Entebbe, Uganda that brought together enterprises from across East Africa.¹¹³

Indonesia

- **Suar Intermuda** [Arief Koesoemawiria, Managing Director]
 - Suar Intermuda supplies solar home systems and renewable energy solutions ranging from irrigation to marine navigation lighting.
- **Interterl Media Prima (Imprima)** [Andre Susanto, Division Head]
 - Imprima provides solar home systems and lighting solutions, as well as renewable energy services aimed at the telecommunications industry.
- **STC Indonesia** [Matt Bock, Director of Consulting Services]
 - STC produces low-cost biofuel and biomass products, specializing in the use of non-food-grade waste materials, providing renewable fuels that can be used with generators to enhance energy access.

Bangladesh

- **Grameen Shakti** [Abser Kamal, Managing Director]
 - Grameen Shakti provides, among other services, financing, installation, and after-sales service for solar home systems. It has provided solar home systems for more than 1.2 million homes in Bangladesh.
- **SolarEn Foundation** [Kazi Mahmud Ullah, Chief Operating Officer]
 - SolarEn Foundation specializes in sales, marketing, and maintenance of a wide range of solar home system packages.

ANNEX II. INTERVIEW GUIDE

The purpose of this interview is to understand policy and regulatory barriers to scaling up energy access from the perspective of your enterprise, and to elevate the perspectives of enterprises to the levels of policy makers at the national level and to the level of international financial institutions.

1. What are the key policy and regulatory barriers or gaps facing your enterprise and holding you back from reaching greater scale?
2. Where have you seen demonstrated success in overcoming these policy and regulatory barriers and gaps?
3. What do you see as the key enabling policies and regulations that need to be in place for social enterprise delivering energy access to thrive?
4. What are the most critical institutions for policy and regulatory decision making in the markets you work in? How do they interact and which actor(s) will be instrumental in creating the right policy enabling environment for scaled-up energy access through social enterprise?

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