ENDING ENERGY POYERTY BY 2030:

AN ANALYSIS OF THE CIVIL SOCIETY LANDSCAPE

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EXECUTIVE SUMMARY

To achieve the UN's Sustainable Development Goals and meet the climate targets set by the Paris Agreement, clean, affordable, and renewable energy must be made accessible to the 1.1 billion people around the globe who lack access to electricity. The potential benefits are enormous: a clean energy economy that provides affordable, reliable, and safe energy to all has the potential to not only transform climate and development, but also to deliver major advances in public health, gender equity, education, and more. Current investment incentives and momentum, however, strongly favor the kinds of large-scale, centralized energy projects that will bypass the great majority of those living without energy access: the rural poor. The global community faces three critical challenges in bringing clean, affordable, renewable energy to the 1.1 billion who do not have it: implementation of policies that support the development of distributed energy, financing that makes it possible to address this problem at scale, and the cultivation of in-country human capital necessary to install and maintain these systems. Civil society leaders are uniquely positioned to bridge this disconnect and address these challenges and needs. Moreover, mission investors can take risks, build the field, and pave the way for an influx of private sector capital.

Finally, it is vital that the collective efforts to bring clean, affordable, renewable energy to the rural poor are well coordinated. The challenges are too great, and the forces advancing a fossil fuel—based solution too strong for us not to be working as a community in the most strategic way possible.

This report provides a broad assessment of the current clean energy access landscape and identifies key existing initiatives as well as critical gaps in the field. We also recommend preliminary near-term investment opportunities for civil society organizations and mission investors that are interested in advancing the needs of the historically marginalized.

1. How to meet the energy needs of those who live without electricity will have an enormous impact on global development goals and determine the fate of the climate.

The UN Sustainable Development Goal 7 (SDG7) commits to ensuring "access to affordable, reliable, sustainable, and modern energy for all" by 2030. Accomplishing the other 16 Sustainable Development Goals—such as ending poverty and hunger, achieving quality education, and promoting healthy lives—is possible only with clean, reliable energy. Lack of clean energy access disproportionately affects the rural poor and women and girls, in particular, hindering their ability to get an education or earn income, and whose safety is at risk as they exercise primary responsibility for fuel-gathering. An estimated 4.3 million people die each year from air pollution produced by the dirty fuels¹ most families in developing nations

¹ "Household air pollution and health," World Health Organization, accessed May 20, 2016, http://www.who.int/mediacentre/factsheets/fs292/en/.

rely on for cooking and lighting. Reliable electricity is also essential, especially after dark, for powering emergency medical equipment, storing blood and vaccines, and performing basic health procedures—all of which are necessary to improve public health. And clean water, a critical but scarce resource in many parts of the world, can be made available at the community scale only through processes that require electricity.

How to meet the goal to end energy poverty by 2030 is inexorably linked to meeting the global climate goals as well. The UN Paris Agreement sets an ambition of holding the global temperature rise to well below 2 degrees Celsius—a goal that leaves little room for new fossil fuel development. As such, seeking to expand energy access without regard to fuel source is simply not an option. In order to mitigate climate change, the collective challenge must be to deliver clean, affordable energy to those who need it most.

2. Decentralized solutions need to be scaled rapidly to make clean energy accessible to everyone.

Traditionally, multilateral development banks have focused on advancing large-scale electrical grid expansion. However, 85 percent of the energy poor live in sparsely populated rural areas where grid extension is not feasible, or affordable. While expanding the grid—and ensuring it's powered by clean, renewable energy—is critically important for meeting development and climate goals, attention and investment must also be dedicated to meeting the needs of those who are hardest to reach.

Fortunately, falling prices and innovative decentralized energy delivery models—which use small-scale wind, solar, and other renewable technologies to generate energy at the home or community level—are bringing energy services to homes that would otherwise not be connected to an electric grid. However, the most growth has been in solar lanterns and clean cook stoves, which provide important quality of life benefits but do not power the economic activity that will lift families out of poverty. Higher levels of energy services, such as solar home systems and mini-grids, offer the potential for livelihood opportunities and community-wide benefits, but because of policy and financial and human capital needs, they remain out of reach.

To scale decentralized solutions, proponents will need to create a supportive environment where the market can thrive. Although there is increasing interest on the part of investors and innovative start-ups with strong models for delivering decentralized energy, significant barriers inhibit the market's growth:

- Policy barriers: Global, national, and subnational development agendas and energy policies
 remain largely focused on large-scale grid infrastructure, which is what policy makers know and
 understand, rather than less familiar decentralized energy solutions.
- Lack of human capital: In-country entrepreneurs lack the training and support to start new ventures, and existing ventures encounter difficulty identifying and recruiting the talent they need to grow their businesses.

• Capital needs: Because the market is nascent, local commercial banks are reluctant to invest in decentralized solutions. Energy access entrepreneurs struggle to find the right kind of capital when they need it.

3. Strong civil society leadership must help ensure that the hardest to reach populations are not left behind.

Pressure on governments and multilateral development agencies is increasing with the growing recognition that ending energy poverty is essential to meeting collective development, human rights, and climate goals. New initiatives have emerged to elevate clean energy access on the global development agenda, advance decentralized solutions that can reach the rural poor, and direct more capital toward ending energy poverty. Yet the landscape of existing efforts to expand clean energy access is hampered by a lack of coordination across the advocacy, finance, and human capital strategies needed to create a functioning marketplace. Decentralized energy advocates work primarily in sector and geographic silos, limiting the reach of their work. And the communities most affected by energy poverty are not involved when decisions are being made about their energy future. At the same time, private investors remain wary of the sector, reluctant to provide the capital needed to grow effective business models.

Civil society leaders from across the philanthropic, development, and faith sectors are uniquely positioned to address these challenges. Advocates from these mission-driven institutions can demand that the global development agenda includes the rural poor, who are unlikely to be served by large-scale infrastructure expansion. And leading civil society organizations can assemble a broad, cross-sector coalition that gives affected communities a seat at the table while collaborating to bring effective solutions to scale quickly. Advocates, investors, and community leaders need a platform where together they can learn from what's working, draw on the diverse skills and experiences of a broader range of stakeholders, and inform investment decisions.

4. Civil society organizations can deploy critical mission-driven capital to help unlock the large-scale private investment needed to end energy poverty by 2030.

The Sustainable Energy for All (SEforALL) coalition estimates² that it will take \$49 billion of investment annually to end energy poverty through 2030.³ Most recent estimates⁴ put current investment in energy

² "Scaling up finance for sustainable energy investments," Report of the SE4All Advisory Board's Finance Committee, 2015. http://www.se4all.org/sites/default/files/SE4All-Advisory-Board-Finance-Committee-Report.pdf.

³ Note that the annual investment needs vary significantly depending upon the level of energy services provided. Based on SEforAll's "Multi-Tier Framework," the World Bank estimates the cost of providing the lowest level of energy (e.g., lanterns) is \$1 billion per year, while the highest level of access is \$40 billion per year.

⁴ "Energy for All: Financing access for the poor," International Energy Agency, 2011. http://www.worldenergyoutlook.org/media/weowebsite/energydevelopment/weo2011 energy for all.pdf.

access at \$9 billion annually, leaving a \$40 billion annual financing gap. The opportunity for mission-driven capital to help fill this gap is significant. The impact investing market has grown to \$77.4 billion in 2016, up from \$60 billion a year ago. And more broadly, the market of investors that consider environmental, social, and governance factors when investing grew to \$21.4 trillion in 2014.⁵ A growing number of investors are already committing to accelerating the energy transition, including a diverse group of investors from around the world holding more than \$4 trillion in assets who have committed to divest from fossil fuels. Many of these investors are moving their investments into clean energy.

This growing recognition of the imperative to invest in the clean energy transition has the potential to unlock new resources for clean energy access. The investment assets held within civil society—the philanthropic, development, and faith sectors—in the United States alone collectively total more than \$763 billion in assets.⁶ As more of these investors seek to align their assets with their missions, energy access offers an attractive opportunity to help counter a range of critical social and environmental challenges. Because energy access has a significant impact on all aspects of human development, it can help unite a broad cross-section of mission investors such as those in the development, climate, faith, philanthropy, health, and agriculture communities.

Mission-driven investors can take risks that will help overcome market barriers and pave the way for large-scale private finance. They can also provide the wide variety of capital needed as businesses grow and develop. By making early investments in this emerging sector, civil society organizations can prove the concept of decentralized renewable energy business models and demonstrate returns to private investors.

5. To reach the goal of ending energy poverty, new investment approaches and vehicles will be required to rapidly deploy capital in the communities that need it most.

While vehicles for investing in decentralized renewable energy exist, they are limited in scope and scale and are not sufficient for achieving universal energy access. Existing investment products are narrowly focused on distinct geographies, technologies, or stages of the business development life cycle and offer varying rates of return, making it difficult for entrepreneurs to access the capital they need. And while large-scale renewable energy projects that aid the transition to a clean energy economy often offer market rates of return, they do not meet the needs of the rural poor.

⁵ "2014 Global Sustainable Investment Review," Global Sustainable Investment Alliance. http://www.gsi-alliance.org/wp-content/uploads/2015/02/GSIA Review download.pdf.

⁶ United States foundations hold \$715 billion in assets, US-based nonprofits working on international development hold more than \$7.5 billion in assets, and faith-based organizations in the United States hold \$40.5 billion in assets. http://nccsweb.urban.org/tablewiz/bmf.php.

Impact investors can help to quickly scale the innovative investment vehicles needed to help fill these gaps and build the capacity of the field. They can provide ready access to the grants, technical support, and early-stage capital that is needed to get community-level projects off the ground and support local entrepreneurs. There is also a need to aggregate decentralized renewable energy projects, creating a steady pipeline of investment-ready deals for investors with varying degrees of risk tolerance and seeking different rates of return. Lastly, impact investors can support financing vehicles that mitigate risks for commercial lenders, helping to unlock debt markets needed to scale effective businesses.

6. Civil society actors can play a unique role in quickly scaling safe, clean, and affordable energy.This report highlights a number of near-term opportunities where civil society organizations can help to end energy poverty, including:

Strengthening Collaboration: To build greater capacity for collaboration across the sector, and stronger representation from impacted communities, civil society organizations should:

- Create a platform where impact investors and development nongovernmental organizations (NGOs) learn and act together
- 2. Develop tools for collaborative funding strategies that are informed by affected communities
- 3. Replicate effective models for in-country collaboration and capacity building

Advocating for Decentralized Solutions: To develop strong political will, increased investment, and a supportive policy environment at the global, national, and subnational levels, civil society advocates can:

- 1. Elevate the voice of civil society leaders to demand an end to energy poverty by 2030
- 2. Hold development agencies and countries accountable for the commitments they made
- 3. Build advocacy capacity at the national and local levels

Building Human Capacity: To create the skilled local human capital needed to launch, implement, manage, and scale distributed energy enterprises and initiatives, civil society organizations should:

- 1. Build a cadre of entrepreneurs, skilled workers, and leaders for the sector
- 2. Rapidly deploy volunteers to support local organizations

Expanding Access to Capital for Clean Energy Access: To increase the amount of capital and access to the range of financing instruments needed to exponentially grow the sector, mission-driven investors can:

- Advocate and build awareness for new investors to enter the market
- 2. Improve the existing investing infrastructure
- 3. Support innovative financing vehicles
- 4. Mitigate risks for commercial lenders

By helping to overcome these critical challenges, civil society organizations can help catalyze the private investment required to ensure access to clean, safe, affordable energy for all.

DELIVERING ENERGY TO THE RURAL POOR

Only by tapping into the transformational power of clean, decentralized energy can the twin challenges of the climate crisis and ending energy poverty be met. Fortunately, dramatic innovation in the distributed energy sector, declining costs, and technology innovation has created an opportunity to deliver clean energy solutions directly to those who are beyond the reach of grid expansion. Rural electrification no longer requires building expensive infrastructure such as pipelines and transmission towers and decentralized solutions can deliver clean energy directly to those who need it most. These clean, small-scale, and locally controlled energy solutions—including solar, biofuels (that do not compete with food), hydro power, wind, and other clean energy solutions—can increase access to energy while setting the stage for economic development and improved productivity, wealth, health care, education, gender equality, and more.

Civil society actors from across the development, faith, and philanthropy sectors are advancing important new initiatives to scale these decentralized solutions in order to bring clean energy to the rural poor. A growing recognition that energy is the prerequisite for meeting the UN's development goals—spurred in part by the UN secretary general's announcement of the global coalition SEforAll in 2012—is helping attract new players and resources toward ending energy poverty. Today, SEforAll is helping to advance this vision through its engagement with governments, businesses, multilateral development banks, and development NGOs. Leaders from within civil society are working to promote stronger coordination across the field, advocate for a strong focus on decentralized energy in development planning, train the professionals and workers necessary to scale solutions, and increase access to financing for entrepreneurs. However, this important work remains dramatically underfunded and fragmented across sector and geographic boundaries.

The following section provides a critical analysis of the current state of civil society sectors—including development, clean energy, faith, and philanthropy—focused on ending energy poverty, as well as an overview of the leading strategies and initiatives working to bring decentralized clean energy solutions to scale.

SECTOR OVERVIEW

Clean energy access has historically fallen through the cracks between the distinct goals of different sectors, each with a stake in ending energy poverty. Sector-based approaches (described below) have hindered larger field-building efforts, and there remains a need for a more holistic strategy that deploys resources across the entire ecosystem of energy access stakeholders.

Global Development Sector

The global development sector is increasingly interested in energy as the linchpin for enabling progress on all of the Sustainable Development Goals. Historically energy—and infrastructure more broadly—has not been a priority of the donor country and multilateral development banks (MDBs) responsible for deploying billions of dollars of development aid annually (more than \$161 billion in 2014).⁷ And energy received little attention as part of the United Nations' Millennium Development Goals (MDGs). The energy poor and development NGOs with a presence on the ground have rarely been at the table with donors and investors, and their voice has largely been absent from development and energy planning.

With the advent of the Sustainable Development Goals (the most recent iteration of the MDGs) and an explicit goal focused on ending energy poverty, MDBs, donor countries, and civil society organizations are beginning to focus more on energy access. However, prioritizing development without concern for fuel source risks pitting economic development against climate, health, and human rights. As large donor countries and multilaterals seek to bring energy to as many people as possible (largely in urban centers), they are deploying public funds into large and costly infrastructure projects, often powered by fossil fuels. This approach neglects the needs of the populations that are hardest to reach (more than 80 percent of the energy poor are in rural areas) and the many interconnected climate, health, and human rights benefits of clean energy.

Civil society development organizations can be strong advocates for the many benefits that clean energy can bring to local communities and the cost advantages of decentralized solutions. An increasing number of development NGOs such as ActionAid USA, Practical Action, and World Resources Institute are working to advocate for solutions for the energy poor. To date they have focused on influencing international finance flows to direct more funding to smaller and more locally controlled projects. There remains little funding for NGOs to expand this work, and few have the capacity to advance implementation-focused projects at the country level.

⁷ "Net Official Development Assistance and Official Aid Received," World Bank, http://data.worldbank.org/indicator/DT.ODA.ALLD.CD?year high desc=false.

Climate and Energy Sector

Alternatively, the climate and clean energy sector has long sought to ensure that those who currently lack access to energy are served by clean energy rather than coal and other fossil fuels. The Paris Agreement has established a road map for emissions reductions, and climate advocates have worked extensively in high-emitting countries to forge strong commitments, primarily from the energy sector, to make emissions reductions. Philanthropy's focus on financing these commitments has unlocked new potential resources for ending energy poverty.

At the same time, the imperative to keep warming within 1.5 degrees Celsius demands an urgent focus on the highest-emitting countries and the fastest-growing economies, such as China, India, and South Africa. Yet the vast majority of the energy poor are located in sub-Saharan Africa. And because clean energy advocates are less focused on the development co-benefits of decentralized energy, larger-scale infrastructure projects have taken precedence with both national decision makers and investors over building the decentralized energy market.

Faith Sector

Faith leaders have made a forceful moral call to action on climate, demanding that the world's leaders take meaningful action to protect those who are most vulnerable. They wield significant influence over citizens and policy makers in many of the countries affected by energy poverty and can be an asset in the clean energy movement. Faith-based development organizations have long been at the frontlines of the poorest communities and have a critical role to play in accomplishing the Sustainable Development Goals. While these organizations have typically focused on other drivers of poverty such as access to clean water and gender equity, their strong focus on disaster relief has led to an increasing interest in climate justice and adaptation.

Faith leaders are also leading the way in helping to shift capital into the clean energy transition. The pope made a clear case for transitioning to a clean energy economy, writing that climate change is driven in part "by a model of development based on the intensive use of fossil fuels" and that fossil fuels should be "replaced without delay." Over 145 faith-based organizations with more than \$25 billion in collective assets have committed to divest their investments of fossil fuels. The University of Dayton was the first Catholic institution to divest its assets. The World Council of Churches, which holds nearly \$68 million in assets, divested its holdings from fossil fuels and encouraged its members to do the same. The organization has immense reach: its members include more than 350 denominations—including Orthodox, Anglican, Baptist, Lutheran, Methodist, Reformed, United, and independent churches—and collectively comprised more than 500 million Christians worldwide. The Church Pension Fund (the Episcopal Church in the United States) has provided a \$25 million anchor investment for Developing World Markets' Off-Grid Renewable Energy Note. And the Franciscan Sisters of Mary recently launched a \$10 million impact investing portfolio.

Philanthropic Sector

Energy access remains dramatically underfunded, and private philanthropy can play a critical role in helping to drive innovation and field-building. Historically, private philanthropy has been wary of energy access, not acknowledging the links to social, development and human rights benefits and believing it's the realm of multilateral development institutions and awash in public sector funding. Yet private philanthropy is needed to help drive innovation, take risks that public development finance will not, and help to build stronger capacity within civil society. There is also an opportunity for funders interested in energy access to build bridges with nontraditional funders that have a stake in ending energy poverty in order to achieve their own objectives, such as those who support agriculture, health, clean water, and human rights.

A large community of climate foundations have focused heavily on emissions reductions and growing the clean energy market, including setting strong targets in the Paris Agreement. For example, the William and Flora Hewlett Foundation and others helped to establish the Shakti Sustainable Energy Foundation in India to promote the clean energy market and policies in India. Climate funders with a strong focus on social justice, such as the Ford Foundation and Mary Robinson Foundation, have focused on building power at the grassroots and within affected communities, giving them a voice in their energy and development future.

Those few foundations working directly on energy access to date have opted to focus on distinct geographies or targeted interventions to help grow the market. The Rockefeller Foundation has sought to pilot, refine, and scale micro-grid solutions in India, though is now looking to expand its work to other countries. The Charles Stewart Mott Foundation has elected to advance a comprehensive suite of strategies to build the enabling environment in Tanzania.

Because private philanthropy is largely targeted by sector or geography, there has been a dearth of funding, particularly within civil society, for larger field-building to help connect these efforts. While the philanthropic community does coordinate efforts on climate change through such initiatives as ClimateWorks and on Sustainable Development Goals through the SDG Philanthropy Platform, it has not coordinated as directly on energy access for the poor. As a result, there is no platform to ensure that important geographies and strategies have adequate philanthropic funding or that experience, lessons learned, and funding are leveraged as much as possible.

LEADING STRATEGIES AND INITIATIVES

A diverse set of civil society organizations from across these different sectors is advancing important work to create an environment where decentralized clean energy solutions can thrive.

Building Stronger Collaboration

As more initiatives and actors enter the energy access sector, there is a need for a collective vision for universal energy access and opportunities where investors, civil society organizations, entrepreneurs, and community leaders can learn from each other. A number of new initiatives hope to create space for greater coordination, enabling advocates to come together on a set of common goals and to better implement country action agendas. However, much of the work that has been done to date around increasing collaboration has been driven by multilateral organizations, and there is a strong need for greater collaboration within civil society.

Building Capacity for Strong In-Country Coordination

The importance of in-country coordination on electrification efforts cannot be overstated. In the developing world, little capacity exists at the national or subnational government levels for sound, sustainable energy planning, including expertise on how best to integrate large-scale grid infrastructure with decentralized solutions. Universities in these countries have not traditionally offered programs on state planning and large infrastructure development.

The impact of building government capacity for energy sector coordination is evidenced in the work of Infrastructure Development Company Limited (IDCOL) in Bangladesh. Since 2003, IDCOL has worked closely with the government and a number of multilateral and country donors to develop and focus the efforts of 47 partner organizations working toward energy access in off-grid rural areas. The program, which brings together financing, technical assistance, and training, has been acclaimed as one of the largest and the fastest-growing decentralized clean energy programs in the world. As of April 2014, the initiative has helped to install 3 million solar home systems, and 80,000 more are installed every month.

Rocky Mountain Institute, along with others, is applying aspects of the IDCOL model in Rwanda to ensure that there is strong collaboration among policy makers, NGOs, investors, and businesses to develop an enabling environment where distributed energy solutions can flourish. It also encourages communication among providers of decentralized solutions and those focused on grid extension to develop a cohesive energy plan for the country.

These extensive national coordination plans provide the greatest dividends in the long run, but the needed infrastructure takes years to build, requiring patience on the part of investors. It takes time to get a country's government ministries aligned, to build the technical and leadership capacity of those incountry who will own the effort, to get multilateral and country donors on the same page, and to get providers of diverse energy solutions working toward the same goal. It also requires considerable upfront research to ensure that the countries are ripe for this level of collaboration. In the end, however, when these efforts work well, they result in a strong policy and energy delivery infrastructure that meets the needs of all citizens, even the most impoverished.

Inspiring Global and National Action

Convened by the UN secretary general, SEforAll leads much of the work toward greater collaboration at the global level by promoting global action, convening a variety of sector leaders, sharing knowledge, and providing national planning support and accountability. SEforAll invites, negotiates, and publicizes commitments and action toward universal energy access objectives on the part of governments, the private sector, and multilateral institutions. By showcasing these commitments in the global arena, SEforAll hopes to mobilize even more commitments and action. To date, it has secured commitments from 106 countries (including 85 developing countries) and the European Union to advance the objectives on the country level.

SEforAll also facilitates the development of action plans for countries participating in its initiative. It provides tools and other support to help countries:

- Assess their energy needs and gaps in relation to development
- Develop strategy and action documents to address identified issues and gaps
- Develop investment prospectuses for implementable programs and projects that can be presented to potential private and public investors

SEforAll then tracks progress on country action plans through its accountability framework. This framework complements its Global Tracking Framework, which measures overall progress on the three objectives above.

Beyond its work shaping country commitment and action plans, assessing progress, and providing accountability, SEForAll is still building the infrastructure and capacity to work alongside countries to directly implement their plans. Depending on the leadership and implementation capacity in-country, some countries actively work toward their plans and regard them as a guide for national action; in other countries, important stakeholders and policy makers may not know of the plans' existence. Since its inception, civil society actors and community leaders have struggled to participate in SEforAll's planning processes; however, the coalition is making strides to ensure that development NGOs are part of its deliberations.

Convening and Providing an Information Clearinghouse

The United Nations Foundation's Energy Access Practitioner Network (part of SEforAll) hosts summits and webinars for practitioners to learn from one another about new delivery models, technologies, and approaches to overcoming market barriers related to policy and finance. It has also developed an extensive directory to showcase financing opportunities for potential investors. To advance these efforts, the decentralized energy sector needs to promote more regular engagement with investors,

philanthropists, and other civil society leaders to collaboratively determine how resources can most strategically be aligned and deployed.

Advocating for Supportive Policies at All Levels of Governance

A large-scale push at both the international and in-country levels is needed to build broad political will, foster favorable policy conditions for distributed energy solutions, and better link these efforts to the global sustainable development agenda. Clean energy advocates are advancing campaigns on multiple fronts (described below), though effective strategies vary significantly as each country—and in some cases localities—have different needs and challenges.

While advocacy efforts at all levels (global, regional, national, subnational) need additional support, the biggest gap in advocacy remains at the national and subnational levels where decision makers tend to be less knowledgeable about decentralized solutions and their potential impacts on development. Even in instances where national governments support distributed energy solutions, local implementation of those priorities can be spotty or even nonexistent given the time it takes for national priorities to trickle down to the local level.

New Coalitions Are Building Greater Public Will for Energy Access

Without civic support from a broad and mobilized base of constituents, efforts to realize universal access to energy will be hampered. Civil society and other community organizations have deep insight and understanding of the needs and challenges faced by the rural poor through their direct service work. Yet a 2015 survey of civil society experience in several countries carried out by the Catholic Agency for Overseas Development (CAFOD), Hivos, International Institute for Environment and Development (IIED), and Practical Action revealed that civil society voices often have trouble being heard in global deliberations on energy access. In that vein, two relatively new initiatives, Alliance of Civil Society Organisations for Clean Energy Access (ACCESS) and Power for All, have emerged to elevate the voice of civil society and push for more citizen engagement in energy policy decisions.

Power for All is a broad coalition of public and private organizations⁸ that are committed to accelerating the deployment of decentralized renewable energy in meeting the targets of SDG7. The campaign began its global advocacy work by primarily targeting multilaterals development agencies, hoping to draw greater attention and development finance to decentralized solutions. At the country level, Power for All is focused on evidence development, communications, and citizen-led advocacy to drive policy action. For example, the coalition is partnering with the Energy African program of the UK Department

⁸ Power for All's co-founders include Practical Action, SolarAid, Sierra Club, Global Off-Grid Lighting Association, Greenlight Planet, and Off Grid Electric. More than 75 partners from civil society, private sector, government, and the development finance community have joined the campaign efforts.

for International Development (DFID) to establish more favorable policy environments for distributed energy solutions in a dozen African countries with a current concentration on Rwanda, Sierra Leone, Nigeria, and Zimbabwe. The partnership focuses on:

- Raising awareness of and changing behavior to popularize distributed renewable energy
- Recruiting and educating African advocates, policy makers, and investors to promote sector growth
- Creating enabling conditions for market building

Early results are encouraging, although this campaign work will likely take a few years to realize the desired level of market transitions; the current funding will need to expand in order to sustain the efforts to help governments deepen stakeholder engagement, inform and influence finance decisions makers and create clear and transparent energy policies that will grow and sustain distributed energy solutions.

ACCESS was created in 2014 to advocate on behalf of people living in poverty for access to safe, reliable, and affordable energy. ACCESS includes several participating organizations: Practical Action, which works closely with public officials as well as CSOs; and Hivos, which implements decentralized energy projects and lobbies and advocates on behalf of the SEforAll process to develop strong country-level plans. As a fairly new organization ACCESS is working to develop its internal infrastructure. Its partners—led by World Wildlife Fund and World Resources Institute—just published a needed road map for multi-stakeholder engagement at the country level.⁹

Engaging Kenyan Citizens in Energy Policy and Solutions

As Kenya's government moves toward ambitious energy access goals, a variety of local and international organizations are making significant efforts to involve the public in energy policy and solutions through advocacy and awareness campaigns. These efforts have proved critical to maintaining momentum and building support for the government's goals.

Kenya is working to reach 100 percent energy access, derive 80 percent of its energy from renewable sources, generate 500 megawatts of electricity from solar energy sources by 2022, and reduce total energy intensity by 2.78 percent annually. These goals are meant to alleviate Kenya's extreme energy poverty—only 23 percent of the population had access to electricity in 2012, and in rural areas, only 7 percent had access. At the same time, more than 80 percent of Kenyans relied on firewood and coal as their primary energy source for cooking and heating.

The Pan-African Climate Justice Alliance—a coalition of more than 1,000 civil society organizations across 45 African countries dedicated to promoting pro-poor African development and to representing African interests in international climate change dialogues—is building the capacity of Kenyan member organizations to advocate for climate action. These organizations have taken out advertisements in the newspaper The Standard to raise consumer awareness of clean energy access. The impacts of these actions are still being assessed, but expert interviewees cited strong civil sector activity as integral to scaling clean energy solutions at the country level.

⁹ "Sustainable Energy Access Forums: Strengthening enabling environments through multi-stakeholder partnerships," World Wildlife Fund, 2016. http://assets.worldwildlife.org/publications/869/files/original/WWF-WRI_SEAF_Report_FINAL_2016.pdf?1460406309 ga=1.148829879.1432381393.1473446282.

Advocates Are Mobilizing Business Interests

The clean energy industry can be a powerful constituency, and several efforts are organizing corporations, including decentralized energy companies, multinational corporations, and small and medium-sized enterprises (SMEs), to lead clean energy efforts.

A handful of industry associations help to mobilize practitioners in support of effective policies. For example, Global Off-Grid Lighting Association (GOGLA) represents the needs of the clean energy entrepreneurs engaged in household lighting business and works with multilateral agencies. While it is effective at articulating what a sound national market policy looks like, it must partner with strong civil society actors to coordinate business advocacy efforts in-country, where its capacity is limited.

It can be challenging to organize access entrepreneurs who have their individual needs. The lack of a unified off-grid industry voice in many places leaves the public uninformed about new technologies and less likely to call on the governments to support them. The Power for All campaign—of which GOGLA is a founding member—seeks to address this challenge. And the Alliance for Rural Electrification is a global industry association working with businesses across the renewable energy access value chain, mobilizing its members to work with decision makers to craft effective policy frameworks.

Another organization, We Mean Business, is elevating the voices of corporate leaders as strong advocates for clean energy. We Mean Business is a coalition of influential businesses and investors such as Bank of America Merrill Lynch, IKEA, and Unilever that are working toward the transition to a low-carbon economy to secure sustainable economic growth and prosperity for all. By changing their energy consumption patterns and demands, these businesses can have enormous influence on the energy policies of the countries where they do business. This can lead to greater uptake of clean energy solutions in these countries and grow the market for those energy solutions. Beyond a broader appeal to climate resilient economies and communities, the campaign does not articulate a specific priority for energy distribution for the rural poor.

The Faith Community Is Advancing a Moral Call to Action

Several networks spanning many faiths and denominations have come together as strong advocates for both the Sustainable Development Goals and climate justice. For example, GreenFaith is helping build a coalition of faith-based institutions that are committed to the goal of ending energy poverty with clean energy and to elevating the faith voice in the multi-sector Power to the People campaign. CIDSE is a network of Catholic social justice organizations that advocate to ensure that global climate financial flows benefit those most affected by climate change. Similarly, CAFOD's One Climate, One World campaign demands that governments support the transition from polluting fossil fuels to sustainable energy for all, elevating Catholic voices to influence the Paris Agreement and international development aid financial flows. The Catholic Climate Covenant and World Council of Churches have both engaged in

negotiations over the Paris Agreement, advocating for those most affected by climate change and urging accountability to commitments made.

Christian faith groups are not alone in leading moral action on climate. In August 2015, Islamic leaders from 20 countries signed a declaration calling for an end to fossil fuels, writing that "excessive pollution from fossil fuels threatens to destroy the gifts bestowed on us by God, whom we know as Allah . . . what will future generations say of us, who leave them a degraded planet as our legacy?" Islamic Relief Worldwide has developed a tool kit to help organizations around the world support the Islamic Declaration on Global Climate Change and mobilize for climate justice in their communities. Similarly, the Bhumi Project seeks to offer a unified Hindu voice in response to critical environmental concerns. The Bhumi Project builds consumer awareness of solar solutions at Hindu festivals in India, reaching as many as 15 million people. It also works to position temples as examples of what good environmental stewardship should look like.

Finally, faith-based networks are using their extensive global reach to help parishioners and other organizations on the ground advance sustainability projects in their communities. The Big Church Switch is a partnership of Christian Aid and Tearfund to help churches and individual Christians of all denominations take advantage of their collective purchasing power and incentive programs to switch their energy supply from fossil fuels to renewable energy. And the Catholic Climate Covenant helps local parishes and other Catholic organizations to build "Creation Care" teams to help advance climate action locally, including creating more sustainable facilities.

While faith leaders can be powerful advocates and educators to their bases, potential challenges will need to be monitored closely. Efforts to bring clean energy into a particular community could be perceived as favoring one religious group over another. Also, some faith advocates push for subsidizing poor people's consumption of clean energy a tactic that makes clean energy industry advocates wary. For example, GOGLA expresses companies' concern that direct giveaways or drastically reduced prices can lead to a lack of willingness on the part of consumers to pay for their products. 10 This then reduces those companies' incentives to compete in those markets.

Advocates Are Educating and Mobilizing a New Generation of Citizens

The youthful demographics of many Global South countries point to the importance of educating and mobilizing a new generation of energy consumers and producers. In some African nations, more than half of the population is under the age of 25. CLEAN India—which grew out of the UN Foundation's Energy Practitioners Network—educates students and mobilizes them as advocates on multiple environmental issues. IIED and Hivos are educating a new generation of Tanzanians about distributed energy access. Their program

Laudable Goals, but Not Enough Action in India

India has set admirable renewable energy goals, but it doesn't have the policies in place that will create an environment conducive to achieving them. Additionally, state- and district-level officials are not as supportive of distributed solutions as the federal government and may be reluctant to pursue the national targets.

Under the leadership of Prime Minister Narendra Modi, India has taken steps to move toward renewable energy, including grid-connected and off-grid systems, in order to reach the 238 million Indians who lack access to energy and the 840 million Indians who use harmful solid biomass for cooking. By 2030, the government hopes to have reduced emission intensity per GDP unit to 35 percent of 2005 levels and to have 40 percent of electricity come from non–fossil fuel sources. It also hopes to bring solar power to every Indian home by 2019.

However, federal policy has not kept up. India levies a value-added tax (VAT), excise duties, and import tariffs on renewable energy products, significantly undermining the market incentive. India has not adequately adopted quality assurance standards, which allows poor-quality products to be imported into the country. The government has also been slow to respond to shifts in clean energy markets and technologies; for example, it only recently amended a subsidy program that had targeted compact fluorescent lights—a decade-old technology—to instead incentivize light-emitting diodes, a more efficient technology.

Experts cite a disconnect between national priorities and local action due to residual effects of the country's longstanding focus on conventional power grid expansion. State- and district-level policy makers may be reluctant to commit to decentralized expansion if they perceive it to be a new and untested technology. In addition, local officials may be missing opportunities to access federal funding to expand energy access. For example, a federal program offers funding to help generate employment opportunities in rural areas. Local officials could seek to access these funds to support projects to build mini power grids.

¹⁰ "GOGLA Industry Opinion Towards the Use of Public and Donor Funding in the Off-Grid Lighting Industry," GOGLA, accessed May 20, 2016, http://www.gogla.org/sites/www.gogla.org/files/recource_docs/gogla-industry-opinion-towards-the-use-of-public-and-donor-funding-in-the-off-grid-lighting-industry-adopted.pdf.

features energy safaris: five-day learning programs designed to explore the main challenges of energy access. The safaris bring together in-country software developers, engineers, entrepreneurs, political scientists, social scientists, and activists to work together on potential new solutions. The data on the impact of this pilot program have yet to emerge.

In fact, current programs for engaging young people in rural contexts are largely untested. CLEAN India focuses primarily on Delhi and urban concerns, and the applicability of its student advocacy model to rural communities where many young people need to work to support their families is unclear.

Advocates Are Demonstrating the Potential of Decentralized Solutions to Policy Makers

Successful pilots and effective in-country businesses can serve as powerful advocacy tools. Vasudha Foundation, Christian Aid, and Practical Action focus on showing, not just telling, local decision makers what good energy policy looks like and how distributed energy can be an economic driver. They highlight demonstration projects for decision makers, helping to tell the story of the impact of distributed energy projects. Power for All is also positioning strong leaders in the Global South to serve as advocates. At an energy access workshop in Zimbabwe, the Kenyan Embassy trade secretary was the keynote speaker, detailing the policy development that Kenya has implemented in its leading decentralized energy initiatives. These efforts are effective at making the case to policy makers but require substantial resources for project planning and implementation and for collecting compelling data.

Building Human Capacity

The decentralized energy sector can thrive only when there are more entrepreneurs who can develop business plans and access financing, effective management professionals who can take them to scale, and trained and qualified individuals to install and maintain energy systems in the rural villages that need them the most. Therefore, growing the decentralized sector and rural electrification rates in developing countries requires near-term investment in increasing technical and management capacity while also making long-term investments in building a trained workforce and cadre of leadership.

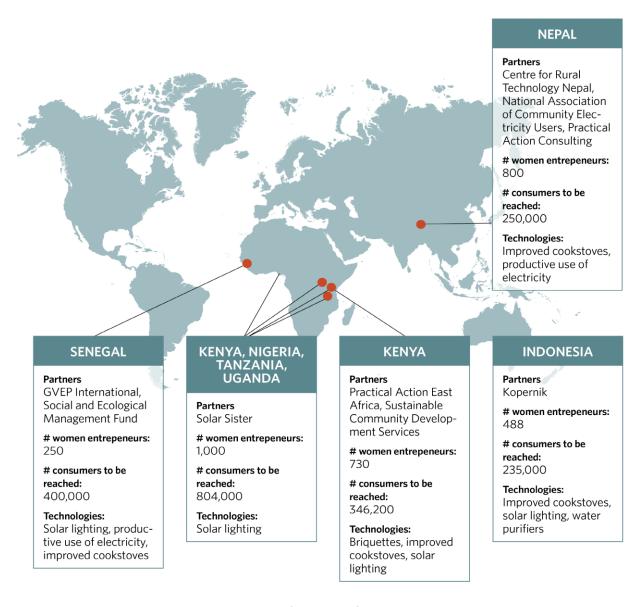
Scaling proven models for developing human capacity can be challenging due to limited funding for these types of programs. The need to tailor programs to their specific local contexts and ensure the sustainability of their business models also poses challenges to scaling efforts. A country or region's talent pool, educational infrastructure, entrepreneurial environment, patterns of recruitment, access to financial support and technical expertise, and cultural and gender dynamics all need to be considered in decisions to select and expand human capital programs.

Entrepreneurship Programs Are Training New Leaders in Clean Energy

Rural consumers will have more energy choices when there are more entrepreneurs to develop and distribute the solutions they need. The Women's Economic Empowerment (WE) Program of ENERGIA works alongside multiple NGOs, such as Solar Sister in Africa and South Asia, to provide training and support to micro-entrepreneurs on finance and distribution, business development, partnerships, marketing, and leadership, but its imprint is small given the size of its operation. This approach recognizes the crucial role that women, who are the primary energy consumers and are most affected by the available energy choices, can play in the scaling of clean energy solutions. Additionally, organizations such as Solar Sister make their entrepreneur support programs more culturally responsive by using Sisterhood meetings as the primary vehicle for that support. These meetings create a sense of community and provide a safe space, as women come together to share their challenges and successes as entrepreneurs.

While these efforts work toward making the clean energy industry more gender inclusive, the need is far greater than WE alone can meet, and the reach of WE's program is contingent upon determining how the approach works in different environments. Its current ambition is to empower 3,000 women entrepreneurs in the delivery of energy services, reaching more than 2 million consumers. That's a laudable goal, but still less than 2 percent of the population that is affected by energy poverty.

Figure 1. The WE Program's Current Footprint of Seven Countries



Source: ENERGIA

Incubators such as Energy4Impact or general entrepreneurship support organizations such as African Entrepreneur Collective and Unreasonable East Africa work with emerging entrepreneurs to build and refine business plans, access professional services and financing, and glean from the experiences and networks of more established business leaders. Energy4Impact also provides business, technical, financial, and operational support to a range to different companies, from start-ups to developed midsized companies. Prizes such as the Ashden Awards select leading sustainable energy entrepreneurs and organizations each year. Awardees receive business, technical, and financial advice from a range of

partners. Awardees' recognition and selection as Ashden recipients have often catalyzed their growth. Another initiative, Embark, is attempting to expand its reach by offering online tools for business plan development for those who cannot take advantage of its intensive coaching support. It is not clear, however, how effective the online component is as a replacement for individualized coaching assistance.

In addition, Unreasonable East Africa provides emerging entrepreneurs with an intensive, five-week training program that includes mentorship and introductions to funders. Its ability to serve multiple entities through intensive trainings as opposed to one-on-one coaching support may also help expand the program's reach. The opportunity to participate in the Unreasonable network on an ongoing basis after the training also helps ensure that trainees retain the program's takeaways over time.

These support organizations are playing a critical role in coaching and building a cadre of in-country entrepreneurs, but scale is limited due to the time it takes to identify and fully support effective ventures. And Embark and the Ashden Awards are among the few entrepreneurial support organizations that focus specifically on clean energy enterprises.

Management Programs Are Training the Professionals Needed to Scale Growing Businesses

Companies and initiatives need leaders who can effectively manage and scale distributed energy enterprises. Strong management talent also better positions energy access entrepreneurs to qualify for financing that will help grow their companies. But entrepreneurs often have a hard time finding candidates with the right skills, given the complexity of recruiting across diverse markets, cultures, and educational systems. One organization, Shortlist Professionals, addresses this recruiting challenge by helping entrepreneurs execute efficient and effective searches for talent in the distributed energy and other nontraditional industries. By designing specialized assessments and taking advantage of digital search tools, the organization is able to identify and test for the most critical job skills among pools of applicants.

Despite these efforts, energy access businesses will succeed over the long term only if there is a strong leadership pipeline, which also presents a huge opportunity for innovation. While the energy access sector lacks a talent development program, it can look to the public health sector for an example. Global Health Corps encourages young professionals to serve in a variety of capacities to reduce disparities in health outcomes and access. The organization provides paid fellowships for promising potential leaders from diverse backgrounds and recruits a spectrum of organizations, ranging from small grassroots organizations to large global institutions, to provide meaningful work experiences. It also fosters crosscultural partnership by pairing international and in-country fellows in work teams and invests in ongoing training and professional development for fellows. In this way, it is creating a core of young advocates who will eventually become seasoned professionals working toward health equity through various career paths.

Technical Training Programs Are Working to Build a Skilled Workforce

Distributed energy businesses also need skilled installers and other technical experts to grow, and technical enterprise-led training academies and national technical and vocational education programs are trying to fill the gap.

Some academies such as Solektra Academy in Mali are bricks-and-mortar institutions that supply best-in-class experts from around the world to develop and deliver curricula on renewable energy for trainees from different parts of Africa. Larger companies such as Off Grid Electric are creating their own academies to develop a steady pipeline of talent. Other institutes such as AnthroPower send trainers to various locations in-country. AnthroPower is also developing online learning modules and content for trainees that entrepreneurs purchase for training in their companies. It also deploys a train-the-trainer model to have more reach, particularly throughout the Indian subcontinent. Some training academies target impoverished women as part of larger gender empowerment and equity objectives.

Another initiative, Barefoot College, provides older women with stable incomes as solar engineers. It works with village elders in a number of Global South countries to identify older, uneducated women to come to its training base in Tilonia, India, to learn about solar technology. The college uses sign language and numerically arranged color codes to help trainees remember the permutation and combination of the wires without needing to read or write. The women then return to their countries as qualified solar engineers.

While these training institutes and programs are devising effective methods for bringing much-needed technical skills to developing countries, and in some cases to disenfranchised populations, the different models face specific scaling challenges. Bricks-and-mortar institutions are capital-intensive. It may be difficult to recruit trainees from other countries, and in the long run, these institutions may determine their economic model works best when they focus on middle-class trainees with a greater ability to pay. The Barefoot model is also expensive given the need to negotiate the selection of participants from the 77 countries it serves and to arrange for their travel to a remote location in India. It also would require significant resources to ensure that the knowledge and skills of the trainees remain up to date and that their livelihoods are secure when they return home. While AnthroPower has a substantial presence in India, its instructional design and delivery would need to be customized for other country contexts. Finally, while all of these programs offer essential and practical technical training for clean energy solutions, they are touching only a small fraction of the potential workforce because the training does not involve larger national education systems.

National TVET programs are more sustainable because they are embedded in government education programming at the secondary, upper, and postsecondary levels, and reach more students. As a consequence, they can do more to substantially increase the clean energy workforce in a given country.

This is an advantage given the relative youth of the populations affected by energy poverty. Senegal and Ethiopia stand out as strong vocational education examples. Senegal conducted a needs analysis and developed a TVET through a public-private partnership to integrate traditional apprenticeships into national training policy. Ethiopia offers a demand-driven, flexible, participatory approach to building its TVET and involves all stakeholders in the planning, policy-making, training delivery, monitoring, and evaluation of the system. 2

While reforming national education agendas is needed to promote energy planning and other important technical expertise needed to advance the Sustainable Development Goals, this is a slow and arduous process. For the most part, national TVET programs tend to be ineffective in providing practical training on energy solutions applicable to rural contexts as they lack expert trainers and training resources in remote areas. Revamping national educational programs to incorporate training on offgrid energy solutions also requires coordination across multiple ministries (e.g., education, energy, labor, etc.) to introduce new curricula and certifications, which can become quite bureaucratic.

A Holistic Approach to Energy Access in Tanzania

The Tanzanian government is tackling energy poverty from multiple angles—favorable policies, private sector support, human capital development—making it more likely to achieve the country's ambitious energy access goals. Tanzania aims to achieve 75 percent energy access by 2033. It is working to address staggering energy poverty: 85 percent of national energy consumption comes from firewood and charcoal, and per capita electricity consumption is 100 kilowatt hours, a fraction of the target 500 kilowatt hours typically associated with an adequate quality of life.

To help promote and scale clean energy solutions, Tanzania provides subsidies and matching grants to private sector companies to make it more affordable for them to provide clean energy products and services. It also supports awareness-building campaigns and demonstrations on the use of solar energy in domestic and commercial settings, and it supports the installation of new technologies in public institutions. The government eliminated its value-added tax and import tax on main solar components (panels, batteries, inverters, and regulators), allowing end users to obtain the technology an affordable price.

The government's Rural Energy Agency also accesses capital from the National Microfinance Bank and Stanbic Bank Tanzania to provide off-grid solar electricity for rural households and public facilities for members of agricultural producer associations (e.g., coffee, tea, and cashew producer associations). And new vocational centers provide technical training on designing, installing, maintaining, and repairing solar energy systems. With support from the United Nations Development Programme and the Swedish International Development Cooperation Agency, Tanzania provides business development services to solar companies in 16 regions. The Rural Energy Agency also administers a competitive grant program for private enterprises that are developing and delivering modern solar lighting products for rural households, businesses, schools, and clinics.

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¹¹ Vocational Training for Renewable Energy, Africa EU Renewable Energy Cooperation Programme.

¹² Ibid.

Volunteer Programs Are Providing Short-term Labor and Expertise

Volunteer-driven programs can mobilize individuals, congregations, and schools to provide labor and resources to help install solar and other renewable energy projects in rural villages and can help provide early capacity to advance existing solutions quickly. The programs can complement and be integrated into larger efforts to build in-country installation and technical capacity if they provide local residents with an opportunity to work alongside volunteers, building their skills. They also increase volunteers' awareness of energy poverty, which in turn helps these volunteers become informed advocates and spokespeople on this issue.

Models such as Grid Alternatives focus on educating volunteers on energy poverty and lean heavily on local organizations to advise volunteers on the cultural context so that they do not jeopardize the project's success by offending the people and organizations they seek to help. The organization team's volunteers with trained technicians on residential and community installation projects in villages. Grid Alternatives' volunteers are mostly from the United States and pay for the experience, which in turn funds supplies and equipment for projects and the services of local, trained experts. The organization also builds in-country technical capacity by making a small number of volunteer slots available to local women for training purposes.

Models such as Engineers Without Borders select community projects (including clean energy projects) from requests made by local CSOs in developing countries. It will take on projects only when it is clear that there is capacity within the community to own and maintain the project after the installation by its expert engineers is complete. Comparable programs from other fields such as Habitat for Humanity pair the services of volunteers with in-country workers who will directly benefit from the project and are willing to provide their own labor to complete it.

As helpful as volunteer solutions are to providing short-term capacity, there are limitations. The need to ensure that volunteers are properly trained on cultural context and that community institutions can maintain solutions once they are installed means that these programs need to be designed specifically for each country. Developers of these programs caution against expanding too quickly as it is critical to get the maintenance planning right. Also, it is tricky to ensure that the right set of technical, labor, and financial resources is in place to launch these projects expeditiously. Models need to ensure that a critical mass of external volunteers is available to serve a particular project at a given time. Grid Alternatives does that by targeting corporations and other groups such as congregations that can provide sufficient labor resources. Financial sustainability can also be a problem for models dependent upon philanthropy such as Habitat for Humanity.

Accelerating Finance for Clean Energy Access

Decentralized clean energy companies and projects need a significant infusion of capital in order to scale to serve the 1.1 billion people who live without access to energy. Fortunately, removing barriers to financing has emerged as a top priority for many civil society advocates, who are launching new investment products that offer varying rates of return, aimed at both seeding innovation and scaling effective business models. Investors with a range of degrees of risk tolerance and return needs have opportunities to invest in clean energy access. However, the investment vehicles that exist today are not sufficient to reach the goal of universal energy access. Large-scale clean energy projects can offer compelling returns, but they will not reach the rural poor.

Thanks to significant research and piloting by Practical Action, the Miller Center for Social Entrepreneurship, the Rockefeller Foundation, the Bertha Centre for Social Innovation and Entrepreneurship, SEforAll, and others, the sector is learning more every day about effective financing mechanisms and what types of capital and support emerging businesses need across their life cycle. In addition, new financing vehicles and products are emerging regularly, and early investors are helping to prove that decentralized energy companies can be bankable and achieve growth. However, the reach of existing investment vehicles is limited, and they remain focused on distinct technologies, segments of the value chain, or stages of growth.

Going forward, the sector is going to need exponentially more capital, and entrepreneurs need to be able to find the right kinds of financing at the right time—particularly seed and working capital. Early grants and investment can have an outsized impact in unlocking the capital needed to end energy poverty by 2030. The following highlights important efforts to bridge the financing gap.

Risk-tolerant Investors Are Providing Catalytic Capital

Emerging sectors such as the energy access sector require a set of investors that are willing to be the first in the space and demonstrate to other investors that the sector is bankable. These first-mover investors in effect catalyze other investment by showing proof of concept. In particular, these activities have the potential to encourage domestic banks to provide more debt financing to the sector, which would fill a significant gap. Some illustrative examples include:

- Deutsche Bank has been providing working capital loans to microfinance institutions for nearly
 two decades, and it has begun to make loans to pay-as-you-go (PAYG) energy enterprises. Both
 microfinance and off-grid PAYG models operate through consumer financing that reflects the
 nature of in-country cash flows. Deutsche Bank also lends to small-scale clean energy
 distributors.
- Doen Foundation offers subsidies, equity investments, loans, and guarantees to initiatives in Africa and Southeast Asia that enable consumers to generate energy themselves.

- Shell Foundation¹³ has been deploying debt and equity into companies providing solar lighting, biogas, biomass gasification, and low-cost energy products for more than a decade. Its model is to support pioneering models, help build market-enablers, and direct capital to underserved enterprises. Other seed investors could replicate Shell's model. Its investees should be able to demonstrate creditworthiness within one to three years.
- The Overseas Private Investment Corporation's Portfolio for Impact program supports
 renewable energy businesses in Africa and Asia with loans ranging from \$2 million to \$5 million.
 The program primarily funds small enterprises that face challenges accessing debt finance from
 traditional sources and that present a strong need for capital in order to reach a commercially
 sustainable scale.

Providing catalytic capital is the first step toward scaling financing, but businesses will require growth capital as well. For the financing for clean energy access to grow, commercial banks and in-country banks will need financial guarantees to minimize their risk, and local lenders will need to be educated about and trained on how to prioritize distributed energy as an investment opportunity.

Specialized Funds Provide Capital at Distinct Stages of Company Growth

Emerging funds tend to focus on distinct stages of business development for decentralized energy providers. Decentralized clean energy companies with different models and at different stages of project and enterprise development have different financing needs, as depicted in Figure 2.¹⁴

¹³ http://www.shellfoundation.org/Our-News/Reports-Archive/Latest-Shell-Foundation-Reports/Accelerating-Access-to-Energy.

¹⁴ "From Gap to Opportunity: Business Models for Scaling Up Energy Access," International Finance Corporation, accessed May 20, 2016,

http://www.ifc.org/wps/wcm/connect/ca9c22004b5d0f098d82cfbbd578891b/EnergyAccessReport.pdf?MOD=AJP ERES.

■ Commercial funds Investors must address the "missing middle" funding needs of the sector Concessional funds between \$50,000-\$100,000 and \$3 million-\$5 million. Maturity Business Model Development The provision of mezzanine financing can enable banks to lend to projects that would not otherwise get debt financing due to high risk. Break-even Technology/Business model advancement Grant funding Carbon prefinanc-Working capital at Grant funding ■ Both concessional and can support can help scale commercial debt and ing has potential to commercial rates is start-ups and replicate equity are required to generate additional required throughout and build an promising finance the start-up and revenue for both the business cycle. investment business models, growth capital needs of cookstoves and Double bottom line pipeline. possibly through early-stage energy access some mini-grids, and commercial incubators or by businesses. and more strucinvestors could offer testing hightured approaches trade finance to ■ Donors can fund potential could help make it groups of companies expensive R&D that business models. more accessible. in the same or related shows sectorwide energy access spaces. promise.

Figure 2. Stages of SME Development and Accompanying Financial Needs¹⁵

Source: International Finance Corporation

Several funds are providing capital to distinct segments of the market, including:

- Off-Grid Renewable Energy Note is a debt vehicle for which Developing World Markets (DWM) is raising funds. The Off-Grid Renewable Energy Note will lend to financial institutions and off-grid operating companies, primarily in East Africa and India. DWM has secured \$25 million of its target fund goal of \$35 million to \$65 million from an anchor investor, the Church Pension Fund. This targeted investment pool aims to leverage faith-based investors to attract more finance-first, commercial capital investors.
- KawiSafi Ventures Fund is a \$100 million impact fund that was launched in 2015 and will provide early- and growth-stage capital for scaling enterprises across the off-grid energy value chain in East Africa. The fund focuses on Rwanda and Kenya, where more than 70 percent of the population does not have access to grid power and yet over 70 percent of people have access to

¹⁵ "From Gap to Opportunity: Business Models for Scaling Up Energy Access," International Finance Corporation, accessed May 20, 2016,

http://www.ifc.org/wps/wcm/connect/ca9c22004b5d0f098d82cfbbd578891b/EnergyAccessReport.pdf?MOD=AJP ERES.

mobile phones. KawiSafi will invest in 10 to 15 portfolio companies providing small and large solar home systems, direct current appliances and electric transport, solar solutions for SMEs, and mini-grids. The fund offers equity, convertible debt, and equity-linked debt. The typical investment size is \$2 million to \$10 million, and the target holding period is five to seven years. In addition, the fund reserves \$10 million for smaller investments into early-stage companies with highly innovative products or services.

- African Renewable Energy Fund (AREF), launched in 2014, is a \$200 million fund that will invest in small- to medium-scale independent power producers. The fund targets small hydro, wind, geothermal, solar, stranded gas, and biomass projects, with an investment range of \$10 million to \$30 million. The fund's lead sponsors include the African Development Bank and the Sustainable Energy Fund for Africa.
- **SunFunder** is a solar finance business that aggregates capital through its Solar Empowerment Fund, a private debt offering that gives investors an opportunity to invest in a diversified portfolio of off-grid and grid deficit projects. While in its early stages, SunFunder has invested nearly \$13 million in projects affecting 555,000 people.
- Green Climate Fund is a multilateral financing entity created by the United Nations Framework
 Convention on Climate Change in 2010. It funds low-emission and climate-resilient projects and
 programs in developing countries using a variety of financial instruments, including grants,
 concessional loans, subordinated debt, equity, and guarantees. GCF aims to allocate 50 percent
 of its resources for particularly vulnerable countries, including Least Developed Countries, Small
 Island Developing States, and African States.

The presence of these funds is a boost to the sector, but many decentralized clean energy entrepreneurs find this financing inaccessible because of their stringent underwriting requirements. For example, the project approval process of the Green Climate Fund, one of the largest specialized funds investing in clean energy, consists of at least seven stages and requires consensus from a 24-country board. This process may take up to six months or more to close, which poses a challenge for smaller projects and enterprises that need more flexible funding. The GCF invests only in intermediaries, not directly in projects or enterprises. And the process of becoming a certified intermediary is cumbersome.

Technical Assistance is Helping New Enterprises Attract Financing

Recognizing a need to help very new enterprises get off the ground, some organizations are working to provide technical assistance and mentorship to off-grid clean energy companies. Rockefeller Foundation's Smart Power for Rural Development initiative provides small-scale energy-service companies that are focusing on mini-grids in India with assistance on business modeling, structuring terms of financing, and contracting with technology and equipment providers. Greater access to seed

capital will help to make these technical assistance initiatives even more effective in launching new energy enterprises.

Investors Look to Better Understand Financing Needs and Impact

Investors, policy makers, entrepreneurs, and other clean energy proponents need a better understanding of where existing finance is going and the impact of clean energy provision in order to develop the most effective investments. A number of global initiatives are hoping to develop more standardized, real-time data on financing flows and what investment is most needed. Power for All and other partners are developing a framework to help decision makers understand the many social and environmental opportunity costs that occur due to the delayed energy access. The median time it takes to bring large-scale energy infrastructure to the rural poor is nine years, while decentralized solutions can be deployed in months. There is little quantitative evidence that details the economic, health, and gender impacts of energy access, which varies significantly based on geographic context and the level of service delivered. Experience has shown that simply providing higher levels of energy access will not necessarily drive more development, and thus funds may be better spent providing lower-level, decentralized solutions that would offer the same or greater benefits. Power for All seeks to quantify this opportunity cost and develop improved energy planning tools for policy makers and practitioners to make more targeted investments that will offer the highest benefits for development at the lowest cost.

Other organizations are helping to highlight high-potential, near-term opportunities for investment. The UN Foundation's 2,000-plus-member Energy Access Practitioner Network maintains a database of more than 200 investment opportunities, totaling more than \$1.3 billion, profiling businesses in need of capital. The database is searchable by financing needs, geography, type of work, and products and services. And SEforAll is launching a multiphase effort to develop a consistent, comprehensive, and transparent inventory of capital flows and to develop a deeper understanding of financing needs within defined markets.

CHALLENGES TO ENDING ENERGY POVERTY

As the decentralized energy market matures, it will need to develop more financially sustainable models for reaching a higher standard of rural electrification that includes clean energy that supports livelihoods and public services (such as schools and hospitals). And while energy access is a global problem, end users and their local context and culture determine what energy delivery models work best in a given environment. The financing, policy, and human capital solutions that best support those delivery models also need to be locally and culturally responsive.

While civil society organizations are advancing important work to address these challenges, the sector lacks the collaborative mechanisms to get to scale quickly. As new investors and actors enter this space, there is a critical need for a community of practice where civil society leaders can collaborate to advance a coherent and comprehensive agenda.

The following section offers a critical analysis of structural barriers hindering the growth of decentralized clean energy market, as well as significant gaps and challenges in the landscape of civil society efforts to address them.

Structural Market Barriers Inhibiting Growth

While innovative business models exist for delivering distributed clean energy, their growth is hindered by structural market barriers, including policies that restrict growth, a lack of human capacity needed to launch and scale effective businesses, and a lack of affordable, accessible capital. These challenges are not unlike those that any small business faces; however, they become more pronounced when working in remote, rural areas. Significant local capacity is needed to help provide the level of energy services required to help lift families out of poverty.

While exact market conditions vary by country, several common obstacles need to be addressed before promising businesses can grow.

Policy Obstacles

Multinational agency and national energy agendas remain largely focused on advancing grid-scale infrastructure, which is needed but on its own unlikely to reach rural areas where grid extension is not feasible or affordable. Some national and subnational policy makers may have little to no knowledge about distributed solutions while others may have knowledge but not the political will to support the policies that would be optimal for creating a strong market for those solutions. BRIC countries like India (the other emerging BRIC economies are Brazil, Russia, and China) have ambitious economic development goals, and some policy makers in those nations are dubious about the ability of

decentralized energy access solutions to help them to reach those goals quickly. When countries do not include decentralized renewable energy into their national electrification plans and policies, these options are not considered viable and lenders are less likely to support them. Three common obstacles that providers repeatedly encounter are pressures on affordability, lack of quality control measures, and threats to their overall operating stability.

Pressures on Affordability

Decentralized companies rarely benefit from subsidies, while fossil fuel companies received \$490 billion in public subsidies in 2014. At the same time, GOGLA reports that VAT rates and tariffs on solar products in many parts of the developing world significantly inflate the costs to end users, constituting as much as 40 percent of the retail price. This makes these solutions less affordable and accessible to the consumers who can most benefit from them.

Lack of Quality Control Measures

Government failure to implement quality assurance measures in some markets makes it easy for inferior decentralized products to enter those markets, giving customers a negative perception about clean energy solutions, and that in turn hampers industry growth. National governments need trained regulators to be able to enforce strong licensing requirements and maintain import offices.

Threats to Operating Stability

Unfortunately, many of the countries facing energy poverty also deal with broader issues of political instability and corruption that can thwart development agendas and jeopardize the operating conditions for clean energy companies. Also, policy makers at the national and subnational levels are not always transparent about grid expansion plans, which makes it difficult for entrepreneurs proposing off-grid solutions to formulate growth plans for their ventures, as they do not want to enter rural markets where grid expansion is likely.

Consumer and Policy Maker Awareness

Decentralized solutions continue to be hampered by a general lack of awareness. Government officials and regulators often do not understand the role that decentralized energy can play in meeting energy access goals, and what the greatest policy needs are. Local lenders lack the understanding they need to feel confident in investing in decentralized businesses. And consumers are either unaware that decentralized options exist, or are unsure of their reliability.

¹⁶ "World Energy Outlook 2015 Factsheet," International Energy Association, accessed May 20, 2016, http://www.worldenergyoutlook.org/media/weowebsite/2015/WEO2015 Factsheets.pdf.

¹⁷ "GOGLA Opinion on VAT and Import Duty Settings for Off-Grid Lighting Products and Solar Home Systems," GOGLA, accessed May 20, 2016, http://www.gogla.org/sites/www.gogla.org/files/recource_docs/gogla-industry-opinion-on-vat-and-import-duty-settings-for-off-grid-lighting-products-and-solar-home-systems-adopted.pdf.

Human Capital Obstacles

The need for more knowledge, skills, and talent in all aspects of clean energy production and distribution remains one of the most significant barriers to developing and scaling effective decentralized clean energy businesses. Many of the early-stage entrepreneurs in this sector are expatriates from North America and Europe, and there has not been enough investment in cultivating leadership locally. In-country entrepreneurs struggle to find coaching support and funding for developing and implementing their business plans. As a result, there are not many local companies in developing countries to provide consumers with enough decentralized energy choices and solutions. The companies that do exist in those countries find it hard to grow because they lack the management talent to operate at scale. Companies struggle to assess the skills and capabilities of the labor pools in their markets, and there are not many public or private programs to help increase the overall pipeline of leadership and management talent for the sector. Companies also face a dearth of skilled labor for installation and maintenance, hampering delivery to consumers.

Investment Obstacles

An overall lack of predictable and affordable forms of capital and steep barriers to accessing and deploying existing financing hinder the decentralized energy market from further innovation and growth. SEforAll estimates¹⁸ that it will take \$49 billion of investment annually to end energy poverty through 2030.¹⁹ While the International Energy Agency reports that energy access receives \$9 billion in public investment per year,²⁰ of this \$9 billion, decentralized clean companies received just 2 percent,²¹ or \$200 million, in 2015.

"The lack of working capital has been the focus of just about every industry meeting in the past few years."

—Donn Tice, clean energy entrepreneur and investor

This wide gap in available financing for decentralized energy companies risks leaving the rural poor behind. Decentralized companies working to serve the rural poor lack the capital they need to build operating capacity and gain traction in the market. Additionally, the relatively small amount of capital that is available to decentralized energy entrepreneurs does not always align with their needs.

¹⁸ "Scaling up finance for sustainable energy investments," Report of the SE4All Advisory Board's Finance Committee, 2015, http://www.se4all.org/sites/default/files/SE4All-Advisory-Board-Finance-Committee-Report.pdf.

¹⁹ Note that the annual investment needs vary significantly depending upon the level of energy services provided. Based on SEforAll's "Multi-Tier Framework," the World Bank estimates the cost of providing the lowest level of energy (e.g., lanterns) is \$1 billion per year, while the highest level of access is \$40 billion per year.

²⁰ Stewart Craine, Evan Mills, and Justin Guay, "Clean Energy Services for All: Financing Universal Electrification," Sierra Club, June 2014.

²¹ Green Tech Media: http://www.greentechmedia.com/articles/read/off-grid-electric-raises-45m-in-debt-for-african-micro-solar-leasing-platf.

Greatest Capital Needs

Although the decentralized energy sector will need an increase in all types of investment—including venture capital, private equity, working capital, and grants—two especially acute stages of development are in need of finance: emerging entrepreneurs and early-stage businesses, and small and medium-sized enterprises. Emerging entrepreneurs and early-stage businesses in the off-grid clean energy sector need larger flows of seed capital than they are currently receiving. Start-up off-grid energy companies require large amounts of up-front investment to fund production or purchase equipment and inventory, as well as funding to cover start-up legal, accounting, and staffing costs. Investment is required far in advance of securing the first customer and well before receiving payment for goods and services—particularly for companies with a fee-for-service model or those operating at the top of the supply chain as a manufacturer or wholesaler. At the same time, the average entrepreneur based in a country with a high need for off-grid energy typically lacks a sufficiently wealthy network of friends and family to provide seed financing in the form of gifts, loans, or equity.

Consumer Finance-Grants/Credit Enhancements Early-Stage Replication Market **Business** Working Growth Proof of and Plan Capital Capital Assessment Concept Scale **Capacity Building-Grants** Grants Short-Term Equity Equity Grants "Sweat" Equity Debt Long-Term Grants Debt **Equity Debt** Debt Risk Mitigants Risk Mitigants Debt

Figure 3. Energy Enterprise Development and Finance Continuum²²

Source: SEforAll's Advisory Board Finance Committee

Decentralized companies that have operated for a short time (one to three years) need access to debt financing to cover working capital needs and provide lines of credit in order to scale their businesses. These enterprises often encounter difficulty in funding day-to-day operations due to the large gap in time between purchasing inputs (e.g., solar lamps, home systems, and appliances) and covering the cost of goods and services sold, and collecting receivables. In addition, decentralized energy companies

²² "Scaling up finance for sustainable energy investments," Report of the SE4All Advisory Board's Finance Committee, 2015. http://www.se4all.org/sites/default/files/SE4All-Advisory-Board-Finance-Committee-Report.pdf.

employing a PAYG model must have a high enough cash flow to compensate for small and infrequent payments for services from poor and remote customers. The need for working capital and lines of credit should be met by adequate debt financing from local commercial financiers and mainstream capital markets. Decentralized energy companies, however, are typically unsuccessful in securing domestic debt due to the perception of risk, minimal track record, lack of interest by local financial institutions, and other barriers. Further, start-up and local businesses tend to lack the visibility that can attract financing from developed markets.

Barriers to Deploying Capital for Decentralized Solutions

While investor interest in clean energy access continues to grow, any number of hurdles can make it too costly and risky to invest in decentralized solutions. There is a comprehensive body of literature on financing barriers, which vary significantly by country, technology, and other factors. Decentralized energy practitioners cite the following as recurring challenges:²³

- **Risk profile:** Commercial and public lenders often assume that decentralized energy providers bear an unacceptably high investment risk because they service poor and remote populations (who are perceived as less able to reliably pay for products and services), and because they may use new energy technologies that are not yet widely adopted or proven.
- Minimal track record: Most decentralized companies lack an established record of realized
 profits because they are still in an early stage and need more time to prove their business
 models. Because they serve poor populations, their models must allow for consumer
 repayment over long periods of time and may require more time to break even.
- Small deal size: Decentralized energy projects that operate on a small or medium scale often have capital needs that are relatively small but bear high transaction costs for underwriting and conducting diligence. As a result, commercial investors do not want to invest in them or will charge prohibitively high interest rates to do so.
- Contract enforcement: Some countries have weak practices—or no practices—that provide
 private investors the comfort of doing business in-country. For example, a lack of contract
 enforcement and precedent to collect on collateralized assets deters investors from placing
 capital.
- **Unreliability of exit strategy:** As the decentralized clean energy industry is still in early stages, there have been few exits or acquisitions that illustrate a reliable and assured exit strategy for equity investors.
- Irregular cash flows: Businesses operating in developing countries tend to experience irregular collection of payments as well as seasonal variations that result in unstable cash flows, which may affect repayment ability. Investors that are unwilling to be flexible in their repayment schedule requirements are unlikely to find suitable investees.

²³ "Policies to Spur Energy Access: Volume 1," National Renewable Energy Laboratory, accessed May 20, 2016, http://www.nrel.gov/docs/fy15osti/64460-1.pdf.

- Lack of familiarity with technologies and business models: In-country financial institutions have limited familiarity with new technologies and distributed energy models. As a result, their financing offerings are not responsive to the decentralized sector's needs. Debt financing often includes requirements for collateral of physical assets. In countries such as India, decentralized energy assets and inventory are not generally accepted because there is not yet a secondary market for off-grid clean energy inventory, equipment, and plant utilities, and therefore these assets are illiquid.²⁴ Investors that are unwilling to accept such assets as collateral or accept other forms of collateral to mitigate the credit risk are unwilling to lend to these organizations.
- Currency volatility: When placing capital in a foreign country, investors are exposed to the risk
 of fluctuating currency—the change in foreign exchange rates that affects the value of
 investment at the time of conversion. Although investors can typically hedge against this risk,
 countries lacking energy access tend to be most susceptible to high levels of currency risk and
 create an additional barrier to investing in energy access.
- **Absorption capacity:** The capacity of government and the private sector to use funding remains a challenge. Only 68 percent of public funding from donor countries was delivered between 2005 and 2011.

Challenges in the Civil Society Landscape

The reach of existing initiatives to expand clean energy access is limited in scope and scale in part because the field remains fragmented across sector and geographic lines. Energy access is by its nature interdisciplinary, spanning a range of issues from climate and energy and development to agriculture and gender equity. Within these sectors is a diverse range of actors—multilateral and regional banks and institutions, national governments, NGOs, philanthropies, corporate interests—promoting related, but often disparate, goals.

Decentralized Energy Solutions Need to Go Beyond the Lightbulb

To reap the full development and climate benefits of energy access and reach the sustainable development goal of universal energy access by 2030, the marketplace will increasingly need to provide a higher level of basic community energy needs. Several common measures animate energy access goals:

Household access to a minimum level of electricity²⁵

²⁴ "The Business Case for Off-Grid Energy in India," The Climate Group, accessed May 20, 2016, http://www.theclimategroup.org/assets/files/The-business-case-for-offgrid-energy-in-India.pdf.

²⁵ As per the IEA, the initial threshold level of electricity consumption for rural households is assumed to be 250 kilowatt-hours (kWh) per year, and for urban households it is 500 kWh per year. The higher consumption assumed in urban areas reflects specific urban consumption patterns. Both are calculated based on an assumption of five people per household. In rural areas, this level of consumption could, for example, provide for the use of a floor fan, a mobile telephone, and two compact fluorescent light bulbs for about five hours per day. In urban areas,

- Household access to safe and sustainable cooking and heating fuels and stoves
- Access to modern energy that enables productive economic activity, such as mechanical power for agriculture, textile, and other industries
- Access to modern energy for public services, such as health facilities, schools, and street lighting²⁶

The sector has historically hampered by a lack of consensus on what constitutes energy access, and significant debate remains about what level of clean energy provision can best reconcile human rights, economic development, and climate goals. For example, the Sierra Club outlines a road map to energy access that projects that a currently energy poor consumer will use 0.15 percent of the energy the average Californian would consume each year. At the same time, international energy experts predict the developing world will follow similar consumption patterns as the West. The Center for Global Development's Energy Access Targets Working Group, comprising 24 sector experts, argues that the current definition of modern energy access—100 kWh per person per year—"is insufficient and presents an ambition gap with profound implications for human welfare and national economic growth." This basic lack of agreement on what constitutes energy access has stymied effective policy action needed to build and enable more comprehensive clean energy solutions, while the energy poor still wait.

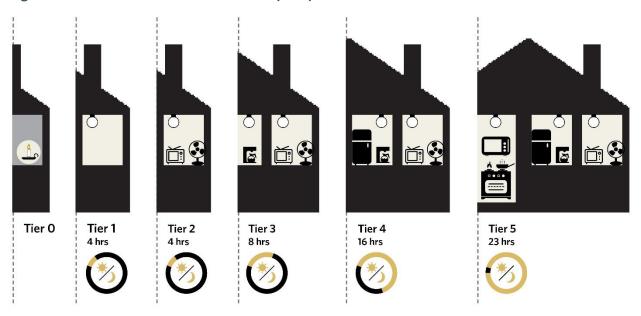
SEforAll has sought to resolve this challenge with its Multi-Tier Framework (MTF), which evaluates different levels of electricity and modern cooking solutions to offer a holistic approach to measuring and assessing energy services. The MTF measures the quality of energy services received by a household across a tiered spectrum: from Tier 0 (no access) to Tier 5 (the highest level of access). This more nuanced assessment of energy access recognizes that services fall on a continuum of improvements and will enable policy makers to make more targeted investments. Using the MTF also allows for a more granular assessment of the cost of delivering clean energy services to the energy poor, ranging anywhere from \$2 billion to \$55 billion annually.²⁷

consumption might also include an efficient refrigerator, a second mobile telephone per household, and another appliance, such as a small television or a computer.

 [&]quot;Defining and modelling energy access," International Energy Agency, accessed May 20, 2016,
 http://www.worldenergyoutlook.org/resources/energydevelopment/definingandmodellingenergyaccess/.
 "Scaling up finance for sustainable energy investments," Report of the SE4All Advisory Board's Finance

Committee, 2015, http://www.se4all.org/sites/default/files/SE4All-Advisory-Board-Finance-Committee-Report.pdf.

Figure 4. SEforAll's Multi-Tier Framework (MTF)



Offering safe, affordable appliances (e.g., lighting, cooking, cell phone charging, air circulation, refrigeration, television, and the like) is an important step on the ladder of energy access, because these items dramatically improve quality of life and provide inroads to more integrated, comprehensive solutions. For the decentralized energy market to mature, however, it will have to offer a higher standard of energy services that meets the basic principles of access listed above. To achieve this, the field must address the expense of comprehensive solutions. A few players such as M-Kopa Solar are beginning to address this need by bundling their lighting and cooking solutions for consumers.

In addition, more research and development is needed to improve the business models for solutions that consumers can use to power productivity such as agriculture, and for community-wide uses. The economic feasibility of these clean-energy solutions such as mini-grids and solar kiosks vary in different contexts, leaving investors wary. The Rockefeller Foundation's Smart Power for Rural Development initiative is making important progress on this front by developing sustainable business models and enabling environments for mini-grids to flourish in villages throughout India. Similar research and development efforts are needed for other technologies and geographies.

Finally, clean energy will attain scale only when consumers have improved capabilities to store and save power, making it available when they need it. Developers of energy storage solutions need to advance the scale, duration, safety, efficiency, response time, sustainability, and cost of battery storage technologies. Some of the better performing batteries on the market cost thousands of dollars, well outside the reach of the rural poor. Investors such as the Breakthrough Energy Coalition are committing significant resources to making these improvements.

The Decentralized Energy Market Needs More Delivery Enterprises at the Local Level

Meeting the energy needs of hundreds of millions of new rural energy consumers will require rapid growth in the number of local energy enterprises deploying a range of business models that are tailored to the needs of in-country markets. An analysis by the Miller Center for Social Entrepreneurship²⁸ found that the sector will need anywhere from 7,000 to 20,000 local providers, each growing to serve an average of 25,000 customers over its life span. Those who directly deliver energy services to the rural poor need to adapt the marketing, financing, and after-sales support to local contexts. For this reason, those focused on direct services to consumers are most likely to remain at the small to medium scale. The Miller Center analysis argues that it's "rare that an entrepreneur most able to build a business that serves local needs will also possess the skills and ambitions to grow an enterprise into an entity serving millions of customers." Thus there is a pressing need to build entrepreneurial capacity at the local level throughout the markets that are the hardest to reach. The Miller Center found that the "sweet spot" for service providers at the local level has investment needs of up to roughly \$1.6 million.

Leading Initiatives Focus on Narrow Segments of the Market

Not unlike a lot of development activities, most existing energy access initiatives address structural barriers to market growth in a piecemeal fashion, often working in silos. These silos exist in donor governments, national governments, and multilateral development banks and within large foundations. Initiatives largely specialize in particular sectors (e.g., energy, agriculture, health) market barriers (e.g., technology, finance, policy) or specific constituents (e.g., entrepreneurs, policy makers, etc.). They may also focus on specific technologies, such as solar or biomass. A lack of coordination among these different efforts makes it difficult to meet the full range of needs of entrepreneurs, policy makers, and investors as they work to scale effective delivery models. Because finance, policy, and human capital are interrelated challenges, innovation in one of these areas can go only so far in the absence of innovation in the other areas.

Disparate Agendas Send Mixed Signals to the Market

These silos impede progress on country energy action agendas. Large government and MDB donors to developing countries sometimes harbor conflicting energy access priorities, which leads to government leaders and ministers in those countries having conflicting energy access priorities. Furthermore, decentralized clean energy is not adequately integrated into development agendas because international development officials and energy experts often do not speak the same technical language and sometimes view their respective objectives as being in conflict with one another (e.g., development officials sometimes want to provide energy regardless of type and those supporting climate action prioritize the type of energy provided over increasing energy access). As a result of conflicting priorities, national commitments do not always translate into local action.

²⁸ "Universal Energy Access: An enterprise system approach," Miller Center for Social Entrepreneurship, 2015.

THE OPPORTUNITY TO BRING CLEAN ENERGY ACCESS TO SCALE

To meet the goal of ending energy poverty by 2030, civil society broadly will need a more comprehensive strategy that puts those most affected by energy poverty first. The decentralized clean energy market will thrive when there is better coordination among energy access efforts; strong political will and a supportive policy environment; human capital in the form of knowledge, skills, and talent; and easy access to affordable financing. And an influx of new funding and mission-driven capital is needed to help overcome these barriers and allow for a thriving market that will attract commercial investment. The following section highlights important opportunities for civil society leadership.

STRENGTHENING COLLABORATION

Strong collaboration across sector and geographic boundaries is needed to advance a cohesive agenda for ending energy poverty and bring diverse constituencies together to make a forceful call to action. Civil society leaders are uniquely positioned to build these bridges, offering a range of tools to promote more field-building and collaborative strategies:

1) Create a Platform Where Impact Investors and Development NGOs Learn and Act Together

The sector needs a venue where diverse civil society leaders, investors, and affected communities can drive collective action to end energy poverty with clean energy by 2030. Development NGOs and affected communities are rarely at the table when decisions are made about where and how to invest in energy access. The clean energy access sector currently lacks a mechanism for collaborating across the many strategies and interventions needed to overcome market barriers to decentralized energy. And significant work is needed to help these diverse actors find common ground on definitions of energy access for particular country contexts and what those definitions mean for in-country planning efforts.

Together investors and civil society experts can collectively monitor progress, identify promising solutions and critical gaps, and generate a drumbeat of stories that highlight successes, challenges, and the moral and humanitarian urgency that is the basis of this effort. Mission-driven investors from civil society can tap into the extensive experience of development organizations with a strong presence on the ground. Together they can develop projects and investments that are designed in partnership with affected communities. This collaboration can start by engaging the community SEforAll has convened, but it needs to include a wide array of civil society partners with the capacity to translate deliberations at the global stage to effective action at the national and subnational levels.

2) Develop Tools for Collaborative Funding Strategies

Collaboration on the scale needed to end energy poverty will be possible only if funding opportunities are aligned. As new resources are committed to energy access, there is a risk that funding will become duplicative and critical gaps will go unfilled. A collaborative funder platform could facilitate philanthropic investment in a comprehensive set of strategies focused on the rural poor and informed by community leaders. This type of coordinated funder action would send powerful signals to policy makers; help to ensure that the advocacy, human capital, and investment needs in-country are met; grow the collaborative capacity of the field; and better align implementing partners.

3) Replicate Effective Models for In-Country Collaboration and Capacity Building

Strong models for country-level energy access planning that incorporates decentralized energy can be scaled rapidly with an influx of mission-driven capital that helps to build capacity at the national and local levels. The examples of Bangladesh and Rwanda offer powerful examples of on-the-ground coordination that create an environment where promising business models for energy access can thrive. Replicating these models will require significant, patient private sector capital that could be pooled to more rapidly deploy resources. IDCOL has captured the lessons it learned in Bangladesh and has been educating other governments, including the Rwandan government, about its success. An assessment has been conducted to determine what conditions need to exist in-country for this model to thrive, and to identify a short list of high-priority countries for significant investment.²⁹ The criteria that Rocky Mountain Institute has developed for effective in-country coordination can provide a strong starting point for scaling this model. Work to build capacity at the country level should also be closely linked to SEforAll's efforts to develop country-level commitments, rewarding innovation and effective implementation.

ADVOCATING FOR DECENTRALIZED SOLUTIONS

A strong civil society advocacy voice can elevate the energy poor on the global development agenda, build political will for decentralized clean energy solutions, and cultivate supportive in-country policy environments that allow effective businesses to thrive. A strong civil society voice is critical to lobbying the MDBs, regional development banks, and national governments to ensure the needs of the rural poor are met. Power for All has created a powerful platform were civil society advocates can raise their voice, and will need significant support going forward. To build stronger support for decentralized energy, advocates should:

1) Elevate the Voice of Civil Society to Demand an End to Energy Poverty by 2030

Mobilize support for SDG7 by more strongly linking to aligned movements. A common concern about the rhetoric for clean energy access is that it does not focus enough on the end uses and benefits for

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²⁹ https://cleanenergysolutions.org/news/policies-to-spur-energy-access.

vulnerable populations. Advocates can cultivate strong allies and support by documenting and providing strong data-backed evidence on the impact of distributed, clean energy solutions on gender empowerment, health and clean air, climate change, and environmental justice. For example, how energy is delivered to the rural poor is inexorably linked to the imperative to transition to a low-carbon economy. Yet decisions about how to meet development and climate goals are often disparate and not aligned. Advocates can harness the growing momentum around the climate agreement to ensure that energy policies and climate finance include a focus on the rural poor.

Being more explicit about the impact of clean energy access will help to build momentum for widespread recognition of the fundamental human rights to power and access to safe and clean energy, upon which other human rights are dependent.

Engage a broad interfaith community to advance a moral call to action. The faith community is uniquely positioned to elevate the moral imperative of ending energy poverty now. There is an opportunity to build on the strong case for climate action made by leaders of all faiths in advance of the Paris climate negotiations, mobilizing faith leaders to shine a spotlight on the rural poor left behind by a fossil fuel—based economy. Several faith-based NGOs already maintain a strong presence at the community level and are leaders in responding to climate-driven natural disasters. These organizations can tap into their extensive networks of supporters, their platform nationally and globally, and their own investment assets to ensure that resources are directly deployed to the communities that most need them.

2) Hold Development Agencies and Countries Accountable for Their Commitments

Civil society leaders should hold countries and MDB's accountable, tracking and engaging those that fall short of stated commitments. There is a need for consensus around a common set of principles that can guide investments in the sector—principles that ensure that the needs of the rural poor are met while also achieving climate, development, and human rights goals. Establishing principles that govern the sector would aid efforts to hold MDBs, donor countries, national governments, and investors accountable. Advocates can also work to demand that an increasing percentage of development finance from MDBs is committed to clean energy access, particularly the distributed solutions needed to reach the rural poor.

As part of this effort, advocates need to track and make public country progress on developing policies that enable the spread of clean energy solutions. The field needs a database that highlights positive and negative policy actions. In this way, positive actions can serve as examples for the field and pressure can be placed on governments for negative policy actions. Two relevant efforts are under way, including the World Bank's Readiness for Investment in Sustainable Energy indicators, and an upcoming Power for All paper analyzing effective policies to support decentralized renewable energy.

3) Build Advocacy Capacity at the National and Local Levels

Global commitments and investment will be effective only if capacity exists nationally to help drive and ensure implementation in-country. Awareness campaigns need to be tailored to specific country, cultural, and religious contexts. This work remains dramatically underfunded, and new initiatives including the UK's Energy Africa campaign, Power for All, and ACCESS will need significant support and partners to advance work at the national level.

Elevate the voices of those most affected in development and energy planning. Those most affected by energy poverty will not be heard in the major deliberations hosted by SEforAll and others until they have resources to travel to these forums and the training needed to effectively engage in them. Coalitions such as ACCESS and Power for All have ambitious goals to engage civil society but need ample financial support to do so. Practical Action's "Poor People's Energy Outlook" report raises the visibility of the plight of the energy poor. Building citizen engagement and a civil society base in this way will help it to mobilize influential constituencies, engage in policy discussions at all levels, and monitor and hold governments and multilaterals accountable for implementation of commitments made to clean energy solutions.

Expand the reach of youth engagement programs, adapting for rural contexts. Educating youth on energy access issues and engaging them in advocacy will help position the next generation as future leaders and policy makers on clean energy. Decentralized clean energy also holds tremendous job training opportunities. Existing programs need to be scaled quickly, which will require finding culturally sensitive ways to engage young people in rural areas. While the project that IIED and Hivos is implementing is largely untested, engaging young adults in an exploration of energy access issues is a step in the right direction and could be effective as part of larger efforts to build the enabling environments in target geographies.

Raise the visibility of effective pilot projects. Decentralized energy projects such as mini-grids can help show the potential for distributed energy to be viable economic interests for local policy makers and regulators. Data from these projects can help to debunk myths about decentralized energy solutions such as its expense relative to grid solutions. While this evidence base is key to helping influence decision makers, little funding remains for this work.

Engage entrepreneurs and the business community as advocates for policy action. Advocates can make more direct links between energy access and business initiatives such as GOGLA and We Mean Business that can help shape national energy policies. There is also an opportunity to better equip clean energy entrepreneurs to join together in country-based campaigns to promote clean energy and its benefits to citizens.

BUILDING HUMAN CAPACITY

The goal to end energy poverty can be met only if there exists a skilled workforce and strong leadership to scale effective solutions. There are both short-term and long-term opportunities to increase the knowledge, skills, and talent to make clean energy more accessible, including:

1) Build a Cadre of Entrepreneurs, Skilled Workers, and Leaders for the Sector

Build a skilled workforce for the clean energy sector. The energy access sector needs a multifaceted strategy to train the workers needed to grow the market. Advocates should look to reform formal education in target countries to include energy infrastructure planning and implementation, with a strong focus on decentralized solutions. Clean energy access experts should collaborate with ministries of education and energy to ensure that formal training programs offer proven curricula and opportunities for practical, applied education. Effective curriculum from existing programs will need to be adapted for other country and cultural contexts, including for rural populations.

Alternatives to brick and mortal educational institutions such as online programs are also needed to reach poor and remote populations; however, these programs will require considerable capacity-building to streamline efforts to recruit participants and place them in the industry. There is also an opportunity to scale niche education programs that serve other social objectives such as empowering women and girls, building the capacity of these programs to more efficiently identify and recruit participants and maintain a presence in more geographies.

Lastly, there is a critical need for a recruiting infrastructure to help develop and train a steady pipeline of management talent for growing decentralized energy businesses. Existing decentralized energy companies can help to grow this sector by providing a combination of training and practical work experience around the globe, but will need help finding top recruits.

Expand support programs for entrepreneurs. Mission-driven investors can help to scale effective support programs by making sure effective start-ups have ready access to the seed capital and technical assistance they need to grow. Effective programs such as ENERGIA and Energy 4 Impact can attain greater scale through direct programmatic growth, model replication, and the influx of capital to fuel enterprise development. Tailoring enterprise training boot camps such as the ones that Unreasonable East Africa leads specifically for the clean energy sector can also help catapult more enterprises into the sector.

2) Rapidly Deploy Volunteers to Support Local Organizations

Organizations working on the ground can leverage volunteers to share their expertise instead of simply providing labor. Many volunteer efforts focus on providing labor capacity, which can be useful to help

get projects off the ground and increase the number of informed advocates on energy access issues. This helps in the short term but does not address the broader lack of capacity in the sector. Ideally, the sector would shift the balance of volunteer efforts to models where experts educate and train local residents as part of skill-building efforts to increase local capacity over the long term. Models that supply labor rather than technical expertise can still be helpful if they follow the Grid Alternatives model of having local residents work alongside volunteers to increase skills within the communities. The work of volunteers should be closely coordinated with local CSOs that will be attuned to the needs of communities and can orient volunteers to local culture and context.

EXPANDING ACCESS TO CAPITAL FOR CLEAN ENERGY ACCESS

An influx of mission-driven capital can help to lay the groundwork for closing the energy access finance gap, increasing access to existing capital, replicating and growing promising innovative finance models, and helping to mitigate risks for commercial and local lenders. Mission investors can help clear the way for private finance by acting to:

1) Advocate and Build Awareness for New Investors to Enter the Market

Call on mission-driven institutions to act. Advocates should build awareness within mission-driven institutions of the social, development, and financial opportunities of investing in decentralized clean energy. Advocates can start by highlighting existing, high-profile investments that will demonstrate the different risk and return profiles offered by current investment vehicles. Profiling illustrative examples will help early impact investors learn about what vehicles exist, what the challenges are, and how they can satisfy their financial requirements while helping to meet the Sustainable Development Goals.

Support information aggregation platforms for investors. Investors or potential investors that are interested in decentralized clean energy deals often cite a lack of investment-ready opportunities. There is a need for a platform that can screen investment opportunities for quality and match them to potential investors based on risk and return profiles. Such an effort may build on existing database work, such as that of the Energy Access Practitioner Network, Convergence, or the International Renewable Energy Agency's Sustainable Energy Marketplace, but ideally should provide a one-stop shop for interested mission-driven investors.

Engage regional development banks to increase lending to decentralized projects. Regional development banks should provide critical capital to help scale effective decentralized clean energy projects. However, their existing lending practices and policies often preclude them from taking on more risk and target small- and mid-scale projects. For example, the West African Development Bank invested

in the African Renewable Energy Fund, which supports small-scale renewable energy projects. Advocates and impact investors can lobby and partner with these institutions to develop investment instruments and tools that will help to elevate high-impact, small-scale projects.

2) Improve Existing Investing Infrastructure

Pair seed funding with grants and technical assistance. Impact investors providing seed funding to emerging enterprises can also provide, or partner with entities that can provide, grants and technical assistance, which are critical for enterprises conducting research and development and completing initial set-up activities. A 2015 survey of the Energy Access Practitioner Network's member organizations indicated that top nonfinancial resources requested by rural electrification companies included matchmaking with potential partners, mentorship, and a wide range of access: to new customers, information, and consulting services.

Improve the governance of the sector. Transaction costs at the country level associated with executing investment deals remains a significant challenge for businesses and investors alike. SEforAll has identified a number of capacity needs to help streamline investments at the country level, including reducing the costs of technical assessments and streamlining contract negotiations and environmental assessments. Civil society advocates should ensure that these measures are integrated into country-level planning and capacity-building. Seed and venture capital from impact investors can also help to mitigate these costs by providing for early up-front expenses.

Develop industry-wide key performance indicators. In order to access commercial capital and effectively make the case to policy makers and energy planners, decentralized energy advocates will need to develop common metrics that capture the full economic, social, and environmental impacts of decentralized renewable energy. Common metrics and platforms for data sharing would help to boost investor and policy maker confidence, create industry baselines, and help to better measure risk. Finance for Resilience (FiRe) has begun to collect data to inform such metrics for the PAYG solar market, in partnership with the World Bank, GOGLA, Lighting Global, and others.

3) Support Innovative Financing Vehicles

Use demand dividend to meet a broader range of capital needs. An innovative financial instrument called demand dividend may be well suited to meet the unique needs of social enterprises, including offgrid companies. The demand dividend structure includes preferential characteristics of both equity and debt and may provide mutual benefit to investors and investees. Demand dividends are typically structured so that (1) repayment is tied to cash flows, (2) a "honeymoon" period of no repayment allows capital time to work, (3) a fixed payoff amount, measured as a multiple of the initial investment, compensates the investor for risk and incentivizes the entrepreneur to follow through on the obligation,

and (4) term sheet covenants and business plans prioritize cash flow to align incentives.³⁰ When financial instruments are structured and customized to meet the needs of social enterprises while also generating financial and social returns to the investor, as in the case of demand divided, larger pools of capital can be unlocked and leveraged to finance the expansion of energy access.

Support aggregation platforms for decentralized energy investment. Investors need a steady pipeline of investment-ready deals and strong, diversified portfolios. Impact investors can partner with fund managers and intermediaries to develop mechanisms for aggregating community-level, decentralized energy projects. Bundling small projects into larger pools will help to reduce transaction costs for investors and offer opportunities for diversification, scale, and liquidity. At the same time, impact investors can help to pool funding as well. They can partner with commercial lenders and development finance institutions to blend funds to create larger and more diversified pools of capital for investors with different risk and return profiles.

Securitize or bundle PAYG loans. There is an opportunity for impact investors to securitize or bundle PAYG loans to provide more working capital and lines of credit to decentralized clean energy providers. SMEs offering clean energy products and services to consumers with a PAYG model have proven highly promising in scaling energy access. Securitizing PAYG loans would entail assessing the underlying portfolio risk of various enterprises, packaging loans to these enterprises based on their underlying risk, and offering these bundled loans for debt providers to consider underwriting based on their risk tolerance. For example, BBOXX is looking to turn the off-grid solar sector into an asset class, creating contracts for thousands of solar rooftop arrays to sell as bonds to investors. Although SMEs with a PAYG model must accommodate extended client repayment timelines, poor and remote customers actually have low default rates overall, making this approach more secure for investees and investors. Securitizing PAYG loans has the potential to attract larger levels of commercial debt to the sector.

Grow early-stage funds for small projects. Small projects with the potential to make a significant impact in a community are often ineligible for financing from large investors, such as World Bank programs, which focus on project transactions of significant size. Early-stage investment vehicles are emerging to fill this gap, such as the Seed Capital Access Facility, but they are too few to spur the level of new enterprise development required, particularly in markets outside of East Africa and India. New early-stage funds will benefit from institutional investors to serve as anchor investors, that are willing to take first loss and assume a subordinated position in order to attract more financing.

4) Mitigate Risk for Commercial Lenders

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³⁰ "Demand Dividend: Creating Reliable Returns in Impact Investing," Santa Clara University, accessed May 20, 2016, http://www.fish20.org/images/Demand-Dividend.pdf.

Utilize development finance institutions to support de-risk instruments. Multilateral development banks are in a unique position to provide first-loss capital, loan guarantees, insurance, and other tools to help mitigate risk, which can help boost the confidence of private investors. For example, Lighting Global is a partnership of the International Finance Corporation, World Bank, and GOGLA to develop quality assurance frameworks for off-grid services in several African countries, which has helped to increase investment in early-stage companies. And the Development Credit Authority of the United States Agency for International Development is offering \$75 million in loan guarantees to cover costs across the value chain. Advocates should continue to push development banks to put more capital into innovative finance instruments.³¹

Draw on mission-driven capital to create a large guarantee pool. Regional and national commercial banks operating in emerging and frontier markets often assess off-grid clean energy companies as too risky for investment. There is an opportunity for philanthropic and private funders to create a large guarantee pool to provide incentives for in-country commercial banks to provide finance. The relatively new Asian Development Bank may be a prime testing ground for such an effort.

Create diversified portfolio options. Many investors who are interested in deploying capital into the offgrid clean energy sector are often wary of the high-risk investments of the sector. There is an opportunity to structure diversified portfolios as KawiSafi Ventures Fund is doing, pairing less risky investments (e.g., in urban electrification and backup power generation) with riskier, off-grid clean energy investments.

Utilize results-based financing to reduce risk for commercial lenders. Investors are beginning to experiment with results based financing—or payment to companies upon delivery of services—to help overcome market failures in clean energy access solutions. In Tanzania, results-based financing has been used to help grow the market for pico-solar lighting, providing temporary funding in the form of incremental sales based performance incentives to import-suppliers and retailers. The incentive has helped companies such as Off Grid Electric, GCS Energy, and Ensol Energy Management Solutions leverage larger private sector loans or investment financing.

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³¹http://static1.squarespace.com/static/532f79fae4b07e365baf1c64/t/578d7f206b8f5bebe7f47444/14688909165 01/Power for All POV May2016.pdf.

CONCLUSION: STRATEGIC QUESTIONS GOING FORWARD

Ending energy poverty by using clean, safe, renewable energy will require strong civil society leadership and an influx of new mission-driven capital. The climate, development, and human rights crises posed by energy poverty demand a concerted civil society voice that can lend a sense of urgency and pressure for rapid new investment. A more cohesive agenda advanced across a range of sectors will help to strengthen the spate of new initiatives entering this space—ensuring existing capital is deployed effectively while filling critical gaps in capacity.

However, leaders from the development, faith, and philanthropic sectors will need to address a number of critical strategic questions as they explore opportunities to advance a civil society agenda for clean energy access:

- 1) What should constitute a set of unifying values and principles that can guide investment and decisions in the energy access sector?
- 2) How might civil society organizations most effectively collaborate across sectors?
- 3) How can affected populations be meaningfully engaged in the discussion about their own energy future?
- 4) How can near-term mission-driven investment to spur innovation and unlock commercial capital be most strategically deployed?
- 5) Where are the greatest needs and opportunities geographically?

Furthermore, during the course of our interviews with leading experts and practitioners in the field, they identified a number of important near-term research projects that would help to advance the priorities identified in our report. These include:

- 1) What is the most effective blend of grants and investments that will spur new investment models, scale existing ones, and help build field-wide capacity for the long term?
- 2) How can data for clean energy access planning and for communicating impact be best measured, tracked, and improved?
- 3) Under which circumstances can particular technological configurations successfully deliver sustainable electricity access?
- 4) How can linkages between energy access and the other SDGs, such as access to health, clean water, and agriculture, be better highlighted?
- 5) What are the energy investment priorities of regional development banks and what they are already invested in?
- 6) What are the most effective models for country-level coordination and energy planning, and how do they vary based on geographic and cultural context?

7) How can pension funds to invest in clean energy access be better positioned? What tools do they need?

Answering these questions will better position civil society leaders to advance a bold new agenda to end energy poverty by 2030 using clean, renewable energy.

APPENDIX: INTERVIEWEE LIST

- 1. Sean Moore and Eleanor Murphy, Acumen
- 2. Brandon Wu, Action Aid
- 3. Julienne Oyler, African Entrepreneur Collective
- 4. Laura Sundblad, ARC Finance
- 5. Sarah Butler-Sloss, Ashden
- 6. Aunnie Patton Power, Bertha Centre for Social Innovation, University of Cape Town
- 7. Gopal Patel, Bhumi Project
- 8. Alison Doig, Christian Aid
- 9. Eric Gibbs and Matt Jordan, CLASP
- 10. Amy Wang, Deutsche Bank
- 11. Yasemin Erboy Ruff, Energy Access Practitioner Network, UN Foundation
- 12. Donn Tice, Frontier Energy, former CEO of D.Light
- 13. Johanna Diecker, Global Off-Grid Lighting Association
- 14. Fletcher Harper, GreenFaith
- 15. Jenean Smith, Grid Alternatives
- 16. Erin Rogers, The William and Flora Hewlett Foundation
- 17. Josh Zinner, Interfaith Center on Corporate Responsibility
- 18. Sarah Best, International Institute for Environment and Development
- 19. Jesse Moore, M-Kopa Solar
- 20. Sean McCabe, Mary Robinson Foundation
- 21. Sandra Smithey, Charles Stewart Mott Foundation
- 22. Sujeesh Krishnan, PeerAspect
- 23. Kristina Skierka, Power for All
- 24. Lucy Stevens, Practical Action
- 25. Brinda Ganguly and Suman Sureshbabu, Rockefeller Foundation
- 26. Stephen Doig and Jules Kortenhorst, Rocky Mountain Institute
- 27. Christine Eibs Singer, SEforAll
- 28. Harish Hande, SELCO India
- 29. Simon Desjardins, Shortlist Professionals, formerly of Shell Foundation
- 30. Marco Krapels, SolarCity
- 31. Becca Schwartz, Solar Sister
- 32. Aniket Shah, Sustainable Development Solutions Network
- 33. Patricia A. Daly, Tri-State Coalition for Responsible Investment
- 34. Srinivas Krishnaswamy, Vasudha Foundation