Innovation in Rural Energy Delivery

Accelerating Energy Access through SMEs

A Navigant Consulting, Inc./Soluz, Inc. Study

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Executive Summary

Access to safe, modern sources of energy is key for development, but often missing. Energy is a major input for poverty alleviation, income generation, education, health, and other developmental priorities. Hundreds of millions of households, small businesses, and communities, however—chiefly in rural areas of developing countries—have no access to electric grids or modern cooking fuels. This situation leaves them without the benefits of convenient, safe, and reliable energy services.

Efforts to expand energy access in recent decades have shown the limitations of conventional approaches. Traditional strategies such as electric-grid extension are expanding coverage, and must continue to be a major part of the energy access equation. But they face growing challenges in extending service to dispersed households and businesses remaining to be served. Increased electricity supply from conventional centralized power plants also contributes to local and global environmental degradation. Modern cooking fuels such as bottled gas (LPG) are also inaccessible to many in rural areas.

While accelerating rural energy access will require various strategies, technologies, and players, *Innovation in Rural Energy Delivery* focuses on opportunities to accelerate access by engaging entrepreneurial small and medium enterprises (SMEs) to provide distributed clean energy technologies, particularly small renewable energy systems and LPG. Such technologies have proven able to meet energy needs adequately and affordably under the right conditions. Rural energy SMEs have achieved important progress delivering systems and service to rural customers, overcoming persistent barriers to rural energy delivery with market understanding and mechanisms that make appropriate technologies technically and financially accessible. Many SMEs are positioned with innovative delivery models for products and financing to expand service significantly where the right conditions, or "elements," for achieving scale can be put into place.

Understanding the necessary elements to accelerate energy access through SMEs requires an appreciation for the dimensions and scale of the challenge and the necessary capacity for addressing the situation. Energy access must involve serving not just more people, but also people of increasingly lower income, and addressing their *range* of energy needs. The opportunity to increase energy services through SMEs, while substantial, is bounded by the potential for conventional energy approaches to supply services in some cases and by extreme poverty in others. A realistic long-term target for expanding energy services through accelerated SME-led delivery and distributed clean energy technologies is 100 to 150 million customers and their communities, a third of the current unserved population. Reaching five to 10 million customers in the near term could provide a solid base for accelerating SME-led service to many others. Achieving such a target will require significant increases in the capacity of SMEs and microfinance partners to develop business models, markets, and services—and the right elements to bring about that increase.

A careful review of the successes and failures of prominent rural energy SMEs over the past decade reveals the elements on which successful acceleration of SME-led rural energy delivery will depend. Rural energy enterprises offer insights from a variety of business models, contexts, and experiences. SELCO India has reached over 50,000 rural households and businesses by focusing on making energy service and credit broadly available and affordable. Soluz has served over 10,000 Latin American customers, including low-income ones, through unsubsidized cash, credit, and rental offerings. Operations in other markets have served thousands and tens of thousands of rural customers with different strategies in response to a range of energy-market conditions. Such enterprises, however, have been hampered by unsupportive policy environments; inadequate financing for customers, assets, or the operations; or insufficient resources for developing innovations and building capacity to serve the poor.

An analysis of interventions that have engaged SMEs to increase rural energy access offers similar lessons for developing appropriate intervention models. Intervention models centered on subsidized venture funds (the *SVF Model*) or large-scale World Bank-backed government projects (the *WBGP Model*) have created enabling environments,

engaged consumer financing, or brought in enterprise finance, and have engaged SMEs as key players in rural energy delivery. They also have disappointed, however, sometimes greatly. The failures of prominent examples of the SVF Model show the dangers of focusing too strongly on a single element—enterprise finance—without managing other necessary ones. Such funds have largely fallen far short of their design targets and timelines and, in many cases, damaged the very enterprises they aimed to support, through excessive transaction costs or complete fund failure. The WBGP Model has produced important successes, but also produced notable failures, with cumbersome project development and spotty integration of, and support for, existing SME capacity.

The efforts within the microfinance sector to develop the necessary capacity to provide the poor with financial services offer another very useful intervention model that could be adapted to help accelerate rural energy service. While focusing on providing retail finance to poor customers, that model has included a comprehensive collection of elements. It has involved engaging debt and equity, shaping government policies to support microfinance services, and channeling significant grants in conjunction with the investment to build the necessary local institutions to serve the poor.

Mixed experiences with developing rural energy capacity, reinforced by observations from successful microfinance sector development initiatives, suggest four key elements for successfully accelerating energy access through SMEs under a comprehensive intervention model—the *SME-Based Acceleration Model*:

- **Enabling Environments** – Accelerating energy service through SMEs requires supportive government frameworks for SME-led rural energy delivery and distributed clean energy. Interventions can reduce barriers to private participation in rural energy delivery and increase fair competition, advance supportive policies, promote "smart" subsidies that minimize distortions and target the poor, and engage existing SME and microfinance capacity in ways that take advantage of the strengths of each.
- **Consumer Finance** – Interventions can promote appropriate mechanisms to overcome the first-cost barriers through finance for energy assets and rural energy consumers. Interventions can help mitigate the risks faced by financiers, reduce consumers' first costs in micro-credit through down-payment financing, and support a variety of finance options such as micro-leasing and micro-rental in addition to micro-credit. They can also embrace a range of energy applications for households and enterprises and improve the economics through carbon finance or other opportunities to leverage environmental attributes.
- **Enterprise Finance** – The enterprise-finance needs for expanding energy access calls for appropriate mechanisms to provide the capital to rural energy SMEs. Interventions can reward efficiency, encourage risk-taking, and support processes that produce realistic expectations about the investment process and costs. They can also create more attractive conditions for investment from a variety of potential financiers.
- **Innovation Funding** – The global challenge of accelerating energy service to the rural poor requires innovation in rural energy business approaches to link technologies and markets, and support for extensive and continued capacity building. Interventions can incorporate soft funding for SMEs' work in addressing all of the dimensions of rural energy access. As successfully applied in the microfinance-sector model, interventions for rural energy can promote capacity building and innovation through funding such as performance-based contracts to SMEs. Successful interventions, balanced with other investments and revenues and focused on transformation and replication, will extend the reach of innovations far beyond the capacity of SME equity, loans, and customer revenues.

The SME-Based Acceleration Model considers all four necessary elements in designing interventions to dramatically accelerate energy access through SMEs. Rather than leaving enterprises hamstrung by poorly designed government attempts to reach unserved communities without embracing private-sector opportunities, this model will shape the way governments engage SME capacity. Rather than limiting rural consumers' access to product and asset financing, it will help SMEs create the necessary microfinance linkages and mechanisms to serve the market. Rather than letting enterprises be

weakened by excessive transaction costs to obtain capital, it will stimulate efficient, well-focused sources of enterprise finance. Rather than constraining enterprise-led innovation and capacity building to the limits of their investment resources or target markets' ability to pay, it will support the necessary progress in developing products, services, and capacity to serve the poorest.

Providing modern energy services to millions of unserved homes, businesses, and community facilities through SMEs over 10 years will require significant support for each of the four elements:

- The largest financial piece will be the consumer and enterprise finance needs. To reach 10 million customers, SMEs and their customers would need to mobilize $2 billion to $5 billion in customer payments and financing—largely consumer and asset financing through local financial institutions, and enterprise finance. Interventions through loan guarantees and targeted investments could play a strong role at the level of $200 million to $400 million.
- Meaningful involvement from international development organizations for the key element of rural energy innovation and capacity building would be on the order of $200 million in grants or contracts to leading private-sector efforts over that decade. That level is much less than the funding for innovative rural energy financing or government projects in the past decade, or annual allocations to build microfinance capacity, but still substantial. Such resources could support innovations through 20 to 40 SME leaders and replication by hundreds of additional SMEs, operating independently or collaborating through networks similar to those in the microfinance sector. Each network could involve tens of REDCO affiliates sharing methodologies, developing best practices, and building capacity to collectively serve one to two million customers.
- Additional resources of $50 million could support creating the necessary enabling environments in several dozen markets worldwide.

Serving 10 million additional customers, itself a major accomplishment, more importantly would lay the groundwork for substantial further energy-service expansion. The capacity and mechanisms developed to reach 10 percent of the 100 to 150 million customers targeted under the SME-Based Acceleration Model could enable services to another 50 percent in the following decade. Such growth would parallel that of microfinance institutions in their service to tens of millions over three decades.

Each of the four elements identified as necessary to support innovation and rural energy delivery via SMEs has important consequences for the SMEs and their ability to serve the rural poor. Even the strongest of leading enterprises are hardly immune to the effects of missing any of those elements. Experiences in engaging SMEs under the SVF and WBGP models also show the importance of each of those elements.

These issues have even stronger implications for unserved rural people themselves. Conventional modalities and technologies clearly will play a major role in expanding access in the coming decades. But they will not reach the majority in remote, marginalized communities. Distributed clean energy technologies offer technical solutions and opportunities to take advantage of the entrepreneurial drive and creativity of SMEs in market-oriented approaches. With the right elements for supporting energy access through SMEs and appropriate energy technologies, many unserved people will be served.

Targeted interventions within the comprehensive SME-Based Acceleration Model, supporting a range of locally appropriate business models and drawing on innovation in many forms, have a strong chance of enabling modern energy service to millions of unserved people in the near term and hundreds of millions soon after. Accelerating energy access for the rural poor demands nothing less.

