

MICROFINANCE AND ENERGY ACCESS IN INDIA

A GUIDE FOR ENERGY POLICYMAKERS



PARTNERSHIP TO ADVANCE CLEAN ENERGY-DEPLOYMENT TECHNICAL ASSISTANCE PROGRAM



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TABLE OF CONTENTS

ABBREVIATIONS	iii
FOREWORD	iv
ACKNOWLEDGEMENTS	v
EXECUTIVE SUMMARY	I
INTRODUCTION	8
I THE EVOLUTION OF MICROFINANCE IN INDIA AND THE ENERGY ACCESS OPPORTUNITY	15
2 ENERGY MICROFINANCE IN PRACTICE: EVOLUTION, FEATURES AND VARIATIONS	33
3 BEYOND LANTERNS: FUTURE DIRECTIONS IN ENERGY MICROFINANCE	42
4 POLICY RECOMMENDATIONS TO ADVANCE ENERGY MICROFINANCE IN INDIA	53
REFERENCES	61
ENDNOTES	62

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ABBREVIATIONS

ANBC	Adjusted Net Bank Credit
AP	Andhra Pradesh
BC	Business Correspondent
BPL	Below Poverty Line
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CB	Credit Bureaus
CBO	Community-Based Organization
CSR	Corporate Social Responsibility
DC	Direct Current
DISCOM	Distribution Company
DDUGJY	Deen Dayal Upadhyaya Gram Jyoti Yojana
DRE	Distributed Renewable Energy
ESAF	Evangelical Social Action Forum
GLP	Gross Loan Portfolio
GW	Gigawatt
HP	Horsepower
ICT	Information and Communication Technology
ICS	Improved Cook Stoves
INR	Indian Rupee
JLG	Joint Liability Group
kW	Kilowatt
KYC	Know Your Customer”
LED	Light Emitting Diode
MFI	Microfinance Institution
MIS	Management Information System
MNRE	Ministry of New and Renewable Energy
MRP	Manufacturer’s Recommended Price
MSF	Mahashakti Foundation
MSP	Microfinance Support Program
MUDRA	Micro Units Development and Refinance Agency
NABARD	National Bank for Agriculture and Rural Development
NBFC	Non Banking Financial Company
NISE	National Institute of Solar Energy
NGO	Non Governmental Organization
PACs	Primary Agricultural Cooperative Societies
PACE-D	Partnership to Advance Clean Energy- Development
PAR	Portfolio at Risk
PMMJDY	Pradhan Mantri Jan-Dhan Yojana
PSL	Priority Sector Lending
RBI	Reserve Bank of India
REMMP	Renewable Energy Microfinance & Microenterprise Program
RRB	Regional Rural Bank
Rs	Rupees
SFB	Small Finance Bank
SFMC	SIDBI Foundation for Microcredit
SHG	Self-Help Group
SHGBLP	Self-Help Group Bank Linkage Program
SHS	Solar Home System
SIDBI	Small Industries Development Bank of India
SRO	Self-Regulatory Organization
UDAY	Ujwal DISCOM Assurance Yojana
UJALA	Unnat Jeevan buy Affordable LEDs and Appliances for All
USAID	United States Agency for International Development
USD	United States Dollar
VLE	Village-Level Entrepreneur



FOREWORD

The USAID PACE-D TA Program is a part of the overall Partnership to Advance Clean Energy (PACE) initiative, the flagship program under the US-India Energy Dialogue. The six year program, implemented in collaboration with the Ministry of Power and Ministry of New and Renewable Energy, has three key components: energy efficiency (EE), renewable energy (RE) and cleaner fossil technologies. Within the RE component there was a dedicated TA offering that focused on support to Microfinance Institutions (MFIs) known as the PACE-D TA Microfinance Support Program (MSP). The Program's focus is on institutional strengthening, capacity building, technology pilot projects, innovative financing mechanisms and increasing the awareness of clean energy technologies.

The overall aim of the PACE-D TA Program is to accelerate the deployment and use of clean energy, expand US-India trade and investment linkages, and facilitate exchange of information and best practices. The Program works with policy makers, regulators, state agencies, private companies, investors, clean energy associations, and other stakeholders to create an enabling environment to increase the uptake of EE and RE technologies in India.

Nexant leads the implementation team for the PACE-D TA Program and is supported by a consortium of Indian and US companies which are implementing the various components of the Program.

Arc Finance, a global non-profit enterprise, is the implementing partner for the Microfinance Support Program component of the PACE-D TA Program. As a part of this Program, Arc Finance provided technical assistance to seven partner microfinance institutions in nine different states: Uttar Pradesh, Odisha, Madhya Pradesh, West Bengal, Jharkhand, Kerala, Bihar, Tamil Nadu and Chhattisgarh.



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Microfinance and Energy Access in India: A Guide for Energy Policymakers presents insights from the PACE-D TA MSP, which was implemented by Arc Finance and focused on TA support to seven MFIs across nine different states in India. The primary authors were Chris Neidl and Nicola Armacost, and the MSP work was carried out by the PACE-D team comprised of: Nicola Armacost, Chikako Fujita, Saiful Islam, Sam Mendelson, Chris Neidl, Bishal Thapa, Shrey Bairiganjan, Jayesh Jain, Ashish Chalise, Siddaratha Poudya, Micaela O'Herron, Cyrielle Jean, Susan Lopeman, Jeani Silberman, Souradeep Ghosh, Neel Shah, Kunal Kabra and Aneri Pradhan.

The MSP focused on building institutional capacity to enable MFIs to implement plans and strategies that resulted in scaling clean energy lending so as to radically expand energy access and in the process reduce Greenhouse Gas (GHG) emissions. The program also produced targeted knowledge products that captured the learning, and delivered sector-building events and policy briefings designed to expand the impact beyond the selected MFIs.

The MSP far exceeded its targets and as of December 31, 2017, MFI partners had sold more than 384,000 energy products, benefitting over 1.9 million household members, with 100 percent women loan clients. Over USD 12 million was disbursed in loans and cash sales, and an additional USD 10 million was secured in investment. Over 9,000 hours of training were provided to both staff and clients, 68 percent of which were women.



EXECUTIVE SUMMARY

The USAID Partnership to Advance Clean Energy - Deployment (PACE-D) program was launched in 2012, during a momentous period of transformation in India's energy sector. The 6-year program's mandate is to promote low carbon growth in the areas of energy efficiency, cleaner fossil fuels, and renewable energy through policy support, capacity building, pilot projects, innovative financing and partnership building. In each of these three domains India has realized historic gains towards its goal of building a 21st century energy system that supports climate security and environmental protection while delivering broad economic prosperity and opportunity for Indian society as a whole. This remarkable transition, playing out in a multitude of forms across every strata of the economy, is the outcome of ambitious government leadership, unprecedented private sector mobilization, rapid technological innovation, and the growing initiative and aspirations of everyday people.

During this same period, and driven by some of the very same factors, financial inclusion in India has also entered a new phase of dynamic transition. Today an ever-growing share of the previously unbanked population enjoys greater access to formal financial services such as savings, credit, insurance and remittances than ever before. One event highly indicative of the magnitude and rate of change underway occurred in August 2015 when over 18 million new bank accounts were opened in a single week under the Central Government's Pradhan Mantri Jan-Dhan Yojana (PMMJDY) universal bank access scheme, a milestone that garnered a Guinness World Record.

Progress can be identified in other trends that are less headline grabbing but no less consequential. Following a 2015 Reserve Bank of India (RBI) mandate that 25% of new bank branches must be opened in non-urban areas, rural and semi-urban coverage grew faster than in all other segments between March 2015 and June 2016, when nearly 5,000 branches were added (Sriram, 9). The greater leveraging of new telecom and now broadband infrastructure by financial institutions signals what will perhaps ultimately catalyze the

most disruptive changes in the long term. Information and digital technologies are giving rise to new forms of outreach, assessment and exchange that are lowering the cost and risk of serving remote communities, and these forms are now beginning to grow at a faster rate than conventional channels. Numerous other developments, including the expansion of both established and new entrants into India's financial inclusion landscape, could be referenced at length to further illustrate the full dimensions of this ongoing process of change.

Since its inception, PACE-D has been focused on identifying how points of intersection between these two domains that are so fundamental to India's economic future – energy and finance – can be fully exploited to support India's energy access objectives in poor and remote communities. Fostering innovative forms of clean energy finance has been one of the program's core mandates, and this has included activities directly aimed at eliminating energy poverty. At the center of this latter effort has been the Microfinance Support Program (MSP), which aims to recruit the unique capabilities, strengths and reach of India's dynamic, fast-growing microfinance sector to meet the energy needs and aspirations of poor people throughout the country. The program was implemented in late 2014 under the direction of PACE-D technical partner Arc Finance and has yielded a level of impact that has exceeded targets established at the outset. Through the program, PACE-D engaged and helped seven high-performing microfinance institutions (MFIs) plan, pilot, expand and secure investment for improved energy product promotion and finance initiatives. In terms of scale, methodology, and clients and geographies served, the group of partner MFIs supported under MSP collectively reflect the growing diversity of the Indian microfinance sector as a whole. The following program results highlight the level of impact and success that the program has achieved as of December 31, 2017:



- Over 384,000 customers have gained access to modern energy products and services, of which 316,684 clients have accessed financing, resulting in 1,920,000 beneficiaries of clean and modern energy across 9 states.



- Over USD 12.4 million has been leveraged for clean energy micro-financing under PACE-D MSP through loans disbursed and cash sales. An additional USD 10.3 million in investments has been leveraged.



- More than 88,170 tons of CO₂ have been displaced under PACE-D MSP (with over 281,700 tons of CO₂ displacement projected over energy product lifetimes).



- At least 9,373 person-hours of training has been provided to MFI staff and clients on renewable energy products and their value under PACE-D MSP, with 57% of training hours received by women.

These figures, however impressive, do not capture two of the most substantial program impacts. The first is the role that MSP partner success might ultimately have on influencing the broader microfinance sector, and helping to establish MFI engagement in energy lending and promotion as a mainstream practice. The second is the high level of business model evolution, process innovation, and new energy product and service offering incorporation that has characterized MSP partner experience. These two developments, now materializing in force as partners shift from pilots to scale and as their efforts gain more visibility among their MFI peers, may indeed ultimately constitute MSP's most important and enduring legacy.

The following report, *Microfinance and Energy Access in India: A Guide for Energy Policymakers*, draws on the experiences of MSP partner MFIs and the perspectives of diverse stakeholders to map out the different ways in which microfinance is and might be relevant to India's energy access and poverty elimination objectives. The report is primarily intended to inform and generate dialogue among readers who are directly or indirectly engaged in energy access policy formulation, analysis and advocacy in the Indian context.

Its release is timely as India is now confronting some of the inherent structural constraints that limit the potential of conventional grid extension to deliver universal, reliable power supply in many remote, rural communities. This reality is elevating debates about the ultimate place of distributed renewable energy (DRE) resources, ranging from small solar lighting devices to village and even district scale mini-grids, within India's rural electrification strategy going forward. In a scenario where additional policy mechanisms are introduced to accelerate greater DRE deployment in conjunction with grid expansion a diverse host of new stakeholders will necessarily be engaged to help make those policies effective and successful in the real world. This report asserts that the microfinance sector offers a promising field of potential collaboration that can be drawn upon to play a number of essential functions upon which sustainable DRE deployment depends.

The following is a concise summary of many of key observations and arguments presented in the body of the report that pertain to the status of microfinance and MFIs in relation to energy access.

Microfinance institutions offer more than finance MFIs are identified strongly with their core financial offering, microcredit. The capacity to provide small loans to low-income borrowers addresses critical affordability barriers upon which consumer demand is predicated. Microloans allow consumers to pay for energy assets over time, in installments that match their incomes and cash flow. From a client perspective, borrowing also offers an informal insurance benefit that makes purchasing energy products less risky: clients can refrain from repaying loans if their products malfunction and not resume until issues have been resolved. However, in addition to providing credit, MFI lending and operational conventions also provide a powerful basis for accessing and influencing clients. Microfinance entails long-term, high contact relationships between MFI staff and clients.

This provides MFIs with insights into changing client demands over time, and the trust formed between loan officers and clients creates interpersonal conditions that can favorably influence product acceptance and demand in powerful ways. Further, the group-based structure of conventional microfinance lending and operations give MFIs unique convening power in which they can reliably and predictably bring together groups of clients in the same place at the same time. This structure can be leveraged to reduce operating costs and uncertainties for energy product providers. Groups also provide powerful contexts that are conducive to peer-to-peer product endorsement, a critical influence in early stages of the adoption curve, particularly for risk averse, low-income consumers.

The prevailing norms and cultural characteristics of microfinance are conducive to sustainable and high impact participation in the energy space. Microfinance derived from the pioneering work of mission-driven NGOs in the 70s, 80s and 90s. While the sector is now dominated by for-profit NBFC-MFIs and Small Finance Banks (SFBs), the social mission core has largely been retained, with many of today's leading institutions tracing their origins back to non-profit beginnings. However MFIs also are disciplined by the realities of business survival, and must be profitable in order to succeed. As such, the sector as a whole balances mission and commercial objectives in a manner that predisposes institutions to adhere to a client-centric, social impact focus, while also viewing opportunities through the commercial lens of financial self-sufficiency, competitiveness and risk.

These characteristics have contributed to the microfinance sector's resilience and adaptivity when confronted with change, crisis and new opportunities. Events such as the Andhra Pradesh (AP) crisis of 2010 and more recent demonetization in 2016 threatened the very existence of many MFIs. But the sector has endured and rebounded in spite of setbacks. This staying power, and an inclination to pivot and adapt in the face of crisis or new opportunities is a powerful asset in the context of facilitating last mile energy access, a role that requires continuity and long-term commitments.

As lenders, risk evaluation is paramount. While this preoccupation has kept many MFIs from engaging in the energy space out of caution, it also ensures that those who do are likely to complete rigorous due diligence to ensure that they only promote and provide loans for high quality products provided by dependable,

service oriented companies. In this sense energy lenders are performing an important quality filter function in the energy access ecosystem, limiting consumer access to inferior products and providers, in favor of superior options.

Microfinance is a sector in transition, and many trends point toward greater future convergence with energy. The external regulations and internal reforms put in place following the 2010 AP crisis in microfinance, along with economic and technological changes occurring more broadly in India have helped restore the sector to new heights and have created conditions conducive to stability. The sector is experiencing impressive annual portfolio growth, driven by increases in outreach and in average loan size. In recent years the sector's growing presence in states in the north, east and northeast, such as Bihar, Uttar Pradesh, and Orissa has placed MFIs in districts where electricity access and reliability are lowest, and demand for DRE solutions greatest. At the same time, mission, regulatory and competitive factors are leading more MFIs to diversify their credit offerings beyond business loans to include a variety of essential service and consumption loans, including energy.

Finally, the sector is seeing consolidation between large institutions, a greater degree of investment by commercial banks in MFIs, and a new level of graduation and conversion whereby leading Non Bank Finance Companies (NBFCs) are being granted bank and new Small Finance Bank (SFB) licenses. While it is difficult to predict the long-term consequences this transformation will have on energy microfinance, it is certain that banks and SFBs that remain committed to microfinance will bring unique resources and regulatory allowances to the project. These factors have the potential to increase both scale of outreach and impact, product innovation, and the diversity of energy services and products that can be offered through microfinance channels.

The evolution of the distributed renewable energy (DRE) sector has reduced risk of MFI engagement. Quality and performance improvements in the retail solar product space have removed many of the key risk concerns previously held by MFIs reticent to engage in energy lending. The cost of high quality components has declined, and plug-and-play design innovation has eliminated many installation and maintenance burdens and costs. At the same time, leading product companies have grown in scale and sophistication, and can now provide more competitive pricing, and better customer support and warranties. These improvements have increased the confidence of MFIs, and have helped draw more institutions into energy practice.

The microfinance sector is internally diverse, with a range of MFIs offering different business models and rationales for engaging in energy financing. Today's microfinance sector encompasses a variety of institutions that can be separated by mission, scale, operational capabilities, legal status, client segments and operating contexts. These differentiating factors both constrain and create opportunities for MFIs to engage in energy lending and promotion. Operating in different contexts, with different resources to serve different clients naturally leads to a diversity of approaches, motivations, advantages and results. The report references a three-category typology developed by Arc Finance that sorts MFIs according to similar characteristics, each of which have implications for how and why energy microfinance is pursued.³

Mission-driven innovators tend to be small, highly-localized NGOs that are focused on benefiting constituents within specific geographies or demographic groups. These organizations are often willing to experiment with different product and service modalities if they determine that the latter will support social mission objectives. Streamlined sprinters tend to view energy as a revenue cross-sell opportunity that aligns with the real needs and demands of their client base, and which their infrastructure and brand are well suited to supporting. Diversified scalers are typically large institutions that have the capacity to reach large numbers of clients across multiple geographies and market segments, and to expand their product and service offerings over time. Scale and diversification are enabled by disaggregation, or the creation of an energy-dedicated company that is managed separately from microfinance operations.

MFIs are now looking beyond small-scale solar retail devices to larger and more diverse products and services Having gained a solid baseline of experience, expertise and success in the energy field, more MFIs – driven by both competition and client-centricity – are beginning to explore beyond the products and approaches that have dominated their energy businesses to date. At the same time they are beginning to examine how to reach beyond existing clients. In the context of PACE-D MSP, multiple partners are currently piloting or exploring agent models that mobilize existing clients as energy product promoters in their communities and social circles. MFIs train, finance and procure products for agents. This model aligns closely with the core focus of microfinance on empowerment through entrepreneurship. New energy products and areas of energy finance currently being explored or piloted by PACE-D MSP partners include:

Larger solar home systems, roof top systems and solar inverters. Having graduated from solar lanterns to solar home systems, and solar fans, many MFI clients are demanding higher capacity applications that support greater energy use. Since the majority of MFI clients served by MSP partners are grid connected, solar inverters with battery back up that can be integrated behind the meter to improve grid service reliability represent a very promising new product category. A lack of quality tested, low maintenance products that fit this niche for low-income end-users represents the main barrier to participation at this stage.

Solar irrigation pumps. For MFIs that already serve agricultural clients, or are seeking to expand into this client segment, affordable irrigation represents an attractive option that addresses a fundamental farmer need. PACE-D MSP partners are exploring group-based lending and ownership models that split costs and liabilities among multiple farmers. The main barrier to participation in this category concerns uncertainties regarding government subsidies.

Microgrids and minigrids. Only a limited number of conventional MFIs are well positioned to provide project financing for all but the smallest microgrids. However, large, diversified MFIs that maintain separate energy operations, as well as mission-driven innovators that are able to secure CSR funding and other soft sources of capital may under certain conditions elect to pursue this course. Another potential opportunity for MFIs in the minigrid context is to provide local clients with loans for productive, income generating equipment and household appliances. Such a facility, paired with training and sensitization, not only facilitates adoption it also accelerates the rate at which grid utilization approaches a maximum, improving unit pricing for minigrid end-users and the overall project economics and viability for grid operators.

Policy recommendations to strengthen microfinance sector engagement and impact in energy access. Many of the conditions that are conducive to greater microfinance engagement and impact in the area of energy access can be actively supported through strategic government initiatives and policy interventions. The following summarizes seven key policy recommendations that have been derived from PACE-D MSP partner feedback, as well as that of other active stakeholders within the energy microfinance and energy access domains.

1. STIMULATE IMPROVED ENERGY PRODUCT DEMAND AND LITERACY THROUGH GOVERNMENT-LED LOCAL EDUCATION AND AWARENESS CAMPAIGNS.

While MFIs have demonstrated a powerful aptitude for cultivating demand among their clientele, the effort to do so requires investments in scarce time and resources, and therefore represents a limitation on the scale and rate of impact. There is a potentially important role for central government and state nodal agencies to play in promoting general interest and energy literacy among energy poor populations through targeted outreach and media campaigns. By elevating the baseline level of energy literacy and product familiarity in high need areas, such campaigns can reduce the level of effort currently born by MFIs and their product partners, thus expanding the market base and accelerating penetration.

2. FOSTER LINKAGES BETWEEN GOVERNMENT ENERGY TRAINING INITIATIVES AND ENERGY MICROFINANCE PRACTITIONERS.

The future growth and diversification of energy microfinance is constrained by the availability of a skilled energy workforce in the remote and rural communities that MFIs serve. This need will only become

more significant as larger MFIs seek to diversify their energy businesses through independent ventures that offer energy solutions that are more technically complex than solar retail products. Government initiatives focused on energy sector skilling and job training could be leveraged to fill critical labor supply gaps that limit energy microfinance growth. The National Institute of Solar Energy (NISE), launched under the auspices of the Ministry of New and Renewable Energy, has implemented the Suryamitra solar technical training program throughout the country to accelerated labor market readiness in this critical sector. MFIs engaged in energy business activities could benefit from this initiative, both by employing trainee graduates, and by seeking admission into the initiative's training programs for its existing energy field staff. MNRE and NISE could explore a formal partnership with energy microfinance practitioners through which tailored training offerings could be designed to meet the evolving labor and skill needs of these MFIs.

3. SUPPORT ONGOING TECHNICAL ASSISTANCE RESOURCES FOR MFIS SEEKING TO ENGAGE IN AND GROW ENERGY PRACTICE

Energy microfinance continues to gain greater prominence in the sector as a whole, as the successful experiences of institutions gain visibility and attract interest, and as the rewards and risks of the energy lending business becomes more widely understood. The critical influence of technical assistance programs, including but not limited to PACE-D MSP, in supporting this trend cannot be overlooked or understated. Such resources help MFIs overcome barriers and risks to participation by helping MFIs build necessary internal expertise and capacity, and better understand and approach the business and impact opportunities of energy microfinance within the context of their own clients and operations. Such programs also perform vital roles in promoting energy microfinance more broadly across the sector, and cultivating attention and engagement among investors and other financial supporters; activities that many institutions do not possess the bandwidth, expertise or interest to lead internally. Therefore, the Government of India could allocate future resources and investments to ensure that technical assistance for energy business development remains available in the future to enable MFIs of various categories to engage, learn and prosper in the energy access space.

4. IMPLEMENT AND MAINTAIN PUBLIC QUALITY ASSURANCE STANDARDS FOR ENERGY PRODUCT AND APPLICATION CATEGORIES.

Through close and regular contact with energy poor clients, MFIs can readily identify strong latent demand for improved energy products, but the capacity to assess and select appropriate, reliable products and product providers presents a separate challenge. The need remains for independent, current and accessible resources with which MFIs (and other channel entities) can measure and compare performance and quality across a range of energy product and application categories in order to make informed decisions. The Ministry of New and Renewable Energy (MNRE) possesses the resources, standing and mission objectives to potentially perform this function, or to partner with other government and non-government parties to advance an independent entity to do so. The presence of such an entity, adequately resourced and made easily accessible to the public, would reduce technology related uncertainties and increase the confidence and decision-making efficiency of MFIs and other channel entities engaged in energy promotion and finance.

5. APPLY TARGETED INCENTIVES TO SPUR EARLY ADOPTION FOR NEWER, HIGH COST ENERGY APPLICATIONS.

A commonly held view of PACE-D MSP partners is that energy product subsidies risk distorting rather than building markets, and that the sector is well positioned to succeed on a commercial basis without them. The success of PACE-D MSP MFI partners to date has largely validated this perspective, at least in relation to solar retail product promotion and finance. However, there are areas of potential MFI activity where financial incentives can have a market-building impact; namely for larger, more expensive applications that MFIs have not yet promoted extensively, or at all. This includes solar irrigation applications and higher capacity stand-alone and grid integrated solar rooftop applications. Some PACE-D MSP

partners have noted that small interest rate, capital or performance based incentives that bring down the upfront or ongoing cost of investment could effectively be applied to strengthen demand among clients. Such incentives could also be time limited in order to encourage early adoption and scale up, and thus accelerate cost reduction, learning curve advancement and demand maturation.

6. PROVIDE SMALL, COMMUNITY-BASED MFIS IN REMOTE, UNDERSERVED AREAS WITH ACCESS TO LOAN CAPITAL FOR ENERGY LENDING.

While representing only a small share of India's total microfinance portfolio, small, community-based NGOs and NBFC's that operate in the most remote parts of the country have a unique role to play in advancing energy access in regions where energy poverty is most severe and chronic. Among MFIs, it is these organizations that are often the most proactive in pursuing energy as a program area, and the most willing to experiment and diversify their activities. Because of their comparatively small scale, and lower turnover and rates of return, these organizations often struggle to secure capital from conventional sources, most notably commercial banks, which favor larger, and more profitable and commercially sophisticated institutions. The Ministry of New and Renewable Energy or other government agencies could help close this capital gap by establishing of a dedicated financing facility for smaller NGO MFIs. Eligibility to avail such a facility could be restricted to institutions operating in government designated priority areas where the grid is least likely to penetrate or where reliability will remain a challenge in the long term.

7. INCENTIVIZE GREATER MFI PARTICIPATION IN ENERGY WITH PILOT STAGE LOAN GUARANTEES TO LEVERAGE LOCAL CAPITAL MARKETS.

Energy microfinance is becoming increasingly common as the success of leading MFIs gains visibility. However, the fact remains that most Indian MFIs, including many of the largest, currently do not promote or finance energy. A loan guarantee fund for pilot stage projects could help offset persistent reservations that many MFIs still harbor regarding the perceived risks associated with energy products and lending. Such a tool would encourage more institutions to test the waters, invest in necessary capacities, and experience initial success at a lower risk. It could also serve as a programmatic channel through which best practices related to model design and risk mitigation could be documented and transmitted to new practitioners.

Microfinance and Energy Access in India: A Guide for Energy Policymakers is offered as a resource for understanding how these factors create space for the sector's greater engagement and impact within the energy access space. PACE-D hopes that it provides the reader with valuable perspective and ideas for policy makers and proponents at an exciting and critical time in India's historic energy transition.

“

India is absolutely well set to prepare itself for the grid in a manner never done before in the world. We are not going to follow what the others tell us to do. We are going to show the world how it can be done smarter.”

—Piyush Goyal, Minister, Indian Ministry of Power and Coal,
CII Annual Session, April 27, 2017



INTRODUCTION

There is no shortage of data from the last few years that can be highlighted as evidence that Minister Goyal’s projections about India’s electricity future are well on their way to becoming a reality, and, indeed, are happening “in a manner never done before in the world.” With each passing quarter, as new generation capacity, interconnection, and cost milestones are reached and surpassed, the initial skepticism - once widely held both domestically and globally - about India’s ability to make good on its many bold 21st century energy goals are giving way to confidence, and, increasingly, no small measure of awe.

India’s new energy exceptionalism is multi-faceted. Speed, scale and strategic novelty are its definitive hallmarks. In short, India is not only moving forward with its energy transformation on a massive stage and at a pace previously thought by many to be impossible, it is also doing so via pathways that have limited precedent globally. Collectively, these pathways reflect (echoing Minister Goyal) a distinctly indigenous playbook based on the country’s unique imperatives, endowments and constraints, rather than imported received wisdom on how energy and economic development should proceed.

The changing makeup of India’s expanding power supply is a critical part of this unfolding story. In 2015, at the Paris Climate Conference Prime Minister Narendra Modi declared: “Today the world must turn to the sun to power the future. ... We want to bring solar energy into our lives and homes by making it cheaper, more reliable and easier to connect to the grid.”

Prime Minister Modi’s words in Paris were backed by concrete commitments and specific policies designed to realize them: 175 GW of new renewable energy capacity installed by 2022, including targets for solar photovoltaics (100 GW) and wind (60 GW). Two years later India is on track to meet these commitments well ahead of schedule. Solar capacity has doubled each year, and by April 2017 had crossed the 12 GW mark. By the close of fiscal year 2017-18 an additional 10 GW will be added, breaking the previous year’s record. As of March 31, 2017, the total grid-connected renewable power capacity in the country has reached 57,260 MW (Djordjevic, 31 March 2017).

In terms of making solar cheaper, the record so far has been equally, if not more, impressive and consequential. The singular scale of India's solar uptake is rapidly driving down costs. Since 2014, following successive rounds of competitive tenders nationwide, the average kWh price of utility-scale solar power has fallen from INR 7.8 (USD 0.12) to less than INR 3 (USD 0.04), with a record low of INR 2.44 set in May 2017 (Djordjevic, 15 May 2017) and is now cheaper than electricity generated from coal, the dominant fuel powering India's thermal fleet (Reuters, 8 June 2017). The historic magnitude of this event is difficult to understate as it has equally profound implications for the future of coal as it does for solar. In June 2017, Coal India, the world's largest coal company, announced that 37 of its mines (representing 9% of all domestic sites) will be decommissioned by March 2018 (Reuters, 8 June 2017). This followed the government's announcement a month earlier that 13.7 GW of planned thermal coal plants would be cancelled, and that no new additional plants will be constructed after 2022.

This is an extraordinary development given that electricity demand in India is growing faster than in virtually every other major economy in the world, and that India alone is projected to attract 10% of total global investment in energy between now and 2040 (BNEF, 15 June 2017). It is clear that growth and investment will not in any significant way involve coal, which until very recently was assumed to be the indispensable driver of India's electricity and economic future. Perhaps the healthiest indicator that India's renewable energy transition is on a sustainable and potentially irreversible course is that it is being financed by some of the largest banks, investors and commercial interests in the world. The nation's ambitious reach to achieve climate and energy security is attracting and generating wealth, not sacrificing it.

The addition of renewable generating capacity is one facet of India's energy paradigm shift. Parallel investments in transmission and distribution are occurring on a similar scale, enabling and optimizing the integration of renewables with India's evolving and expanding grid. Energy efficiency and conservation strategies are transforming the market for lighting and appliances, and thus allowing fewer kWh to deliver more value to a growing population with escalating energy demands at a lower cost. The Government's Unnat Jeevan Buy Affordable LEDs and Appliances for All (UJALA) scheme, for example, is arguably the fastest, least expensive and most successful efficiency conversion intervention in history. As of July 2017, nearly 250 million subsidy-free 7 and 9-watt LED bulbs have been distributed through the initiative.²

Central Government efforts have not been limited to energy infrastructure and demand-side consumer interventions. Policy is also focused on the need to modernize and improve the fundamental commercial viability of the country's energy supply backbone. Most prominent in this area is the Ujwal DISCOM Assurance Yojana (UDAY) debt restructuring and bond initiative launched in 2015. UDAY is improving the financial standing and reducing the AT&C losses of India's chronically distressed state distribution companies (DISCOMs) by reducing the cost of capital for DISCOMs, increasing operational efficiencies, and imposing greater financial discipline and accountability.

The latest and possibly the most ambitious proposal articulated by the Central Government is the recent announcement in May 2017 that India will strive to eliminate nearly all petroleum-based automobiles from the road by 2030, in favor of a 100% battery-powered electric fleet. The proposal is remarkable for its scale and timeframe alone, but also marks a sharp departure from e-vehicle support policies that have been advanced in most developed economies in that it will not be consumer-subsidy driven. Rather the strategy will turn on a novel “made in India” lease-based battery swap model that will drastically reduce the battery price premium for automobile owners, while giving rise to a whole new battery service industry.



To outside observers accustomed to incrementalist and subsidy-based approaches, the proposal may seem shockingly unfamiliar and unrealistic. However, through the lens of India’s specific challenges, goals and resources it makes profound sense in at least three different ways. First, scaled up, plugged-in, and distributed vehicular battery capacity will help balance a grid increasingly dominated by intermittent solar and wind. Second, the phasing out of tailpipe emissions will not only cut carbon, but also significantly resolve India’s urban air pollution crisis. And third, cutting petroleum imports will dramatically improve India’s balance of payments.

The other part of the story of India’s energy revolution that is both unprecedented and truly radical involves ends as much as means. For over a generation global energy and climate policy discourse has been implicitly dominated by the assumption that the embrace of low carbon energy must necessarily come at a cost to economic growth and development. While this long-standing bias has eroded substantially in recent years as the installed cost of solar, wind and now battery storage have precipitously declined worldwide, what is happening in India today just might represent the historic moment when this assumption is comprehensively and permanently dispatched. India, soon to be the most populous nation on earth in which 1 in 5 people today live in poverty and nearly 300 million people lack access to grid electricity, is pursuing a clean energy future not in spite of its development priorities, but rather because of them. And in 2017 the economic argument for this position is clear: renewable energy capacity can now be deployed cheaper, faster and on a wider-scale than conventional fossil fuel energy infrastructure, and it leverages India’s vast, local and inexhaustible resource base, rather than increasing dependency on expensive imported and diminishing sources of energy.

As higher capacities of renewable energy have come online each month in an attempt to keep pace with growing demand, India’s grid has simultaneously reached thousands of rural districts, blocks and communities for the first time. The Central Government’s Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) scheme has been the main policy driver accelerating this expansion since 2015. The specific Power for All target to connect 18,452 villages by May 1, 2018 is matched by a “24/7” availability and reliability goal. According to the Government’s online Garv dashboard, which provides up to date electrification data which track the achievements of DDUGJY relative to 2019 objectives, as of July 2017, connectivity goals has been achieved for nearly 75% of targeted villages.


The magnitude of this achievement is a powerful measure of India's rapid energy transition, and underscores how poverty reduction and economic development, along with climate protection, are the basis of its signature urgency. However, while progress is visibly manifest in the life of rural India today, the experience of DDUGJY, like that of the many government initiatives that have preceded it, has also revealed the intractable technical and economic limitations that centralized grid expansion encounters as a mode for universal electricity access in the India. The augmentation of sub-transmission and distribution infrastructure, interconnection subsidies for below poverty line (BPL) households, improved metering and collection, and other measures to reduce system losses and improve performance delivered under DDUGJY have and will continue to drive massive improvements at the village level. However, at the level of the individual household or workplace, much progress remains to be made, and it is increasingly clear that the demand and supply-side cost barriers that arise and accumulate with efforts to extend, maintain and extract payment for distribution and power in last-mile, low-density, low-income contexts may be impossible to completely overcome through conventional, centralized means.⁴ In a June 2017 Draft National Energy Policy document, the Government of India policy think tank NITI Ayog identified the extent to which DDUGJY, and its predecessors, have fallen short in realizing rural household electrification, and the limitations of measuring progress based on the village-scale:

Studies have revealed that in spite of major strides made by the earlier schemes in providing connections and now, DDUGJY, the problem of electricity 'access' did not improve appreciably. An inherent challenge in the process is ensuring the coverage of households as opposed to only villages. Several states with high electrification rates still have poor household electrification, and certain hamlets, not covered in the national sample surveys and the DDUGJY, housing a considerable section of the populace, are also without access to energy (NITI Ayog, 17).

Rather than relenting to these limitations, India - consistent with all other dimensions of its energy transition (and Minister Goyal's recent declaration) - is poised to pursue an alternative way forward which may "show the world" how rural electrification "can be done smarter" - which is to say, cheaper, faster and more sustainably. This way forward will inevitably involve the scaled deployment of diverse, distributed, highly localized clean energy modalities that work in conjunction with centralized power infrastructure to collectively meet the specific and changing needs of different population segments and income groups. This latter point is critical as it contrasts sharply with the long-standing conventional view that assumes the existence of two distinct and separate "off-grid" and "on-grid" spheres. That dividing line is already blurred, if not erased, throughout much of India today, and has given way to a much more complex reality in which centralized and distributed energy modalities can and do co-exist at the district, village and even household scale.

As with large-scale renewable energy capacity and transmission, India is now a global innovator and leading deployer of a growing range of distributed clean energy products and service platforms, including, but not limited to, portable solar lights and stationary home systems, solar irrigation pumps, as well as micro and

mini-grids that range in capacity from a few hundred watts to several hundred kilowatts. Perhaps more significantly, the collective emergence of innovative product and service development around the particular needs and demands of a growing number of market segments is giving rise to a new paradigm in India in which these and future distributed modes will coexist, overlap and sometimes compete with each other and with grid power for the indefinite future. In this new ecosystem, end-users are not purely “off-grid” or “on-grid”, but rather accumulate and manage a changing portfolio of energy solutions that are available to them and meet their economic and performance needs. In this paradigm, distributed energy modalities do not represent a temporary prelude to a universally available central grid, but rather a more permanent component of long-term energy access in certain contexts.



Energy products and services must be affordable, desirable and accessible to end-users, and the companies and organizations that bring them to market, alone or in partnership, must achieve financial and operational sustainability if they are to deliver continuous value at scale.”

However, distributed generation technology comes with its own significant challenges. Energy products and services must be affordable, desirable and accessible to end-users, and the companies and organizations that bring them to market, alone or in partnership, must achieve financial and operational sustainability if they are to deliver continuous value at scale. This means high levels of private and public investment, a supportive market ecosystem and policy environment, and constant innovation to reduce costs, and increase efficiency and competitiveness. Achieving this represents no small feat in the context of last mile India. However, one of the distinct advantages of distributed energy, in contrast to incumbent centralized energy, is that its evolution, improvement and proliferation is fueled by the resources, creativity and initiative of the many, rather than the few, and that diverse actors can enter the arena to solve problems, spur innovation and fill gaps in order to advance access as a whole. This fact, born out vividly in the recent global history of distributed renewable energy, plays directly to some of India’s greatest strengths and outlier characteristics: size, diversity and complexity. When distributed renewable products and services appear in the Indian market, even as concepts, they are surrounded by an almost limitless variety of potential co-creators from the private, public and civil society sectors, not to mention end-users, who exert their own creative influence through specific choices and behaviors.

Financial institutions that serve low-income, unbanked populations are among those entities that have enormous potential to support the growth and sustainability of distributed energy in India. These institutions possess resources and capabilities that can be productively applied to overcome many of the barriers that limit such growth. The aim of this report is to demonstrate how the microfinance sector, one of the most vital and significant players within India’s financial inclusion landscape, fits into this picture and the overall project of eliminating energy poverty in ways that align with the broader contours of India’s historic energy transformation.

India’s microfinance sector, the largest in the world in terms of both clients served and loan portfolio size, first emerged to meet demand for financial services, most notably credit, among poor urban and rural women who were not being served by mainstream banks because of the high associated risks and costs. Since its earliest development in the 1970s, the sector has grown, diversified, and become increasingly commercially sophisticated over time, and along the way has pioneered and adapted outreach and lending methodologies that balance the unique financial needs of poor people with the imperatives of business survival. These

characteristics, and the sector's record of success and resilience in the face of change and crisis, provide a valuable reference point for any entity or business that endeavors to serve poor and last mile markets in any capacity, and this certainly includes distributed energy.

Today's microfinance sector is in a period of significant transition, characterized by regulatory reform, institutional consolidation, growth, geographic expansion, and product diversification. These changes are converging with parallel transformations in the distributed energy sector to widen the pathway for the participation of Microfinance Institutions (MFIs) in the energy access space. Today, a growing number of MFIs active throughout India are engaged in different forms of energy microfinance, supporting affordability and access to improved energy products for their diverse client bases. Many of these activities have centered on the promotion and finance of small solar lighting products, but as experience, confidence and lessons have accrued to early and committed practitioners, it is increasingly evident that the sector has an important future role to play in advancing more diverse products and services at a larger scale.

Since 2015, the USAID funded PACE-D Microfinance Support Program (MSP) has been both witness to and catalyst of this development through its technical assistance activities in partnership with seven different Indian microfinance institutions. In this capacity, the program has gained important insights into the drivers, business variations, success factors and future trajectories of energy microfinance practice in India. This report will serve as a resource for a general audience interested in the subject, but has been specifically prepared for energy policymakers who aim to increase their understanding of the current and potential future relevance of microfinance within the energy access space, and how the sector might support central government and state level objectives. The report consists of five sections.

SECTION 1 provides a landscape overview of the contemporary Indian microfinance sector, including historical background, an overview of key features, trends and ongoing changes that are relevant to future and current sector engagement in the energy access space. The section concludes with a survey of sector and institutional characteristics and norms that put it in a strong position to have an impact.

SECTION 2 draws on the real world experiences of PACE-D MSP microfinance partners and other energy microfinance practitioners to define the key value additions that microfinance and MFIs bring to energy access effort: affordability, access, acceptance and institutional diversity. The section concludes with short profiles of three specific energy microfinance programs that are managed by PACE-D MSP MFI partners.

SECTION 3 presents emerging and potential future directions for energy microfinance, in terms of energy product diversification and new operational approaches will be explored. These projects reflect areas of new practice currently being explored and piloted by PACE-D MSP MFI partners.

SECTION 4 offers a set of recommendations for consideration by government policymakers that would support the growth and continued evolution of energy microfinance in India, and its capacity to link with and advance government energy access objectives.

The content and findings of this report are the product of extensive interviews with diverse energy microfinance stakeholders, including the management and leadership of PACE-D MSP MFI partners and other energy microfinance practitioners, REMMP MFI partners, PACE-D MSP technical assistance staff, leading energy product companies, microfinance self-regulatory organizations (SROs), and energy policy experts. The report also draws on client feedback and data collected by PACE-D MSP monitoring and evaluation staff through client focus groups and phone surveys, as well as a review of extensive published resources pertaining to the Indian microfinance and the power sectors, their histories, current composition, and the regulatory, technical and market dynamics that continue to influence their transformation.





1 | THE EVOLUTION OF MICROFINANCE IN INDIA AND THE ENERGY ACCESS OPPORTUNITY

SUMMARY

Looking back from the perspective of 2017 the story of microfinance in India has been one characterized by successive periods of rapid commercial evolution and growth, institutional diversification, and considerable resilience in the face of internal and external transformations and crises. The sector has an impressive record of not only weathering the doldrums of abrupt and gradual change, but also emerging from them more strongly positioned and better adapted to new conditions than before. The present period, marked by resurgent portfolio growth and expanded client outreach, as well as increased institutional consolidation and stratification, owes much to the regulatory, normative and business practice reforms that have followed in the wake of the Andhra Pradesh crisis of 2010, and in response to more pervasive economic, social and technological shifts taking place in India as a whole.

As Indian microfinance continues to evolve, the opportunities for MFIs to participate in energy access finance and promotion and to effect positive outcomes in alignment with national goals will expand and diversify accordingly. This section provides an overview of the sector with an emphasis on key characteristics and trends that have bearing on its present and possible future engagement in the energy space.



MICROFINANCE WITHIN INDIA'S FINANCIAL INCLUSION LANDSCAPE

The microfinance sector's current and potential relevance to India's energy access outlook is best understood in reference to specific conditions that have come to define and distinguish it both within the domain of Indian financial inclusion and global microfinance more broadly.

SECTOR ORIGINS

India has a long history of financial inclusion initiatives and support undertaken by government, civil society and the private sector dating back to the pre-Independence period. As a consequence of this legacy, today's microfinance institutions operate and co-exist within a diverse eco-system that includes regional rural banks (RRBs), commercial banks, credit cooperatives and other formal and informal entities that provide low-income rural and urban clients with access to financial services, including credit, savings, insurance, pensions, and remittance transfer.

The emergence of Indian microfinance began with the growth of informal self-help groups (SHGs) in the 1970s, which first established the core collective group unit, solidarity mechanisms and gender focus that subsequently became, and to a large extent remain, the basis of microfinance lending, risk management and client engagement.⁵ SHGs proliferated widely throughout rural India during the 1980s largely through the efforts of pioneering NGOs that promoted and facilitated groups in last mile communities untouched by formal banking institutions. Deploying group-based member selection, solidarity and peer accountability in lieu of collateral is the central innovation of the SHG model that opens up access to credit for poor, unbanked members. Beginning in 1992, NABARD vastly extended the impact and scope of this model in India with the introduction of the SHG Bank Linkage Programme (SHGBLP). The SHGBLP enabled SHGs to deposit savings with banks in the name of the group, which could also then be leveraged to access bank credit. By 2016, more than 7.3 million groups were depositing savings with banks, and 4.5 million groups were borrowing (representing approximately 58 million people). It is important to note that many of these SHGs provided a range of services to members beyond just credit, including training and market linkages, and serve as an inspiration for current client-centric efforts including financial literacy training.

The economic liberalization reforms initiated in 1991, as the SHGPLP was first being formulated, had significant consequences for the trajectory of financial inclusion in India, and specifically helped catalyze the emergence and growth of modern microfinance over the following two decades. As the banking sector opened up and diversified, poor and rural populations remained, on the whole, largely excluded from the direct impacts of this transformation. This was primarily due to the high risks and costs that are associated with serving low-income populations that are remote and/or engaged in the informal economy. The financially excluded, numbering in the hundreds of millions, require small, frequent transactions, lack physical and financial collateral, and command low margin potential as a market segment. Early microfinance institutions, initially dominated by non-governmental organizations, entered this void equipped with group-based, joint-liability outreach and

lending methodologies derived from the SHG and Grameen banking models to provide poor women with credit for informal income-generating activities.

THE EVOLUTION OF MICROFINANCE INSTITUTIONS (MFIS)

The delivery of group-based finance necessitated a high degree of embeddedness in last-mile communities that the banking sector had not been able to achieve. As the popularity, high rates of repayment and positive impacts of microfinance gained visibility, the status and reputation of microfinance steadily garnered attention and support from donors as well as public financing entities, most notably the Small Industries Development Bank of India (SIDBI). Beginning in 1994, with the launch of its Micro Credit Scheme, SIDBI provided infusions of capital that enabled early NGO MFIs to scale up their lending operations and portfolios.

However, the limited absorption capacity of many small organizations was revealed during this phase, underscoring the need for institutions to evolve commercially and operationally as a precondition for future scale and sustainability. To this end SIDBI created the SIDBI Foundation for Microcredit (SFMC) in 1999 to develop and nurture a financially viable, growth-oriented professional microfinance sector in India. Over the ensuing decade, SFMC helped cultivate a network of 150 partner MFIs, comprising a mix of informal societies and trusts and private NBFCs. As the commercial opportunity and success of these institutions became increasingly evident, the nascent sector enjoyed an influx of professionals with formal mainstream financial sector experience, which, in turn, helped hasten the commercialization of microfinance and accelerate the conversion of a growing number of MFIs from NGOs into for-profit NBFCs.

At the same time, the Reserve Bank of India (RBI) recognized the potential for microfinance as a mechanism to financially empower the poor and enacted a set of measures to make it easier for MFIs to operate in a financially sustainable way by liberalizing interest rates in 1998. These efforts continued in 2004, when the RBI certified microfinance as a priority sector. As institutions barred from collecting and mobilizing savings deposits, the change opened up access to new previously unavailable sources of low cost capital from mainstream banks. This immediately fueled the rapid growth of dozens of institutions, favoring the largest and most commercially sophisticated. At the time that priority sector lending for microfinance was instituted, the microfinance sector, as a whole, had outstanding portfolios of approximately INR 248 Cr (USD 50 million), and was reaching less than two million people. By 2010, the sector's portfolio exceeded INR 24,750 Cr (USD 5 billion), and its client base had reached nearly 27 million borrowers. (SIDBI 10)

FROM CRISIS TO RESURGENCE

In October 2010, in the midst of growing reports of borrower over-indebtedness the state government of Andhra Pradesh introduced an ordinance dictating immediate restrictions on the operating and lending activities of area MFIs. This resulted in a steep and immediate decline in loan repayment, and the imposition of costly operational burdens for MFIs. Portfolio quality suffered dramatically and because Andhra Pradesh was the epicenter of Indian microfinance and accounted for a large share of sector gross loan portfolio (GLP), this local event reverberated

nationally, quickly throwing the entire sector into crisis. The resulting strain on collections and revenue, combined with uncertainty surrounding when and how it would be resolved, capital supply from banks froze almost overnight for MFIs, large and small. By March 2012, the sector's client base had contracted by about a third. Nearly INR 4950 Cr (USD 1 billion) worth of financial assets in the form of microfinance loans were lost, and virtually the entire Andhra Pradesh portfolio became unrecoverable. (Sinha, et al, 6)

The widely held diagnosis that emerged during the period was that a small number of leading institutions had grown too big, too quickly and along the way had become unmoored from the social development mission upon which the sector was founded. District-level oversaturation had led to too many MFIs competing for too few clients, with little oversight between them, causing widespread over-borrowing and over-indebtedness. Growing equity investment in the largest, fastest growing MFIs had elevated pressure to expand and increase profitability. Interest rates were viewed as high relative to commercial bank lending rates (even though the cost of microfinance was much higher than that of banks). Some MFI staff were charged with employing aggressive recollection methods.

In response to the crisis, the RBI convened the Malegam Committee to study its causes, and propose measures to stabilize the sector and reduce risks that might contribute to future crises. The Malegam Committee Report, produced in January 2011, marked the beginning of a series of interventions by the RBI, accompanied by internal measures advanced from within the sector, that have helped contribute to the latter's remarkable recovery and reconstitution today. The reforms described below have helped restore the financial and reputational standing of microfinance in India, and consequently, the sector has regained and now exceeded its pre-crisis dimensions, in terms of portfolio size, client outreach, and geographical spread. Other performance indicators are further testament to the sector's improved health. By 2016 microfinance had regained an average on-time repayment rate of more than 99 per cent, while portfolio at risk (PAR) had consistently remained at around 1 per cent (Srinivasan, 112).



Long-standing critiques of the industry's pricing practices, which have been influential in shaping public and government perceptions of microfinance, have lost validity as microfinance interest rates have declined across the board since 2010, owing to increased efficiencies and scale. Data from MFIN, the MFI Self-Regulatory Organization, and 56 NBFC-MFI members indicates that the average interest rates have fallen from 36.79% in 2010 to as low as 19.8% today, with annual declines of 10%-16%. By contrast, the average rate of interest offered by Indian private sector banks in 2016 was 26% (Misra, 28). The combination of growth with these favorable performance metrics is helping to blur the line between the microfinance and mainstream banking sectors. Misra (2017) observes "as NBFC-MFIs have continued to raise the bar and lower the interest rates, making Indian Microfinance one of the most efficient markets in the world, the demonstrated business model is attracting new players to lend to the same segment."

Finally, in sharp contrast to the position of microfinance during its earlier phases of development, microfinance is now widely seen by the government as a valuable and even vital instrument for advancing financial inclusion in India, as well

as other development objectives. This is perhaps best signified by the launch of the Micro Units Development & Refinance Agency Limited (MUDRA) Bank by the central government in April 2015, and the subsequent awarding by the RBI of eight out of ten first batch Small Finance Bank (SFB) licenses to large NBFC-MFIs in September 2015. In April 2016, in a further indication of support for the sector, the RBI granted NBFC-MFIs permission to act as channel agents for the distribution of loans under central and state schemes, exempting them from qualifying asset criteria (Sa-Dhan, 25).

SECTOR TRANSFORMATION AND IMPLICATIONS FOR ENERGY MICROFINANCE

In aggregate, this turnaround reflects the efficacy of government policy response, the resilience and adaptability of the sector, and the enormous demand that exists for microfinance services among the poor and unbanked. In the last 5 years, new trends and transformations have reshaped Indian microfinance in important ways. These changes, still unfolding and highly interdependent, have implications not only for the present course of microfinance, but also for the future position and prospects of energy-based activities within the sector. The following section summarizes these change factors, and offers an assessment of how they currently or potentially may influence the conditions that determine MFI participation in the energy access space.

SECTOR REFORMS AND REGULATIONS

Since 2011 the Reserve Bank of India (RBI) has issued a series of new guidelines and regulations aimed at reforming the microfinance sector which are specifically aimed at reducing risks that contribute to crisis, protecting clients, and supporting steady and balanced growth. For leaders of all ranks within the sector, these reforms have been, on the whole, broadly welcomed, and indeed, many were advocated for by the sector even prior to the A.P. crisis.

A number of the new client protection guidelines are focused on preventing client over-indebtedness. These include loan size and term limits for first cycle and subsequent cycle clients, as well as a rule that no more than two MFIs can lend to the same borrower at any given time. Compliance with the latter rule is facilitated by the growing role of credit bureaus (CB), such as CRIF High Mark Credit Information Services and Equifax, which gather and update credit data on borrowers on a weekly basis. This data can be drawn by MFIs on as part of their assessment process. MFIs, for their part, have widely incorporated CB data analysis into their operations, a shift that has been aided by general upgrades in ICT and MIS systems throughout the sector.

The sector's two self-regulatory organizations, MFIN and Sa-Dhan, have also assumed a greater responsibility in promoting compliance among MFI members with these and other regulations, as well as values and best practices that generally support client protection and financial stability. Most notably, the SROs have revised the industry Code of Conduct to reflect RBI guidelines, and to explicitly codify sector adherence to the principles of responsible finance and client-centricity. Key elements of the revised Code include: a renewed emphasis on integrating "double bottom line" values into operations; enhanced social impact monitoring

New client protection guidelines are focused on preventing client over-indebtedness. These include loan size and term limits for first cycle and subsequent cycle clients, as well as a rule that no more than two MFIs can lend to the same borrower at any given time.

and reporting, subject to regular board review; improvements to and expansion of client feedback and grievance mechanisms using client-available ICT; introduction of staff procedures and incentives to promote ethical and fair treatment of clients; and increased transparency and clarity of terms and conditions for services rendered to clients. In aggregate, the sector's embrace of these changes is seen by many observers to represent a course correction and return to the original social development values upon which the sector was founded decades ago.

While these protection-based reforms do not directly pertain to energy microfinance, per se, the values and norms that they work to engender improve the overall governance of the sector and its viability as a platform for reaching and assisting poor clients across multiple service dimensions, inclusive of energy promotion and lending activities.

Furthermore, it can be argued that the reassertion of "client-centricity" as a guiding value has helped give lift to a more expansive reappraisal among some MFIs of the scope of their work and the impact they aspire to have on the lives of their clients. The "credit plus" movement, which stressed the importance of including a range of financial instruments beyond bread and butter business loans, dated from the early days of microfinance. The credit plus approach reinforced the notion that MFIs should leverage their reach and relationships with clients to advance a broader set of social and developmental objectives, beyond the provision of a limited set of financial services, harkening back to the roots of microfinance as a tool to financially empower the poor. Energy lending, to a great extent, is a manifestation of this view, that sits along side other activities, including the finance and promotion of housing, clean water, sanitation and education, and other essential services. Additional development focused, non-credit activities have also become more common, reflecting mission driven program diversification. By the close of 2015, more than half of SRO member MFIs delivered job training, livelihood protection, and financial literacy training initiatives, and an almost equally high percentage offered preventative healthcare services (Ernst & Young, 21).

Arguably the most significant RBI regulations that have had both direct and indirect effects on microfinance generally, and energy microfinance, specifically, are those that relate to the MFIs' primary sources of revenue. In February 2014, the RBI removed the temporary 26% interest rate cap that it had placed on loans from microfinance institutions. However, in doing so, the RBI stipulated that large MFIs should establish lending rates by calculating their cost of funds plus a maximum 10% margin or the average base rate of the five largest commercial banks by assets multiplied by 2.75 times, or whichever is lower, for smaller MFIs the cap was 12%⁶. The introduction of this margin cap, in general, has forced MFIs to do more with less, explore new cost saving methods and technologies in their operations, and also partially explains the sector's near-term growth in lower-cost urban markets.

An indirect but important consequence of the margin cap, which has immediate relevance to MFI engagement in energy, is that it has increased the appeal or even necessity of cross selling as a business strategy. As the cap has squeezed profits from interest margins, MFIs have increasingly sought out new revenue streams. The strength of MFI outreach in last mile and informal communities is a powerful

advantage that can be leveraged to earn margins from the promotion and sale of non-credit financial services, such as insurance, but also a range of other goods and products, of which energy devices, such as solar lanterns and improved cook stoves, can increasingly be counted. The RBI's additional rule limiting processing fees to no more than 1% of gross loan amount has further deepened, though less significantly, the appeal of cross-selling for MFIs who must now pursue additional means to cover their costs and maintain profitability in markets that are inherently expensive to serve.



To summarize, the general trend towards diversification beyond core enterprise lending - of which energy lending and promotion is a part - is being driven by both mission and bottom line factors. On the one hand, the aspiration to increase client impact and deliver value based on client demand. On the other, the imperative to diversify revenue sources in order to keep afloat in a competitive market in which profits are regulation constrained.

Two additional and more recent RBI decisions issued in April 2015 are worth noting for their influence on the sector at large, and their potential effect on energy microfinance. The first is the ruling to increase the maximum loan size for microfinance loans from INR 50,000 [USD 780] to INR 100,000 [USD 1,560] for non-first cycle clients. While at present there is little evidence that this guideline has yet had consequences for the state of energy-related practices, it has the potential to create opportunities for MFIs to finance larger and more expensive energy assets in the future. As will be explored in the following section, many energy microfinance practitioners have reached a stage in the maturity of their energy programs where client demand is now pointing in this direction. Therefore, the raising of the loan amount level may have removed a constraint on future business opportunities.

The second is a relaxation of the norm that microfinance loans must be exclusively used for income generation purposes. The new guidelines stipulate that housing repairs, education, medical and other emergencies, as well as other purposes can now comprise up to 50% of an MFI's portfolio, where such "non-qualifying assets" were previously held to 15% (Misra, 16). Energy loans can plausibly be defined in reference to more than one of these purposes. While for many of the energy products that have been most widely financed by MFIs to date (most notably solar lighting devices), income-generation can clearly be demonstrated, energy lending does not clearly fit within regulations pertaining to qualifying assets and definitions of "productive use." This relaxation of the prior standard gives MFIs greater latitude and certainty to pursue energy lending as a bigger part of their portfolios.

GROWTH AND GEOGRAPHIC EXPANSION

One measure of microfinance's restoration is gross loan portfolio (GLP) growth, which has been extraordinary since 2012. During the FY12–16 period, sector GLP grew at a CAGR of 48%, and as of March 2017, total loan portfolio of INR 106,916 Cr. (USD \$16.6 billion) (MFIN, 8). This growth trajectory rose sharply each year, surging to 84% in FY 2015-16. While average loan size increased by nearly 20% for the top 18 MFIs (representing nearly 90% of sector GLP), overall portfolio growth was driven more significantly by the addition of

new clients in established and new areas, reaching a 50% increase in 2015-2016 among this cohort (Misra, 83).

By May 2017, the total number of clients served by NBFC and non-NBFC MFIs crossed 35 million (Sinha, et al., 20). When factoring in the clients of Bandhan, which converted into a universal bank in 2015, but maintains a vast and growing microfinance operation, that number exceeds 43 million. Another sign of industry vitality is reflected in the total number of NBFC-MFIs now operating in the market, which as of April 2017 had reached 73, up from 54 in 2012, and 65 in 2015 (Sriram, 119). An additional 95 non-NBFCs, consisting of trusts, societies, cooperatives and other non-for-profit organizations were also engaged in micro-lending activities.

This level of growth is embodied in the collective operational reach of the sector today. As of June 2016, MFIs were operating in 30 states and union territories, and in 676 out of 707 districts, nationally (Sriram, 119). In 507 districts, 5 or more entities were providing group-based microloans (up from 430 the previous year). In aggregate, NBFC-MFIs commanded a total network of nearly 10,000 branches by the beginning of 2016, with 85,888 employees, two-thirds of which are front line loan officers (representing a 38% annual increase). (Misra, 76).

The geography of this expansion is highly relevant to the discussion of energy's future place within the sector. Microfinance, historically, has had a dominant presence in the Southern states of Andhra Pradesh, Tamil Nadu, and Karnataka, and, indeed, the region as a whole still accounts for 33% of sector GLP in 2017 (Sinha et al., 5). However, the South's relative share has declined from a peak of 52% in 2011. This owes in part to the steep decline and negligible recovery of activity in Andhra Pradesh following the crisis. But the far more important factor has been the expansion of both established and new microfinance institutions in the East and North. These two regions now collectively account for over 50% of total GLP, up from 35% in 2011. (Sinha et al., 5). Much of this increase has been achieved by West Bengal-based Bandhan alone, which, at the time of its conversion from an NBFC to a universal bank in 2015, constituted 23.75% of sector GLP (Misra, 82). However, newer entrants based in U.P., Bihar and Odisha have recently played a more significant role in expanding the coverage map in these adjacent regions.

With this shift in activity to the East and North, the microfinance sector has moved its center from a cluster of states where near universal household electrification has been attained to regions that include the least electrified, least grid-reliable states, and the largest total underserved populations. It becomes strikingly evident that in these areas the “energy poor” are exactly the same people as typical microfinance clients. In 2015, the starting year of the DDUGJY, just five states accounted for more than four-fifths of people without electricity access, four of which – Bihar, U.P., Orissa and West Bengal - were located in the North and East (Banerjee et al., 2). While significant interconnection and reliability progress has been made in the intervening period.

TABLE 1: ELECTRIFICATION RATES IN NORTHEAST INDIA MAPPED TO MFI PENETRATION

State	HH ⁴⁴ electrification rate (JULY 2017)	No. of HHS without electricity (JULY 2017)	No. of MFIs ⁴⁵ operating (2016)	No. and % ⁴⁶ districts with MFI operations (2017)	No. of MFI branches (2017) ⁴⁷	No. of MFI clients (2016) ⁴⁸	Percent client growth (2015 - 2016)
Bihar	45.88 %	6,652,348	21	38/100 %	856	1,931,000	60 percent
Uttar Pradesh	50.15 %	14,016,424	19	71/95 %	1,291	3,127,000	48 percent
Odisha	54.43 %	3,830,112	13	30/100 %	692	2,135,000	53 percent
West Bengal	99.08 %	127,581	14	20/87 %	1001	2,191,000	30 percent

Sources: Garv.gov.in; Misra 2017; Sa-Dhan 2016.

While regional and state patterns show a clear trend towards sector expansion, it is critical to underscore that the relative share of urban to rural microfinance borrowers, particularly among NBFC-MFIs that dominate non-bank microfinance, has increased both nationally and regionally since 2012. This development has obvious implications for the nature of energy demand among MFI clients. In 2015, rural borrowers represented 33% of the total client base, with peri-urban and rural borrowers accounting for 67% (Sa-Dhan, 16). This represents a nearly perfect inversion of 2012 proportions, when rural borrowers made up 69% of the total client base. This shift has been widely attributed to the impact of the RBI's interest margin cap, which puts cost pressure on MFI operations. Outreach to remote, dispersed rural communities is inherently more expensive than outreach to more densely populated areas. In spite of the extensive presence of the formal banking sector in more densely populated areas, demand for microfinance remains high due to continued reluctance by mainstream banks to cater to small borrowers.

However, for multiple reasons this recent shift should not necessarily be interpreted as a signal that energy microfinance is destined to decline in relevance in both the near and long term. The experience of PACE-D MSP partners reveals, contrary to conventional assumptions, that demand for distributed energy products, such as portable solar lights and home systems, is strong in peri-urban markets where grid penetration and interconnection rates are also high among clients. This is because the basis of demand for energy products among these segments is not the total absence of grid service, but rather lack of service reliability. Customers who have become accustomed to high quality light and the convenience of other household energy services (e.g. mobile charging) that the grid affords are more likely to develop a lower level of tolerance for inferior alternatives, such as kerosene (which is more prevalent in rural markets). When grid power is not available during productive hours, either on a predictable or unpredictable basis, end-users will aim to fill in (or "smooth") service gaps with solutions that provide comparable output and quality, such as solar LED devices.



For many microfinance clients who are engaged in home-based livelihoods for which productivity and income are directly related to the hours of availability and quality of light that they can predictably secure (e.g. tailors, weavers, bidi-rollers, etc.), the adoption of small distributed devices is less a matter of preference than economic imperative. This applies equally to clients engaged in professions where some activities must take place outdoors when the sun is down, such as food vending, livestock farming and fishing.

Second, while the urban/ peri-urban shift has been significant in the short-term, it is more a function of exceptional growth in these markets than of retraction in rural areas. In an overall rapid growth scenario, expansion in urban districts has greatly outpaced that occurring in rural districts. In the longer-term, however, the proportions may begin to stabilize and even swing back in the other direction, and there are some indications that this is already occurring.⁷ The RBI's two-lender rule, described above, could have a countervailing effect on the impact of the margin cap.

This regulation has the indirect effect of limiting the market carrying capacity of MFIs operating in a given area, and therefore promotes expansion to less competitive, saturated districts over time, including less densely populated ones. The growth and competitiveness of new small finance banks (SFBs) in urban areas will likely increase pressure on more NBFCs (as well as other SFBs themselves) to expand into more densely populated areas. And while adoption thus far has been uneven and gradual, efficiency and cost-saving operational improvements from current and future information technology and digital finance mechanisms should further mitigate the costs and risks of serving rural customers over time, across the board.

Energy lending and promotion activities may ultimately bring strategic advantages to MFIs that aim to expand into and improve their competitiveness within underserved rural areas. Demand for improved energy offerings for both household and productive use in this market is enormous and largely untapped. From a client-centric perspective, therefore, financing household energy products and productive equipment powered by distributed sources, such as solar irrigation pumps and cold storage, would help meet the primary needs of rural clients engaged in agriculture. Further, as a starting point in the client lifecycle, providing access to energy – a basic need with direct economic benefits – can increase client income and income-generating opportunities, and therefore create inroads to building and retaining regular microfinance borrowers. This latter phenomenon has already been observed in the case of one PACE-D MSP partner, the Mahashakti Foundation (MSF), whose novel non-profit village microgrid program in several tribal communities in Odisha has become, unexpectedly, a source of recruitment for new microfinance clients in a region where the organization previously did not operate. Microgrid access has increased household incomes, but also the standing of MSF in the eyes of the community, both of which have proved to be conducive to client conversion.

Finally, from a revenue perspective, energy products such as solar lanterns and home systems are also quite lucrative as they offer MFIs margins on both interest and products. The extra revenue generated from energy product transactions can

therefore potentially help offset the added operational costs that come with serving rural, last mile markets. The same could ultimately hold for a more diverse range of energy products and applications that are specifically relevant to rural livelihoods. Thus, for both demand and supply reasons, energy, as a distinct vertical, may represent an effective tip of the spear for institutions that wish to increase their rural outreach.



STRUCTURAL TRANSFORMATIONS IN MICROFINANCE

As noted at the beginning of this section, microfinance evolved from the innovative practices and early successes of mostly grant-dependent, non-profit social development organizations. By the mid-2000s, the sector had come to be dominated by for-profit NBFCs who possessed the capacity and business sophistication to increase efficiency, manage growth and ultimately achieve a high measure of financial self-sufficiency in an increasingly competitive environment. The sector's commercial evolution continues today in dramatic fashion as a result of post-AP crisis realignment, and broader changes in the Indian financial sector and economy, as a whole. An important feature of this current phase is the growing convergence between the mainstream banking sector and microfinance in the form of conversions to banks, partnerships, equity investment and acquisitions.


As already noted, Bandhan, previously the largest NBFC-MFI in India with nearly one quarter of the sector's GLP, converted to a universal bank in 2016. This was a momentous event in microfinance, given Bandhan's size. While now no longer in the ranks of NBFCs, nearly 99% of Bandhan's portfolio at the end of FY 2015-2016 was in the inclusive finance space, under the umbrella of its "doorstep service" division, and the bank's total microfinance portfolio grew by 28% in its first year (Sriram, 120). Bandhan has indicated that it will remain predominantly a microfinance lender, albeit one that can now raise and mobilize capital from a greater variety of sources, including deposits, of which it raised INR 120 billion (USD 1.87 billion) by the close of FY 2015-2016. Bandhan's conversion into a bank has direct implications for the future of energy microfinance because it currently operates a separate energy product promotion company that works in collaboration with its microfinance or doorstep service division. Support to develop this energy lending program was provided by Arc Finance under the USAID-funded the Renewable Energy Microfinance and Microenterprise Program (REMMP).

Given the stature and scale of Bandhan within the India's financial inclusion universe, this operation, which will be previewed later in this report, has enormous potential to raise the profile and standing of energy microfinance in India, and to pioneer the promotion of new energy products and services. As a bank, Bandhan is not subject to regulations applicable to NBFC-MFIs related to interest rates, loan size and term, which – paired with its considerable capacity to invest in energy-specific operations – could give it greater room to diversify and upscale the categories of energy applications that it chooses to promote and finance.

Similarly, SFBs, of which eight are former NBFCs, will account for 27% of microfinance lending in India once all are fully converted and operational by the close of 2017 (MFIN, 8). SFBs are able to raise capital from savings deposits like

banks, but, like NBFCs, are bound by higher priority sector lending requirements (75% of portfolio) and loan size restrictions, and are also permitted to provide unsecured group loans. The RBI has indicated that this initial granting of licenses marks the beginning of what will likely be an ongoing process of large, high capacity NBFCs converting to SFBs, ensuring a potential major adjustment of microfinance activities in the coming years (Sriram, 141).

The extent to which SFBs will gravitate towards energy business opportunities remains to be seen. However, ESAF, based in Kerala, and one of the eight NBFCs that have converted as part of the initial cohort, may provide some advance perspective on future directions. The bank, which has received technical assistance under PACE-D MSP since 2015, is an active energy product promoter and financier that is currently advancing some novel business strategies in partnership with smaller entities. As with Bandhan, an institution of ESAF's size, resources and standing has the potential to prove the mission and commercial value of energy lending to an expanding number of its SFB peers going forward, as well as the growing number of NBFCs that aspire to follow in the same path. Given that the combined portfolios of Bandhan and the eight new SFBs that were formerly NBFC-MFIs constituted a full 63% of microfinance GLP in 2016 (Sriram, 141), the future participation of these types of institutions in energy, which are only likely to increase in number, will greatly determine the overall impact energy microfinance, and influence the specific forms that it takes.



New priority sector sub-targets aim to direct 8% and 7.5% of adjusted net bank credit (ANBC) to small and marginal farmers, and microenterprises, respectively, and these targets must be met on a quarterly basis to avoid penalty.”

Just as former major MFIs, like Bandhan and ESAF, are crossing over into the mainstream banking space, a growing number of commercial banks are deepening their indirect and direct engagement in the microfinance market. This development has taken the form of growing business correspondent (BC) tie ups between banks and MFIs, as well as increased equity investment by the former in the later, and even multiple high profile acquisitions. Some notable examples from 2016 include IDFC Bank's equity investment in ASA International India Microfinance Private Limited, and the former's full acquisition of Grama Vidiyal, an NBFC with 1.2 million customers in six states. DCB Bank, RBL Bank, and Kotak Mahindra Bank are a few other institutions that have also been actively ramping up direct investment in MFIs (Sriram, 120). This turn can be explained by both pull and push factors. Under the BC model, which has been steadily growing as an overall share of microfinance activities, MFIs are contracted to execute client facing outreach and collections activities on behalf of commercial banks for a fee. Recognizing the size of the untapped market, the potential of technology and digitalization to lower transaction costs, and the high rates of repayment and favorable returns associated with small borrowers, more banks are seeking to directly manage client outreach and collections to secure a higher margin (Misra, 29).

Regulatory changes related to priority sector requirements are also influencing this trend. First, new priority sector sub-targets aim to direct 8% and 7.5% of adjusted net bank credit (ANBC) to small and marginal farmers, and microenterprises, respectively, and these targets must be met on a quarterly basis to avoid penalty. Second, banks are now required to open 25% of the incremental branches in unbanked rural areas going forward. From a cost and compliance perspective, the imposition of these targets increases the logic of working directly with, investing

in or acquiring existing MFIs already engaged and present in these segments and areas, rather than building infrastructure and brand awareness from scratch. It is unclear to what extent this trend will either increase or decrease the level of energy-focused activity taking place within the microfinance sector.

DIGITALIZATION AND TECHNOLOGICAL CHANGE

Any overview of changes occurring within the Indian microfinance sector that overlooks the growing impact of digitalization and technology would be incomplete. With improving mobile phone and internet infrastructure, driven by ambitious government initiatives like “Broadband for All”, and aggressive expansion by private telecom companies, some core aspects of microfinance operations, including assessment, disbursement and repayment, will be increasingly streamlined, automated and made virtual over time.

Theoretically, as a result of these changes, transaction costs and client risks will likely decline in some areas, while the influence of geography and distance on service delivery will also diminish. These changes are already creating new opportunities for MFIs to expand outreach and presence in underserved areas at lower cost and with fewer risks. Sales force management, streamlined KYC (‘know your customer’) and client onboarding, enhanced analytics and alternative “big data” credit scoring methodologies, virtual customer service delivery platforms, and real time logistical integration with partners and suppliers, along with other tech-supported value additions are now available through increasingly competitive third-party services (PwC, 8). Competitive pressures and regulatory constraints make the exploration of these and other solutions not only interesting for MFIs, but also increasingly urgent.

The realization of this potential over time will expand and diversify the sector’s aggregate client base to include a growing number of the energy poor and energy aspirational. At the same time, the material realization of a highly digitalized and technology-supported microfinance ecosystem presupposes widespread access to reliable, affordable electricity for both institutions and clients, alike. Thus, electricity access should be seen as a precondition upon which the broader movement towards technological change depends.

However, while progress can be observed and the promise of digitization is widely accepted within the sector, the rate of transition is playing out unevenly. Embracing new technology and ways of doing things entails the acquisition of new knowledge and expertise, requires upfront investments in scarce attention, time and capital, and produces fears of risk and uncertainty that can result in inertia and the preservation of the status quo. At the same time, while the cost reductions and outreach expansion that an embrace of technology will enable brings rewards, MFIs must proceed cautiously in this direction so as not to diminish the strength of institution-client relationships that are supported through face-to-face interaction and communication, and underlie the historical and present success of the sector.

THE ENABLING ROLE OF SECTOR NORMS AND VALUES IN ADVANCING ENERGY MICROFINANCE

India is home to an extraordinarily rich diversity of private sector, public sector and civil society entities that operate in markets where energy poverty remains chronically high. Microfinance and MFIs, therefore, are by no means the only platforms that are well positioned to actively partner with energy solution providers to advance affordability and access in these contexts. However, while expressed in different degrees from one institution to another, certain norms and values prevalent across the microfinance sector are conducive to its sustainable and effective participation in the energy access space.

These core traits, described briefly below, provide a helpful framework for understanding the increasing convergence between the microfinance and distributed energy sectors presented in the next section.



1. FOCUS ON WOMEN

Ninety-seven per cent of Indian microfinance clients are women, and among PACE-D MSP MFI partners the ratio is even higher at 100%. Access to improved energy products for lighting and other services not only bolsters health, security, safety, comfort and educational achievement, creating improved conditions that impact women and children more than men, but also directly enhances income-generation for many of the women-led livelihoods that microfinance supports. Outside of the context of microfinance, male family heads typically command greater decision-making power over household and livelihood investments and purchases. However, microfinance empowers women to take greater control over economic decision-making, and since demand for improved energy products is often higher among women than men, energy microfinance helps overcome gender-based demand barriers that would otherwise be more prominent in its absence, effectively enlarging the market.

2. COMMERCIAL AND SOCIAL MISSION BALANCE

Microfinance is a quintessential (and arguably the original) form of social enterprise. As described in the last section, the sector's historical origins are rooted in the pioneering work of social mission-oriented NGOs. Indeed, the private sector transition of microfinance that began in the 2000s was largely driven by an adherence to, rather than a departure from, social objectives and a desire to expand and sustain impact. As of 2016, of the top 20 NBFCs, banks and SFBs (ranked by gross loan portfolio) that provide microfinance services to poor clients, 11 (including the three largest) started as NGOs. While, on the whole, the sector has unquestionably become more profit-oriented and commercially robust over time, it is also the case that the development objectives of economic and gender empowerment remain central to the sector's values, and how it measures its own success.

MFIs of every variety must survive and grow on the basis of their own business acumen, competency, and self-sufficiency, yet are internally governed and influenced by the development goal of improving the lives and economic security of their clients. As a result, more so than most purely mission or profit-driven entities, MFIs are likely to grasp, holistically, both the commercial and mission

significance of energy access to their clients and bottom line, and to possess the internal capacity to assess and act on the opportunity with a view to both impact and financial and operational sustainability.

In terms of grading commercial effectiveness, it is valuable to briefly contrast microfinance with other major players active in India's financial inclusion space. Measured by outreach and coverage, India's regional rural banks (RRBs) and primary agricultural cooperative societies (PACs) command far greater membership and presence in rural India than MFIs. RRBs, backed by donor and government support, have played an important and pioneering role in financing and promoting solar home systems on an impressive scale in rural India over the past two decades, well before microfinance entered the field. But the current and future position of both cooperatives and RRBs are more tenuous and stagnant in 2017 than that of the re-ascendant microfinance sector. There are many structural factors that contribute to this situation; however, for the purposes of this discussion, the different nature of each sector's historic relationship to the state is a significant factor.

To be sure, greater regulation by the RBI in recent years has improved the stability and vitality of microfinance; but the sector's relative autonomy from direct government intervention and control has also helped engender the norms of self-sufficiency and entrepreneurial initiative in a way that has not been experienced by more constrained regional rural banks (RRBs) and cooperatives. The latter, to a greater degree, have been integrated into the government entitlement apparatus, and as such have had their activities, operations and balance sheets more directly dictated by the changing development priorities of the state in a manner that microfinance has not been subject to (Sinha et al., 5). As a result, MFIs can be broadly characterized as having a stronger orientation towards competitiveness, growth, profitability, and self-sufficiency, and, as such, appraise and execute energy activities in a manner that is arguably better set up for sustainability and long-term success.



3. CLIENT-CENTRICITY

Closely related to the double-bottom line orientation just described, “client-centricity” is both a mission-based value and a strategic approach to effective service delivery that is native to microfinance. The term describes a standard of product and service offerings that derives from the specific real world needs, demands and constraints of clients, rather than supply-driven assumptions about what's best for clients without reference to actual client experience. The original features of microlending – small loan amounts, frequent transactions, “door step service,” collateral-free group-based risk mitigation – all reflect close adherence to customer-centricity, and help explain enduring demand for microcredit among the unbanked, and the success of microfinance, as measured by growth, high repayment rates and portfolio quality. Client-centricity is also a driver of the sector's more recent tendency towards consumer protection mechanisms and financial literacy programs⁸ as well as product and service diversification, including its energy activities. Indeed, when asked to explain the motivation to move forward with energy lending and promotion activities, the executive leadership of virtually all PACE-D MSP partner institutions interviewed for this report were remarkably consistent in their responses: because their clients expressed a need for it.

It is important to emphasize, as well, that a value-based commitment to client-centricity will only be actualized if concrete investments are made in operations that support close, frequent and deep connections between institutions and clients over the long-term. MFIs have pioneered unique systems for achieving the degree of client access required to practice, not just preach, client-centricity. The benefits of this apply just as powerfully to energy microfinance as to conventional forms of microfinance. MFIs are uniquely well-positioned to sustain dialogue with clients about their changing energy needs and desires over time, and the data and perspective gained from this exchange informs critical business model components such as energy product and partner selection, and loan product design.

RISK FOCUS

As lenders, MFIs are inherently focused on assessing and managing default risk and maintaining portfolio quality. As a result, they are not quick to promote or finance energy products whose quality and durability cannot be sufficiently demonstrated, or partner with energy companies that cannot prove that they are capable of supplying and servicing products in the long-term. MFIs have a strong incentive to be highly cautious because failure to screen for quality directly threatens their mission and commercial interests by eroding client trust and satisfaction, decreasing loan repayment rates among dissatisfied clients, and thus damaging overall portfolio quality and market position.

In the short-term, this preoccupation can be a barrier to participation in energy lending, and, indeed, historically, it helps explain why the sector has been slow to embrace energy as a business opportunity. However, in the longer-term, this risk focus is of enormous benefit to MFIs, clients and to the energy access sector because it serves as a quality assurance filter, facilitating the flow of high quality, reliable products and providers into the marketplace, while blocking low quality products and providers.

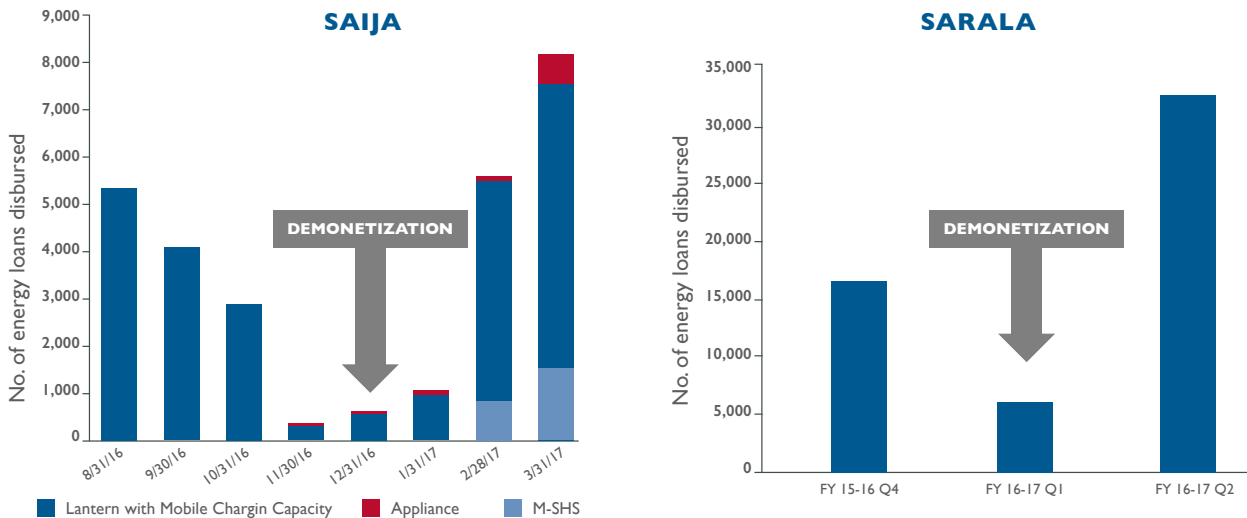
RESILIENCE, ADAPTABILITY, INNOVATION

Over the course of its history, microfinance has repeatedly demonstrated strong adaptive tendencies that have enabled it to grow, shift and survive as conditions within and around it change. Most recently, the government's demonetization of INR 500 (USD 8) and INR 1,000 (USD 16) notes in late 2016 triggered a major disruption in the sector. Since client transactions in microfinance are cash-intensive, the loss of value of 86% of currency over night froze the business activities of clients across diverse rural and urban livelihoods, making it impossible for them to repay loans. The situation was further aggravated by the fact that MFIs, unlike banks, were not authorized to handle the notes that were being removed from circulation (Sinha et al, 3). The persistence of these conditions for several months triggered an abrupt sector-wide decline in portfolio quality, with past-due repayment rates rising from less than 1% to 6-8% nationally (MFIN, 27).

While the PACE-D MSP MFI partners, as well as energy product companies, interviewed for this report unanimously reported that demonetization had highly disruptive, painful consequences for their businesses and clients in the short term, as of July 2017, nine months after demonetization went into effect, pre-crisis conditions have largely been restored. As an upside, the crisis helped spur greater adoption of cashless electronic transactions during the period, a positive development that is anticipated to reduce both costs and risk of fraud. As for the MFI's

energy business, average sales and lending now exceed pre-crisis levels among most PACE-D MSP partners, reflecting the resilience of the institutions and clients, and of this specific business vertical in response to disruption. The following charts illustrate the dimensions of both the impact of demonetization, and the subsequent recovery during the months prior to, during and after the event for PACE-D MSP partners Sarala and Saija.

FIGURE 1: ENERGY SALES AND LENDING CRISIS AND RECOVERY



MFI resilience is also made evident with more gradual changes and uncertainties surrounding client preferences and needs, institutional consolidation and competition, technological transformation, and government policy and regulation. Over the course of these changes, MFIs have struggled and many have ceased to exist, but the sector as a whole has recovered, survived and regained balance. This trait recommends microfinance as a strong platform for promoting and financing energy access, which, by its nature, requires long-term continuity and engagement.

Related to resilience, effective MFIs also tend to exhibit an openness and ability to make voluntary changes in order to pursue new opportunities that will increase benefits for clients and bolster financial performance and sustainability, provided that those opportunities are prudent from a risk perspective. This is evident today with energy product diversification. While progress and evolution in energy microfinance has been gradual, it is important to not lose sight of the fundamental fact that promoting and financing energy products represents a distinct operational departure from conventional sector activities, and that engagement in energy financing is an entirely voluntary business decision. Many leading, well-managed MFIs could elect to continue a business as usual focus on conventional financial services and still prosper, or at least survive. However, mission and competitive considerations are driving a growing number of institutions to explore

and test energy business approaches. In the process, with each attempt, new approaches, methods and insights are generated and disbursed for the learning benefit of the sector as a whole. In short, microfinance as a sector exhibits a tendency toward innovation, experimentation and evolution over time. This characteristic both explains the growing interest in energy, and increases the possibility that the current parameters of energy microfinance today will likely expand and change in the future.

CONCLUSION

Over the years, and most dramatically since 2012, the microfinance sector has evolved in ways that have increased its potential involvement and impact in the energy access space. These transitions relate to scale, reach, and financial performance, but also to core values and mission commitments. In the next section, the factors and trends giving rise to energy microfinance as a distinct area of practice will be analyzed more closely.





2 | ENERGY MICROFINANCE IN PRACTICE: EVOLUTION, FEATURES AND VARIATIONS

SUMMARY

In the post-2012 period, microfinance sector engagement in the energy access space has steadily increased in India.⁹ While it is difficult to predict what the state of this still emerging practice will be in the coming years given the transformation of the Indian microfinance sector, such a shift in interest suggests that energy lending and promotion, as a distinct microfinance business activity, is likely on the ascent.

During the course of the PACE-D project period energy microfinance has attracted many new adherents and practitioners, and now constitutes an increasingly diverse cross-section of institutions, geographies and client segments that reflect the makeup of the sector as a whole. In the process, individual MFI experiences have both converged and diverged around different business, product, client and context related factors, exhibiting, in aggregate, a rich spectrum of motivations, models, and outcomes in a relatively short period.

This section will provide an inside view to contemporary energy microfinance practice in India. It will begin by introducing a 'full value' framework for understanding the current and potential position of microfinance within the energy access space, which is based on an integrated assessment of both the financial products (i.e. credit) offered by MFIs and the organizational

capabilities that characterize MFIs and the sector as a whole. Following on some of the sector developments described in the previous section, the analysis will then provide an overview of different factors that are causing microfinance and energy access to converge in India today. An analysis of energy microfinance business typologies, which describes both common elements and variations that can be observed across different institutions, will then be presented. Finally, potential future directions in energy microfinance, in terms of both new business approaches and energy product offerings, drawn from recent PACE-D MSP partner experience and feedback, will be explored.

ASSESSING THE FULL VALUE OF MICROFINANCE WITHIN ENERGY ACCESS CONTEXT

The current and potential contribution of the microfinance sector in advancing energy access is often primarily assessed in terms of how the sector's core financial product, microcredit, builds client demand by making energy products affordable for poor people. This emphasis is understandable and justified given the critical importance of price as a barrier to demand among low-income, energy poor consumers, and how credit can be applied to overcome this barrier. However, to fully understand the actual and potential relevance of microfinance to energy access, it is necessary to expand the analysis of MFIs and the sector by taking fully into account the concrete operational and business capabilities that MFIs command as real world organizations. Indeed, these factors are equally significant to microfinance's value in the energy context because they form the basis of the sector's special capacity to access energy poor customers throughout the customer lifecycle, and to cultivate high levels of acceptance of, and demand for, such products among energy poor clients.

The following analysis will present an overview of the value realized in the access context by microcredit, microfinance outreach and infrastructure, microfinance-client relationships, and institutional variation within the sector.



AFFORDABILITY: MICROCREDIT OVERCOMES INCOME BARRIERS THAT LIMIT ENERGY PRODUCT ADOPTION

Microfinance encompasses a wide range of financial services, including savings, insurance, pensions, and remittance transfers, but credit remains the most important and high demand offering for most clients. Lending is also the primary mechanism by which MFIs make improved energy investments affordable for client end-users. Access to loans for energy products significantly addresses the critical constraints that limit demand among low-income customers who are typically unable or unwilling to pay for such products on an upfront cash basis.

The characteristic features of conventional enterprise microloans offered by most Indian MFIs are designed to match the income and cash flow patterns of poor borrowers: small amounts, short terms and frequent repayments. The average loan amount available to clients is determined by their business needs and their prior credit and repayment histories, with limits increasing as clients successfully progress from one completed loan cycle to another. In 2016, the average microfinance loan amount was INR 16,934 (USD 264) (Ernst & Young, 17), and, as noted in the previous section, the maximum loan amount permitted for disbursement

by regulated NBFC-MFIs, per RBI guidelines, is currently INR 100,000 (USD 1,560). For early cycle or specialized small loans, terms can be as short one or two months, involving as few as four weekly or bi-weekly repayment installments. In subsequent cycles and for larger loan amounts, terms are extended to 6-month, 1-year and even 2-year terms. Over the course of loan disbursement and repayment cycles, MFIs gain rich insights into client credit capacity, as well as the latter's needs and demands, and entrepreneurial effectiveness. Indeed, the inherently long-term and high interaction nature of the MFI-client relationship creates a unique and highly valuable platform from which changing client energy demand can be viewed, assessed and met.

Another definitive feature of microcredit is that it does not require collateral. Historically, different forms of group-based solidarity and joint-liability methodologies have been used to mitigate client risk in place of collateral and conventional forms of client assessment that are typical in mainstream banking. Whether in the form of SHGs, solidarity groups or Joint Liability Groups (JLGs), women clients voluntarily form groups, ranging from 5 to 30 members in number, depending on the specific model. The group relies on social cohesion - mutual familiarity and trust - and members pledge to collectively bear each other's risk. This general formula is largely responsible for the extraordinarily high rates of on-time repayment and overall strong portfolio quality among MFIs.

The group lending nexus, over time, establishes client credit history and risk characteristics, which can then provide the assessment criteria for the disbursal of larger loans on an individual basis. The more recent maturation of sector credit bureaus, as well as still experimental "big data" assessment methods that compare client characteristics with large, granular client data samples to predict creditworthiness and repayment risk will continue to strengthen and expand the relatively recent introduction of individual lending technologies in India in the coming years.

Microfinance interest rates have been characterized as excessively high and even usurious by some observers in the policy and political classes. However, such criticisms have tended to be based on inappropriate comparisons to lending practices and cost factors that prevail in mainstream, urban markets that are less expensive to serve, or to financially unsustainable, subsidized rates offered by public sector and development banks. In general, microfinance pricing should be fairly understood as a measure of sustainability, not excessive profit-seeking

The basis of this criticism is diminishing as a result of scale and efficiency driven reductions that have occurred across the sector over the past five years. As Sa-Dhan reports, in 2016 "the top 10 NBFC-MFIs contributing 80% of the sector's Gross Loan Portfolio . . . have a weighted average interest rate of 23.13%, far below the 26% max cap under PSL guidelines." Data further shows that over 36 NBFC-MFIs reduced rates significantly in 2016 (Sa-Dhan, 1). This trend can be attributed to both market maturation as well as regulatory intervention.

Energy lending conforms to the general parameters of microfinance, though with some modifications based on the price characteristics of energy products that currently dominate the practice, namely portable solar lighting devices and solar

home systems (and to a lesser extent, improved cook stoves (ICS). These products typically range in MRP from INR 1,000 (USD 16) to INR 6,000 (USD 94), and therefore require smaller, shorter-term loans. The following table illustrates the size, term and installment characteristics that differentiate conventional business loans and energy microfinance loans for popular solar products offered by PACE-D MSP partner Sarala, which is representative of partner offerings as a whole.

TABLE 2: COMPARISON OF LOAN CHARACTERISTICS

LOAN CHARACTERISTICS	MICROFINANCE LOANS	ENERGY LOANS
Loan Term	10 or 12 months	1 to 12 months
Loan Characteristics	INR 12,000–20,000 (USD 185–298)	INR 400–6,000 (USD 6–92)* *Loan size corresponds to product price
Repayment Frequency	Every one or two weeks	Every one or two weeks
Number of Installments	24 to 45	4 to 24

The cost of servicing smaller loans is higher than serving larger loans, and therefore it is common practice among MFIs to make energy loans for small products available to clients who already are in the process of completing a loan cycle for a larger business loan. This allows MFIs to contain their costs by collecting repayment for both loans at the same time. Because the energy loan amounts are comparatively small, this practice does not contribute to excessive indebtedness, and at the same time does not force clients to choose, at any given point, between accessing cash for their business activities or purchasing energy products. From a risk perspective, the physical products, by their nature and in contrast to cash for enterprise purposes, constitute collateral that can be repossessed in the event of non-payment.

The fact that energy lending takes place within the context of more diverse credit and financial transactions occurring between clients and MFIs increases the likelihood that energy loans will be fully repaid. Clients are strongly incentivized to repay their energy loans fully and on time because not doing so risks barring them from accessing additional credit in the future for other business and household needs. In a joint liability or group-lending context, the possibility of facing social pressure from other group members provides another strong incentive to pay.

In the short term, the dual loan approach places a limit on the types of energy products that are financed, favoring smaller ticket items. However, in the longer-term, as clients proceed through cycles and gain access to higher loan amounts, their capacity to invest in larger products and energy equipment will also increase. At the same time, larger products and equipment may present greater revenue and savings potential for clients compared to smaller solar products, thus potentially reducing the economic dilemma of having to choose between energy investments and working capital in a scenario in which the total credit limit constrains a client's ability to take both simultaneously.

PACE-D MSP partner MFIs, responding to demand expressed by clients, are beginning to explore and pilot new larger, more expensive, and higher service products, such as multi-function solar home systems and solar fans. Demand among microfinance clients for these types of products is increasing as incomes and energy expectations rise. According to Green Light Planet, a leading solar product company, approximately 95% of the leading solar home system products that it sells in India (MRP USD \$100 - \$150) are financed with loans from microfinance partners (Khanna, Sahil, Personal Interview, 31 March 2017).

This level of dependency on microfinance also underscores an important link that is emerging between microfinance availability and energy product evolution and quality improvements. First, in supporting affordability by allowing for incremental payment over time, microloans can also help resolve tensions between product quality and affordability by creating room for marginally higher retail prices. This buffer can ease the need for aggressive trade-offs by product companies between cost containment and investments in product improvements. The relationship between microcredit and product evolution can be characterized in even bolder terms: reliable availability of the former for target customers can influence energy product development and help drive new products into the marketplace.

This has already been demonstrated with the arrival of small, plug-and-play solar home systems. As noted above, the great majority of Indian customers who purchase Greenlight Planet's Sun King Home systems (MRP USD 100- 150) finance their purchases with loans from MFIs. The company acknowledges that microcredit availability and the company's existing MFI partnerships were critical preconditions informing the company's decision to explore, develop and launch this new product category. Without microcredit availability, demand would likely have been insufficiently high to warrant such an investment.

MFI client energy demand and aspirations are changing and as MFIs continue to advance along the learning curve gaining greater comfort, familiarity and satisfaction with energy as a business. At the same time, Indian and global distributed energy product providers are growing and evolving too. Under these conditions, it is not unrealistic to project that microfinance will inspire more and more new innovative energy products. The opportunities for this type of sector shaping influence are greatest for large institutions with massive client bases, such as banks and SFBs.

MFIs play an important role in providing clients with real consumer choices and agency in relation to energy access that few other providers of energy access products can boast. Microcredit not only makes energy products affordable for clients, but also makes their purchase and ownership more secure and less risky. In effect, microcredit serves an insurance function that helps build client confidence in the long-term value and security of the client's investment. If a product malfunctions and is not adequately serviced, then borrowers can exert a simple but powerful form of leverage: they can stop repaying their loans until the problem is rectified, or, in an increasingly competitive market, opt to move on to another microfinance institution.

MFIs are highly sensitive and responsive to this possibility, and the risks of non-payment and client attrition heighten the incentive for MFIs to invest in

MFIs play an important role in providing clients with real consumer choices and agency in relation to energy access that few other providers of energy access products can boast.”

selecting reliable energy companies and products, and negotiate warranty and after sales service arrangements that are favorable to clients and which reduce risk. From a client perspective, loans and loan terms create leverage and a window of time in which they can be sure that any product problems that arise will be addressed. In markets that are at an early adoption phase, this added level of certainty and peace of mind can have a significant influence on demand and rates of conversion.

Microcredit not only enables clients to pay for single energy products over time but also enables clients to accumulate a portfolio of energy assets that meet their complete and evolving needs. Among PACE-D MSP partner institutions, there is a high reported incidence of clients taking multiple energy loans over time to acquire more than one solar lantern. For example, clients may obtain lanterns for multiple rooms in their home, or for multiple household and livelihood purposes, to reach an aggregate level of service and reliability that is not afforded by a single device, or, for that matter, the grid.

Similarly, having obtained and gained value from a lantern product, clients are often then more disposed to borrow for larger products or products that provide different energy services, such as solar fans, radios and televisions. Microcredit allows clients to gradually finance greater energy service access in stages, according to their means. This set of behaviors, observed across a number of energy lending programs, presents a more nuanced picture of consumer preferences, strategies and decision-making than is often assumed in discussions of rural electrification that are based on off-grid/on-grid segmentations.

ACCESS AND ACCEPTANCE: MFIS BUILD ACCESS TO CLIENTS THROUGHOUT THE ENERGY CUSTOMER LIFECYCLE

As illustrated in the previous section, the Indian microfinance sector, including NBFCs, SFBs, Banks and non-profits, has achieved substantial penetration nationally, and now serves tens of millions of clients across 80% of all districts in the country (Misra, 78). This diverse spread encompasses rural, peri-urban and urban communities, and considerable socio-economic and livelihood diversity. Since 2012, the microfinance industry has gradually expanded its footprint into the northern and northeastern regions, where energy poverty and lack of access to reliable electricity remain most acute. Microfinance has thus established a robust channel through which improved energy products can be promoted, sold, distributed and financed in the most needy parts of the country.

However, the scale of the sector's reach only partially accounts for the full advantages that microfinance can apply to the effort of achieving and sustaining client access. The long-term, high touch, and group-based character of MFI-client interactions and relationships provide a powerful and cost-effective platform for building consumer awareness and demand, and conducting product sales, distribution and finance. One of the most important capacities that microfinance institutions possess in this regard is their ability to convene groups of clients on a frequent basis in market contexts that are typically challenging and expensive to



serve. The ability to bring together 10 to 30 clients in the same place at the same time on a regular, predictable basis creates economies and efficiencies that directly reduce the cost of marketing, sales and distribution, as well as finance. In general, the impact of group convening power is greatest in areas where energy poverty is also most pervasive: remote, rural communities with low population densities and limited transportation and communications infrastructure.

Additional social and interpersonal factors typical of microfinance groups and client relationships are conducive to demand creation. As described above, the term and repayment characteristics of micro-lending entail long-term relationships between clients and field staff that are strengthened by frequent weekly or bi-weekly interactions over multiple repayment and loan cycles. As a result, clients and loan officers develop a high degree of personal familiarity and mutual trust over time.

The nature of these relationships can help overcome demand barriers that are common at early stages of the product adoption curve. For example, many microfinance clients will naturally be reticent to invest scarce income in unfamiliar products and whose technical quality they are not equipped to evaluate and judge. At this phase, peer endorsements by ‘early adopters’ are critically important to establishing demand, and it is here where relationships between clients and loan officers can have a profound effect. Whereas clients may have little reason to trust an unknown energy product sales agent concerning the value of an unfamiliar solar lighting product, they may be more inclined to give it serious consideration if it has been directly or indirectly vouched for by their their loan officer with whom they have a personal relationship. To a degree, therefore, loan officers can function as a peer proxy, based on the strength and trust basis of their connection with clients.

As early adopters begin to emerge and take loans for energy products, the group context creates conditions that increase the likelihood that other members, who are less inclined to take risks, will subsequently follow this lead and do the same. During group meetings, early adopters can be called on by MFI staff to provide personal feedback about their experience as energy product owners, and how ownership has benefited them and their families. Provided that the experience has been positive and the benefits clear and demonstrable, the structured environment of the group is ideal for propagating demand from peer-to-peer. Demand and adoption within groups most often follow this trajectory, with a small handful of members proving and validating product value for the larger group, with additional input and encouragement from MFI field staff.

The microfinance sector’s internal institutional diversity as a distinct and changing ecosystem is itself a source of value and possibility because it ultimately promotes variation and innovation in energy microfinance practice. Different types of institutions, separated by scale, capabilities, mission objectives and other characteristics, are drawn to energy lending for varying reasons. In the course of their pilot programs and efforts to overcome challenges, they generate alternative approaches that are valuable for peers. The resulting diversity expands the number of real world reference points that other institutions can subsequently learn from, replicate and adapt as they plan to embark on their own energy businesses.



INSTITUTIONAL DIVERSITY: MFI VARIATION CREATES MULTIPLE ENERGY FINANCING BUSINESS MODELS

The previous section presented a picture of the changing composition of microfinance in India today. In terms of portfolio size and gross client outreach, the sector is increasingly dominated by large NBFC-MFIs, banks and now SFBs. Middle-tier NBFCs compete to join the ranks of their larger peers, or to fill specialized, underserved niches. At the same time, NGOs, trusts and societies – while small and diminishing as a share of GLP and client outreach – remain an active factor at the margins of the sector. While these organizations face distinct challenges to their long-term viability, some of which result from the success of larger, for-profit players, their enduring importance to energy microfinance development should not be overlooked. These organizations often operate within last mile districts where larger, commercial MFIs have minimal presence. Often, they embody a more holistic social mission that extends beyond financial inclusion to encompass a range of economic and social objectives, including energy access.

In view of this diversity, from an energy access perspective different categories of MFIs, separated by scale, commercial orientation, mission priorities, and market focus, possess different motivations, tendencies and advantages vis-à-vis the business of energy access. In the experience of PACE-D MSP this aggregate diversity represents a positive factor unto itself, since each class of institution has the potential to serve, innovate and share in different ways. These efforts benefit a broad range of people in the highly stratified “energy poor” population.

For the purposes of analysis it is useful to segment the sector into separate categories based on some common traits, motivations and barriers that influence the rationale for and manner of participating in the energy space. It is important to underscore that individual organizations rarely fall squarely within any one category, but rather more often exhibit some characteristics of one or more. Therefore the following segmentation is best viewed as a spectrum on which different institutions can be located, rather than as a taxonomy.

Mission-driven innovators view energy through the lens of a holistic double or triple bottom-line mission of which financial inclusion is one element. As a result, these organizations are programmatically the most diverse, often engaged in multiple economic, health, and education-focused activities in the communities that they serve. As a result, promoting energy access represents a logical extension of a broader mission. Small, highly localized NGOs that are focused on benefitting constituents within specific geographies or demographic groups often fall into this category. For such organizations, profitability is explicitly understood to be a means of sustaining and expanding social impact and mission success, rather than an end in itself. Grant and CSR financial support are often blended with business revenue to launch and sustain new and existing programs. Within the context of energy, due to their holistic development focus, these organizations are often willing to experiment with different product and service modalities if they determine that the latter will support social mission objectives. Often, these organizations pioneer new areas of energy practice.

Streamlined sprinters tend to view energy as a revenue cross-sell opportunity that aligns with the real needs and demands of their client base, and which their infrastructure and brand are well suited to supporting. Many mid-sized and even large NBFC's, feeling the dual pressure of competition and interest margin caps, and recognizing the full commercial potential of their operations and client relationships, fall into this category. These MFIs seek high demand, high margin products that can be easily integrated with their existing operations, and do not require costly and risky modifications. As a consequence, such institutions are often in a good position to quickly move forward with energy promotion and lending activities at a relatively fast pace and across a wide portion of their operating footprint. However, these organizations also may be constrained in the diversity of energy products and services that they are willing and able to support, favoring options that are well established and can be integrated into core operations at relatively low cost and risk. These types of MFIs have greater flexibility to exit the energy space quickly without incurring significant losses if desired results have not been realized.

Diversified scalers are typically large institutions that have the capacity to reach large numbers of clients across multiple geographies and market segments, and to expand their product and service offerings over time. Scale and diversification are enabled by disaggregation, or the creation of an energy-dedicated company that is managed separately from microfinance operations. Larger, more sophisticated and less capital constrained institutions are often better positioned to make the investments required to launch and operate a separate energy business. Such institutions are also often better able to engage in strategic business planning that elevates long-term objectives and outcomes over shorter-term gains. In contrast to many holistic innovators, these organizations have the financial wherewithal and commercial sophistication to plan for large-scale, profit-driven growth over time. Unlike streamlined sprinters, they are less driven by short-term business needs and opportunities, and therefore better positioned to invest in separate, specialized energy operations that are set up for long-term growth, and can support product and service diversification based on changing market opportunities.

CONCLUSION

The range of energy microfinance business models described above, as well as the variation in institutional size and reach, illustrate how energy lending has been successfully pursued by all types of MFIs in India. PACE-D MSP partners have shown that size is not a determinant of success and that all types of MFIs can play important roles in innovating and scaling energy access.



3 | BEYOND LANTERNS: FUTURE DIRECTIONS IN ENERGY MICROFINANCE

SUMMARY

Retail energy products, such as solar lanterns, SHSs, and improved cook stoves, have characteristics that align closely with microfinance client demand and the lending conventions and operational capabilities of MFIs. Energy microfinance, to date, has also focused largely on meeting the energy demand of existing microfinance clients. To some observers these product and model conventions may represent the limit or end-point to what forms and directions energy microfinance can ultimately take. However, recent activity across different PACE-D MSP partners, suggests that promoting and lending for retail energy products, as currently established, may in fact represent a starting point from which new practices will continue to emerge. Having gained a solid baseline of experience, expertise and success in the energy field, more MFIs – driven by both competition and client-centricity – are beginning to explore products and approaches that go beyond those that dominated their energy businesses to date.

The previous sections of this report have provided a comprehensive view on how historical trends, sector characteristics and practices, and institutional diversity provide a powerful basis and rationale for microfinance participation in the energy access space. In this section, emerging and potential future directions for energy microfinance will be explored. These directions include both new approaches to customer engagement and market expansion, as well as different forms of energy products and services that MFIs may more commonly promote in the future.

The review will be preceded by a brief assessment of how new trends in energy microfinance overlap with broader energy access policy objectives in India that have been embraced and undertaken by the Indian Central and State Governments. Consistent with the subject scope of the report's preceding sections, this summary will primarily focus on microfinance's potential impact vis-à-vis efforts to improve access to, and the reliability of, modern electricity service in rural and other underserved communities.

ENERGY MICROFINANCE WITHIN INDIA'S BROADER CONTEMPORARY ENERGY POLICY CONTEXT

The recent trends described in the previous sections, and the potential future directions of Indian energy microfinance, discussed below, intersect with the Government of India's broader policy objectives for improving electricity access and reliability in a number of different ways.

Consistent across years of evolving and changing policy directions undertaken by Indian central and state governments has been an acknowledgement that rural electrification is central to the nation's economic and social development. As a resource, electricity directly and indirectly pervades all aspects of domestic and productive life, making consistent, universal and affordable access is a fundamental precondition to rising living standards, security and prosperity. Over the past half century, Government efforts to deliver electricity to rural and underserved urban communities has been punctuated by a number of major programmatic and policy initiatives. The creation of the Rural Electric Corporation (1969), the Minimum Needs Programme (1974), the Kutir Jyoti Yojana (1988), the Remote Village Electrification Programme (2001), Accelerated Rural Electrification Programme (2003), and the Rajiv Gandhi Grameen Vidyutikaran Yojana (2009), represent a notable sample of coordinated public efforts to overcome chronic barriers to access by government. The current day Deendayal Upadhyay Gram Jyoti Yojana (DDUGJY), launched in 2014, proceeds from this legacy, while reflecting the opportunities, realities and urgencies of the current moment in its aims and scope.

As noted in the introduction of this report, an important feature of this progression over time, particularly in the past decade, has been the growing significance and centrality of renewable sources within India's broader energy system. This development reflects the substantial economic and technical evolution of leading renewable sources, most notably solar, as well as India's powerful resource advantages that enhance the latter's local viability and economic appeal. At this juncture, dominant policy directives have largely favored utility-scale, grid integrated renewable capacity deployment, and transmission and distribution infrastructure expansion.

However, in parallel with this approach, distributed modalities have come to present an important complement to grid expansion, particularly in remote communities that are challenging to reach and serve on an economic basis, and where lack of service reliability remains a chronic impediment to the goal of universal, 24/7 access. The Ministry of New and Renewable Energy, working in concert with state nodal agencies, has actively endeavored to advance clean, distributed alternatives

for lighting, cooking, and other household and productive needs for the rural, agrarian context through a series of ongoing programmatic efforts. It is in relation to these and other related efforts, that the future evolution and diversification of energy microfinance, discussed below, are most relevant.

THE DIVERSIFICATION OF ENERGY MICROFINANCE PRODUCTS AND SERVICES

A number of dynamics are directly and indirectly promoting greater openness among MFIs to diversify their energy offerings and activities. The promise and realization of “24/7” universal power access and reliability continues to exert itself on last-mile consumer expectations, and clients are becoming more accustomed to the conveniences of the energy products that they have already acquired. At the same time, real demand for improved energy services is escalating as client incomes and borrowing capacity increase.

From the position of the microfinance sector, the drive to expand and grow into new territories will continue to increase the diversity of client segments that MFIs serve. This will translate into additional opportunities to answer new and different energy needs, based on livelihood and context. As already noted, product advancement and diversification in the distributed energy space has opened up microfinance engagement in energy in recent years. As this trend continues and accelerates, new energy business opportunities for MFIs are manifesting. Government interventions can and do influence the pace and character of energy product and service evolution, and therefore the opportunity landscape for MFIs.

At the institutional level, some MFIs will be better equipped than others to embrace particular products and approaches, based on their clients, market environment, operating scale, technical and commercial capabilities, and business and mission objectives. As such, the distinctions between the categories of MFIs described in the previous section will likely drive energy microfinance diversification in the future.

Evolving client energy aspirations and rising incomes, paired with greater confidence and experience in energy businesses are leading more experienced energy lenders to explore new products and services to finance and promote. The following categories represent product directions that different PACE-D MSP partners, as well as other India based institutions, are currently investigating or piloting in different markets.

LARGER DISTRIBUTED SOLAR APPLICATIONS

In recent years, energy microfinance has seen a general progression from a narrow focus on small solar lanterns to more diverse solar products that offer additional functionality and uses. These products, including new SHSs, include more light points at higher luminosity, mobile charging, and, most recently, fans and radios. This diversification and movement towards higher capacities are beginning to include larger systems that deliver more energy, edging into the roof-top solar space. There is also a move toward systems that can be integrated behind the meter with grid service to improve overall reliability, a critical demand factor for grid-connected MFI clients.

This latter product type converges with the existing market for battery inverter back-up systems, offering high quality options with solar charging capacity to underserved customers. Among low-income consumers this category of product increases rather than diminishes demand for grid electricity, because it offers a solution to smoothen reliability inconsistencies that continue to suppress consumer willingness to legally connect and pay for metered grid power.



As the price of core components continues to decline the economic appeal of these products for poor households will rise. In a future scenario where electricity tariffs more closely reflect cost of delivery and market value, and are structured to support greater financial sustainability for DISCOMs, the relative affordability of distributed solar and battery systems will increase accordingly.

If larger products meet the financial and use needs of low-income, energy poor people, then MFIs, in partnership with product manufacturers, can play a role in bringing these products to market. Microfinance has already influenced product evolution in the case of plug-and-play solar home systems. Pre-existing partnerships with MFIs and the credit facility that they offer were important pre-conditions for the development of these products. As client demand shifts towards grid compatibility, this influence could continue to have an impact. This is particularly relevant for larger MFIs that occupy the diversified scaler end of the spectrum. Large institutions with significant client bases, fewer lending restrictions, and the operational capacity to support more technically sophisticated offerings have unique leverage over vendors, and potential to directly collaborate with product designers to bring innovation into the real world. In order for this to occur, three conditions must be met:

1. Products must be high quality and reliable in order for MFIs and their clients to endorse and adopt them
2. Price points must be affordable for clients, and must fit within the parameters of microlending. In the past, one of the main factors that kept MFIs from financing conventional solar home systems was that the average pricing required comparatively large loan sizes and extended terms that MFIs were either unwilling or, by regulation, unable to provide.
3. Technical requirements necessary to integrate, install and maintain these products must not impose burdens, upfront and over time, that exceed the operational capability of MFIs to sustainably deliver (plug-and-play and low-maintenance design innovation were critical innovations enabling MFIs to incorporate new solar home system products into their portfolios).

For larger, even more sophisticated products, the challenge will be to similarly reduce installation and maintenance complexity through design. There are limits to the degree to which product innovation can fully internalize installation and maintenance functions and costs; inevitably, larger applications will require greater inputs from providers. Here, too, diversified scalars that manage independent energy businesses will naturally be better suited to absorbing any additional product related complexity than smaller, more streamlined MFIs that more often embed their energy businesses within their existing lending operations.

At present, PACE-D MSP partners the Mahashakti Foundation (MSF) and Sarala are exploring product options in the solar inverter and larger SHS categories for

their grid-connected client segments. ESAF is also looking to a future in which it will finance 100, 500 and 1,000 KW rooftop solar systems for both its mature microfinance clients, and even larger systems for its growing pool of more affluent clients that it will now serve as an SFB.

Another energy microfinance concept that has been proposed by PACE-D MSP technical assistance staff and shared with partner institutions for feedback substitutes the established credit and ownership model for an energy service model. In this arrangement the proven capability of MFIs to generate demand and build acceptance; maintain long-term relationships with clients, individually and in groups; and consistently collect full payment would form the basis of the model, not microcredit lending. MFIs would own and install solar home systems sufficient in capacity to meet the energy needs of clients, and collect weekly, bi-weekly or monthly fees for the service over a multi-year period. At the end of the period, clients in good standing would have the option of maintaining the same level of service, or upgrading to a higher level.

Based on the capabilities just highlighted, many MFIs are very strongly positioned to pursue some variation of this approach both in areas where grid connection is high, but is reliability sporadic, as well as in areas where grid penetration is low. The potential is particularly strong for MFIs that have established separate energy companies and can develop the in-house capacity to procure, install and manage distributed solar home systems.

Additional microfinance strengths could be leveraged to make the service model successful. First, MFIs have an existing client base that is served largely through geographically concentrated groups that reside in the same communities. This feature would allow MFIs to draw on existing operations and relationships to promote the service, recruit customers and collect payment just as they do currently for energy lending. The geographically concentrated branch and group nature of microfinance would also introduce local aggregation and economies of scale to reduce installation and collection costs. From a general business development and competitiveness perspective, the energy service could be a powerful way to recruit and retain clients. Also, since the model does not entail loans, regulatory constraints around ‘qualifying assets’ and overall client debt limits would not come into play.

I. SOLAR IRRIGATION

As discussed in Section 1 of this report microfinance sector growth and expansion has disproportionately taken place in peri-urban and urban markets since 2012. However, the rural segment remains significant with agriculture-based loans making up 30% of total sector GLP in FY 2016-2017 (MFIN, 20). In the coming years competitive pressures, technological advancements and mission commitments will likely drive more MFIs to increase their outreach and presence in rural districts. This inevitably will mean a greater focus on the immediate needs of farmers. There are few if any factors that have a more significant impact on farmer productivity and prosperity than access to affordable irrigation, and therefore this need represents a potentially strong strategic focal point for MFIs seeking to expand and build new client bases in rural areas.



Grid-powered irrigation is cost optimal, but still not reliably available in a great number of rural districts. Farmers who depend on diesel-based irrigation face price volatility and uneven availability. Low maintenance and fuel-free solar-based irrigation solutions have emerged as a viable, increasingly cost-effective alternative that aligns closely with government development, energy access and climate objectives. The installation potential for solar irrigation sets in India by 2020 has been estimated to be 70 million (Blunck, 1). In recent years, solar irrigation technology has been promoted through multiple central and state-based subsidy and financing schemes.

Multiple PACE-D MSP MFI partners are currently exploring a range of means to finance solar irrigation pumps for agricultural clients. Early model concepts would leverage multiple native MFI capabilities to fill critical supply and demand side gaps that currently limit solar irrigation penetration. These include credit facility and repayment collection; training, awareness and demand generation; and group-based mobilization.

One promising concept would deploy a modified JLG structure to split costs and risks in proportions that are advantageous to both farmers and MFIs. In such a model, JLGs consisting of 8 to 10 farmer members who reside in immediate proximity to one another in the same community would collectively own and share access to a single centrally located solar irrigation unit. The MFI would finance the acquisition, with each farmer borrowing in proportion to his share. In line with the standard mechanics of JLG-based lending, all members would share the liability with all other members, agreeing to collectively absorb delayed payment or defaults by any individual members during the loan period.



PACE-D MSP technical assistance staff has developed a joint ownership financing model based on a 7.5 HP solar pump that would be owned by 8 to 10 member JLGs whose members currently rent diesel generators for irrigation. In this model, the group would receive a two-year loan that would be repaid in monthly installments. The model assumes:

- Water head at 60 feet
- 200k liters per day
- Irrigates 3 days/week for 9 months in year

Based on these parameters, and the average price of diesel-based irrigation in the reference market (Eastern Bihar), the model projects that farmers would save immediately from day one of their loan cycle, and then pay nothing after the two-year term, reaping enormous savings from opex reductions for the remaining operating life of the system. In addition to providing finance, MFIs would perform client education, demand generation and training in collaboration with pump distributors.

Multiple PACE-D MSP partners have signaled interest in piloting this and alternative approaches, including Saija, Sarala and MSF. Promoting and financing solar irrigation represents a clear opportunity to support income-generating livelihood activities for existing clients engaged in farming, and a promising focal point for rural expansion.

The greatest barrier at present to forward movement in this area is uncertainty surrounding current and future central government and state subsidies and financing schemes. If MFIs are certified to participate as channels for future subsidy and/or financing schemes, then activity in this area would progress. If they are not, and if customer expectations continue to be shaped by current or potential future subsidies, then solar irrigation will not present a competitive opportunity for MFIs.



2. MICROGRIDS AND MINIGRIDS

Decentralized micro and minigrids have gained traction in the private sector as platforms for rural electrification, as well as growing support and interest from both funders and government in recent years. The microfinance sector has not been actively involved to date in this area, but a small number of institutions, including two PACE-D MSP partners, have piloted micro/minigrid initiatives. The experiences of both, along with those of other practitioners outside of the sector, provide insights into how different kinds of MFIs can fill critical gaps and barriers that confront and limit micro/minigrid development and sustainability.

The level and cost of capital required for all but the smallest microgrids do not closely conform with the types of offerings that make up the core of microfinance, namely small microloans for women entrepreneurs engaged in the informal economy. Mission-driven innovators and diversified scalars committed to energy access, may be in position to directly finance or co-finance grids with combinations of grant, CSR, debt and equity contributions in the future. PACE-D MSP partners Vayam, a subsidiary of the BASIX group, and MSF are examples of organizations that have directly funded micro/minigrid projects.

In the longer term, the functions that MFIs will most likely be best positioned to perform at scale, in partnership with private micro/minigrid developers, are in the areas of customer education and mobilization, equipment financing, and fee collection. The animating sector values of client-centricity and entrepreneur empowerment, group-based methods of outreach and delivery, and long-term, high touch relationships with clients equip MFIs with unique advantages that align well the requirements of micro/minigrid development and management. At the same time, participation in this new and evolving space can offer attractive new client growth, revenue and impact opportunities that MFIs are just now beginning to explore.

Vayam's project experience in Bihar offers insights into how large, diversified institutions can potentially approach the minigrid opportunity. Vayam is the energy service subsidiary of the BASIX group, a large multi-state organization that has played an important role in Indian microfinance since its early phases. With grant funding provided by the Rockefeller Foundation and the Schneider Electric Foundation, Vayam* was able to fund the design and construction of two DC minigrids in Gaya district, Bihar, which were commissioned in May 2016 and February 2017. The grids, 8.4 kW and 7.2 kW in capacity, respectively, are owned and operated by local village-level entrepreneurs, who are also responsible for fee collection from end-users. For the pilot, the VLEs

contributed approximately 20% to the total project CAPEX. In a future scenario, post-pilot, Vayam could provide a loan to the entrepreneur to cover his share of the upfront contribution, and then maintain equity in the projects for a longer period, providing the VLE with the option to eventually buy-out Vayam and gain full ownership, or continue in partnership.

The Vayam business model possesses a few novel features, some of which draw on conventions and methods common to microfinance. First, the microgrids support both irrigation and household loads, with the former providing the “anchor” which accounts for upwards of 80% of total usage in terms of energy, and the largest share of revenue generated. This configuration, a typical feature of many sustainable minigrid business models, reduces the relative significance of household loads (lighting, mobile charging, fans) as a share of revenue, and enables the VLEs to offer affordable monthly tariffs for household ratepayers.

Second, the grids’ technical design includes distributed battery storage, in which end-users are responsible for purchasing battery systems at the household level. Drawing on parent organization BASIS’s core competency as a microlender, Vayam developed a financing plan that enables end-users to pay for their battery units in installments over time. This configuration shifts a portion of system CAPEX to the client, reducing the overall amount of investment required of the VLE.

Third, as a means of promoting sustainability, end-user recruitment and retention are rooted in social and economic relationships associated with existing local livelihood institutions, rather than the village, at large. Both pilot VLEs lead village-level milk cooperatives, and recruited their household end-users exclusively from co-operative members, which represent around 20% of the total village populations. This pre-existing economic interdependency creates an extra dimension of accountability for end-users to participate and pay, and for the VLE to consistently deliver service. Failure to do so on either end of the transaction risks compromising more fundamental social and economic ties between the VLE and end-users. Pilot VLEs have also reported that providing reliable electricity to members strengthens relationships and retention between them and their members, while also improving productivity by making it easier for members to milk their cows longer in the evening under electric light.

The livelihood-basis of the model reflects a distinctly client-centric, demand-oriented approach that is characteristic of microfinance. Vayam field staff closely studied local conditions and social and economic structures prevalent in the villages, and solicited feedback from VLEs and village residents before arriving at this specific arrangement. Exhibiting another core MFI strength, Vayam also took time and great care to educate and build awareness about the elements and advantages of the microgrid program, which helped generate demand and willingness to participate. While the scale potential of this model will ultimately depend on the financial performance of each project over time, as well as regulatory and policy factors, including future subsidy and financing options made available for such projects, Vayam has introduced a number of model elements that leverage MFI strengths, support sustainability, and can be replicated and adapted in the future.



The Mahashakti Foundation's (MSF) microgrid initiative, already highlighted in the profile above, offers a very different example of how and why MFIs can engage in microgrid projects, and the types of impacts and advantages they yield as a result. MSF is a prototypical mission-based innovator, and its entry into the microgrid space was driven in large part by its organizational culture and holistic development focus. The organization's experience of developing 43 microgrids in remote, tribal communities where neither microfinance nor grid electricity had been present, illustrates how an initial focus on delivering the essential service of electricity in new markets can be integrated with microfinance client recruitment. In short, MSF brought electricity to unelectrified communities, which enabled local tailors and agriculturalists to work longer hours and earn more income, which, in turn, made them receptive and open to forming groups and taking loans from MSF.

The experience also shows how MFIs can effectively leverage CSR funding potential from banks and other corporate sources to jump start and expand novel program areas. Because MSF acts as a BC for multiple banks, it enjoys existing relationships that can provide a reliable channel for soft CSR funding. This example provides one small illustration of how greater integration occurring between microfinance and mainstream banking in India can produce innovation in the area of energy microfinance.

A final example of potential future directions for microfinance in the micro/minigrid context can be drawn from outside of the sector. The MLINDA foundation, a Kolkata-based NGO, has pioneered end-user finance approaches that could be replicated by MFIs in partnership with microgrid operators. Since 2012, MLINDA has worked to form special energy-focused SHGs to coordinate and finance over 300 250 W – 1KW microgrids in West Bengal, using a joint liability model and finance from NABARD. Based on this experience MLINDA recognized the need for holistic, comprehensive electrification platforms that can offer more than basic household lighting and mobile charging, and support productive, agricultural loads that have the potential to transform local village economies.

Since 2015 the organization has constructed 8 microgrids in tribal communities in Jharkhand, ranging in capacity from 22 KW to 38KW. The minigrids support 3-phase loads including solar irrigation pumps, rice hulling machines, and wheat milling machines, which collectively account for 70% of total consumption. MLINDA worked extensively with community leaders and households prior to design and construction to build understanding, trust and interest, and solicit feedback concerning demand, expectations, and potential barriers to participation. The program has connected 950 households to grid service, and is planning to commission an additional 45 minigrids by December 2019. To date, MLINDA has financed 95 pieces of agricultural equipment, including 30 irrigation pumps. It has also financed over 30 energy efficient televisions for household use.

The component of MLINDA's model that may be most readily replicated by MFIs exploring microgrids as an opportunity is its financing facility which

enables community members to obtain productive and household energy products and equipment. This facility has been introduced with financial support from Milaap, a Bangalore-based crowdfunding platform that raises capital from online donors, corporations and high net worth individuals for organizations that provide loans for energy, clean water, sanitation, education and other essential services.

The provision of finance has two significant impacts. First, it enables low income borrowers to invest in income generating equipment that they otherwise could not afford, and, in the case of irrigation, switch from expensive diesel-based sources that must be rented from remote towns. MLINDA, in addition to providing financing also educates clients about equipment options, and the financial benefits of adoption. Importantly, in providing finance, MLINDA also acts as a quality filter, only providing financing for high performing, energy efficient models of different appliance and equipment classes.

Second, the availability of financing accelerates the rate of energy utilization among end-users, enabling MLINDA to offer affordable kWh pricing while, also maintaining the overall financial sustainability of projects. This impact underscores how the availability of financing can fundamentally improve the project economics and financial viability of minigrids.

Each of the customer mobilization and financing functions that MLINDA performs matches well with the core strengths of MFIs that have been described at length in this report. This introduces the potential for future replication and adaptation of the MLINDA model within the microfinance sector. Just as MFIs currently partner with energy product companies for their energy lending initiatives, MFIs could form collaborations with minigrid developers and operators. MFIs that already operate in rural districts where demand for minigrids is highest can focus on communities that they already serve through existing branches.

Importantly, the group nature of microfinance lending and customer engagement means that MFIs will already have a core of clients within target communities which could form a critical mass of demand upon which additional recruitment could be carried out by both members and field staff. For MFIs that do not serve a high proportion of rural clients but are seeking ways to increase their footprint, tie-ups with established microgrid operators could represent a powerful means by which to facilitate such an expansion. As the experience of MSF has shown in another tribal setting, supporting energy access can open up opportunities for new client recruitment and retention. Financing partnerships with minigrid operators could present a similar vehicle.

CONCLUSION

The model variations and energy product and service areas summarized in this section represent a sample of directions that are currently being contemplated or piloted by PACE-D MSP partners. Additional developments not covered but already in limited practice include MFIs functioning as third-party collection agents for DISCOM's. Such an arrangement parallels BC partnerships that MFIs increasingly form with banks, and plays to established strengths of

MFIs: highly effective loan repayment collection methods, and extensive outreach in last mile and informal communities. In addition, the focus of MFIs on energy product finance can extend to a host of different appliances in the future, including TVs, refrigerators, laptop computers and tablets, among other high demand assets. In this capacity, MFIs can also act as a quality filter, as they have for distributed solar products, by exclusively financing best in class products in terms of quality, warranties, price and efficiency.

In view of these different directions, a more general lesson regarding the relationship between microfinance and energy access: the long-term trend will most likely be one of diversification and expansion, rather than narrow contraction around a very limited number of products and delivery models.





4 | POLICY RECOMMENDATIONS TO ADVANCE ENERGY MICROFINANCE IN INDIA

SUMMARY

The aim of this guide has been to present how various dimensions of microfinance create opportunities for the sector to play a greater role in advancing electricity access in India. The perspective offered on this subject has been enriched by the real world observations and experiences of PACE-D MSP partner MFIs and the program's technical assistance team, who together do the challenging work of planning, implementing and adapting energy microfinance in districts all over India.

The analysis has focused mostly on the relevance of MFI financial products, organizational capabilities, and core values as the key factors through which these opportunities can materialize. Microcredit makes improved energy products affordable for low-income consumers, enabling the latter to pay gradually in installments and to accumulate multiple energy assets over a longer period through multiple loan cycles. Equally as vital, PACE-D MSP partner experience has demonstrated how the operational capabilities and outreach and lending methods common to microfinance can effectively be leveraged to fill essential energy access value chain functions related to logistics, distribution, marketing, sales and maintenance.

The nature of the capabilities and resources that different MFIs can apply to these tasks vary from institution to institution, reflecting the sector's considerable internal diversity. This diversity is itself a source of value within the context of energy access, because it promotes a profusion of approaches to engaging and meeting

the needs of India's highly segmented energy poor population. Finally, "double bottom line" values and norms that merge social mission and business imperatives have pervaded and animated microfinance in India throughout its history, and continue to do so today. As a result, the sector has demonstrated a consistent commitment to meeting the critical needs and aspirations of poor people, while also embracing financial discipline, self-sufficiency and a drive to grow, compete and survive in a market that much of the formal private sector has largely ceded. These traits also help explain the sector's signature resilience and adaptability in the face of change and crisis.

As noted in the introduction, the report has been developed to serve as a resource for readers who are directly and indirectly engaged in policy creation and debate in the energy access domain in India. The primary hope is that the insights and arguments presented will support greater recognition of microfinance's potential utility in reducing energy poverty; and help spur new ideas for how the sector can be more productively incorporated within energy access planning and strategy in the future.

In conclusion, it is appropriate to explore the role that government initiative and policy can play in fostering more robust and diverse forms of energy microfinance that have real impact in the future. The Government of India is currently embarked on a momentous policy and programmatic effort to rapidly reform and reconstitute the nation's electricity sector. The magnitude and scope of this effort reflects the extraordinary economic and environmental outcomes that are at stake for the nation. India's success in driving economic transformation with resilient low and zero carbon energy infrastructure requires novel approaches that draw on the nation's diverse and unique resources, endowments and strengths.

For the goal of securing clean, affordable and reliable electricity access for poor and remote communities, the PACE-D MSP experience indicates that India's ever evolving microfinance sector has a role to play in helping realize this end. A growing number of institutions are demonstrating a clear prerogative and ability to advance energy access of their own accord without direct government support. However, government can enhance and accelerate this market and mission-driven trend by making investments that strengthen the ecosystem within which these MFIs are increasingly active and well positioned to make an impact.

The following recommendations are derived from PACE-D MSP partner feedback, as well as that of other active stakeholders within the energy microfinance and energy access domains. Collectively they cover diverse ground, offering different ways in which government intervention can foster more extensive and sustained microfinance sector engagement in the energy access space.

PROMOTE PRODUCT DEMAND THROUGH EDUCATION AND AWARENESS CAMPAIGNS

Government-led stimulation of improved energy product demand and literacy can be accomplished through local education and awareness campaigns. General awareness and acceptance of clean energy products among energy poor consumers has grown appreciably in recent years as product quality and provider reach have improved and expanded. However, within the context of energy microfinance



field staff largely shoulder the burden of establishing basic awareness and trust in such products in rural markets where penetration remains limited. While MFIs have demonstrated a powerful aptitude for cultivating demand among their clientele, the effort to do so requires investments in scarce time and resources, and therefore represents a limitation on the scale and rate of impact.

Therefore, there is a potentially important role for central government and state nodal agencies to play in promoting general interest and energy literacy among energy poor target populations through targeted outreach and media campaigns. Without favoring particular product providers or institutions, government can mobilize resources and leverage its relationships with local agencies, organizations, media outlets and community representatives to raise awareness in priority areas about clean energy alternatives and energy microfinance options. By elevating the baseline level of energy literacy and product familiarity in high need areas, such campaigns can reduce the level of effort currently born by MFIs and their product partners, thus expanding the market base and accelerating penetration.

FOSTER LINKAGES TO PROMOTE TRAINING

Linkages between government energy training initiatives and energy microfinance practitioners can be fostered to increase skills. The future growth and diversification of energy microfinance is constrained by the availability of a skilled energy workforce in the remote and rural communities that MFIs serve. As discussed in early sections of this report, staff capacity and skill building is an essential precondition of MFI participation and ultimate advancement in the energy access domain. This need will only become more significant as larger MFIs seek to diversify their energy businesses through independent ventures that offer energy solutions that are more technically complex than solar retail products. At present, MFIs must take on the responsibility of training staff internally to promote and manage energy activities. The costs in time and financial resources that this requires constitute a barrier to entry for many MFIs. While energy product partners and technical assistance providers make important contributions to training efforts, there is a clear role for the Government of India to play in reducing this burden.

“Skilling India” in order to meet critical 21st century labor demands in the coming decade is the mandate of the Government of India’s Ministry of Skill Development and Entrepreneurship, formed in 2014. This objective converges directly with the government’s clean energy vision, as progress on the latter front will not materialize as envisioned without concomitant investments in skill development and training across the clean energy sector. The National Institute of Solar Energy (NISE), established under the auspices of the Ministry of New and Renewable Energy (MNRE), is tasked with the responsibility of executing multiple skill development programs throughout the country in the field of renewable energy technology. Beginning in 2015, NISE launched the Suryamitra initiative in collaboration with state nodal agencies to ramp up technical training and skilling of the labor pool in the area of on-grid and off-grid solar technology applications. In addition to providing vocational technical training, the initiative also works to promote job placement through events that invite solar industry stakeholders to engage with trainee graduates.

MFIs engaged in energy business activities could benefit from Surymitra's training initiatives, both by employing trainee graduates, and by seeking admission into the initiative's training programs for its existing energy field staff. As noted, the need for this skill pool will be greatest among larger institutions that operate independent energy ventures that promote and finance a diversity of energy solutions. However, even among more conventional promoters and financiers of smaller retail solar products, skill training in the technical fundamentals of solar for outreach staff would stand to improve performance and reduce internal training burdens for MFIs. Therefore, MNRE and NISE could explore a formal partnership with energy microfinance practitioners through which tailored training offerings could be designed to meet the evolving labor and skill needs of these MFIs.

SUPPORT ONGOING TECHNICAL ASSISTANCE FOR MFIS

Ongoing technical assistance resources for MFIs that are seeking to engage in and grow energy business models can be promoted. The first two sections of this report highlighted the recent history of Indian microfinance sector involvement in the energy access space, and identified different push and pull factors that have influenced this convergence over time. One factor that requires more explicit consideration within the context of potential public policy interventions is the impact that access to third-party technical assistance has in causing MFIs to enter into, succeed at and persist with energy microfinance programs. Energy microfinance continues to gain greater prominence in the sector as a whole, as the successful experiences of institutions gain visibility and attract interest, and as the rewards and risks of energy business become more widely understood. The critical influence of technical assistance programs, including but not limited to PACE-D MSP, in supporting this trend cannot be overlooked or understated.

The resilience and growth of microfinance in India owes much to the sector's core focus on risk avoidance and mitigation, operational streamlining and standardization, and fiscal discipline. These pervasive traits, while promoting success and survival, can also impede potential business and mission diversification. Multi-year programs such as PACE-D MSP exist to overcome this impediment by providing critical technical assistance and knowledge and capacity building within institutions that make the prospect of engaging in new and unfamiliar sectors, such as energy, less risky and uncertain. Effective technical assistance in this area helps institutions understand the business and impact opportunities of energy microfinance within the context of their own clients and operations, while assisting them in designing, implementing and adapting energy business models that match their institutional capabilities and goals. Such programs also perform vital roles in promoting energy microfinance more broadly across the sector, and cultivating attention and engagement among investors and other financial supporters; activities that many institutions do not possess the bandwidth, expertise or interest to lead internally.

Energy microfinance is indeed growing and diversifying in India, and this trend shows little sign of abating. However, energy is still a long way from attaining universal acceptance within the sector, and therefore the continued availability of technical assistance for business development for both new and established energy

microfinance practitioners is highly warranted. The need for such assistance is enhanced in light of the rapid sector transformations discussed in Section 1 of this report, as well as the potential areas of future diversification that were explored in the previous section. The design and implementation of energy microfinance business models requires a detailed assessment of each institution's specific circumstances and capabilities.

As microfinance institutions continue to evolve and take new forms, new potential directions for energy microfinance will emerge. Technical assistance providers with both expertise in energy and microfinance can help institutions identify and act upon such opportunities. Therefore, the Government of India could allocate future resources and investments to ensure that technical assistance for energy business development remains available in the future to enable MFIs of various categories to engage, learn and prosper in the energy access space.



IMPLEMENT QUALITY ASSURANCE STANDARDS FOR ENERGY PRODUCTS

Public quality assurance standards for energy product and application categories could be implemented and maintained. As described in Section 2, lack of internal understanding and expertise of energy products and applications has historically been a key barrier to MFI engagement in energy lending and promotion. Through close and regular contact with energy poor clients, MFIs can readily identify strong latent demand for improved energy products, but the capacity to assess and select appropriate, reliable products and product providers presented a separate challenge. This barrier has declined in significance through the interventions of technical assistance programs, and as leading energy product providers have grown in reach and established track records in the marketplace. In spite of clear progress, however, the need remains for independent, current and accessible resources with which MFIs (and other channel entities) can measure and compare performance and quality across a range of energy product and application categories in order to make informed decisions.

The Ministry of New and Renewable Energy (MNRE) possesses the resources, standing and mission objectives to potentially perform this function, or to partner with other government and non-government parties to advance an independent entity to do so. Lighting Asia/India and Lighting Global, joint initiatives of the IFC and World Bank, provide useful reference points for how a program of this sort could be structured and made available to relevant stakeholders. With the resources of the Government of India brought to bear, the potential exists to expand the scope of standard testing and quality assurance to a broader range of energy products and applications beyond portable lighting devices. The presence of such an entity, adequately resourced and made easily accessible to the public, would reduce technology related uncertainties and increase the confidence and decision-making efficiency of MFIs and other channel entities engaged in energy promotion and finance.

CREATE INCENTIVES TO SPUR EARLY ADOPTION OF HIGH VALUE ENERGY APPLICATIONS

The early adoption of newer, high value energy applications can be spurred by applying targeted. One of the common themes that unites most of the

recommendations offered in this section is that policy interventions could be designed to reduce risks, uncertainties and barriers to MFI participation in energy promotion and lending. The application of subsidies to drive down energy costs for consumers did not emerge significantly in discussions with PACE-D MSP stakeholders as a preferred vehicle for advancing energy microfinance. The common view of practitioners is that subsidies risk distorting rather than building markets, and that the sector is well positioned to succeed on a commercial basis without them. The success of PACE-D MSP MFI partners to date has largely validated this perspective, at least in relation to solar retail product promotion and finance.

However, there are areas of potential MFI activity where financial incentives can have a market-building impact; namely for larger, more expensive applications that MFIs have not yet promoted extensively, or at all. The high level of interest among many PACE-D MSP partners in financing solar irrigation pumps in farming communities provides a strong example of such a case. MFIs already engaged in energy are likely to gravitate towards this solution because it stands to have an enormous economic impact on farmers by addressing a fundamental livelihood need. This fact makes solar irrigation lending a natural progression for MFIs that already serve agricultural clients, as well as those that aim to in the future and are looking to identify high demand, high impact points of entry. MFIs are well positioned to put in place group-based asset lending and ownership models for solar irrigation to divide costs and risks between multiple clients, without compromising value or access.



Some PACE-D MSP partners have expressed that small interest rate, capital or performance based incentives that bring down the upfront or ongoing cost of investment could be effectively applied to strengthen demand among clients. Such incentives could also be time limited in order to encourage early adoption and scale up, and thus accelerate cost reduction, learning curve advancement and demand maturation. However, energy microfinance practitioners, aware of some of the common criticisms that are frequently made about government subsidy schemes for solar irrigation and other distributed energy products, harbor reservations about how subsidies might be structured and implemented. Namely, that the process of availing subsidies post-sale is time-consuming and hard to predict; and that the status and terms of subsidy schemes might change abruptly, making business planning difficult.

Further, MSP partners that have explored solar irrigation during the program period have frequently encountered expectations among clients that the majority or even full cost of investment should be covered by government subsidies. The prevalence of such expectations in the market make it exceedingly difficult for MFIs to gain traction, even if the proposed financing model would generate substantial economic benefits for clients. Therefore, for energy microfinance practitioners well positioned to promote and finance solar irrigation pumps, as well as other larger solar applications, subsidies are welcome, provided that they are transparent, consistent, relatively easy to access, and priced to build sustainable markets, rather than pre-empt them through unnecessary largesse.

PROVIDE MFIS WITH LOAN CAPITAL

Small “mission-driven innovator” MFIs in remote, underserved areas could be provided with access to loan capital for energy lending. One of the insights from PACE-D MSP concerns the unique potential of small, community-based NGOs and NBFCs that provide microfinance in the most remote parts of the country. These areas have the lowest rates of electricity interconnection and reliability, and tend to be places where larger MFIs have a more limited presence. In Section 2 of this report, these types of institutions were characterized as mission-driven innovators. Such institutions have a greater tendency to view both energy access and financial inclusion within a broad holistic development framework that is focused on improving over all economic and social conditions for constituents. While such organizations often face resource limitations and only represent a small and even diminishing share of Indian microfinance GLP and outreach, they exist in great numbers and are well distributed in the most needy and vulnerable parts of the country. It is these organizations that are often the most proactive in pursuing energy as a program area, and they are often the most willing to experiment and diversify their activities.

However, because of their comparatively small scale, and lower turnover and rates of return, these organizations often struggle to secure capital from conventional sources, most notably commercial banks, which favor larger, and more profitable and commercially sophisticated institutions. This capital gap could be addressed at least in part by the Ministry of New and Renewable Energy (MNRE) or other government agencies through the creation of a dedicated financing facility for smaller NGO MFIs. The facility could be used to help smaller MFIs secure loan capital to finance energy products and services. Prioritization could be geared towards MFIs operating in government designated priority areas where the grid is least likely to penetrate or where reliability will remain a challenge in the long term.

INCENTIVIZE MFIS WITH LOAN GUARANTEES TO LEVERAGE LOCAL CAPITAL MARKETS

Greater MFI participation in energy lending could be incentivized with pilot stage loan guarantees to leverage local capital markets. In order to encourage more conventional NBFC-MFIs and banks to engage in energy lending and promotion, early stage loan guarantees could play an important role. Concerns about risk is a definitive feature of MFIs as lenders, and this presents barriers as well as advantages in regard to energy lending. Energy practice is becoming increasingly common as the success of leading MFIs becomes more visible. However, the fact remains that most Indian MFIs, including many of the largest, currently do not promote or finance energy. A loan guarantee fund for pilot stage projects could help offset lingering reservations that MFIs still harbor, enabling them to test the waters and learn the ropes at lower risk. It could also serve as a programmatic channel through which best practices related to model design and risk mitigation could be documented and transmitted to new practitioners.

A loan guarantee is also an attractive incentive option because it does not distort the market by artificially altering prices for end users. Even more fundamentally guarantees use relatively limited amounts of public investment to leverage large amounts of private capital, thus requiring only a small public contribution to deliver a potentially big impact.

Each of the above recommendations reflects the ideas and recommendations of a broad range of practitioners interviewed for this report. The development of these and other recommendations would benefit from a more formalized, long-term dialogue between the microfinance sector and relevant agencies tasked with advancing energy access at both the central and state levels. A move in this direction, more than any specific policy action, is what the authors of this guide would most strongly recommend in the interest of promoting the full potential of energy microfinance in India. The content of this guide has been prepared and presented with a direct view to supporting that goal. Going forward, USAID and the PACE-D program look forward to an active partnership with the Government of India and India's microfinance sector in facilitate this convergence in the future for the benefit of communities that lack access to clean, reliable and affordable energy services.



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ENDNOTES

- 1** Arc Finance, *Business Models for Microfinance Energy Lending*, 2017.
- 2** The total conversion will reduce aggregate energy consumption and peak demand, respectively, by an estimated 32,450 million kWh (annually) and 6,497 MW, while saving ratepayers Rs 12,980 Crores per year, and preventing 26,284,205 tones of CO2 emissions.
- 3** GARV Government of India Dashboard.
- 4** Lessons from other countries indicate that using expensive technical designs to extend electricity in rural areas can cost up to 30 percent more than those more appropriate for rural levels of demand (Banerjee et al., 8).
- 5** The Self-Employed Women's Association (SEWA) was a pioneer in promoting this approach in India and FWFB was a pioneer in financing these early MFIs.
- 6** See RBI Notification (February 7, 2014) "Non-Banking Financial Company-Micro Finance Institutions' (NBFC-MFIs) – Directions – Modifications in "Pricing of Credit."
- 7** According to MFIN (20), as of March 31, 2017, the geographic spread of GLP was 43% rural and 57% urban/peri-urban.
- 8** Over 50% of Sa-Dhan's MFI members have implemented financial literacy programs. (Bharat Microfinance Report 2016). This development, driven internally by the sector, has helped clients make informed decisions about both borrowing and the financial management of their businesses. Arc Finance, PACE-D MSP technical assistance provider, has drawn on the pedagogical conventions of microfinance financial literacy programs to develop and implement an energy literacy training methodology, which it has transferred to most PACE-D MSP MFI partners. The training helps clients recognize and quantify energy expenditures and potential savings with renewable energy and efficiency investments.
- 9** According to the microfinance network organization and SRO Sa-Dhan, approximately 30% of its membership have explored or commenced begun activities related to energy lending activities (Satish, P. Personal Interview, 6, April 2017).