



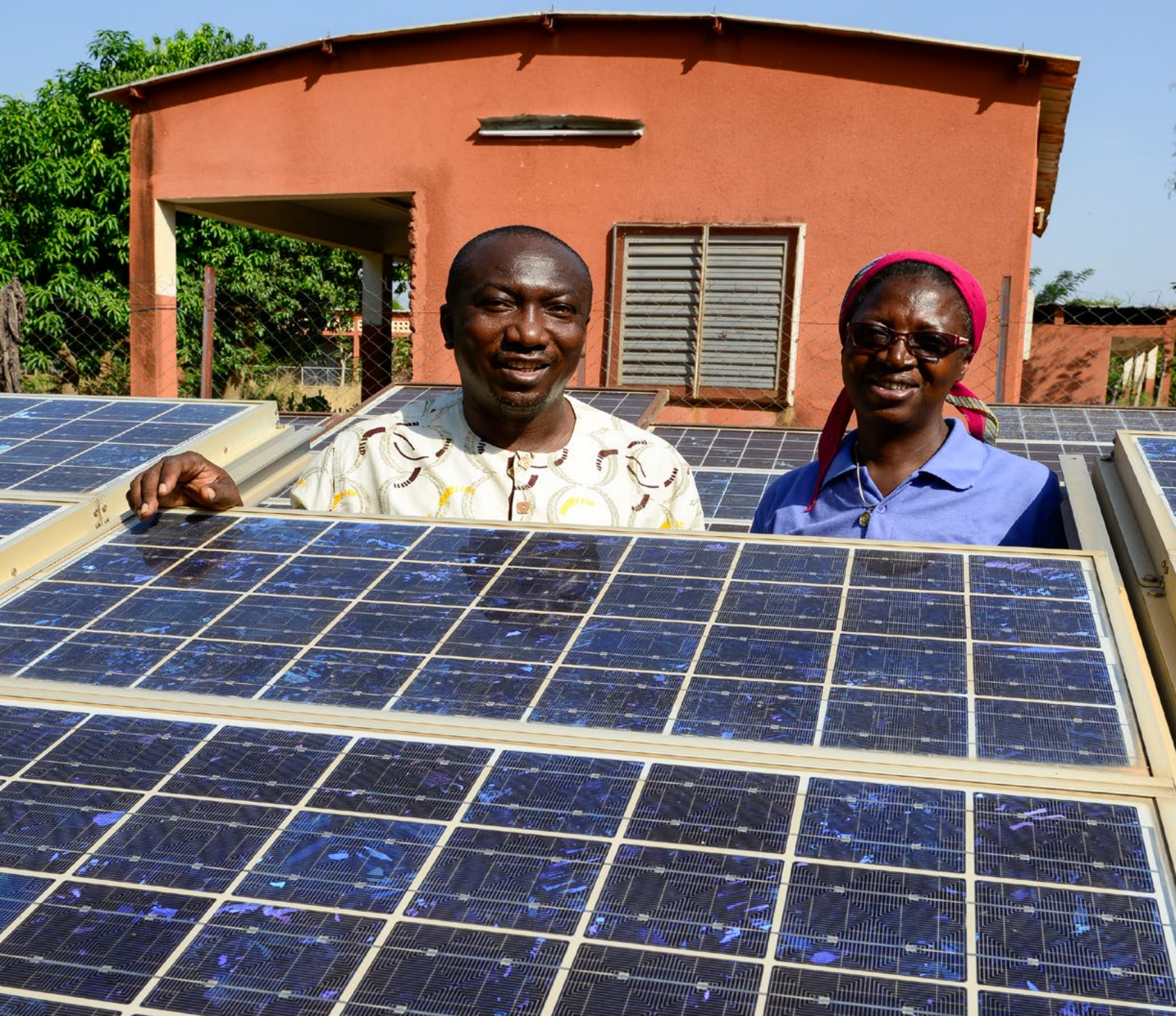
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# SHARING THE POWER

A COMMUNITY-ENGAGED ENERGY ACCESS OPPORTUNITY FOR SUB-SAHARAN AFRICA

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PROPOSAL BY ROCKY MOUNTAIN INSTITUTE, SEPTEMBER 2018



# TABLE OF CONTENTS

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EXECUTIVE SUMMARY ..... **3**  
    **Sidebar:** The Bigger Dream ..... 5

**RMI'S DREAM EXTRA PROJECT PROPOSAL FOR THE DUTCH POSTCODE LOTTERY**    **7**

THE URGENT NEED ..... **8**  
    **Sidebar:** How Electricity Can Transform Agro-processing ..... 9

BARRIERS AND CHALLENGES ..... **11**

LESSONS FROM THE PAST ..... **13**

PLANTING THE SEEDS OF A POWER REVOLUTION: THE RMI PROPOSAL ..... **14**  
    I. A Path to Expanding Community Engagement ..... 15  
    II. Lowering Minigrid Costs (Projects) ..... 17  
    **Sidebar:** Proving the Business Case to Accelerate Scale-Up ..... 18  
    III. Communications Strategy ..... 20  
    IV. Scaling beyond the Extra Project ..... 21  
    V. Time Line, Deliverables, and Budget ..... 22

ABOUT RMI ..... **25**

APPENDIX I: COMMUNICATIONS PLAN ..... **27**

APPENDIX II: LETTERS OF SUPPORT ..... **29**  
    **Carnegy Mellon University** Paulina Jaramillo ..... 29  
    **Power for All** Nigeria Campaign ..... 30  
    **All On** Dr. Wiebe Boer ..... 31  
    **REA** Damilola Ogunbiyi ..... 32  
    **Sir Richard Branson** ..... 33  
    **SEforALL** Rachel Kyte ..... 34

ENDNOTES..... **35**

# EXECUTIVE SUMMARY

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Electricity is the lifeblood of the modern global economy. It's essential to economic growth, national competitiveness, and social progress.

Yet this transformative form of energy has yet to reach more than 1.1 billion people, including 65 percent of Africans. Hundreds of millions more have only an unreliable and intermittent supply.

The problem is particularly acute in sub-Saharan Africa, the focus of this Extra Project. As many as half a billion people live in poverty, in large part because they lack the electricity that's crucial for underpinning economic development and for powering their entrepreneurial dreams. Indeed, this region is the only place in the world where current efforts to electrify are falling behind population growth, meaning that if nothing changes, more people will be in darkness in 2040 than are today.

This Extra Project proposal tackles this enormous problem with an innovative bottom-up approach. Most electrification strategies are planned from the top down to meet specific gigawatt targets delivered. This Extra project builds the work from the community level, identifying their power needs, assessing the minimum requirements for financial viability, locating land for power generation, and understanding how growing a community's power use can reduce overall costs to all users.

Coupling this with small-scale financing resources for purchase of labor-saving agricultural or other equipment balances the availability of new power resources with the tools to grow economic development. Other key components are building local decision-making and potential ownership into plans, and drawing on RMI's and others' recent work in designing and creating standardized minigrid systems, which can promise major reductions in costs over today's more costly custom installations.

The approach would be a modernized version of the rural electrical cooperative model that successfully transformed rural economies all across the United States, Canada, Europe,<sup>1</sup> and Australia in the 20th century. In those cases, governments and development agencies offered low-cost loans to communities not just to extend transmission lines to farms, homes, and businesses, but also to enable rural people to buy refrigerators, pumps, washing machines, electric stoves, and scores of other electricity-using devices and appliances. They even sent "home electrification specialists" to rural areas to teach people about the many productive uses of electricity. In the United States, the result was a remarkable period of rural economic growth that expanded electricity access from less than 10 percent in 1935 to more than 90 percent just 15 years later.



We now have the opportunity to update this model for sub-Saharan Africa using 21st-century technologies—solar-based minigrids with battery backup, combined with mobile money and pay-as-you-go financing, remote monitoring, and wires-free communication for support. Keeping the focus on strong community engagement would be a departure from many of the current efforts to build such minigrids, which typically are designed from the top down and involve developers prospecting for opportunities, a “customer push” model. The new model would be one where there is strong customer “pull.” Taking this approach offers numerous advantages:

1. It would solve one of the paradoxical problems that some current minigrids have faced—lack of demand to fully utilize the minigrids’ capacity, leading to high electricity costs for the power that is sold and a challenging business model.
2. Combined with minigrid standardization, it would drive down costs and thus electricity prices by more than 60 percent by lowering customer acquisition costs, ensuring high-capacity utilization of the system, and expanding the use of standardized solutions. That, in turn, would lower risk and thus financing costs.
3. It would enable a not-for-profit model, like the original rural electric cooperatives in the United States and Europe, lowering overall costs (without the need for private sector–type returns on projects that are perceived as risky) and allowing revenues to be plowed back into expansion to new customers or to support new cooperatives.
4. Low electricity prices and low-cost concessional or cooperative financing for productivity-enhancing equipment such as grain mills, milk refrigeration, and cold storage would stimulate economic development and start a virtuous circle in which the increased revenues of community businesses fuel accelerating economic and job growth.

5. It would avoid the current conundrum in which isolated minigrids are de facto monopolies that don’t have incentives to always serve the best interests of their customers.
6. It would lead to rapid scaling through a community-led “pull” model in which other communities, supported by community-based organizations such as agricultural cooperatives, faith-based groups, and economic development agencies, identify productive uses of power and sign up the loads critical for commercial viability.

Our larger dream is that thousands of community-engaged cooperatives (CECs) can be established, meeting the needs of more than 100 million Africans with reliable, inexpensive, and sustainable energy over the next decade. We know such a rapid expansion is possible, because it has been done before.



## Sidebar: The Bigger Dream

Our Extra Project proposal is the foundational test of a much larger dream. We believe that successful demonstration of the potent combination of community engagement and lowered costs will open the door to bringing the benefits and opportunities of affordable and sustainable energy to the hundreds of millions of people now without access to that power.

Here's what such success would look like in about 2030. The community-engaged model would be widespread, with the creation of national and regional chapters of community-owned electric cooperatives. These cooperatives would organize, educate, and supply their members with reliable electricity to meet their needs—and fuel thriving and growing local economies. These same co-op's would provide financing for agricultural equipment, household appliances, cold storage systems, pumps, and many other important labor-saving devices. They would also bring in additional services such as Internet when the private sector won't step in, and function as centers of knowledge

on the latest technology trends that could benefit their members. They could even provide advice to those too remote to be served by minigrids. These not-for-profit chapters would be trusted sources of information whose members serve on their boards, work in their offices, and service their equipment. They would also be sources of employment, for example, in technical or clerical jobs, and would serve their customers by aligning their needs with the co-op's incentives.

Our Extra Project will test the viability of a cooperative model. It will understand the indigenous community service groups that can play a role in bringing power to villages, it will develop the tools needed to engage communities, and it will test a model in which communities are organized to be part of the solution, while lowering the costs of those solutions. The funding will enable us to show that such an approach can overcome key barriers that exist today and that hamper rapid scaling, and it will lay the groundwork for a much larger effort that could unfold by late 2020.



Image Courtesy: Off-Grid Electric, Masai Kid in Tanzania with a Solar Light

But we must learn to walk before we run. This Extra Project is designed to seed the future by tackling a more limited set of goals. We are convinced, however, that working to achieve these goals will catalyze a widespread community-engaged revolution with transformative consequences. With the support of a €2.8 million grant from the Dutch Postcode Lottery, we would:

1. Develop partnerships with organizations such as the One Acre Fund, Babban Gona, and faith-based groups that have deep roots in community engagement and have already begun to bring affordable power to communities via solar lanterns.
2. Develop and apply a set of selection criteria to identify high-potential communities, expanding on our existing relationships with key players such as Nigeria's Rural Electrification Agency.
3. Work with three to five communities and our partners in two countries (Nigeria and Ethiopia) to develop and implement a community-engaged rural electrification model.
4. Work with local and global companies to develop a low-cost, standardized minigrid solution that can be readily adopted by communities.
5. Work with communities, companies, and development agencies to install six to 10 minigrids in order to demonstrate their commercial viability and therefore scalability, show communities and community-based organizations their benefits, and create models for a standardized solution.
6. Demonstrate that the combination of standardized equipment and strong community engagement will cut costs of minigrids by more than 60 percent.
7. Test different levels of community engagement, including full community ownership.

8. Provide low-cost financing for productive equipment and appliances such as grain mills and refrigerators, and test price signals and other demand stimulation levers to demonstrate how support for expanding the use of electricity accelerates economic growth and community well-being.

Our proposal is to work with local and community-based organizations to bring affordable, reliable electricity to up to 10 villages, with an average of 1,000 people and dozens of businesses each. We expect to prove the viability and importance of this “community pull” model, showing how it can simplify customer acquisition, grow demand, improve capacity utilization, and increase commercial viability. We also believe it can help create new generations of local community leaders who will have a lasting influence for generations to come.

**As a result, we hope that this relatively small project will have an impact. It has the potential to set the stage for the rapid growth of minigrids from rare novelties to the ubiquitous backbone of a rural economic transformation led by local communities in Africa.**



Image Courtesy: Power Africa, Villagers in Sipané, Senegal After Getting Solar Power. Photo by Xaume Olleros.



## RMI's Dream Extra Project Proposal for the Dutch Postcode Lottery

Image © RMI. A mill in a village near Woreta, east of Lake Tana, in Northern Ethiopia. Farmers from the region bring their maize and tef, the local staple, to be milled here using loud, polluting diesel-powered motors. The village is not electrified and fuel for the motors is carried 20km by donkey. This is one of 16 mills operating in a cluster on the edge of the village.

# THE URGENT NEED

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The evidence for the transformative power of electricity is enormous and persuasive. In the first half of the 20th century, rural electricity efforts in North America and Europe dramatically boosted agricultural productivity and incomes, stimulated the creation of new businesses and industries, freed families and their children from tedious labor, raised education levels, and significantly increased national GDP levels.

Even today, the arrival of affordable and reliable electricity in rural areas brings impressive economic gains and improvements in quality of life, as recent studies show. “The response of business to electrification appears to be quick and dramatic for rural industries,” concludes Douglas Barnes in the 2014 edition of his book *Electric Power for Rural Growth*.<sup>2</sup>

When electricity came to rural villages in the Philippines between 2004 and 2009, for example, household income jumped by nearly 42 percent.<sup>3</sup> Rural Indonesians bought sewing machines, water pumps, refrigerators, and other appliances at a higher rate than expected once they had power.<sup>4</sup> In Colombia, virtually every new business that was created depended on newly arrived electricity.<sup>5</sup> In Chanpatia in Bihar, India, RMI’s team visited a new enterprise selling water purified with reverse osmosis systems made possible by a new minigrid. And at the vast Sabon Gari Market in Kano, Nigeria, a recent switch from expensive intermittent power created by hundreds of diesel-powered generators (gensets) to reliable minigrid electricity led shop owners to expand and invest in air conditioners and other equipment. “I’m very excited about how entrepreneurial people will become once they have a power supply,” Damilola Ogunbiyi, managing director of Nigeria’s Rural Electrification Agency, told RMI. “There is a direct correlation between electric power and economic growth.”

That’s why there is such an urgent need to bring reliable, affordable electricity to vast areas of Africa and Southeast Asia. In Nigeria, half of the nation’s 186 million people have no electricity at all, and many of the rest have only an intermittent or expensive supply; they often pay more than \$0.50/kWh for electricity from noisy, polluting gensets. Costs are even higher in countries that are not oil rich as Nigeria is. Globally, more than 1.1 billion people, including 65 percent of Africans (600 million in sub-Saharan Africa alone), lack access to this essential form of power.

A successful rural electrification effort would profoundly improve lives. It would lift productivity and incomes, open the door to new businesses such as grain mills and welding shops, keep milk and fish from spoiling, enable life-saving drugs and vaccines to reach distant villages, and even allow communities to simply gather around a TV, cold drinks in hand, to cheer on their favorite soccer teams.

RMI’s team members have already seen glimpses of these powerful impacts in their work in Africa and Southeast Asia. In Obayantor in Nigeria’s Edo State, a 37.8 kW solar minigrid built by a company called Arnergy, with support from the United Nations Development Programme, is now supplying electricity to 200 homes, a welder, several mills for grinding crops, a water well, and a growing business using refrigerators and freezers for cold storage. In the Indian village of Bheldi, electricity from a 30 kW solar-powered minigrid funded by The Rockefeller Foundation has enabled owner Siyaram Pandey to invest in new machines and hire two more workers in his carpentry shop. His profits have climbed more than 20 percent.





## Sidebar: How Electricity Can Transform Agro-Processing

Electricity banishes darkness and backbreaking labor. It makes products more affordable and reduces spoilage and waste. It meets people's needs, powers their entrepreneurial dreams, creates jobs, and stimulates economic output.

For much of the developing world, electricity means improving livelihoods by transforming farming and other agriculture-based activities.

Imagine a small village where farming is the predominant activity. A local community group (church, agricultural savings and credit cooperative organization [SACCO], school, health clinic) informs the village of an opportunity to bring power to the community. The community group explains that to have that electricity, the village needs to meet a minimum load requirement, some of which is based on commercial activity.

The members of the village then sit down together and identify the improvements that power could bring to their agriculture. Perhaps milk spoilage can be reduced with refrigeration, which would enable dairy farmers to get more yield from the same cows. Or tomatoes could be processed, concentrated, and stored, giving

farmers more income—plus a source of income in the off season. Low-cost electricity could boost yields and reduce spoilage for a tea cooperative. Or the availability of power could enable merchants to develop business cases for new enterprises, such as a cold storage facility or a small water purification plant that could be built (with concessional financing) to make clean, pure water and to flexibly use excess power capacity during sunny days.

Once these potential uses of power are identified for a village, a community engagement specialist from a local or regional power cooperative would help community leaders build the business case for investment. The specialist would also work with a minigrad developer to understand the cost and complexity of a system that would meet the village's needs. Citizens and businesses could band together to find sufficient load of the right mix so that they could be confident that the power would be affordable, that they would be able to pay for it, and that they could trust those who are selling them the power (in this case, the villagers themselves, as they have been involved every step of the way).



Image Courtesy: DFID. Ramadhan Stands Among His Cabbages at His Home in Rugina, Rwanda

Let's make this real with an example. In a village we have visited, we found welders, cacao processors, small-scale dairy operations, and a woodworking shop. The village also has establishments that offer cold drinks and other goods—even some entertainment in the form of watching soccer matches and movies.

Now imagine that a local church group hears of the electricity co-op effort and organizes a village meeting with the local chapter's experts, the village leadership, and interested citizens and community businesses. The experts describe how the power works, talk with businesses that might use the power, and help the community understand the business case. The local leadership then spends further time with the community to explore what it will take to have a system installed, including who needs to sign up, what it will cost to connect, and the expected cost for power when the community meets a minimum threshold. The experts visit again once the base case for the community is created to further

explore the need for financing and to understand what land can be made available for the minigrid. Then a local developer is engaged or the co-op undertakes the development. After the full case has been assembled, it is forwarded to the local chapter of the co-op organization for consideration and approval. Once the community is given a green light to proceed, the cooperative begins to organize people and resources to install the system and sign up the loads. At the same time, concessional financing (when needed) is made available to those who want to purchase equipment and appliances with on-bill payments. Within weeks, groundbreaking begins. Three months later, the first lights go on. Citizens know exactly what they will have to pay. The co-op is certain that the system is commercially viable. Private-sector businesses begin gearing up to serve growing demand for goods and services. The existing welders, cacao processors, dairy farmers, and carpenters see gains in productivity and income, and new businesses spring up, starting a virtuous circle of economic growth and prosperity.



Image Courtesy: USAID, Alhassan and Musah Zakari Work for Gundaa Produce Company, Ghana

# BARRIERS AND CHALLENGES

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Harnessing 21st-century technologies to bring off-grid power to millions of people is not a new idea. There is already a rapidly growing market for solar lanterns and home solar systems that can light a house, run a radio, recharge a mobile phone, and, increasingly, power small appliances such as fans and televisions. At least 11 companies sell such systems in Africa, including Greenlight Planet, d.light, and Off-Grid Electric (OGE), and they have more than a million customers combined.<sup>6</sup>

In addition, a nonprofit group called the One Acre Fund, which started by providing high-quality seeds, fertilizer, and technical assistance on credit to farmers, has sold hundreds of thousands of solar lanterns made by Greenlight Planet since 2011.<sup>7</sup> Typically, customers make an initial payment for a panel, battery, LED lights, a phone charger, and a radio, then pay a monthly fee for two to three years until they own the system outright.

These small-scale systems are limited, however. The real engines of economic development are devices such as cassava grinders, welding equipment, sewing machines, band saws, refrigerators, water pumps, washing machines, and scores of other important devices. They collectively require not watts of electricity, but kilowatts.

That's why foundations and development partners have invested more than \$400 million in solar-based minigrids, with hundreds of 20 to 200 kW projects in operation across the developing world.

But these so-called minigrids remain curiosities despite the significant investment. Although technically successful, few have demonstrated a viable and scalable model, with sufficient return on capital to draw in the really large investments needed to scale up the approach.

**Our work has identified four major barriers that stand in the way of using minigrids to achieve widespread rural electrification.**

## Most Minigrids Are Still Too Expensive

Although several companies are now developing standardized designs, most current minigrids are unique, custom installations. Buying individual components, without the purchasing power that comes from a large scale, means that the up-front costs for hardware are high. Because each project has a unique design, project development and construction costs are also high.<sup>8</sup> RMI's detailed analysis shows that the up-front costs can exceed \$1 million for a 200 kW peak load solar minigrid with diesel and battery backup. The costs of operation, customer service, and overhead add up to tens of thousands of dollars per year. As a result, the typical levelized cost of electricity (LCOE) for a well-run minigrid today is at least \$0.60/kWh.

## 1. The Power Produced by Minigrids Is Underutilized Because of Lack of Support for Demand Stimulation

If a minigrid has customers for only a fraction of its full capacity, then the LCOE soars and the business model becomes even less viable. This is an especially paradoxical problem given the urgent need for affordable, reliable electricity all across the developing world. But the unfortunate truth is that sufficient demand may not exist to support a minigrid because typical rural households lack the resources to buy water pumps, electric irons, refrigerators, and other devices and appliances that could use the electricity.

It's critical, therefore, that minigrids be located near *productive* uses of energy (grain mills, garment factories, hospitals, or a business district of shops, for instance) and that steps be taken to nurture and stimulate demand, such as by offering loans that enable communities to buy new equipment or appliances. These steps would make it possible to build larger, much more cost-effective grids than most of the current installed systems, which are typically in the eight to 15 kW range. RMI estimates that the minimum viable system size is actually greater than 30 kW, so the demand side of the equation is critical.



## 2. There Are Few Mechanisms for Community Engagement in Power Generation

One of the most powerful drivers for scaling up minigrid development is “customer pull,” in which communities actively seek out a minigrid to meet the demand that already exists or that can be anticipated. That’s a stark contrast to today’s typical “customer push,” in which minigrid companies have been seeking to find demand. Creating that customer pull requires strong community engagement and convincing proof of the transformative effect of affordable electricity. In one telling example, Nayo Tropical Technology Ltd. built a minigrid in Tunga Jika in Niger State as part of Germany’s Nigerian Energy Support Programme (NESP). Once it was up and running, no fewer than 10 neighboring communities saw the benefits—and stepped forward to ask if they could have similar systems. Now Nayo is moving ahead to build those additional minigrids, at significantly reduced costs because of economies of scale.

## 3. Scaling Up Is Difficult

In the current customer push model, minigrid developers must individually approach each and every village, work their way up the chain of command, then painstakingly identify possible loads and cajole people into signing up. This takes considerable time and adds costs and expenses, significantly slowing the spread of minigrids. Flipping the model to customer pull, as happened in the villages near Tunga Jika (as well as most of the rural electrification efforts in the United States, as the next section describes), strips away all that time and cost, and creates the momentum that will make rapid scale-up possible.



Image © RMI. RMI staff on a site visit in Nigeria

# LESSONS FROM THE PAST

How can we now overcome these four barriers? A quick look back at the successful rural electrification efforts in the United States and Europe highlights three crucial elements.

## 1. Strong Community Involvement

In the United States and Scandinavia, rural electrification was driven by farmers who joined together to form cooperatives that built and owned transmission and distribution lines, with the support of low-cost government loans. “Country folk came together, organized cooperatives, and provided labor to build the systems that they ultimately came to own,” explains Smithsonian curator Harold D. Wallace Jr.<sup>9</sup>

In Sweden, the support came from the main utility, Vattenfall, which promoted the formation of local cooperatives.<sup>10</sup> In the United States, the government provided more than \$30 billion in low-cost loans. Considering that the total losses from defaults over the US Rural Electrification Administration’s (REA’s) 43-year history were less than \$50,000,<sup>11</sup> it was a remarkably successful investment in US economic growth and prosperity. Today, nearly 900 consumer-owned, not-for-profit electricity co-ops are spread over 47 states, with a combined value of almost \$400 billion, serving 42 million customers.<sup>12</sup>

## 2. Extensive Support for Growing the Use of Electricity

The US REA understood that farmers could rarely afford the stoves, refrigerators, radios, washing machines, pumps, and other appliances that electricity could power. So it offered loans for those as well. It made larger equipment available, including coolers to store eggs, vegetables, and milk, which a dozen families could buy together and share. It even sent “home electrification specialists” around the country to teach people how to cook and do household chores with electricity and how to operate and maintain productive equipment. Meanwhile, manufacturers of appliances and tools jumped in to market washing machines, wood saws,

hay balers, sheep shearers, churns, incubators, and dozens of other products.

Those efforts had a powerful multiplier effect. “The record shows that the farmer invests in plumbing, in electric appliances, in vehicles, four times as much as is invested under the REA loans in the power facilities themselves,” observed then Wyoming Senator Joseph C. O’Mahoney in 1940.<sup>13</sup>

## 3. Reduced Costs from Standardization and Economies of Scale

“By placing line construction on a mass-production basis and simplifying and standardizing designs and materials, the Administration engineers have been able to establish substantial reductions in the costs of rural lines, the effect of which has been to broaden the area of economical widespread rural electrification,” REA economist Robert Beall wrote about the US effort in 1940.<sup>14</sup> By 1939, the cost per mile of new lines had dropped to \$583 (or \$10,000 in today’s dollars), down from \$904 in 1936 and more than \$1,500 before the REA was established, Beall reported.



Image Courtesy: Power Africa, Villagers in Sipane, Senegal After Getting Solar Power. Photo by Xaume Ollerós

# PLANTING THE SEEDS OF A POWER REVOLUTION: THE RMI PROPOSAL

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RMI's *Sharing the Power* proposal draws on these past lessons and extensive analysis and fieldwork. Our goal is to lay the essential groundwork for solving the problem of bringing affordable, reliable electricity to the unserved hundreds of millions of people in sub-Saharan Africa and beyond.

With the support of a €2.8 million grant from the Dutch Postcode Lottery, we would work to accomplish the following outcomes:

1. Develop partnerships with organizations such as the One Acre Fund, Babban Gona, and faith-based groups that have deep roots in community engagement and have already begun to bring affordable power to communities at smaller scale (e.g., with solar lanterns).
2. Continue to develop and apply a set of selection criteria to identify high-potential communities, expanding on our existing relationships with key stakeholders.
3. Develop and implement a community-engaged rural electrification model yielding 10 installations serving roughly 10,000 community members, dozens of community businesses in at least two countries, for example, Nigeria and Ethiopia to develop and implement a community-engaged rural electrification model yielding six to 10 installations serving roughly 10,000 community members and dozens of community businesses.
4. Implement a low-cost, standardized minigrid solution that can be readily adopted by communities, in collaboration with local and global companies.
5. Install six to 10 minigrids to demonstrate their commercial viability, show communities and community-based organizations their benefits, and create models for a standardized solution, in collaboration with companies and development agencies.
6. Demonstrate that the combination of standardized equipment and strong community engagement puts us on a path to cut costs by more than 60 percent, from about \$0.60–\$1.00/kWh today to \$0.25/kWh by 2020.
7. Test different levels of community engagement, including full community ownership.
8. Provide low-cost financing for productive equipment and appliances such as grain mills and refrigerators, and test price signals and other demand stimulation levers to demonstrate how support for expanding the use of electricity accelerates economic growth and community well-being.
9. Identify and support additional local leaders from the communities where projects are being tested, who can then help accelerate the scale-up of electrification in their regions.

Based upon the work that RMI has already done, these outcomes are realistic and can be achieved with the Lottery's support. As this proposal has described, the cornerstones of the overall effort are community engagement and lowering minigrid costs. The next sections explain why and how they can be accomplished.



Image © RMI. RMI site visit in Rwanda



## I. A Path to Expanding Community Engagement

The crucial first step to greater community engagement is to identify communities where a certain amount of demand for electricity already exists, because of current productive uses of energy such as grain mills, garment factories, hospitals, or a business district of shops.

In the typical current approach, satellite imagery is used to spot rural areas that are dark at night, the assumption being that they are not connected to the grid. Then teams search those dark areas for communities that have enough economic activity to justify building a minigrid.

The imagery, however, can be misleading, since areas with grid connections are often dark at night because of the unreliability of grid power. Moreover, companies in East Africa report that they can drive around the countryside for weeks at a time without finding a village that offers sufficient demand for a minigrid.

To improve the search, we have already worked with Nigeria's REA on a smartphone/tablet app designed to gather better data on possible sites. The app allows a field worker to visit a community and collect data on the numbers of households and people, schools, churches, and businesses (such as grain mills, welders, or hotels). The data then makes it possible to estimate the existing loads and the potential for additional loads.

Using this approach, the REA has identified 114 promising sites for minigrid development in Nigeria, each with an average estimated peak demand of 100 to 200 kW and enough existing businesses to support the minigrid investment. Ideally, a site would have several existing commercial energy users, such as a grain mill that could serve as an "anchor" load. We are also expanding this smartphone or tablet app approach by making it possible for village leaders to input and send in data on their own communities, increasing the likelihood of community buy-in and participation.

If this proposal is funded, we will work toward even greater grassroots involvement, not just identifying possible loads but also signing up a critical mass of initial customers and exploring various levels of community engagement. We also plan to show local leaders what's possible by taking them to see successful minigrids. That can be a powerful tool for community buy-in.

Another key part of our plan is partnering with existing trusted groups, including agricultural cooperatives and faith-based groups, who can help increase community buy-in and offer a path toward actual community ownership. Promising precedents already exist.

In East Africa, for example, the nonprofit One Acre Fund was started in 2006 to help smallholder farmers, who often struggle to grow enough food to feed their families. The organization provides high-quality seeds, fertilizer, and technical assistance on credit to farmers. Then it helps the farmers store and sell their crops. By providing information on markets and fluctuations, One Acre enables farmers to sell at the highest prices.



Image © RMI. RMI site visit in Tinchí near Woreta, Ethiopia

To make the model work as efficiently as possible, One Acre enrolls farmers with a tablet-based system, collects data remotely, and uses a flexible repayment approach with mobile money that allows farmers to pay back their loans in any amount throughout the loan term. From its first group of 38 farmers in Kenya in 2006, One Acre has grown to serve more than 400,000 farmers in six countries; it expects to reach 1 million by 2020.

A logical next step is to move from seeds and fertilizer into agricultural processing, working with farmers to grind their own cassava and other crops, adding value and increasing revenues. That processing, of course, requires affordable and reliable power. Both the One Acre Fund and Babban Gona, which has created an agriculture franchise model in Nigeria, have told us that they are exploring the idea of minigrids, and are looking for partners that can help with the construction and financing.

Another existing cooperative model in Africa is the savings and credit cooperative organization, or SACCO. A SACCO is owned, managed, and run by its members, and it provides a structure for the residents of a village to pool their savings for projects. There may be other options as well, such as the innovative German crowdfunding platform Bettervest, which recently funded a minigrid project at Gbamu Gbamu in Ogun State, Nigeria.

Our goal with this Extra Project is to partner with organizations like these to help identify promising minigrid sites and increase community engagement. We are engaging with other potential partners with a strong community engagement focus and deep connections. We also see Nigeria and Ethiopia as two of the countries with great potential for project success, because of our history of working there; existing connections with government, development partners, and minigrid developers; and the compelling village structure and latent economic activity.

After those sites are identified and community buy-in is achieved, the next key step is finding ways to create

or stimulate demand. Because incomes are generally low in rural Africa, people seldom have the resources to buy electric motors for grain mills or electric pumps. So it's crucial to provide financing in addition to electricity, just as loans to farmers for buying appliances were necessary for successful rural economic development in the United States in the 1940s. Small-scale trials have already begun. In the Nigerian village of Bisanti, for example, GVE (Green Village Electricity) has been able to increase utilization to 74 percent of peak capacity for its minigrid by providing loans for soft-start electric motors, CEO Ifeanyi Orajaka told us, with expectations of raising that figure to 90 percent. Other minigrid companies such as Rubitec Nigeria Ltd. are offering loans for refrigerators and other appliances.

Our model will encourage the creation of new community businesses that use electricity, or partnerships with companies to bring such new businesses to a community. This has already been done in Chanpatia, India, where the availability of minigrid power made it possible to build a facility to purify water through reverse osmosis, providing a steady income from selling water.



Image © RMI. RMI staff Ebum Ayandele and Andrew Allee during a site visit in Gbamu, Nigeria.



## II. LOWERING MINIGRID COSTS (PROJECTS)

Community engagement, however, is only part of the solution. The other essential step is lowering the costs of minigrids and making them commercially viable. Commercial viability is critical because universal electricity access in Africa (and globally) cannot be funded through grants alone.



Image Istock. Solar Panel Manufacturing

## Sidebar: Proving the Business Case to Accelerate Scale-Up

A critical missing ingredient for minigrids is the proof that they can be commercially viable regardless of the ownership model.

We have visited and evaluated dozens of projects and potential sites in Nigeria, Uganda, Rwanda, Kenya, Sierra Leone, and India. What we have found is that although the minigrids are technically successful, few have demonstrated a viable and scalable business with sufficient return on capital to draw in the really large investments needed to scale up the approach.

Typically, minigrids are installed, are run for some period of time, and then languish when available money is insufficient to pay for ongoing costs such as maintenance and operations. Those ongoing costs often dwarf the initial capital cost, and cannot be ignored. In many cases, the central problem is that only a fraction of the capacity of each minigrid is utilized, reducing revenues and making the business case more challenging.

Until they can demonstrate commercial viability, minigrids will be unable to play a significant role in powering economic development. The total investment needed to bring affordable, reliable electricity to the unserved hundreds of millions of people adds up to billions of dollars. That scale of investment will not be possible without sufficient returns and a strong business case. Whether the investors are church groups, community-owned cooperatives, development banks, venture capitalists, or hard-nosed Wall Street financiers, the capital has to be paid for so it can be recycled into the next project.

Our proposed project addresses the current barriers to commercial viability in several ways.

First, the community engagement approach is crucial. We plan to carefully identify the loads at the outset, and work with communities to find and

support new sources of demand with low-cost loan programs for equipment and appliances. That will ensure that the capacity of the minigrids will be utilized as fully as possible so that revenues will also be as high as possible.

A community pull model also will reduce overall costs. Expenses are lower for minigrid developers if the initial loads have been identified and customers are already signed up. The needed returns on investment will be lower in a not-for-profit model, and any excess cash can either be returned to owners or used as a low-cost source of capital in a revolving fund. And our active demand stimulation program with concessional financing not only will ensure high utilization, and thus reduced cost per unit of power, but also will fuel economic growth that increases communities' incomes—and their ability to buy even more electricity.

Second, we plan to achieve further cost reductions through standardized minigrid design and construction.

Third, we have developed a long-term roadmap for increasing the scale of the investment to the transformative level that's needed. The idea is to demonstrate that a few carefully designed and sited minigrid projects, funded through grants or using a nonprofit model with community engagement, can indeed generate sufficient returns to prove the business case. That proof, in turn, would help attract interest in other communities, and open the door to concessional financing to support building minigrids in those additional communities. The success of those facilities, documented with hard data, could then attract venture capital and private equity investors and turn on the spigot of low-cost commercial financing for both minigrids and the new appliances and other devices that would accelerate the demand for energy.



Currently, the typical minigrid system is assembled on-site, with workers painstakingly connecting perhaps six separate inverters and other electronic components to each individual solar panel and the battery and/or generator backup system. Then the workers do something similar, but also customized, at the next site.

A more cost-effective approach is to design the electronics as essentially a “minigrid in a box,” with correctly sized inverters already connected to the other necessary components. Ideally, the electronics and solar panels would be a “plug and play” system and would be available as different-sized commercial products, much as it is now possible to buy heating, ventilation, and air conditioning units with a wide range of capacities off the shelf.

We are not the first to think in terms of a minigrid in a box. In India, the Institute for Transformative Technologies, with support from The Rockefeller Foundation, has designed and built prototypes of what it calls a “utility in a box.” The basic module combines electronics with a 10 kW array, and can be scaled up as needed. PowerGen is developing aspects of a similar product at its manufacturing facility in Kenya.

Two major suppliers of the electronics used in minigrids, Schneider Electric and General Electric, are also working on standardized and modular systems that could be delivered in a standard metal shipping

container. The container would include the panels, the inverters, the batteries, and the charge controller. Once delivered, the solar panels would be pulled out and mounted, and the container would house all of the electronic equipment.

There are also opportunities for companies or nonprofit groups to do their own design and assembly and act as intermediaries to bring standardized systems into the market.

Our analysis shows that the combination of standardized and modular minigrids and larger-scale deployment will lower the final cost of the minigrid power by \$0.11/kWh, or about 20 percent of the total LCOE.

Through our analytical work and fieldwork, and our recent minigrid charrette, we have already forged relationships with such suppliers as Schneider and GE, as well as minigrid developers including PowerGen, Powerhive, Rubitec, GVE, and Nayo. We also have partnered with the World Bank, the UK’s Department for International Development (DFID), the African Development Bank, and other financiers to explore support for innovative minigrid development.

If this proposal is funded, we will work with these developers, hardware suppliers, and other partners to bring these ideas for standardization and the resulting cost savings to our planned six to 10 minigrid projects.



Image © RMI. Kisii Powerbox and Panels

### III. Communications Strategy

Some of the most critical work that would be funded by the Lottery Grant would be partnering with community groups and village leaders to bring affordable electricity to new communities. As part of that effort, we will hold meetings in communities and engage with leading energy officials in Africa.

In addition to outreach with community groups and leaders, we see the key role communication plays by bringing media attention to this project. Coverage in local, national, and international press, along with a strong social media presence, will be very important to making local communities aware of the opportunities, helping to create the community pull that can accelerate rural electrification efforts.

See Appendix I for the communications plan, which includes a mainstream media strategy, social media strategy, and events convening.

RMI has a reputation in the industry for providing scalable energy solutions across many industries. With each milestone announcement, we publicize our successes in compelling stories that are covered by top-tier international media (e.g., the *Wall Street Journal*, the *Economist*, the *New York Times*) and in the countries in which we operate—namely Nigeria, Ethiopia, and Uganda—via leading trade publications such as the *Guardian*, *Vanguard*, and *This Day Live*.



Image © RMI. RMI staff Sachi Garber and James Sherwood during a minigrid site visit in Benin

## IV. Scaling beyond the Extra Project

The Lottery's Extra Project award would support 36 months of community engagement, creating community-driven projects and communications to amplify and scale learnings broadly. Ensuring that this work increases the commercial viability of minigrids will ultimately unlock the significant additional traditional (non-grant) financing that is

needed to bring 100 percent electricity access to the world. Specifically, the Extra Project will enable the next steps of the larger dream of "Power a Village, Transform a Nation" (see video here: <https://vimeo.com/229807637> [password: rmi]), which aims to drive down the cost of minigrids, making community-driven electricity available to millions of people.



Image © RMI. RMI site visit in Nigeria

## V. Time Line, Activities, Deliverables, and Budget

### TIME LINE

An indicative time line for the completion of the Extra Project is described below.

	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Partnership Development	█	█										
Community Selection Process Development	█	█										
Program and Business Model Development	█	█										
Standardized Solution Development		█	█									
Community Selection and Engagement			█	█	█	█						
Minigrid Development and Installation					█	█	█	█				
Data Collection, Analysis, Synthesis to Inform Scaling						█	█	█	█	█		
Adjustment and Iteration of Program Design								█	█	█		
Knowledge Sharing and Scaling							█	█	█	█	█	█



## ACTIVITIES AND DELIVERABLES

The following activities and deliverables describe our approach to community-engaged minigrids in more detail.

### Partnership Development

**Activities:** Build on previous efforts to identify and partner with community groups and minigrid developers; outreach and engagement; relationship building

**Deliverable:** Short list of partners with memorandums of understanding or strong indication of willingness to collaborate in place

### Community Selection Process Development

**Activities:** Develop site selection process and documentation, solicit feedback, iterate

**Deliverable:** Community selection process document

### Program and Business Model Development

**Activities:** Leverage RMI and partner work to date to create a set of business and ownership models for community-engaged minigrids; solicit feedback from key players and communities; iterate

**Deliverable:** Business and ownership model option summary and recommendations

### Standardized Solution Development

**Activities:** Use previous work and experience to create a set of system designs that are well suited to community-driven development; solicit feedback from key technical and finance experts; iterate

**Deliverable:** Standard system template for minigrids

### Community Selection and Engagement

**Activities:** Due diligence, engagement, and evaluation of high-potential communities in two countries; education and training campaigns regarding opportunities for additional community member participation and for using electricity to grow local economies

**Deliverable:** Six to 10 communities selected for project development with clear rationale provided; training and outreach in selected communities

### Minigrid Development and Installation

**Activities:** Creation of solicitation documents, developer evaluation and selection, construction and commissioning

**Deliverable:** Six to 10 minigrids installed

### Data Collection, Analysis, Synthesis to Inform Scaling

**Activities:** Data collection and analysis; identifying key insights and synthesizing implications for scaling

**Deliverable:** Thought leadership pieces tied to impact and value of community-engaged minigrids, focused on unlocking additional funding for further community-engaged projects

### Adjustment and Iteration of Program Design

**Activities:** Modify program implementation based on early data and insights as needed

**Deliverable:** Revised program structures

### Knowledge Sharing and Scaling

**Activities:** Engage key stakeholders and broader ecosystem through one-on-one briefings, media placements, convening key groups, scaling rationale and case development, etc.

**Deliverable:** Set of succinct and high-impact touch points (insight briefs, meetings, media coverage); scaling concept note and proposal for broad set of financiers



## BUDGET

The table below shows the proposed three-year budget for the Extra Project. RMI operations and communications will cover personnel, partnership outreach, analysis, development, and scaling work described in this proposal. Direct project investment includes capital expenditures on physical minigrids, demand stimulation and financing programs, and other direct project implementation expenses.

	Dutch Postcode Lottery	Additional Leveraged Funds	Total
<b>RMI Operations and Communications</b>	€1,8M	€1,8M	€3,6M
<b>Direct Project Investment (including demand stimulation programs)</b>	€1,0M	€4,0M	€5,0M
<b>Total Budget</b>	€2,8M	€5,8M	€8,6M

Additional leveraged funds include support to RMI program operations and communications in core program grants and multilateral funding from partners such as the Global Environment Facility, The Rockefeller Foundation and Virgin Unite. Additional operations funding will be raised during the three-year project period. We expect to leverage €1,0M in Extra Project funding to secure an additional €4,0M in direct project investment over the next three years. This will be done in numerous ways ranging

from taking advantage of complementary programs the World Bank is developing in Nigeria to provide a connection-based subsidy for minigrids to securing additional private capital through minigrid developers to leveraging additional foundation capital. If additional direct project investment is not secured, the grant from the Dutch Postcode Lottery will finance at least three minigrid projects to demonstrate impact. The RMI SEED program has core program support from The Rockefeller Foundation and Virgin Unite.





# ABOUT RMI

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Rocky Mountain Institute (RMI) is an independent, nonpartisan Colorado-registered charitable nonprofit organization founded in 1982 with the mission of transforming global energy use to create a clean, prosperous, and secure low-carbon future. RMI engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables.

RMI manages hundreds of projects and provides technical expertise on energy and climate to governments and businesses worldwide. The technical teams at RMI are recognized leaders in their respective fields and bring high-level experience from large corporations, consultancies, governments, research institutions, and the financial sector. Multidisciplinary teams make up the core practice areas of Buildings, Transport, Electricity, and Energy Innovation.

RMI's Global Energy Transitions practice helps emerging economies build clean energy pathways through efficiency and renewables. This includes supporting the Chinese government in planning emissions reductions; helping India meet ambitious goals involving renewable energy and clean mobility; accelerating the transition of island economies away from fossil fuel dependence; and helping developing countries expand access to clean, reliable electricity.

Since 2015, RMI has been working actively in sub-Saharan Africa through the Sustainable Energy for Economic Development (SEED) program, supporting African governments and development partners in improving energy access and energy planning. The program currently involves a team of 18 people with expertise in energy efficiency, energy systems planning, electricity networks, and off-grid solutions. The program is led from RMI's Boulder office and supported by several program coordinators based in the region.

Key publications by RMI over the past years have been instrumental in shaping the debate around the role of efficiency in energy planning, and the importance of market-led energy solutions in the energy transition (most notably in "Reinventing Fire," Amory Lovins & RMI, 2013). RMI's recent publication on minigrids ("Energy Within Reach," RMI, 2017) has become an important reference document for electrification in sub-Saharan Africa.

## MONITORING AND EVALUATION

RMI's leadership tracks the success of milestones and impact of every program through quarterly and annual reviews by its programmatic managing directors and the Institute's Executive Council. A board of trustees subcommittee provides approval of strategic initiatives to evaluate program effectiveness and efficiency. The board evaluates climate impact metrics annually. This four-tiered evaluation ensures governance and accountability. The RMI Project Management Office provides structure and repeatable processes for project implementation, control, and closure. These standards allow for a consistent method for delivery of impact in order to effectively deliver results. We utilize the Prosci ADKAR model of change management as a best practice.

## COMMUNICATIONS AND OUTREACH

RMI has a professional marketing and communications team that accelerates progress to the new energy era through strategic and compelling communications. It supports programmatic and philanthropic objectives (impacts, outcomes, and outputs) via targeted communications that leverage multiple channels, diverse media, RMI experts, and exceptional editorial, media, design, and digital and direct marketing. RMI web assets receive approximately 1.75 million unique visits yearly; its blog has several hundred thousand views not counting numerous reposts of content on many trade outlets; and the work of the Institute generates several hundred million earned media impressions yearly.



## DIVERSITY

Rocky Mountain Institute values, encourages, and actively seeks diversity in its employment practices, management, and board. RMI values the individual diversity of all employees, applicants, donors, clients, board members, and volunteers. Differences in age, race, ethnic heritage, religion, appearance, sexual orientation, or any number of other distinguishing factors provide experiences, viewpoints, and ideas that can strengthen and enrich our work environment. Our goal is to create an environment that is inclusive, respectful, and equitable, and to employ the talents of people with different backgrounds, experiences, and perspectives to accomplish our mission.

RMI is an equal opportunity employer and complies with applicable equal employment opportunity laws. We do not discriminate against any individual because of race or ethnicity, national origin, creed, gender, color, disability, sexual orientation, age, marital status, political association, or association membership. The vice president is charged with ensuring that all applicable state and federal laws relating to equal employment opportunity are closely observed.

## POPULATIONS WE SERVE

RMI devises, implements, and scales market-based solutions to energy efficiency and clean energy in the most energy-intensive sectors of our global economies. We aim to better the lives of millions of people worldwide and in target populations in each region where we work—currently focused in the United States, China, India, Caribbean island nations, and sub-Saharan Africa. We directly engage with governments, regulators, industry, civil society, and corporations as a key lever for driving change. The resulting impact of our efforts to drive a clean, prosperous, and secure low-carbon future touches every member of society—particularly those suffering from poor environmental conditions or other effects of climate change.

## FUNDING

The majority of RMI's funding comes from generous individuals and foundations. Our partnership with the Dutch Postcode Lottery for nearly a decade has been transformational, particularly in RMI's ability to expand its work internationally. This Extra Project award would be instrumental in realizing our dream to provide clean, reliable, and resilient energy to the millions of people in sub-Saharan Africa who need it



# APPENDIX I: COMMUNICATIONS PLAN

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## The *Sharing the Power* Communications and Influencer Strategy Will Focus on Four Broad Audiences:

- African energy leadership
- The communities where we pilot minigrid solutions
- Development partners based locally
- The Dutch public

## We Will Use Three Primary Channels of Communication:

- Global mainstream and regional media outlets
- Direct engagement and convening key stakeholders
- Digital and social media communications, including Twitter, LinkedIn, and Instagram

## At the Core of All Communications Will Be Three Key Messages:

1. Communities are the ideal test case for piloting minigrid technology that will solve electrification challenges and can be replicated in other communities in need.
2. Building a cohort of African energy leaders will ensure that lasting traction occurs and that energy challenges are addressed for years to come.
3. A free, online minigrid learning platform will enable the sharing of lessons and insights with other communities and countries seeking minigrid knowledge.

## COMMUNICATIONS TACTICS

### Initial Media Announcements

Initial media announcements will signal to the key stakeholders and wider world what *Sharing the Power* is here to do:

- Targeted to regional trade media, use all key messages in announcement
- Partnership with the local development partners
- Targeted to Dutch national media, international wires, and European media as well as selected trade media

### Thought Leadership Series

Promoting a Thought Leadership series will ensure our target audiences are aware of the lessons we are learning throughout the project journey and aware that we encapsulate good practices for other organizations to utilize and replicate:

- White papers and their accompanying web pages on rmi.org will be launched at the SEforALL forum, one of the most influential gatherings of global energy leaders.
- The *Sharing the Power* launch at SEforALL will be supported with a press release.
- *Sharing the Power* will have its own program page on rmi.org, and for the launch, we will feature it in a robust social media and digital communications campaign.

### Launch of the First Community Pilot Microgrid

To celebrate the success of the milestone and to ensure that the story of the project journey is well documented, we will conduct the following efforts:

- We will produce a short video that highlights the project journey.
- We will hold an opening ceremony that invites key stakeholders from all organizations involved.
- We will promote the event in regional and international media.



### Global Media Outreach

This part of the program will ensure that *Sharing the Power* is showcased in global media. Many aren't aware that millions of Africans don't have access to electricity; this presents a real opportunity to educate the public on the energy and technology solutions that can bring power to millions:

- One feature or interview every six months in global media such as the *Economist*, the *Financial Times*, or the *Wall Street Journal* over the three-year term of the project.
- Interviews will be conducted by all leading parties in *Sharing the Power*, including the Dutch Postcode Lottery as well as authoritative third parties supportive of the project such as technology providers and local development partners.

### Digital and Social Media Campaign

Digital and social media enable a campaign to achieve far greater reach, and still deliver powerful knowledge and expertise sharing. Such media will be a key channel throughout many elements of the communications plan, given the ability to increase reach and influence at a lower cost:

- A series of Webinars will invite African energy leaders to learn from our team and third-party experts about the first pilot project. These Webinars will be recorded and distributed online.
- We will promote the Thought Leadership series digitally via rmi.org and our partners' channels.
- We will use RMI digital channels to promote events, milestones, etc.

## COMMUNICATIONS TIME LINE

### 0–6 Months

- One announcement/press release
- Outreach to global media to secure one media opportunity to showcase the project
- Initial digital campaign to support launch of the Thought Leadership series
- Ongoing energy expertise Webinars
- First media feature/placement

### 6–12 Months

- Ongoing production of Thought Leadership series
- Teasing for SEforALL forum announcement via digital media
- Continuing digital and global media campaigns
- Ongoing energy expertise Webinars
- Second media feature/placement

### 12–18 Months

- Ongoing energy expertise Webinars
- Ongoing digital and global media campaigns
- Third media feature/placement
- Project video launch

### 18–24 Months

- Ongoing digital and global media campaigns
- Ongoing energy expertise Webinars
- Fourth media feature/placement



# APPENDIX II: LETTERS OF SUPPORT

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**Carnegie Mellon University**

**Department of Engineering  
and Public Policy**  
Carnegie Mellon University  
Pittsburgh, Pennsylvania 15213-3890  
Telephone: 412 268-2670  
Fax: 412-268-3757  
[www.epp.cmu.edu](http://www.epp.cmu.edu)

August 20, 2018

Nationale Postcode Loterij  
Van Eeghenstraat 70  
1071 GK Amsterdam

To Whom It May Concern:

I'm writing to support the Rocky Mountain Institute's application for the Nationale Postcode Loterij Droomfonds. As an Associate Professor in the Department of Engineering and Public Policy at Carnegie Mellon University and an affiliated professor in our campus in Rwanda, I am involved in multi-disciplinary research projects to better understand the challenges and opportunities for developing sustainable energy systems in Sub-Saharan Africa. In particular, I am involved in research to better understand consumption patterns of newly electrified customers served by rural mini grids in East Africa. We are also studying interventions to stimulate demand for electricity and support economic development. Finally, I am interested in evaluating the social, economic, and environmental implications of electrification efforts in communities that currently lack access to modern energy services.

RMI's proposal to the Nationale Postcode Loterij is very well aligned with my research interest. As a result, should RMI receive the funding for this project, I look forward to collaborating with them in developing and testing the community-based model for rural electrification and demand stimulation. In addition, I am excited for the opportunity to participate in the data acquisition, data analytics, and hypothesis testing efforts. I thus I offer my support for this proposal without hesitation.

Sincerely,



Paulina Jaramillo  
Arthur Hamerschlag Career Development Professor of Engineering and Public Policy  
Associate Professor, Engineering & Public Policy and CMU Africa  
Co-Director, Green Design Institute  
Carnegie Mellon University  
[www.paulinajaramillo.org](http://www.paulinajaramillo.org)



# POWER FOR ALL

22nd August, 2018

The Selection Committee  
 Nationale Postcode Loterij  
[Van Eeghenstraat 70](#)  
[1071 GK Amsterdam](#)

*I'm writing to support the Rocky Mountain Institute's application for the Nationale Postcode Loterij 'Extra Project'.*

Power For All is a global market development campaign to promote decentralized renewable energy as the fastest, most cost-effective and sustainable way to achieve universal energy access with the aim of reaching universal energy access by 2025. With our Nigerian program focused on market development and unifying collective voice towards *universal electrification in Nigeria for close to three years*; Power For All operates in five other focal countries with a global spread in twelve (12) countries.

Rocky Mountain Institute in well over a year of working in Nigeria has earned the reputation and credibility for building collective action towards Mini-Grid development for rural and un-served communities across Nigeria. From their track record, this proposed community needs assessments finance and build a mini-grid electricity system where the through strong grassroots community involvement, the community feels a sense of ownership and actually begins to enjoy several other energy dividends including better health and education as a result of Mini-Grid.

As one of our focal partners globally and in Nigeria – we are pleased to write in support of the proposed RMI program on unlocking barriers to energy access by “engaging with communities to understand their needs” and designing ways to address those needs through innovative small scale financing can meet these identified community. We believe that this proposed work would go a long way to furthering the energy access sector’s goals and ensure the survival of mini-grids in Africa, which have the potential to play a critical role in bringing clean, “real” power to millions of Africans in the coming years. Should RMI’s proposal be accepted, we look forward to collaborating with them and we fully support RMI’s selection for this incredible opportunity.

Yours faithfully;  
**Power For All, Nigeria Campaign**

No 10b Samora Machel Street, □ Off Yakubu Gowon Crescent □ Asokoro □ Abuja  
 □ Post-Code 900231 □ Abuja □ [www.powerforall.org/Nigeria](http://www.powerforall.org/Nigeria) □ +2348092320770





Nationale Postcode Loterij  
Van Eeghenstraat 70  
1071 GK Amsterdam

23<sup>rd</sup> August, 2018

All On  
Human Resources  
44 Bourdillon Road, Ikoyi,  
Lagos, Nigeria  
Tel +234  
Telex +234  
Website: [www.all-on.com](http://www.all-on.com)

Dear Project Review Committee:

**RE: Support for the Rocky Mountain Institute application for Nationale Postcode Loterij 'Extra Project'**

I am writing to support Rocky Mountain Institute's (RMI) application for the Nationale Postcode Loterij 'Extra Project' both as CEO of All On, a Nigerian based off grid energy impact investment fund, and as a long-time resident of Nigeria who well understands the challenges and needs of energy in Nigeria and sub Saharan Africa.

All On is an off-grid energy impact investing fund seeded by Royal Dutch Shell. The fund is focused on the Nigerian market with a mandate to invest in businesses that will substantially increase access to clean and renewable energy for low income communities across Nigeria. With an estimated 120 million people either off the grid or provided less than four hours of power a day from the grid, this is not only a massive challenge, but also an attractive opportunity.

All On sees community support as a critical component of energy access and power to underpin economic development. From our work investing in off-grid technologies, we understand the challenges of the market in detail. The proposal and work that RMI is submitting to you can play a pivotal role in accelerating rural electrification in Nigeria, Sub Saharan Africa and more broadly in the world. While we are already investing in minigrid and other off-grid technologies (as are others) there are several challenges that must be faced to compress an additional decade or more of learning, trial and error and missteps into just a few short years.

We look forward to working with RMI here in Nigeria, will help align others in the country and region to work with them to help them translate their proposal into a vibrant and high impact reality. As a Dutchman born and raised in Nigeria, I am particularly excited about the prospect of funding from another Dutch entity making such a big impact in addressing Africa's access to energy challenges.

Sincerely,

Dr. Wiebe Boer  
CEO, All On

**RURAL ELECTRIFICATION AGENCY**

ENERGY = EMPOWERMENT = EFFICIENCY

**REA/01/MDCE/GEN/VOL.4/2018/1143****August 28, 2018**

Nationale Postcode Loterij  
Van Eeghenstraat 70  
1071 GK Amsterdam

I'm writing to support the Rocky Mountain Institute's application for the Nationale Postcode Loterij 'Extra Project'.

The Rural Electrification Agency (REA) is tasked with the development and sustainable implementation of the Nigerian off-grid electrification strategy. As the Managing Director of the Rural Electrification Agency, I oversee this strategy in the largest market in Africa. We have extensive and deep experience in Nigeria looking at the problems of off-grid electrification. Community involvement and engagement is core to effective rural electrification, and is an integral part of our strategy. Developing a replicable community-driven solution would be an exciting solution to accelerate our efforts, but for that to happen we need to develop and test the innovative models that Rocky Mountain Institute (RMI) has proposed to focus on in this proposal. We're eager to partner with RMI to answer these questions and make important progress that impacts the lives of millions of Nigerians.

Should RMI's proposal be accepted, I look forward to collaborating with them. I fully support RMI's selection for this incredible opportunity.

Kind Regards,

**Damilola Ogunbiyi**

22, Freetown Street, Wuse 2. P.M.B. 5072 Wuse Zone 4, Abuja, Nigeria.  
Post Code: 2349, +234 811 249 4040, 810 782 9134  
info@rea.gov.ng | www.rea.gov.ng





August 31, 2018

Nationale Postcode Loterij  
Van Eeghenstraat 70  
1071 GK Amsterdam

**Support for Rocky Mountain Institute's application for the Nationale Postcode Loterij 'Extra Project'**

For the past three years we have been honoured to support Rocky Mountain Institute's (RMI's) work in sub-Saharan Africa to transform energy systems to benefit people and economies through access to electricity. This critical work they are doing can truly shift the course of history for so many people and nations who have been left behind simply because they have no access to energy.

I am writing in support of RMI's application for the Nationale Postcode Loterij 'Extra Project'. The community-driven solutions that are proposed in their application are a critical step in transitioning from energy systems that serve the few to serving the many, allowing true community engagement and ownership from those with the most at stake in sub-Saharan Africa.

We are constantly humbled by the work of the Postcode Lottery and are hopefully that this might be an initiative we can partner on. Thanks for taking the time to consider their proposal.



Sir Richard Branson





August 27, 2018

Nationale Postcode Loterij  
 Van Eeghenstraat 70 1071 GK  
 Amsterdam

**Support for Rocky Mountain Institute's application for the Nationale Postcode Loterij 'Extra Project'**

I am writing in support of the Rocky Mountain Institute's (RMI) application for the Nationale Postcode Loterij 'Extra Project' in my capacity as Chief Executive Officer of Sustainable Energy for All (SEforALL).

Electricity access is transformative for the sustainable development of rural communities. Ensuring access to affordable, reliable, sustainable and modern energy for all one of the Sustainable Development Goals (SDG 7) agreed by the United Nations—it is critical for improving the health and livelihoods of billions of people around the world. Access to sustainable energy can provide new jobs, increased family incomes, improved education prospects, more reliable healthcare, and improved gender equality.

Community-driven solutions are a particularly important component of energy access and power to underpin economic development. Minigrids and other technologies have a critical role to play for the achievement of SDG 7, but a scalable business model is needed to extend their reach to hundreds of millions of people, particularly in Africa, who do not currently have access to electricity. Demonstrating solar energy as a profitable alternative to large oil and coal plants in the developing world is essential for global success in addressing climate change.

RMI's proposal offers an innovative theory of change to unlock the potential of a community-supported energy solution. Developing and testing this approach can accelerate market development for minigrids and off-grid technologies, and bring together the international community around a set of well-conceived and bankable investments.

Through our Partnership Framework, SEforALL will support RMI's efforts through SEforALL's proven convening power, and ability to make connections with key decision makers and major funding partners.

Should this proposal be accepted, we look forward to strengthening our collaboration with RMI and the opportunity for breakthrough progress on this critical opportunity.

Yours faithfully,

Rachel Kyte

A handwritten signature in grey ink, appearing to read "kyte", is positioned below the printed name.

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# ENDNOTES

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<sup>1</sup> V.C. Lagendijk, *Electrifying Europe: the Power of Europe in the Construction of Electricity Networks*, DOI: 10.6100/IR638264. Published: 01/01/2008 <https://pure.tue.nl/ws/files/3219860/200811526.pdf>

<sup>2</sup> Douglas F. Barnes, *Electric Power for Rural Growth: How Electricity Affects Life in Developing Countries*, Second Edition published by Energy for Development, 2014

<sup>3</sup> <http://www.rff.org/research/publications/lighting-last-mile-benefits-and-costs-extending-electricity-rural-poor>

<sup>4</sup> Douglas F. Barnes, *Electric Power for Rural Growth: How Electricity Affects Life in Developing Countries*, Second Edition published by Energy for Development, 2014

<sup>5</sup> Ibid.

<sup>6</sup> <https://www.csmonitor.com/World/Africa/2018/0220/Off-grid-solar-energy-takes-root-in-West-Africa>

<sup>7</sup> <https://oneacrefund.org/blog/loan-and-light/>

<sup>8</sup> Rocky Mountain Institute, *A Design Charrette to Achieve 20c/kWh by 2020*, published by Rocky Mountain Institute and the Nigerian Rural Electrification Agency. <https://www.rmi.org/wp-content/uploads/2018/04/Minigrid-Design-Charrette-Pre-read.pdf>

<sup>9</sup> Harold D. Wallace Jr., “Power from the People: Rural Electrification Brought More Than Lights,” *Smithsonian* online. <http://americanhistory.si.edu/blog/rural-electrification>.

<sup>10</sup> How Electricity Conquered the Countryside. <https://history.vattenfall.com/the-revolution-of-electricity/how-electricity-conquered-the-countryside>.

<sup>11</sup> Long-Term Cost Implications of Rural Electrification Administration Direct and Guaranteed Loan Programs, PAD-80-19: U.S. Government Accountability Office, Published: Dec 31, 1979. Publicly Released: Jan 21, 1980. <https://www.gao.gov/products/PAD-80-19>

<sup>12</sup> <https://www.electric.coop/electric-cooperative-fact-sheet/>

<sup>13</sup> Kerry Drake, “Rural Electrification Changed Farm Life Forever in Wyoming,” WyoHistory.org, <http://www.wyohistory.org/encyclopedia/rural-electrification-changed-farm-life-forever-wyoming>

<sup>14</sup> Robert T. Beall, Rural Electrification, <https://naldc.nal.usda.gov/download/IND43893747/PDF>



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