

Pay as You Go: A Sunny Future

—Transcript of a webinar offered by the Clean Energy Solutions Center on 16 September 2014—
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Panelists	Yasemin Erboy Ruff, Senior Associate, Energy and Climate, UN Foundation Mansoor Hamayun, Co-founder and CEO of BBOX Klara Linder, Product and Service Developer, Mobisol GmbH Graham Smith, V. P. of Business Development, Off Grid Electric Paul Needham, President and Co-founder, Simps Networks
Moderator	Jacob Winiecki, CGAP
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Sean Hello everyone. I'm Sean Esterly of the National Renewable Energy Laboratory, and welcome to today's webinar, which is hosted by the Clean Energy Solutions Center, in partnership with the United Nations Foundations Energy Access Practitioner Network. And today's webinar is entitled, "Pay as You Go, a Sunny Future." And before we begin, just one important note of mention, is that our presentation, the Clean Energy Solutions Center does not endorse or recommend specific products or services, and information provided in this webinar is featured in the Solutions Center Resource Library, as one of many best practices resources reviewed and selected by technical experts. And you have two options for audio today. You may either listen over your computer or through the telephone, and if you do choose to listen over the computer, please select the mic and speakers option in the audio pane, and doing that will just eliminate the possibility of any feedback and echo for you. And if you choose to dial in by phone, then in the audio pane please select the telephone option, and it will display the telephone number and audio pin that you should use to dial in. And just a reminder, panelists, that we ask please when you're not presenting, just make sure you mute your device. And if anyone's having any technical difficulties with the webinar, you may contact the GoToWebinar's help desk at the number displayed at the bottom of the slide. That number is 888-259-3826.

And so we encourage anyone to ask questions at any point during the webinar. And do to that, simply type your question into the questions pane, and those will be presented to the panelists following the presentation. And if you're having difficulty viewing the materials through the webinar portal, we did post pdf copies of the presentations at cleanenergysolutions.org/training so that you may follow along as the speakers present. And additionally, an audio recording of the presentations will be posted to that Solutions Center training page within about a week of today's broadcast. And we are also now adding all webinars to the Solutions Center YouTube channel, where you'll also find other informative webinars, as well as video interviews with thought leaders on clean energy policy topics.

Now we put the agenda prepared for you today, and it is centered around the presentations from our guest panelists. Yasemin Erboy Ruff, Mansoor Hamayun, Klara Lindner, Graham Smith and Paul Needham. Also, Jacob Winiecki will also be joining us following the presentation to moderate a discussion among the panelists. And to begin, Yasemin from the U.N. Foundation will be providing an overview of the Energy Access Practitioner Network. And then panelists will showcase their respective organizations' approach to pay as you go models, discuss and contrast specific geographic concepts and share their respective challenges and successes to provide collective best practices. Now before our speakers begin their presentations, I just want to provide a short, informative overview of the Clean Energy Solutions Center initiative, and then following the presentations we'll have the moderated discussion led by Jacob, followed by the question and answer session where panelists will address any questions submitted by the audience, and then finally we'll wrap up with some closing remarks and a very brief survey for the audience.

So this slide provides a bit of background in terms of how the Solutions Center came to be formed. And the Solutions Center is one of thirteen initiatives of the Clean Energy Ministerial that was launched in April of 2011, and it's primarily lead by Australia, the United States, and other CEM partners. To now come to this unique initiative includes support of developing countries and emerging economies, the enhancement of resources and policies relating to energy access, no cost expert policy assistance, and peer-to-peer learning and training tools such as the webinar you are attending today.

And there's four primary goals for the Solutions Center. The first goal is to serve as a clearinghouse for clean energy policy resources. Second is to share policy best practices, data and analysis tools specific to clean energy policies and programs. And third, the Solutions Center delivers dynamic services that enable expert assistance, learning and peer to peer sharing of experiences. And then lastly, the Center fosters dialog on emerging policy issues and innovation around the globe. And our primary audience is energy policy makers and analysts from governments and technical

organizations in all countries. But then we also strive to engage with the private sector, NGO's and civil societies.

And one of the marquee features that the Solutions Center provides is the no-cost expert policy assistance, which is known as Ask an Expert. And the Ask an Expert program has established a broad team of over thirty experts from around the globe, who are each available to provide remote policy advice and analysis to all countries at no cost. So, for example, in the area of policy impact on cost, we are very pleased to have Uday Varadarajan, Senior Analyst at the San Francisco office of the Climate Policy Initiative serving as one of our experts. So if you have a need for policy assistance on policy impact on cost, or any other clean energy sector, we do encourage you to use this valuable service. Again, it is provided free of charge. So to find out if the Ask an Expert service can benefit your work, please contact me directly at sean.esterly@nrel.gov, and that email address is displayed in the orange box on the slide, or you can call me at 303-384-7436. And you can check out more about that on the website, as well. We also invite you to spread the word about this service to those in your network and organizations. So in summary, we would encourage you to explore and take advantage of the Solutions Center resources and services, including expert policy assistance, the database of clean energy policy resources, subscribe to our newsletter, and participate in webinars like this one.

And so now I'd like to provide some brief introductions for today's speakers. And our first speaker is Yasemin Erboy, a senior associate with the U.N. Foundation's Energy Access team, primarily coordinating efforts to scale up energy access in developing countries. And then following Yasemin we'll hear from Mansoor Hamayun, the co-founder and CEO of BBOXX, a dynamic young company that designs, manufactures, distributes and finances innovative solar systems to improve access to energy across Africa in the developing world. And then our third speaker today is Klara Lindner, a Product and Service Manager at Mobisol GmbH. Klara has been working at the intersection of microfinance in energy since 2009, and her academic background lies in engineering, business and design thinking. And then our fourth speaker today is Graham Smith, and Graham is Vice President of Business Development at Off-Grid Electric, and his work focuses on securing financing, government relations, building partnerships and developing the company's expansion strategy. And then our final speaker today is Paul Needham. And Paul is the President and Co-Founder of Simpa Networks. And Simpa Networks has a bold mission to make clean energy simple, affordable and investable. Simpa sells solar as a service to energy poor households and micro-enterprises in rural India. And then I'd also like to introduce the moderator for the panel discussion following the presentations, Jacob Winiiecki. And Jacob is an Energy Sector Specialist for CGAP, with over nine years of experience developing innovative approaches to financing modern energy

for low-income consumers in Sub-Saharan Africa and Asia. And so with that, I would now like to welcome Yasemin to the webinar today.

Yasemin

Good morning everyone. Can you hear me OK?

Sean

Yes, we can, Yasemin.

Yasemin

Perfect, thank you. Thank you everyone for joining another monthly Energy Access Practitioner Network and Clean Energy Solutions Center webinar. I don't want to take up too much of our time today. I just wanted to introduce the Sustainable Energy for All Initiative and our Practitioner Network to give some context to the discussions, especially for those who might be joining us for the first time. Next slide, please.

So the Sustainable Energy for All Initiative was established in 2011 by the U.N. Secretary General, Ban Ki-moon to call on governments, businesses and civil society, a broad range of stakeholders, to implement means to action to accomplish three interlinked objectives by 2030. And these are ensuring universal access to modern energy services, doubling the global rate of improvement in energy efficiency, and doubling the share of renewable energy in the global energy mix. The U.N. General Assembly member states have recently declared 2014 through 2024 as the decade of sustainable energy for all. So energy is now on the forefront of the global development agenda, with the upcoming sustainable development goals, as well. Next slide, please.

So many countries and various stakeholders, such as businesses and NGO's have already made commitments to support a wide range of energy services to deliver universal energy access by 2030, as well as addressing the Sustainable Energy for All Initiative's other objectives, as well. Some of these commitments come from our Energy Access Practitioner Network members, who have been an integral part of Sustainable Energy for All from the start. Next slide, please.

The Energy Access Practitioner Network was established as the U.N. Foundation's contribution to the Sustainable Energy for All goal of universal energy access by 2030. We focus on off-grid rural electrification, and we just celebrated our third anniversary, seeing a tremendous growth from about twenty members when we started to over 1,800 members now. These 1,800 members have been recently surveyed, and we've seen that just a quarter of these members who had responded to the survey have reached over 230 million people in their lifetimes. So we're seeing big growth in sector, and if you are not, if any of our attendees today are not an Energy Access Practitioner Network member and you are interested in joining, please do reach out to me after the webinar so that we can get you to join. Next slide, please.

So as many of you may know, the International Energy Agency estimates that micro-grid and decentralized energy solutions will account for

roughly 60 percent of the electricity access needs for those who now lack it. In the survey that I just mentioned, only one-third of our respondents, responding members, reported using any kind of financing scheme such as pay as you go. Many are still expecting just one time cash payments. So we thought that a webinar like this one, where some of our illustrious practitioner network members will discuss their organization's approach to pay as you go models and how to reach scale would be useful to many of our members. This is going to be a bit different than our previous webinars in terms of context and format, so we're very excited and we hope that you will enjoy it. And with that, I'd like to open up the discussions with the panel, with our first panelist, Mansoor Hamayun from BBOXX. Thank you.

Mansoor

Hi there. I hope you guys can hear me.

Sean

Yes, we can.

Mansoor

Oh, great, great. Thank you for the invitation first. So the purpose of this presentation is to outline what BBOXX is, what we're trying to achieve and how we're trying to achieve it. So if someone can help me alternate slides?

We started BBOXX with a very bold statement. We realized that rural electrification and energy access is a global problem, and we needed to create a company that had a global impact. And the aim of the company is to be able to electrify at least 20 million people by 2020. And I would love to tell you guys how we're planning to do that. So if we can move on to the next slide.

So what I've achieved so far. BBOXX is four years old at the moment. To date, we have installed over a million watts of solar panels on the roofs in our fourteen countries. We have 41,000 products sold of various sizes. We have 140 employees in the company. We have 28 wholly owned distribution points in Kenya, Uganda and Rwanda. Overall, as a company we estimate that we have impacted over 200,000 people's lives to date. Next one, please.

So what does BBOXX actually do and how do we do it? So we can divide our business into four key categories and we try to develop solutions around that. First, the category for us is product. We have a wide range of products to be able to cater to a wide range of needs in the marketplace. Our systems go from 15-watt systems all the way to 1.5-kilowatt systems. So basically from small-based phone charging charging all the way to solutions that can empower a small clinic or a small micro-finance bank, etc. We also have our own retail network to be able to reach and customize, mostly from a service perspective, and I will tell you a bit more about why we are doing that, as well. Financial access is a key by which we'll be able to reach and customize as well, so developing technology and solutions around both the technical framework and legal framework is

a key part of our activities, as well. And finally, the last part of our story is really about information access. And that's really about educating wealth customers, the sales network, and the technical base of the company to be able to cater for the growth of the pay as you go solar market. Next one, please.

The way we do this is smart solar as a service. We have a wholly owned way of installing our products. So through our own network of shops in Kenya, Uganda, and Rwanda, after the credit check, etc., we actually install the kits. Our boxes are pretty smart. They have remote monitoring and two remote control capabilities so we actually can monitor where people are using the products, and more importantly, be able to service the products remotely in case we detect a problem with them. We can also locate where the products are and what they are up to, if there is any movement, anything unusual happening. All in all, we try to learn as much as possible from our customers and end users and be able to offer a good service to our customers.

So the three key challenges for us to be able to reach a mass market is the physical access. The physical access, by that we mean our ability to reach end customers in rural areas. One of the key realizations, as I'm sure many people on this call know, there is no Wal-Mart, no tests for its inspiration in large parts of our operating regions. And in partnering with local distributors, etc. can be tricky at times. The sales part tends to work, but the service part doesn't typically work too well. That's why we have taken an approach of being able to create our own retail network in East Africa, in Kenya, Uganda and Rwanda, and we have enabled that by a series of technologies, from hand held devices and phones to be able to see our own systems, we log customers to do credit check, to ERP systems and shops and accounting software to be able to link everything together. And more importantly, also being able to take advantage of our modern technology such as mobile money, and being able to create that vertically integrated service provision that customers actually need for us to be above the scale in our regions.

Yes, the financing. So the next big challenge for a company is always the access of financing. And I'm sure a lot of people have tried to partner with local MFI's, etc. and banks. Although we enjoyed localized success many times with micro-financing institutes, etc., we were nowhere really about to scale it up nationally, let alone pan-Africa. And that's the reason we decided to do financing in house. And ultimately, the value proposition for customers of moving from an out front cost sale product to energy in a service or payment plan product is a game changer. And the way we did that, to be able to support that, is having the right legal infrastructure in place and operational infrastructure in place to be able to attract the right sort of investors, to be able to give companies of all sorts debts that we need to be able to extend now to end customers and draw the payment plan business. So that's been our key challenge that we've been trying to overcome.

And training. Essentially, what many of us are trying to do is give people electricity for the first time since the dawn of mankind. And as we go up in energy ladder, especially from people wanting to use radios, more functionality, the customer needs to be educated, the sales agent needs to be educated, the technical services need to be educated. So as a company, we have a huge focus on training. We have training centers wherever we operate completely ourselves, in Kenya, Uganda and Rwanda in specific. We educate both our employees in a regular fashion with new systems and when new products come into place, but also the customer training side. And this is where the smart technology kind of comes into play, as well. Because we are able to learn how our customers are using the product and if the original thought of what they were supposed to do with the product was actually what they do. It's something that can help understand better in training the customer, as well, about how to use the product better in the future. That's basically it for my side. Thank you very much.

Sean

OK, thank you Mansoor. We'll turn it over to Klara now.

Klara

Hello everyone. Can you hear me?

Sean

Yes we can, Klara. Thank you.

Klara

OK, cool. OK, yes. I'm very honored about the invitation to present Mobisol's approach, and I chose to split it up into three parts. So firstly I'll run you through what Mobisol actually offers, and then who our customers are, and then I've picked a few challenges that we faced in our scale up and I want to share how we dealt with them.

So this is a picture of the actual hardware product that Mobisol has, so it's our PD system, actually complete with cabling and lights, and some other appliances to make use of the electricity that is generated. And the key difference to regular solar systems is that orange box in the middle. It's our Mobisol controller, but I'll come back to that a bit later. So we offer four different setups of this technology, and make them affordable through spreading the total cost over a period of three years. And included in that total price are system installation, customer education and also the after sales service, which we provide to our customers free of charge throughout the entire credit period. And currently we're also working on a post-warranty service so that customers that have a system that truly belongs to them are still able to make use of our existing maintenance infrastructure.

So now that's a picture of one of our families, our customers, they are part of the VOP and they live off the grid. That doesn't mean that they are undemanding, and so with our systems, they get to use more than just lights and phones. They can run radios and TVs, they can run business appliances like this one, it's their professional phone charger where you can charge several phones at the same time and make a lot of money in rural areas, and you can run your own DC fridge.

So the enabling factor behind is the orange box. On the left hand side you see our Mobisol controller. We put it in each system, and it tracks usage and payment remotely. And the customer pays through Empresa and then automatically the system unlocks for another month. Also, the system shuts off in case of payment default, and it's impossible to say that without breaking. With the data that is sent from the Mobisol controller, our local offices deal with the after state, so it's in a more effective way.

So here you see some screen shots of our powerful back end that enables us to offer this after-sales service under commercial circumstances. Also, we're able to target customers based on known preferences and we maintain a long-term relationship with all the data that we've collected from them. And this data is accessible to all our staff in real time, and we have, just like Mansoor said, also the mobile technology in place so that you can access this data from wherever you are on a smart phone. And on the second screen shot you see a picture of our map where we locate all the systems in the field, and which makes it easy for us to find customers who maybe forgot to pay and their systems are off, and we get to talk to them.

Alright, so a bit more about these customers. Currently, Mobisol is available in Tanzania and Rwanda. And there, the process of becoming a Mobisol customer I outline here. So we have a very decentralized network of so-called market huts, which are located in different areas close to markets, and there customers can approach us and first have to pass either a credit check, where we assess their willingness and also their ability to pay. We have stock right there next to the market hut, and the customer is bridging the last mile on his own. So in the middle you see one of our customers on a motorcycle driver bringing home the system. When they're at home, a local technician that we've certified before is waiting and is installing the system in his home, because it's quite advanced technology. They are big systems with 40-kilo batteries, so it's not really viable to let the customers do this installation completely. And once done, we have a follow up call to find out if everything's fine and that the customer has had a happy experience.

What Mobisol also does is we try to offer productive appliances. And we foster productive use through our business out of the box. Here you see an example of Siti in Rwanda, who is running a barbershop that is powered by Mobiso. We also have appliances in place for that.

Here is another example, which I thought was quite exciting for the World Cup. One of our customers, he, when the children wanted to watch this game, he had the village cinema where you see how many people were watching the World Cup, and it was a great experience for them to take part in the World Cup, but also for him it was really interesting to have that business up and running.

Alright. In the third part, let me come to some of the challenges that we've faced. And so one challenge that we faced at the beginning of our scale up was we had those good quality German solar systems and we want to assure proper installation, even though we install maybe hundreds or thousands of systems in a week. And in the end, what we came up with is the pluck and play version where we only need one technician who goes through a week-long training, and then he's able to put up the system within one hour and all that he needs is a hammer and maybe a ladder that the customer already has at his home.

Another challenge that we faced at a later point was how to actually find trained staff that helps us in our growth. And I don't know if you know about the school system in many of those East African countries, but it's very tough, and so in the end we came up with our own Mobisol Academy. And it's basically a place where we train people in different staff positions, from marketing through installation or maintenance, and even provide them with a job guarantee once they've passed their courses. And we're also made a 3-minute video explaining more about our Mobisol Academy, and it's on the website if you want to have a look at it later.

And then our third challenge was how to actually get into those rural areas, because that's where the off-grid population lives, right? And similar to BBOXX, we also set up our own distribution network, because nothing was in place that we could feed back on. And we created that market hut structure in which small, decentralized sales spots are everywhere where our customers are, and we make sure that they have enough stock all the time and we provide them with the right technology, smart phone apps, for example, that they are able to do the business in those rural areas. Also, not only our customers pay us over Empresa, mobile banking, but also all our staff is paid with mobile banking, which makes corruption much less pronounced than in other businesses where people, where the money has to go through several hands. And also we worked a lot on the packaging so that it allows our customers to cover the last mile on their own, and we set up a network of maintenance technicians that enable us to repair any kind of system fault within 48 hours.

OK. That was it from my side. I think it was quite a quick summary, and I'm sure you have a lot of open questions, so feel free to use that little chat on the bottom or look at our website or write me later on. Thank you.

Sean

Great, thank you Klara. And we'll move along now to Graham Smith.

Graham

Hi everyone, hope you can hear me.

Sean

Yes, we can.

Graham

Great. This is Graham Smith from Off Grid Electric. Just a quick thank you to the team for organizing the call and for everyone for joining today. I know that we have a lot to cover, and so in the interests of time, I think I'm going to be clear that I won't be able to go into too much detail, but I welcome and questions or follow up that people may have. So broadly speaking, when we think of energy access, we're thinking of the one in five or one in six people around the world who lack access to light and electricity. Most of these people are using kerosene. Some use solar lanterns, but the vast majority are using kerosene. And in our opinion, that's an incredibly expensive, inefficient form of energy consumption, along with one that carries some extreme negative environmental and health impacts. So similar to the others on the call here today, our view is that distributed household solar is the way to address this challenge. And more than that, we feel that it also presents an opportunity to leapfrog some outdated approaches to delivering energy access and making a really large-scale difference. So if I can advance to the next slide?

So what we strive to do is to provide affordable, reliable energy services to individuals and communities that lack access. Simply put, we aim to make an aspirational, modern energy lifestyle accessible and affordable to everyone. And this essentially boils down to getting the right product or service to the right people in the right place at the right time for the right price. May I ask for the next slide, please?

So I think everyone, or at least to date the people who have spoken on the call, refer to the idea of solar as a service. For our customers, they refer to this as M-POWER. What we deliver is a complete technical, operational and financial model that makes high quality renewable energy services available to anyone, anywhere. So similar to the other groups, we're using a pay as you go approach. And customers pre-pay for energy services through their mobile phone, and in return receive secure unlock codes via SMS. They customers enter these codes into small-scale solar PV systems installed in their homes by a local entrepreneur, who we refer to as an M-POWER agent. And they use the energy generated from their solar panel installed in the battery of their M-POWER system. So from our perspective, this eliminates a lot of the costs and the risk involved with retail markups and cash held products. It also removes a lot of the challenges that customers face or have to bear with more traditional ownership models. If we could move to the next slide please?

Just taking a quick step back, what we've seen are four main barriers to the widespread adoption of household solar in Africa, in particular. The first is up-front costs. The second is risk aversion. The third is service, and the fourth is distribution. So without draining through these slides, I think probably everyone who is working in this space is very familiar with each of these. If we can move on to the next slide, please?

So what we've done is designed our model to address each of these barriers. We reduced the up-front entry costs. We try our best to eliminate

the risk. We provide the service, and we reach beyond the last mile. So again, this goes to the idea of getting the right product or service to the right people in the right place for the right price. We leverage economies of scale in the production, shipping and financing, which combined with the pay as you go approach dramatically reduces the up-front cost to the customer. We give the customer the flexibility to make payments on schedules that reflect their cash flows. We're also allowing them to adjust their system configuration and accessories. As part of their payment for services customers receive ongoing support from a network of agents, as well as our centralized support services. Households are charged a simple daily fee and we provide the customer with the services to make sure their system remains active. So should the system require repair, we fix it, and should the system need to be replaced, we swap it out for a new one. Should a customer elect to move from one level to another and increase the system size, we offer that as well. We also utilize our custom built software and mobile applications to enable an e-commerce or m-commerce like supply chain, which means that we're meeting the customer where they are, rather than having them engage in a fixed location. We also align the incentives throughout the chain to minimize the investment costs on our end, but also to ensure rapid delivery to the customer's home.

So not here on the slide today, but I think just building on what some of the others have spoken of, we sort of see a convergence of five factors that have made this model possible today. The first, that's already been highlighted, is the growth of mobile money, making cashless electronic payments possible for an unbanked mass market. So Empresa and several of the other mobile operators' platforms, we also see the proliferation of smart phones and the ubiquitous nature of data has enabled mass distribution for our service network. The decline in cost of lithium batteries, as well as the decline in cost of LED lighting and the decline in cost of solar panels have all helped to push the cost curve down on household solar and make it a truly appropriate solution and a cost effective one.

So just moving to the next slide. For us, the entry point for our level 1 system, which is our standard offering, is priced below the cost of kerosene, so this ensures mass-market affordability. And as I said, we really view kerosene as the competition here in terms of what the incumbent solution is. Each of our service levels are then designed to allow customers to progress to higher levels as their ability to pay grows, and also as their needs increase. So customers typically would start with basic needs, which are effectively lighting for their home, phone charging, and increasingly we see radios being sort of an entry point. From there, they move up towards more aspirational goals like televisions, satellite decoders, possibly tablets, and looking for other productive uses for small businesses. So with the pay as you go approach, again so much is we aim to provide customers with flexibility and mobility. They only pay when

they use the system. So rather than locking into a long term agreement and having them be in a position where they're obligated to payments, they're paying simply as they use the system. Should they move or travel and no longer need the system, we can redistribute the hardware to another home to insure that it's being used. In our view, it's combining the mechanics of this pay as you go approach with the core elements of the service model that we think make it highly scalable. And there's just a few other points on that slide, speaking to the idea of service and also the technology. But maybe we can move forward to the next slide.

So in the interests of time, I don't want to drain this too much, but I just wanted to highlight a few of the impacts that we've seen. Although we are a for profit organization, similar to the others, the impact of our work is very important to us. And also we hope to see this grow as we grow the company. So currently we focus on Tanzania, but are planning to expand throughout East Africa. And much like the others, we have ambitious goals of ultimately lighting Africa within the decade. I think maybe we can move to the next slide.

So again, I know we've only really had a chance to scratch the surface here, so if there are any questions or follow up, please be in touch. Again, I'm happy to speak with anyone after the panel today, but with that I'll pass it over to Paul.

Paul

There's my microphone. Can you hear me now?

Sean

Yes, we can, Paul. Thank you.

Paul

OK, good. Thank you, Graham. And thanks for the invitation. My name is Paul Needham, and I'm the President and Co-Founder of Simpa Networks. Here in India we operate as Simpa Energy, and we sell solar as a service to energy-poor households and micro-enterprises in rural India. Some people call it pay as you go. We call it solar as a service. And like the other companies here, we've developed a for-profit business model that is mobilizing investment capital to put an end to energy poverty. And I'm a firm believer that the only way to end energy poverty is to unlock private capital at scale. We have to make clean, distributed energy investable. And like the other companies here, I'm convinced that solar as a service or pay as you go is the right way to mobilize that capital.

So here's how our model works. First, the customer makes a small initial payment to have a Simpa-powered solar energy system installed. There's a credit check process, as well, of course. But the system doesn't work unless you top it up by purchasing energy credits. So customers make their payments to a local agent, who runs the transaction using his mobile phone. Again, there's a small initial down payment for the device, and then pay as you go for the service. Each of these payments for the energy service also add up towards the total purchase price, and once the

customer has completed the contract, the whole system unlocks permanently, generating electricity free and clear.

We offer a range of products, but our most popular product looks like this. There's a 40-watt panel, a 26-ampere battery, two or three energy efficient LED lights, and an energy efficient DC fan. The fan is actually a big selling point in western Uttar Pradesh, where we're operating, in Northern India. Summer temperatures can climb to 48 degrees Celsius, nearly 118 degrees Fahrenheit. So fans provide relief from the heat and mosquito control at night. But the fan uses five times as much energy as an LED light. So the system has to be large enough and powerful enough to meet the customer's demands. And that, of course, increases the costs. Our customers cannot afford the up-front costs of a system this powerful, which is why we believe a solar as a service model is so important to unlock market demand. Consumers pay for the energy services that they value.

We developed our own proprietary prepaid metering and mobile payments technology. When customers make a payment, they receive a code via SMS to their phone. The customer then goes home and enters that code into their Simpa home energy system, and that unlocks the system for the prepaid amount of time. Our customers live in off grid villages and in bad grid villages. There are 400 million people in India who have no access to electricity at all. That's about 72 million households without a grid connection. And there are probably just as many families that have an extremely unreliable connection. Power cuts are rampant, and we focus on bad grid villages that get less than 12 hours of power per day.

But the Indian market is notoriously difficult, but there are three reasons why we are really excited about the opportunity here. First, because education is highly valued. People readily invest in their children's future. Our customers often highlight the educational benefit of having lighting and cooling for their children's studies. Secondly, because rural India is highly aspirational. The ancient divisions of caste and class are everywhere being challenged. People are pursuing new livelihoods and new opportunities. Many people in rural villages have relatives in urban towns. They've seen the urban life, and they aspire for city comforts. And third, because it's really a very large market with great solar resources.

We sell through local village level entrepreneurs, our Simpa Urga Mitra, your energy friends. Over the past twelve months, we've recruited and trained over 2,000 sales agents. We recruit ambitious, local entrepreneurs and we provide them opportunities to develop new skills and increase their incomes. As you might expect, they appreciate the extra income, but what I find exciting is that many of these solar entrepreneurs also say that they really like being on the cutting edge, selling solar and improving people's lives. One of these entrepreneurs put it to me this way. He said, "When we give a family an extra four hours of light every night, we extend their day. We give them more time to be together, more time to work, more time to

study, more time to talk. We not only give them four more hours of light, we give them four more hours of life every day.”

We support our sales agents with training and branding, such as these large-scale wall paintings, a common strategy in rural India. We also have marketing vans that travel through the villages and we distribute posters, banners, flyers. We host village level marketing events that attract big crowds. We also recruit people from the rural areas to become our solar technicians. They go through an initial 7-day training program before becoming certified to work with Simpa. Then we provide ongoing skills development training in everything from system installation, maintenance, repair, workplace safety, proper customer communication etiquette, and more. And this is typical, I think, of many solar as a service business models. Because companies like us only get paid if our customers’ systems are well maintained and properly serviced. It’s in our interest to invest in training. So rural skills development is an added social benefit of this growth in solar as a service business models.

I want to now return to this question. With all this business model innovation going on, is there finally a sunny future for the billion plus people who today lack access to electricity? Can these solar as a service business models really scale up to meet the need, to meet the massive market opportunity? All of these models require capital to invest in the up-front costs of the solar equipment. How much capital is going to be needed? Where is it going to come from?

To answer these questions, I’ll reflect on what we see here in India. In India, a typical energy-poor household has on average five family members, and their basic electricity needs can be met by a small solar home system that costs about \$200 up front. We can disagree about whether that is \$100 or \$300, but for the sake of argument, let’s go with \$200, which means that to meet the basic electricity needs of a single person requires an up-front capital investment of about \$40. The math is pretty simple. This is a large, large scale, there’s a billion people, ten to the nine, there’s a billion people, \$40 per head, that’s \$40 million. And you might think it’s a little more, a little less, but that really depends on how much power and energy we’re talking about providing. So I’ll stick with this simple assumption just to illustrate the point. The point is that real scale needs to be financed by real money. And that’s only going to come from mainstream commercial investors. Private capital that is seeking market rates of return at scale.

But there are two other categories of investors that have critical roles to play to scale up the sector. First, impact investors. They typically come in early, when the company is focused on their proof of concept phase. And at this phase, early stage companies are developing their market, their customer value proposition, and they need enough capital to get out into market, to iterate their model, and to reach some initial scale. Perhaps 10,000 end users, 2,000 customers. For an individual company, this could

require anywhere from \$100,000 to \$400,000 in capital, it really depends on the model. And most companies in our sector have been backed by innovative and pioneering impact investors.

The second phase of development in our sector is happening now, as many companies graduate from this proof of concept stage and start to focus on proving commercial viability at some meaningful scale. As a sector, in this phase we're growing from reaching 10,000 people to 10 million people. And the capital requirements become significant. As with my assumptions here, that's looking like \$400 million just to fund the up-front capital costs of the solar equipment for 10 million people. In this phase, we're starting to outgrow the early stage impact investors. And now development finance institutions have a critical role to play. I'm talking about groups like IFC, ADB, FMO, DFID, Proparco, etc. They are beginning to lead investments to provide long term, patient debt, and to help companies in the sector scale up and prove the commercial viability of their models at some meaningful scale. And this is really a precondition of the next phase.

Let's remember the goal. We want universal access to clean, reliable electricity. We're not satisfied if we reach only 10 million people. We need to reach a hundred times that many people. We need to reach a billion people. To achieve universal energy access, our sector needs to unlock private capital. And to do that, we need to deliver market rates of return at scale. Private capital doesn't care about the social impact. It cares about earning financial returns. That's where we need to go. And as a sector, that's where we are going.

Solar as a service is the right way to expand access to clean, reliable electricity. It requires up-front capital investments for the solar equipment. But that capital can be recycled over and over again as customers pay for the energy services that they value. It's a business model that creates new skills and new jobs for people in rural areas. And most importantly, new opportunities for the families that gain access to clean energy for the very first time. And when we finally reach a billion people with clean, reliable electricity, I think the sector will really just be getting started. Most people will not be satisfied with only basic levels of energy. Most people will want more power. More power to run TVs, more power to run refrigerators, coolers, water pumps, computers, power tools and other machines. Energy is opportunity, and opportunity cannot be denied. I'll turn it over to Jacob.

Jacob

Thanks, Paul. Can you guys hear me?

Sean

Yes, we can, Jacob.

Jacob

Great. So my name's Jacob Winiecki. I'm an energy sector specialist for CGAP. CGAP is an acronym for the Consultative Group to Assist the Poor. The website is cgap.org. CGAP is an independent policy and research institution that's housed at the World Bank, focusing on financial inclusion. So we develop innovative financial solutions for the poor through active research partnerships and engagement with the private sector, financial service providers, policy makers and funders. We recently launched an initiative called Digital Finance Plus, which focuses on the use of mobile money and branchless banking to expand access to essential services and utilities like clean water, energy, health and education. I'm coordinating CGAP's work in digital finance in energy, which is primarily focused on the emerging pay as you go solar sector. So I'll be moderating a short discussion with our panelists. And I'll start off with a question to Graham.

So Graham, in your presentation you described Off Grid Electric as delivering energy as a service, so rather than being a pay to own or leasing arrangement. Can you tell us a little bit about where you see the advantages to this model, and if you anticipate having to modify this as you expand to new markets, or if there are regulatory changes in the markets you operate in?

Graham

Sure, thanks Jacob. And I think, from the others, I would certainly invite them to comment on this as well, because it sounds as if there's been certainly a movement towards the service structure over the last few months or years for many actors in the space. So I think we've probably collectively covered the main points in terms of up-front costs, risk reduction, maintenance and repair, and then also distribution. I think for the customer, what the service really comes down to is that it allows for a lower daily price, flexibility and mobility, support and maintenance, and then the ability to adjust their level on the accessories or start and stop as needed, rather than worrying about taking ownership of a particular unit. For the company, I think our having a relationship with the customer is probably the thing that we value the most there. We can achieve economies of scale by centralizing the production, distribution, training, support. And when it comes to the economics of an individual unit, we can reclaim or redistribute our assets as needed based on what sort of the market's telling us the customers, we're not tied into the idea of a particular customer will need a particular unit and how that works as they mature and as their needs change. And we also think that this gives us the opportunity to scale quickly as we enter into new geographies.

So to the idea of whether we we'll have to modify as we expand to those new markets, I think the majority of what we do will probably remain the same. Certainly there are aspects that we need to adapt as we look at the context of a local environment. Some are probably more obvious, say the language we use for the software, the currency we price and things like that. But there's probably others that are a bit more nuanced. So what happens when we enter a region and it's different dynamics with respect to

demographics, purchasing patterns, distribution channels, one example would be looking at data like population density and how that affects our ability to provide service, or how we set customer expectations in terms of response time or system performance, things like that.

But I think what's interesting, and probably more broadly applicable to not just the group speaking today but probably a lot of the listeners, is regulatory changes. And again, I think most of what we do will probably hold as we expand, but it's something that I think we collectively have to think about as something that certainly warrants a broader discussion. Obviously, regulatory changes impact more than just our work. And maintaining supporting policies or advocating for new policies is something that I think will probably take a joint effort. The issue of that on solar products in Kenya, a market that we aren't in today, but that's an example where a regulatory change could have a major impact on everyone in the space, not just the individual company. So whether or not that market grows, whether or not others enter into the space, what existing actors in that space have to deal with, I think regulatory hurdles either supporting or protective policies are probably going to be things that collectively, as the market matures and, as Paul suggested, if we're discussing the idea of trying to reach a billion people, those are sort of the hurdles that are kind of unknown right now, and certainly will take more than just any one individual actor to address.

Jacob

Good, thanks Graham. Our next question is for Paul. So the payment enforcement technology used in a lot of pay to go solar products requires businesses to make sure your customers have convenient ways to make ongoing payments, and sometimes that they have reliable cellular coverage to process the payments or communicate with the solar product itself. So how has mobile money availability and cellular connectivity influenced Simpa's technology and business model choices?

Paul

Good question. Yeah, when we looked at where to take this and decided to come to India, we saw this was going to be a major challenge. Mobile money does not have mass adoption in India. Empresa is here, Airtel money is here, they've launched, but they have very little adoption. So we simply cannot rely on mobile money as a channel either to pay our people, which I think is very innovative, I love that, or to receive payments from our customers. We can't do it. We had to build our own channels to sell the Simpa recharge, and of course that does add cost to the model. But we try to always look for ways to combine roles for added efficiency. So for example, many of our Urga Mitra, the village level entrepreneurs, they're also not only generating leads and signing up customers for us, but they're also collecting payments from customers. And as they sign up more and more customers around them in their villages, the income opportunity from selling Simpa recharge becomes just as significant as selling another system or signing up another customer. So I think there are some synergies there, but that was absolutely a challenge when we entered the market. I think it's going to look different in five years, and we'll be ready, and we're certainly tracking that.

Cellular connectivity can certainly be a problem. Again, when we looked at the market we were, when we started selling here we were selling in the south of India in the state of Karnataka, and we were selling in mountainous areas, and many times customers just don't have a reliable cell connection inside their house. They just couldn't rely on there being a good cell connection inside the home, just like in San Francisco sometimes. So we designed a model where we're not actually dependent on that availability of the cellular network in the home itself. As long as the customer has access to mobile phone, they can receive our codes via SMS, and then they manually enter those codes into the Simpa energy system.

Jacob

Great, thanks Paul. So I have a question for Mansoor. So two of the big risks that I often hear associated with pay to go business models is that first, somehow your customers will figure out a way to use the product without paying, either through things like tampering with the hardware or hacking into your software, and second, that customers will just decide to stop paying once the product is actually at their home. So I'm curious from BBOXX's perspective, how real are these risks, and how are you as a company structuring your product and your business model to mitigate these risks?

Mansoor

Sure thing. I guess the high level answer to that is we're trying to demonstrate value for money. The moment that perception drops among customers then problems of this sort can become very real. And there are obviously technical ways to be able to overcome the tinkering problem and making alerts in the system, etc., etc. that allow us to see if someone is doing something they're not supposed to do with the systems. But more overarching than that is it's an important thing to be able to demonstrate the value of the money they're paying to BBOXX, but also to be able to incentivize good behavior. Like a good paying customer, at BBOXX we're trying to implement a bonus program effectively. People who are paying on time, etc., they get rewarded for their good behavior. And it's very important for us to make sure that each payment that people are paying us also looks a bit like an investment for them. And that's really part of our broader strategy, we concentrate on a long-term relationship with the customer. And that largely is working well. I mean, to date, we haven't had many people complaining about or trying to tamper with our products to overcome the whole payment issue.

But the other interesting thing that should be noted as well in any of these morals that are trying to get implemented, is that one needs to really differentiate the question of ownership versus service. Because in our model, the ownership is transferred to our customers, which we think is an important incentive for people to pay off and actually to unlock, that you own something like that. And people take the different affairs, and as we've seen in this conversation, have different approaches to that. And the service is an element on top of that. So as many of us have spoken today, unless we are unable to design to provide service to the customers and make them realize and see the value that continues to support is required to maintain a healthy product, but more importantly also to help the customers upgrade the energy ladder, I think if that story is sold well throughout the network, many of these risks are mitigated.

Jacob

Thanks, Mansoor. So our next question is for Klara. It seems like a lot of energy enterprises are taking on the financing in customers themselves, oftentimes out of necessity because perhaps there might not be a local partner that could finance the customer. Do you see opportunities for Mobisol to work with banks, or local banks, I should say, and micro-financing institutions in the future, or do you think that this kind of technology enabled finances is best suited for energy companies to directly serve customers without partnering with local financial institutions?

Klara

Yeah, Jacob. So I think a solar company partnering with a micro-finance institution on paper looks almost like a non-brainer, so you think, ah, yeah, they have a lot of VOP customers and we have the technology and we don't know anything about their customers, so let's collaborate. But I think the reality is that at least in Sub-Saharan Africa, in contrast to Bangladesh where one model similar to that is really successful, those micro-finance institutions, they're not in rural areas. They have outlets in urban centers and they use a few guys who are driving around on motorcycles to those rural areas, but they're not there yet. So at times we couldn't really find anyone to collaborate. And also, I think in addition to that, just like many bankers we know from, I don't know, European or North American context, those bankers are quite risk adverse and don't really want to go into any new ventures that they haven't studied thoroughly enough. So at the moment, I think our way of doing the financing on our own just works best with the pace that we are having. However, we are talking to some quite visionary leaders in the FIRE sectors, and let's see what comes out of that in the future.

Jacob

Great, thanks Klara. My next question is for Paul. One of the questions that I often here is how are these pay to go solar companies measuring portfolio health? And a number of companies are using language, I think borrowed from the micro-finance sector to describe things like portfolio at risk and your repayment rates. So how do you approach the challenge of monitoring Simpa's customer portfolio, and what metrics have you found to be the most effective?

Paul

Well, we also take our cues from the micro-finance sector. But of course, our models are different. So we take it a bit further to pick up on some early warning signs. For example, we measure something called "in the dark." When a customer runs out of credits and we know their system is shut off, we say that that customer is in the dark. And it's actually normal for customers to wait until their system's shut off before going out to make another payment. Perhaps this is just normal consumer behavior, right? Even for essential things. How many times have I run out of toothpaste or milk, for example, and only then come to the shop for it? So I think this is normal behavior, but we want to track it very closely, because even if it's normal for people to fall into the dark, we expect them to pull themselves out of the dark within the next four to five days. So we track a metric called "percent in the dark," and we track it at the branch level. We try to keep that around 10 percent, which we're finding is turning out to be normal. I love the ideas that were mentioned earlier about incentivizing your customers to do the right behavior, like Mansoor was talking about. And we're starting to do a bit more of that, to incentivize people to top up before they go into the dark.

We also track portfolio at risk. If a customer is 15 days behind on their expected payments to us, then we say they are par 15, they're in the par 15 bracket. And we track, we track par 7, par 15, par 30, etc. And you know, as I mentioned before, it's very important for our sector to really speak the

language of investors. So we consciously adopted the language that's used by micro-finance companies, who in India have been very successful at raising private capital, as well. And because we're going to be talking to many of the same investors that are investing in micro-finance, and we want to think about our portfolio and use some of the very same metrics. We also obviously track true defaults, and we work very closely with customers to take back their systems if they really don't want to use the thing, that customer value proposition is lost.

And one way in which our model is different than banking models is that customers can prepay for any number of days or weeks or months in advance. So while some customers pay late, others are paying far in advance. So we track the actual payments received, relative to the payments we expected to receive by a particular date. And it's probably the experience of many other companies here, but we always have about 120 percent more revenue, more cash, than we would expect on a particular date, because many customers are buying many days in advance, sometimes months in advance.

Jacob

Great, thanks Paul. I'll actually ask the same question of Graham, so we'll move from India to East Africa. So how does Off Grid Electric think about measuring and reporting your portfolio health in Tanzania?

Paul

Sure, and I think what I'm taking away is that I certainly need to sit down with the rest of the panelists here and we need to compare notes at some point, because I think a lot of the things we're doing are similar but with subtle differences, or we've learned things from the market. So our modern activities are driven by the data we collect through our software and our mobile application, our agent network, and then the interaction that we have with our customers through our customer support and call center. So we collect a lot of data. But as I mentioned earlier, I think we view our relationship with the customer as ultimately being the most important part of our model. So although we aren't a micro-finance organization or a lending group, we do have to make some considerations for our overall portfolio. We look at indicators that are familiar to both micro-finance but then I think also ones that are very similar to the mobile phone industry, so metrics like our crew, customer churn, the frequency and size of payments are sort of similar to as Paul described there. We also look at metrics like the number of days that a customer utilizes their system. We don't refer to it as days in the dark, but I think effectively we're trying to accomplish the same thing, which is say how many days is the customer using the system over the number of days that they could be using the system.

Where we've probably found the most value and learned the most, though, is through the customer service component. And since we provide that support, we frequently hear from our customers. And the most effective thing for us to do, to keep our customers happy, the most effective thing is really for us just to listen to them. This allows us to be making

adjustments to our offering, to refine aspects like customer education, how we set expectations with them, and also to proactively deliver messaging and sort of design and deliver interventions that hopefully will allow us to meet customer needs before they're even explicit. So following on some of the comments that Paul made, we also track the days where a customer is not actively using the system. What we've learned, though, is that sometimes this isn't as simple as just the ability to pay. Sometimes what we're seeing is that it's related to other factors. For example, further education that's needed in terms of how to make a payment, confusion around the entering of a code into a system, the ability for a customer to understand when they actually need to top up, and one is perhaps an environmental consideration like rain or cloud cover versus something that's actually a system performance related issue. I mean, those are all things that if we didn't have our customers telling us about, we wouldn't necessarily be able to intervene, and we wouldn't see the progression in terms of customer use. So I don't think it's necessarily just a matter of risk that we view in terms of payments on the portfolio, but it's also a matter of what are the contributing factors, or what are the underlying causes for some of those things that might cause fluctuations.

But ultimately, I think we are trying to do something, so maybe what the rest of the groups have highlighted, and that is that we're trying to really demonstrate that off grid households are an investable asset class. We're trying to grow the sector. We're trying to bring people from darkness into light, and ultimately give them opportunity. And so do to that, we want to show that there are commercial returns in this market and that we have the ability to put capital to work effectively and efficiently. And I think that that means sort of speaking that language of micro-finance or other organizations like the mobile industry that have seen tremendous growth in some of these markets. And I think that that's not to discount the idea of the impacts indicators or the metrics that people look at from more of a development side of things. But I think to really crowd others in and to bring some large scale capital to the sector, what we're going to need to show are things like what the return on the investment is, what your default rates are, other factors that ultimately are more financially oriented than they are development driven.

Jacob

Great, thanks Graham. So jumping now to some of the questions we've been receiving from the participants, so this particular question is for Mansoor. So the question is, what is the advantage of having your own retail outlets as opposed to having sort of a franchise network or appointed distributors?

Mansoor

Yeah, sure thing. Thanks for your question. There's a few things really. It's really about service provision. One thing we realized is that outsourcing your sales network is a relatively easy thing. You have the right incentives, you can treat the right incentives and you can find people or networks that can sell your products to earn customers. But the idea of being about to service those customers once installed, and especially as Paul mentioned, we only get paid if our products are actually working, we have found that outsourcing the technical service, the support side is a lot harder. And that's why we, as a business, have decided to keep that part of the story in house, and that's the real purpose of the retail networks. And the retail networks also work as an additional tool, as well, as Paul mentioned as well and many other people mentioned as well, they are also educational centers for sales agents to get trained and to be able to leverage the network. We are effectively micro-franchising moving shops, so there are people who want to distribute it. In many ways, it's about really creating a presence, a presence for solar in the rural area. And I think that, in any other way, is really tricky and not scalable. And there is the scalability issue that has driven us to the model that we have today.

Jacob

Great, thanks. So I'll jump to another question. I guess I'll pose this to Klara. So you talked a little bit about Mobido's own distribution network and that model, and you've already gone through expansion to other countries. So this question is about, if you were to expand to other countries, perhaps other countries in East Africa or another region, what is Mobisol's approach? Do you feel like it's the kind of thing you need to build from scratch again, and sort of own the distribution network in each of the countries you operate in? Or are there opportunities to partner out on distribution? What has Mobisol's approach been in the past and what do you imagine doing in the future for expanding into new countries?

Klara

Cool, sure, yeah. OK, great, can you hear me now? So yes, Mobisol has set up its own distribution network, and when we first moved to another country, which was Rwanda this year, we also there set up our own distribution network. And we figured that it actually could happen quite quickly, because we had so many learnings from our scale in Tanzania that within three months we were operational in Rwanda, and are now opening up regional huts and market huts much quicker than our first market huts that we had in Tanzania. So we think that in the end, setting up our own distribution network, even though it sounds like a whole lot of effort, it is, but finding distribution partners also is not that simple. And we are trialing partnerships with partners that do the distribution for us, and we're learning a lot from these trials, so whoever posed that question, feel free to get in touch with me so we can discuss further about opportunities.

Jacob

Great, thank you Klara. So this question is coming from a participant and I guess is directed to Paul. You described in India having to build out your own sort of payment collection or payment agent distribution, essentially, to sell the recharge or top ups because of the sort of immature nature of the mobile money market in India. The question is, has Simpa looked at partnering with a mobile network operator and think about how you might be able to build on top of their network of existing prepaid mobile airtime agents or some of their other authorized agents' infrastructure?

Paul

We have, we certainly consider that. There's a couple challenges. One is that the mobile operators very often don't have direct relationships or even very indirect relationships with the agents that are selling airtime. So what that means is as a consumer, you can go to an agent and you can buy airtime from any mobile operator. That agent does not belong to only one mobile operator. So the mobile operators don't actually have their own proprietary distribution channels for their airtime. Some do, and Vodafone has got a stronger proprietary network than others, but there's a tremendous amount of overlap. They're all using the same agents. And there are aggregators of these agents. And for example, there's a group here called Oxygen, and they have thousands of agents that they then make their network available to mobile operators. Satellite TV systems here called direct to home, or DTH, also have this pricing model where you get the box installed in your home, but then you have to recharge it every month to continue to get service. Those companies also leverage these existing networks, these aggregators of agents. So that's where we'll go, actually, not directly to the mobile operator, but to these aggregators of agents. We've not done it yet because our geographic footprint is pretty small. We're in eight districts of western Uttar Pradesh, and we found that when we leverage our own sales agents to also sell the recharge, it sweetens the deal for those guys, as well, so they can make more money.

Jacob

Great, thanks. And I guess I'll pose this question to Klara. So Klara, pay to go solar products require additional hardware and software, and you walked us through Mobisol's proprietary hardware and software. Does this mean that for an end customer it ends up becoming ultimately more expensive than similar products that they could buy on a cash basis? So if a customer was to pay in full, would it be better for them to purchase sort of a more traditional cash retail product? And how do you see pay as you go making products more potentially more affordable or more expensive for the VOP, so it potentially lowers the up-front costs, but what's the impact on the overall price that a base of the pyramid customer ends up paying?

Klara

Oh, yeah, sure, thanks. So really, I'm not going to go into the details of how much our systems cost. Just to let you know that the additional hardware cost for the Mobisol controller is not, I wouldn't say it's a detector that makes the system too expensive for a customer to buy it. It's actually the necessity to buy it up front which is the barrier to many of the customers to purchase their solar system. And if we can just with a small fraction of money allow our customers to pay for the system over three years' time, which makes it easier for them because they are able to substitute what they've already been paying for kerosene or [inaudible 1:16:41.4] or running a generator, so it makes it much easier for them. And then our Mobisol controller is also there to build up a whole maintenance infrastructure, and so for the first time, actually, for many of our customers in Tanzania and Rwanda there is a company who is taking care of the technology that they are selling, even after the point of sale. And we can lift the worry of non-functioning systems from them, and this is actually our unique selling proposition to many of the customers, besides the ability to pay off over time. And we're only able to do that on a commercial scale because of the hardware technology that we include in the system. So not including it in the system would not make so much sense from our point of view.

Jacob

Great, thanks. So this question I'll pose to any of the panelists who would like to respond. I'm curious if you could discuss any of the challenges that you've had in working with mobile network operators and what you would consider your wish list of support that you could receive from the telecom industry to help catalyze pay as you go.

Mansoor

I'm happy to start, if that's OK.

Jacob

Please go ahead.

Mansoor

Yeah, I think there's quite a few challenges with mobile operators. I mean, there's a few ways to think about this. If you look from a lot of our systems are now going into place, like Mobiso, etc. need data connectivity to be able to manage. And managing contracts that automatically top up and global level and things like that is quite difficult to get by and administer. So there's definite support that's required on that side. Mobile money integration with your system, especially in marketplaces where several different mobile money platforms exist, and integrating that into your own in-house IT system is often not the easiest thing in the world, and could be made easier by telecoms and is really in their advantage. I guess a lot of, a few companies have tried to access the massive distribution network assess that the telecom companies have. Again, I think as Paul mentioned as well, a lot of the telecom operators are using the same agents to be able to distribute their services and products to end customers. I think leveraging, more better understanding from the telecos of the energy market would definitely help in the efficiency of any such partnership. I guess that's what we might be main concerns with the telecos with me, so far.

Jacob OK. Anyone else interested in providing something?

Klara I think I can add to that.

Jacob Sure.

Klara Yeah, I would be available. So yes, I mean we already have quite good relationships with telecom companies and we received some [inaudible 1:20:08.5] in April our process [inaudible 1:20:10.9] in Rwanda, which was very fortunate. But one idea I had is Empresa is kind of really programmed into the syntax of each photocom client or [inaudible 1:20:23.3] and that allows customers with any phone that they have to make Empresa transactions. And if that technology could also be extended to pay as you go companies like we are, then we could just piggyback on the technology that is already there to make it even easier for our customers to pay off. So that was just my spontaneous idea to put on the table.

Jacob Great, thanks. So I'll just move on to other questions. And maybe I'll pose this to Graham. So what sort of interactions have you had with governments? So either national, sub-national, local, and how have these groups responded to Off Grid Electric's private-sector driven approach?

Graham Sure. So we've interacted with government I think on a fairly steady, regular basis, at least in Tanzania. We've been able to certainly engage them at the early stage to make it clear sort of what we're hoping to accomplish. I think if I were to characterize it in terms of the relationship, we're able to find a mutually beneficial sort of relationship with them. We can offer them things that are obviously high on their list, as far as providing energy access and a lot of the benefits that come from that, whether they be education-driven, health-driven, economic-driven, and what we've tried to characterize it for them as is that we think we can accomplish a lot of the goals that they're setting out in a public forum, just in a private sector approach. So if they are thinking of expanding the grid, we would challenge that to say could we get there quicker, could we reach more people in a more timely fashion? I would say that overall everything we've done with government has been positive. I think also that the difference between a public sector and a private sector approach typically comes down to the speed at which they move. So I think that there's some inherent challenges in trying to work through the public sector, and hopefully those are things that we can minimize or remove when we take a private sector approach. So encouraging is probably the best way to put things in terms of our relationships with government.

Jacob OK, great. Thanks, Graham. So now I'll pose this question to Paul. So without access to things like a formal credit score for energy-poor consumers in India, what have you seen to be some of the best ways to assess credit risk of your potential customers?

Paul

Good question. I think we're learning. We collect, we ask about thirty questions on our customer application form, all the usual things that a bank would ask about income and wealth, and we try to ask it in ways where we can hopefully elicit good information. We ask how many cattle do you have, how many acres, what are your crops? We want to know about the household size, the composition, number of members of the family. But I can't say that yet we have established that any of those things are really good predictors of ultimate payment behavior. We also look at things such as the area. We talk to micro-finance companies that have worked in the areas, and we stay away from villages and areas where other companies have really had a hard time.

I'll tell you what does seem to predict or what does drive bad payment behavior. And it's not the questions you ask up front. It's whether or not we do a good job of servicing that customer. Everyone else here has kind of said the same thing in a different way, that the most important thing is that customer relationship. And I hear different companies investing in that customer relationship in different ways. Face to face visits, phone calls, SMS reminders, bonuses, rewards. That's what really drives good payment behavior. When we do a deep dive into those customers who are really falling behind or who are even angry with us and not payment, it's always because we have failed them. Maybe they had a technical issue with the product and we said we'd be there in three days and it took us ten. Maybe they wanted to make a payment but we didn't have a local payment agent that was actually convenient for them. Those are the things that are really driving good and bad payment behavior.

Having said that, we will continue to collect all of that information up front on each customer, and we hope to better understand those patterns. I think, you know, once we get to 20,000, 30,000 customers and over time, we'll start to see those patterns emerge. But I think the encouraging thing to hear and for us to learn was that we're actually in control of this. We can control payment behavior. We just have to do our job and keep those systems running and keep communicating with customers.

Jacob

Thanks, Paul. So this last question I'll just pose to Mansoor. The question is, do you see any opportunity to raise and channel domestic private capital within Africa, as an example? Or do you imagine the end user financing to be primarily mobilized outside of that region?

Mansoor

That's a great question. I want to comment on Paul's great slide, as well. Paul, I think you're missing one layer in between there, which is local debt and local capital in between, which I think is the next step for a lot of companies. There's definitely a lot of interest among local investors and local financing institutions to get involved. And I think it's about selling the story a lot better. I think one thing in this industry we have to do in the local market, we definitely have much more limelight on our sector than we have outside our markets, is to highlight the performance numbers, the [inaudible 1:27:20.2] their experiencing. The numbers in the sectors are encouraging, and as Paul said, largely we are in control of those numbers as well, then it's a definite pull marketplace. And it's about selling the value proposition to existing financial institutions better, that we actually are an industry which can overcome your distribution costs of capital, your collection costs of capital, your marketing. We can be a channel for that. We can track where your money actually is. We can also result in the impact that electrification can have. So I think there will be a lot, at least in East Africa, I know a bit less about other places, but at least in East Africa we are experiencing interest both in equity from institutions and debt as well, so I think that's going to be an interesting time in the next one to two years, especially as we build up more history of the local companies, and the local entities start becoming profitable. I think that will open up a lot of doors for the local capital.

Jacob

Great, thanks Mansoor. Thank you, everyone, for this excellent discussion. I think we'll have to cut it off there. Thank you very much for the opportunity to be part of this discussion. I think, as Graham mentioned, I think there's a lot of things that we could continue discussing. We'll have to think about ways in which we can continue this discussion. But I'll hand it off now to Sean. Thank you very much.

Sean

Great, thank you Jacob, and thank you everyone else. That was a great discussion. And thank you to the audience for all the questions. Unfortunately, sorry if we didn't get to address your question in particular, but we are running out of time, as Jacob said. So we're going to move on and just wrap up the webinar real quick. And before we do so, we do have a quick survey for the audience. And so the first question has been displayed, and you can respond right in there. And the question is, "Did the webinar content provide you useful information and insight?" And the next question is, "The webinar's presenters were effective." And then the final question is, "Overall, the webinar met my expectations." Great.

Thank you for answering our survey, and on behalf of the Clean Energy Solutions Center, I just want to again thank each of our expert panelists today, and all our attendees for participating in the webinar. I very much appreciate you taking the time out of your day, and I invite everyone to check the Solutions Center website to view the slides from today's presentation, and also to listen to a recording of the webinar, which will be posted in a couple days following the broadcast. Additionally, you can find some previously held webinars on there. I also want to mention that

we are now posting all the webinars to the Clean Energy Solutions YouTube channel. Please allow for a few weeks for it to be posted up there. And we also invite you to inform your colleagues and those in your networks about the Solutions Center resources and services, including the no-cost Ask an Expert policy support. And so with that, I hope everyone has a great rest of your day, and we hope to see you again at future Clean Energy Solutions Center events. And this concludes our webinar.

DRAFT