

Webinar Panelists

Richenda Van Leeuwen	Energy Access Initiative
Rene Jean-Jumeau	Energy Security for Haiti
Allison Archambault	EarthSpark International
Michelle Lacourciere	Sirona Cares Foundation

This Transcript

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Sean Esterly

And, today's webinar is hosted by the Clean Energy Solutions Center and the United Nations Foundation for Energy Access Practitioner Network. Today, we're very fortunate to have Richenda Van Leeuwen, Dr. René Jean-Jumeau, Allison Archambault, and Michelle Lacourciere, joining us. These great panelists will be focusing on energy access in Haiti.

One important note of mention before we begin our presentations is that the Clean Energy Solutions Center does not endorse or recommend any specific products or services, information provided in this webinar is featured in the Solutions Center's resource library as one of many best practices resources reviewed and selected by technical experts.

Now before we begin, I'll just quickly go over some of the webinar features. For audio, you have two options. You may either listen through your computer or over your telephone. So if you choose to listen through your computer, please select the mic and speakers option in the audio pane. Doing that will just eliminate the possibility of feedback and echo. And, if you select the telephone option, the box on the right side will display telephone number and audio pin that you should use to dial in.

And panelists, just another reminder that we ask you to please mute your audio device while you are not presenting. And if you have any technical difficulties within this webinar, you may call the phone number that's up on that slide for assistance. That's [\(888\) 259-3826](tel:8882593826). Now we encourage all audience members to submit any questions that they might have at any point throughout the webinar. We will have a question-and-answer session at the end. You can submit questions by typing your question into the question pane in the go-to webinar box. If anyone's having difficulty viewing the materials through the webinar portal, we will be posting the PDF copies of the presentation at cleanenergysolutions.org/training, and that link is up on the slide right now. I will also email or send that out

through the chat box to everyone once the webinar is underway. And also, in the next day or two, an audio recording of the presentation and the entire webinar will be posted to that site.

Now, we have great agenda for you today is that is hoped to fund the work underway in Haiti to support energy access using off-grid renewable energy. And before our speakers begin their presentations, I just want to provide a short informative overview of the Clean Energy Solutions Center initiative. Then following the presentations, we will have question-and-answer session; and then wrap up with any closing remarks and a very brief survey.

So this slide provides a bit of background in terms of how the Solutions Center came to be. The Solutions Center is an initiative of the Clean Energy Ministerial and is supported through a partnership with UN Energy. It was launched in April 2011 and primarily led by Australia, the US and others CEM partners. Outcomes of this unique partnership include support of developing countries to 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.

There are four primary goals of the Solutions Center. The first goal is to serve as a clearinghouse of clean energy policy resources. Second goal is to serve, 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 a peer-to-peer sharing of experiences, and then lastly, the Center fosters dialogue on emerging policy issues and the innovation around the globe. So our primary audience is energy policymakers and panelists from governments and technical organizations in all countries. But then we also strive to engage with the private sector, NGOs, and the civil societies. And one of mark key features that we have at the Solutions Center is the expert policy assistance. This is known as Ask an Expert, and it's a great service offered through the Solutions Center and it is offered at no cost. So we have established a broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis to all countries. So for example, in the area of enterprise development in micro-finance, we're very pleased to have Ellen Morris, the President and Founder of Sustainable Energy Solutions, serving as our expert. So if you have a need for policy assistance on development or microfinance or any other clean energy sector, we do encourage you to use this service. Again, it is provided free of charge. So to request assistance, you may submit your request by registering through our Ask an Expert feature at cleanenergysolutions.org/expert. We also invite you to spread the word about this service to those in your networks and organizations. So in summary, we encourage you to explore and take advantage of the Solutions Center resources and services, including that no-cost expert

policy assistance; subscribe to our newsletter; and then participate in webinars like these.

And so now, I would like to provide brief introductions for our distinguished panelists today. First up today is Richenda Van Leeuwen, the Executive Director of the Energy Access Initiative, overseeing the UN Foundation's work on energy access its engagement with the UN Sustainable Energy for All Initiative. Richenda will be providing a brief introduction for the UN as Energy Access Practitioner Network. And then following Richenda, we will hear from Dr. René Jean-Jumeau, the Minister Delegate to the Prime Minister of Energy Security for Haiti. And then our third speaker today is Allison Archambault, the President of EarthSpark International. And then our final panelist today is Michelle Lacourciere, the Executive Director of the Sirona Cares Foundation. And so with those brief introductions, please join me in welcoming Richenda to the webinar. Richenda?

Richenda Van Leeuwen: Thank you very much and good morning everybody. I'm delighted to have such a distinguished panel to focus on energy access today in Haiti.

Next slide, please.

By way of background, the work—the underpinning for the work that we do here at the United Nations Foundation is really providing support to the United Nations' and World Bank's initiative, Sustainable Energy For All, where we're looking at three broad global goals to achieve by 2030. The first of which is ensuring universal access to modern energy services looking at very much, both electrification, cooking services, as well as energy for heating purposes. United Nations General Assembly unanimously declares 2014 to '24 as a decade for sustainable energy for all. So a very happy first month of the decade of sustainable energy for all to all of you.

And what we really want to see and focus on is mechanisms and really capitalizing further activity so that we can help to support achieve achievement of these goals globally; and then really focusing as well in a targeted way on the specific countries that has had perhaps more various—more challenges and now, where there are more opportunities to help support them as they work towards providing the services for their net populations.

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So the energy access practitioner network, just very briefly. We need to update the bio [ph] slide. We've grown significantly in the last year to 1,500 members around the world, which collectively have provided electricity to more than 50 million households; and they're drawn from around 191 different countries. These members are predominantly focusing on the electricity services utilizing either microgrids and

distributed generation supplies and cover all ends of the supply chain of battery manufacturers, solar panel manufacturers to investors to small-scale distributors.

And we will be hearing shortly from two of our members of the network, Allison Archambault and Michelle Lacourciere, about their work, particularly, in this off-grid/microgrid space.

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So I'm sure that we will hear from our distinguished panel a little bit more about the energy access situation in Haiti today. But just for those who may be joining and learning about this for the first time, we just wanted to say that many of you may know that Haiti, unfortunately, is in the challenging position of having the least level of energy access per capita in the Western Hemisphere. It has a very particular challenge in terms of provision of electrical services to—in the rural areas, but no doubt, Minister Jumeau, will also be telling us about some of the challenges even in the open areas in Haiti, particularly following the earthquake several years ago.

It's compounded by poverty. Certainly, that's still a very serious challenge in Haiti. So the tension between trying to improve the infrastructure but at the same time ensure the affordability of services to customers. And again, I know that our panelists will be talking about that further. And just by way of understanding that in a little bit more detail, analysis has shown many people in developing countries spend between 5% to 15% of their annual income on kerosene that candles for home lighting, which are not really particularly suitable technologies or solutions really for today's 21st century environment, where we have a cleaner, more efficient and more effective, and actually, equally affordable and sometimes often more affordable solutions that are now more and more available even in very rural markets and rural environments.

Within the practitioner network, we have about almost 130 member organizations that have reported operating in the country. Some of them are solely focused on Haiti. Many of them have some relationship to Haiti. They may be providing product that is entering the country rather than actually having on the ground operations there. But we do have a strong membership base and we certainly want to see and capitalize that to the extent possible to help provide the market and the civil society engagement and support as the government really works through addressing its energy access issues.

So I will close with that and say particularly that I'm delighted to welcome the distinguished leader of the panel, Dr. René Jean-Jumeau, Minister of Energy Security from Haiti, who will give us, I think, an overview particularly in terms of the government programs and how he sees the way

forward for Haiti in terms of addressing this issue Dr. Jean-Jumeau, thank you very much.

René Jean-Jumeau All of you, an idea of the challenges we face and that the—the strategies that we've developed to address our energy challenges in order to try to work for the Energy Access for All of the Haitian population.

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We have approached things, obviously, we've continued what we would call a conventional approach but has been going on with the electrical utility for the past 40 years essentially. We, in our office, have developed new approaches, and in particular, worked for one of the aspect—one of the most important aspects of the electricity availability is the need for lighting. So just publicizing domestic lighting and we are trying with a new model for Haiti, at least, of developing electricity access. So I will talk about these five points in my presentation this morning. Next?

The conventional approach is—has been with the electrical utility, Electricité d'Haïti, EDH, to develop—to extend their grid progressively as funds are available through the public treasury. And usually, it doesn't really happen with national aid funds or anything of that nature. The extensions are made through the funds to develop from public treasury and so is the state fund that are used to develop the network. And then to extend the EDH grid progressively. And when we looked at the statistics, we realize that in 1970, the electricity access grid was 20%. Over the years, it's now like 42 years old. Well, in those 40 years, approximately EDH has increased the access through extension of the grid only to about 25 or 36, depending on the numbers that you're looking at. So basically, in 40 years, they've been able to extend the electricity access by about 10%.

So particular, in the past two years, we've been able to measure about 8,500 new customers via progressive extension of the grid the Northeast. If you look at the map of Haiti, the Department of [inaudible] [00:15:33] saw some extension in the center from [inaudible] [00:15:40] up to [inaudible] [00:15:43]. And in the Western continent, from [inaudible] [00:15:50], all the way to south to [inaudible] [00:15:52]. Those are the—essentially, in the past two years, this is what has happened, and this has allowed about 8,500 new customers. As you can see, this is not very effective and the increase has not been significant enough so therefore, we will look at other options.

Next slide, please.

Now this is what we call using more innovative approach, in particular, looking at new technologies and looking at the developments and microgrids. This is where we partnered with EarthSpark or we supported the work that was done by EarthSpark. Allison will talk about that a lot more in a few minutes. EarthSpark started with a few customers and it

developed progressively. And next year, should go up to over 400 customers. Also, we are planning with the collaboration with UNEP, IDB, and NRECA, which is the National Rural Energy Association—Cooperative Association from the US. We are working for—towards, I mean, using microgrids to develop electricity access for three small cities on the south, I think, close to Haiti. Next, please?

The idea of using microgrids, please note that, that means that these cities are not on the main grid. They're not on the EDH, Electricité d'Haïti grid. Therefore, this is a new option that these people did not have before to have access to electricity. We are also continuing trying to use biomass power generation and this is using extensively, agricultural waste or plants that are used for other benefits—for which we could use the excess leaves, the excess growth to reduce [inaudible] [00:18:21] biomass products that we could use in gasifiers to produce electricity. We are experimenting this at the moment and hopefully, this will give an option for the rural sector specially. Next?

Another part of the approach is to look at the—one of the means of electricity. The main need for a lot of rural areas and small cities this in lighting. Therefore, we decided to address public lighting and domestic lighting. Obviously two different—we made two different approaches and strategies to address these two of parts, but they make up most of electricity used in small cities and developing nations. And therefore, we realize that even before we were able to provide full-blown electricity access, it was already possible to use new technologies, in particular, solar panels, and solar streetlights and small solar systems provide lighting to areas which did not have access, and which today do not have access to electricity. And therefore, we were able to develop a program over about a year. We have been able to install or 4,816 solar streetlights and growing. We are still working at it today using grant program which is called Limyé PéP, essentially, the peoples' light. And we are also developing public-private partnerships with the municipalities and various private providers of streetlights. And to this day, we have already signed with 32 different municipalities and have already been able to put up 1,050 solar streetlights with that program. So that means that between the two programs, we are approaching the 6,000 streetlight installation after about a year of work.

Obviously, we have six or seven months of prep work before that but in all, in less than two years, we're able to put up about 6,000 streetlights throughout the country, and in particular, what's rewarding about this is in particular, small cities that did not have electricity for years now, for the rural areas that never have had electricity, we're able to provide solar street lighting at night. So that changes the dynamic of life for people because that allows for social activities in the evenings that allows for commercial activities to continue throughout the night. And also for things like public transport to operate since people are out and about. And it enhances security because lighting reduces the rate of crime. And one of the effects of increasing the public lighting throughout the country in spite of the fact

that there was no electricity is that this will, we know, affect positively the population growth rate in the sense that when people have more things to do and they're out and about. They have less time to make babies. So—it sounds a little funny, but it is a fact and we are banking on that. And we think it's an important part of the objective that we're meeting.

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The domestic lighting, we have to have a different approach. With a population of 10 million, meaning approximately 2 million households, we could not have a program big enough to be able to donate lights to everyone. And if we did try to do that, then the whole country will be dependent upon a grant to be able to provide their own lighting and this would create dependency. We have decided that the best approach was to develop the market for small solar home systems and small systems in general. This technology, again, it only has developed in the past few years that the technology that's been around for decades already has become competitive in terms of pricing and we've now found that using solar home systems and small systems using solar power, people can spend actually less money providing their own lighting than what they're using now, the money they're spending now, with using kerosene and candles and other forms of lighting.

So this strategy is to boost the sector by supporting the companies by—we talked to providers about these small systems; by informing and educating the population; and by helping these companies develop their market as opposed to us doing some form of grant program that would, in fact, on the contrary, slow down the sale of the small systems and reduce the expansion of use of these systems. So is a fully different strategy than the solar streetlights; although with the streetlights, we are going into the face of using more public-private partnerships where the municipalities will have—will develop by having the population, the constituents pay for their lighting in the long run.

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And finally, a new approach for developing electrification throughout the country. To this point, the model has been one of a public monopoly for public utility being a sole provider of electricity to the population. And as I mentioned before, in 40 years, that has given us an increase in access of only about 10%, from 20% about 30% and this is very generous with our numbers. Therefore, we have decided in the government that there was a need for involving the private sector much more in the electricity sector and the Prime Minister has asked for the development of an RFP, requests for proposals, that is to be prepared as we speak by the CMEP, which is the Counsel for Modernization of Public Enterprises that is used to privatize or develop management contracts or any form of transformation from a public monopoly to a more open system, more open methodology for developing a public service. And in this case, the methodology adopted

is that of concessions. The country has been split into four regions. As you can see, a northern the region, a central region, a western region and a southern, involving—each region involving several departments, what we call a geographical or geopolitical departments, of which we have—well, 10 groups so that there are four regions.

And the RFP will be open to local companies or international companies or interested in being the providers of electricity in those regions and in which case, they will engage into the whole vertical structure meaning from a generation of electricity to—all the way to commercialization and sale to the general public.

So the RFP will be coming out, at best, in about a month, that was in a few months, and the idea is that companies will vie for position to provide electricity in one of the regions. And the assets of EDH will be part of what these companies will be able to use. EDH will be essentially a partner, not an operating partner but a partner of these companies, shareholder. And also, EDH will transform into one of management of the overall transmission network, monitoring systems, energy monitoring and control systems, also monitoring the operations of these various concessions. And being the interface between these companies and the state.

So this is a new approach. It's not—it's something totally new to us. So we haven't experienced it before. We are going to go through growing pains. We are not guaranteed that going from public monopoly that this is perfect. However, as I said before, 10% of increase is 3 years unacceptable. We can't continue with a public monopoly that is totally ineffective. Therefore, we need a better solution and this is after having pondered the problem, having tried, over the past 10 years, various solutions to improve the public monopoly with most success during. This is the option that we grew at to.

So those various elements are what we've been attempting in the past year and a half to two years in order to improve energy access, in particular electricity access, to Haiti, which as I said before, is still at less than 30% access of the population to electricity. Therefore, we need to make significant bounds. We need to make significant progress. It is not acceptable that we stay in the status quo and just witness a few percentages in increase every year. In that case, it will take us, if we're growing at 2% increase a year, it's going to take us another 30 years to get to close to 100% access. So we can't let the Haitian population be subject to that. Our objective in this government is to work for justice and in public services, to work for equality and the provision of public services and have what the Prime Minister calls “A Preferential Option for the Poor.” And we have to look at the poorest population and work as hard as we can to improve their situation. If we do that, then we know that we're improving the situation for the whole country.

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I think that is the extent of my presentation. I thank you for your time and I'm hoping to any questions that you may have at the end of the webinar.

Sean Esterly

Well, thank you Dr. Jean-Jumeau. And at this point, we will turn the webinar over to Allison. Allison, we do have your first slide up, please. I see you, thought, that you're on there. We're receiving feedback from your line.

Allison Archambault Here I am. Thank you very much for the presentation. And thank you very much also for the opportunity to present.

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EarthSpark International is working on building clean energy access in Haiti and I think that's true for everyone on the presenter side of the call today. But specifically, we are a nonprofit—a US-based nonprofit that works on building sustainable business model that compose the sustainable energy services. So in that light, we're sort of an incubator for social businesses delivering clean energy solutions in Haiti.

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As we've heard from Richenda and Dr. Jean-Jumeau, energy property is incredibly expensive. Seventy-five percent of households in Haiti don't have access electricity but people who are paying a lot of money, both in percentage of their income in total net terms for very small amount of poor quality energy services. So many people are paying for kerosene and candles and paying for a third party to charge a cell phone. Equivalent kilowatt-hour charge that people are paying is over \$100.00 per kilowatt-hour to charge a cell phone. If you think about what they're paying for a charge for small Nokia battery.

Next slide, please.

No electricity means low productivity. It's hard to study if you don't have clean light. It's hard to keep a business open. We are working in an area that is incredibly rich in agriculture and yet our agricultural products rot for lack of processing.

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What we're working on achieving is affordable, reliable electricity. And with reliable, affordable electricity, we really can unlock a lot of potential. Kids can study, businesses can stay open, refrigeration can happen, people have better health. And also, we're now really focusing on agriculture. Agriculture can be transformed.

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We have an approach that is multipronged. We see a huge opportunity in distributed small-scale solar products. And also—and we've been doing that since 2010. And we've grown into a national retail called line called Enèji Pwòp, which means clean energy in Haitian Creole. And the multipronged approach is—we're really looking at both retail and microgrids. On the retail side, we've been—we've a longer track. So since 2010, we've seen \$150,000 in revenue. We sold over 8,000 products. We have a national network of over 100 clean energy entrepreneurs around Haiti, usually, small entrepreneurs, what you're going to see in the slide, selling clean and efficient energy products from an existing retail outlet that he or she has. And as Dr. Jean-Jumeau mentioned, the customer payback is very small. People are saving a lot of money when they choose to invest in these clean energy products. And the average customer payback that we see when people switch to solar or efficient cook stove is under four months. Here is –

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Here, you'll see some of our products. We have small, solar products ranging from just the simple no kerosene solar light bulb and few Barefoot Power products, the GeoBulb lighting and sun charging and then some larger solar home systems that will do small appliances as well. We also—we work on energy access, are looking at selling clean and efficient cooking stoves. So we have a variety of products, but the one you see on the slide is very simple Enèji Pwòp cook stove called the Miracle Stove. It saves you about a quarter of the charcoal and sells at a small premium. So we've been promoting that as well as some other cook stoves available in the market.

We've invested a lot of time in backend business processes for our retailers. And also at the bottom, you can see one of our new sort of marketing campaigns where you see the difference between two kids studying by the light of a traditional kerosene lamp versus one of our clean solar lamps.

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The other prong that we have taken is looking at microgrid program. And just as a family replacing a kerosene lamp with a clean solar lamp is a step change in terms of quality in life—quality of life. Going from a small amount of electricity to a socket in your wall is also a step change in terms of quality of life because you're able to grid electricity, tap into a much higher density of energy services delivered right to your home or business.

So I'll talk a little bit about what we've done in the microgrid space so far. Back in November 2012, we launched Haiti's first prepaid microgrid, a very small pilot. We launched with just 14 customers and it was running off an existing diesel generator that was then powering the cell tower that was in this little town. And what we were proving with just that initial

pilot was not a sustainable business model. All we wanted to prove was the value of the three things. One was prepay electricity in Haiti. It's not a new concept but it's something that hasn't been done. The mentality of prepayment is very prevalent because everyone pays for phone credits in a prepay way. So you buy your phone minutes and then you use them.

So we proved the value of prepay electricity, we jumped right through deep efficiency. So went right through LED light bulbs with the understanding that people value energy services more than kilowatt-hours. So if you have excellent lighting services even with a small amount of kilowatt-hours because you're using very efficient end-user products that delivers the value the people want. And then finally, we wanted collaborative business models. This idea that we could partner with the telecommunications company to deliver clean energy services even to a small number of people was something that we thought was important. Step 2, late last year, we expanded with the next stage smart meters that we've developed. And we're now actually serving 54 customers. And Step 3 is something that we're looking to view by midyear this year. It's to expand to a full town size solarized smart grid. And that's the real model that we see as transformative. This is something that we see as an opportunity to truly leapfrog really and take advantage of the lack of incumbent energy infrastructure in the small towns in Haiti. To really think about those 100 years of practice that human beings have, managing power systems, and take the best practices, the best lessons learned and the best available technology to deploy the best available microgrids in these rural towns. So just to walk through –

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This is Slide 9. Step 1, it's just sort of a visual of where we started with the microgrid. Again, 14 customers, everyone was on a 30-watt power limit but it was 24-hour a day electricity.

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Again, it's powered by a diesel generator that was existing in the town to power the telecommunications tower. But it had a lot of excess capacity and so we were just able to work with Digicel, the telecommunications company, to tap into that excess capacity. Each home and business had some light, and a circuit breaker, and a plug installed.

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And now Step 2, we are serving 54 customers of 48 residential and 6 commercial. We've also worked with René's office to source and work with a local Haitian company, who has developed fluorescent streetlights and so we do have 8 streetlights attached to our grid that run every night. And we have a variety of tariffs. The lowest tariffs now, as I mentioned was 30 watts, but we do have a bar in Les Anglais that's cooling drinks

and running its business off of the microgrid and that customer has 600 watts power limit. I invite you all to come visit Les Anglais and enjoy the cold drinks yourself and see the microgrid.

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We're able to expand in this way and envision this expansion to be full town size solarized smart grid because of the smart meters that we developed with some volunteers through EarthSpark and have actually spread out technology companies focusing on low-cost, high functionality smart meters for low consumption customers. We, as EarthSpark, look at what was available on the globe— global market place, to be able to serve low-consumption customers. And with metering, and we didn't find anything that fit our need so we actually had to build it ourselves and we're quite pleased with the technology that we've developed. It's low-cost, sort of low risk that enable us to do prepay in a way that we think can really unlock the potential for sustainable business models to serve low consumption customers.

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So Step 3, we're looking at midyear, 400 to 500 total customers. And you can see in that picture the sort of list served customers and then the potential candidate. We're going to do street lighting for the whole town and we'll be serving the road for the solar dual hybrid generation system including batteries.

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On Slide 15. We are able to expand because we have gotten the funding from USAID and its partners through powering agriculture grant challenge for energy development. And the pitch was that building out a town-size polarized smart grid can deliver affordable, reliable energy services to agricultural processors in a way that can reduce their cost of energy and really unlock a lot of potential. So we're doing three things under that grant. We're expanding the grid from our Phase 2 to Phase 3. And then, we're also looking at some demand generation and sort of unlocking business potential here in the agricultural sector by taking a look at some existing milling that is going on and assessing whether it makes sense to local businesses to transition from its old diesel mills to electric mills that could be more efficient.

And then, finally, we're looking at products that is a very perishable fruit here. Red fruit has a shelf life of about 2 days but if it is processed, then that shelf life extends to many months. And so you can so you can process that into chips or flour, but you need some machines to pique the harvest, you know, in sort of professionalized way. So we looking at doing agricultural processing into a sort of export quality products right here in

the small town of Les Anglais where usually the highly nutritious crops just rot at the base of the tree for want of processing.

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And in this way, were looking at a virtuous cycle where they grid unlocks agricultural value and then agricultural businesses strengthen the grid.

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And we see this model in sort of the World Bank's ABC, Anchor Business Community model, as something that's very relevant, not just for agriculture, but for economic development in general specially with the smart meter, where we can actually do demand management in a pretty sophisticated way. We're able to—planning on being able to optimize the asset for the smart grids that we have a very high uptime, which can reduce our overall globalized cost of electricity.

We're looking at ways of also incorporating this model into other towns where entities may be interested in financing not only sort of agricultural processing facilities but other facilities like health and educational facilities with reliable electricity. And in that way, we could use that as sort of the financial seed to launch a town-size solarized smart grid.

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So this is just a very quick overview of these EarthSpark social ventures that we discussed. The solar retail that we see is very relevant and complementary to our microgrid work. As you'll hear from Michelle, it doesn't make sense to have microgrids start everywhere serving 100% of the population in very rural areas. So we see a very real space for the work that she's doing in our sort of distributed solar products. But the microgrids are excellent solutions for densities of population in the small towns in Haiti and actually around the world. The smart metering system, we see as very instrumental to really unlocking the microgrid business model in a way that can serve the low consumption homes and business. And then we're really looking at demands generation by looking at local businesses and how they could be grown and have increased business revenues if they were to switch the microgrid electricity. So final slide, thank you very much. I appreciate your time and look forward to hearing questions.

Sean Esterly

And, thank you, Allison. And at this point, we'll turn the presentation over to Michelle.

Michelle Lacourciere

Good morning, everyone. Thank you for having me. I want to tell you about Sirona Cares and our mission to bring—to build sustainable communities. We really do believe that energy is the cornerstone of a sustainable community and providing electricity and communities—not

only providing the power, but also placing the power to create, use and sell that power into the hands of the people in the community is the work that we do.

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So our focus is on energy for off-grid populations. We are beyond the towns like Les Anglais and we are far out of the cities, so our solution has to be radically affordable. We are really dealing with that percentage of the population that is living on a dollar-a-day so we must be affordable. We have a very large population in Haiti to attempt to serve and so we may need to have a solution that scales very rapidly; and the solution has to be very robust and designed to serve a community that is out in the countryside. And the terrain in Haiti is very mountainous so you do have a lot of varied terrain and a lot of hurdles to get over in deployment processes, and you have to be prepared for that. So Sirona's program has been developed and is working very well right now. We can bring lights to 1,000 people in a day at the cost of a \$0.01 a day per person.

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Sirona's background is that we started with the Jatropha biofuel program in Haiti in January of 2009. That program has continued. We partnered with the Institute for Electrical And Electronics Engineers in 2010 to design an energy solution for the farmers that we were working with. We were very familiar with off-grid communities at that point and wanted to work out towards a solution for power for their homes. We needed a culturally appropriate business plans if these homes were going to become customers of ours. So we worked with the community leaders in those rural areas to develop that business plan. And in 2011, we deployed our first 6 solar stations. They initially served 240 homes and they are still operational today. Today, we have 14 charging stations and the capacity to provide energy 1,400 homes. We're currently adding an additional 3,100 homes with funding from UNEP and the Government of Norway.

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Our entire program is designed for the 80% of rural Haitians that lack access to basic energy. It was important to us to be sure that we were bringing household up to the first tier of energy access as defined in the millennium development goals. We have accomplished that. Our programs are built to empower and encourage self-reliance rather than be a charity. And we operate our program—we have a Haitian business, Sirona Haiti as a—established in Haiti to run this whole program. So we absolutely offer it as a business in Haiti and it's all run Haitian to Haitian. I am the only non-Haitian that participate in this business.

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So what is the business? Our program centers on small portable battery kits. The Haitian name for them is Ti Soley, which means little sun. We rent these kits to our home customers. Each kit contains a battery that gives a customer's home 9 usable amp hours. We provide two 4-watt LED bulbs and the necessary wiring. The kit itself has 2 DC power outlets and one USB port for cell phone charging. It comes with a flashlight and a voltmeter so that the customer knows when they're needing to take it back for a recharge. And it is built to be sturdy. We are in the process of changing the outside form of this case but the functionality of it will be the same.

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With that much energy access, you've got the ability to run one of our light bulbs for 31 hours. You can run all three lights for nine hours. You can charge nine cell phones. You can charge a laptop 1.5 times. You can charge small hand tools. You can run a radio. Basically, our customers just need to decide how efficient they're going to be with their energy and choose which level that they want to use. And when their kit is depleted, they bring it back to the station for recharging. It's interesting to note that the customers who live closest to our charging stations tend to charge a lot of other people cell phones to make money for their homes. So they're more often recharging. The customers who walk further are very energy efficient and may not come back except for every 5 to 7 days. But a kit generally lasts from 3 to 5 days in a home.

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The batteries are recharged at 1.5-kilowatt solar charging stations. These stations are very easy for the operator to use and it simply involves plugging in the Ti Soley kit and letting it recharge for about three hours. And they can charge 20 kits at a time. Each station can manage 100 households.

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So Sirona's program, everything—all of our solar stations are run as individual franchises. Each franchisee selects 100 customers and collects deposits from them. The stations are deployed and customers pay a flat rate for the ability to recharge their kits as often as they need to do. The rate in Haiti that they pay is \$6.25 per month and we do not do pay-per-charge. You actually—that covers your whole month of charging.

Each franchise pays a fee to Sirona and that is \$300 per month. And the balance of the customer payment, the other \$300 per month stays with the franchisee. That allows for community enhancement and support of local programs where we have deployed our stations. Sirona sends a technician to monitor each station and we're responsible for all maintenance of the equipment so everything stays in working order at all times.

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Customers and do pay less than they're currently paying for kerosene and cell phone charging. Allison highlighted the amounts that households are paying at the moment. We did a market survey of 800 homes and determined 10/5 of the US was the median amount that households were paying for cell phone charging, kerosene and candles. So our \$6.25 rate was set to allow for Sirona's sustainability for service and maintenance, but also to try and reach—it's our endeavor to reach as low as we could into the population because we are trying to provide the most cost-effective electricity that we can. Our equipment is maintained every month. That's paid for with these payments; and as we add units, the payments will go to scaling our program. And when I mentioned community enhancement, the funds that leave in the community, when we deploy one of these patients at a school, for instance, the \$300 that is made on site at the school can go to teacher salaries or supplies. There are services and places in these rural communities that the community really needs to have—receiving income regularly and we're able to promote those with our program when we deploy, at schools, for instance.

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Like Enèji Pwòp, Sirona has also created a brand Ti Soley, little sun. We did revise all of our equipment and on the back, you see the pictograph. We're working in a non-literate population for the most part. So we have done everything we can per ease-of-use and to make a product that was very robust for them.

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Sirona strongly believes that partnership brings opportunity. At a national level, we actually work to enhance the national utility. We are working in areas where the utility has not—the grid does not reach. And when we are providing electricity, we're also training customers to pay for energy. We had as—one of the villages where we have a system. In Marmelade, when Dr. Jumeau was showing the extension of the central grid. That went into Marmelade and we didn't expect it but it was a completely seamless transition to take our solar station, transition our customers over to the EDH power, and we moved the station 7 kilometers out into an area that had no electricity, and immediately had a full customer roster of homes looking for our service. So we can balance with the national utility and enhance their efforts very well without any form of competition.

In fact, we will be applying our program with an end of grid application using the new EDH lines in the South and the three new microgrid communities that were mentioned by Dr. Jumeau in the next year. Part of our UNEP effort will be providing our kits that are powered off of those microgrids to customers in those areas. So we—you know, coordination and partnership is absolutely the way to go when you're trying to reach

large populations. At the community level, I've mentioned that we support and enhance local programs and we know that by providing electricity into these communities, we're helping to build sustainable communities.

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In the beginning, I mentioned the scalability being a mandate of our program. Deployment of one of our solar stations to serve a hundred homes and all the insularly equipment requires a pickup and a team of two people. The equipment is unloaded and setup in an hour, the franchisee is re-trained by the setup crew and immediately customers 100 households begin receiving service. A team of two can easily deploy two units per day to serve 200 homes and we estimate a home of five people, so you can reach a thousand people in one day—every day with a team of two.

This is a very exciting scalability plan because it doesn't rely upon large distribution networks being created. It's absolutely just a matter of having the funding to build the units and a team of two or multiple teams of two people deploying them very rapidly.

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The program is also very, very affordable per household, per person. Our lifetime of our equipment is 10 years and because we regularly maintain it as part of the model, we can rely on that lifetime, and we assume the household of five for a calculation. So, a unit cost including the solar station and the kits is \$22,500.00. The equipment cost per home then is \$225.00. Now, that is a cost for over 10 years, so the cost per year is \$22.50 per home; each month the cost is \$1.88 per month, and each day the cost \$0.06 a day. When you were talking about a household of five, that means the cost per person is a penny a day. So you can see that this is a really affordable way to provide clean energy to a lot of homes very quickly.

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We do know—we're not just talking about community enhancement. We know that our program works. In Jeremie, Haiti, one of the orphanage directors, he has always relied on the good will of his community to donate money to help him feed the 54 children in his care and that was the way he got by since the 1980s. We deployed a solar station at his orphanage in July of 2011 and he immediately became a service provider of one of the most highly sought commodities that—in a long time. Now, it has a much more pride, higher dignity and he's generating in revenue to feed the 54 children in his care. So we've actually changed everything for that orphanage and that orphanage director and that community by providing electricity that enterprise people can afford. So it's a very, very exciting program to watch unfold.

So to summarize, we've developed the sustainable business plan. We have had equipment in this field for two and a half years now. We have demonstrated the viability and the usability of the technology. We have definitely demonstrated interest in the local market in the product. We have waiting list in our existing areas of—in excess of 2000 homes. We have demonstrated the interest of local entrepreneurs in operating franchise businesses. We have a waiting list of people hoping to get a station. We've had our successful pilot and with the 14 operational stations, we have had zero theft in two and a half years. It is a built-in safeguard that by having 80 to 100 homes relying on a station, that nobody has been brave enough to attempt to take one of our solar panels out of any of our communities. So that has worked incredibly well.

We have built foundational funding partnerships. We did a grant with USAID to put nine units into the northern part of—Saint Mark and we are currently working with UNEP for a further extension to 3100 homes. And we have developed relationships with solid manufacturing partners, so we have all the equipment that we need to deploy just as soon as we have the funding available.

So our current goal is to connect with new organizations. We're looking to grow and scale our program in Haiti, and scale internationally. And our goal is always been to reach a million people in Haiti, so we are working on that. We believe that there are a lot of solutions needed and a lot of coordination amongst the solutions like EarthSpark and all of the efforts that the government is looking into. We just want to be a part of helping serve energy access for the 1.4 billion people who need it. We do believe that through the practical application of technology and business principles, we can build sustainable communities.

So there's my contact information and again, I thank you for having me as a panelist and we look forward to any questions.

Sean Esterly

And thank you Michelle for that presentation, and thank you to the rest of our panelist for the great presentations. We did get quite a few questions from the audience, so let's just drop right into those. The first question that I received was for Dr. Rene Jean-Jumeau and that is—first of all, greetings from Adam Atnavigan, and he asked, “Do you see a significant role for Propane or natural gas in rural access to energy?”

Dr. Rene Jean-Jumeau

Well, thank you to Adam for the question. We had, I think discussed the scope of that in presentation, and we had a specificity that it was going to be like electricity as only part of the whole energy picture. Therefore, we only address in this presentation the electricity aspect. However, we are very much interested in other forms of energy and we are working—luckily we have the opportunity to [Inaudible] [01:06:48] recently and we'll work on the—to develop and increase the access of Propane gas—I mean LPG in general for Haiti as a strategy to reduce the deforestation, reduce pressure on resources of Haiti that are being used in

majority right now as the form of energy used for household energy mainly for cooking—in terms of wood and charcoal.

Domestic energy, household energy, and energy for small and medium sized businesses is mainly in a form of wood and charcoal, and therefore we need to rationalize that sector so that there is very specific production of wood for energy in Haiti as opposed to—any forest being cut down for the purposes of using energy. Therefore, our strategy is to promote the use of LPG. We have worked with Navigant in that sense of developing rational strategy and being able to systematically work towards increasing access to LPG, reducing the pressure on our wood resources in Haiti. So yes, there is a very important role for LPG, however I wouldn't say it was mainly for the rural sector, I'd say mainly for the urban areas and that will reduce the pressure on rural areas of Haiti.

Sean Esterly All right, thank you very much for that comprehensive response. And the next question, this was asked by a couple of people, “How do you work around the rest of people scaling solar panels from the street lights?” Or just in general, how do you deal with that?

Rene Jean-Jumeau Okay. Working around it, there are a number of things that we have to work towards in terms of strategy. Can you remember that there is not something that was invented by people using solar panels? We can't—I'm sure there are stuff of vehicles all over the world—work around the vehicle. We work towards improving security within the country; we work towards reducing the vulnerability of the equipment that is installed. Therefore, we talk about the type of installation, we talk about the technical approaches to making the equipment, solar street lights, small solar systems that's less vulnerable. But the most important thing is to work with the communities. We found—the area where we work with the communities before lights are installed, before solar street lights are installed and the communities appropriate—the lights that are being installed as something that is being done with them and each person, each neighborhood having responsibility for a street light, there is very, very, very rarely theft in those areas.

We have found that there is theft almost systematically in places where instances and institutions and NGOs, government institutions come in, decide that they're going to put street lights in the area without really working in the communities, installing the lights and walk away. Those lights are vulnerable because nobody has a responsibility for those lights. And, however inappropriate it may seem, however unreasonable it may seem that in an area that people need lighting that these lights are stolen and the community has not been appropriated. It happens and it almost systematically in terms of percentage—we have one very specific case. I can give you numbers. In 51, there were 40 streetlights installed by a government institution in the fashion—they came in, they installed the lights and they walked away. And then my office installed 20 streetlights

in other area while working with the community, working with the local elected officials and deciding with the community where the streetlights were installed.

Well, the results after about I think three months, we have 19 of the 40 street lights that were installed by the other institution were stolen and only one of the 20 street lights that—therefore this is something that we kept working with the various institutions, working with the communities—it's the manner in which lights are installed. It's a lot more important than the technology used to protect them from theft.

Sean Esterly All right, and thank you again. So I'm going to move down to some of the other questions. If we do not get to all of the questions today, I do want to remind the audience that we will be forwarding those questions to the panelists so that they can get back to you thru e-mail. The next question is, "Are there any comparative advantages of wind-generated electricity over solar in Haiti?"

Rene Jean-Jumeau Is that also addressed to me?

Sean Esterly Anyone can drop in and answer if they like.

Rene Jean-Jumeau Well, I'll be the first to answer. If anyone who wants to add something, they could. Comparative advantage is these are two vintage technologies obviously that are both—engines in terms of the type of the electricity that they produce—meaning it is not a stable base type of electricity. You can't put a system neither with solar or with wind by itself without having either another form of electricity, another form of production that is used to smooth out the variations or form of storage. Storage is very expensive and for the moment, most industrial uses of intermittent renewable energies buy direct injection into the grid that has another form as a backup.

Comparative advantages, obviously it just depends on the geographical site for the use of energy because some areas have less sun and more wind, some areas have more sun and less wind. Haiti would be in that second category therefore it's a lot easier for us to use the sun than to use the wind.

The second advantage of solar power for Haiti is in terms of deployment. Solar panels as you know are relatively small and are assembled in a modular fashion therefore one can put up one, four, eight, sixteen, a hundred solar panels progressively even in areas whereas it's difficult to access. And in terms of using wind power, we are talking in an industrial use of wind power, we are talking very big structures that are difficult to transport. Therefore, if we're talking about an area that has difficult access, wind power is a hard process to implement. So I hope that answers the questions. Anybody that has anything to add, please jump in.

Allison Archambault This is Allison. I would second to what Dr. Jean-Jumeau just said and I'd just add the servicing component as well. But, we're really looking at wind—or for microgrid market, wind is an incredibly site specific and even doing proper assessment tends to take some resources and also tends to be quite seasonal. And so in a place like Haiti, you can always rely on the sun even on the cloudy seasons, so it's been a quick and easy way for us to install a reliable and very serviceable generations.

Sean Esterly All right, thank you Allison and Rene. The next question is for EarthSpark but anyone else, feel free to jump in. We did get this question from a number of attendees. The question is, "How will the microgrid being developed by yourself and others with new grid operators? Will they eventually be subsumed under the new regional grid operators?"

Allison Archambault Well, that's sort of to be determined. We have a confession, we've been working with Rene's office and with the municipality here, the mayor's office in Les Anglias in order to make sure that we are comfortable developing microgrid operations in grid but the regulatory—that we're actively working on and we will understand that as the regulations become more equipped. Rene, I'd love to hear your stuff as well.

Rene Jean-Jumeau Yes. That's important point. The regulatory framework is something that we're working on also at this point. We have been hindered by the fact that the institutional structure right now in terms of energy is very fractured. There were a lot of institutions involved but few institutions responsible. Therefore, it's difficult to implement, to propose, and to get to authorization of final approval. So we're working on that. Hopefully, this is the year since the IBB is interested in developing what they call a white paper for energy. Essentially, it's something that we should be working on with all the partners that are interested in energy in Haiti with the public sector partners as well as the international cooperation partners. Therefore hopefully this will generate a document where there was a general consensus and where we could adopt various laws that are needed in energy sector, that's not only electricity, but we did look at electricity as specifically renewables and we're on that for—what Ali mentioned before, the LPG sector, the charcoal and wood sector, etc.

Therefore, we are working, we are planning this year to propose a number of projects or laws that will improve our regulatory sector in Haiti, and we're hoping that that will help the development of the energy sector.

Sean Esterly All right, thank you both. I'm going to try to group these few questions together regarding education, so it's kind of a two-part question. The first part of the question comes from someone that works on integrating clean energy technology training into the community college system and they ask how receptive and how committed the Haitian government is to the integration of renewable energy, environmental management, and sustainable training into education curriculum?

The second part of the question is that any of the organizations represented here today have any educational materials that they would recommend for college level or in education in general.

Rene Jean-Jumeau

In terms of commitment, we have in our office a department for energy training, energy education, energy information, and we are dedicated to that. However, if we're talking about globally for Haiti, it's a lot harder to answer that question since we think that one of the problems that we are confronted—energy sector as a whole. Therefore, what we are doing, we are producing document, we have a monthly bulletin that we put out. We have an energy guide that we promoted. We have various informational documents that we produced in order to help people and particularly the decision makers to better understand the energy sector.

So in terms of the actual academic curriculum, personally, I'm interested in developing an energy curriculum that will be taught in the University of Maryland—that's probably what I'll be doing once I'm done with this job—and we were hoping that since we're working with some of the universities, working with the state university, we're also collaborating with—university, and what we're doing, we're hoping that this will also develop more interest, more commitment within the universities to have an energy curriculum. In particular, what we have done is we have trained—we have had a specific training program, we had support some USNAP, so using our own budget, we developed a short term training program in solar power technology for about a hundred young students who were specifically from very poor neighborhoods, low-income neighborhoods.

Anyway, that training with work study, with other types of training and insertion into work that we are doing with those students—and those are the things that I think show the commitment of my office, and we wanted to promote that for the other institutions involved in energy in Haiti and also in particular for the universities.

Richenda Van Leeuwen: This is Richenda. Thank you very much, Dr. Jean-Jumeau for that. I'd like to just add more broadly within the energy access practitioner network, that one of the areas that we focus on globally is also the dissemination of emerging good practices if not best practices and the sharing of knowledge resources. And we've been working closely with groups like electricity defrost (EDF) who have developed a curriculum specifically around their work in predominantly West Africa on rural electrification, and they've been funded by the European Union and very much looking at disseminating that, translating it into other languages, specifically for utilization and pickup of mostly at the vocational level in more countries.

We've also seen in other parts of the world as well as specific training of existing electricians in both theoretical classroom and then also practical training to help bring them the expertise that they need to also be able to

install and maintain renewable energy solutions. So there's a wide variety of practice within our experience and I was speaking beyond that Haitian context right now just to say that in fact we do see a stronger incorporation particularly at the vocational level for being able to provide that combination of classroom and hands-on experience for technicians, for people who are doing the installation and maintenance for solar and for other renewable solutions as well.

In the past, with the best ones in the world, many aid programs we focused on sort of giving a couple of days or training for the community and then somehow expecting that to be appropriate for maintenance of the solution set for the next 20 years. We're way beyond that now. There are many opportunities to really ensure that in fact whatever level, whether it's a university level or whether it's the apprenticeship level or vocational training institutions, that in fact these curricula are incorporated as part of the core educational offering.

And then also very much the need to tie it closely with those employees who are working on those projects, on those services in the community, so in fact you can have—relatively seen the system for hiring those trainees and incorporating them more closely into the operations. So we have some resources available here at the practitioner network as well around the global stage of play in the sector.

Allison Archambault One thing that EarthSpark can offer through the practitioner network is also materials that we've developed through training the resellers—the retailers of small scale solar and efficient cook stoves which are both sort of how these things work and very basic sort of technical check in terms of what our resellers should be able to assess when some things stop working, and also how to increase overall energy literacy in the communities which is a critical part of energy education if we are trying to expand people's interest in developing Clean Energy Solutions.

Sean Esterly All right, thank you everyone for those responses. Now, I do need to apologize, we are running out of time so we don't have time for any more questions. As I mentioned earlier, I will take all the questions that I didn't have time to present and I will e-mail them to the panelist so that they can respond back directly to you and through e-mail. And at this point, we will move on a very great survey. We just have three questions for the audience to evaluate how the webinar went. And Heather, could you please display the first question?

That question is “The webinar content provided me with useful information and insight.”

And the next question, “The webinar's presenters were effective.”

And then the final question, “Overall, the webinar met my expectations.”

Great, and thank you very much for answering that survey. Again, I just want to remind everyone, I apologize that we didn't get to your questions but those will be answered through e-mail over the next few weeks. So on behalf of the Clean Energy Solutions Center, I just like to extend a thank you to our expert panelists today and to each of our attendees for participating in the webinar. We had a great audience, a lot of questions generated and we very much appreciate your time.

We invite our attendees to check the solutions in our website over the next day or two if you like to view the slide, and also look into a recording of the entire presentation, as well as any previously held webinars. Initially, you could find information on the upcoming webinars that we have and other training events. We also invite you to inform your colleagues and your networks about Solutions Center resources and services including the no-cost policy support. Hope everyone has a great rest of the day and we hope to see you again at future Clean Energy Solutions Center events. And, this concludes our webinar.

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