

Opportunities and Challenges for Rural Off-grid Lighting and Distribution Markets in India

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Webinar Panelists

Tripta Singh	UN Foundation
Praveen Kumar	International Finance Corporation
Ajaita Shah	Frontier Markets
Gaurav Gupta	Dalberg
Anjali Garg	International Finance Corporation

This Transcript

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Sean Esterly

And, welcome to today's webinar hosted by the Clean Energy Solutions Center and the United Nations Foundation's Energy Access Practitioner Network. Today we are very fortunate to have Tripta Singh, Anjali Garg, Praveen Kumar, Ajaita Shah, and Gaurav Gupta joining us. These outstanding group of panelist would be discussion Opportunities and Challenges for Rural Off-Grid Lighting and Distribution Markets in India.

And one important note to mention before we begin our presentation is that the Clean Energy Solutions Center does not endorse or recommend 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.

Before we begin, I just want to go over some of the webinar's features. You have two options for audio. You may either listen through your computer or over your telephone. If you choose to listen to your computer, please select the "mic and speakers" option in the audio pane. This will just eliminate the possibility of feedback and echo and if you choose to dial in over the telephone, a box on the right side will displays a telephone number and an audio PIN that you should use to dial in. And panelists you just have to please mute your audio device while you are not presenting. And if anyone has technical difficulties with today's webinar, you may contact or go to webinars Help Desk. At the number at the bottom of that slide, which is 888-259-382—26 sorry.

And we encourage attendees to submit any questions at any point throughout the webinar. To do so, simply submit in the question pane.

You type it in and submit it there. And if there's anyone having difficulty viewing the materials through the webinar portal, you will be able to find PDF copies of the presentations at <http://cleanenergysolutions.org/training> and you might follow as our speakers' present. Also, an audio recording of the presentation will be posted to the Solutions Center training page within a week of the webinar.

Now, we have a very exciting agenda prepared for you today that is focused on the Challenges Opportunities within India's Rural Off-Grid Lighting and Distribution Markets. Now before our speakers begin their presentations, I'll provide a short informative overview of the Clean Energy Solutions Initiative and then following the presentations, we will have a question and answer session, closing remarks and a very brief survey.

And this slide provides a bit of background in terms of how the Solution Center came to be. The Solution Center is an initiative of the Clean Energy Ministerial and it's supported to a partnership with UN Energy. It was launched in April of 2011 and is primarily led by Australia, the United States and other CEM partners. Outcome to this unique partnership includes support of developing countries, the enhancement of resources on 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 are four primary goals for the Solution Center. It served as a clearinghouse of clean energy policy resources. It also serve to share policy best practices, data, and analysis tools specific to clean energy policies and programs. The Solutions Center delivers dynamic services that enabled expert assistance, learning, and peer to peer sharing of experiences. And then lastly the center foster dialogue 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. We also strive to engage with the private sector, NGOs and civil society.

And this slide highlights one of the marking features that the Solution Center provides which is the Ask an Expert service. And Ask an Expert is a valuable service operative in the Solution Center at zero costs. 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 in the area of lighting, we are very pleased to have Gustau Mañez Gomis, a Project Manager in the United Nations Environment Programme serving as our expert. So if you have a need for policy assistance and lighting or any other Clean Energy sector, we encourage you to use this useful service.

Again, it is provided free of charge. So to request assistance, you simply submit your request by registering through Ask in the Expert feature at <http://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 the expert policy assistance, subscribed to our newsletter and participate in webinars like this.

And now I'd like to provide a brief introduction for our distinguished panelists today. Our first speaker will be Tripta Singh, the Deputy Director for Energy Access at the UN Foundation. And in her current role, Tripta works on the operational coordination and strategy for the Energy Access Practitioner Network, and leads the Network's engagement in Asia. And then following Tripta, we will hear from Anjali Garg, an Energy Specialist in Sustainable Business Advisory Services for the IFC and is part of the core team of the Lighting Asia - India Program. And our third speaker today is Praveen Kumar. Praveen is the Rural Marketing Expert with the Lighting Asia/India Program at the IFC. And the next speaker after Praveen is Ajaita Shah. Ajaita is the Founder/CEO of Frontier Markets and the President of Frontier Innovations Foundation. So Frontier Markets is a rural marketing, sales, and service distribution company providing access to affordable and quality solar solutions to low-income households in India. And then our final speaker today is Gaurav Gupta. Gaurav is the Partner and Regional Director for Asia at Dalberg and also co-leads the firm's energy and environment practice. And so with those introductions, please join me in welcoming Tripta to the webinar. And Tripta just make sure you unmute your microphone. I'm thinking your microphone is muted. Tripta it's still on mute. You need to unmute still. Your microphone is muted.

Tripta Singh Do you hear me now?

Heather Yes, thank you.

Tripta Singh Okay. Thanks. Thank you very much Sean and so in my presentations today, I'll provide a course overview of financially access practitioners network focusing mainly on our work in India and then I will hand it over to the other panelist to talk about issues in the off-grid distribution of solar projects—off-grid distribution of projects in India under the IFC's Lighting Asia Program as well as the experience of Hunter Markets in dealing with this issue.

So in 2011, the Secretary—the UN Secretary-General Ban Ki-moon launched the sustainable energy for all initiative. And the initiative calls on governments, businesses, and civil society to make commitments to action to mainly accomplish and all those three by 2030:

The first objective is ensuring universal access to modern energy services. The second is doubling the global rate of improvement in energy efficiency and the third is doubling the share of renewable energy in the global energy mix. And then what is energy is especially to this audience, it's not something that needs to be discussed in great detail. We—most of us know that there are 1.3 billion people in world who have—who don't have access to electricity, and there about 2.8 billion lack access to clean cooking solutions. And as we know energy is not just important for its own seek but also because of the interconnection cited has with other development issues such health and education.

The S.E. for all initiative or, the Sustainable Energy for all initiative explain that by the UN and the World Bank and it is not worth the in terms of the cooperation between the two international organizations and the way that it aligns both the resources to support these three goals. The energy access practitioner network and moving on to the next slide. Heather you can move my changing slide please.

Heather Anjali you have a presentation capabilities so you just need to click your keyboard or your maps. We are looking at your desktop. If it's not working, I'm happy to run this slides. I can do that just let me know.

Tripta Singh Oh, sure, next slide please.

Heather You can change the slide on your own system. It's running on your desktop.

Tripta Singh Okay. My computer is unfortunately...

Heather Oh, okay. There you go.

Tripta Singh Thanks.

Heather It's coming up.

Tripta Singh Energy—thank you. Okay.

Heather You're welcome.

Tripta Singh Great. The energy access practitioner network was created in 2011 and the goal was mainly to bring together the people who are working on the ground and then have them come under the umbrella of sustainable energy for all so that the recommendations and—the recommendations and the issues and barriers that people who are working on the ground. The issues that they face can fit into the global initiative. So the network currently has 1600 members and with a total of—representing around 191 countries. And you can see in the chart, you can see the breakdown of the organization types in the network. It mostly represents small or medium

enterprises. So there are about 57% SME set or part of the network. There—it also has international organizations, academic institutions, finance institutions, as well as individuals without organization affiliations. And there's a small there are about 20% that represents civil society in general so a grouping that represents NGOs, social enterprises and some corporate foundations. The network was launched in 2011 and at the end of 2011, it has about—it had about 100 members. But since then it was grown pretty rapidly and so we currently had, the membership is increasing and so we have 1600 members and the network is still growing.

Next slide please.

So, since the topic, our slide presentation to therefore focus in India, I just wanted to provide a couple of figures. So the World Energy Outlook estimates that there about 289 million people without access to electricity in India. And obviously the decentralized energy solutions have an important role to play in advancing access particular due to communities that are—that live in remote rural areas. And there are India—there are examples of a number of innovative approaches and initiatives that exist in India but our problem that is always—that has consistently being mentioned is scaling up those initiatives and also and enabling ecosystem to—that else and the lack of enabling ecosystem that sometimes prevents those efforts and initiatives from taking [inaudible] [00:12:44.].

So under practitioner network currently has about 300 members that are operating in India. And one thing that we've consistently heard from these members is that even though there are number of efforts and initiatives that exist, there's a lack of coordination, of fragmentation amongst our various, this various initiatives. And so does that impede, not only does that impede working together and building on synergies and not having to reinvented new when you are doing something but it also prevents agencies such as government agencies or policy makers to deal with anyone organization or anyone body that represents the collective voices of the practitioners in the country. So there's an overwhelming agreement on the need for a countrywide decentralized energy focus network. And that's something that practitioner network has been trying to create in India. So we are currently working in collaboration with key networks and organizations to facilitate the creation of a countrywide network of clean energy enterprises in India. And this when I say key networks, I basically mean it's a combination of organizations that represents social enterprises, funders already exist in alliances. So we have, so our partners organizations like the Asian India Collective, Circle Foundation, [00:14:18] Foundation, The Energy and Resources Institute, Council to Energy, Environment and Water as well as some others. And there are couples of list that this network would bring together social enterprises and will also include a numbers from other stakeholder groups such as the

private sector, research organizations, financial institutions, policy makers et cetera.

The membership will be a no cost, open source membership and the key areas of activity for the proposed network will be policy advocacy, which includes working on regulatory frameworks and policies in the country. It will include access to finance, polishing of skills and training, technology and innovation including standards for products and information serving as the information and networking hub. So these are the key areas around which we would structure our activities and as the panelists that are—as the speakers that are part of this panel will tell you, there are—in a long cases technology is really not factor that impedes adaption of great projects to promote lighting and electricity. It's mainly, a lot of it has to do with how do you get the projects to end consumers. And the supply chain and logistic issues that are part of it.

So with that I will invite other—and the next speaker which is Anjali Garg from the International Finance Corporation. She's a program manager for Lighting Asia to begin [inaudible] [00:16:05]. Thank you.

Anjali Garg

Thank you very much Tripta and Sean for giving us the background on the energy access and of course lighting across the global sector for India. On behalf of [inaudible] [00:16:25] let me first thank you—let me first find the Energy Access Practitioner Network, the UN Foundation and the Clean Energy Solutions for giving us this opportunity to talk not only about Lighting Asia's and their program but also our experience in the authorizing and distribution market along with our associates and [inaudible] [00:16:46] market and [inaudible] [00:16:46]

In my presentation I'll give a brief overview of the off - grid lighting market in India, the challenges which give market currently faces and how the Lighting Asia India Program is trying to adapt some of the challenges and help get up the market.

Before I began talking about the off-grid market in India, for the benefits of those who do not know International Finance Corporation, let me give a very brief introduction. IFC, the member of World Bank Group and it has a largest global development institution which focuses exclusively on the private sector in developing country. IFC was established in 1956 and is owned by 184-member country and we work with more than hundred countries.

IFC's purpose and objective is to leverage the power sector to create jobs and tackle the world's most pressing development challenges. Specifically in South Asia, the strategic builders which IFC's work is focus are included growth, clean growth and global integration. India is a very important country to the priority countries for IFC. We have a portfolio for

around 4.5 billion dollars and we continue to do more in this country. In infrastructure, renewable energy, focusing on financial market, manufacturing [inaudible] [00:18:10] other high invest sector.

Moving on, the off-grid market scenario, as most of you already know from Tripta's presentation about 1.3 billion people in this world live without electricity access. Of these 400 million are in India and I say 400 million, this is based on information sometimes of Indian people who do not use electricity as a primary source of lighting. And of these 400 million, 90% or more live in India. The most important and the key fuel that they used for lighting is kerosene. For example in the two large state Uttar Pradesh and Bihar, their electricity connectivity and access of the keen issue more than 70% of household that to be used kerosene for lighting.

So most of these household while they are not there, that kerosene is dangerous. It's one of the most common causes for burn. It can lead to fire that actually lead to fire, which may also lead to death. A study in South India suggests that children who suffered from kerosene related burns of all the children which are admitted to hospital approximately 10% of these children die and you're not able to save them. It is a poisonous fuel. If swallowed, it leads to poisoning. In fact, it is one of the most common causes for poisoning of children in India. There are several study which are again being undertaken on this and a 3-year study which was undertaken for the sake Delhi Hospital shows that of all the admission which are happen 47% admission on poisoning is due to kerosene poisoning. We all know that it has harmful fumes and can lead to several ailments like bronchitis as [inaudible] [00:20:00].

Kerosene is a very, very expensive fuel, not only people who are [inaudible] [00:20:08] in human but [inaudible] [00:20:10]. In India a total USD 4 billion spent on kerosene every year. Out of which 2.2 billion dollars is spent by the Indian government and 1.8 billion dollars. It actually spent by household who buy kerosene. It's a no brainer that it's a very polluting fuel. It emits carbon monoxide, carbon dioxide, sulfur dioxide, nitrogen dioxide and several other very, very harmful fuel. As I said many of the households think, know that kerosene is harmful. They have no idea that there are other options which actually it's not the case now because we have several other options available, the new household can actually switch to LED-based-off-grid lighting.

You see the possible solution because high efficiency LEDs are not getting [inaudible] [00:20:59] in the market. These are affordable. They're new latest technology. They're efficient. They have a very fast feedback. They are safe and they're non-polluting. And what are interesting is these are these products are now available in a variety of consideration to meet the need of the various types and the various target segment that we have

from portable solar lantern to small solar home system. So what we now see is that there are people as we just established LED products. They are the product which are available in the market they're manufactured.

But what is the real market here that they're talking about. Out of the 400 million, how many are the people can actually afford the product? So a study which Dalberg has recently undertaken for us based on surveys and based on data which is available on income level and affordability. We clearly see that there's a large percentage of this population which actually by the product. There are about 205 million people who can afford a basic solar lighting system. Of these 50 million can actually afford a multifunctional system and 10 million can afford basic solar lighting system. Off this 50 million can actually afford a multifunctional system and 10 million can afford basic solar lighting system. Given all these background we would have view that there's a huge beneficent of solar appliances in the country but that is actually not the case and then you look at the numbers that have been sold or have already been distributed towards the market. We see that the penetration is actually less than 5%. It ranges between 2.4%–3.8% as the latest between estimate.

So what is the reason that the market has really not taken-off? What is the reason that there is such low penetration of this product? The World Bank groups experience and award that we've been doing for several years especially in the Africa region and Asia show that there are many, many challenges in getting these products to reach the right market and these are the reasons that the market still remains to be intact in [inaudible] [00:22:59]. Our experience is also supported by the experience and studies which are being done by the several stakeholders and practitioners and we will see that when Ajaita and Praveen also talk about these challenges in their presentation.

The six main challenges that we look at is between from seeing the growth of this market. The first and foremost is that there is market spoilage. This is mainly cause because there are poor quality products available in the market. Such product actually clear the perception among the public consumers that the technology and the product do not work. And then these consumer actually become [inaudible] [00:23:35] product available in market in spite of the quality standard. In the last you've actually seen that there are lot of the lighting product and technology which has immersed but because there are increases all the products then you must use these products that dissatisfied with their performance as several extent.

The second challenges that even if products, good quality products that are available, consumers do not know that these products are there and that they can become an effective solution for them. There are recent study by IFC. It actually show that while there was awareness on solar and the

technology, consumer still do not know that there are small product which can actually need their basic lightening needs. Competitions from kerosene subsidy continue to be a big challenge and I'm not going to delve a lot into this because this is a policy issue and the private sector does not have any control from it. So, fourth and fifth are again very, very important. They have lack of finance at all levels, consumer and manufacturer gets [inaudible] [00:24:35] than retailer and there seems to be of this. Last but not the least actually, the most important aspect which we are actually going to focus in the following presentation is that last my connectivity of actually getting the product of the real beneficiaries continue to be a big challenge.

So what are we trying to do? What are the Lighting Asia and the Program trying to do here? We are trying to address most of the challenges that I just described in the previous slide. We are doing this in partnership with the government of the United States and the government of India therefore keeping one of the program to which we are trying to address these challenges. The first and the most important [inaudible] [00:25:11] basis of the program is the quality assurance framework. We know that product quality is extremely critical to ensure the sustainable growth of the market. And there it's extremely important that there is very robust quality assurance in testing program so that the consumer confident in this and some—in the [inaudible] [00:25:30] application.

Another program is doing in this aspect, it is linking the internationally established Lighting Global Quality Assurance framework to India and they're making it relevant in the Indian context to see what—to make it work for India. These test methods [inaudible] [00:25:44] developed by the IFC and the World Bank [inaudible] [00:25:49] to be adapt [inaudible] [00:25:48] by the International Electrotechnical Commission which is the International Standard Testing, testing body of the world. Second is consumer awareness. As I've said, consumers do not know that these products are available. As part of the program. We will be launching a very large consumer awareness campaign and to begin with we will be focusing on three steps. There's electricity, the very big issue, Uttar Pradesh, Bihar and Rajasthan and even reach out not only to the consumer [inaudible] [00:26:19] but also to all stake holders, the MFI, the World Bank, the distributor, the retailer.

Third is the market information and research fellow. By there are lot of studies which give a macro picture of what the market looks like. We are doing deep dive and doing the market assessment for output products in India. We are also undertaking associative studies which focus mainly on consumer preferences. What is really the consumer really want then they go and buys a product? What kind of product really exist in the market? Those are market they're having support. Then we are doping films, case studies, giving technical note. We are also doing workshop and conference

and we will soon be launching a website which will help mobilize this industry. The fourth key pillar is the supply chain and distribution and after sale. We all know that it's extremely important and without this, the market will not be able to grow. So we are trying to support [inaudible] [00:27:15] business linkages and [inaudible] [00:27:16] so that they can paired off as part of the business model that the company they're using to skill up. Access to finance again for both working capital as well as and consumer financing.

We are working to reach out financial institution to unlock the sector and unlock financing for these appliances. They are supporting the private sectors. They're very in depth advisory so there's even capacity building. They have an associate program. Then they're working with companies to help them develop scalable and [inaudible] [00:27:47] business model. In this program we are looking at both appliance companies as well as mini grid operators. For mini grid operators, our focus is more on providing daily invest advisory services on the strategies and business expanding for [inaudible] [00:28:01]. Some of our clients and partners on mini grid side include—on mini grid we have Minda NextGen and SunEdison. Bit Solar Appliance company. We are working that the market leader, we working with D. light are therefore ECCO Electronics. On distributors we are working with Frontier Markets and you will share a gentle experience [inaudible] [00:28:20] in the next presentation. We are also working with Simpa Energy on payment solution and on quality assurance we have close dealings with TERI. In fact very recently the solar lighting [inaudible] [00:28:33] it is now the first [inaudible] [00:28:37].

This is the last slide that I have. This is what we want to achieve, wanting to provide and we want to reach to the consumer with better lighting, affordable lighting and in this process I [00:28:54]. This is the end of my presentation and with this I now handle what do Praveen and Ajaita for the next presentation. Thank you.

Praveen Kumar Thanks Anjali and thanks to Sean and Tripta for giving us this opportunity to let me speak about the opportunities and challenges in the distribution—rural distribution market. Good morning, good afternoon, good evening to all the listeners [inaudible] [00:29:40]. Along with me the presentation is Ajaita from Frontier Markets which is a Clean Energy distribution formula based on India.

Ajaita Shah Hello everyone, my name is Ajaita and thank you so much for giving us the opportunity to speak. Looking forward to take Praveen forward.

Praveen Kumar All right then, so let us get into the rural India, a large magnificent solving market place, full of opportunities and some challenges but exciting nevertheless. Having travel these roads and done this journey over and

over again, I'm still excited every time I get to speak on it because this is very something that is huge and challenging but it has large opportunities that we can look up to. So here we go and come along with me. Before we start I actually would like to set—Agenda is to, you know, what are the topics that we would really covering so talking about the scope of the presentation, next, just a second please.

Yeah, so we'll be scoping the presentations. Is it going? The products that we will be covering here would be the off-grid lighting and the solutions that come another off-grid lighting base and the—because solar is a huge market and they [inaudible] [00:31:32] but we will be speaking about the solar lanterns.

Praveen Kumar Yeah, now we have the slide up. So, we put the scope and the boundary to the products that we will be covering and we will be covering the solar lanterns and then we will be speaking only about that and this particular presentation, these are the solar task light, the torches and the plug and play solar home systems.

Heather Praveen this is Heather, if you're having difficulty would you like me to run your slide for you if you're having some trouble?

Praveen Kumar Yeah.

Heather Okay. Please hold and I'll get that ready for you. One moment, please.

Praveen Kumar Yeah.

Heather There you go, Praveen.

Praveen Kumar all right.

Heather You should key the slide you are on, I think or is this...

Praveen Kumar Yeah, so these are the slide I was on and so we—we're still launching, yeah, yeah. Thank you very much. So we are in the slide number two. We'll I was just setting the boundary for the scope of the presentation and we talk about the product. Next slide please.

Heather You should see the next slide, scope of presentation State Focus.

Praveen Kumar Yeah. The slide please, presentation State Focus.

Heather That is what we have. Thank you.

Sean Praveen, are you able to see the slide on your computer?

Praveen Kumar Yeah, I'm able to see.

Heather Okay, you can go ahead, speaking and just tell me next slide please. You go ahead.

Praveen Kumar Yeah, sure. Yeah, so for the scope of the presentation, we'll be focusing on India and clearly the states of Rajasthan, Bihar and Uttar Pradesh which are the three highlighted states in the map as we can see. These are used tips and, you know, as we talked about these areas. We're talking about the huge population of some 370 million which is, you know, maybe larger than what the population of the US is and I'm very close to what the European population. And so basically, you know, what we're trying to show here is that this population is very large in the area covered and therefore the discussion is also relevant for a lot other large states or countries at least maybe. Therefore, they're relevant in terms of the three parts. We will be specifically talking and speaking to their states of—three states of India and we'll be speaking that in the presentation while talking about the rural distribution.

Next slide please.

Yes, so now, now I'll invite Ajaita to speak a little from Frontier market before we go ahead with the presentation on the rural markets.

Ajaita Shah Thank you Praveen. So, I wanted to just give everyone a quick brief about what Frontier Markets does and what is been our role in distribution for Solar in India. Frontier Market was established essentially to fill the gap that I think you've heard Tripta, Anjali and Praveen talked about which has been one of the challenges in getting essentially these solar products to market. So the way that we've been doing, this is by addressing a few challenges that we've seen on the ground which is creating awareness about actually better quality solar products and what that really means for the rural household. So we do that through on the ground campaigns, night demos and working with channel partners on the ground that can actually see the relevance for the solar product Praveen had mentioned in his presentation. We then actually provide the opportunity for sales like creating a dealer network or a retail network. So our supply chain for distribution has been really given an opportunity to localize sales of solar solutions through retail points that are branded by us and are actually present in this deep local last small distribution points or villagers where there is no electricity.

We then manage a logistics by delivering these products to those retail point and have local hubs that essentially stock these products to allow, you know, a local access readily available. The key part of our work which has been I think the crucial part of really making this successful has been than then providing the aftersales service. One of the key elements of really ensuring that there's trust in solar products has been to make sure that once we sold that product, you actually have someone there engaging

those rural households and being able to help them use that product, understand it and then repair it locally if there's any sort of challenge that they face which I think has been one of the niches that Frontier Markets has really focused on. And the last part of these has really been then continuously engaging in household to understand them better. Once they purchase the solar lantern and they understand the concept of solar. How do we then help them engage in other product solutions? Get feedback from them to help even our manufacturing partners understand how to better design and improve the products that—products in the market.

So we've been doing this for about three years in Rajasthan and have a really interesting experience about what end-to-end supply chain looks like for mile distribution. And in India, you know, currently have 100 retail points set up, 180 retail points setup in Rajasthan, working on their credential, have been really working with a lot of the key solar players to help bridge that gap of product creation and getting it to the hands of the household. So, I'm going to pass this back to Praveen to actually start talking about some of the key challenges that we've been seeing in distribution and then provide some, maybe local context for that.

Praveen Kumar

Thanks Ajaita, next slide please. Okay, so now we do have—we do have conventional models working in the Indian markets. We have got about 15 million outlets, retail outlets in India supported obviously by a huge whole seller universe, yet why don't we talk about, you know, you know, why the conventional models not working for Clean Energy appliances?

Now you look, there are three key points which we need to look at when you're seeing this slide. There are three key issues which are, the demand and government intervention, and there is existing business for the [inaudible] [00:39:17]. So what we're basically trying to say in this slide is, that although there is a sector which is already there, why are we not able to capitalize on that model and why do we look at—why don't we see that there are opportunity and challenges and look at hurdles, another issues in the existing models. When you look at demand, you took about—the pull not been there and the brands, you know, the [inaudible] [00:39:39] states and therefore volumes are not coming in to increase different channel into using these products, their own and owning it. Better use of lighting problem if the demand is low and not up to the mark, the kind of volumes that people from their existing channels would look at.

The second important point note from this slide is the government intervention is not enough in terms of the common scale-up, I mean we have seen government intervention in solar energy sector and solar appliances in terms of various schemes that are in the country but when we talk about creation of infrastructure or to the private enterprise there is still a gap which is also leading to problems as far conventional models

being able to adapt these products. And the final point that comes from the state is that this, that the current-risk adapting this product and those their existing business. For example if there's a fear or the quality going bad, a feedback or a backlash from the customer it can really affect their current business. This they do not want because they want their business to last, they're established and there is no scaling back if there is a problem for the [inaudible] [00:40:52] for the category which obviously [inaudible] [00:40:55]. So this is one of the—these are three basic points but this is one very big concern that why the conventional model is not working for the Clean Energy appliances sector as of now as you going on.

Next slide please?

Okay, so now we start looking at the challenges and there are five challenges that I'll be speaking about. Starting with the first which is cost and, this is obvious. If you see the [inaudible] [00:41:30] and the goods. I mean you go to a mall and if you're talking the people, or talking [inaudible] [00:41:36] more than the kind of shopping that you do in the mall, I think it's ridiculous. And so the whole game here, because of the problems that we spoke about and the problems because of which the tradition challenge [inaudible] [00:41:48] the problem is there in terms of the first challenge, I would say, which is a cost because trade has to be incentivized as you know because that the volumes are low, the actual earning is low from the current trade volumes that we get in this product category therefore, the channel has to be incentivized more and we can see here that the cost of running this channels could be as high as 35% of the MRP which is really huge compare to the normal FMCG channels margins which are, you know, even below 25% depending on the brand strength of cost. They could be range into it. It's not absolute but still much higher than what a conventional channel or the conventional product that is offering. So the cost becomes a big challenge because of the whole [inaudible] [00:42:40] pushing their trade to push their product into market with their consumers. And of course these are all related when people speak about low volumes, the warehousing/transportation is being high. So it all falls under I would say one back which is the economy of steel which doesn't thicken because the volume itself is low and therefore, it becomes an issue, of course the last one being the working capital requirements are high because it again is related to the same fact about sale being low and therefore you have to get [inaudible] [00:43:11] category actually moves out. So there is a lack in the primary to secondary sales. There is lack from secondary to tertiary which means while the customer [inaudible] [00:43:19].

While you see all these things, you know, let me actually say in the beginning itself before I talk about the five challenges, the first being the cost, that every challenge from [inaudible] [00:43:33]. It is actually at the end of the day, still there's a huge [inaudible] [00:43:37] whatever the

challenge would be. Here the opportunity as we see is the huge market growth that you've seen in this category which in India at moment is very, very rare to find. I mean [inaudible] [00:43:49] and I see very few categories [inaudible] [00:43:52] categories. There you can see this kind of growth very [inaudible] [00:43:55] 45% growth per annum. You talk about the smaller appliances category going to 25 percent while goods 15%.

Next slide please.

Ajaita Shah

So, before we get into the next slide, I just wanted to make a quick comment for context to this. So, you know, I think as Praveen's point I think the cost they're very interesting factor challenge and to this shed some light in my own experience, you know, when we first set up our model to do retail distribution, we initially tried working on channel margins that were ranging between 12 and 15 percent because as Praveen said, without volume you're not really getting a significant margin from the manufacturer. So and 12 to 15 percent is what we decided we could give to our retailers who were selling to the rural households. But the reality was, but the retailers were not interested unless there was a minimum of 20% margins to actually really take these solar products on. And this I think is a comparison to looking at how appliances and white goods, today working conventional distribution in India. So as soon as we kind of change our model and we said, you know what? Let's start passing a larger margin downstream so we can actually start placing more products into the field. We can see big, we can actually create more presence in India by having become a stock or product. It worked. We were able to get a lot more, you know, entrepreneurs interested and wanting to stock solar products and potentially even sell them to their customer base but the challenge we started facing was then passing on that high margin give us really nothing to work with and that's been include our ability to cover our cost which are really about market awareness campaigns, after sell service and stocking. So there's a little bit of a challenge that I, you know, I guess I agree with Praveen about the difference in volume, the margin and the channel to really make this work well for distribution.

Praveen Kumar

All right is the second challenge on the channel please. So the secondly challenges is the logistics and ecosystem. This is a large country, the second in the world, second in terms of population. And whatever we see in terms [inaudible] [00:46:31] in the slide 634,000 villagers, 64-66 percent of the rural population living in villages below 10,000 population numbers. The number of retail outlets 9.8 million. I would bring out a fact here that this is not only the numbers that you see here. Actually India is a country where a lot of Indians into one India so every region is [inaudible] [00:46:54]. The people in the south, southern part of the country [inaudible] [00:46:57] particularly the northern part of the [inaudible]

[00:47:00] and so the markets and the retail and the channel. So the challenge here is not only in terms of size but also in terms of the variety of the cultures, the religion, the kind of people, the kind of trade practices and [inaudible] 0:47:14] preferences. I think that's a big challenge here and we need to understand [inaudible] [00:47:21] what challenges was also large population is [inaudible] [00:47:25] to get that and this is a huge, huge [inaudible] [00:47:28].

Ajaita Shah

Thanks Praveen. So to give again context to this, we're operating in Rajasthan and Rajasthan is really one of, you know the largest states in India. There's about—but the challenge is given how large Rajasthan is. It's still very scattered. You're talking about 200 people per square kilometer, the population of that 6.8 million people in 33 districts. So what is that really mean? That means that cost deliver services in the last mile becomes very expensive against the volume of sales.

So, just to give you an example. A lantern that cost about 10 dollars for the customer would cost me an easily a dollar which is quite high to even reach them in terms of the logistics and ecosystem building which would include marketing, converting and then actually building the product. So there's again, an opportunity because there's a large customer potential but there's so scattered that the cost to deliver to them is still pretty high.

Praveen Kumar

Next slide please. So the third challenge that we're going to talk about is in terms of product quality. Here actually it's a sort of triple running for their customer. Faster fall, I mean you are not aware which product or a brand to buy if you are in the village in India. You] may not be aware of solar. If you are aware you don't know which brand to buy. You go and buy a particular product from the market and then, then you go to buy, there are cost issues and if you do manage to buy a product, you finally may not or may or may not beat the kind of product that you wanted to buy. It tend to be a poor quality. So that's a real challenge for trade, for the industry and from the customer perspective, it can be difficult because what we have seen until now is that in that past there had been certain companies and certain kind of products that have been given to the markets and has reached the customer which is not really turned to—turned out to be the to be the kind of quality that the customer expects. And therefore there are a lot of issues of markets. What is the [inaudible] [00:49:38] behind it which is not a good history to talk about and therefore product quality becomes an issue and therefore the also in product quality and testing because we need to have products in the market which are of the quality that the customer expect therefore, the whole industry can build up especially because it's in a very new stage. After sales also a very key requirements which are the moment is not really up to manufacturers are trying their best to do but again, you know, when you look at the first which I have spoken about, cost and logistics, it really becomes a challenge to meet the requirements in these terms in terms of after sales and managing the

quality because it all requires a certain kind of cost. Finally, of course there is a lack of educated and trained manpower also because the industry is evolving. I'm sure this going to happen all the time but at the moment we really do face a challenge on this point. Of course the opportunity should be here that I see is a lot of brand will lead an awareness rising will happen, all of this creates as we see the volumes rising, I'm sure [inaudible] [00:50:42] and then everybody's [inaudible] [00:50:45] and do the job that is want to be done and therefore the challenge can [inaudible] [00:50:50].

Ajaita Shah

Thanks Praveen. You know, when Praveen was writhing his challenge is out I had a really unfortunate smile on my face because I do think this is the biggest challenge. So I absolutely agree. You know it's one of the reasons why Frontier Markets felt this is an after sales service as much as we do because we are always stuck in the middle between an understanding whether a product is in fact quality or not. You know, an example of that is that early when we started—2 years, ago we had worked with the product that was, that seemed quite right for the customer in terms of its relevance as well as its pricing, but that product turned out to be a very poor quality product and that led to a lot of challenges. Households got frustrated. We had to do a lot of after sales service on the ground, we had to fix the product, otherwise we were having a fear them losing faith in us and also faith in Solar. And we've seen this a lot of times. Whenever we've seen someone coming with the low quality product in our village whether it's a solar street light or whether it's a home lighting system, the reaction of the household has is that solar fails the technology just unreliable. So when we started in a really understanding and working with folks of the IFC and TERI on better quality products, we saw that there were not only lesser servicing issues but it also a lot of scale presence when you free because the customer satisfied and what it helped was, it helped us create a really interesting brand identity. And so there isn't really interesting balance between quality of product and pricing. It's very sensitive but we can say with experience the quality is definitely the most important thing in the long run.

Praveen Kumar

Next slide please. We come to the next challenge which is all about the one key issue which is finance. I mean, so who plays Santa here? All the points that we are talking about from the building—we need the cost, we need the largest [inaudible] [00:52:50] of the country, the product quality all that request many and plus there are so many other challenges when you go to sell the product to a customer. There are issues—there are customer financing and so here we're talking about two kinds of issues and finance. One is from the manufacturer and the three point of view where they require a lot of capital to purchase raw material, and you know, their entire stuff about right from the procurement of the material, the [inaudible] [00:53:13] from the manufacturer, the co-worker's money, from the trade partner which could be a huge 60 to 90 days, are even more

depending on the product [inaudible] [00:53:21]. And similar for the distributor and the traders because every point there is a need to keep stocks and then we talk about a new category obviously we are talking about slower moving stocks which all relate to, adds up to capital requirement because we all know that stock means money. And finally, you know, when we have customer, rural customer here in India would not really be able to buy products which are good quality and also satisfying all their needs when we talk about plug and play system for example of two LEDS and on the mobile. The prices which any place which is you know more than you know more than you know 20 dollars, 15 dollars, it could be an issue for a customer and therefore we need financing and that level also for which you find a lot MFI or banks, rural banks really helping. [Inaudible] [00:54:09] which I see we have [inaudible] [00:54:14] sales that 2018 in the market is estimated to be 500 million US dollars which is really huge for any product and even you are a small player in this market and having 10% market share, I think [inaudible] [00:54:31]. Yeah.

Ajaita Shah

Again, I'll give some context from this in my perspective. You know, while I want to, you know, understand where the manufacturers are coming from and what the challenges are with customers and our distributor, I think that we have a very big mass of financial burden to that. We're blocking capital to stock from the manufacturer, the passing credit terms to all retailers who do not have sufficient amount of capital to stock the volume products that we believe can sell in this market which we end up the covering in 45-day period. Many customers require financing. So this financing issue becomes very high cost for us. We are talking that 80% of our equity capital to date which is only on product department, it's way too much. We're hoping that manufacturer will be able to start passing credit terms or someone can actually come in to alleviate this cost significantly so we can make the market in a different way.

Praveen

The next slide please. The final challenge is on the technology issues. I would very briefly touch up on this subject. We all know that rural India is still already behind as far as the technology and communications are the whole ICT performance is concern. We too when we talk about mobile penetration, we talk about huge penetrations in India but if you look at the sim card users, the penetration of mobile is not more than 60 to 70 percent. There's also the issue of understanding the language, the literacy is an issue and therefore even if you use a technology it could be an issue in terms of the literacy levels of the population there. And therefore the ability to understand and use the channel as an important channel. Although I would like to add here that the opportunity for us is great here because ICT, information technology as we speak about is going very fast. There are other things happening. E-commerce as such as a category in India is growing hugely and expected to be about 60 billion US dollars market by 2023 which is really huge, which is about, is going to 7% of the

total retail market that we are able to see. And that's the trend. And as you can see here, we already have this kind of sales happening on various web portals. And therefore that it is there but it's still it will take time before [inaudible] [00:56:43] markets.

Ajaita Shah

So this is a huge opportunity for [inaudible] [00:56:45] distribution. Today we're working on paper trails and marketing and in order for us to take this scale and really do deep penetration to tract the products or, you know, even do real time deposits or get in touch with the customer, mobile technology is really required and as software solutions. How our finding the right companies and partners would give us a solutions that's been want to challenging so what we're hoping to see is find experts that have the solutions to understand our operations so we can be very successful but it's a massive mass of opportunity that were helping can get solved.

Praveen Kumar

Yeah, we are I think two-way challenge. I think we discussed enough challenges the first being was getting my slides on. So we are talking with rural markets. There are kind of hiccups that you'll find when you come to the rural markets of India but we will all come visit just as all can in the presentation itself. We are running slightly behind time so we'll quickly go to the distribution models.

The next slide please.

I'll try to, you know, bring forward to the table the kind of models that I actually—currently people are using so we spoke in the beginning about the traditional channel not really being there and why not really being, you know, coming forward to adopt this category. So the first kind of a model that I want to speak about is the village level entrepreneur which is a proprietary model of various level entrepreneur which is also known as the VLE. The other company, a lot of people would be aware of Greenlight Planet which is using the proprietary model in the sense that it is not its own VLEs in the villages which are known as the Sun King Business Associates. The last some of them currently in the state of Bihar. There is also [inaudible] [00:58:21] that the employee to look after these Sun King Business Associate our of VLEs [inaudible] [00:58:28] good moral terms which is happening. These VLEs typically not really bound to the company but more or less, they keep selling the companies for [inaudible] [00:58:39] and therefore we brand on the proprietary model of the village level entrepreneur. So the first model of distribution in rural India that we talk about for Clean Energy is the village level entrepreneur which is updated by the company except for its own product which is known as propriety.

The next slide please.

The second kind of a model that I—we'll be discussing today is the village level entrepreneur again but there are different kind of, you know, a little just of a tweak in the model. So the next model which is used by a company known as Dharma life. It's a firm working with the normal VLEs who are selling different kind of products. So these are not proprietary in the sense. They sell different products and they also do not sell only cleaners or solar lighting. They also sell products like drinking water [inaudible] [00:59:30] medicinal products, even bicycles, etcetera but that's an open market kind of a channel.

We also have another model, the third model which I will be talking about is the migrant VLE model which is used by a firm called Pollinate in the peri-urban areas where there are typically population which are—which is a poor population which do not have actually they have no electricity access maybe because of the cost or because they are living in the peripheral for a large city. And here, their communities which the [inaudible] [01:00:02] there are [inaudible] [01:00:02] by Pollinate. They go and work with the slum communities and therefore they manage to sell lighting solutions to them. Of course these is another model which is the franchisee retail model yet there's a firm call Defmart which is leveraging very interestingly. The retired personnel from the army and you know, from the Arm Forces and these people come forward in their own villages then they come back. They open the center called the Urja Kendra, the Urja as an energy. So these are energy outlets that these people open and they sell clean energy product as well as lighting from this shops which are currently in three states.

Can I have the next slide please?

There's also a multichannel approach. So, you know, if you are a person or a firm or company dealing in solar lights and clean energy solutions, there are so many channels that are there and all of them are cover into one slide and a company called D.Light Design which is covering all these—there is a public sector vehicle. HPCL and BPCL actually are the petroleum public sector petroleum companies in India who [inaudible] [01:01:08] distribute the gas and into households. So this is a very good important channel which is being used very effectively by the D.Light Design and it is contributing to 50% of the sales. The other channel that they used is the Common Service Center which is a VLE model but it is actually—it's a government [inaudible] [01:01:27] actually which is a PPP model, the public-private partnerships model. We are again these are [inaudible] [01:01:32] villages and these villages can sell different kinds of products, financial products and also products which are like the solar lights. Government bodies like post and telegraph department is also being used by several companies. In fact one of this is the d. Light Design. And you will be actually astonished to see the numbers. There are some 139,000 P&T, I mean post offices in India and I already or some of them are

[inaudible] [01:02:01]. So this is a large channel. Of course there are challenges dealing in government channels with government channels and partners. So it is not fully utilized to the extent it could be but it is a huge channel. MFI of course are very huge channel which I want to speak in the next slide. Of course open market, we already spoken about. So these are [inaudible] [01:02:19] channels approaches. [inaudible] [01:02:21].

Next slide please.

MFI channel is a new channel and very quickly, you know, the need for MFIs themselves is because you know there's a gap on the percentage and so that they can charge. So there is a need from the MFI channel itself who got into different product categories and sales and different kind of things that could earn them the additional income. The strength for the MFI of course is that they already have a base. So the MFI already have the microfinance institutions, already have members of the villages [inaudible] [01:02:50] their profits which can deliver is to sell these products and they also have people waiting to this markets to sell their financial products. So I think MFI channel is a huge channel which is they're everything for all of us to take if we have v this category of products.

Next slide please.

Okay. So, only patrol for them is so that they have to be on the lookout for products which are often the quality because it could damage their quality existing the most which are there in the rural parts of India and therefore, they are being one issue [inaudible] [01:03:24] which prevent them from building. I think this can be taken care of, and people are getting over this issues, and they are getting into the distribution of solar products. Of course there is a business correspondent channel which is nothing but, you know, in the financial inclusions scheme of the government of India and the kind of push Central Bank of India has given, the banks which unable to open branches in the [inaudible] [01:03:45] they are using this business correspondents channel [inaudible] [01:03:51] actually get banking to their doorsteps [inaudible] [01:03:55].

The next slide please.

Well the large corporates, they have their own channels like huge corporates like Tata, the Mahindra and the global companies like Schneider. So basically these companies already have existing channels in the market and [inaudible] [01:04:17] and of the trade that they are already into. And they can use these channels to sell solar lights and these can be a huge channel because this is already established. This is traditional channel, the difference mean that the other traditional channel for an outsider would be hesitant to, you know, [inaudible] [01:04:33] support

the new company but these are their own eternal channels which can be daily used. The problems in this is only you know the silos and the companies themselves are actually really getting to leverage. I have seen being part of the [inaudible] [01:04:55] large corporate and the other which really is, it's [inaudible] [01:04:58] around, you know, all these various department within the company itself. That being a challenge is that is overcome we see the sides is a huge potential the people are looking into and the future will see large [inaudible] [01:05:10] existing channels. Next slide please.

Very quickly, some other distribution models. There—I have spoken about the PPP model which is the firms like Srei Sahaj which is a government initiated public-private partnerships model where they are these firms will go out and the villages they have been given charge of states, huge state [inaudible] [01:05:39] village and the [inaudible] [01:05:41] villages to sell for us and financial services. One such organization, Shaj itself is about 25000 villages covered in one state of the [inaudible] [01:05:48]. So you can imagine how big this channel can be and this is really a channel which people are already using as I've mentioned.

There is a micro-enterprise model so where, you know, the energy and the [inaudible] [01:06:00] of India is getting entrepreneurs and villages to have solar panels and several appliances whereby you know the [inaudible] [01:06:09] charged and given out for a fee to individual users.

The rural retail chains of course in India has come up and going down so we a lot of large corporates who were having large retail chains like the a lot of large corporates who were having large retail chains like the [inaudible] [01:06:23], a large corporate v set up but now, we found very few of them [inaudible] [01:06:26] which has the this Choupal Saagars which is actually a rural retail which also sells this products, the various [inaudible] [01:06:33] folks.

Next slide please.

Okay, so there are pros and Conservative of all these channels and the VLE, the proprietary VLE model has cost that has to it and you know because if there is only one company that they are dealing with there could be an issue of [inaudible] [01:06:52]. They're not motivated enough and [inaudible] [01:06:53] support their families. For the open market or the Clean Energy, the early model. There are no fix player how you can, you know, track them and how you can get your targets through them because they are really not sending on your product. They're not only attached to one company. So that can be a challenge. For the MFI and business correspondent what are they spoken about? The product failure could be an issue because they have—there were huge thing going out there in

terms of the financial product that they're selling. Large corporate established trade channels; they are truly capitalized on that because I think [inaudible] [01:07:30] as we spoke about [inaudible] [01:07:32]. All these roadblocks [inaudible] [01:07:36] we get into capitalizing of this channel.

Last slide please. Okay. So, just before I pass the [inaudible] [01:07:44] to divert for presentation, the last part of the presentation. I just quickly to say that a lot of these issues, the challenges and the opportunities we spoke about and the different channels of the solution are known to less several people who are interesting his business and who have been in business in rural India but the idea was to bring all these together, to let people think as to what are the right things to do in this market. I think people need to get into measuring these channels to a cost analysis as to these channels and the different factors. There are different factors for example whom, do you deal for with these companies? [Inaudible] [01:08:18] and all these [inaudible] [01:08:21] and there are different firm dealing with each of the channels successfully while we're not be able to do the same things with another. So that's the thing to look into. I think I have a very important [inaudible] [01:08:32] to. I think a lot of us are working in these markets using our own efforts and energies and all that is going to different directions. We need to collaborate. We need to come in one umbrella or if I may use a term. You don't make one large market [inaudible] [01:08:46] of these and there's huge opportunity for all of us. I think there's a large [inaudible] [01:08:53] rural markets into the solar lighting space. Thank you very much and I would like to invite now Gaurav Gupta to speak a few things about his understanding of the market.

Gaurav Gupta

Thanks Praveen. And also you did a good job I think covering the whole distribution side of things. So, I'm actually not going to go through a lot of details about specific distribution models and so forth but rather what I thought would be helpful at this stage because you already got a great overview. Is just start to focusing on what is different about the distribution challenge of energy versus just the general distribution challenges that exist in any case with any of the rural product? And I think what you heard from Praveen and Ajaita is/ or examples of an industry in transition.

So if we go to the next slide, it's really a—so for starter but the industry was very much on the left-hand side initially where there's a really need to not only distribute but use distribution itself as a way of explaining the people what the product is. Solar was not very well understood. People, all of the operators was small startups and so the starting point from distribution was always these MFIs and NGOs. And that's where the distribution started. And in the right side is the traditional. They end with the market like this which is instead of a push, it become a pull market and you go into your regulars of usual wholesale and retail chains. And so

these two reflects so that you know startup, immature market and then to the right in terms of a more mature market which what we traditionally see with white good products. But what you heard from I think from Ajaita then and Praveen is some of the transitional models in between where you still have a product category that's growing very fast but from a small base.

So as we heard, you know, around you is that's going to grow at about 50% year on year. It's going to become a 500 million dollar market but right now there is, you know, less than 5% of this market has been penetrated. So distributions do remain at the transition point where if you got to the next slide, you'll see that what folks have done is, some of the disadvantages of the push market where, you know, MFIs, especially NGOs they are not perhaps well set up to do the distribution in marketing. So folks like Greenlight Planet have, you know, created their own agent model. All the energy had actually created its own retail chain as well. And for, you know, the people like Frontier Markets that Ajaita works on it created the specialized capability around distribution in the space and helping other distributors.

These are all true to us an example of the transition that's happening in the market because ultimately once a product next to a high level of scale and lots of people know about it, then many of these things start to become less relevant and shift to what a traditional distribution space. I will give one example to everyone on this. That is Hawkins pressure cooker. So if look at Hawkins pressure cooker which have sort of staple in your kitchens, 40% of their pressure cookers are actually sold in rural India and they do not have a single rural outlet. That's an important insight because at a point of which we became obvious that everyone need to have a pressure cooker.

Anyway it is a reasonable investment for a pull household, you know, ranging from a thousand, 2000 piece that—to a solar lighting product. The distribution side happens in tier 3 and tier 4 towns. So the towns and the usual retailers who kept this products where there was enough scale and easy access to transport. People from diligent would come and people from outside. And so I think there's a real question mark on how long distribution needs to be that going right to the last mile because often you have to go to the last mile when you really try to push the product and differentiate yourself and educate the market and how much will distribution end up being—how quickly will distribution move to the market as educated and in fact people will come to small towns and buy solar products, solar lighting products, other rural energy products, like they do with the rest of their white goods. And I think that's a very interesting area to explore. I think there will always be an opportunity in our perspective to do push marketing, to do door-to-door sales like Greenlight Planet but the challenge at remains—one of the advantages of

that is it's a great way of competing against, you know, other folks that have very similar types of products – the challenge is that has been always network for that model is what do the VLEs, what do the women that are in your network do after that first sale and they're enough in terms of upgrades, in terms of repeat buying after 2, 3 years.

Does it justify the model or is that a model that can only work for several years and then transitions retail model. I think that will be interesting to see. We thought about this problem and looked at where is it, a door-to-door sales sustained and I think many of you will be familiar with those models with respect to Avon and many of the companies that sell chiffons and sort of household knives and so forth. But it's been very unusual to see a door-to-door sales of electronic products white goods in terms of over a long period. So, again, we think given the kind of product category that solar lanterns are and other renewable energy products. It is unlikely that the models that you have seen today have a ones that are going to sustain over the next decade when this becomes a product that has, you know, essentially captured, 30, 40 percent penetration. Because then you're getting into volumes that speak to, you know, 10, 20 million units being moved every year.

So, in that one thing I wanted to through up there from to reflect on based on the presentation that Ajaita and Praveen gave which is next overview with the market is today but then you also now stop thinking where the market move to and as you think about investing in the distribution how quickly it will move to that. You already seen quite significant sales happening from traditional retail channels and I think it was Ajaita that also bring up the importance of the growing e-commerce. If you speak to any of the VCs that are coming and investing and that whole trench of e-commerce site in India, one of the key markets that focus on is the rural consumer with access to internet because they recognized that e-commerce to them fulfill a huge information or logistics issue because they don't even get access to a local shopping market. And this become a tremendous growth over the last six months coming out of rural India. This will have, as Ajaita said, quite a lot of implications or even this kind of products and so it becomes more about solving the information challenges as opposed to the distribution challenge.

If you just to the next slide. I think the other question I wanted to throw out there something to consider is there is one aspect that is distribution is another aspect that is choice. And as we start to think through economics of getting product out there. There's another question about the economics of getting two products out there. So even though many of our analysis, for example throws up a whole range of products being developed for this markets. I mean there's a mutual explosion of solar lanterns for example that are now available and by so lantern are even good quality solar lanterns. The question is how many of those are actually available in a

village. If you pick any particular village in India, does the consumer have a choice amongst these 2030 top-ranging lanterns or in reality do they only have a choice of one. That would be a very interesting sort of question to answer and adding totally from some of the work we done and seen, the truth is that you normally have only one real choice in any village for as a choice of a quality sort of product

So some says that today distribution equates to marketing because since the market is so early, if you can actually get your product there, you don't have to necessarily any real competition except against cheaper products and cheaper or low quality products as I think Anjali was also talking about and how that ruins the market. But it's a very interesting space right now because if you can actually win the distribution game today. You're actually going into [inaudible] [01:19:19] and it's not about necessarily how your products is stepping up against second rate product and I think that's one of the reasons why the Greenlight Planet model has been so successful because it essentially using distribution and marketing as being one of the same thing but you're to adopt. So I think that's another important question to keep in mind that distribution is one challenge but then it also means that often when we're talking about choice theoretical. When we talk about all the different models out there it's theoretical because the distribution challenge means that in reality consumers have only ever seen one or two of these products in their market. And again, e-commerce, the fact that things will move to ones of retail chain and in tier 3 and tier 4 towns, will dramatically change that picture because you will start to see products and you know stock in shelves against each other and it will be more about how did you in the consumer differentiate yourself from the product next year assuming they're already quality products. So, I mean that's another important issue to be consider.

And I think just looking onto the last slide, we felt we would just put that some of the—as we're going through this current transition period what are some of the things that people can sort of think about and dealings with some of the economics that Praveen and Ajaita they're also talking about some of the difficulties. I know we have to recognize that you know people maybe socially minded, people maybe called social entrepreneurs but ultimately these are all individual businesses that really do think about what they share and what they don't share. The three areas that we have seen or we think can be that you think about distribution [inaudible] [01:21:18] is to think about how competing products can still collaborating in terms of awareness building and market activation activities. I know the guy had seen for example has put a lot effort around the awareness building aspect because it is a public good. So, that's one area where people have sort of forming their own distribution and marketing change can think about combining.

There's also scope common after sales service in terms of this products. I think I'm not sure if that's exactly what Ajaita was alluding to but it sounds like Frontier Markets can play that kind of role and so they're already service providers that are trying to aggregate the after sales. So this component, which is expensive to do for individual entrepreneurs. And then I think the third thing that we started to see is bundled offerings because if the scale and transport cost, because of the scale in financing and because of the scale of after service, people are bundling, you know, solar lanterns with cook stoves, with other rural products as part of the larger package of solar products, as part of the top up loan for another product that have been bought. And this idea of bundling is one way which you can attack the poor transaction costs that exist in getting distributing of product. So there sort of three things that at least we've observed that in this—in the solar space, that is emerging can overcome some of the different economics. I will stop there, as I know we've run of the time. There should be a few questions. So let me turned it back to Sean and Heather.

Sean Esterly

yes, and thank you. Thank you to other panelist for the great presentations. We are a little short on time so I'll try ask a few questions but I just want to let other attendees know that if we don't have time to answer your question I apologize but I will email any questions that go unanswered to the panelist so that they can respond directly through email when they have the opportunity to do so. So I try to ask the question that was presented for each panelist. The first one is for Anjali. And the question is can you please elaborate on how the lead payback is so fast? I mean Anjali you still need to update. I think you're still needed Anjali. Anjali if you're there you're still on mute. All right, we'll come back to that question. I'll move on to the next one. The next question is for Ajaita and Praveen. And the question is, regarding your presentation, are we only talking small PV solutions?

Praveen Kumar

Yeah, we are talking in this particular presentation we're only talking about the small solutions. The torches, the home lights—home lighting systems and the small lantern kind of solutions.

Sean Esterly

And one more question for you. One of the attendees share your concern about the quality and they asked what is the possibility for using the Lighting Africa qualification process for India?

Ajaita Shah

Sure. I think I'll answer that. So, I've seen broad end, you know, quality testing in Lighting Asia. So we are now working with them directly on wanting to bring in their quality-tested products into our basket. So we are directly addressing this low quality issue by partnering IFC to make sure that we bring in their manufactures that have been talks of the certified.

Sean Esterly Great, thank you. I believe this question was for Gaurav Gupta and it is, how if the adoption of your product in relation to the acceptance or switching to a quality of the products?

Gaurav Gupta If I heard you correct, how is the acceptance of the product you needed to the quality of the product is that right?

Sean Esterly I believe so. Yeah, this word is a little strangely. I think what they're basically asking is, how is the quality accepting that adoption of the product.

Gaurav Gupta Yeah, I think it's a good question. I mean, because there are sort of—if you look at many of the lighting products, a lot of the understanding of the quality comes from experiencing it and often experience all the time if you look at even the way the technology works just writing itself, you know the degradation of an LED and how much light puts out can happen very quickly after 40 minutes you can get often 30, 40 percent of light you got initially. So even that initial 10-minute demonstration can be very misleading and it's only when you live with the product which you understand it's true quality. So, you know, we've seen examples of villagers being willing to pay quite a substantial amount more for products they have a chance to live would for a week than just with an upfront demonstration. I think that's a challenged represent itself both for distribution and marketing in terms of how can distributors effectively if they are quality product how can they effectively distinguished themselves. And I think they're I'm sure Anjali may have more to say because that's one of the reasons why I have seen had been pushing the quality standard and potentially one that really gets a rating. Because it is not an easy product to judge from a quality perspective but we do know that villages care about quality.

Sean Esterly Okay, thank you. And I think we have time for one more—for a really quick response. How do you handle the disposal of products of none functioning product especially in rural areas?

Heather Sean, can you just specify who that question is for.

Sean Esterly Yeah, it didn't actually specify but I believe Ajaita was for your presentation also.

Ajaita Shah Sure. So as of right now we've been doing reverse collection of products that out of warranty so usually it's batteries and we've just been collecting the batteries and sending it back to the manufacturers. We right now are in the middle of actually working with a larger European company that actually is trying to understand what if they can take those recycle that they can say take those batteries and actually get them to be functioning

again but, you know, it is a waste issue that we're trying to address but we do collect it from the rural villages and get it back to the manufacturers.

Tripta

Sean and just do after that. I'm sorry I have a bit of technology issue earlier Sean just to add to what Ajaita that even in the lighting, not only in the Lighting Asia Program but globally for all around Lighting Program. IFC and the World Bank Group is actually looking at this particular issue very closely. We are working to see what are the recycling option available. We have also undertaken a study on what are the possibilities and we're trying to work with organization who are into the business of recycling to see if these products can be recycled and what kind of backward supply chain can be structured to get these products and not just being critical in the market [inaudible] [01:30:05]

Sean Esterly

Great. Thank you. We have unfortunate run of time but I do have everyone's question that were submitted and as I said, I will forward all of those to the panelist. And now I just like to ask the audience to take a quick moment for a very brief survey that we have. Heather, if you could go ahead and display that first question for the survey. And that question is the webinar content providing me with useful information and insight? And the next question please Heather, the webinar's presenters were effective? And then the last question please Heather. Overall, the webinar met my expectations. And thank you for answering our survey and on behalf of the Clean Energy Solutions Center I just like to again thank each of our expert panelist and to our attendees for participating in today's webinar. We had very much appreciate your time and hope you enjoy it. I invite our attendees to check the Solutions Center website over the next few days. If you would like to view the slide and listen to our recording of today's presentation as well as any previously held webinars. Initially you will the find information upcoming webinars and other training events. We would also invite you to inform your colleagues and those in your network about Solutions Centers Resources and Services including the no cost policy support. So I hope everyone has a great rest day and we hope to see you again at future Clean Energy Solutions Center events and this concludes our webinar.