

# Best Practices for Decentralized Energy Solutions Focusing on Lighting and Power in Humanitarian Settings

—Transcript of a webinar offered by the Clean Energy Solutions Center on 24 May 2017—  
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## Webinar Panelists

**Luc Severi**  
**Kathleen Callaghy**  
**Paul McCallion**  
**Mason Huffine**  
**Olivier Jacquet**

United Nations Foundation  
Global Alliance for Clean Cookstoves  
UNHCR Geneva  
LittleSun  
Schneider Electric

## This Transcript

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## Sean

Hello everyone. I'm Sean Esterly with the Clean Energy Solutions Center and welcome to today's webinar which is being hosted by the Solutions Center in partnership with the UN foundation's Energy Access Practitioner Network in collaboration with safe access to fuel and energy humanitarian working group. Today's webinar is focused on the best practices for decentralized energy solutions focusing on lighting and power in humanitarian settings.

And just want to go over some of the webinar features. For audio, you do have two options. You may either listen through your computer or over your telephone. And if you do choose to listen through your computer, please select the mic and speakers option in the audio pane. That will help eliminate any feedback and echo. And if you're dialing in by phone please instead just select the telephone option and a box on the side will display the telephone number and the audio PIN that you will have to use to dial in. If anyone is having any technical difficulties, you may contact us through the question pane or you may contact the Go to Webinar's help desk at 888-259-3826.

And at any point during the webinar we do encourage attendees to submit questions for the panelists. You may do that by typing your questions into the question pane and we will save those for the question answer at the end of the webinar. If you are having difficulty viewing the materials through the webinar portal we have posted most of the PDF copies of the presentations

and we'll be posting all of them at the [cleanenergysolutions.org/training](http://cleanenergysolutions.org/training). And you may download those there. Also, we'll be posting an audio recording of the presentations to that same page within a few days of today's broadcast. And just a reminder we're also adding Solutions Center recordings to [our YouTube channel](#), where you'll find other informative webinars as well as video interviews with thought leaders on clean energy policy topics.

One important note of mention before we begin our presentations 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. And we have a great agenda for you today centered around the presentations from our guest panelists Kathleen Callaghy, Paul McCallion, Mason Huffine and Olivier Jacquet who have joined us to discuss the role of distributed energy solutions in humanitarian conflict in displacement settings.

Before we jump into the presentations I just want to provide a quick overview of the Clean Energy Solutions Center and the Clean Energy Ministerial. And the Luc Severi from the United Nations Foundation will provide a quick overview of the energy access practitioner's network. Then following the panelists' presentations is when we'll have the question and answer session where the panelists will address questions submitted by the audience. And then just a reminder at the end of the webinar you'll be automatically prompted to fill out a very brief survey for us and we thank you in advance for taking a moment to respond to that.

So, the Solutions Center was launched in 2011 under the Clean Energy Ministerial. And the Clean Energy Ministerial is a high level global forum to promote policies and programs that advance clean energy technology, to share lessons learned and best practices and to encourage the transition to a global clean energy economy. There's 24 countries along with the European commission that are members covering about 90 percent of clean energy investment and 75 percent of global greenhouse gas emissions.

And as I said earlier this webinar is provided by the Clean Energy Solutions Center which focuses on helping government policy makers design and adopt policies and programs that support the deployment of clean energy technologies. And then this accomplished through support and crafting and implementing policies and regulations relating to energy access, no cost expert policy assistance and peer to peer learning and training tools such as this webinar for example. And the Clean Energy Solutions Center is co-sponsored by the governments of Australia, Sweden and the United States with in kind support from the government of Mexico.

And the Solutions Center provides several clean energy policy goal programs and services including a team of over 60 global experts that can provide remote and in person technical assistance to governments and government supported institutions. The no cost virtual webinar trainings on a variety of clean energy topics, partnership building with development agencies and regional and global organizations to deliver support and also an online library

containing over 5,500 clean energy policy related publications, tools, videos and other resources. And primary audience for the Solutions Center is made up of energy policymakers and analysts from governments and technical organizations in all countries. But then we also strive to engage with private sector NGOs and also civil society.

And the Solutions Center is an international initiative that works with more than 35 international partners across a suite of different programs. And several of the partners are listed on the slide and include research organizations like IRENA and the IEA, programs like SE4ALL and regionally focused entities such as the ECOWAS center for renewable energy and energy efficiency as well as many others.

And finally, one of the marquee features that the Solutions Center provides is our no cost expert policy assistance known as ask an expert. The ask an expert service matches policy makers with one of the more than 60 global experts selected as authoritative leaders on specific clean energy finance and policy topics. So for example, in the area of lighting we're happy to have Gustavo \_\_\_\_\_ Gomez and light and project manager serving as one of our experts. So if you have a need for policy assistance specifically in lighting you could apply and we would connect you with Gustavo or any other clean energy sector we have experts in those areas as well.

And again, the assistance is provided to you completely free of charge. So if you have a question for our experts please feel free to submit it through our simple online forum at [cleanenergysolutions.org/expert](https://cleanenergysolutions.org/expert). And we also invite you to spread the word about this service to those in your networks and organizations.

And so now I would like to provide some brief introductions for today's webinar. Today's webinar is being co-moderated by Luc Severi. He is an energy access manager for UN Foundation's energy access activities focusing primarily on the energy access gap in the health sector. And for our panelists today, first up is Kathleen Callaghy who is a program associate with humanitarian Global Alliance for Clean Cookstoves. As a program associate she coordinates the alliance's co-leadership of the safe access to fuel and energy also known as SAFE humanitarian working group.

And our second speaker, following Kathleen we will hear from Paul McCallion. Paul is an energy officer with UNHCR based in Geneva within the division of program support and management and provides technical support to a wide range of projects. And then following Paul we will be hearing from Mason Huffine who is business and sales director at Little Sun. He has worked to expand business in Africa and developed a strong humanitarian program within the company. And then our final speaker today is Olivier Jacquet who is global account manager with refugees emergency in war in sustainable development and global strategy at Schneider Electric. And so, with those introductions I'd now like to turn things over to Luc.

**Luc**

Hi, Sean. Hi everyone. Good morning, good afternoon, good evening depending on where you're calling in from. Very excited to be here. Very

excited to have this webinar to be able to talk about a very exciting—especially about our stellar lineup. So I'm going to keep this short so we can all learn more from our expert panelists. Today's topic as it was mentioned by Sean is we'll talk more about the best practices on decentralized energy solutions focusing on lighting and powering in the humanitarian sector. I'm first going to provide some introduction in terms of what the Energy Access Practitioner Network represents and who we are. There is—we have a massive challenge on our hands still in the energy space, in the energy access space. We're still more than one billion people around the world are lacking energy access. And then a further billion are lacking reliable access. And the numbers on the clean cooking side mirror that or actually exceed that.

So the UN Foundation launched the Energy Access Practitioner Network back in 2011 to support or to help meet this energy access challenge. The Energy Access Practitioner Network or EAPN in short is currently the largest global network of energy access practitioners currently counting more than 2,500 members. If any of you on the line are not yet a member I of course encourage you to join the Energy Access Practitioner Network through [energyaccess.org](http://energyaccess.org). Membership is free of charge.

And through the Energy Access Practitioner Network we're able to share knowledge. We're able to build partnerships and facilitate that and also to help catalyze actions. We have a range of activities. I think the one that is most relevant today is our webinar series where we organize monthly webinars usually on a specific theme and typically also fitting within a series. So this one fits in our best practices series. Clearly the theme today is we're focusing much more on the humanitarian sector than in our previous webinars.

So as I said this will be the theme for this webinar, powering and lighting in the humanitarian sector whereas in recent times the conversation has revolved very actively around the clean cooking side about food security and we are very excited to have this opportunity to quite literally shed a little bit more light on the electricity side of how energy impacts humanitarian settings. So we'll focus specifically on powering and on lighting today. We also encourage you to join the conversation on Twitter in particular using #PNwebinar. We also always use #energyaccess through our handle Energy Access PN. PN of course standing for the practitioner network.

So very briefly and this is also an introduction of course to our next speaker Kathleen. The UN Foundation's Energy Access Practitioner Network is a steering committee member of SAFE which stands for Safe Access to Fuel and Energy. But in recent years we've also carried out several events in partnership with UNHCR with lighting global, with GOGLA to help shed more light on this topic to talk more about solar lighting in particular but also about powering humanitarian relief efforts.

And lastly, a little shout out to the EAPN annual survey which we carry out or which was carried out over the summer of 2016 which is also available through our website in which we included a small section on humanitarian energy because a significant number of our practitioners, of course two of

those are also on the line today in Little Sun and Schneider Electric are active in the humanitarian sector as well in addition to their other activities. So without further ado I'll pass this back first to Sean and then to Kathleen. But we're very excited to learn more about this topic from our speakers. Sean?

**Sean**

Yeah. Thank you very much Luc. And with that actually we'll just turn things right over to Kathleen for her presentation.

**Kathleen**

Thanks Sean and thanks Luc for that great introduction. As Luc mentioned much of the sort of buzz around this topic in the last couple of years has been on cooking and cooking solutions. So I'm just quickly going to run us through that perspective on things and then set the stage for the discussion of lighting and powering today which I'm really excited for. So just a brief introduction. The Global Alliance for Clean Cookstoves is a public private partnership whose mission is to save lives, improve livelihoods, empower women and protect the environment. And overall our goal is to create or to facilitate 100 million households adopting clean and efficient cook stoves by 2020.

A large part of our humanitarian portfolio is dedicated to co-leadership of the safe humanitarian working group, the mission of which is to facilitate a more coordinated, predictable, timely and effective response to the fuel and energy needs of crisis affected populations. The working group is currently co-chaired by us and by the Food and Agricultural Association and the World Food program with a steering committee that includes all of the organizations that you see here, especially highlighting UNHCR.

Just to give a brief overview on the role of the working group and the alliances work within it, the alliance's work is based around six humanitarian pillars coordinating the sector and sharing information on energy access in humanitarian settings. And this is where the SAFE working group comes into play. Largely when there are humanitarian emergencies such as the Nepal earthquake we helped to mobilize around providing access to products on the ground related to energy since there is no formal role for this in the humanitarian system. We commission research and build evidence such as the link between the risk of gender based violence and firewood collection, providing technical support, building capacity through annual workshops that aim to train humanitarian practitioners how to think about incorporating energy, advocating for energy access globally both to the UN based humanitarian system and then mobilizing resources for energy projects in humanitarian settings.

So to set the stage for our discussion today as we've seen, we've seen global displacement numbers skyrocket in the last couple of years. In 2015, UNHCR reported that 65.3 million people are, were forcibly displaced from their homes as a result of persecution, conflict, generalized violence or human rights violations. That number of—the number of displaced people is in reality much higher when you add in natural disasters. So I think OCHA set it last year closer to 125 million.

The difficulty here is that most of these people rely on biomass energy so firewood, charcoal and agricultural waste as a key source of their fuel for cooking, for heating and in some cases, even for lighting, so candles, kerosene lamps and so forth. So the goal of the SAFE working group and the alliance within it is to reduce the risks that crisis affected people experience because of these, this poor and limited access to energy. So we've done quite a lot of advocacy work around raising the awareness about these risks that exist.

So what you're seeing right now are some examples of how energy access plays into existing sectors within humanitarian response including food security and nutrition, protection, health, livelihoods and environment. But the reality is that energy interacts with almost every area of humanitarian response. So what you'll see here is the humanitarian cluster system which is how the UN OCHA organizes aid among its different—apologies there—organizes aid into different categories. Energy currently has no formal role within this system. It's kind of addressed ad hoc throughout. But as these little icons show cooking, powering, lighting and heating have a role in most of these wedges.

So just to before we pass over to Paul as we stated before the Global Alliance for Clean Cookstoves has done quite a lot of communication around the dangers related to cooking and especially related to the safety of women and children. So today we wanted to support this discussion on powering and lighting. And you'll see here just a couple of examples of why these technologies are so important. Mobile phones for example are becoming increasingly important in humanitarian emergencies for people to stay in touch with each other and communicate with their loved ones. So in order to make use of many of the fancy apps that are coming out of the Silicon Valley these days to assist refugees, refugees need to be able to charge their phones.

And then of course lighting has always been a key part of energy access in humanitarian settings for safety but also for education and the ability to work after dark. I believe that's exactly five minutes so I'll stop there.

**Sean** Great. Thank you very much Kathleen. And we will turn things over no to Paul.

**Paul** Hello, everyone. This is Paul McCallion and I'm the renewable energy officer with UNHCR. And I'm just here to present on basically lighting and power in humanitarian context. And some updates on I suppose the state of play. So lighting and power needs across camps and host communities.

**Sean** And, Paul, sorry. Just before you get started, we can't see your slides yet. Can you accept the controls over? We can show them for you.

**Paul** Will do it. Ok. How is that?

**Sean** I still can't see them.

**Paul** Hold on. What about that? We're there? Yeah Ok.

Sean

Perfect. Thank you.

Paul

Ok. So just to go back so basically my name is Paul McCallion. I'm the renewable energy officer with UNHCR based out of Geneva with sort of like travelling to the projects for planning or whatever the need may be. So lighting and powering across the camps and host communities in the humanitarian context, just to emphasize at the start it's extremely important that any—let alone any planning is appropriate technology wise and culturally wise but also that both communities benefit from it. So although our mandate may be more with refugees, we always have to ensure that any work that we're doing ties in with any security or energy policies that the government have and also that the host communities also see the benefit and that we have cohesion and consensus across any of the planning that we do.

The slide that you see at the moment was Azraq camp. That's prior to the solar farm that was—that got up and started last week. And Azraq in Jordan we've just commissioned and switched on 200 megawatts of the solar farm for the refugees. It's exciting for us in that it ties into the national grid and ties into the government's renewable energy strategy and it ties into the grid and that the host community are 20 to 30 kilometers away so the energy going into the grid benefits the country as a whole. And then obviously we don't need the environmental headaches of battery storage because the grid is our pathway. So we put in during the day and we take out at night.

So the state of play, fuel and energy poverty across the developing world, never mind in a humanitarian setting is pretty acute. Of energy poverty fuel poverty would be the largest need. And like what Kathleen has said it's unfortunately still being mainly based on wood and biomass. So some of the stuff UNHR are moving in the direction of partners like global alliance, other partners who we'll go through later is the fuel distributions. So like Jordan obviously the vegetation is where we're looking at gas distributions. Cash for fuel where we give cash distribution to refugees and sometimes host communities and they identify the best fuel option.

So for example, in Nepal it's the cash distribution will always be on LPG because that is what the preferred fuel is with both communities. Then we're doing some pilots in \_\_\_\_\_ where we're trying to work with gas distributions through conversion of charcoal providers to become gas providers. And again, that's where scenarios where there's just clearly not enough vegetation. Clearly in a lot of countries there is some form of by product from gas and \_\_\_\_\_. On the lighting front the traditional approach we always took was street lighting and household portable items. That obviously is still very important from a protection point of view for trying to address basic energy poverty at a household level.

Community power would be community centers, maybe besides sports grounds would be clinics, would be what you'd expect. And the solar farms, there's another one planned for Jordan and the one I just spoke about earlier in Azraq. And then mini grids we're starting to try to expand our knowledge and also our energy solutions through mini grids. Mini grids are like small solar farms or in some cases they may just be two 100 watt panels clumped

together producing energy for community power needs, community lighting needs.

And then so CBIs as I briefly mentioned. CBIs, cash based interventions. Cash based interventions is where we try to give cash vouchers to refugees to design their own lighting solution which could be they could decide to prioritize three small lights or they could decide to prioritize one large light with phone charging capacity. And then also on the fuel front it will allow them to choose the stove or the fuel that they find most appropriate. Because as we all know, sometimes the—sometimes when you overdesign something whereas you just need to be basic and actually go to the people you're actually supposed to be working for and say what do you think the best solution is.

So Nepal and Ethiopia we've been starting to plan for 52 mini grids in Ethiopia in the \_\_\_\_\_ region, Malca Dida for the refugee and host communities. And in Nepal, we've just had—we're in the middle of a very successful collaboration with EWB engineers without borders USAID on mini grids. So we've had a lot of strong technical support from engineers without borders and we've had funding from the IKEA foundation which has allowed us to do a lot more energy planning and do it correctly and do it in a lot more planned and less ad hoc way. And then some of these—these are just some of the new partnerships.

It goes without saying that we've always been involved with UN Foundation. We've been involved a lot with lighting global as in Africa and Asia. And we've also been long before I joined UNHR we've been working with the globalized clean cook stoves. So we're trying to bring the mesh between maybe creating an environment across camps and host communities that enables target communities to, their markets to have access to products they choose. So for the likes of Philips or Little Sun or Schneider we're taking—they're just three examples where we're trying to get to the state where we empower the populations to make their own decision about a product. And also through that obviously local vendors would then start supplying the product and then the product is a lot more accountable warranty wise and stuff like that.

Euroelectric is where we are, we're working with Euroelectric to try to create the \_ where we've got technical expertise in the different European energy or electricity providers. So for example, it could be a national electrical distributor from Portugal or Spain or whatever. So they would offer their high level of expertise across the different areas of expertise that we need be it biogas, be it lighting, be it solar farms. So that's a pretty big and exciting collaboration too. Moving energy initiative, we've been working with for the last three years and EWB USA we've already mentioned. We're starting to collaborate then on technical side.

COOPI, we've started to work with them, a lot of them in their early stages. FAO we've obviously got a lot of common need when it comes to addressing fuel. Practical action we've started working with. We've got a strong reputation in development market based energy solutions. The World Bank.

WFP and GIZ we're starting to work on with the early stages of maybe trying to move our operations to being less diesel fuel dependent so trying to actually make our operations and our programs also more \_\_\_\_\_ as well as trying to identify the needs of the refugees and host communities. And that's me done and I'm happy to answer questions at the end of, during the discussion period.

**Sean**

Thank you very much Paul. We'll move right along to the next presenter, Mason.

**Mason**

Ok. All right. Press the button. Great. So I just want to say thank you for including Little Sun in this program and thank you to everybody joining who have a passion for energy access to those most vulnerable. Little Sun is a German based solar product manufacturer and we have produced the sort of iconic Little Sun which actually started as an arts project in Europe but has become an actual company doing solar all over the world. We produced the Little Sun solar lamp as well as the power bank Little Sun charge which is a phone charger. And we have other products that we're developing now as well.

The company is a social business and a registered B corps. And we're unique in that we have about equal sales in the on-grid market as well as in the off-grid market. And Little Sun has become a bit of a symbol of light and hope in the humanitarian sector. We can see this when we receive images back from our partners who are doing work in this area. And because Little Sun has such a presence in the on-grid market and on grid world, we're able to bring attention to this issue through that.

Our focus has always been on trade and developing our distribution and business networks around Africa. But with the growing refugee crisis we've increasingly been asked by NGOs and other relief agencies to get involved in providing personal portable solar lamps into these settings. And we've now set up a Little Sun Foundation and have a humanitarian team to support this type of work. And we're starting to see the impacts from this.

We've done projects in Ethiopia with IOM, international migration organization, supplying lights for IDPs who are receiving them in the dignity kits. We've done projects with Oxfam in South Sudan where they put them into their hygiene kits with the women's safety program. We've worked in Nigeria with Save the Children with people escaping the Boko Haram. We've also worked in Uganda with UNHCR in a small schools' project running education lighting. We've worked in Nepal after the earthquake with disaster relief and we're doing projects in Tanzania and Rwanda. And currently in Rwanda we are testing our market based solution.

And as I think was mentioned before, because energy access has not ticked a real traditional box in the humanitarian sector such as shelter or water and sanitation. It hasn't actually been that easy to get these kind of products or these kind of things into these projects and to get these things moving. But really there's a really strong case for what I think is classified as portable integrated solar products. We know that there is a demand. We heard from

IOM during a recent stakeholder interview that the stakeholders were requesting solar lamps instead of the traditional torches and disposable batteries that they had been supplied with in the dignity kits. And in this slide, you can see a highly technical training document which is there to show you that these types of interventions do not take a lot of difficult to get involved, quite easy to implement.

Oxfam's monitoring and evaluating report from the project we did with them, interviews from the refugees and IDPs in South Sudan said that the solar lamps were the most useful thing they received in their hygiene kit. And in that same program we heard a story of a woman who had had to flee during a raid and she had found refuge on an island. And this was a very swampy area and the island was infested with snakes as often happens during the flood season. And she reported that the solar lamp was really helpful in avoiding getting snake bites. So along with all of the many benefits that you have from having small scale solar lamps I think we can now add snake repellent to that list.

In Rwanda where we're working on market based solutions, when you really think about it, selling products in very remote locations where the refugee camps usually are to customers with little or no money isn't exactly an obvious business model. But Rwanda has been identified as a place to test this cash disbursements programs and I think that's the first place in sub-Saharan Africa to be doing that and so we decided we would work with the stakeholders there to try to develop a program.

So we've been doing trainings with refugees and we've recruited out of three refugee camps, we have eight entrepreneurs so far. They've been equipped with a starter pack including some lamps and a uniform. And they have a credit of around \$150.00 each. And that started at the end of 2016 and they've sold well over 1,000 lamps in that time. It should be noted that this is actually before cash disbursements for nonfood items have been set up so it's currently for food items. I think that just shows that we know there's a demand and in terms of a priority we know that there's an interest in solar.

There are of course a lot of real challenges. We can talk more about this later but least of which is that the solar light business especially with all of the sort of fake products or low-quality products coming into the African market, the margins are very low and the cost and risk of working in refugee camps are actually quite high. So it's a little bit challenging there. There is a lack of capital for entrepreneurs in the refugee setting. We know that it's very important to have a local partner who has good relationships within the camps already and that institutional commitment and support is there. Traditional—without the traditional distribution systems, it can be very expensive for refugees to be able to get lights. Often, they'll have to travel long distances into cities or have someone travel for them to pick up the actual stocks because we wouldn't necessarily have the normal distribution chain there.

And there's also this overall issue of balancing traditional aid to those who are most vulnerable, those who would never be able to afford a light and really need that support with more sustainable solutions and how do you

make those decisions? And we've had situations where we've done donations into an area and we're also trying to support entrepreneurs selling lights in those areas. And we've had it where it works and we've had it where it doesn't work and we've had problems. So there is issues that had to be balanced out there. Overall though cash disbursement programs do open up this opportunity and but it's our conclusion that there will still need to be outside support for them.

If there's one thing that I could leave people with as a takeaway it's that there is a strong case for personal portable lamps. We in the slide here you'll see a box. 72 lamps can fit into there and getting those up into an area that really needs support is much easier than creating large scale infrastructure projects which is really often where the conversation goes when I talk to people about working in the humanitarian sector. They want to do big street lights and things like that. And because there's no—there's very little maintenance with small scale solar and they're very easy to deploy but ultimately it really comes down to the fact that there are limited resources for supporting these communities and that really in my belief a simple light has the highest impact for dollars spent.

So I'll leave you with what I think will become a famous quote someday. "With light, people have the opportunities and freedoms that are lost when the sun goes down." Some genius said that somewhere. Anyway, thank you very much. And we would like to—we'd like to work with anybody interested in doing these kind of projects. We'd like to see how it works for you so do get in contact. Thanks very much.

**Sean**

Great. Thank you, Mason and definitely a nice quote at the end there by our fellow speaker. And now I'd like to turn things over to Olivier.

**Olivier**

Hello, everyone. Thank you, Sean, for passing me the ball. Very pleased to be included in this panel and have the opportunity to share with you our strategy and offer range for what we call Schneider access to energy. It starts with a statement which may sound obvious. We believe access to energy is a basic human right. This is coming from the top of our company and we've made this a company strategy. So looking into the numbers which were already presented by Luc before they are roughly slightly over one billion people not having access to electricity. And that's a figure from last year. We really want to take part with impact full action to try to solve this in the coming years.

As it was explained by Kathleen, access to electricity is not only for the sake of having plugs at home or simple lighting. It has an impact on many aspects of the life of the refugees. Health is one of them. Security, we recognize that whenever there is light in the camp, security issues are sharply decreasing. Economic development, I think it was shown by Mason before that it enables people locally to start businesses, to start activities and get cash and money out of it. Education because in most of those countries, mainly Africa or southeast Asia, the night comes at 6:00 and after that if you don't have a light at home it's very difficult for kids to do their homework, difficult for adults to have activities. And with the light it really changes their life. And there are

many different applications as Kathleen explained such as irrigation, water pumping and so on.

So at Schneider Electric we have a structured reaction in three types of different activities. The first one and I will present it later on is the different offers which we are trying as we go to adapt to the needs on the ground. It also goes together within these models because it's one thing to be able to do business in large cities or very urban areas. It's another thing to do business in rural areas in refugee camps for instance. Then you have investments.

So we do have a fund, helping startup companies to develop the activity. We believe we can support them and develop this access to energy topic through the startups. And we have a very important piece of our action which is vocational training. We recognize in all those areas that training skills is lacking. We just displayed a number to illustrate this. I was told that 80 percent of the micro grids in Africa are not operating because there's need of maintenance skills to make it run. So clearly, we have a deep row to plow.

Now going to the offer, basically as it was explained by Paul before, we believe and we identify different steps in the needs that people have in the camps. The first one is a need for mobile devices. So it's basically equipment which we have at individual level such as the one displayed by Little Sun, so a light which is rechargeable with a small solar panel and could include USB charging device for mobile phone as well. Then we have a second step or second level which is to provide access to electricity at the house, at the home level. So it comprises a system made of one battery, three, two to three outputs for lighting two to three rooms in the house and then also some outputs to feed the radio, fan or DC TV which can enable people to have access to information as well.

And the third step which is the ultimate one is to start to develop a community solution such as micro grid. So you would have a small solar farm and then you would be able to distribute the energy to different households. So that's basically the three steps which correspond well to what UNHCR described before and it concretely translated into this offer that we have at Schneider. Again, there are many others in the market but this is what we promote. So for mobile solution, we have this lamp together with the USB charger for mobile phone for home appliances. So we can put this for example in shelters and able to light two to three rooms. And then a simple system to feed the \_\_\_\_\_ of camp or a group of houses.

And it all—again, it all comes with training. As we speak, 20,000 units of the what is called here Mobyia is being distributed to a camp \_\_\_\_\_. And we see that even for simple devices like this training is needed. We have to explain to people how to use it. By the way together with the packing we have a notice for use which is using only diagrams, drawings, not any explanations in written because some people cannot even read and write in these camps.

So basically, we have spots of our strategy. We have set ourselves some mission objectives starting from where we are today. Since we've started this initiative of access to energy ten years ago, we've helped over two million

people have access to energy. So we're not only in the camps but also in rural areas for the most people in need. And we want by 2025 to increase this number up to 50 million. So we have a lot of work to do. And starting from 100,000 electricians trained in the world, we want to go to 1 million. So another access for action which is going to be a great challenge. And for this, we're looking for partners.

Schneider Electric is involved in mainly studying electrical information products. And in order to provide food solutions we do want to partner with companies, startups willing to develop this access to energy initiative. So thank you very much. I hope this will attract your interest. And I remain at your disposal for any questions you may have.

**Sean**

Excellent. Thank you, Olivier. At this point we will have the moderated discussion amongst the panelists which will be moderated by Luc. And then following that is when we will have the question and answer session with the audience where we can address any questions submitted by the attendees. So I'll turn things over to Luc now.

**Luc**

Thank you, Sean. And thank you, Kathleen, Paul, Mason and Olivier for those presentations and for perfectly setting this scene. I have a range of questions. I'm sure we won't be able to cover them all today. And I want to start with this nugget which comes from a recent report that states that out of 8.7 million refugees and displaced people in camps, only 11 percent have access to reliable energy source for lighting, 11 percent. So that's the backdrop against which we're working and against which we're all trying to see improvement. It's been mentioned twice in the presentations today and I want to start with that which is call it international recognition, call it maybe an increased need for coordination because it's currently not a specific cluster.

There's no specific coordination or a lead agency, one agency that's taking the full lead when it comes to energy which of course comprises multiple subsectors when it comes to either electricity or heating or on the cooking side, and so forth. Similarly, SEGs there's no specific SEG on refugees. Clearly it touches so many of them but again it shows that with more actors getting involved in this, especially on this nexus issue of humanitarian relief needs, energy access. More players are entering the field. We saw many being mentioned already today but maybe a question first to Kathleen because you mentioned it first on the cluster approach and where, what would you like to see? What is happening? What are possible ways for increased coordination and where is this moving? Same question to Paul but maybe Kathleen you can kick this off.

**Kathleen**

Thanks, Luc. Yeah. We have always wanted to see more formalized collaboration around [Break in Audio] humanitarian system. However, it is not necessarily required for energy to become a major topic in humanitarian response. What is really needed I think is for major humanitarian agencies to start thinking about how to holistically incorporate access to energy in their existing programs whether they're surrounding health or shelter or education. And that really comes down to advocating for this topic and raising

awareness and educating each of these organizations about how important energy is and where that fits in. And I think the alliance and UNHCR and all of the members of the SAFE working group have really taken up the banner of advancing that discussion in the humanitarian space. But I'd definitely like to hear Paul's perspective since Paul is coming from the field level.

**Luc** Paul just to add to that and maybe more from a UN perspective. We've already heard about IOM. Clearly, WFP and FAO are also playing an important role in their specific fields of expertise. What's the level of coordination and where are you seeing things going on that aspect?

**Paul** Well, I think Kathleen has given a very good overview. On the UN side, I suppose with the UNHCR scenario set in like—and again going back to Kathleen's presentation whether it's shelter or wash or protection, energy is a big part of ticking a lot of those boxes. And with regards to the cluster side of it, it is surprising that it hasn't been coordinated from the start. But I think that's more to do with whether you look at NGOs or the develop of humanitarian, the different side. It's always been neglected. There are a lot of very specialized NGOs and there's never been this almost like a global champion or advocate on it.

So, on the UN side now well, then just what we've been doing in the energy section in UNHCR. We're doing a lot more now with FAO, WFP. At the moment, we are just trying to get to trying to take it one step at a time and solidifying where we're working on common ground with FAO, solidifying where we're working on common ground with WFP. We always have weekly discussions within the organization. I just left a meeting where I was with protection obviously. And at the moment it is baby steps and it's more like trying to individually pull it all together and agree on internally where—like we don't want replication. There's been an awful lot of replication. So it's getting that ironed out and then setting up a culture of sharing of knowledge and sharing of strengths and weaknesses.

**Luc** Thanks so much Paul and Kathleen. Linked to that because we have so many new actors in this space which we can only encourage and be very excited about. There's always a big dichotomy between the short term and the long term or humanitarian versus development. Clearly there's not a clear break in terms of where the former ends and the latter starts. But it's—I'm curious to see how you have been experiencing—and it's a question for everyone, especially those actively working in the field.

How are you experiencing this change in terms of a switch towards more long-term planning which then again allows for say investments in renewable energy solutions much more than a six month or a one year funding cycle in which you're pretty much limited to the \_\_\_\_\_ approach, the diesel gen set or lanterns, kerosene lanterns. Maybe Mason you can start this off. How would you as a supplier been experiencing this? And how have you been able to engage further and further and partially influence maybe as well how this sector is approaching this issue.

**Mason**

Well, first I would say I would sort of put a reminder out there that most of these interventions were not economically viable ten years ago. So when I started the price per watt was \$7.00 a watt and now it's less than 30 cents per watt. So the game has changed dramatically in the last few years and it's not surprising that large institutions aren't that nimble and quick to change with those kind of realities. But I was advised when I first started looking into this by some of the hardened humanitarian workers that are out there that it's a very long process and that I should start by communicating with people in the field, the field offices and setting up projects with them so that they could get experience with using these technologies on the ground and send that signal back up to the people who write the funding programs.

Because without—there's a demand in supply in the funding of these processes. So getting it into the ground, getting those folks to go to their head offices and saying "Hey. This really works. We're getting a lot of positive impact here. Can you write that into the next tender?" That's kind of the approach they told me and they said that that would be a three year long process. And frankly it's been that long and I'm now seeing a change. I'm seeing people come to us and saying "Hey. We want to start to include this. How do we do it?" So I think I'm seeing a slow change but it's been a long-term investment.

**Luc**

Thanks, Mason. Olivier, do you want to add maybe the Schneider perspective on this one?

**Olivier**

Yes, with pleasure. So this was actually one of my first three questions when I first met with UNHCR. It was with Paul Quigley and another Paul. Is how long on average would a camp exist? I mean what's the life expectancy of a refugee camp? And the answer provided by Paul and I speak under your control Paul McCallion is over 20 years on average. That's really not a good number to have but that's a reality. I believe with 20 years life expectancy, yes, maybe people are thinking of investing over a long time to make sure. But the people who are born in the camp, some live most of their life in the camp, can access rather better infrastructure. And I think there is room for investments.

So far, we have not seen it very well. But back to the number I mentioned before, 80 percent of the micro grids in Africa are not operating. I think there are still technical obstacles we have to overcome in terms of monitoring platforms. In terms of remote control of those systems. But I think we have everything enhanced to solve it. So there are opportunities in front of us I think to help equip those people with much reliable installation.

**Luc**

Great. And let me pick up on that because it was actually my next question as well is so in recent reports the number 17 years is stated as the average stay of an individual in a camp. More recently I've been hearing even 26 being quoted on numerous occasions. I mean clearly if I'm not sure we need more information to make that switch from more short term to long term thinking and planning. Maybe Paul if you could dig in a little bit deeper on this. What do we need on the data side or on the evidence side to get whoever is able to facilitate this more, i.e. the donors to come around to this mind set as well, the

more long term thinking especially on the planning side and thinking multiple steps and multiple years ahead?

**Paul**

That's a great question. I think for example the moving energy initiative which is a \_\_\_\_\_ funded initiative where you've got a strong commitment to trying to bridge a gap between access to energy and grid involvement with the private sector. It's always been an area that NGOs and humanitarian development in the private sector have never been able to feel comfortable about entering or about how to enter it. And I think that there's two big topics that need to be involved in that. National governments and their strategy for energy and maybe the right to work for refugees. Then on top of that donors advocating that the collection of data is so important.

But the collection of data hasn't happened because it's never been as such. Like donors wouldn't say well, here's x amount of funding over x amount of years and we want—20 percent of this must be spent on energy related activities. So the reporting back on energy interventions has never been there. So we think it's a cross between working with governments to maybe allowing more interaction between refugees, host communities and right to work and also strong advocacy by donors to arm the humanitarian development would allow us to collect the data.

So I think it can be addressed definitely but it needs to be playing catch up and it needs to be driven a lot more from the host governments with donors to try to provide the data, to try to move energy access forward which then in turn will allow refugees and host communities to actually find alternative ways to create income generation. People don't want to have to spend two days a week collecting firewood if there is an alternative for them to recharge batteries, charge phones, use refrigeration to supply products. It's just human nature. If you can make an income in a less labor intensive way you'll do it. So it's more the high level that there has to be maybe a change in the approach to how funding through energy and climate change is done.

**Luc**

And, let me follow up on that on the private sector side. Mason, are you happy with the progress that's being made in terms of involving the private sector in the interventions and whether it be opening up a market rather than a procurement procedure? Because you mentioned the low-quality competition that you're sometimes in, that you're sometimes trying to beat. And that's obviously a big issue in any normal market but equally so in the humanitarian settings. Could you talk a little bit about that, about how can we get the private sector more involved? What would you like to see?

**Mason**

Well, specifically for working refugee camps, these are—they're all different everywhere so there's no one that's the same. But it does seem to me that they're often very kind of restricted. Not everybody can go into those so you have to get permission. So for us having a local partner who already had been in the cook stove side of things and already had the passes to go in and was allowed to do the trainings, that really helped us. Because we wouldn't have been able to do that ourselves. I have to say though, it's still quite difficult to get those liaisons working probably because it's just a very difficult environment to begin with. But if there was a focus like a program to kind of

encourage this type of activity like there is in Rwanda right now, then that might make it easier to kind of even be allowed in and create those things.

I do know that a lot of governments aren't exactly happy about having refugees. And the idea of creating infrastructure projects or bigger home systems in people's houses, it may be that that becomes a nicer place to live than where you came from because you didn't have light there. So that's one of the reasons why we've been advocating personal, portable lights because people may want to move back. Governments we haven't really—as a small business we don't really get too much involved in the government side of those things.

But on the larger side of trying to get the business things going in there, one of the reasons why we do think this can be an opportunity is that countries like Ethiopia are trying to implement rules to kind of make sure only lighting global products like Schneider and Little Sun and \_\_\_\_\_ Light and Sun King and all these others can be allowed in. But the others have to go through quality assurance tests. And in an environment like the refugee camp, those kind of rules could be implemented. Because the last people in the world that need to be cheated are the refugees, the ones that have the least amount of resources.

**Luc**

Thanks, Mason. That's very clear and I think you're echoing concerns that everybody around the table and many in our audience will have. Olivier, similar question in terms of how do you, how do you make sure that you capture the needs of those that you want to help or those that you want to supply an energy project or even thinking somewhat larger, an energy service to. Are there enough studies? Is there enough data regarding willingness to pay versus then of course the ability to pay?

**Olivier**

Well, it's quite difficult for me to say. I think the work we're doing around optimizing our offer range for this specific market as we call it. We collect data directly from NGOs which are partners. We collect data from institutions such as UNHCR. We also get feedback from the 140 countries where we have a commercial presence. In order to try to converge to a solution that we believe we can sell. However, what we see on the ground is that it is much more difficult to address the business in an issues manner locally than to try to distribute large volumes through major institutions or NGOs because they have much more means than what we find locally.

And obviously that is a [break in audio]. However, I strongly believe in the approach that Mason presented. I think in those camps with a lot of people with energy, willingness to succeed, to find ways of developing activity on this type of let's say access to energy can provide opportunities for them. Charging phones, charging solar lamps, mobile lamps. Yes. I believe there is opportunity. Then the concern we have is to try to make those business models viable. And then you have to come up with an initial investment for the local entrepreneur to his business properly. I also think of how do you recycle batteries? How do you manage the environmental impact, etcetera? So it has to be a full plan over the life cycle of the product.

**Luc**

Exactly. That was my follow up question so I don't need to ask it but exactly. As Mason said on the quality standards be it lighting global or other international standards or national standards that are being enforced. With quality comes responsibility on your end of course to make sure that warranty periods can be honored and especially, Olivier, you mentioned this very clearly in your presentation as well. The need for training and the need for skills to be presents, skills to be transferred. It's a very big aspect.

Maybe Paul, can you pick up on the training side briefly because it's, I don't want this to be unrepresented in this conversation. How do you—what's UNHCR's position in terms of maybe stepping away from the pure distribution and the procurement process but including this skills transfer in an attempt to create more long-term sustainability or at least have some sort of an end of life strategy or a life cycle strategy in place for these types of products and services?

**Paul**

Well, there's one example I'll give which is on the knowledge transfer and the skills transfer and I see it now in the \_\_\_\_\_ region in Ethiopia on the Somalian border and the camps and host communities. Those who are providing energy through a generator to market places on the host communities to host communities, they have a very sophisticated but simple way of doing that. They will buy a cheap but well trusted diesel engine. They will then buy a very cheap but well trusted alternator. They will connect the diesel engine to the alternator by finding a tire from a car, a tire from a lorry, cutting it in half and they instead of using what we would call a flexible coupling which is a shift that's moveable to connect the two and they just bolt the diesel engine to the alternator and the alternator turns and they provide electricity.

The knowledge transfer on basic mechanics and electrical, it's been there for let's just say 80 years. So the local solution works and they have a very good knowledge transfer on how to repair a generator, on how to repair a diesel engine. Sometimes they'll just take the filter out. They'll just basically have a large \_\_\_\_\_ cam with a pipe which hangs from a coal truck and goes straight in supplying oil rather than go through the oil system that has stopped working and the generator after two years of constant use. So knowledge transfer is key to the sustainability side.

So, on the solar front, obviously if you go to different regions of the world there's different amounts of knowledge. Our camps and host communities in Nepal have a very, very basic but very, very workable understanding of household solar and how they use it. They may not use things like a solar charger or a charge controller or regulator. They will take the energy straight in. But at the same time, they will maintain panels and stuff like that. So on the training front, we're just about to go into our first ever energy services center which we will be training refugees in host communities across maintaining of street lights, installing of street lights, installing of mini grids, maintaining of mini grids as well as the basic education on the proper charging of lanterns and the proper use of batteries.

The only way that we're going to address this is by getting the knowledge to communities in a very pictorial, practical repetition way. So we need more energy technologies that are very easy to transfer skills. But equally people see where they make their savings so that they understand ok, I can pay—I can pay 20 cents for a couple of AA batteries and they will last me a week or I can actually use rechargeable batteries. I can have a stall that charges them using a small solar panel going directly through a charger and I can recharge batteries continually. So the price, the fact that solar, the price of solar has dropped as well but the commitment to training I think we went away from it. I think it was there maybe in development within the '70s and '80s. And then for some reason it was vocational skills were thought as less productive to creating livelihoods and we sort of dropped it.

So I think across the development humanitarian sector and particularly private sector companies who come in with this knowledge—that it needs to be given a lot more focus. So we're starting to look at pilots that we ran on the \_\_\_\_\_ light where we worked with refugees in the host communities to help them to assemble lights. So I think that the supply chain and the way that we transfer the knowledge needs to be given careful attention and it needs to be a lot more commitment by all organizations with an interest to reinvigorate training through community structures and national governments because we're going nowhere. We will still end up with 80 percent of small solar grids or small diesel generator grids not working which is probably I would say the reality if we don't completely re-approach how we do knowledge transfer and skills transfer.

**Luc**

Thanks, Paul. I would like to end this moderated conversation with one more question for Kathleen because I want to end it on a very positive note. I think originally, I wanted to get a little bit more information on the UNHCR side, on the Azraq plan but it was mentioned already in the presentation. I encourage everybody listening in to read up a bit more in terms of what's happening and how that has materialized because it's a good example of long term planning of bringing in the energy needs of refugees as well as host communities and really planning for the future. So I encourage everyone to read up on that.

Kathleen, the last thing I want to ask before I hand it back to Sean is can you just in two sentences—maybe in more than two sentences. In two minutes just talk a little bit about the work that SAFE has been doing and especially focusing maybe briefly on the Nepal crisis, the Nepal response and how—the need and the benefit of that increased coordination that we saw probably for the first time on this specific nexus issue in Nepal.

**Kathleen**

Thanks, Luc. So despite the fact that energy is not formally included in the UN infrastructure around humanitarian response, it's not—it's not invulnerable to the same problems that happen in every other UN cluster which is essentially that as Paul mentioned earlier there is a lot of duplication and a lot of reinventing the wheel. So the benefit of having a group like the cross cutting group like the SAFE working group is in order to share knowledge and exchange information such that these problems such that

we've discussed already in terms of willingness to pay, ability of refugees to pay or appropriateness of technologies providing training to users is something that we can all collaborate on and share best practices. So that's a key role of the safe working group.

In terms of Nepal, the when the earthquake happened as happens in many natural disasters, cooking facilities were lost the ability to charge mobile phones. And what we were able to do as the SAFE working group is we basically have weekly calls with all of the major aid agencies who were coordinating providing energy products into the country. So Mercy Corps was providing D Lights which are solar lanterns. This excellent organization called \_\_\_\_\_ Power was going across and providing solar panel based mobile charging stations across Nepal.

And another key aspect of this in terms of just making sure that energy needs were even assessed at all in the rapid assessments that were initially done on the ground, that the products that were being provided were of good quality whether that was based on lighting global or other standard existing or the IWEA standards for cook stoves. And also making sure that in the provision of these products we didn't disrupt local markets. Mason mentioned earlier that no government is necessarily very happy about having refugees in their country but it's doubly complicating when relief products are flooding into an area that already has a certain, this type of product available. So working with local markets is actually very much in everyone's interest. Does that answer your question?

**Luc**

Perfectly. Thank you so much. Thank you so much Olivier, Mason and Paul and Kathleen for this very, very engaging conversation. I've been taking notes throughout. I think my key takeaways are that there's definitely an increased need for more data, for more evidence and signs of impact to help influence this short term versus long term debate and to work more towards the long-term planning. There's been very positive developments on the technological innovation side which actually have made it possible for us to have these conversations to talk, to have Schneider, to have Little Sun, to have many, many other energy practitioners to participate in this conversation and to actively help satisfy the energy needs of refugees.

However, that has meant that there's probably an increased need for training, for skills transfer where again the private sector can play a very important role. And thirdly, and I'm keeping this for last because it's my main takeaway. It's the coordination. It's the need for partnerships and to make sure that everybody who needs to sit at the table has a voice and that includes specifically host communities because they may actually be impacted in a negative way even when we do energy interventions. So those are my main takeaways. Once more, thank you to all the panelists. I know we've had a range of questions being sent in through the audience. We won't be able to address them all but Sean will pick out a few and we'll address those as best as we can. Thank you very much. Sean?

**Sean**

Great. Thank you, Luc. And yes, excellent discussion. We touched on a lot of topics actually that we have received questions from the audience on so yeah,

great information there. We do have a couple of questions I'd like to get to before we wrap up. So this is just open to all the panelists, especially this first question. I think it applies to everyone. For one of our attendees that has done work in the humanitarian setting specifically in zones that have any kind of conflict. They note that it's a complex scenario with climate change and political processes creating conditions that do not lend themselves to progress. And that populations as they become more concerned just about basic security, what are some ways to work in those situations and under those circumstances that you have experienced or that you would recommend?

**Paul** This is Paul here. Is that the security of the people, of the people working with the target groups or is that the security of the actual people living in the area?

**Sean** The way the question is worded I would interpret it to mean both. More so the people in the targeted area than the providers.

**Paul** Ok. The way it's been traditionally approached is the importance of integrating, trying to integrate as carefully as possible between the two communities and also the need for obviously the need for lighting. So I suppose culturally sometimes it's very, very different as we said earlier. Like no camp is the same. So it's a combination between trying to coordinate closely that there's harmony and there's tensions between both communities so that eliminates any unexpected developments. And then obviously trying to provide as much energy infrastructure as you can to prevent issues happening at night. And also, a big one is the collection of firewood. So by trying to address the fuel issue, you're taking away something that's not always a big bone of contention be it with host governments, host communities and refugees.

**Sean** Great. Thank you. And so, to summarize you could connect the energy issues and those services to solving the security issues would be one approach.

**Paul** Exactly.

**Sean** Great. Another question from one of our attendees that has been working on a DC micro grid project in an off-grid village in Pakistan. They note that they are facing issues in engaging with the local government and especially to insure the longevity and sustainability of the project. And the local district committee is basically uninterested at this point. Any recommendations or best practices on approaching this issue?

**Paul** This is Paul again. Sometimes that can be very, very difficult. It may help in some instances to speak at the government level and try to renegotiate or negotiate the percentage of impact. So ok. If we're going to do this project, 50 percent of it will directly impact the host community and then the other 50 percent will directly impact the refugee community. But on a country by country basis it varies but sometimes trying to even out the impact or the funding of the project across the communities—like sometimes irrigation projects will be 50/50 because it's producing food and that's so essential. So

sometimes things like that can help. That would be the only sort of case by case example I would have. If anyone else has any suggestions.

**Kathleen**

This is Kathleen. I would just add that as with any partner that is troublesome to negotiate with to find out where possible what the priorities of this government are. SAFE has been fortunate to work with governments such as the government of Rwanda and government of Ethiopia who are actually quite amenable to solutions for refugees because they understand that it directly impacts the environmental health of their country given the impact of deforestation. So it's really just presenting a way of addressing this issue that is absolutely within the government's interest whether that's promoting environmental health in the long term or saving money in the long term, making your argument on those grounds.

**Sean**

Great. Thank you, Kathleen.

**Olivier**

Maybe another practical example we got in Vietnam while equipping a village with a hybrid off grid system is that we negotiated with the local authorities everything before the investment took place. Because we have to realize that once the investment is made, your bargaining power is less. So it's important that all of the conditions that will be necessary to fulfill at the time of operations are agreed and put in writing before the investment is made.

**Sean**

Great. Thank you, Olivier. So we probably have time for about one more question. We received a number regarding funding these projects so I'm going to try to group them together into one more concise question. Could you just explain, maybe everyone could just take a few seconds to explain how their projects are typically funded? And then has anyone—there was a lot of talk about donors as a funding mechanism. Has there been more work recently into other business structures such as pay as you go? So just to recap if everyone could just briefly say their general funding structure and then has there been any advances on pay as you go structures?

**Kathleen**

Kathleen. I can—go ahead, Mason.

**Mason**

Okay. I'll just quickly start with that. What we've typically in the humanitarian sector have had either individual donors who want to do a program or project with that or we've had NGOs procuring those. For the investment in market based solutions we've done that as a company but we know that it's not necessarily going to be the most profitable. But we've done that on a sort of social responsibility side. We are like many solar companies preparing to do our pay as you go technology and that would easily fit into the entrepreneurial program. And those do allow people to climb an energy ladder and it makes it easier for them to invest in and its becoming quite successful across Africa and there's no reason why that wouldn't be successful in the refugee camps as well. So but I haven't seen any support for companies to go into refugee camps or to go into host communities in those areas specifically.

**Kathleen**

Yeah. For the global alliance, so our general work is funded through a combination of both regular donor funding and capital investment. On the humanitarian side, it's almost exclusively donor funding. However, the funding that we channeled to support different projects in the field, we try to funnel it towards projects that have a built in sustainability plan that is like—because donor funding is by its definition limited to a certain number of years and humanitarian settings always need to be thought of in the long term, we encourage people to think about how this product will or product or a project will scale up and become sustainable whether that's being subsidized through revolving loans or carbon financing or building like a small market for maybe for a certain fuel or cook stove in a combination of a refugee camp and a host community. So it's a combination of donor funding to sort of move things off the ground and then different market based approaches to keep them going after the initial couple of years.

**Paul**

And this is Paul here. And on the pay as you go, it is certainly the way we would like to go to address household energy. The one thing that we'll probably—we've got a few pay as you go projects that we're planning for the next over the next 18 months. But the big thing is the economic climate be it brought on from environmental effects or maybe government restrictions or requirements with regards to the right to work. So on the pay as you go, we're it's biggest fan. But within some of the economic and environmental areas we work in, it could prove difficult. With regards to funding, UNHCR, a lot of their energy interventions have been very, very strongly supported by the IKEA foundation. That's my two cents.

**Sean**

Great. Thank you, Paul. And with that we are out of time so if we did not have time to get to your questions, I do apologize. But I will be forwarding those through email to our panelists so they can respond through email to your questions. And on behalf of the Clean Energy Solutions Center I do again just want to thank our panelists for the excellent presentations and addressing each of those questions and also to our attendees for participating in today's webinar. Thank you very much for the time. We do appreciate it. And I would like to also invite each of you to visit the Clean Energy Solutions Center training page. Under this webinar you'll find the PDF copies of the presentations as well as a recording of this webinar in its entirety. We'll be getting that up there in the next one to two days.

Also, I do encourage you to check the [Clean Energy Solutions Center YouTube channel](#) where you will find this recording as well as all the other Clean Energy Solutions Center webinar recordings that we've done. So finally, before we close out I would like to kindly ask you to just take a moment to complete the short survey that will pop up once we close the webinar. And with that, thank you again to everyone and please enjoy the rest of your day and we hope to see you again at future Clean Energy Solutions Center events. This concludes our webinar.