

# Vocational Training for Energy Access: Impacts and Lessons Learned from Developing Countries

—Transcript of a webinar offered by the Clean Energy Solutions Center on 19 April 2016—  
For more information, see the [clean energy policy trainings](#) offered by the Solutions Center.

## Webinar Panelists

<b>Luc Severi</b>	United Nations Foundation
<b>Rim Razzouk</b>	Arizona State University
<b>Carol Weis</b>	VOCTEC
<b>Laura Stachel</b>	We Care Solar
<b>Rachel Mahmud</b>	Global Alliance for Clean Cookstoves

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**Stephanie Bechler** Hello everyone. I'm Stephanie Bechler with the National Renewable Energy Laboratory. And welcome to today's webinar which is hosted by the Clean Energy Solutions Center in partnership with the UNF's foundation's Energy Access Practitioner Network and the Arizona State University. Today's webinar is focused on vocational training for energy access, impacts and lessons learned from developing countries. One important note of mention before we begin our presentation is that the Clean Energy Solutions Center does not endorse or recommended specific products or services. Information provided in this webinar is featured in the Solutions Center resource library as one of many best practice resources reviewed and selected by technical experts.

Before we begin I'll quickly go over some of the webinar features. For audio you have two options. You may either listen through your computer or over the telephone. If you choose to listen through the computer, please select the mic and speakers option in the audio pane. And if you choose to dial in by phone please select the telephone option in the box on the right hand, and the box on the right hand side will display the number and audio pin. If you have any technical difficulties with the webinar you can contact the go to webinar help desk at 888-259-3826 for assistance. If you would like to ask a question we ask that you use the questions pane where you can type it in.

If you are having difficulty viewing the materials through the webinar portal you will find PDF copies of the presentations at [cleanenergysolutions.org/training](http://cleanenergysolutions.org/training) and you can also follow along with the speakers. There will be an audio recording and presentations will be posted to the Solutions Center training page within a few weeks and will also be added to the [Solutions Center YouTube channel](#) where you can find other informative webinars.

Today's agenda is centered around the presentations from our guest panelists, Dr. Rim Razzouk, Carol Weis, Dr. Laura Stachel and Rachel Mahmud, Mahmud. These panelists have been kind enough to join us to introduce the vocational training and education for clean energy and to discuss other training programs and highlight the importance of such programs in developing countries also sharing lessons learned, sharing learning outcomes particularly for training focusing on women. Before our speakers begin their presentations I'll provide an informative overview of the Clean Energy Solutions Center and Luc Severi will provide an overview of the Energy Access Practitioner Network. Then following the presentations we will have a Q&A session where the panelists will address questions submitted by the audience followed by closing remarks and a brief *[break in audio]*.

This slide, this next slide provides a bit of background in terms of how the Solutions Center came to be. The Solutions Center is one of 13 initiatives of the Clean Energy Ministerial that was launched in April of 2011. It's primarily led by Australia, the United States and other CEM partners. Outcomes of this unique initiative include support of developing countries and emerging economies through 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.

The Solutions Center has four primary goals. It serves as a clearing house of clean energy policy resources. It also serves to share policy best practices, data and analysis tools specific to clean energy policies and programs and the Solutions Center delivers dynamic services that enable expert assistance, learning and peer to peer sharing of experiences. And finally the center fosters dialogue on emerging policy issues and innovation around the globe. Our primary audience is energy policy makers and analysts from governments and technical organizations in all countries but we also strive to engage with the private sector, NGOs and civil society.

A marquee feature of the Solutions Center is the no cost expert policy assistance known as ask an expert. The ask an expert program has 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 at no cost. For example, in the area of clean energy policy and assistance we are very pleased to have Terry Walters, president and founder of Katevan Consulting serving as one of our experts. If you ever have a need for policy assistance in clean energy policy or any other clean energy sector we encourage you to use this valuable service. Again the assistance is provided free of charge and if you have any questions for our experts please submit it through our simple

online forum at [cleanenergysolutions.org/expert](http://cleanenergysolutions.org/expert). We also encourage you to spread the word about this service to those in your networks and other organizations.

And now I'd like to provide a brief introduction to today's panelists. First up is Luc Severi, project manager for energy access at the United Nations Foundation. Luc will provide an overview of the UN Foundation work on scaling energy access in developing countries through its 2000 plus member strong energy access practitioner network. Following Luc, we'll have Dr. Rim Razzouk. She is the senior instructional designer at Arizona State University. In her current position Dr. Razzouk leads the curriculum development and assessment and evaluation process for the vocational training and education for clean energy project. Following Dr. Razzouk we will hear from Carol Weis, lead program instructor with lead care solar. Carol has worked on as a solar electric instructor and consultant in the U.S. and internationally teaching coed and women only classes since 1998. Her work has included projects in Asia, Africa, the Caribbean and Central America.

Our next speaker is Dr. Laura Stachel, cofounder and executive director of we care solar. Laura is the champion for sustainable energy solutions for women's health and speaks around the world on this topic. She has been active in the UN Foundation's sustainable energy for all initiative and co-chairs a working group on energy and health. Our final panelist today is Rachel Muhmad, a gender associate for global alliance for clean cook stoves. She is responsible for managing grants that support women's empowerment and youth awareness raising in clean cooking sector. She also supports the design and management of the alliance's gender program. And with those introductions I would like to welcome Luc to the webinar.

## Luc Severi

Hello. Good morning or good afternoon or good evening depending on where you're calling in from. My name is Luc Severi. I'm a project manager working on energy access with the United Nations Foundation. Thank you, Stephanie for the introduction and thank you and your colleagues for all the work in bringing all of this together. Welcome everyone to this webinar on vocational training for energy access. Before the speakers talk about their experiences and their lessons learned in this domain I will just briefly present a couple of introductory slides.

I think by far by now almost everyone calling in knows that we have more than a billion people around the world still who, still without access to electricity and actually many more only have intermittent or unreliable access. To address this challenge the international energy agency estimates that about 60 percent of the new energy will have to be met by distributed energy solutions, mainly off grid mini grid solutions. The global initiative tackling this challenge is SE for All, stands of course for Sustainable Energy for All which I assume is by now well known to all as are the three key targets on the energy access on energy efficiency as well as on the share of renewables in the energy mix. These targets are also mirrored in SDG7 which plays a key part in unlocking and achieving many of the other SDGs as well.

Now a few words on the Energy Access Practitioner Network which is United Nations Foundation's contribution to sustainable energy for all. The network which is still growing now counts 2,300 members with truly a global coverage as you can see from the numbers listed on this slide. More than half of the members are private sector market led organizations with operations primarily in developing and emerging countries. As the graph also shows the circle in the middle of the slide it also covers many small and medium enterprises which I think has a very large value. The energy access practitioners network aims to promote new technologies and the financial and business models. It provides a platform for global collaboration and information exchange and thirdly it also facilitates the development and adoption of quality standards.

Now on to the topic of today's webinar on technical capacity and vocational training. From our own experience and also from our network I'd just like to present two of the main key considerations. Firstly, there is the quality of training which needs to be considered so of course needs to be technical but also needs to be practical. It needs to be cognoscente of international best practices and it's also important to insure that gender is mainstreamed at all levels at curriculum development but also at the deployment of the training.

Secondly, there are different levels of training to ensure that there's long term sustainability and "operationality" of the energy solutions. It is important to transfer operational and technical knowledge at multiple levels where with end users for example it will be more on the operational side and making sure that light bulbs can be changed and that solar panels can be cleaned. At a more maybe a district level of a central level this will be more on the technical, on repair, on more advanced maintenance and even on supply chain. I think it's just—it's important to acknowledge whether the current experiences on the ground and what do we want to see in place at the different levels. It should never be the goal to turn nurses or teachers into electricians.

So to end before I pass the controls to my colleagues on this webinar I would like to refer you to the energy access practitioner network on the website which is mentioned on this slide, [energyaccess.org](http://energyaccess.org). Joining is free of charge and through the network we communicate on funding, on investment opportunities, on knowledge, on information sessions such as this webinar which we are also live tweeting under the hash tag PNwebinar. PN stands for practitioner network. Now I would like you all to sit back and enjoy the rest of the webinar. Back to you, Stephanie.

**Stephanie Bechler** Thank you so much, Luc. We will now begin with a presentation from Dr. Rim Razzouk. Rim, it's all you.

**Rim Razzouk** Thank you Stephanie. Can you see actually my presentation?

**Stephanie Bechler** Yep. Everything looks great.

**Rim Razzouk** Thank you very much. Good morning everybody. Thank you Stephanie and Luc for the introductions and thank you everybody for joining us today in

today's webinar. I'm going to briefly talk about the vocational training and education for clean energy programs, its components, some accomplishments and lessons learned. So the vocational training and education for clean energy program is a global program initially funded by the United States for international development and then by Arizona State University. It aims to improve the sustainability of renewable energy infrastructure and investments in developing countries by increasing awareness, knowledge and capacity of local stakeholders primarily in the centralized clean energy technologies such as solar photovoltaic, wind and micro hydro.

One of our major objectives—one of the program major objectives actually to build local capacity to operate and maintain clean energy systems. This objective is achieved through the development and the transfer of curricula because we in VOCTEC we contextualize curricula and specific technologies for local needs. It is also achieved through strengthening institutional capacity and this is by developing training centers and providing the necessary tool kits and curriculum, through training of educators and staff and integration of nontechnical curricula such as gender inclusion, entrepreneurship and effective teaching skills. And in VOCTEC we also incorporate assessment, the assessment and evaluation process to assess and evaluate the impacts of the trainings.

And I'm going to speak briefly about these two. VOCTEC is a multi-tier vocational training program that delivers trainings in three different areas, solar photovoltaic, micro hydro and small wind on three different levels, train the trainer model or the educators, trained technicians and policy makers. The VOCTEC program includes several components. These components are mainly in each training. I will start with our mobile training tool kit.

So the mobile training tool kit is actually a lab in a box that we use for the hands on, for the hands on training in our trainings for technical training. We have the classroom material and this includes modules that incorporate technical and nontechnical material for the classroom and handbooks. We have the online environment and the online which is the online learning platform or virtual learning environment that includes repository of content and material and discussion forums. We also provide supporting materials such as posters, manuals, end user posters. We also developed some educational games to reinforce some skills in specific areas such as troubleshooting or sizing a solar photovoltaic system.

And in VOCTEC trainings too incorporate some academic process which is the assessment and evaluation process to measure impacts and outcomes of the trainings. As I also mentioned we incorporate the nontechnical, nontechnical curriculum which is across the whole curriculum of the trainings to—and this includes social awareness and gender inclusion to achieve participation among women and disadvantaged groups and other modules can include project management and entrepreneurship.

So far through USAID funds so far VOCTEC delivered 37 trainings on the three different levels, solar, micro hydro and wind. As of today we trained 320 technicians, 200 educators and 115 policy makers in different regions

such as the pacific islands, Africa and Asia. This slide summarizes some of the VOCTEC USAID trainings that we've been doing since 2012. So far we've been in pacific islands, Africa, Asia and other places. So we have four of these trainings are mainly all woman as well.

So because of VOCTEC's holistic approach that included not only the technical components but also the nontechnical, the hands on activities and the assessment and evaluation processes VOCTEC has broadened geographically by attracting also new partner organizations such as the inter-American development bank, the international renewable energy agency, European union, the Asian development bank and also has broadened its service portfolio to include regional certifications program for example in West Africa. So as we can see here on this map now VOCTEC is in many regions around the world such as Asia, Africa, Caribbean and the Pacific Islands.

This is originally VOCTEC started with two partners, the \_\_\_\_\_ and Green Empowerment and now it has actually expanded. So these are some of the partners and sponsors to list a few. As of today the in total we trained through USAID fund and other funds we actually trained 620 technicians, 200 educators, 115 policy makers and 20 entrepreneurs. In this section I'm going to speak about some key accomplishments and then transfer the presentation to Miss Carol Weis who is actually joining me on this presentation as well to speak about some gender inclusion and women empowerment examples in real world.

So one of the accomplishments actually developing a complete solar curricula and the development of the mobile training tool kit. We've developed curriculum. Our curriculum usually in VOCTEC training for the solar photovoltaic is like 50/50 classroom lectures to hands on exercises and we developed the mobile training tool kit as I mentioned before which is the lab on a go and it includes as you can see on the right hand side you can see that it includes not only the training tool kit but also the exercises by subject area. So it has the manual with every tool kit. We have two versions of this training tool kit, the expanded version and the light version which is a smaller version but includes exactly the same components and the same activities. It's just lighter weight.

We also created interactive games. We have posters for end users and the pre and post assessment and surveys. And all of these are actually for the purpose of strengthening institutional capacity. So we have the two educational games for solar PV. Why we decided to create or incorporate educational games in the VOCTEC curriculum because games in general assist in learning about a certain topic and concepts and to reinforce the development of the skill or a concept in a fun and interactive way. It also gives the learners the freedom to experiment because they can keep repeating the game and teach them how to set goals while providing them with feedback. It also enhances their problem solving skills and in a way they can actually relate to the real world learning environment and the hands on activities.

So the first game that we—so through VOCTEC we created two games, the solar PV troubleshooting game which is where the learner actually can troubleshoot different components such as the load, converter, charge controller, battery and others systematically and then identify and fix the problem. The second game is actually the solar PV system sizing. And it includes five mini games that mirror the proper sizing steps for sizing a small solar PV system.

One of the important components in our VOCTEC training which is originally maybe a more academic approach is applying the assessment and evaluation model in a vocational setting to measure knowledge acquisition, skill application and aptitudes of the learners or the trainees. Why this is important because the assessment and evaluation process is a very important part of the training program because not only because it provides the feedback on the trainees' performance and learning and effectiveness of instructions but also because the feedback and the insight gained allow us to improve the current and future training and training programs.

The model that we've been using is actually adapted from the Kirkpatrick evaluation model and it includes four measures. The first measure is actually reaction. That measures the participant's perception of and the satisfaction with the design and the delivery of the training program. The second measure is learning. That measures the extent to which the participants acquire new knowledge and skills. The third measure is behavior. That measures the participant's ability to apply the newly learned knowledge and skills following the training. And the last one is actually impact. That measures the long term impact of the training on the trainee's knowledge acquisition and application of skills.

Some of the lessons learned that we gained throughout the VOCTEC training and those are some of them and Miss Carol Weis is going to speak about more later on in her section. First we learned that strong partnerships are very critical for sustainability and not only for the implementation of the program. Having infrastructure and resources are very important for long term sustainability. And we've been doing that also through building institutional capacity and providing the mobile training tool kits to our partners and institutions and the curriculum that some institutions also have been integrating in their curriculum.

Evaluating the trainees learning performance motivates them to succeed because it makes them take things more seriously as well. So this is one of the lessons learned too. Another lesson learned is following up with the trainees is actually challenging specifically when we are doing that in developing countries due to lack of connectivity or it's hard at many cases to reach the trainees after six or eight months from the training to assess their knowledge again. So this has been a very challenging experience in that case. Definitely diversity of the languages should be always taken into consideration and knowing—so in our case we created the online platform for example but in many countries because of internet connectivity as well we had to save things for example on flash drive. So give them the online platform on USB so they

can actually directly use and download on their computers because of lack of connectivity.

One of the major accomplishments through the VOCTEC training is actually empowering women and the gender inclusion. So we were actually successful in conducting almost all women, for all women training in different countries. So 2015 we conducted an all-woman training in Kenya and in 2016 as well in Kenya and in India in 2016 we conducted a training that was almost 85 percent women. And in Nepal too VOCTEC delivered a training for an all-woman training in Nepal. So VOCTEC will plan actually to keep expanding and utilizing that developed curriculum and the mobile training tool kits and the other materials to seek new opportunities in the future.

And before handing the presentation to Miss Carol Weis to talk about some real world examples about and lessons learned from women trainings and gender inclusion I'd like to thank you all for joining us today and I need to mention that my contact information will be at the end of the presentation after Miss Carol Weis is done. And please don't hesitate to contact me if you have any questions or if you'd like more information about VOCTEC. Thank you very much and enjoy the rest of the webinar. Back to you Stephanie.

**Stephanie Bechler** Thank you so much for that. Next for the next portion of this presentation we will go to Miss Carol Weis. Carol?

**Carol Weis** Ok. So can you see my screen?

**Stephanie Bechler** Yes, we can. That looks great.

**Carol Weis** All right. Ok. Thank you so much Rim and thank you Stephanie and the UNF for organizing this. Good morning everyone. My name is Carol Weis and I am an independent solar electricity trainer. And I originally started working as an electrician and a solar installer in the United States and now I work all over internationally also. My presentation to start with I'm going to talk about the VOCTEC women's solar class specifically in Kenya. And then I'm going to move to discuss the importance of women's trainings and then I'm going to close with some general comments about training programs.

So to start in 2015 I was asked to be the lead technical trainer at VOCTEC's first women's train the trainer course in Kenya. And Strathmore University was the local partner and they had held some coed classes in the past and tried to attract women to come to the classes. But their classes were predominantly male. So this class in 2015 was actually publicized as an all-women's class and 18 women attended.

These participants that attended were highly educated women with a large number of electrical engineers and PhDs including professors and lecturers and community organizers. And I co-taught this course with Teddy Alabega who is an engineer from Strathmore University and we felt it was really important to have women leading the technical lectures and all of the hands on and that's what we did. And then Ambica \_\_\_\_\_ who is pictured in the



middle is a program manager from ASU and he came for the first several days to teach the nontechnical sessions such as entrepreneurship.

So by the second day of this class this highly, highly motivated group had already started organizing themselves, the participants. They were so engaged and interested with being with all women that were in the trades that they wanted to continue to empower women in renewable energy after the class ended. So this group has now formally been named WISE, Women in Sustainable Energy and Entrepreneurship. And pictured here is one of the local Kenyan participants, Tamizan, who is one of the main organizers of the group. So I wanted to highlight some of their goals. They have many goals and so I'm just going to touch on a few.

But they are interested in building women's capacity in Kenya in renewable energy on many levels. So they want to continue educating and design, installation and maintenance. They want to educate county policy makers and they want to engage with women end users. And what I find really interesting is that one of the benchmarks that they set for themselves as a near term goal is that they want to increase the number of solar licenses held by women to 10 percent. So they want to help mentor the women that go through their program to help achieve this goal. So they took off running.

This group they, as through the first train the trainers session they received all of the PV curriculum from the VOCTEC project and the WISE members organized their first women's technician class that same year. So they did this in partnership with ASU and Strathmore University. And all of the trainers were from that first class. So Teddy, Tamizan and another woman Carolyn McKenzie they were the main instructors. And then two other members of WISE who were trainers at the technical colleges there in Nairobi assisted with the hands on labs. So it was all local women trainers and it was all women participants.

And so as a note there were 50 applicants for that class that only had 25 spots. So it really goes to show that there was a demand and an increase in the demand as the word got out that there was women only classes. By teaching this class not only was the goal of training women realized but there was also a resulting increase of women's solar licenses. So as you can see in the slide 16 of the total 267 solar licenses in Kenya were held by women. Of those 16 women 4 came directly from the 2 women's trainings in 2015 or 25 percent of those people. And then there's four more women registered to sit for the next exam with two more ready once they get their practical experience. So they are well on their way of achieving this goal.

WISE has already started a mentoring process for women to gain employable skills. So women are studying together for their electrical exam. They're sharing job opportunities that they have seen in the field. And women who are already in the field are providing hands on job experience for women that are just trying to enter the field. So in this picture we have Daisy who is in the first all-women's class seen mentoring another member of WISE who needed practical experience to sit for her exam.

So in March of 2016 I was fortunate enough to be invited back to the women's train the trainer class and again there was a very high caliber of student that attended this course. There was many technical trades professors and lecturers present as well as one woman from the energy regulatory commission and another woman from Kenya Power. And it's worthy to note that for this class 75 women applied to attend and there were only 25 spots. So again this is demonstrating that there is a demand for these types of women only classes.

This time in the train the trainers class Teddy took the lead role as the instructor and I assisted her. She really took a strong step into a leadership position as this was her third class that she had taught as an all-women's class. Tamizan took Ambica's spot teaching the nontechnical sections about entrepreneurship and gender inclusion and she really plays a role model for the students because she had a lot of hands on experience in her past. And this time we tried something new and we had the participants get up in front of the class and practice their teaching skills as many of these women are lecturers themselves.

Since I've been teaching women's renewable energy classes since 1998 I get asked this question all the time. Why do you have to have women's only classes? Why can't women just attend the regular coed classes? And so the answer that I give and that I've observed over and over as an instructor is that women simply do not come out to coed classes in significant numbers. In fact, women participants they answer this question by saying that they feel more comfortable in a women's only class, that they feel less intimidated to learn new skill sets. They find it easier to try out new tools in this type of environment as many of the women have not used hand tools and power tools and specialized solar tools before this training.

Women are excited to meet other women who are in the same field with the same background, with the same future interests and it can be very, very powerful and I've even heard life changing for some women to be surrounded with all other technical women. Because of many of these women as they're going through their engineering classes they are not seeing other women. Or if they're at the electrical job site they don't see other women. Or if in their trade school departments they're not seeing other women. So this is an area where they can meet their key relation, they can make key relationships with other women in the field. And women take huge pride after they have learned how to use the tools, wire up the electronics and they see their light turn on for the first time. You can see on their face that they take a lot of pride in this.

So beyond naming the benefits to the women participants these classes also benefit women instructors by allowing teachers a comfortable environment to build their teaching skills. So Teddy, she co-instructed the first class with me which then gave her more confidence to lead the second class. And then with her in the lead role other women co-teachers were invited in to assist in the class and build their skills. And in my own life I'm extremely grateful to have started my teaching career by teaching women's only classes which in turn gave me the confidence to eventually be the only woman in the room which

many of the classes that I teach today I am the only woman in the room because it is a traditionally male field.

The reason we need to make these less intimidating environments for women to learn in is that we need women present. We need their perspective present to create a clean energy future. We need women like Anupa who is reaching local impoverished women and making them a priority to be trained, who is pictured on the left here and then pictured on the right. We need more women like Mercy who is a technical trainer and she's a role model at her technical college. She's helping encourage women students at her school to stick with the program and creating more inclusive environments. We need women to push for funding that insists on including women in renewable energy programs.

We need people like Pam Bollinger who is pictured right here who works for USAID and she's the main funder of the—USAID is the main funder of the VOCTEC program and she is the main advocate for the VOCTEC women's classes. So Pam was actually a student of mine in 2008 and she attended an all-women's two week course and she saw firsthand the benefits of being in a course like that. So when she heard—when it became apparent that women were not substantially represented in the VOCTEC programs she pushed to have a women's only class.

And from what I understood or what I understand from talking with all of the parties is that initially there's a lot of skepticism of offering the women's only classes thinking well, if they're—if women aren't coming to the coed class why is that going to change. But as I've shown and as we've seen the numbers it really turned out to be a great success.

So in closing I want to wrap up my presentation and deviate a little bit about talking just of the work that I've done with the VOCTEC women's classes and share some personal conclusions from being solar PV trainer for many organizations over the past 17 years. And as you'll notice I stopped showing pictures of all women in the slideshow because we—there's a lot of male technicians that are coming to the classes and we need them also. So at this time the industry has now matured to the point that we need to broaden our trainings. And we're all realizing that in order to grow the industry at the rate that's needed to meet all of the renewable energy targets that we have put out there we need to be inclusive of all people which means elevating local trainers who can work within their communities and using existing trades institutions to create renewable training centers.

And I just wanted to pose some questions here and some ideas is that these training centers in order to have a highly trained workforce at the end we really need to focus on individual skill sets. So trainings cannot be a one size fits all. We have to ask ourselves who is the audience. And if we are trying to train designers as our first group they would have—they would need to know a specific skill set so they would need knowledge of computer software, electrical layout, analyzing load demand and evaluating solar specific equipment, all of the specifications, etc.

This would be in contrast with an installer training. For an installer training it would be very different. It would be reading electrical schematics and making on the site decisions about hardware to use to install the specific solar electric system in a safe way that needs specialized safety training for installation and commissioning and they need to know how to use all of their personal protective equipment. And installing new equipment somewhere is very different than being the on-site maintenance technician who would need a very specific training on the exact equipment that's installed in the facility that they're working at which could be what is the weekly and monthly maintenance to these, how do I trouble shoot this equipment, collecting data from the meters on the inverters and controllers, etcetera.

And finally we really need to make sure that all three of those categories of people can communicate to our end user about how to use the system because these are the people that will be interfacing with the system every day for the next 20 years. And so they need to know how to work with the system and reduce loads if they need to or what they do—figure out what to do if there's cloudy weather, etcetera. So in my last slide the people who are offering trainings really need to be thinking about beyond the training, about how to help students transition into the clean energy industry.

And so questions that need to be asked before the training are things like what types of jobs will the graduates from this training program be prepared to work at after this training. So this is a way that we can evaluate our training programs that have been created to see if students really have marketable skills that are needed in the workforce and that they can be hired after a training.

The second question is, is the market developed enough to employ trained students. So training for the sake of training is great and nice but it needs to be targeted and we need to look at the market needs and what types of employees they need. So special work may need to be done in conjunction with other business organizations or at the policy level to help develop a renewable energy market to create jobs for this newly trained workforce.

And then lastly is the program assisting students to enter the workforce as apprentices? Because for some of the shorter trainings they are just getting enough training to be dangerous. Right? So they need to have that next step of learning on the job. So we need to make mentoring partnership opportunities for the students. So that concludes my presentation. Thank you so much. And this is the contact information for both Rim and myself.

**Stephanie Bechler** Carol, thank you so much. That was really excellent. Our next presenter today is Laura and Laura the floor is now yours. And Laura we're not able to hear you right now. Oh there you go.

**Laura Stachel** Ok. Can you see my slide?

**Stephanie Bechler** Yes, we can and we can hear you great.

Great. Well, thank you Carol. That was really, really excellent and, Rim, it was really great to hear both of you and I think that what I'm going to do as the executive director of We Care Solar is just give another example of a training program. And I think that I'll be demonstrating some of the things that the last two speakers have already spoken about. Unlike the last two speakers I'm actually a physician rather than an engineer or electrician or technical person but I think what this speaks to is how important it is for lots of different types of people to be getting training as we try and improve energy access around the world.

My organization is called We Care Solar. And We Care Solar focuses on bringing small solar electric systems to the developing world for the purposes of maternal healthcare in particular. It came from work that I did many years ago in Nigeria. One second, I'm trying to change the slide. So in Nigeria I began working in 2008 to try and look at ways to lower maternal mortality in the hospitals and small medical centers and realized while I was doing observations that there was a really lack of reliable electricity in many health centers and that part of the women, part of the reason that many women and newborns were dying during childbirth had to do with lack of energy access of the health providers. So there was no lighting at night.

There was no power for some of the medical equipment and that led my husband and I on a journey to try and provide small solar electric systems to a lot of outlying clinics. What you're seeing in this picture is one of the early solar electric systems that we put together that probably is not very dissimilar from that kit that ASEC has been using through VOCTEC to try and train people on the basics of solar electricity. This was a kit that was put together by Hal **Erinson** who is my husband and a solar educator to try and allow me to bring something fairly simple into clinics. And initially all of the work that we did was through volunteers who each had their own modifications of these systems.

So what I'm going to show you now is just some of the different solar electric systems that we put together. All of them were focusing on 12-volt DC and were kind of miniatures of larger solar electric systems that Hal had designed for hospitals but was something small enough that I could pack in my suitcase and bring with me directly to health clinics. Over time this evolved into something we called the solar case which includes solar panels, a controller, batteries and then the end appliances that we thought were very important to use in the health facilities. So there was medical quality lighting. There was headlamps to supplement overhead lights, fetal Doppler which is a monitor used to check on a baby's heartbeat, phone charging so that health providers could call for emergency transport or for backup help.

And then these solar electric kits could actually be enlarged by bringing in larger panels and batteries and could be used to power additional devices such as the laptop computer in this picture and in a couple of cases we've used them for blood bank refrigeration. Some of the features that were really important in the design of the solar suitcase was to make these both easy for end users who were not technical people, people like midwives and nurses

who were in the hospitals to be able to use the equipment. And as well something very easy for installers to use because we weren't relying on professional installers. We were first using people from our own teams and then we were trying to use local technicians, drivers, health providers themselves to become the installers and that's what I'll be illustrating in the next slides.

Initially the trainings were really primarily focused on the end users and so I would carry these solar electric kits to health centers. I would usually bring with me a couple of staff. At that point everybody was volunteers to do installations and then we would basically do an installation and be providing instruction to health providers so this for example are Nigerian women who were in a local hospital. We also realized that some of the health providers themselves were not very conversant in English and so we began to train people locally to help with teaching in the local languages. So in northern Nigeria the language that we used was \_\_\_\_\_.

We also saw that in clinics posters were a key element of education for any type of healthcare workers and so we developed a poster that was focused on proper use of the solar suitcase emphasizing some of the key parts of our training.

In Sierra Leone we worked with someone who taught in the local language which was kind of a pigeon English there. And so where we could we would train local midwives to become the trainers themselves. In those days most of the installations were done with a lead installer. In this case you can actually see Carol Weis who was volunteering with us at the time. So she's on the makeshift ladder that was available in this particular clinic in Sierra Leone and then we would have local people work with us to try and help do the installations. And one of the things that we saw was that people were so excited about being involved in the installations and so very often the person who was our driver would come with us and was very eager to be involved in both doing the installation of solar panels on the roof as well as putting the solar suitcase on the walls.

Inside the clinics people from the local villages would want to be involved in doing the installations and so I really think at that time we really had what I would describe as an apprenticeship model. People that were very eager to be involved would get involved but we did not have a formalized training program. Here's another example of Carol in Sierra Leone and these were some local boys around the clinic that were out of work and were so eager to be involved. And so they tried to do everything possible. And Carol is such a great teacher that she got each of them using tools and doing things. And when it was time to leave they were so disappointed. They said "Can't you take us with you? We really want to be doing this all around our country." So it really showed us what a strong interest there was in people getting training.

Well, as we moved from program to program we found that our programs were getting larger and we needed to have some more formalized processes in place to do trainings. This is a picture from Liberia where we partnered with World Health Organization and another small organization called Liberia

Institute of Biomedical Research to do 20 solar suitcase installations. And we realized that we wanted to have a more formalized training program. This training was primarily focused again on the end users but we wanted to provide a deeper grounding in solar electricity. So we had a classroom training where we brought some health technicians and all of the midwives that we'd be visiting in these 20 clinics together to do a training teaching about some of the basics of solar electricity.

And as Rim had been talking earlier about games we also found games to be important. In this case you're seeing a slide of an energy budget game where we were trying to teach midwives that they had a fixed amount of energy to work with and to give them some sense of how much electricity was being used when they were trying to do things like charge cell phones or use lights or use computers. And so each of these cards represented a different amount of wattage and we were trying to have them work out different combinations of hours of usage of different items to show that the same total amount of energy could be used to supply different appliances for different amounts of time.

After we taught them in the classroom when we went to the clinics to do the installations we actually asked the midwives themselves to be the teachers for the other people in their clinics. And I guess that was our very first taste of a train the trainer program. They had learned with us for a day in the classroom and then during the installation they were some of the teachers for their own peers. We had one main solar installer who worked with our team to do installations in the clinics both putting the solar suitcase which I didn't mention becomes a permanent cabinet which gets fixed on the wall. So the entire system is otherwise prewired inside but the rest of the system is quite plug and play and actually in the room with me is Hal Erinson who developed and designed the solar suitcase. And so if there's questions later on that you would have about that technology he's available as well.

And then also we had practice doing the installations on the roof. And at this time again it was more of an apprentice model for the installations. But as we started venturing to do larger and larger programs not just with 20 solar suitcases but sometimes with 50 or even 100 we developed a training program that was more geared towards the installers themselves and when we partnered with an agency we wanted to get some of their staff to become trained and also we wanted to train people that were permanently based in the districts. So we trained district technicians, sometimes these were coal chain technicians and other times they were people that were local engineers that worked for the district in multiple sectors, not just in healthcare.

We also realized we were going to need a lot more people to do the trainings and so we developed what's called the Women Solar Ambassador program. And if you can see in this picture Carol Weis is also here in the red in the front. She was one of the lead teachers for this program and the idea behind this was that we needed people besides Hal and myself to be doing the trainings around the world and we knew that we were focused on women's healthcare and going into the health facilities both the patients were women

as well many of the health providers were women. And we found that if we had women doing these trainings it was a lot less intimidating. People were very accepting of it. We also wanted women to be role models for other women in the same for some of the same reasons that Carol was talking about.

So Solar Energy International worked with us to help find these women and we had many, many more applicants than we could accommodate and it turned out that the people who applied for this program were far more trained than we had anticipated. Some of them were professional solar installers themselves. We had doctors and geologists and engineers and electricians. And they represented five different countries. They did an online course with SEI for about six weeks before coming and spending a week with us in Berkeley, California to do hands on training. They learned to actually take apart the systems and actually put together their own small solar electric system. They learned in depth about the solar suitcase.

And then we created makeshift structures in our back yard so they could practice things like tool safety, roof safety, how to do installations of solar panels on low roofs and then higher roofs. And then we created things that looked a little bit like some of the bare bones of a clinic so they could practice doing installations on the wall. We then took these women into the countries in which we were working to do classroom training. And here's an example from Malawi where there's two solar ambassadors that are doing the teaching.

What we've come to now typically is a two-day classroom training which includes some of the basics about solar electricity, how to site solar electric systems on roofs and then how to do a lot of practical exercises that reinforce things like using tools. We try and get people to have their hands on as much as possible as everybody realizes if you can have people interacting and using tools themselves it's going to really reinforce learning a lot better than just sitting in a classroom. We do have books. We have posters. We have Power Points and we have videos that reinforce the learning and as Rim said it's really important to have the Power Points on some sort of a thumb drive because the internet usually is very poor in these countries.

We have found that most of the trainees have not had a lot of experience with power tools and so we try and reinforce how to use tools in a safe way and even very basic things like using a ladder or something that we spend quite a bit of time on. I showed you a fairly makeshift ladder that Carol had used in Sierra Leone in an earlier slide. We've actually found it's not that easy to get good ladders in country. And now when we're doing our installation programs we send tools including things like retractable ladder that's of high quality because we feel this is one of the important parts of having safe installations and it's not always easy to get a ladder in country.

As we had larger solar electric systems our systems move from being completely plug and play to ones that needed some wiring. So here's teaching people how to do wiring and junction boxes. As our programs are getting larger once again I think we're moving to use whips and to have more of a



plug and play system again in the future. But in this type of picture you're seeing people who have already done classroom learning on how to do the wiring and junction boxes and now they're having practice on the ground doing it before going to the field.

After we've done the classroom training we follow this with many days of actual installations in clinics and we usually break the class into teams. People are given checklists of what's important to do during an installation and every time we do the installation we review the checklist. And then once we finish the installations we use that as opportunities for people to review skills. They do have a number of skills they need to complete for them to be certified for us as installers. But we also find that every time we go to health center we run into different types of challenges and there's nothing that can really replace what it's like to have practical experience in the field and having people do problem solving on site and really try and understand what the challenges are and really review what are some of the best practices.

So here's another example of one of our solar ambassadors doing a training. And one of the things that's been a challenge for us is how do we get more women to be the actual field technicians. We always encourage our partners to be bringing women in but many times a lot of the existing technicians in the districts are primarily men. And so it's not that easy to always get women to be the trainees as much as we're trying to promote this.

Another thing that's been very important in our trainings is actually providing teaching pedagogy so people know how to be good teachers to the health workers. And that's something that we don't see comes natural to all of our technicians and so we really need to work with them about how to become a clear instructor and not just to focus on showing that they understand something but how do they get health workers to also be participatory, to be engaged, to be turning on switches so that after we leave the end users are going to be very comfortable using the technology.

Here's an example from Malawi where some of our technicians are now engaging health workers. And often we get community members that are really excited as well to learn about doing the installations. I just want to mention as well you'll see a lot of bags on top of this table. That's because in addition to the solar suit case being a user friendly solar electric system we actually include all of the hardware that's needed to do the installation as part of each kit. So there's the hardware for mounting the panels on the roof. There's silicone gel to plug the holes. There's a screwdriver. There's all the screws that are needed.

And that's—the reason we include this is that we found over time that when we're in very, very rural communities trying to do installations it's almost impossible to get the right screws and the devices that will really facilitate installation. So we learned the hard way that if we didn't bring these ourselves it might be impossible to get high quality hardware for the installations. I'm going to actually invite Hal to say a couple of words here. What I want to show you is that in addition to just having these classroom trainings, we've now constructed something that isn't unlike the structures

that in our back yard. They're mock roofs and this was a training—do you want to mention a couple of words, Hal, from this experience in the Philippines?

**Hal Erinson**

Sure. So in the Philippines they invited all the technical trainers for the national training institute to come to Manila and we gave them a couple of days on solar training on solar suitcase and trouble shooting. And then we also constructed these mock units that are both a roof and also a wall so that they could get hands on practice installing the systems. What we like to do is we like to kind of give them the concept of how you do an installation. And then instead of doing it with them, we encourage them to take initiative, the students to take initiative. And we'll stand to the side and just kind of kibitz. We'll kind of offer some suggestions, give them a few reminders but it's really great to have people self-organize in the training so that then we can reinforce that when we do the on the job portion of our trainings.

**Laura Stachel**

So just to give you a sense of where we've been doing trainings, most of these this map is showing all of the different places where solar suitcases have been introduced but the countries in gold are really the ones that have had the trainings and most of these have actually been led by our solar ambassadors often with one of our staff members as well. But the solar ambassadors have done a lot of the trainings in the countries that we've mentioned here. One of the things that we'll be introducing this year is a regional training. We're going to be doing a training in Ghana and bringing in solar—or not solar technicians, just technicians and people from other partner organizations to Ghana. We'll be creating structures like the ones you just saw that Hal described in the Philippines so that people can get hands on experience during the classroom and practical training and then we'll be going into clinics to have hands on training in clinical sites as well. And we're hoping that that's going to equip the trainees to go back to their own countries and actually lead solar electric programs themselves.

Typically, now when we work with a partner agency it's a group like UNICEF, Save the Children, Pathfinder, a group that's already working to strengthen healthcare but they don't have solar expertise. And so our role has been not to actually create new entrepreneurs but actually to be building capacity within existing organizations for them to be able to lead solar and to make our solar units easy enough that they'll be able to have a really reliable and rugged system that will work for years to come. When we first did our solar ambassador training we had expected that we'd be doing many more of these –

**Stephanie Bechler**

Laura, if I could just—if I could interrupt you for one brief second we're running a bit short on time. If you could find a good stopping point soon that would be great so we'll have time to get to some questions.

**Laura Stachel**

All right. And this is actually the last slide. I was just going to say that the –

**Stephanie Bechler**

Perfect.

**Laura Stachel**

Solar ambassadors have actually continued to work with us. We've now given them an advanced training and they're continuing to do projects with us and they'll be doing that throughout the year. Here is our website and thanks for the opportunity to share all of this information.

**Stephanie Bechler**

Thank you so much, Laura. Sorry to cut you off there. And now we'll go to our final presentation. Rachel the floor if yours whenever you're ready.

**Rachel Mahmud**

All right. Thank you and thanks to all of the previous panelists for their great presentations. It's been really informative and great to see all of the excellent work that you're doing to support women's energy entrepreneurship. My name is Rachel Mahmud. I'm the gender associate at the Global Alliance for Clean Cook Stoves. And today I'm going to give an overview of some of the alliance's gender capacity building tools and resources that we use to help enhance the impact of clean cook stove and fuel enterprises.

So just to give a quick overview of the alliance I can't—I'm not sure if this is blocking my screen so I'll try to move that out of the way. So the alliance is a global partnership, public private partnership that aims to create a thriving market for clean cook stoves and fuels. And our mission is to save lives, improve livelihoods, empower women and protect the environment. And we aim to reach 100 million households adopting clean and efficient cook stoves and fuels by 2020. And based on our latest reporting we are on track to achieve this goal and expect to exceed it by 2020.

And the reason why this is such a critical issue is because as many of you know every day 3 billion people are cooking on dirty and inefficient traditional cook stoves which traditionally looks like a three stone fire burning wood on an open fire. So they're exposed to many of the health and environmental impacts that result in about 4.3 million deaths on an annual basis. And then there are a number of climate and forestry and other environmental degradations that occur due to the cutting of wood fuel for burning and as well as the number of social and physical impacts on women and girls who suffer from the "drudgerous" experience of carrying heavy loads of firewood as well as putting them at risk for attack when they go out to select that work for hours at a time over the course of a week. We've also found that clean cooking contributes to a significant portion of global black carbon emission so there's a lot of potential by introducing some of these new and cleaner burning and more efficient burning technologies at the household level.

So the alliance has a specific gender strategy because women and girls are at the forefront of the issue that we're trying to address. We're looking at how to increase the role of women as entrepreneurs and address different gender issues within the value chain to help scale adoption. So clearly women are the main users of these products and therefore they're going to ultimately determine how they are used and whether or not they're adopted. Women entrepreneurs are also potentially untapped resource that could really help scale the sector and create a much more sustainable market. So we're looking at women, who are the fastest growing cohort of entrepreneurs in developing countries. They have been found to reinvest 90 percent of their incomes back

into the communities which is a much higher percentage compared to men. They have a very high rate of payback on loans and they're able to better reach female consumers who are often in isolated areas which ultimately can help increase sales.

And so we've identified a number of challenges that need to be addressed in order to scale women's empowerment through the sector. Of course beginning with the capacity of the enterprises and NGOs on the ground who are implementing different clean cook stove and fuel initiatives. They need to better understand how to mainstream gender and women's empowerment into their business models. There's a need for financing in the sector to look at how women can be integrated into the value chain as well as how projects can better impact women users. There's a current gap in the evidence of understanding what exactly are the gender impacts of the sector and then there's the high level policy need to set and influence national level as well as international at the United Nations level policy to increase awareness and advocate for these policies.

So the alliance has about five pillars to its gender strategy. The first is to help build the evidence and share data. So we've commissioned resource—I'm sorry. We've commissioned research on some of the most effective approaches for working with women in the value chain and we've also developed new methodologies to measure the socioeconomic impacts of clean cooking solutions. We also have a component of capacity building with enterprises and NGOs so we have developed a resource guide for scaling women's energy entrepreneurship in this sector which looks at the role of women at each level of the value chain and how you can best engage them based on universal best practices.

We've also developed an online knowledge hub where each of these resources for each segment of the value chain can be tapped into. We also conduct gender due diligence with our grantees and look at what is the baseline for their gender interventions in the business model and how can we help them improve that. And additionally we have an empowerment training that we've designed with researchers and tested in the field to look at how we can strengthen the empowerment and leadership skills of women micro entrepreneurs.

Along the access to finance pillar we have the women's empowerment fund which is an annual grant fund that commissions about five grants of about \$75,000.00 each to different women led enterprises as well as enterprises looking to further strengthen women's role in their business model. And we also provide connections between enterprises and investors who are interested in measuring and investing in the gender impacts of clean cooking businesses. And then finally we have two other components that include awareness raising and influencing policies. And so that includes mainstreaming gender throughout our national awareness campaigns which are currently being piloted in Ghana, Uganda, Bangladesh and India and then also looking at how to integrate energy access into school curricula and extracurricular activities for boys and girls so that they can actually serve as the next generation of

change agents within their communities for adopting the improved technologies.

And then finally we're working at the international policy level to integrate energy access across the global gender community as well as working with the energy sector to help build their capacity to better integrate gender into their programs. So the alliance has developed the empowered entrepreneur training handbook which is one of the tools that I referenced. It was developed as part of our strategy to scale effective approaches for increasing goal and the value training and to increase the social and economic benefit of clean cook stoves and fuels for women and girls. The handbook provides six days of business skills, empowerment and leadership training mostly targeted for women micro entrepreneurs, small size enterprises and sales agents who work throughout the household energy sector.

And the empowerment component of the training takes a transformative agency based approach which enhances individual's capacity to create and focus in on their goals. And then the leadership component helps individuals realize those goals with a set of tangible tools to execute them. It's designed to be adaptable to any context using a human centered approach and it allows trainers to design and implement the training curriculum independently. The handbook you might find is different from some of the other trainings you've seen on women's empowerment not only because it includes specific empowerment and leadership training modules but also because it looks at business skills from a gendered perspective and addresses the different challenges that men and women face in running a successful business.

We find that the empowerment and leadership components of the training are particularly significant for women entrepreneurs because women frequently lack access to formal education and training. And so this training tries to address that gap by offering a curriculum that's accessible to any player in the sector and addresses the constraints and gaps that women consistently face in business. We've actually commissioned some research with John Hopkins University and some of our partners, implementing partners on the ground to test the impact of the training. And in Kenya the research found that women sales agents received empowerment and leadership training sold three times as many stoves as men who received the same agency based training. And additionally we found that users who purchased a cook stove from women reported greater customer satisfaction. They're more likely to use it predominantly, consistently and as well as promote the stove to others.

So over the past year and a half the handbook has been tested in at least ten countries in sub-Saharan Africa, South Asia and Latin America and we have mostly used a training of trainers format which was designed to build the capacity of enterprise and NGO level trainers to then work directly with women micro entrepreneurs. And actually over the last six months or so \_\_\_\_\_ international has taken on this curriculum in its cook stove program which is funded by USAID and they have hosted two regional training of trainers for partners in East Africa and South Asia. And overall with all of the

trainings combined that have been conducted so far nearly 500 women entrepreneurs have been supported through this handbook training.

And following the TOT, the partner's organizations will then typically facilitate their own trainings of women entrepreneurs in their sales network and the workshops give each organization an opportunity to develop a concrete plan of action for implementing the guidelines in the handbook. Another partner of ours, Energia which is the international network on gender and sustainable energy has also participated by sending its women's economic empowerment program grantees to attend these regional TOTs. And then the alliance's own women's empowerment fund grantees who are operating in Uganda and India have also attended the regional TOTs which will prepare them to test the handbook within their own business models. And we also have each of our grantees under the women's empowerment fund incorporating elements of the handbook into their training programs.

We encourage all of our partners to make use of the resource and it's something that's publicly available on our website and we believe that it will enhance existing training programs and help fill key gaps in women's economic empowerment. The authors of the handbook who have been, also been supported by \_\_\_\_\_ and USAID have also designed a set of tools for measuring the impact of the training on women's economic empowerment and leadership and these tools were developed in line with the alliance's broader social impact MNE framework which is a global measurement system that we developed in collaboration with ICRW which is the International Center for Research on Women to better understand the socioeconomic impacts of clean cooking programs.

So we've worked with ICRW as well as external, an external steering committee to provide guidance on the social impact tools and methodologies. And we have on our website a theory of change, a set of indicators and tools and there will soon be a guidance note on how entrepreneurs and NGOs can use this framework within their own business models. And I'll be sharing a link to that MNE framework at the end of my presentation. So the next piece that I want to touch on.

**Stephanie Bechler** Rachel.

**Rachel Mahmud** Yes.

**Stephanie Bechler** Sorry to interrupt right now but we're running a little bit short on time. If you could find a good stopping point as soon as we can get to some of these questions that are coming in.

**Rachel Mahmud** Absolutely. So I'll go ahead and wrap it up here but what I have highlighted on this slide is the key components of the alliance's gender capacity building process. And so instead of going through this slide I'll let participants if they have access to the Power Point at the end of the presentation they can access this and then they can go to our website and learn more about the exact process that we follow when we provide gender capacity building services to our grantees which is the first link listed and then the remaining links listed

and the empowerment handbook. We have an HR and operations training as well as the resource guide for scaling adoption and our social impact MNE framework. So thank you very much for your time.

**Stephanie Bechler** Thank you so much for that Rachel and thank you to all of our panelists for the really excellent presentations. I'm going to dive right into questions here. This first one is for Rim. And we have someone asking how much does it cost for each training and are the materials used open source?

**Rim Razzouk** So the trainings usually we do them through our partners and we send them the solar tool kits and everything. So I cannot really give a specific number per person but we have some sources on our website as well as on [www.wecaresolar.org](http://www.wecaresolar.org). For the MTTs we have separate orders if people also like to order specific ones for their organizations. And they can actually contact me and we can actually provide them with a form to complete or with a quote for specific entities or if they want to do their own trainings we can also work on something around that.

**Stephanie Bechler** Great. Thank you so much. And do you hold the train the trainers or TOT training?

**Rim Razzouk** We do. We've been doing that through our partners as well. So as I said in every country we have a partner institution that we deal with and we give them the curriculum and we go there and do our trainings. But definitely like if they contact us we can also discuss and we can work something out for them. If the number of the audience is, the number of trainees is actually a good number. We don't provide one on one definitely but –

**Stephanie Bechler** Thank you. And then this question is for Laura. Is there a place that people can go to find countries that you're still active in? We've received questions inquiring about Ghana, Liberia, and is there a way for them to find out countries that you're still working with?

**Laura Stachel** Can you hear me? I think that –

**Stephanie Bechler** Yes.

**Laura Stachel** Probably the best thing to do would be to contact us. You could either write to me [laura@wecaresolar.org](mailto:laura@wecaresolar.org) or [info@wecaresolar.org](mailto:info@wecaresolar.org). And I think that would probably be the best way to get the most up to date information for 2016.

**Stephanie Bechler** Great. Thank you so much. And we'll have the presentations will all be posted online. Some of our attendees have been asking. We'll have the PDFs available so you can get most of the contact information there. This question is for Laura and Carol whoever would like to answer. What is the criteria used for selecting countries where trainings are held? Noting that there's a strong West and East African focus.

**Laura Stachel** So, for our organization for We Care Solar we actually have a very strong focus as well in east Africa. We're doing a lot of work in Tanzania, Malawi,

Uganda in addition to the work that we're doing in West Africa. But for us we look at countries where there's energy poverty as well as high rates of maternal and newborn mortality. So we're looking strategically at where our solar electric systems can have the most impact on improving health outcomes and then we have to look for places where we can have good partnerships both with the government, the local districts and as well to have an implementation partner because we don't have full time staff in countries. So we always need to work for, look for a partner agency that can be an important resource for us and for our programs.

**Carol Weis**

Yes. For ASU I think that Rim would be more qualified to answer that question. I am just the trainer for the organization but I don't do the organizational part.

**Rim Razzouk**

So we'll actually have the—it depends also on the grant. So for example now we are also, VOCTEC is also in the Caribbean because of a different grant and we are also in West Africa and Asia and Pacific Islands and different locations. And also it's a where there is energy resources and lack of the use of and the knowledge of how about how to use those energy resources and poverty. So mainly in the places where we can actually enhance the quality of the people's lives and train them and educate them about using those clean energy resources and benefit from them in their countries. So, so far we've been in Asia, Pacific Islands, Caribbean, West Africa, East Africa as well. So mainly the similar reasons as We Care.

**Stephanie Bechler**

Thank you, Rim. And do the trainings offered by VOCTEC follow national certification schemes and another portion to that question is for countries that don't have established certification or licensing systems how do you go about promoting the training?

**Rim Razzouk**

So, so far we've been doing certification for West Africa and mainly our curriculum follows the somehow the NABCEP certification even in the countries that they don't actually use NABCEP certification. But we try to always adhere to the regulations of that in our curriculum. So we've been doing also some of the NABCEP certification trainings with in different counties as well. But in West Africa we've been doing it for their—we've been customizing the curriculum for the regional certification. But other than that we don't really have a specific certification process for now.

**Stephanie Bechler**

Great. Thank you. And this is a question for Rachel. You had mentioned the clean cook stoves obviously but do you have any information on solar furnaces?

**Rachel Mahmud**

I do not. We're working with the household cook stove and fuel products so that's a little bit out of our main focus area.

**Stephanie Bechler**

Fair enough.

**Rachel Mahmud**

if someone would—sorry. If someone would like me to connect them with a fuel expert, I could do that.



**Stephanie Bechler** Great. And again those contact information will be available on the presentations online. This question is for Laura. What is an acceptable number of participants per solar training or does it depend on the focus of each training?

**Carol Weis** Actually, one of the things we realized is that we don't want to have the trainings to be too large because we want to have each person to have practical experience. I'd say our largest training was 23 people and that seemed to be a bit large. We try and keep it to be closer to between 15 and 20 and then we break up into groups that are typically maybe seven or eight people in size when we go and do the installations in facilities. And we always need to have at least one if not two people for that group of seven and eight as mentors.

**Stephanie Bechler** Excellent. And is the solar suitcase available for purchase?

**Carol Weis** We really try and work with institutions to try and provide humanitarian support for health centers. We have another version that's for schools and for orphanages. So it is available from institutions to purchase. It isn't available as a consumer product for individuals.

**Stephanie Bechler** Ok. And how are these solar kits or other items financed within that? Is it end user purchased or do you guys ever work with a grant subsidies?

**Carol Weis** Were you speaking to me? I kind of missed that one.

**Stephanie Bechler** Yes. Sorry.

**Carol Weis** So, we're a nonprofit organization and we are primarily funded through foundations, through individuals as granters. The health facilities themselves do not have to purchase the solar suitcase but they do need to show a commitment towards maintenance by setting aside a fund for things like battery replacement or for servicing later on. We often will work with the district health organizations to try and set aside funds if a clinic doesn't have any funds of their own. But there's usually a third party that's paying for the capital costs of the solar suitcase itself.

**Stephanie Bechler** Excellent. Thank you so much. And that is all the time we're going to have for questions. There's about three that we didn't get to that we'll have the panelists after this webinar is over. But thank you so much for everyone's time and these wonderful presentations. Before we sign off we'd like to ask the audience to take a brief survey. It's five short questions that you'll need to answer. It's really important that we get feedback so we can understand who we're doing. And the first question is going to be displayed on the screen in just a minute. Did you find the webinar content provided you with useful and insight, information and insight? And please select on screen if you strongly agree, agree, not sure, disagree or strongly disagree. Great. Thank you so much.

Our next question, the webinar presenters were effective. Thank you very much. Our next question, overall the webinar met my expectations. Thank

you. Our fourth question today, do you anticipate using the information presented in this webinar directly in your work and/or organization? Great. Thank you so much. And our final question today. Do you anticipate applying the information presented to develop or revise policies or programs in your country of focus? Yes, no or not applicable? Great. And that is the end of our survey.

Thank you so much for participating. ON behalf of the Clean Energy Solutions Center I'd like to extend a thank you to our terrific expert panelists and the attendees for participating in today's webinar. We've had a great audience and we really appreciate your time. I invite our attendees to check the Solutions Center website if you would like to view the slides and listen to a recording of today's presentation as well as previously held webinars.

Additionally, you will find information on upcoming webinars and other training events. We are now posting webinar recordings to the [Clean Energy Solutions Center YouTube channel](#) and please allow about one week for that to be posted. We invite you to inform your colleagues and those in your networks about the Solutions Center resources and services including the no cost policy assistance. Now we invite everyone to have a great rest of your day and we hope to see you again at future clean energy Solutions Center events. This concludes our webinar.