

## Energy Access in Humanitarian Settings: Examples from Recent Crises

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### Webinar Panelists

**Yasemin Erboy Ruff** UN Foundation  
**Wani James Henry** UN Food and Agriculture Organization  
**Sandeep Giri** Gham Power  
**Corinne Hart** Global Alliance for Clean Cookstoves  
**Dinesh Tripathee**

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### Speaker

Hello everyone. I'm Tim Reber with the National Renewable Energy Laboratory and I'd like to welcome you to today's webinar, which is hosted by the clean energy solutions center in partnership with United Nations Foundations Energy Access Practitioner Network and the Safe Access for Fuel and Energy Initiative. Today's webinar is focused on energy access and humanitarian settings. One important note of mention before we begin our presentation is that the Clean Energy Solution Center does not endorse or recommend specific products or services. Information provided in this webinar is featured in the solution center's resource library as one of many best practices 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 your telephone. If you choose to listen through your computer please select the mic and speakers option in the audio pane on the right side of your screen. Doing so will eliminate the possibility of feedback and echo. If you choose to dial in by phone please select the telephone option and a box on the right side will display the telephone number and audio pin you should use to dial in. Panelists we ask that you please mute your audio device when you are not presenting. If anyone is having technical difficulties with the webinar you may contact the go to webinar help desk at 888-259-3826 for assistance.

If you would like to ask a question and we please ask that you do, we ask you to use the questions pane also on the right side of the screen where you may type in your question. If you are having difficulty viewing the materials through the webinar portal you will find PDF copies of the presentation at [cleanenergysolutions.org/training](http://cleanenergysolutions.org/training). You may follow along as our speakers present. Also, an audio recording of the presentation will be posted to the Solutions Center training page within a few weeks and will be added to the [Solutions Center YouTube channel](#) where you can also find other informative webinars as well as video interviews with thought leaders on clean energy policy topics.

Today's webinar agenda is centered on presentations from our guest panelists. Our panelists have been kind enough to join us to highlight the role of sustainable decentralized energy solutions can play in humanitarian settings focusing specifically on the recent Nepal earthquake. They will discuss quality approached and share lessons learned and best practices for settings in need of aid-based approaches with local market may be disrupted or indefinitely suspended at least in the short term.

Before I begin the presentations I will provide a short informative overview of the Clean Energy Solution's initiative which will be followed by introductions to U.N. foundation's Energy Access Practitioner Network by Yasmin Erboy and an introduction to the Safe Access for Fuel and Energy Initiative by Corinne Hart. We will then launch into the three guest panelists' presentations. After the three presentations we will have a question and answer session to address questions submitted by the audience and we'll finally finish up with a few closing remarks and a brief survey.

This slide provides a bit of background in terms of how the Solution Center came to be. The Solution Center is one of 13 initiatives of the Clean Energy Ministerial that was launched in April of 2011 and it's primarily lead by Australia, the United States and other Clean Energy Ministerial partners. Outcomes of this unique initiative include support of developing countries and emerging economies to enhancement of resources on policies relating to energy access, no-cost expert policy assistance and field learning and training tools such as the webinar you are attending today. The Solution Center has four primary goals. It serves as a clearinghouse of clean energy policy resources. It also serves to share best policy best practices data and analysis tools specific to clean energy policies and programs. The Solution 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 innovations 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 Solution Center provides 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 and no costs. For example in the

area of energy access and rural electrification we are very pleased to have \_\_\_ H. Raymond serving as one of our experts.

If you have need for policy assistance in this area or any other clean energy field we encourage you to use this valuable service. Again the assistance is provided free of charge. If you have a question for our experts please submit it through our simple online form at [cleanenergysolutions.org/expert](http://cleanenergysolutions.org/expert) or to find out how the Ask an Expert service can benefit your work please contact Shawn Esterly directly at [shawn.esterly@nl.gov](mailto:shawn.esterly@nl.gov) or call him at 303-384-7436. We also invite you to spread the word about this service to those in your networks and organizations.

Now I'd like to go ahead and provide a brief introduction for each of today's panelists. Our first speaker will be Yasmin Erboy. Yasmin serves as an energy and climate officer with the U.N. Foundation's energy and climate team where she works to coordinate efforts to scale up energy access in developing countries. She is responsible for the operation and coordination and strategic planning of the energy access practitioner network and will be providing us with an overview of the network. Yasmin earned her master's degree from the Yale School of Forestry and Environmental Studies with a focus on climate change and resource management.

Next up will be Ms. Corinne Hart. Miss Hart is the director of gender and humanitarian programs with the Global Alliance for Clean Cook Stoves. As part of her work she leads the alliance's efforts to ensure the available supply of improved cook stoves for immediate deployment in emergency response to reduce gender based violence and malnutrition that can result from limited access to cooking fuel. Miss Hart will be providing an introduction in the Safe Access to Fuel and Energy program which is co-chaired by the Global Alliance for Clean Cook Stoves.

Our first expert panelist will be Mr. Dinesh Tripathy. Dinesh is a civil engineer with the government of Nepal's alternative energy promotion center. With eight years of experience he'll provide an overview of the importance of energy access for humanitarian settings touching on both electrification and clean cooking and will share examples of AEPC's experience in this regard focusing on the Nepal's government coordination efforts around the recent earthquakes. Next up will be Mr. Sandeep Giri. Mr. Giri is the foundation and CEO of Gham Power and active solar PV company active in the development of microgrids and other productive end uses to enable energy access.

Prior to founding Gham Power in 2010 Sandeep studied computer science at University of Nebraska in the U.S.A and went on to launch multiple technology companies in the San Francisco bay area. Sandeep will reflect on the recent Nepal earthquake on behalf of all energy access practitioner network members that are coordinating or leading relief efforts. And he will share latest developments and lessons learned via Gham Power's live map and illustrate where work is being done to coordinate solar companies and relief agencies.

Our final panelist will be Mr. Wani James Henry. Mr. Henry has been working with the FAO in South Sudan for over seven years with the focus on energy access issues including those stemming from the recent war between South Sudan and the Sudanese government in \_\_\_. Since the onset of the war Mr. Henry has been involved in the Safe Access to Fuel and Energy initiative. Mr. Henry will cover the clean cooking aspect by elaborating on FAO's role on the state's steering committee and the organization's work on biomass fuel and cook stoves in humanitarian settings. And with that I'd like to go ahead and pass it off to Yasmin who is going to be providing us an introduction to the U.N. foundation.

**Yasmin Erboy**

Thank you very much Sam. Can you hear me?

**Tim Reber**

Yeah.

**Yasmin Erboy**

Perfect. Good morning everyone or good afternoon depending on where you're joining us from and thank you all very much for joining this month's practitioner network webinar on energy access in humanitarian settings in the context of refugee aid. I just wanted to provide a quick overview on the Sustainable Energy for All initiative and our energy access practitioner network. For those of you who may be joining us for the first time before we get to the main presentations. Next slide please.

So as many of you are joining us today know 1.2 billion people worldwide lack access to energy and a billion more have only intermittent access. 2.8 million people lack access to clean cooking solutions. With this in mind the U.N. secretary general launched the sustainable energy initiative in 2011 calling on a range of stakeholders to make commitments to action to accomplish three objectives by 2030 and these are insuring universal access to modern energy services, doubling global innovative improvements in energy efficiency and doubling the share of vehicle energy in the global energy mix. The U.N. General Assembly also unanimously declared 2014 through '24 as a decade of sustainable energy for all. So this is really an opportune time to scale activities on sustainable energy and decentralized energy solutions in particular within the international development community. Next slide please.

So many countries and a large range of businesses and NGOs and other stakeholders have made commitments to support the Sustainable Energy for All initiative in particular to deliver universal energy access by 2030. A number of these commitments are from members of our own practitioner network and you can look at the Sustainable Energy for All initiative's website on their commitments web page to see all the new commitments that were made during the second annual Sustainable Energy for All forum which took place this May in New York. Next slide please.

So having mentioned the energy access practitioner network our practitioner network is the U.N. Foundations' contribution to the energy access objective at the Sustainable Energy for All initiative. We bring together a wide range of stakeholders, mainly small and medium enterprises and practitioners working on the ground to deliver sustainable energy services but also \_\_\_ by the social

enterprises, larger corporations, government agencies, academics, anybody who is working on decentralized energy solutions or involved in settings are welcome to join. We now have over 2,000 members from all across the globe and they have reported reaching over 230 million individuals over the course of their organizational lifetimes. The practitioner network is focused on market-based solutions but our members might have noticed that we have been doing more work on humanitarian settings where the market breaks down or is nonexistent and this webinar is a contribution to this needed focus area under our practitioner network. Next slide please.

So the international energy agency estimates that decentralized energy solutions will provide energy access for roughly 60 percent of those, that population that now lives without energy access and we've seen a change over the last few years in renewables especially on the electrification side and a growing applicability of renewables in humanitarian settings which goes beyond simple solar lanterns. Access to clean energy solutions as you can all imagine is key in relief efforts for both first responders and victims and quality assurance is extremely important, as we need to be able to deploy systems that will work with little to no maintenance. This is still a newer sector. We're learning with every new emergency since no two are all the same and we can't predict what renewables due to battery or storage concerns like we would be pre-deployed.

Both the humanitarian and the energy sectors are learning to manage these crises and the energy needs that come with them together and the practitioner network now serves as the electrification or lighting expert on the safe access to fuels and energy steering committee and you'll be hearing more about SAFE shortly. I also wanted to give a shout out to a number of our practitioner network members who have been at the front lines of who have helped coordinate relief efforts for relief in Nepal earthquake, including Gham Power, \_\_, Empower Generation, \_\_ and many others. And you'll also be hearing from Gham Power today about their experience in doing so.

So without further ado I'd love—I would now like to turn it over to my colleague Corinne to begin the conversation on our current work and challenges around energy access in humanitarian settings from SAFE's perspective. Thank you.

### **Corrine Hart**

Great. Thank you. Thanks everyone for joining us today. My name is Corinne Hart. I'm the director of gender and humanitarian programs for the Global Alliance for Clean Cook Stoves which is an initiative of the United Nation's Foundation. And I also want to introduce my colleague who is also on the line. Katherine Arnold, who is the senior associate leading a lot of our SAFE work here at the alliance. So just some quick background on the Global Alliance for Clean Cook Stoves for those who are not familiar with it. We are a public private partnership that's working to save lives, improve livelihoods, empower women and protect the environment by creating a thriving global market for clean cook stoves and fuels and we have a target of 100 million households adopting clean and efficient cook stoves and fuels by 2020.

There are a lot of impacts around the lack of access to clean cooking solutions in the developing world. Over four million people are dying every year from breathing in the toxic smoke. Women and girls in particular are spending hours every day collecting fuel in the humanitarian settings risking their safety to do so. There is a lot of, many different environmental impacts and these impacts around health and economic burdens disproportionately impact women and girls.

So I think people are generally familiar with the impacts around the lack of access to cooking solutions in the developing world but people may not be as aware of the very serious impacts for crisis-affected populations. So they suffer from all of the same impacts by not having access to cook stoves and fuels but sometimes these impacts are even more dire and life threatening. In particular there is a serious protection issue in humanitarian settings. Displaced women can walk for hours sometimes to find firewood and have to carry incredibly heavy loads back to the camp which can lead to risks of dehydration, physical injury and attack. And when they leave the safety of the camp they face an increased vulnerability to the risk of gender-based violence such as rape.

The health issues are also very serious for those living in humanitarian settings. For example open cooking fires can increase burns and devastating fires. For example in 2015 we saw a cooking accident which triggered a fire in an entire refugee camp leaving almost 3,000 Burmese refugees without shelter. And similar accidents occurred in 2012 and 2013. So it's a very serious risk. In 2008 for example we saw a fire that destroyed almost 95 percent of the housing structures in a refugee camp in eastern Nepal which forced almost 1300 families to sleep out in the open without shelter and it was caused by an old oil lamp. So this is a very serious risk in humanitarian settings particularly camp settings where shelters can be incredibly susceptible to fire.

We also see some health issues around the inability to boil water sufficiently where refugees are trying to save fuel because they don't have enough to boil the water and can lead to the consumption of contaminated water. And also the scarcity of cooking fuel can force households to trade their fuel, trade their food rations for fuel in order to cook the food rations that they do have. And what we see in those situations is that it's often the woman in the household who goes without eating enough calories to have a proper nutrition. And then of course those living in humanitarian settings are also exposed to household air pollution which can kill four million people, which kills over four million people every year.

And then of course there's environmental degradation. Harvesting of firewood contributes to deforestation, soil erosion and a loss of agricultural and grazing environments. And this deforestation and erosion can increase the risk of natural disaster and even more importantly in humanitarian settings it can actually exacerbate the tensions between the humanitarian populations and the host communities furthering conflict in crisis which really creates a

cyclical problem in terms of refugees needing somewhere to go but needing the resources to sustain themselves.

We also see issues around unsustainable livelihoods. Refugees are often not allowed to legally work in the settings that they're living in and so firewood collection and charcoal sales are sometimes the only source of income available to them and then further environmental degradation caused by fuel collection can seriously hamper their livelihood opportunities around agricultural and pastoralist communities. So it's a very serious—a very serious issue for refugees when they lack access to clean cooking solutions.

So the alliance in order to address this issue and to be part of creating solutions around this is the co-chair of the Safe Access to Fuel and Energy in humanitarian settings steering committee. This steering committee is led by a consortium of organizations including all of the major humanitarian implementers like UNHCR, World Food Program, UNICEF, FAO, Mercy Corps and others. And we're really working to address this cross-sectorial issue in humanitarian response and are focused on improving access to energy for cooking, lighting, heating and powering. Our vision is that there would be a world one day in which all crisis affected populations are able to satisfy their fuel and energy needs for cooking, heating and lighting in a safe and sustainable manner without fear or risk to their health, wellbeing and personal security.

So cook stoves is only one piece of this, cooking energy. We have many SAFE partners working on the energy piece more broadly. The alliance is obviously bringing the cooking expertise to the table but we see UNHCR for example working to improve access to solar lighting and power generation for health centers. FAO is establishing tree nurseries and World Food Program is working on the school feeding programs around cooking and lighting for schools. So many people are working on the issue in many different ways.

The SAFE steering committee has a strategy that is focused on six different pillars so we are coordinating the sector and sharing information. We have a website that has a global mapping of all of the different projects being done in humanitarian settings for example where people can, practitioners can connect with each other. We commission research and build evidence to make the case that energy access is critical for these populations. We're providing technical support so we have trainings for humanitarian implementers on energy for example, building human resource capacity of those working in these settings as well as energy practitioners who need to understand the complexities around humanitarian settings. We conduct advocacy and raise funding for the sector as well.

So the alliance's humanitarian target for our phase two which is the next couple of years is one million crisis-affected households gaining access to safe fuel and energy by 2017. And I should mention here that the new global trends report released by UNHCR just announced that there are now actually 59 million people displaced in the world up from the 51.2 million featured on this slide. So the number is increasing which is making the situation even more dire. And just to give you a snapshot of what the alliance is doing in our



phase two for our humanitarian program we're working to train humanitarian field staff. We'll be having a training later in July in Uganda. If anyone is interested in that I encourage you to get in touch with us. It will be for humanitarian implementers to learn more about how to do safe interventions, how to roll out energy access interventions.

We're conducting advocacy for the sector so we really want to see SAFE and energy access to be recognized as part of the UN humanitarian response system. So for example when there is an emergency or when humanitarian implementers are rolling out programs in protracted settings. Having a place for energy to sit within the humanitarian system so that it can be funded appropriately and that there are staff responsible for it. And we're really working to increase the types of tools available so for example we really pushed at the SAFE steering committee to have energy questions inserted into the rapid assessment tools and then the Nepal response so that we could get some data around what the energy need actually is as humanitarian implementers are responding to these crisis. We're working to mobilize resources. We're coordinating the sector as I mentioned, really trying to insure that people are avoiding duplication, learning from what we've already tried and leveraging different areas of expertise from different sectors.

And then we are focusing a lot on conducting research to understand which approaches are most effective for reducing gender-based violence and then working to identify minimum technical standards for cook stove selection. So for example when UNHCR releases tenders and is trying to procure different technologies we are trying to work with them to help them understand where they should set minimum technical specifications around efficiency, cleanliness, but also looking at things like what should they be spending on it, how much, how durable should the products be, how can they measure safety, etcetera. So I'll leave it there but that was just an overview quickly of what the alliance is doing in this area and I welcome any questions after we've heard from the other presenters. And there's my contact information as well as the SAFE fuel and energy website that has a lot more information about what we're doing. Thank you.

**Tim Reber**

All right. Thank you both Corinne and Yasmin. Very interesting. So with those two introductions we'll launch into our presentations from our expert guest speakers starting off with Mr. Dinesh Tripathee. And Dinesh you are still on mute and I did just pass you the control you should be able to show your screen. Hi, Dinesh, are you there?

**Tim Reber**

So Dinesh if you want to go to the top left of your control panel on the right side of the screen there should be an option to un-mute yourself. Ok. Well it seems like we might be having some technical difficulty with Dinesh so Sandeep—

**Dinesh Tripathee**

Hello.

**Tim Reber**

Oh, never mind. There he is. All right. Great.

**Dinesh Tripathee**

Hello.



**Tim Reber** Hi, Dinesh. I passed you the controls to show your screen so you'll want to accept those and you'll be able to show your Power Point. Very good.

**Dinesh Tripathee** Do you see?

**Tim Reber** Yes, we can. Just go ahead and make that slide show view and you're all set. Great. Thanks, Dinesh. Go ahead.

**Dinesh Tripathee** Ok. Hello everybody. I'm Dinesh Tripathee. I was looking at biomass energy as a component of alternative energy in Nepal. This certainly has alternative energy promotional centers in \_\_ focal agencies for the promotion of renewable energy technologies in Nepal and right now we are implementing a national renewable energy program in \_\_ which is supported by different diplomat partners and we have leading energy. So I prepared a brief slide as we are more focused on the re-elevation package. So I'll just focus on the re-elevation part. And just as all of you might know we are also a member of the Global Alliance for Clean Cook Stoves and we also do have here a national alliance for clean cook stoves and we have a project to make all households of Nepal smokeless by 2017. That was a brief introduction so now I can move on to my presentation.

That's the algorithm of my presentation. Mostly as we are more focused on the sustainable part of the renewable energy. So mainly after the quake what we did the national gridline in the one area. It was not working to focus on \_\_ every which way. We just simply did not. So most of them were supplied by the national grid after the quake. That was the benefit of \_\_ so most of the cost makers were collapsed and most of the people fell down. Even in the capital city we didn't have electricity for seven days, even eight, nine days for some parts. So what we learned from that was that this traditionalized energy system, renewable energy system might be useful even for the urban area, not only for the rural area which we earlier we focused only in the rural area but this has a \_\_ that we should also have a disaster network with our duties with that and our renewable energy as a backup for the redistribute. We'd need to have electricity in the hospitals now where we better think here, even at oxygen producing factories so that was one of the lessons we learned from that.

Just I want to general overview of the off grid premise but four of the six were affected and a lot of them within district were severely affected while the western part of the country was less affected. But the central part of the country region was the most severely affected. It took—we had backup in 648 \_\_ and 16,808 after injure and we also have to take off the houses that were destroyed by the quake. We had almost 500, more than 500,000 houses were fully destroyed and more than almost 270,000 houses were partially destroyed and out of them the government houses, the government offices were off 978 were destroyed. Actually distributed were 3,021.

And this also had an effect on the renewable energy technology. So for that we asked for all the centers that are 2011 we got a brief information. We do have, out \_\_ structures have the districts. The district energy environment and climate in sections and also we have our implementing partners, the regional

service centers working at the district so that we would help those partners, we collected our data and as for our data in the districts would build 500,000 households were affected as I mentioned earlier and out of them it affected we needed to look at the data with a number of [Break in Audio]

### Tim Reber

Hi Dinesh. Hello Dinesh. Are you still there? Hi Dinesh. Are you still on the line with us? All right. I think Dinesh might be experiencing some technical difficulties so we might have to move on to Sandeep at this point and we can always come back to Dinesh and let him finish up his presentation. So why don't we go ahead and do that? We haven't heard from him. So we'll move on to Sandeep. Oh Dinesh are you still there? All right. We're going to move along to Sandeep. Sandeep I'm going to hand you the controls for your presentation and like I said we can come back to Dinesh after that.

### Sandeep Giri

Thanks. I appreciate that. This is Sandeep Giri. I hope you can see my screen. So we all love this lady from \_\_ which was the epicenter of the unfortunate earthquake from, on April 25th. This photo was taken actually by one of our field teams who visited there with some solar lights and charging stations for mobile phones. And it just goes on to reflect how energy access is so important in humanitarian settings as we saw firsthand in the Nepal earthquake. I know you've heard a lot of things in the media and seen lots of unfortunate images and I found this infographic from \_\_ and Facts Nepal about the recent earthquake. And the number of casualties and damages is obviously very, very disturbing.

What we, when we go into this relief and rebuild phase find particularly troubling is a) the number of aftershocks that are still going on. So even after almost close to two months now this last week we had close to five Richter scale aftershocks. So things are literally in flux as we speak. And hopefully we all think they will subside. But it is there as a constant reminder. And then in addition to like the lives that are impacted what's also troubling is the number of buildings that were completely damaged so you see at the bottom there's close to 500,000 buildings completely damaged and the schools about 7500 of those are damaged, health facilities and the number of livestock people have lost. So it's a pretty major impact from the earthquake.

Now in our own case we're a solar company based in Nepal and Gham Power has been working in Nepal since 2010. We have a staff of about 40 people. And this is our office in Katmandu. Now this photo was taken about roughly a few days after the April 25th earthquake. The earthquake happened on a Saturday. Obviously for us the biggest thing was to figure out friends and family were safe and also our staff. And luckily we were fortunate that all of our staff were pretty—they were shaken up but physically nobody was harmed and few people lost their homes. And when we showed up on at the office on the Monday the immediate question for us is what do we do. And there were about seven or eight of us at the office and we're looking at each other and we think what do we do at this point as a private solar company just and just as people who were shaken up ourselves.

And we felt the most obvious thing we could do was just to grab everything that was in our inventory and our stock and just find places where we could

help. And we were hearing in the news that there were a lot of these, a lot of these shelters and tents and so forth which, where people were starting to take shelter. We were also hearing news from the field that a lot of the villages it was hard to get help out there. So we just started going out there with whatever we can grab, solar panels, lights, phone chargers and so forth because that was the most immediate thing we could take. I also found it to be most helpful. And so these are the 20 volt units our staff started assembling that very week because right after your basic medical necessities and getting food and water the most obvious thing for people is to call somebody and let them know that they're ok and just have some lights when things are so dark at these tents or even wherever their households were. And so having some basic lights and more especially being able to charge their phones was a very big thing and so we started assembling these just from the parts we had around and started taking to different sites.

Here is one of the villages in Nepal which is a district nearby Katmandu, but it took us about six hours to get to this site. This is actually a charging station we put together which could charge about 20 phones at a time. And we had lines that, where people waited for about up to three to four hours including the local policemen in this case who was just waiting for his phone to get charged so he could make his both work and hopefully personal calls as well. Some of the kids had more fun. Obviously they almost had put the circle around and as harsh the situation might be managed to keep themselves happy. And of course we were very happy that we could be of help. You can look at the number of mobile phones and the level of porch lights that are on the ground.

And this is a health station at the same location. This health clinic because it was so dark inside the clinic even during the daytime you can see that they're administering all of the services outside the clinic and obviously this was one of the places for us, it was very obvious to go ahead and put some lights in there so they can start providing some of these services from the inside. But that just goes on to show that how even little things like lights and mobile chargers can be so helpful in so many different ways at these locations. Now we were also trying to figure out how big is this problem because very soon, almost in a matter of days, we as a small company of 40 people were running out of our inventory as we were trying to help. And we were trying to figure out like, ok, how big is this problem and how do we organize ourselves?

So we at the same time this group—this is a site called [quakemap.org](http://quakemap.org) and it's organized by this group of volunteers, very energetic young people called Katmandu Living Labs. These are open source software folks who have been working on a mapping project called open street map which apparently had a lot of, was able to put out a lot of help at the Haiti earthquake and so forth. So they started putting a map together called [quakemap.org](http://quakemap.org) that you see here and at the bottom you see all of those red circles which is basically capturing all sorts of incident reports. People, everything from people trapped under their houses, some requiring help, somebody requiring water, food. Some basic emergency stuff. It's all geotagged and put together in a map and shared with every relief agency that's out there.

And we were very inspired by this and we reached out to them and said, “Can you also track wherever people are in need of electricity like lights, chargers or even something greater?” And obviously they were very overwhelmed at that point and they suggested like why don’t we just kind of do something, track data on our own and we will agree to share data between ourselves and get it to the widest audience possible. So with that in mind we put together a website called [nepalquake.ghampower.com](http://nepalquake.ghampower.com). It’s a simple Google form where either folks can directly enter data about wherever they need help or even our staff as they’re getting requests from over phone, over just our field visit folks making field visits just from our own office, even our Facebook page. We have about 40,000 followers and there’s a lot of requests coming from there.

This was our way of entering all of the information but who out there needs help in terms of lights, charging stations or anything to do with electricity. And we took this data and put together on a Google map called [nepalquake.ghampower.com/requestmap](http://nepalquake.ghampower.com/requestmap). It’s live right now and it’s a live map where each of these map markers is a help request. The color codes are as follows. The red ones, we have 84 of those right now waiting for help where we haven’t been able to respond. There’s 53 sites where solar is on its way so it’s our cells or any of other relief organizations. So we’re sharing this map with everybody that we know and we have a lot of partners in power generation who is also going out there, taking supplies in spaces and I’m happy to report that 45 of these sites we have actually completed solar installations.

Now this by no means is the comprehensive portrayal of what the help, what all the help is needed. I mean this is just stuff that Gham Power as a small company knows just with our limited interfaces. But that just goes to show how these technologies are so helpful in figuring out where help is needed and also more importantly to coordinate our efforts. Because this is definitely beyond just one company or one agency and we’ve called that some way to share this information is definitely very, very helpful. And also knowing that as a company our resources wear out mind you and this is like four days after the quake and we’re already out of supplies. And as a private company there’s only so much we can do. So we also started a campaign called rebuild with sun. So here’s our Facebook page, Rebuild with Sun, just to create awareness so a lot of people know that this is something we’re doing and we can solicit their help. We also started with an Indigogo page and we’re using this to raise money just from friends, family, folks we know from our network at work but more importantly trying to get awareness on a larger scale from other solar companies that are working around the world.

And I’m happy to report that a lot of folks, Solar City, they committed to helping 200 different schools, working with power generation. \_\_\_ in Germany, they committed 20,000 Euros. \_\_\_ run a matching donation campaign from their employees. One Million Lights is a nonprofit based in bay area. They committed to help with building out some of the smaller lighting systems and nanogrids. So this was actually what we wanted a lot of different organizations working together, coordinating our efforts to get solar powered solutions at these individual locations. And as we started to get this

help we could do work on a greater scale. So for example we were able to send a larger group of sites using our staff as volunteers from local organizations.

So here you see folks like having to literally find a new way. This was our team on the way to the epicenter of the earthquake, a village known as Barpak which was pretty much leveled completely. A lot of places the common road to get there was basically disappeared after landslides and so forth so folks were really having to make their way through difficult terrain. Once we got to the village, this is the village of Barpak as you can see in the background. There are very few houses that were left standing up there. And as we installed these solar panels obviously this was stuff that we, so things that we pre-kitted ourselves at the office and we just basically had to take to the site and put it on the roofs.

And we can see that just having some basic light to read inside their house. We heard from one of the, one of these local ladies that just seeing their kids being able to read during the night kind of gave this feeling that things are slowly getting back to normal. And that was very profound to us to see how this would make a big impact. The local children were also a big help. Very curious about how the technology worked and willing to help wherever they could. That was very, very promising and it just goes on to show like how beautiful these places are that were devastated and us being able to take solar out there was rewarding in so many different ways.

Now there were also a lot of these tent cities that you see, sorry, tent shelters that you see. This was on the way to Barpak. We saw a lot of these. The scattered rubble around the house. And these pictures don't exist on the map so very hard to sometimes figure out who all needs help. So this is an ongoing I guess an issue and challenge for all of us. Some of these places we've also taken solar and used these little street lights to provide community lighting. And like I said as help starts coming in we find that installing larger community charging stations like the ones you see here is probably the most effective way to get a lot of people power in the fastest way possible during the relief period.

So how big is this problem? Well in Nepal the 14 districts out of 75 have been tagged as highly affected. And the government estimates are about 2.8 million people having been displaced. Looking at the census data this means about 746 village development committees, VDCs. There's roughly about three villages per VDC. So when we try to figure out how big is this problem we took a strike at having some initial estimates. And again these are very broad level estimates ourselves. I think for the immediate level which we see between 30 to 60 days I think about at least in our estimate about one million personal lights and mobile charging kits are needed. And I think the number that's been deployed is still in the lower thousands.

And we also feel very strongly that at least each one of these VDCs if not more needs one community charging station that the entire community can use and is within the reach of the entire VDC. So roughly about 1,000 community-charging stations are needed immediately and we're nowhere

close to that right now. In the near term which we think is about six months we feel very strongly about the community charging stations because we see those transitioning slowly into picogrids when the rebuilding phase begins. And this number is about 10,000 picogrids, one for each roughly the community. And what the picogrids do is basically a centralized sort of PV system with a small transmission line, DC transmission line going to individual households, providing basic lighting, mobile charging and powering other DC appliances.

And so that's what we feel very strongly about the community charging stations because we can install those at a specific community so it can help the community in the relief base very immediately. But as it goes into rebuilding you can start extending transmission lines from that charging station and also probably upgrade that charging station so it can fit the needs of the community. We have had installations as small as 200 watts or 400 watts that have been able to provide basic lighting and mobile charging stations to a community of about 20 to 30 households that are in a close enough cluster that you can join with DC wiring.

And lastly the long term six month estimates, we feel that this is definitely an opportunity to build it better. A lot of these houses have pretty terrible electricity conditions or a lot of these villages and communities has pretty bad electricity conditions to begin with even before the earthquake. And that's why a company like ours was in Nepal in the first place to provide microgrids and productive in use systems. So over the long term we feel pretty strongly that these picogrids need to transition into microgrids where they're not only just providing some basic household level electrical energy needs but also providing productive end use in those communities whether it's powering a rice mill, a dairy chilling center, a local clinic, school, what have you or even telecomm towers. And thus getting those communities on a path to having sufficient electricity not only for household uses but also being able to put to productive end use and generate a local income.

Obviously that's a long-term view. What's needed immediately is to basically having enough power to run power tools, help with the relief work and get the communities enough lights and charging but definitely you can do that in a way that's not just providing Band-Aid solutions with solar lanterns and so forth but actually going into providing larger PV systems that can last for a longer time and provide greater value.

And like I said we've also tried to take some rough numbers. We think the immediate help that's needed that's at least an estimate of about \$1 million just to provide the one million charging kits and the 1,000 charging stations. The 10,000 picogrids, our estimate is roughly about \$50 million, around \$5,000.00 per picogrid. And then the microgrids we are putting north of 20,000 microgrids over the course of time. That's going to be at least a billion dollars in investment or more. Now obviously these are big numbers which require a large ecosystem to implement. And also this is both private funds as well as public funds. I think that's what needs to be combined to get this



there. And happy to report that in order to get this work done there are a lot of companies like Gham Power who can help.

And just by ourselves we've been in Nepal since 2010. We've deployed close to 600 projects in Nepal and we strongly believe that the scale, way to scale solar is by standardizing projects, aggregating them, providing pay as you go financing, PPAs and so forth. And also not just us, enabling a bunch of other companies in places like Nepal to do the work that's needed to address not just the earthquake related relief issue but also to build it better. Thanks for your time. I really appreciate it. Again I'll be taking questions at the end of the session.

**Tim Reber**

All right, Sandeep. Thanks very much. Some really fascinating work you guys are doing by your staff. So I guess we're going to move on. Dinesh seemed to be having some technical difficulties so we're going to—we're not going to go back to him but for those of you interested in what he was speaking about we will try to post his slides to the Solution Center website shortly. So with that we will go ahead and move right on to James. So James are you there?

**James Henry**

Yes, I'm right here.

**Tim Reber**

Great. Ok. Well I think we'll be—we'll be running the slides for you so if you want to just let us know when to advance the slides we'll go ahead and do that for you. And James can you see the first slide up? I have it all up there for you.

**James Henry**

Hello?

**Tim Reber**

Yes. So James, can you see the slides there on your screen?

**James Henry**

Yes. I'm seeing the slide right on the screen. Yeah. Here.

**Tim Reber**

Ok. Go ahead and get started and we'll click through for you.

**James Henry**

I would like to briefly talk on the ease of access to energy and technology access to displaced people in South Sudan. My presentation will quickly have five or six points. One to give a general overview that is the events of FAO in this current context of crisis in the country. [Break in Audio] to the displaced and also look at the interventions that FAO had put in place in order to address issues related to access to energy and the technology. Just quickly to have an overview of biomass energy needs in South Sudan, generally access to energy has been a very big concern even before the war. And the country depends on the use of firewood or charcoal for cooking or for heating, even before the crisis.

This demand has actually even gone higher or significantly increased simply because of the concentration of people in small place with very limited access to the traditionally wide area of gathering and collection of firewood.

Traditionally the immediate response from the humanitarian organization has been providing food and provision of food without access to secure access of

energy this is a very serious problem not only to the households but in regards to health or protection issues but also a significant impact on the environment physically because a number of people concentrate in a small place and all these individuals actually that are the same or collect the sources for cooking from the same area. This workload is entirely on women and children. So in this context addressing a wood-based energy and wood for consumption is very important in responding to humanitarian crises given the experience that the country has gone through. [Break in Audio] Are you there?

**Tim Reber** Yeah. We're here James. James?

**James Henry** Yes. Yes.

**Tim Reber** Yeah. We're here.

**James Henry** The reason why I wanted you to—great. Yes, please. Yeah. The intervention was basically to address the serious challenges that are linked to protection of civilian sites and in IDP terms. And in order to really understand [Break in Audio] used and in that way the protection is to gender environment increased on livelihoods in order to design and intervention to the energy crisis that was affecting the internally displaced people who are either in the civilian protection sites or in IDP camps. Yes, we can move to the next slide. Hello?

**Tim Reber** Yeah. It should be showing the rationale slide right now.

**James Henry** Hello?

**Tim Reber** Yeah, James. Can you hear us?

**James Henry** Yes.

**Tim Reber** James, we're on your rationale slide right now.

**James Henry** Yes, I'm getting you. Yeah.

**Tim Reber** Yes. Go ahead.

**James Henry** I'm right there too. Yeah. The rationale actually we are, the rationale actually behind this intervention was to minimize the impact of the increase of population on limited area as a safety concern and this increase of population on a very limited area has very significant impact and this collection of biomass energy from this limited area is often as I said it would be very inefficient technologies for actually cooking and heating. That's why FAO in context of these challenges based on some findings and studies opted to [[Break in Audio] fuel stoves that use fuel efficiently and this introduction of fuel-efficient stove was to address a number of issues.

This environment, health, livelihood and protection issues because in some of the areas actually in one of the POCs there were already incidences of rape that had been recorded. And it has become a very serious gender related

problem in the civilian protection site especially when women and small girls go to collect firewood for cooking and also as a source of livelihood for earning money. So in order to address this risk before the efficient stove were introduced in the camps where internally displaced people are currently sheltered. Hello?

**Tim Reber** Yeah, James. If you just say next slide when you're ready to move on to the next slide I'll advance them.

**James Henry** Hello? Yes please.

**Tim Reber** We're on your protection slide right now. So you just need to let me know when to move on to the next slide please.

**James Henry** Yes. Ok. I will let you know. Thank you. Yes. As I said on their own there are already reported incidences of rape in some of the civilian protection sites especially when women and girls go out gathering firewood for cooking and also gathering firewood for selling in other to earn some money to buy a few things in the household. Ok. Move to the next slide. Hello? We can move to the next slide.

**Tim Reber** James, I think it's just a little bit slow maybe in the connection. There's some delay. We're showing your environment slide James. I think it just might be a slow internet connection.

**James Henry** Yeah. I actually have a very slow internet here.

**Tim Reber** No worries. I think everybody else will be seeing this.

**James Henry** You know, because of—

**Tim Reber** And James we have about 10 more minutes for your presentation so if we could move through a little bit quicker. I know you have a few more slides. If you could try to wrap up in the next ten minutes.

**James Henry** Ok. Yeah. Basically what I wanted to say here is that because of the [Break in Audio] for adding or making money most of the internally displaced people opt for collection of firewood and selling of charcoal. And this has very significant impact in the degradation of the environment and long-term food security potential of the country. We can move quickly to the next slide.

**Tim Reber** Very good. We're on health and nutrition.

**James Henry** Yes. In some places where households were unable to get enough energy they resort to some coping mechanisms, having food eaten dry or soaked in water and cooked for a very short time and this often has very negative impacts in terms of the health status of especially children whose digestive systems are not still very strong eaten undercooked lentils or grains often resulting to diarrhea because of incomplete digestion of the food. And as I said earlier on most of the households actually use the traditional stoves for cooking and this has a lot of health related problems because of the smoke and because of also

the inefficiency. A lot of energy is being wasted as a result of this and all of this will contribute to health related problems because of food which is not properly cooked and also because of the inhalation of smoke in the process of cooking. Yeah. So come up to the next slide.

**Tim Reber**

All right. We're on livelihoods now.

**James Henry**

Yes. I said earlier on because of limited income generating activities children and women are forced to go to collect firewood, getting out of the camps or the protective sites and this expose them to a number of risks, rape, abduction and all these issues have actually been documented and imported in a number of U.N. situational reports regarding current conflicts in South Sudan. Yes. You can move to the next.

**Tim Reber**

Yep. We're on methodology now.

**James Henry**

Hello. Yes, please. We can move to the next slide.

**Tim Reber**

Yeah. It should be on methodology. James, just go ahead and when you say next slide I'll move on and just go ahead and start presenting for the next slide.

**James Henry**

Ok. Yes. Well in order to really design a technology or a invent a technology which is very suitable a baseline study was undertaken and this baseline study was basically undertaken to understand the sources of biomass energy and the types of technology that individuals use in a household so that our intervention would be right and quite relevant to the situation of the households who count in the civilian protection sites that are being managed by the U.N. You can move to the next slide.

We also, the baseline survey was followed by a post distribution survey. This post distribution survey was actually done after the distribution of the first batch of stoves that were issued to the IDPs or the internally displaced people. And I would like to quickly run through some of the results from the baseline. Yes, one of our findings from the baseline study was that most of the households were using firewood. Over 97 percent of the households were using firewood for cooking and heating. And the next option was actually charcoal. Although traditionally agricultural residues and animal dungs and other types of fuel could be used or are used in households.

But because of the confinement in the refugee or the internally displaced camps where most of these people have lost their assets they don't have access to animal products. They don't have agricultural farm. So basically there are only two forms of biomass energy that were used, firewood and charcoal and firewood being the highest actually commonly used source of energy in the household. Quickly on types of—basically those are the technologies you see where it is, where it's firewood and the tree stumps. Those are the two traditionally used stoves for cooking, a tree stump and a metallic charcoal stove where there's a kettle on it for heating up water for your I think tea. This picture was taken in a nearby site where it is a restaurant. So basically these were the two types of technology, the tree

stumps and the metallic charcoal stove which are very, very inefficient types of energy use and also some of the negative associated with it.

We also tried to look at the source of firewood and how it was sustained. Most of the households actually collect their firewood from the forest and very little actually collect, a small percent people access the market and nine percent of households are provided with some source of energy \_\_ and this is mainly in the urban area, a place like \_\_ where most of the households cannot actually go to the forest because of the setup of the city. A number of the forests near the city have already been cleared for construction so there's no forest so they entirely depend on it from the NGOs that manage the camp.

An average actually household made 33 trips in a week to collect firewood that can last a week to prepare food. So you can see over six hours or four hours are spent every time one goes out to collect firewood. On average most of the households actually go from five, cover from five to six kilometers that is to go and collect and get back home. They take around five, they spend, they cover around six kilometers every time they go out to collect firewood which is very significant amount of time that is spent only in collection of firewood. And predominantly this work is being done by women and yet traditionally most of the household activities are done by women. So with this kind of tent the burden on women actually has been very high because of they have to spend six hours to collect firewood and have very little hours for cooking and doing other domestic work.

**Tim Reber**

James—

**James Henry**

So basically I also came out. Yes?

**Tim Reber**

Yeah. We've got about two minutes here to wrap up real quick so if you'd like we could just move on to the recommendations and conclusions slide and give you a chance to provide some closing thoughts.

**James Henry**

Ok. Let's just get quickly just move to the conclusions and recommendation and one thing that I would like to say was that FAO provided two types of cooking stoves and this is stoves where one is charcoal and the other one is firewood and most of the households actually prefer to use the firewood stove simply because of accessibility to the forest where no cost is incurred [Break in Audio] worked I would like to say based on our experience in this current conflict is this need to recognize problems of fuel for cooking, heating and other immediate needs in the context of humanitarian setting, not a traditional approach of only providing food items and nonfood items like shelter related materials.

Access to cooking fuel has effects on the livelihoods, the wellbeing of the people, the environment and the resilience of the affected population to respond to such. And because of this strong link between energy access and food security imagine for the response to be considered as lifesaving interventions and to have a firm place in any emergency response considered. And this can only be done through some advocacy which FAO properly did in the country. But it's not all in the fuel but it is also need for energy to be

integrated in the support to be provided to people who are in crisis or people who are displaced. I think for now this is what I can say and for details some of the things are on my slide regarding statistics and findings from the baseline survey and the result of the baseline survey. Thank you.

### **Tim Reber**

Thank you very much James and I'm very sorry we didn't get a chance to get to all of your slides. It looks like it would have been a very interesting presentation but for those of you interested in the rest of James' slides as well as again I'm sorry we weren't able to finish with Dinesh due to technical difficulties. I'd like to remind you that all of those slides for all of the presentations will be posted in their entirety to the Solution Center's website. So if you'd like to go back and look at some of those they should be up there very shortly. And again I would like to apologize for some of the technical difficulties we did have. When working in developing countries and particular places undergoing humanitarian crises this sort of thing is bound to happen.

But we do have a few questions from the audience and I wanted to make sure to leave some time to get to some of those questions so without any further ado we'll jump right into those. The first one is for Corinne with the Global Alliance for Clean Cook Stoves. Unfortunately she had to leave but we have her delegate Katherine Arnold who has joined us representing the alliance. So Katherine there's a question here.

Somebody is interested in knowing if there's a chance to mobilize resources for projects in Columbia, South America particularly. I don't know if you can speak to that or point them in a direction where they might be able to find some information. Katherine are you with us? Ok. I guess Katherine is not there, not on the line so we'll just move on. The next question here is for Sandeep. Sandeep you mentioned the microgrid powering telecomm towers as well. What kind of viability does Nepal have for that in potentially turning telecomm towers towards microgrids?

### **Sandeep Giri**

Actually there's a great potential for that and in fact we're—this year we'll be starting with our first project working with the local telecomm company to work in this model. So let me just give you a background. There are like two major telecomm companies and Nepal telecomm which is partially owned by the government and then there's a private company called \_\_ which is part of the \_\_ group. And then there's a couple of smaller regional players as well in Nepal. So and these companies just like any other I guess developing country they're growing leaps and bounds. I think last I saw the number was in maybe 30,000 or 40,000 telecomm towers or something like that. Don't quote me on that number but there's a significant amount of telecomm towers out there.

And each one of those towers in rural areas is being powered by either currently with the diesel generators or a mixture of diesel generators and solar energy. In some cases they've tried to go completely solar and obviously for telecomm towers that's a huge burden because these towers are, those are at remote sites. It's expensive to own and operate it yourselves. Support is a big issue if you're not a solar company designed to support these kind of towers. So long story short a lot of the telecomm towers we met have expressed a lot of interest in a model where it's a more of energy services kind of a play



where a company such as Gham Power or any other ONM service provider can guarantee them a certain amount of energy with a certain amount of up time and work in that business model.

So what we've looked at is the opportunity of using telecomm towers as an anchor load for a rural microgrid opportunity and so obviously this doesn't work for all of the towers especially towers that are quite far away from the nearest community or village but to the extent that you have a tower let's say within a like a one kilometer radius of a significant size community or village. And significant size to us is somewhere around 100 households. Then in those cases it's a great model because you basically have a centralized PV system that's not only powering the households and the community but is community businesses or micro enterprises but also the telecomm tower which then increases the size of the install and makes it more financially viable. Not to mention the availability of telecomm tower also would help with mobile payments for the microgrid which again helps a lot on the collection side.

**Tim Reber**

All right. Thank you so much Sandeep. We'll just move right on to the next question. This one is for James and Corinne and Katherine. In immediate relief efforts isn't it better for relief camps to have central cooking facilities rather than distributing stoves? So whoever wants to field that one please feel free.

**James Henry**

Can you come back again with the question?

**Tim Reber**

Yes. It's questioning the merits of centralized cooking facilities versus distributed stoves in immediate relief efforts.

**James Henry**

Oh can I get to you on that.

**Tim Reber**

Sorry.

**James Henry**

Yes, cultural—we raised this same question actually for example in \_\_ and ask whether it would be acceptable for the households to have a common cooking place. But I think traditionally cooking is a privacy. Each household would like to have some kind of privacy when preparing a meal. It won't fit well in the current cultural situation of the households. And remember these households sort of come from rural areas with very strong leaning to their customs, to their practices and besides not all households have access to the same types of food. Some food items take longer to cook. Others take short time. So to manage a common cook place would in one way or the other actually be a source of a conflict rather than actually addressing the problem. Because of who is to use.

**Tim Reber**

Katherine do you want to touch on this a little bit as well?

**Katherine Arnold**

Yeah. I can also speak a little bit on this. I think that James point is very well taken. I think also there are a few places where the alliance has seen from its work with the SAFE steering committee that communal cooking can work but it's mainly in sort of the transit centers where a lot of people are in one small

area for a short amount of time and they know that it's temporary. We've also seen communal cooking work in some cases in camps with Ethiopian refugees for example or others who use flatbread baking and sort of do a large amount at the same time. So for example in some of the refugee camps in Ethiopia they use electricity for communal kitchens where they bake \_\_\_.

So that's a little bit easier because it's sort of a communal activity that women are doing and they don't have to do it three times a day. They do it once a day or a few times a week and can use those communal facilities for those baking purposes and then when it comes to actual the cooking the meals for the family to, the breakfast, lunch and dinner that's done on the household level. So there are instances where communal kitchen facilities can actually, can work well. So I just wanted to give those examples.

While I'm on the line I also wanted to just quickly touch on the Columbia question that was asked. I was having some technical difficulties so I wasn't able to answer it. We are very interested in the Columbia situation as well because as the person who asked the question probably knows there's a huge number of internally displaced people within Columbia. So far we don't have as many partners working on the ground there on the cooking issue and we haven't heard through needs assessments that the cooking issue is quite as dire as it is in some of these other countries that we've been working in, especially in for example East Africa or Bangladesh.

So it hasn't been targeted for alliance work yet even though we do have within the broader alliance portfolio a focus on some of the Latin American countries like Guatemala and even reaching into Columbia as well. So it hasn't been one of our focuses and it hasn't been one for most of our SAFE steering committee partners but that said I think we would definitely be interested in looking more into how we can help promote clean cooking solutions and cleaner energy solutions more broadly within the SAFE steering committee in Columbia. So I encourage whoever asked the question to also get in touch with me one on one and I think we'd be interested to talk through that a little bit more.

**Tim Reber**

Great. Thanks Katherine and thanks for joining us. I think we have time for one last question. This one is for Sandeep. What—the question is often duplication of efforts when providing relief given the lack of coordination among local agencies—how did Gham Power avoid this and how did Gham Power decide on which communities to support and who were going to be the individual beneficiaries?

**Sandeep Giri**

Well that's a great question. I don't know if I have the complete answer to that because we sometimes ourselves were pretty confused especially during the early days on what, how not to do that. And especially when the communication networks are not working well and when you have folks out in the field who cannot contact the, I guess the headquarters or the main office. I mean it's really tricky. We had many instances where we would send people out and they would get to the site and nobody at the site would know where to direct them and half the day would be lost as to finding out the right

place where solar was to be put in. And a lot of times we had to improvise and find locations ourselves.

In one instance we went out to find assuming there was a local school we could put our community charging station but the school was nowhere to be found or maybe it was damaged. We don't know. And we ended up just finding a clinic that needed help and we installed that or I mean we installed there. So it's tricky and so that is why we felt the mapping technology like the one initiated by the Katmandu Living Labs folks that have the [quakemap.org](http://quakemap.org) was so valuable. And they even went to the extent of running it as a crowd sourced effort where anybody around the world who was willing to help they could basically sit on their computer, look at satellite images, before and after the earthquake and they could tag buildings that were damaged or roads that were damaged or businesses that were missing or anomalies that would basically make it recent damage on a live map that would then be available to all of the relief workers or anybody who is working in that area.

So very much inspired by that we felt that the live map to basically capture all of the incoming requests was very valuable at least to us. It was also very clear that this problem was much more than just one company. I mean our own resources could maybe address 10—20, that sort of issues but the requests were definitely much more than that. We captured probably close to 100 something but that's basically a drop in the bucket. So we really feel that sharing is really important. Now the thing is how do you share? I mean we're a private company. We're not in relief work. We don't even know how to manage relief work.

So we basically used social media and people we knew just to share at least to the people we knew, both for profit companies and nonprofits and relief agencies and government. We invited APC from the government to also look at that. So the question is how can you coordinate that and that's an open question. I don't think a private company would be able to do that. Probably somebody from the nonprofit or NGO or government who has expertise in disaster management is much better suited. And later on there are a lot of sites who have been pretty good but having that centralized probably under government ownership or management would probably be the best thing but again sometimes the reality is not like that. So I don't know if that answers your question.

And the last part about how we selected sites, it was basically based on where would we be most efficient and economic. So frankly we were highly prioritizing locations that were close to either our offices in Katmandu or any of our field offices. So for example \_\_\_ is the epicenter and so we were able to send our team from our office there which is a five, six hour or probably longer than that to get there but that was something we could address. Some of these sites which are still unserved I mean they happen to be in places like \_\_\_ or where there isn't an easy way for us to go. And so in those cases if we can deploy anything we basically put it out there in the community to say are there any relief organizations going that way or have the resources to visit those locations we'd be more than happy to provide but we can from a

technology perspective like a solar kit and so forth. But again it was mostly based on what was most practical for us to serve.

**Dinesh Tripathee** And I want to add to that to answer.

**Tim Reber** Yes. Very quickly. We just have time for a 30-second response really.

**Dinesh Tripathee** Yeah. I want to add that we have a distribution \_\_\_ so that would be one way, a good institution for the coordination.

**Tim Reber** Great. All right. Well thank you very much. Thank you to all of the panelists and again we apologize for the technical difficulties. We would like to move on to a quick survey of the attendees. So we have three short questions for you to answer and we'd like to ask you just to go ahead and answer the poll on your screen now. All right. And we have a second question here. Thank you and one last question.

All right. Well thank you for answering the survey. On behalf of the Clean Energy Solution Center I'd like to extend thank you again to all of our expert panelists as well to our attendees for participating in the webinar. We appreciate all of your time. I invite our attendees to check the Solution Center website if you'd like to view the slides and again those will be posted because I know some of them got cut off. We'll also post a recording of today's presentation to the Solution Center website as well as previously held webinars if you'd like to go back and view some of the older ones.

Additionally we are now posting webinar to the Clean Energy Solution's YouTube channel. Please allow about one week for the audio recordings to be posted and we invite you to inform your colleagues and those in your networks about Solution Center resources and services including our no-cost policy support. So with that we'd like to wish everybody a very happy rest of the day or evening depending on where you are and hope that you'll join us for future Solution Center events. Thank you very much.