REN21 Renewables 2015 Global Status Report: Distributed Renewable Energy

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Webinar Panelists

Christine Lins **Laura Williamson**	Renewable Energy Policy Network for the 21st Century (REN21) REN21
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Tim Reber	Hello everyone. My name is 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 the Renewable Energy Policy Network for the 21st Century, or REN21. Today's webinar is focused on the Renewables 2015 Global Status Report and its findings that they relate to distributed renewable energy. One important note is mentioned 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 practice resources reviewed and collected 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 pen. 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 in the right side will display the telephone number and audio PIN you should use to dial in. If anyone is having technical difficulties with the webinar, you may contact the go to webinar help desk at 888-259-3826 for assistance.
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through the webinar portal, you will find PDF copies of the presentation at cleanenergysolutions.org/training. You may follow along as our speakers present. Also an audio recording and the presentations will be posted at the Solution Center training page within a few weeks and will be added to the Solution Center YouTube channel. We also find other informative webinars, video interviews with thought leaders, and other clean energy policy topics.

Today's webinar agenda is centered around the presentations from our two guest panelists, Rana Adib and Fabiani Appavou. These panelists have been kind enough to join us to provide an overview of REN21's newly released Renewables 2015 Global Status Report and a look at the status of distributed energy. Before our speakers begin their presentations, I will provide a short, informative overview of the Clean Energy Solution Center Initiative. And then following the presentations, we'll have a question and answer session where the panelists will address questions submitted by the audience, closing remarks, and finally a brief survey. This slide provides a bit of background in terms of how the Solution Center came to be. The Solutions Center is one of 13 initiatives of the Clean Energy Ministerial that was launched in April of 2011 and is primarily led by Australia, the United States, and other CEM partners. Outcomes of this unique initiative include support of developing countries in 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 serves to share policy best practices data and analysis tools specific to clean energy policies and programs. It delivers dynamic services that enable expert assistance, learning, and peer-to-peer sharing of experiences. And finally, the solutions center fosters dialogue and 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 that the Solution Center provides is a 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 enterprise development and microfinance, we are very pleased to have Ellen Morris, president and founder of Sustainable Energy Solutions, serving as one of our experts.

She will have a need for policy assistance and clean energy enterprise development in microfinance or any other clean energy sector. 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 forum at [cleanenergysolutions.org/expert,](cleanenergysolutions.org/expert) or to find out how the Ask an Expert service can benefit your work, please contact Sean Esterly directly at sean.esterly@nrel.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.

And now I'd like to go ahead and provide brief introductions for today's panelists. First up today is Rana Adib. Rana is the research coordinator at REN21 and has assisted with the annual production of the REN21 Renewables Global Status Report. Today, Rana will provide an overview of the key findings from the status report. Following Rana, we'll hear from Fabiani Appavou. Fabiani is a consultant at REN21 working on the development of a distributed renewable energy data collection, namely in developing countries. He also supports the work and research of REN21 in developing renewable energy and energy efficiency regional status report for Africa.

Fabiani will be providing an overview of Renewables Global Status Reports' finding as they specifically relate to distributed energy. And now with those introductions, I'd like to go ahead and welcome our first speaker, Rana, to the webinar. Rana, whenever you're ready.

Rana Adib   Hello everybody. I hope that you can see my screen and also hear my voice. I'm very happy to have the opportunity to present the Renewables Global Status Report with a particular focus on distributed renewable energy for energy access in developing countries just because that's really a field which is rising a lot, but is also causing specific challenges in the work we are conducting. So very quickly on REN21, REN21 is a multi-stakeholder network dedicated to the rapid uptake of renewable energy worldwide. It's a network where we're – different stakeholder groups are working together. It's NGOs and all society industry associations, national governments, international organization, and science and academia.

I underlined the fact that it's multi-stakeholder network and also this network character because all our activities are really done in a very collaborative approach. REN21 produces every year the Renewables Global Status Report. The report – the 2015 edition was launched in June at the Vienna Energy Firm and was the tenth edition. Again here, the way the report is produced is really reflecting very much the structure of REN21 because it's a joint effort of approximately 500 contributors, researchers, reviewers worldwide. We have different features here focusing on a general overview about renewable energy and power heating and cooling and transferred.

Then there is a section on market and industry trends on the specific renewable energy technologies, on investment flow. This is a work undertaking in collaboration with UNEP Frankfurt School and Bloomberg Energy Finance. So we are basically presenting a summary here. Obviously, a section on policy landscape, and we have a specific faction on distributed renewable energy for our energy access. Just because we think it's an area which is not that well known, there is more and more information on energy access, but not the specific role of renewable energy for in this field. And so that's the reason why we have a specific section for that. The GSR 2015 for the first time featured a section on energy efficiency just to really underline the need to think renewable energy and energy efficiency jointly. There is no

way to reach basically a sustainable energy for all goals on renewable energy shares without including the demand side.

Every year, there is a changing feature. This year, it was on using renewables for climate change adaptation in view of the COP in Paris. Next year, there will be a feature on community energy. The report covers all renewable energy technologies, power heating and cooling and transfer sector, and energy efficiency. We don't do any forecasts. There is no real analysis. It's really about the status of renewable energy. Now let me take you through some – before taking you through some numbers, I would also like to mention the fact that we are – since a couple of years producing original renewable energy and energy efficiency status reports because the field is getting so large that we really see that there is a need for regional efforts on data collection on having regional strategies.

Last year, we launched November report on the ECOWAS region, and there is a couple of upcoming reports, one on _____ South African Development Community, one on UNECE, and in early probably first quarter of 2016 on the East African Community. The data collected in this GSR effort and in the regional reports are also presented on a web portal, which allows for – facilitates basically the access to the information at the country level. Now let me take you through some numbers. Generally, what we can say if we look at the decade of renewables, the last decade on renewable evolution, renewables really surpassed all expectations.

There is a global and sole capacity production from all renewable technologies have increased substantially, and basically, they have – yeah, the expectations have been surpassed and nobody – yeah. Nobody really expected such a rise. This is very much linked to significant cost reductions for most technologies. What we also see, however, that policy frameworks play a very important and crucial role throughout the world. If we have a look at the renewable energy in the world, what we can say is in 2013, and this is not a data of 2014 because such care data is really not available in such a timely manner.

The share of renewables presented 19.1% of global final energy consumption. The share of modern renewable energy increased up to 10.1%. What is important here is to keep in mind that one of the objectives under SE4All is to also move basically the share from traditional biomass towards modern bio-energy use, which really means an improvement of the energy service in many developing countries in rural areas. We need to see these figures, again, basically the rising energy demand. Global fine energy consumption has increased by about 1.5% annually in recent years, and this is primarily driven by developing countries, which also mean that there is really a need to look more on the renewable energy play in these countries.

The good news of this year that despite the rising energy use for the first time for decades, the global carbon emissions associated with energy consumption – this is really a result of renewable energy deployment and energy efficiency measures. Let's look at the champions. In terms of investment in renewable

power and fuels, and this is not including hydropower larger than 50 megawatts. China, the US, Japan, the UK, and Germany were the leader.

What is very interesting here is if you look at the investment relative to annual GDP, we will have a completely different type of countries appearing. It's _____, Kenya, Honduras, Jordan, and Uruguay. And this is really important to keep in mind because it shows that these countries really can be force runners in renewable energy deployment. In terms of total capacity, what is interesting again is that – I mean you have, again, the big countries, China, the US, Brazil, Germany, and Canada in this case, including hydropower. However, when we have this relative to per capita data, we will see a list of Denmark, Germany, Sweden, Spain, and Portugal, which are all European countries, and this can definitely be explained by the fact that these countries have since a long time a very stable policy framework providing good opportunities to develop renewables.

Now what we clearly see – so I mentioned we're looking into the role of renewables in the different sectors – in the power sector, renewables or – renewable energy development is really the most dynamic in the power sector. Here renewables account for 27.7% of the global power generation capacity and 22.8% of global electricity demand. What is very interesting here is to see that this year, and it's for the first time, renewables made up to 59% of the net additions to global power capacity and surpassed, basically, the additions in the – the net additions in the coal – in the fossil fuel market, so that's really very interesting news.

What is also interesting to keep in mind is when we are thinking about – and this is less linked to distributed renewables, but still something important to keep in mind. When we're thinking about the integration of a rival renewables, which is often mentioned still as a major challenge on renewable energy during deployment. We see that when power, for example, met approximately 40% of electricity demand in Denmark, 27% in Portugal, 21% in Nicaragua. Solar PV capacity end of 2014 was enough to meet eight% of electricity demand in Italy, 7.6 in Greece and 7 in Germany.

So there is – it is possible to have renewable energy at large _____ here is also grid connected ones. When we are looking now at the heating and cooling market, energy used for heat accounted for about half of total world final energy consumption in 2014, which shows that it's extremely important to really focus also on the heating and cooling sector. Approximately eight% of the global heat demand was covered by renewable energy, by modern renewable energy.

It's much more complicated to have real assessment and quantitative data on the share of traditional biomass to this demand just because of the very decentralized and non-traded aspect of the sector. The trends are clearly that there is a growing interest, although advanced systems represent still a small fraction of the global market. There is loss potential, but there is really compared to the power market rather a slow growth in this field. This is really something which is to underline because it means that policy makers need to

give it more attention because having developed renewable energy, heating and cooling is really key for the energy transition.

In the transport sector, we have a similar situation as in the heating sector. Renewables accounted for an estimated 3.5% of global energy demand for road transfer in 2013 up from two% in 2007. The primary focus today still lies on liquid biofuels, whether we're looking to markets in these trained policies. However, what we see trend wise is really the development of gaseous fuels and electricity which are not always directly linked to renewables, but allow to really create pathways to integrate renewables into transportation.

I will not go into detail in all different renewable energy technology, but really focus on the ones which are also relevant for distributed renewables. So when we are looking into wind power, there is a total global capacity of 51 gigawatts, which was – no, sorry, of 370 gigawatts, and 51 gigawatt have been added in 2014. Compared to 2014, there is a 44% increase – or in 2014, there was a 44% increase over 2013 markets. This is really a very, very dynamic market, which is growing recently. Interestingly by the end of 2014, there were at least 85 countries that had seen commercial wind activities. Seventy-four of them with an install capacity of larger than ten megawatt, and 24 of them even larger than one gigawatt.

So wind is really a mainstream technology in the energy landscape. When it comes to – 77 gigawatt. What is very interesting that more than 60% of all PV capacities in operations worldwide were added over the past three years, and this is mainly due to significant and unexpected cost reductions, which really – I mean costs some challenges in terms of policy framework, so there were countries with really reduced their policy support for PV. However, the – it also creates many opportunities because PV is now a technology which is cost efficient, also – and applicable for distributed renewable energy activities in developing countries, and find in ways to other applications.

When we look at the regional developments, we clearly see that Asia eclipse of all markets and account for approximately 60% of global additions. Obviously with China, very active, and in China, we also see that there is a strong increase in large scale power plants. Bio-energy. So by the total primary energy demand from bio-mass was approximately of 16,000 to 150 terawatt hours. Bio-mass was used to produce an estimated 12,500 terawatt hours of heat, and the bio-power capacity increased by an estimated five gigawatt in 2014, reaching a total of 93 gigawatt. What we see is that the split up is a larger is linked to solid bio-mass, part of it them to municipal solid waste, bio-gas, and a little part for bio-fuels, which are rather used in the transfer sector.

Here we clearly have a major challenge, which is have good, timely, continuous reliable data. Again, bioenergy is really very decentralized in its use and its application. There are multiple pathways from different sources to different energy uses. The energy carriers are very often not traded, so it's a major challenge to have good data, and especially with regard to the use of renewables, also for distributed renewables. There is a need that the

international community and all players really work together to improve the data citation here. I took the example of solar panel heating and cooling just because it's really also important to look into the heating and cooling market, and we see that for some technologies which are decentralized, it's however possible to have better data and good data. So solar panel heating and cooling reach a cumulative capacity of 374 – sorry, here is an error. I'm sorry for that.

Let me check this. I will need to check this because I'm not sure about the cumulative capacity if the installed capacities – yes, oh, sorry. There is no error. The installed capacity was 374.7 gigawatt thermal, and we had an increase in 2014 of 44 gigawatt thermal. China account for nearly 81% of global market, so there is again a real focus on Asia. Technology wise, there's a focus more and more on glaze water collectors. There was also slowdown in market growth in 2014 which continued here, and this is really very much linked to the distributed nature of that market on the one side, but also the reduced costs in power technologies, renewable power technologies which basically make end users and project developers choose, for instance, PV wind geothermal with heat pumps as an alternative to solar panel.

So what we clearly need to keep in mind is that renewable energy offers not only – yeah, offers many possibilities, also economic opportunities to create jobs and renewables so that global employment continue to increase with originally estimated 7.7 million direct or indirect jobs in renewable energy industry. The global wind power employment cross the one million jobs threshold in 2014. Here again when it comes to jobs in distributed renewables in developing countries, this is something where arena really puts a lot of effort in improving the data situation, but it's again very decentralized and it really means that we need to all work together to improve the data situation.

The global investment and renewable energy in 2014 is estimated to 270.2 billion USD. This is including – if we include the hydropower, large hydropower, it reached the 301 billion USD. The reasons for increase is really the increased solar power installations in China and Japan, the investment in solar wind up 25%, and interest – also to manage it is really the record investment in offshore wind projects in Europe.

So solar power and wind were the leading technologies by far in terms of dollar committed, with solar power accounting for 55% in new investment, wind 36.8%, and what is also important to mention that in 2014, more than a quarter of new investment in renewable energy went to small scale projects, particularly to solar PV. So this is really an indication that dairy markets, such as distributed renewable energy markets, are gaining. When we are looking at the investment and the regional split up, we see real different. So variations here. In Europe, because of the reduced or decreasing positive policy frameworks in some countries, investment decreased, and what we clearly see is that the Asian countries are rising significantly.

When we are comparing developed countries towards developing countries, there is – I mean 138.9 billion investment in developed countries versus 131.3 billion in developing countries. However, if we see the increase in developed countries, it was a 3%, but of 36% in developing countries. All that is

possible. So what we clearly see is policy frameworks, regulatory frameworks are key to retrainable energy deployment, so when we're looking at the map, there is clearly a positive trend because there is more and more countries, these other ones in red which have policies and targets. The dark orange are the ones with only policies, no targets, or no data. The light ones are with targets and no policies, and then we have some gray ones for which either there's no policy or target or no data available.

The trend we can really see is that there is more and more countries are choosing more complex I'd say policy design, so there is the targets. Targets are really used as, yeah, dynamic tool I'd say to push policy frameworks. But they are – to date, they are really linked to policy measures. One thing to mention here is that counting the policies is obviously not enough to really assess the effectiveness and efficiency of policies. So there are 164 countries with renewable energy targets, 145 with renewable energy policies in place, and when we're looking here at the different types of policies, what we clearly see again is that it's again the power market which is presented here in the bluish colors which attract the policy makers' interest more. So it's a main focus.

With the feed-in tariffs being the most popular type of policies, then we also see an increase of net metering and net building policies. Now we – as I mentioned before, we have a specific section on distributed renewable energy in developing countries. What we see is that renewable energy clearly play an important role in the energy access improvements, and in 2014, the situation was still that 15% of the global population still lack any access to an electricity grid. 2.9 billion people lack access to cleaner forms of cooking. There is an increasing awareness of it that distributed renewable energy systems really offer a great opportunity to accelerate the transition to modern energy service.

This is certainly due to the increased cost competitiveness, but also to the fact that renewable energy projects can be pulled up much, much quicker than fossil fuel projects, that there is a certain – that there is a flexibility, that there are – that it offers solution for local sub-national strategies. We see here that very clearly there is big differences, big regional differences when it comes to the electricity access situation and the access to clean cooking. What we also see is that these topics are predominantly rural challenges still, rural peri-urban challenges, but rather rural with 87% and 83% also population of the population – yeah, sorry, but I guess you got to this.

A challenging situation here is that there is really little quantitative information on distributed renewable energy markets. There is a lot of qualitative information. There is a lot of case studies, success stories, more and more information on energy access, but it really comes to the specific role of install capacity, energy output based on renewable energy. It's quite challenging. The information which is available however really shows – indicates that the markets are significant. For instance, there is information floating around that say 64 billion USD of investments have been took place,

basically, on off grid solar PV. What we also see from the information we could collect is that there are huge regional differences.

For instance, if we look at Sub-Saharan African, excluding South Africa, there is an installed renewable energy power capacity of 23 gigawatt, and this is less than one-third of the renewable energy power capacity installed in India. On the other hand, we have huge success stories like in Bangladesh where three million solar home systems are operational, and of May 2014, and they are electrifying 9% of the country's population. So it also show that when there are large scale programs with good frameworks it is really possible to make it a real significant market which is great for energy access, but also great for renewable energy, investment, and industry.

Otherwise, we see the trend that there is an increasing involvement of private sector, increased recognition of the rule of renewable energy that this place for energy access. Especially also because of the cost competitiveness, and that as a result, there is uptake in off-grid renewable energy programs, and partly even the creation of specific distributed renewable energy institutions in some countries. In the last years, we started just because of on our side, we really had a certain frustration on the lack of quantitative data because this quantitative data is really important to attract investors, renewable energy investors to these markets.

So we started really to collaborate with different organizations and start collecting data to at least have some indications on what's ongoing in the countries, how much systems have been installed, how much it might represent in terms of installed capacities and renewable energy capacities. This is an effort we really want to strengthen over the next coming years, and Fabiani will talk more about this. So looking at the renewable energy development, the overall conclusion is that the renewable energy can continue to grow in 2014 against the backdrop of increasing global energy consumption and a dramatic decline of our prices in the second half of 2014.

The very positive message is really that CO2 growth has decoupled. Economic and CO2 growth has decoupled, which is a record for renewables in energy efficiency. What is still important is clearly to have long-term and stable policy framework, which can adapt to changing environment, and this is specifically linked also to the cost reduction. So there is really a need that these policy frameworks can adapt to these technology developments, market industry developments.

However, it is extremely important to create and maintain a stability, because otherwise you're risking to have full sectors industries going down. There is a need for greater attention for heating and cooling in the transferred sector, and there is clearly a need to improve the information on distributed renewable energy markets in developing countries. I would just like to have a very quick outlook on what we specifically plan on distributed renewables in the next upcoming global status report, so the objective clearly is to portray the distributed renewable energy market using qualitative and quantitative data, and to also highlight the importance and growing role of this renewable energy market segment.

The _____ are in October 2015, we will start the collection of country and regional information. We will also start the collection of quantitative data for 2014 more at the program project industries level. In January, there will be an expert review of the distributed renewable energy section, and in February, we will ask for an update of quantitative data for 2015. I think I did – forgot to mention this in the beginning. We really aim to have continuous and very timely data, so in 2016 in the upcoming GSR 2016, we will report on 2015 developments.

This is really a call to participate. Don't hesitate to contact us. I'm pretty sure you have information and pieces of the puzzle which will allow us to really portray the overall picture. Thank you very much, and I'm available for questions at the end of the Q&A session.

Tim

Great, thank you so much, Rana. I really appreciate that great overview. We do certainly ask that everybody in attendance feel free to ask questions for Rana. We're collecting those and will be saving them to the end. So in the meantime, we'll be moving right on to Fabiani. So Fabiani, whenever you're ready, go ahead.

Fabiani Appavou

Thank you. So since I _____ good morning or good afternoon to everyone who is joining us for this webinar, so I think at my place right now, I think it's more kind of good night. So building on what Rana has been presenting, I'm going to kind of stress on a distributor being an image port for energy access, and as my presentation kind of title says, it's about tracking shadows in the sense that we are kind of tracking pieces of a puzzle. We kind of know that there's a big potential for it, but the figure is kind of shows that kind of data have been developing shows that yeah, it is playing a big part into the whole _____ for all paradigm, but still we're struggling and we are facing kind of lots of challenges in how to get through this data, how to kind of like compile this data, and how to report this data in such a way that it portrays at the end of the day the right information.

So my first slide is about a bit of an idea of energy access situation. I think Rana had talk about it earlier about whether proper tracking firm would have been saying in 2012 we had 1.1 billion people still lacking electricity, and 2.9 billion people still lacking access to clean and _____ cooking fuel. And building on ways what we have seen is in the past two years for 2010 to 2012, it has been some kind of improvement in providing energy access to people around the world. Things are moving on for sure, but according to experts in the field, things are not moving fast enough so that we can reach the target of energy access for all.

Universal energy access for all. According to the _____, what we have seen is like okay, so we have a big challenge to meet, but how do we meet that challenge? And according to a study about the IEA, at 2030, it said that like 70% of the people currently lacking energy access would be served for decentralized system. The reason for this can be numerous, but I think everyone would agree that one of the two reasons is because implication of it. One of the main reasons why people are lacking energy access would be the cost implication of governments investing into expanding their grid.

At times, _____ need to be expanded in _____ outer wage. Always think by example of the Philippines, which are composed of different regions and different islands, and it's quite difficult at times to have - _____ tricks into EIS, which are mountainous, out of reach, or to the extent of which to an island where only like 120 people. So it's not like economically feasible to do so. So one of a key element to providing energy access to them is for decentralized energy. Second point is for – five kind of points is that for universal access, 55% of all new power until 2030, we've come from decentralized energy sources. And the part that I like, we _____, and that is philosophized.
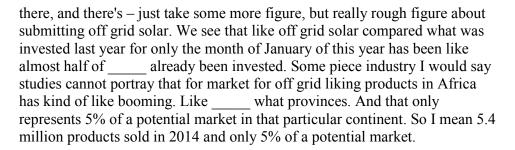
But 90% of it will be from renewables. Just portray the whole picture of where we're going. Decentralized energy from renewables. And of all the investment that will be needed by 2030 to achieve universal access, 64% will be enough grid and mini-grid. Technologies. I want to really work on best picture because I think it kind of just tells the story on what needs to be done, what needs to be achieved, and where we need to invest. One thing that I quite like about this figure is particularly of a bar chart where the green part shows isolated upgrade and the kind of pink part shows the mini-grid.

And we say that around the world, we have exception of _____ in America perhaps, but in Sub-Saharan Africa where it is in India, or in a part of Asia Pacific, we see that like isolated off grid and mini grids which many composed a part of distributed renewable energy in terms of _____ wherever they need to be invested so as to provide energy access to people around the world. At the same time, just keeping in mind this part that we are moving forward, a lot of progress is being made.

But at the same time, to reach that goal of universal energy access by 2035. Sorry. So we need to move a bit faster, a bit more in that particular field. I would say if the IEA kind of like submits that we need 700 billion – some kind of study that shows that we may need less, like ten times less, and we can achieve in a universal energy access in less time, like ten years earlier by really going for distributed energy – you know, just _____ technologies. I think those studies, maybe you can question the figures and portion from a _____, but at the end of the day, it just shows the wishful thinking for sure, but it shows the end of the _____ people trying to make things happen. And as one of it was saying earlier, if you look back in time, ten years back, who would say that like renewable energy itself would be playing such a big role nowadays.

Ten years back, people were saying it's kind of expensive, it's kind of not feasible yet, need to wait and see. But now it's just booming. And if you look at a situation about DRE, it's kind of the same thing. Not so much interest like three or four years ago. It was just only being done by charities in two countries or to invest like provide energy access to schools or hospitals, but nowadays, it has become major to provide electricity and clean cooking, fuel, to millions of people around the world.

So you have seen the potential for DRE, especially for image access, and as portrayed already by Rana and her slides, there is massive growing market

there, and there's – just take some more figure, but really rough figure about submitting off grid solar. We see that like off grid solar compared what was invested last year for only the month of January of this year has been like almost half of _____ already been invested. Some piece industry I would say studies cannot portray that for market for off grid liking products in Africa has kind of like booming. Like _____ what provinces. And that only represents 5% of a potential market in that particular continent. So I mean 5.4 million products sold in 2014 and only 5% of a potential market.
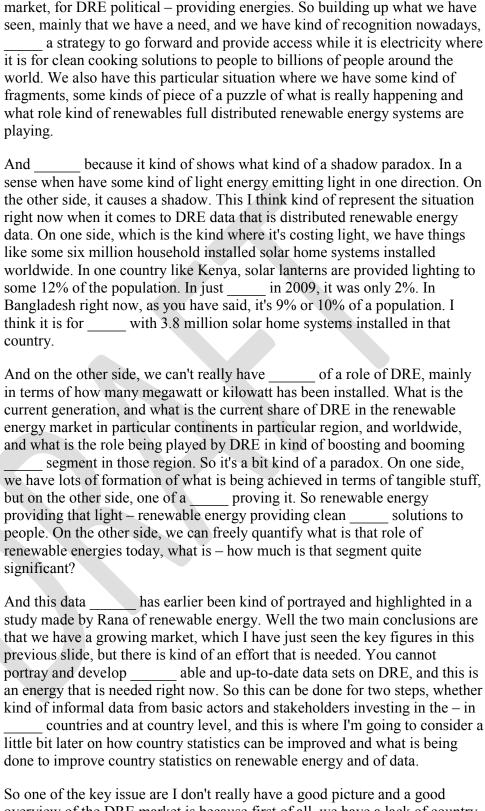
So there's massive role to improve massive role – invest massive role for any kind of like private sector industries to going to that particular market into that. The diagram on which – on the bottom of slide kind of shows a number of customers for _____ utilities around _____. And it's quite interesting to see big names like Ena or EDF, OEN, Overton 4. And so really big utilities around the world. And we have a particular one which is like lying down of the ninth position. Maybe it's Delight, which is one company which is kind of special tasking to solar off grid systems, mainly solar lighting systems and solar home systems. And to see that like for a particular company, which is meant for gasses on distributed or decentralized renewable energy systems, we found we got them out of customers, and I would say the top ten companies around the world in terms of utilities shows how the market is growing and how the market is proving to be a key player in the coming years.

Some key figures which I'm sure most of you have come across for your research, for your readings, or just in the news – so along the way, it's estimated that like 26 million household are currently being served by off-grid renewable energy. Twenty-eight million people have been provided with solar lighting according to figures from the lighting program, which is an IFC World Bank initiative. And in Bangladesh, where I was saying earlier about like some nine to 10% of the population currently served by solar home systems.

What has been observed in the past month is like every month, like 60,000 sort of home systems being deployed. And I'll come back to Bangladesh later on because I've pointed out it's a very good example of what is being done to provide energy access to a population for distributed renewable energy. And how the market is booming and how the market is really growing and maturing. And if you go – I mean I was saying across the news, everywhere you'd come across figures telling you that something is being invested in distributed or off-grid renewable energy, I feel like the figures is all about how many systems are being active, the tech _____ for example, we want to achieve one million solar homes. If you take, for example, institution of Ghana, which aims at 200,000 solar systems in the next five years, they will want to kind of invest and provide solar energy panel to a million people in its country.

And USAID had just announced last month that it is investing 41 million in India on off grid renewable energy. So figures are quite big, figures are quite impressive, and figures quite rightly portrays economic situation, a growing

market, for DRE political – providing energies. So building up what we have seen, mainly that we have a need, and we have kind of recognition nowadays, _____ a strategy to go forward and provide access while it is electricity where it is for clean cooking solutions to people to billions of people around the world. We also have this particular situation where we have some kind of fragments, some kinds of piece of a puzzle of what is really happening and what role kind of renewables full distributed renewable energy systems are playing.

And _____ because it kind of shows what kind of a shadow paradox. In a sense when have some kind of light energy emitting light in one direction. On the other side, it causes a shadow. This I think kind of represent the situation right now when it comes to DRE data that is distributed renewable energy data. On one side, which is the kind where it's costing light, we have things like some six million household installed solar home systems installed worldwide. In one country like Kenya, solar lanterns are provided lighting to some 12% of the population. In just _____ in 2009, it was only 2%. In Bangladesh right now, as you have said, it's 9% or 10% of a population. I think it is for _____ with 3.8 million solar home systems installed in that country.

And on the other side, we can't really have _____ of a role of DRE, mainly in terms of how many megawatt or kilowatt has been installed. What is the current generation, and what is the current share of DRE in the renewable energy market in particular continents in particular region, and worldwide, and what is the role being played by DRE in kind of boosting and booming _____ segment in those region. So it's a bit kind of a paradox. On one side, we have lots of formation of what is being achieved in terms of tangible stuff, but on the other side, one of a _____ proving it. So renewable energy providing that light – renewable energy providing clean _____ solutions to people. On the other side, we can freely quantify what is that role of renewable energies today, what is – how much is that segment quite significant?

And this data _____ has earlier been kind of portrayed and highlighted in a study made by Rana of renewable energy. Well the two main conclusions are that we have a growing market, which I have just seen the key figures in this previous slide, but there is kind of an effort that is needed. You cannot portray and develop _____ able and up-to-date data sets on DRE, and this is an energy that is needed right now. So this can be done for two steps, whether kind of informal data from basic actors and stakeholders investing in the – in _____ countries and at country level, and this is where I'm going to consider a little bit later on how country statistics can be improved and what is being done to improve country statistics on renewable energy and of data.

So one of the key issue are I don't really have a good picture and a good overview of the DRE market is because first of all, we have a lack of country reporting and consolidation to try their assistance. Just like if I take 15 years ago, we had a lack of reporting mechanism and kind of collection mechanism on DRE systems. So country statistics were created capturing what was

happening in the renewable energy world. Right now, we have the same thing for DRE systems. And one of two reasons for this is particularly that country statistics, you look at systems that are kind of more than one megawatt installed capacity. So if you take the case of DRE systems, we're talking about _____ systems, and those are not less captured within the country statistic spot. Also lack of reporting from donors, from private sector, from NGOs, or from industries.

On their activities, on their initiatives under their projects. Although I must say that in the past couple of months, one of the things we've seen while working a particular field is that it's not really a lack of reporting as such because we do report internally, it's a lack of sharing that information wherever. And we have that information somewhere, but we have to dig to get it, or we have information in a nonconsolidated way. So there is some kind of screening in a way that _____. I was saying the forecast has been on the end rather than on the means, the end being providing energy access to people. So how many people do we provide an edge to, how many people are being served by a particular system?

How many people are being provided with electricity or lighting? How many people are now being able to cook with a clean cooking solution? Well the means is about the source for renewable energy that is being used in most cases. So we focus rather on the _____, but not on the means of doing it. And _____ put a picture in terms of impact. So X amount of people is being provided X, that represent X amount of a population is being provided with energy access. It doesn't give credit over renewable energy in that particular field. And what it does, actually, what it may do, it may actually undermine the whole world of renewable energy because we focus on okay, yes, we are providing energy access for systems, for distributed systems to people.

But for what means? Since we don't have the data quantify of the mean, the part of a mean is being kind of put aside. And it's quite funny to think in an interview in The Financial Times two weeks or one week ago, one of the head of the World Coal Association was kind of like putting forward a case for the use of coal actually to come back in energy property. And I was just looking at the way he was portraying his argument. I was saying that I already have the figures to show that no matter how much renewable energy is being – what role and how much renewable energy is actually being used to provide energy access in the world and how much renewable energy has provided with _____ and how much progress actually has been made, it's due to renewable energy.

That will undermine all of his arguments he was putting forward in his article. And the other reason is that at times, we might have data from a current study from something for one that has no job on it. That data comes let's say for 2012. You look at the same data for 2014, there is just not update on that data. At times, it did not really are able – in the sense that we have contributing data for – from – maybe from a same source or same country or same project. So I was saying one major implication of having those data gaps on the _____

market is that we don't have a proper understanding of market dynamics, and really the role played by renewable energy in providing energy access.

And this can kind of like prohibit some decision-making in putting the right policy instrument or right frameworks in the right enabling environment to attract and _____ investment in this particular sector. Just a little reporting of something that happened last week. I was actually in a meeting talking about energy, and in – it all concerned a country that would face – that had huge – a huge problem, huge challenge in the coming years, which is a blackout situation. That country for the past couple years had been investing large in renewable energy. There was a clean way of going that was more renewable energy.

The simple fact that there was this blackout issue that was coming popping up, this did make – there was some kind of shift in the way policy makers were reacting in the sense that they were no more looking about how can we increase our capacity for renewable energy, how can we make this renewable energy more progress and boom in our country, but whatever the key question was more about okay, how do we produce more, how do we _____ blackout. Irrespective from what we were doing, irrespective of the sources we're using. So what I'm trying to say is that like when you lack the data to reassure what is the role of which technology and how it can play a role to serve many other programs that you may have, what happens is you are often put it aside.

But as I think Einstein would say, if you don't – never did I – if you can't measure a problem, if one can't measure a solution that can be put forward to serve a program, we're never going to be able to make a change for it. That's the paradox that we have. Renewable energy actually from the data, from the present pieces that we have, is playing a big role in the energy access market, but actually we can't really quantify how much. We can for some projects, we can for some countries, but not for a particular region, not for a whole world. And I kind of love that side because it just kind of portray one of the key message for – we tried to do at REN21 over the past couple months and over the past couple years through the GSR and particularly on a chapter on DRE.

So the top picture is _____, and what is quite interesting for us, it's like we almost see the same image of a moon where I felt we are on the planet, and whatever we do, we kind of see the same image of the moon most of the time. And the picture of a button is a _____ released picture from NASA which actually portrayed the other side of the moon, the part that we don't see. Kind of like a satellite which was moving away and just turn around and had this picture, and just say that okay, we had a picture of a moon first, and we knew that it was here. And we kind of used to how it was. When we look at the side, we had another kind of like perspective.

And in DRE, it's the same thing. What we are trying to kind of like change if initiatives at REN21, like is really change – have a look at the other side of the moon. So we have been used to people telling us we have X amount of solar home systems, we have X amount of solar lighting, we have X – we have X amount of people being served by many grids, and many grid could be biomass or biogas based, hydro based, or solar based. But we are trying to

see the other side of it. It's how much megawatt, how much kilowatt does that represent, and how does it fit within the whole energy strategy of a country.

And I won't spend too much time on this one because I think Rana has quite covered that bit, but saying that we have a particular section which talks about distributed renewable energy for energy access, which given the second sensors, given the data available, purely and solely can concentrate on providing that information about how many people for sure will illustrate what kind of technology is being used, what kind of new technology can be used for different segments, for lighting, for cooking, for providing higher grade level, to move along for energy level. What kind of like systems renewable energy base can be used. And we have done for the past edition of energy, so we have tried to contact donors, we have tried to contact international organizations, private sector people, industries, and tried to get the data from them.

Okay, you are working that particular country, you are working a particular region, you are working on providing energy access, and most of the time, what you're working on is based on renewable energy. So how much are you kind of like working with – and at the start, I had been working, I say, "Okay, we literally work – we will really be able to gather data from people maybe who don't have the data maybe because from our side, we haven't seen much reporting." Maybe data that doesn't exist, and what you have seen is massive. You look at the table, actually, I think it's once over five or seven big – I think Rana may correct me afterwards, but of data we have been able to gather for different regions of _____.

And it was quite amusing the response that we did get. It was like massive we are able and truly tremendous data showing what we sense we usually had a feeling about all the growing market in the DRE segment. But what was quite frustrating at the end of the day, it's like let's say if you take the case of Mozambique, for example, even the data that we have on different units of the data that we have – oh, not even the same unit or does it cover the same kind of technology, or they are not in a consolidated manner being portrayed here or rather than by projects or by initiative. One of – able really to innovate let's say for solar in Mozambique. We have X amount for DRE, and we know that we have let's say ten megawatt of solar that _____, but just for illustration.

We have ten megawatt of solar installed in Mozambique, and out of it, four is from DRE systems. This kind of information is what you're trying to portray, but we are kind of struggling with it to portray in that particular way.

| Tim | Fabiani, sorry, we're just starting to get a little conscious of time, and we would like to try and save some time at the end for questions. So start to wrap up in the next five or ten minutes, leave at least a little time here for questions, that'd be great. |

| Fabiani Appavou | That's good, that works. |

| Tim | Thank you. |

Fabiani Appavou   So I think I have five or six slides coming, so that will be coming. I was talking about this other side of the DRE market. If you talk about Bangladesh, if you talk about the _____ people installed, 15 million people being provided with solar system, roughly 10%. But then if we dig further and we dig through the national authority in charge of providing energy access, this _____ have a figure for making it work. It's 155 megawatt currently. And actually want to provide energy access to everyone at REN21, which kind of represent 24 gigawatt to be installed by that time. We are to expect 10%.

So we can say that for particular market, but like Bangladesh, we do have the figures available. Same thing for India. India actually has a very good country statistic system in place. For sure we can say that like there's much improvement in terms of providing the data in terms of megawatt or gigawatt for solar power, but at least there's some kind of accounting being made about how many has been installed in each and every state of the country.

Same thing for Ghana. I think if you go through all the SFO documents about country action agent over _____, you see that like in those documents, there are lots of information on number of megawatt installed capacity for solar for instance in Ghana. And the fact that those information are being complied and available just shows that the data are not so scarce. It's not really any issue about it's not being collected or – but just we are not aware. We need to dig for it, and the energy some kind of assistance to get information from the other side of the moon to the side that we can see.

Same thing for a company like Delight, which is very much involved now on 60 countries I believe in providing solar lighting portable systems. And if it kind of like _____ by saying that like we have that 50, one million people, and so on, one people – 1.1 billion in terms of energy expenses, we have _____ about 81 gigawatt hour of electricity generated. So again, we can have the data. On the other side, we have companies such as Solar Aid who just portray – but have been the same side of the moon that we see is how many people are being served, how much money is being saved. But really lacking that part of telling us the whole story of how many megawatt has been installed.

This is from Power Africa annual report. The edition is July 2014. Well _____ had been stopped by technology. Those data from the Foundation for Real World Energy System. The services _____, which can have a very good reporting overview of how many systems are being stored, what type of systems are being stored, and most importantly for us at REN21. How many kilowatt is being stored? So just to go the key constraint again, one of the key issues I was saying is the up to date data that we have. The frequency of reporting of the data actually is kind of important for most projects I have seen for most initiative that have a very good reporting system. We kind of go for like every two years, one and a half year, or when actually the industry is doing kind of a study on the particular market.

I was saying that less than one megawatt you need is usually not captured in country statistics, and most of the data collection reporting is _____ on the end with energy metrics. So those are the things that we kind of need to

change. And what we have been doing at REN21 is kind of contacting stakeholders, people working in the field and trying to see how we can work together to have a better picture of the situation. One good example is actually energizing development initiative where from their actually published report I've seen, it's kind of how many people have been served, how many systems have been installed. But just _____, we did realize we actually have the data on how many kilowatt hour, how many kilowatt has been installed. And we just gave some kind of gleam of hope that we are moving in the right direction, and there are some kind of information being portrayed.

Just need to be able to tap into those information. And to the countries, to the private sector, and to all stakeholders, being able to capture some second _____ and capture voice information will be indeed helpful for building the momentum for DRE systems. So this will be my last slide, and I starting by saying my presentation would be tracking shadows, and I kind of _____ that we have this shadow effect of when you interject in it light in one direction, and the other side is kind of crossed with shadows. What we're trying to do and what we're trying to achieve is really have these different pieces to make us have this beautiful picture.

This is actually what we call a light and shadow painting, which is casting light on translucent objects. And you might say that right now, what we have on the DRE sector if we have some kind of opaque objects, but we are trying to make translucent so that we can have a beautiful picture. So shadows are not just shadows, but can be used to bring to light information that otherwise we wouldn't be able to foresee. So thank you for your kind attention, thank – that's it. If you have any question, Rana and I, I think, would be happy to answer.

Tim Okay, great, thank you so much, Fabiani, and thank you again to Rana. We do in fact have quite a few questions that have come in, and those of you in attendance who would like to ask us more questions, feel free to do so. So without any further ado, I guess we'll just jump right into it. So our first question has to do with wondering if it's possible to get a very short, brief overview about how the percentages of renewables are calculated and where and how the data for calculation is gathered. I don't know, Rana or Fabiani, if either of you could speak briefly to that issue. Just remember, you might be on mute as well.

Fabiani Appavou Can you repeat the question again, please?

Tim Sure, they're asking about the percentages of renewables. For example, renewables accounting for 27.7% of global power generation capacity, and they're just wondering if they can get a very short overview of how those numbers are calculated and where that data comes from.

Rana Adib I think I'll take that question. If the person will answer who asked that question if he wants some more details, because that's really digging into the math _____, I suggest that we can follow up by e-mail. In principle, the information comes we're collecting data from country contributors. We're

working together with the industry associations, collecting this information and obviously we're also working together with IEA and mainly with IEA, partly with Irina to have a good understanding of the reliability of the data. We're collecting also from the informal sector, and then we have an authoring team and a research direction team who are basically doing the data crunching, coming up with the figures, and also coordinating it a lot with IEA to come up with share figures specifically.

When it comes to the install capacities, it's a fact that over in the different renewable energy technologies over the last ten years, we really established a very good understanding of the renewable energy markets. We have a close collaboration, and they are partly membered. They're in all part of our network in any case with the global, regional, partly national industry associations and technology platforms. So that there is a very good established dialect. If you want some more information on the methodology, please don't hesitate to drop me an e-mail, and also in the figures, in the numbers themselves, how they are calculated, it's not part of the hard copy, but in the electronic version, there is I think something like probably 50% of end notes where we really tried to be very transparent on how we calculated the information, what type of data has been included on it.

Tim

Okay, great. Thank you very much. Moving on, another question has to do with what institutions might help you be using entrepreneurs and setting up distributed energy products, both from a technical and financial standpoint?

Rana Adib

Yeah, you can also answer, Fabiani. I think you have a – you're probably better place.

Fabiani Appavou

Not so sure about that. I mean what we have seen with the – particularly in the DRE market and particularly concerning solar, there has been a huge boom of what we call pay as you go sources, innovative business models coming out, kind of making use of technology. And what has happened at least like with everything of technology and providing energy solution has been one of the reasons why there has been lots of _____ room. Of course, mountain _____ in that particular sector. Do you want to add something, Rana?

Rana Adib

I think that what we also see is basically on what institutions – what we clearly see a part of, there is a purely commercial market. What we see, however, if we really want to scale up, basically, the development of DRE, and also involve I mean as a public private partnerships, then it is extremely important to really have the policy frameworks. Obviously I mean the barriers of which are still existing is really for protective purpose. Access to finance. This is really an issue, and the stability of policy frameworks not only linked to I'd say energy, but in general in many developing countries is a challenge for attracting basically investors, but also accessing industry and technologies. So I think there is not only one answer to this. It depends very much on the market sources and the policy framework in a country.

What we clearly see it that then that a good collaboration between a public private collaboration is certainly an increasing trend, even in countries like

	Bangladesh where you have the policy framework. It always builds on private sector, too.
Tim	Great, thank you. So we have a question here interested in whether or not you have any information or could refer folks to any studies concerning the break-even distance where Micro Bid and/or solar home systems are more cost competitive than extending the network. If there are rules of thumb or some sort of formulas for figuring that out.
Rana Adib	I think there is the World Energy Outlook from 2012, there was really focus on energy access where basically the electrification strategies and also basically the shares of how many people would be electrified based on the electric grid. Many grids in isolated systems is included. I don't have this – the details of mine, but I'm pretty sure this is based on some rules, cost rules, et cetera. Again, don't hesitate to drop me an e-mail. I can put you in touch with the right person at IEA. This would be one study I can think of. The other part would certainly be to have a look in end of publications. Yeah. I don't know, Fabiani, did you come along with something else?
Fabiani Appavou	Yeah, if I may add, I think like whenever I work with _____ cost effectiveness of off-grid or on-grid, but just for that mutual _____, I think if I was going to extract of a world _____ outlook, if I was in need of a _____ 2012 for all, that kind of goes down to the details, kind of portrays, okay, for on-grid, how much would it cost, and for off-grid, how much would it cost, and kind of as competitiveness. There's another kind of study on the IFC – but _____ 2012. Trying to search for the name of a study. But that study goes down for that level as technology by technology, ensuring that if you go for this kind of upgrade technology based on renewables, it's kind of hard because of competitiveness, but maybe countries could be looking for. Maybe just _____, and I will kind of _____ those two studies and kind of forward it to you.
Tim	Great, thank you again to both. For those in the audience, we'll share both Fabiani's and Rana's e-mail through the chat. So those of you who are interested in reaching out for more information can do so. Moving on, a couple more questions. What are the best and most efficient policy initiatives that could be used by governments in order to stimulate increases in distributed energy, particularly in Sub-Saharan Africa?
Rana Adib	It's a really hard question because it really depends on the market _____ players, too. Very clearly, when we see many grid development, one feedback is clearly allowing for independent power producers so that that's the basis, and so that players are legal in selling electricity. When it comes to tariffs and regulations, we really see that highly subsidized - and that's really linked to the fact that energy prices, energy tariffs are very political in many developing countries. So this is something which where they need to be of a very close discussion between the government and also private players on the tariff setting, whether it is for isolated systems or mini-grids just because often, the subsidized tariffs, fossil fuel based tariffs do not allow for cost covering activities of private players.

I think that's two very critical points. The other part is also when we are really thinking about the renewable energy technologies, working on standards and quality which are used basically in the countries to really allow for a sustainability of renewable energy market development just because we really see from the past experience that bad technology has a major impact on the acceptance of renewable energy technologies by non-electrified people.

Fabiani Appavou Yeah, building on what Rana was saying, I always kind of say that we try to identify right policy kind of framework or right policy makes to kind of move – to kind of increase the role or increase investment in DRE. They talk a lot about the risk. As Rana always said, that's always the kind of policy and political race associated with energy because it's such a sensitive issue. And if you don't kind of address political and policy risk, people won't really be interested in going. And in one ways of going for it is as Rana was saying what PPA is, what power budgets, agreements, and so on. But kind of establish down the line some kind of rules where people investing in it know that okay, you have a market here. We can invest by assuring that short region and long-term that we will be able to continue to make profits, continue to go into that market and increase our coverage.

When I was also talking about the market and commercial _____ to it, and this is linked to the systems within that particular country. As I was saying earlier, one of the goal that has been happening is really about innovative business models growing out, and this has been able to do kind of like technology _____ market, the use of mobile phones and so on. So it all depends how the market is structured, what are the technical barriers that have been broken down for the whole environment to be kind of safe and sound _____.

Tim Great. Wonderful. Thank you very much again. Another question. Wondering what the estimates are with regard to investment required to achieve universal energy access. I think they're looking for rough ballpark numbers, questions specifically are we talking closer to 70 billion or 700 billion, and also along terms of timing, is 2025, 2035, what's more sort of a reasonable outlook?

Fabiani Appavou I would like to – it depends on how you see the _____. I think the 100 billion is a fairly conservative one when we take into account – we either think that okay, it might take much more time to invest in some kind of technologies, invest in putting in _____ to build it, and the 70 billion is more of a very kind of optimistic power. I would characterize it as wishful thinking, but rather than like okay, we can come into the country, we have a technology, we have kind of a systems in place, we know how to use it, how to deploy it. We just come in country, come into origin and deploy it right away. And this is what was really the case. I think we were actually being _____ by 2023, we're on 70 billion for sure.

But given the current state of affairs, given that some countries are not on the same level at all, the different regions defers in the ways they treat universal, they treat distributed renewable energy, and in some regions, there's always some kind of like reluctance to move that way because it's something that we don't know. So I would say it is in kind of between. But I think efforts are

being made. I'm not so sure about being able to achieve it by 2023. Just 70 billion. But I'm kind of sure we'll be able to achieve the energy access for given the dynamic information put in place, and the incentive being granted by 2035. Seven hundred billion, we'll see.

Tim

Great, thank you again. So it looks like we'll have time for maybe one more question. Those of you who didn't get your questions answered, we'll be sharing those via e-mail with Rana and Fabiani afterwards. So hopefully we can get those questions, and again you can reach out to either of them directly for further questions. So final question is just wondering if you can give a little more information about how to participate and help out with the next global status report, GSR 2016.

Rana Adib

Okay, so what I'd suggest is to – I think I included this in the slide. There is an e-mail address. Either you can send me an e-mail directly to Rana.Adib@_____.net, or an e-mail to GSR for Global Stats Report @REN21.net. We will start data collection in October, so basically we're really looking for project developers, practitioners, industry, industry associations, NGOs, development organizations, development banks, private investors to participate in that process. We are looking for country information, so really information on what are the noteworthy trends in a country, policy frameworks. Here we have a questionnaire which is predefined where we also have a specific part on distributed renewable energy, and the table Fabiani presented. So we will prepare basically an Excel sheet where we are collecting quantitative information, and this will be sent around more to the organizations, program developers, project developers.

In partly, you can just send us an e-mail if you have one information on your project, your – the project you are doing, we are partly also taking – I mean we're doing desk research obviously in the authoring teams. So it is quite flexible, but we try to streamline it along a questionnaire and along this Excel sheet we will send around. The best way is really to make sure that you are in our database, so to say, of the GSR community so that you receive the information and by the different data collection processes. Another part is, as I mentioned, we have a peer review. There are two peer review round. The one on distributed renewable energy will take place in January. This is always another easy way to also contribute. So basically see what is already there. We will certainly circulate in this context the – this reference table we plan to produce or the Excel sheet so that you can also compliment information in the peer review.

And if you would like to have more detailed questions or more targeted, we're always available per e-mail to schedule a call. We can even do if you have networks you would like to mobilize, it's important for them to be aware of this platform. Don't hesitate. We can also organize specific webinars or join calls. So we're happy to do so.

Tim

Okay, great. Well that's about all the time we have. So thank you very much to both of you, Rana and Fabiani. One last thing before we close. We just have a very short survey, three questions for those in attendance to answer so that we can get some feedback on how we've done. So if you can go ahead

and answer the first question you see on your screen there, we'd appreciate it. Okay, thank you. And second question. And one final question. Okay, great, thanks for answering the poll. Once again, I'd like to extend a warm thank you to Rana and Fabiani of REN21 for presenting today. I'd also like to thank everybody in attendance for joining us. We invite you to check the Solutions Center website if you'd like to view the slides and listen to a recording of today's presentation, which should be posted hopefully within the week.

You'll also find information on other upcoming webinars and training events on the Solutions Center website. We invite you to inform your colleagues and those in your networks about the Solutions Center resources and services, including our no-cost ask an expert policy support. And with that, we'd like to invite everybody to enjoy the rest of your day, and we look forward to seeing everybody at future solutions center event. Thank you very much.