

Webinar Panelists

Thani Al Zeyoudi Director, Energy and Climate Change, Ministry of Foreign Affairs, United Arab Emirates

Christine Lins Executive Secretary, REN21

This Transcript

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Vickie Healey

I [would] like to welcome you to today's webinar, hosted by the Clean Energy Solutions Center, and REN21. We are very fortunate today to have Christine Lins, and Thani Al Zeyoudi. Joining us in this great group of panelist, we'll be discussing the REN21 Renewables 2013 Global Status Report with the focus on the Middle East and North Africa.

One very important note, I've mentioned before we begin our presentation is this little disclaimer that I'll read which is the Clean Energy Solutions Center does not endorse or recommend specific products or services. And, information provided in this webinar is featured on the Solutions Center's resource library as one many best practices resources reviewed, and selected by our technical experts. So, before we begin—excuse me, I will quickly just go over some of the webinar features.

For the audio, you have two options where you may either listen through your computer or over your telephone. And 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. And if you select the telephone option, the box on the right side will also display the telephone number, and the audio pin that you should use when you dial in. panelists, just a really quick reminder, we ask that you please mute your audio device while you're not presenting so that we can't put in any background noise.

And if anyone in our audience is having technical difficulty with the webinar, we—you may contact or go to webinar's help desk at 888-259-3826 and we'll be happy to assist you. So, if you would like to ask a question, we ask that you use the questions pane where you can type in your questions. And if you're having any difficulty viewing the materials through the webinar portal this morning or this afternoon, we do have PDF copies of the presentation posted at the Clean Energy Solutions site at the URL provided here on the screen.

And you can access the presentation fair and follow as our speakers present. Also, we'd like to let you know that an audio recording in the presentations will be posted to the Solutions Center training page within a few days. So, we have a really great agenda prepared for you today that is focused on the REN21 Renewables 2013 Global Status Report. And we'll provide also a focus on the Middle East and North Africa Region. Before our speakers begin their presentations, I'm going to give a short informative overview of the Solutions Center. And then, following the presentations, we'll have a question and answer session and then, that will be followed by any closing remarks and a short survey that we'll ask to take.

So, this slide provides a bit of background on how the Solutions Center actually came to be. The Solutions Center is an initiative of the Clean Energy Ministerial, and it's supported through a partnership with UN Energy. It was launched in April of 2011, and it's primarily led by Australia and the U.S. Government, and as well as other some country partners. An outcome to this very unique partnership includes support of developing countries through enhanced on a resources on policies relating to energy access, and renewable energy and energy efficiency.

We offer a no cost expert policy assistance, and also peer-to-peer learning and training tools such as this webinar you are attending today. So, the Solutions Center, we have four primary goals. First, we serve as a clearing out of Clean Energy policy resources. We also serve to share best practice—policy best practices, data and analysis tools that are specific to Clean Energy policy programs. The Solution Center delivers dynamic services that enable expert assistance, learning, and peer to peer sharing of experiences.

And lastly, this inter foster's dialogue on emerging policy issues in innovation around the globe. Our primary audience is energy policy makers and analysts from governments and technical organizations in all countries. So, we also try to engage with the private sector, NGOs, and civil society. So, a marketing feature that I just briefly mentioned before that the Solution Center offers is our expert policy assistance. And we call this feature or service Ask an expert, it's very valuable service that's offered through the solutions center, and we've established broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis. And this support is provided to the requesting country or official at no cost.

So for example, just to highlight an example of one of our renewable energy experts. In the area of renewable energy finance and market, we have Toby Cature [ph] of east coast and Berlin, and he serves as one of our experts that I just mentioned. So, if you have a need for policy assistance on renewable energy or any other Clean Energy sector, we very much encourage you to use this useful service. And again, we remind you that this is provided free of charge. And to request assistance, you may

submit your request by registering through our Ask an expert feature on the Clean Energy Solutions center homepage. And we also invite you to spread the word about the service due in your networks and organization.

And you can—if you want to become more involved with the solutions center, we encourage you to explore and take advantage of the solutions center resources and services, including the expert policy assistance I just mentioned, you can subscribe to our newsletter and participate in webinars. So now, I'd like to just provide a brief introduction of our distinguished panelists. First up today, we will have Christine Lins who is the executive secretary of REN21, and Christine will provide an overview of the key findings of the 2013 Global Status Report.

Following Christine, we have Thani Al Zeyoudi who is the director of Energy and climate change of the United Arab Emirates Ministry of Foreign Affairs. And so with that, after providing this very brief introductions, I'd like to turn the webinar over to Christine. And Christine, welcome.

Christine Lins

Thank you very much, Vickie. Good afternoon ladies and gentlemen, it's my pleasure to be here with you today. I'd like to give you an overview on the Global Status of Renewable Energy. I am very honored to be joined by my fellow, Thani Al Zeyoudi from the United Arab Emirates. We left the webinar with specially focused on the many regions, which is the region that is seeing emerging renewable energy roles. And I think we have—hopefully we'll manage to demonstrate this work. To start with about REN21. REN21 is a stakeholder [ph] a policy network, a coalition of the willing of all those poles from private and the public that are engaged in the promotion of renewable energy. We have a series of national governments, among them, the United Arab Emirates, different national organization, national energy agency, the U.N. agencies, European Commission, the World Bank as well as IRENA, the International renewable energy agency where its headquarter in Abu Dhabi. Different industries, associations, NGOs, as well as actors [ph] from science in the academia.

And we are producing an annual report, our pledging publication with the Global Status Report that basically keeps an overview on global market industry, policy trends globally. Has especially focused distributing renewable energy in developing countries, promised all technologies, and all sectors from power heating and cooling to transport. This report is produced with a team of over 500 contributors researchers and reviewers worldwide, is launched together with UNEP's Global Trends in Renewable Energy investment, and every year, the report has a special feature. This year, it is on system transformation because we see that countries having higher shares offer new rules need to put the focus on integrating its high shares into their energy systems. So, the transformation aspect in the operation form is an important work.

This year, together with IRENA and the United Arab Emirates, we produced dedicated status report on the MENA region, it was launched in [ph] as an outcome of the Abu Dhabi International Renewable Conference in direct, it was organized and hosted by the UAE together with the [inaudible] [00:09:42] Energy Summit in January this year. And we did this report with a net total of 55 plus from the region to provide an overview on developments in the release in North Africa because there's a lot of things that are going on there, and also, the Global Status Report describes the global context, we felt the need of quite a bit more specific when it comes to the MENA region.

So, now, let me take you as more the findings of the Global Status Report Introduction. Renewable energy at the end of 2011, supply estimated 19% of global final energy consumption, that is actually the only figure that is from 2011, all the others are based in 2012. But as the share is put in relation to overall final energy consumption, and they are—I think it's only very good for 2011, that is even this year. You see in this graph that the shares composed of probably half of modern renewables, and the other half computation with Biomass, and there is a goal of the U.N. Secretary General, and versus Renewable Energy for all to total the share of Renewable Energy in the global mix from 18 percent which was to share I see in 2010 to 36 percent by 2030.

What does this now mean in terms of electricity. In 2012, Renewable Energy comprised more than 26% of global generation capacity, and about 22% of electricity globally produced from renewables. In 2012, for the first time, renewed is counted for more than half of all new installed electricity, so, more than half of all new products has to do a bit where renewable space, they share them for the European Union, was in the order of 70%, so, more than two-thirds of all the power plants, well, newer space, and then, the MENA region, well, we see that renewable electricity production has risen at a faster rate than conventional energy sources since 2008. There it has 1.7 gigawatt of power capacity installed in the MENA region, and giving [ph] solar has the highest average annual growth, and also been followed by means.

And I think this a very remarkable development when you think of the Middle East as oil exporting countries where you see that there is really a new increasing focus on the renews. So, as far as Solar PV is concerned, 2012 was a very interesting year. Capacity reached the 100-gigawatt milestone. You see the various deep increase of the graph. And when you look effectively on the trends, you'll see that it took us about 15 years to go from close to zero to 40 gigawatts, and then, this—and it was more than doubled in just two years, so, you see a clear acceleration of development that came with falling prices to Sola PV modules. And we see that in the MENA region, similar to the global trends, Solar PV has been going rapidly with an annual average growth rate of 112% throughout this last years. And we see now that all MENA countries use Solar PV to meet electricity demand.

So, they are very interesting and driving development. And actually, there are no to scenarios out there that completely underestimated the install capacity for Solar PV for this decade, not only from the international organizations, but also from many industry associations. So, I think even the industry people were surprised by how directly this development took place. As far as wind is concerned, almost 45 gigawatt of wind power capacity came in operation in 2012, but increased the global wind capacity by 19% to 283 gigawatts. And a total of 1.1 gigawatt of wind was installed by the end of 2012 across nine Mena countries.

As far as concentrating Solar thermal power is concerned, total CSP capacity increased more than 60 percent in the course of the last year to roughly 2.6 gigawatts. And 40 % of countries operating CSP plants in the world were located in the MENA region, and most in interest in from different countries and 2013 are saw the opening of the world's largest CSP plant, Shams 1, with an installed capacity of 100 megawatts in the United Arab Emirates. As far as investment is concerned, renewable energy global investment in renewables decreased in 2012 by 12 % from the previous year.

This is still the second highest year ever of investment. We saw it only one had installed capacity with that, plus 30%—30 gigawatt in the field of PV, 45 in the field of wind, 30 gigawatt in the field of hydro. I have not come on all the technology as sectors simplified in the GSR for the sake of time. Follow me ahead. The reason for the reduction of investment was on the one hand, fallen technology cost, but also we action of investments in the United States and in the European Union, partly changing points and frameworks and also of course the financial crisis.

What is very interesting to see that 2012 showed a continued shift in the balance of investment activity between developed and developing economics, and they have—you can see that these 244 billion U.S. dollars which I mentioned before they ask for it—they are consisting of about 112 billion nowadays invested in developing countries, which represents an increase by 34% from 2011, and then, continued unbroken eight-year growth trend. Whereas the developed economies there, and that's especially the U.S. and European Union, their investment friend, 29% to 130 billion U.S. dollars, that was the lowest level since 2009. And in this graph, you can effectively see the merging renewable energy check in the Mena region with quite an impressive increase in investment.

And I mean, there is already a lot of typhooning there and also a lot of denouncements in April 2013, 106 projects are totally in over 7.5 gigawatt or renewable energy capacity were in the pipeline, then would represent if they all come online at 4.5 increase—followed increase in over existing capacity. So, we see that there is actually quite a lot of development, and also, lots of investments and announcements in the field of policy to which I would come in just minutes. As far as renewables are concerned, worldwide renewable energy employment continues to increase.

According to a study from IRENA, an estimated 5.7 million people work in the renewable energy sector worldwide, and you see there on the graph a reputational distress [ph] in the different technology key areas.

As far as policy is concerned, I mentioned it briefly before we have now all 21 Mena countries having policy targets, there is an increase of at from five in 2007, and at least 19 countries have another technology specific targets. So, specific targets for wind or for Solar PV, etcetera. On a global level, we have about 140 countries all around the world with renewable energy targets in place, about 130 of these, two-thirds of which are in developing countries has policy frameworks in place. And it's actually encouraging to see that a number of countries with renewed energy targets more than doubled between 2005 and 2012. So, a clear frame towards diversifying the geography of renewables, which on the one hand as I mentioned before is definitely a clear side from reduced technology costs, but I think which also fairly shows that more and more countries are convinced that renewable energy will be integral part of their future energy supply. And also, I think with the rapid increase of membership of the International Renewable Energy Agency, this is also reflecting these trends and these developments.

So, a quick word on the future outlook. You might be familiar with the UN Secretary General's sustainable energy for all campaign that was actually launched in Abu Dhabi a year ago, and one and a half years ago already and that consists of three complimentary goals to be reached by 2030, ensuring universal access to modern energy sources, doubling the global rate of importance in energy efficiency and doubling the share of renewable energy in the global energy mix.

The UN has actually declared the upcoming decade, 2014 to 2024 as the decade of sustainable energy for all, to underline the importance of these objectives. And REN21 and the coordination of the World Bank and International Energy Agency together with many other international organizations more towards developing a baseline for this sustainable energy for all company, which is summarized in the global tracking framework that also launched in May this year and that is available on both [inaudible] [0:21:20] but also the REN21 website. That gives a baseline on what used to be done—what is the state of—the basis for governing the share of renewable energy in the global mix from 18% in 2010 to 36%.

REN21 earlier this year direct launched its global futures report, which provides an overview of how they're thinking about the future of renewable, and in the course of this exercise we did not come up with our own scenario but we did a comparison of different scenarios that are out there in the world and this craft actually gives an overview and also puts the sustainability for all target into context, so you see that we analyze the series of I think 50 different scenarios and classify them into conservatives, moderate and highly renewable scenarios. And there on the

graph we could see that the conservative scenarios of course and the moderate ones provide lower shares of renewable supplies scenarios with a focus on renewable deployment as well as focus on energy efficiency. They clearly show that this sustainable energy for all target cannot only be reached but can effectively be easily surpassed.

When looking at this, we also did some analysis about past projections and there we see that many of these projections were actually much too conservative as far as renewable deployment is concerned, especially in the field of wind and [inaudible] [0:23:16] and solar. So, there were many focuses that were not only achieved but were actually met and where actual development work was much higher than what was actually projected.

In conclusion, we see that achieving objectives will be feasible. I know it will take policy action. It will need increased financial flow into the sector and for these to happen, stable and predictable policy is absolutely key for the industry. We also see that the bubbling of the share of renewable will need to result by 2030. It will need to result in at least a tripling of the share of modern renewable including sustainable hydro power, and for this it is important that all centralized and decentralized renewable will be deployed.

We still have a suggestion in the world that there are a lot of untargeted fossil fuel subsidies existing and these would need to be phased out in order to create a fair, level playing field for renewable and last but not least, we clearly see that integration of renewable in energy systems is becoming more and more important.

All these need a closed dialog between the public and the private sector. This is what we are aiming to do within REN21 and with this I thank you for your attention and I gave the floor to Thani [inaudible] [0:25:07] to provide a complimentary perspective. Thank you very much.

Thani

Thank you so much, Christina for the introduction and thank you to REN21 for the invitation to speak here today. Renewable energy, as you all know [inaudible] [0:25:31] for the United Arab Emirates toward our ultimate goal to diversify our energy. We are the host of the International Renewable Energy Agency; we're one of the key players in the board of REN21.

[Inaudible] [0:25:50] to speak about the case for renewable energy in our region especially now with the huge promising changes in the market. And before I start with my presentation, I'm really proud to say that today, we commissioned 13 megawatts photovoltaic projects in Dubai, and we are now in the second stage in the renewable solar city complex within Dubai, targeting 100 megawatts in the second stage.

Let's start by looking at the renewable energy landscape of the Gulf countries. In 2008, there was almost no installed [inaudible] [0:26:41] coming from a renewable source. Now, in 2014 we're up to almost 200 megawatts, half of that being the UAE [inaudible] [0:26:51] project which has been commissioned mid of this year. We fast-forward to 2022 and we're looking at an incredible 60-gigawatt sun project. Overnight, the middle east has become one of the most exciting renewable energy markets to the world. This change has generated a huge amount of interest both globally and regionally, and we will try to provide some perspective on the reason for this shift to sustainable energy.

Next, looking back a decade. At the time, the UAE was the only country in the region seriously speaking about renewable energy. This was largely a function of our leadership legacy. Our founding father, Sheikh Zayed, began a government trend of resource stewardship, diversification and openness to the new idea. So, when renewable energy came into the leadership, there was a strong willingness by the governments to enter this sector. Our reputation and our history has commitment to the environment and our resources are—saving was [inaudible] [0:28:16].

The UAE rationale for renewable energy became the standard for the region. Our people argued renewable energy could allow diversification away from hydrocarbon, create jobs, de-carbonize our energy sector, access to the clean [inaudible] [0:28:37] mechanism, reduced air and water pollution.

When we all look at these reasons objectively, it is a complicated picture, because renewable are more expensive rather than hydrocarbons in the region. They would have to be subsidized. The new jobs would therefore also be subsidized. Climate finance was not a very large revenue source and the pollution would be important. But there were enough counted in financial terms. So, many of utilities did not take into consideration those financial terms when deciding among the fuel options. Therefore, the only [inaudible] [0:29:22] renewable energy were the visionary countries that could afford to waste [inaudible] [0:29:27] on investment.

But now in 2013, we are talking about 60 gigawatts with a project in a single country. Clearly, renewable energy is no longer seen as something only for the generic country, but a practical choice. For all of our perspective, the original case for renewable energy remains barren but there are three key new reasons. First one are the renewable energy [inaudible] [0:30:01] on hydrocarbons have remained high. There is now a large opportunity cost, we are consuming oil and gas at home instead of exposing them.

Similarly, if you are importing energy at high Asian prices, it might be cheaper for us to choose a renewable energy option. Lastly, as an importer of fuel supply and the cost of fuel supply is much safer is you are producing it locally.

The most common case for renewable energy has been in countries but then, crude for power which are Saudi Arabia and Kuwait. As local demand grows rapidly, export potential has been affected badly. Moreover, global renewable energy finance estimates that a solar plant in Saudi Arabia could be able to turn around 20% return only freedom for export. This is the reason that Saudi Arabia is now talking about around 64 gigawatts by 2032. [Inaudible] [0:31:13] renewable energy if you are burning coal.

For us importers such as UAE, Kuwait, the case has improved too. PWC believes that if you are obtaining around \$15.00 per barrel, you are better off investing in renewable energy. This is the situation that needs to see especially now. For many years, our gas was some of the cheapest in the world. However, we are not competing with Japan and Korea for energy. The result of the competition between gas and renewable energy is getting much closer. We are able to bring lots of domestic gas online. The case might turn in favor of gas again but the gap would still be much not to worry. New domestic gas is quite expensive and the renewable energy continues to become cheaper. It might be the choice above even the domestic gas.

For gas exporters like Qatar, the case is also getting better. The issue [inaudible] [0:32:27]. So if you believe PWC, there may as well be an opportunity to consuming gas at home instead of exporting. A key variable for the cost of energy in North America and conventional gas, as it arrives in other quantities, it could make the gas exported attack the [inaudible] [0:32:47] and therefore reducing the appeal of renewable energy. However, the North American energy is still more expensive than what you see it is used to before. So between gas, renewable energy would still narrow significantly.

One other aspect of the [inaudible] [0:33:09] renewable energy industry to highlight the overseas investment which is [inaudible] [0:33:13] for renewable energy around the world and the global. They are now even subsidized on working as the investment, the most famous being the UAE master clean fund. These numbers do not have any doubt about renewable energy. We have also seen growth and development as a standard for renewable energy led by the United Arab Emirates. Over \$500 million of grants and loans are available now exclusively for renewable energy projects in developing countries and [inaudible] [0:33:50]. So while the agency is investing at home renewable energy, we're also investing abroad. This investment will grow, the renewable energy becomes more and more competitive globally.

In terms of the timelines for renewable energy implementation, large-scale projects are already being announced approaching centering. The biggest wave will be in Saudi Arabia. The government is planning to do several hundred megawatts and benefits are serious. [Inaudible] [0:34:23] with energy. After understanding the cost of the [inaudible] [0:34:27] they are

considering moving to a [inaudible] [0:34:28] for the remaining of the 64 megawatt renewable.

For the distributive generation that's under consideration across the agency, how much that would be subsidized. Some governments may refer to that, the subsidy for the projects of economies of scale, unless they decide they want public participation on renewable energy. For the overseas investment, this ought to be happening, the funds and development agencies are actively seeking projects provided that they need screening criteria. So, the message from the agency right now about renewable energy was this space that's coming. Thank you.

Vickie Thani and Christine, thank you so much for those great presentations. It's really good to see a focus on the MENA region. So, with that, we have quite a bit of time left over to answer any questions that the audience has and again, if you do have a question, there's a questions pane on the right hand side of your screen and you can type in your question there. We've had a few questions come in so far and one of them actually has to do with energy efficiency. Christine, the question is if you could elaborate a little bit more on how to double the energy efficiency in the SC for all initiative and if there is a baseline for this objective?

Christine Yes, thank you for forwarding this question. Yes, there is a baseline. The global tracking framework, there was a report that was launched in May, 2013 at the Vienna Energy Forum and this was prepared by I think 17 different international agencies and with the coordination of the World Bank and the International Energy Agency and this is a record providing a baseline for the reaching of these objectives in the three areas, excess, energy efficiency and renewable. Effectively, the energy efficiency sector looks at many different elements from increased industrial efficiency to standards for appliances and building codes and all the different areas and it's really a starting point but all this very interest in this exercise is on the one hand the inter-related nature of these objectives and I think it's very important to really not only look exclusively on the supply side but also look at how demand can be curbed with it, how one of them makes this tool to utilize energy most efficiently and then also put that into the perspective of ensuring energy excess for all by 2030.

Vickie Great, thank you so much for that answer. The next question is actually regarding the North Africa region and the question is, is there information available for the market development in North Africa?

Christine The main status report, maybe produced together with the UAE and Arena. It's focusing both on the least so on the Gulf countries, but also focuses on the North Africa region and there it's available from the REN21 website, REN21.net and there, people can really have an overview on development also in North Africa.

Vickie Thank you so much. Next question is, is there a regional breakdown of the sustainable energy for all targets, and if so, what are the implications for the MENA region?

Christine To my knowledge, there is no breakdown of the targets. I think that Arena is in the process of producing [inaudible] [0:39:22] for countries with a focus on 2030 to incorporation with the countries, but clearly these stable energy for all complain of the Secretary General is an inspirational goal, highlighting the interlinked nature of the three objectives and giving an indication of the level of condition that is most likely to be reached by 2030 given that

Vickie Thank you. And Christine, actually, this next question is for you as well. And the person asking the question is asking if you could share the global rise in nuclear facility with regard to solar and wind internationally and the MENA region. And is this renewable rise more than the rise of nonrenewable sources?

Christine Yeah, so I mean, clearly what we do in the global status report is as outlined we are tracking renewable development and there we see that more than half of new power generating capacity is actually renewable space so renewables are clearly very much moving forward, quickly moving forward than other sources. However, we are not making detailed analysis of other sectors but just when you look at situation of renewable energy share of long time and energy consumption, we had a share of 19% and that compares to about 2.8% of nuclear in this share and then another share of 78% of fossil fuels. So, clearly, we see that renewables are advancing rapidly and as I have stated in one of my slides, there we see that in the MENA region renewables has been growing more quickly than fossil fuels and conventional fuels. So I hope that answered the question of the person who asked it. I don't know Thani whether he would like to add anything. We see that in the MENA region, renewable energy production, electricity production has risen at faster rates than conventional energy sources and mainly in the field of solar and wind [inaudible] [0:42:12] rates.

Vickie Okay. Thank you, Christine. The next question comes from someone who has been working in the field since 1995 and the person asking the question states that finance is a major share stopper when it comes to implementing solar energy projects as a solution in developing countries. And the question should that is how countries working in this field, I guess, based on getting finance or investments to support these types of projects in developing countries?

Christine So, I mean, my answer on this would be that anywhere whether it's developing countries or emerging economies or industrialized countries that predictability and the stability of the policy framework is the most important in every factor for taking pilots. And lots of you meant I go to people talking about that fact that money is available but money will flow

to markets which has stable conditions and the policy changes that we have seen in the past in some European countries and also the stock and gold policies in the United States, they are ultimately making it difficult for investors to predict the return of investments. And so we see that these are the markets where investment actually might down so we see many others where stable conditions are based, where really money is also flowing into these markets. And I think also as Thani has outlined in his presentation, the Middle East is a very interesting region because on the one hand capital is available, and then on the other hand there is this huge potential and not really this huge understanding that it's economically more viable to use renewable energy sources in these countries and export the fossil fuels to other places. I was two weeks ago at the Global Clean Energy Forum organized many potential [inaudible] [0:44:41] in Doha, Qatar, and there it was clearly stated by several project developers in the region that they have no problem to actually get financing for the projects because they are clearly in lined with policy objectives and policy frameworks.

Vickie Thank you, Christine. This next question is—actually, I think Thani you might be able to address this first, then Christine you may be able to add some additional comments. This question is regarding promoting renewable energy through feed-in tariff and the question is will feed-in tariff contribute greatly to developing renewable energy in developing countries and North Africa bearing in mind that the success of feed-in tariff such as how it will structure in Germany was mainly a distribution of the additional cost on to the cost consumers or right payers?

Thani Absolutely, the feed-n tariff was an important element in promoting renewable energy in the region. However, second consideration is the use of subsidies that the government in this region is boosting on the conventional energy option. The governments are investing heavily on the endorsed renewable energy government. They could help more the renewable energy projects faster in the region. The other thing that we should analyze is the government, the utilities, power generators here in this region, they should evaluate renewable energy to the other energy options or fuel taking considerations the international market and from there we can move ahead and make the case for renewable energy projects in the region.

Vickie Thank you, Thani. Go ahead Christine.

Christine No, I just want to add to what Thani has said that effectively there are—I mean, we see that still today majority of renewable energy capacity is deployed and feed in various markets so it will be easy that there are very promising experiences emerging in different countries with renewable energy handlers such as in Brazil and in South Africa, that prices for projects have really gone down significantly and again here I would come back to my previous point and emphasize that it's not so much important what's framework is put in place. What is more important is that the

framework is stable and predictable so that investors know what they get from their donor or Euro investors when they get back.

Vickie Thank you, Christine, for that follow-up. The next question is—I don't know—a little bit of an exercise act in compared to a natural gas and the question is related primarily to GCC countries. The question is most of our electricity is generated using natural gas so what is the natural gas price point at which PV systems can become economically more competitive? That might be a tough question to answer but—

Christine Maybe, I mean, I don't know exactly about the exact level of price but I would argue that especially given the amount of sunshine the middle east gets, PV is a very viable option and effectively a combination of the viable renewables with fossil fuels that can be quickly switched on and switched off such as gas power plants is a very interesting combination and I think we will definitely see more of this in the years to come.

Thani Can I jump in here? Based on PwC studies, the thing that the gas pipes should be something around \$15 per million Btu. However, based on our studies the range is between \$10 and \$15 per million Btu up down for the PV project to be accountable with regards to the power plant.

Vickie Thank you so much, Thani. Next question, is there a maximum limit that should not be exceeded for the production of green electricity on the grid? And I imagine that would have to depend quite a bit on the state of the grid in the country. But, basically, how do you solve the issues of variable renewables on the grid? Do you have any recommendations on that?

Christine Maybe I can answer it generally, and then let Thani provide any comments for any main specific comments there. So in general, I mean, there are already countries nowadays have a quite high shares [inaudible] [0:51:00] high share of reliable renewables in the system. It all depends on the stability of the grid. It depends on lot managements. There are ways and there are scenarios out there and was foreseen at 100% electricity generation from renewables between now and the mid of the century or between now and 2050. I think there is no magic number of saying it can only go up to X percent of renewables. What is important is—that's why we have plan a feature on this aspect. It's important to integrate these high shares of renewables into electricity grids and has to be planned for. There are very good programs nowadays to forecast wind and sunshine and lot management is capable of doing many things. It needs to be planned and this is, I think, a challenge and we still have some resistance of [inaudible] [0:52:19] because [inaudible] [0:52:20] to integrate these high shares but technically there are some challenges. These challenges can definitely be overcome so far. On the global, I don't know what that—can you wish to add anything on MENA region?

Thani Based on a couple of studies we did, there were some of, I think, [inaudible] [0:52:45] something around 25% of the total power generation

over based on the recent studies you can't go even more than 25%. So it depends on the ability of the MENA countries on the huge and mega project and connects them to the grids taking consideration on the severity of other elements that Christine was talking about.

Vickie Okay. Thank you, guys. Thani, this next question is for you regarding wind resource in the UAE and the person asking the question is stating that well Dubai and Abu Dhabi, the wind resource in that region is not all that great. There could be a better wind resource on the Fujairah site. So how is the UAE addressing how to deploy wind energy projects within the country?

Thani Very good question. Actually, you're right. The resources in general in the United Arab Emirates when it comes to one that does not attract especially the period of something around 2 to 4 meter per second. So it's not a kind of viable for us to go on. And the [inaudible] [0:54:15] you're right. We did couple of studies evaluating the wind resources there in that area of region of the country. However, still we haven't reached the right case to say that this is the right case to do the wind projects there. What we're doing now here to [inaudible] [0:54:39]. We are developing the solar and wind [inaudible] [0:54:44] and from there we will be able to identify the right locations and spots within the UAE and the gulf region where we can develop wind projects.

Vickie Thank you, Thani, for that answer. This next question is really more about the debate of whether waste energy should be counted as a renewable energy resource. Some say it should, some say it shouldn't. Do you have any thoughts on the waste energy when it comes to counting that as a renewable?

Christine So in the quality of status report, the biodegradable share of waste is integrated into the renewable share and then it nationally accepted definition whereas the non-biodegradable part is not considered.

Vickie Thank you, Christine. We do have another question, regarding the residential sector. The residential sector is becoming a main energy consumer in the MENA region. So what steps are they currently underway to promote solar water heating and in individual level within the region, in which countries are sort of leading by example or leading the way in this area? So Thani I think that is a question for you.

Thani One of us comes to the residential sector. You're actually right, it's one of the main energy consumers in this region especially because of our hot climate and the need for AC etc. They cover [inaudible] [0:56:44] within the United Arab Emirates [inaudible] [0:56:47] MENA countries to have sort of water heater project. Meanwhile, the government, the UAE especially are working heavily in energy efficiency initiative on the project produced the consumptions on those residential areas and buildings. So the launch by UAE in last few years from now that is

forming up in the other region, the green code, the [inaudible] [0:57:22] which means that [inaudible] [0:57:23] code in Abu Dhabi which is going to be applied to all public sector by 2040 and the barring some of the air conditioner which has distant 20% efficiencies. The efficient lighting [inaudible] [0:57:40] so many initiative are taken by the government to ensure that the power consumption of the residential sector is really tackled.

Christine Maybe I can add to this from the North Africa perspective that there are excellent promotion programs like the consult program that was developed in Tunisia and the Morocco that gives us schemes for the promotion of solar hot water heaters and all around toward the course. We also have policies in the field of net metering providing possibilities of uses of—of people installing solar PV installations on their roofs to directly fit in the electricity into the electricity grid.

Vickie Okay. Thank you, Christine. I'm going through the questions and it looks like we have answered all of the questions submitted by the audience at this time. So with that, I think I would like to at this point just thank both of you, Christine and Thani, for your time and this great presentation you've provided, just great information on the region and the overview of the key findings of the global status report and we thank you very much for that. And at this time, I just like to—if you have any additional closing remarks should you like to make, I'd like to give you the opportunity to do that.

Christine Thanks a lot, Vickie. Well, on behalf of REN21, again a big thank you to the Clean Energy Solution Center for providing this excellent platform as well as to the United Arab Emirates for the support and of course particularly to Thani for joining us on today's Webinar. Thank you very much.

Vickie Thank you.

Thani Thanks, Christine. A couple of thanks on my side. One of the things related to one of the questions raised at the beginning, the United Arab Emirates announced the huge investments and the non-grade renewable energy projects in Morocco and we announced hundred million US dollar investments on those renewable energy projects in Morocco. At the same time, we're exploring some of the renewable energy developments for renewable energy projects especially wind and solar in Egypt and the announcements of those projects I'm going to some at the right time when we clearly identify the location of those projects. So the MENA region is really moving towards having many more renewable energy projects. We're sure that we're open to collaborate or could be global investors and technology provider on this sector. With that, I close my remarks. Thank you so much for inviting us to be on this discussion as well as our pleasure to be here on the [inaudible] [1:01:12].

Vickie

Thank you, Thani. Thank you, Christine. So with that, we'd like to now move on to a really quick survey for our audience to respond to a few questions. Just to let us know a little bit about how we did and where we might be able to improve. So first question in the survey is the Webinar content provided me with useful information and insight. So if you could vote with the answer that most appropriately speaks your experience here. Then our next question on our survey is the Webinar's presenters were effective. And our next question is overall the Webinar met my expectations. So great, thank you to all of you that responded to answering our little survey. And with that on behalf of the Clean Energy Solutions Center, I'd like to extend a very sincere thank you to Christine and Thani, you're both expert panelist, and also to our attendees for participating in today's Webinar. You've been a great audience. You've asked terrific questions and we really appreciate your time in attending. And then I also invite our attendees to check the Solutions Center website over the next few days because we will be posting an audio recording of the presentation as well as copies of the side deck which are actually on the Solutions Center site currently. So, you have that opportunity to go back, review the slides and listen to the recording of today's presentation as well as listen to previously held Webinars. And we also invite you to remind you to inform your colleagues and those in your networks about the Clean Energy Solutions Center and our services and resources that we offer specifically the no cost policy assistance. So with that, I'd like to wish everyone a great rest of your day and we hope to see you again at future Clean Energy Solutions Center event. This concludes our Webinar.