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REN21 Renewables 2014 Global Status Report: Middle East and North Africa

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Webinar Panelists

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Sean Welcome to today's webinar which is being hosted by the Clean Energy Solution Center in partnership with the Renewable Energy Policy Network for the 21st century also known as REN21 and today's webinars is focused on the launch of REN21's flagship report the 'Renewables 2014 Global Status Report' with a special focus on the Middle East and Northern Africa. One important note of mention before we begin our presentations is that the Clean Energy Solutions Center does not endorse or recommend specific products or services. Information provided in this webinar is featured in the Solution's Center's resource library as one of many best practices resources reviewed and selected by technical experts.

Before we begin I'll go over some of the webinar features you do have two options for audio you may either listen through your computer or over your telephone and if you do choose to listen through your computer please select the “mic and speakers” option in the audio pane doing that will just eliminate the possibility of feedback and echo and if you choose to dial in by phone please select the telephone option the box on the right-hand side will display the telephone number and the audio pin that you should use to dial in. If anyone is having technical difficulties with the webinar you may contact the GoToWebinars Help Desk at the number at the bottom of the slide that number is 888-259-3826.

We encourage anyone from the audience to ask questions at any point during the webinar and to ask in questions simply type it into the audio pane, I'm sorry the question pane and submit it through there and I will present those to the panelists during the question answer session. If you're having difficulty viewing the materials through the webinar portal you will find PDF copies of the presentations at http://cleanenergysolutions.org/training and you might follow along as our speaker present. Also an audio recording of the presentations will posted to the Solutions Center training page within about a week of today's broadcast and will be added to the Solutions Center YouTube channel where you will find other informative webinars as well as video interviews with thought leaders on Clean Energy policy topics.

In today's agenda center and the presentation from our guest panelists Laura Williamson, Ali Al Shafar and Dane McQueen and these distinguished panelists have been kind enough to join us to discuss the launch of REN21's flagship report the Renewables 2014 Global Status Report. This 90minute webinar we'll look in detail at the Middle East and North Africa region where we will find out what renewable changes happened in the region over the course of 2013. Where in much technologies are contributing to increased power capacity and hear how changes in policy have affected investment levels and market development in the region. Before our speakers begin their presentation I'll provide a short informative overview of the Clean Energy Solution Center initiative and then following the presentation we'll have a question answer session where the panelists will address any questions submitted by the audience followed by some closing remarks and a brief survey.

Now this slide provides a bit of a background in terms of how the Solutions Center came to be formed. The Solutions Center is one of 13 initiatives Of the Clean Energy Ministerial that was launched in April 2011 and is primarily lead by Australia, the United States and other CEM partners. Some outcome of this unique initiative include support of developing countries and emerging economies through enhancement of resources on policies where they lead to energy access no cost expert policy assistance in peer to peer learning and training tools such as the webinar you are attending today. The Solutions Center has four primary goals. First goal is to; Serve as a Clearing house of Clean Energy Policy resources; second is to share policy best practices, data and analysis tools specific to Clean Energy policies and programs; third the Solutions Center strives to deliver actinium services and enable expert assistance learning and peer to peer sharing of experiences; and lastly the center crosses dialogue on emerging policy issues and innovation from around the globe. Our primary audience is energy policy makers and analyst from government and technical organizations in all countries. We also strive to engage with private sector NGOs and civil society.

One of the marque features that Solutions Center provides is a no cost expert policy assistance which is known as "ask an expert." The Ask an Expert program was established of a team of over 30 experts from around the globe where each is available to provide the remote policy advice and analysis to all countries at no cost. So, for example in the area of buildings we're very

pleased to have Cesar Trevino, the leader of the Mexico Green Building Counsels serving as one of our experts. So if you have a need for policy assistance in buildings or any other Clean Energy sector we do encourage you to use this valuable service. Again it is provided to you free of charge. To our process systems simply go to http://cleanenergysolutions.org/expert and submit your request through the Ask an Expert form on that page. We also invite you to spread the word about this service to those in your networks and organizations. So in summary we encourage you to explore and take advantage of the Solutions Center resources and services including the Ask an Expert policy assistance, the database Clean Energy Policy Resources, subscribe to the newsletter and participate in webinars like this one.

Now I would like to provide brief introductions for today's distinguished panelists. Our first speaker that we will be hearing from is Laura Williamson the Communication Outreach Manager of REN21 and here we will be discussing key findings from the REN21 Renewables 2014 Global Status Report. Following Laura we will hear from Dane McQueen and form the United Arab Emirates Ministry of Foreign Affairs and Dane will also be providing insights into the status of renewables into the Middle East and North Africa region. Our other panelists today is Ali Al Shafar from the United Arab Emirates Administrator for Foreign Affairs and Ali will also be discussing the status of the renewables in the Middle East and North Africa region. With that out now I will like to turn the webinar over to Laura.

Laura

Hello, thank you very much for that presentation can everybody see my—I'm just going to pull up my side snap. Thank you for the introduction and the invitation to speak today. My name is Laura Williamson I am going to give you a very brief overview of the current status of renewables in the world today with some examples of what's currently happening in the MENA region but the following presenters both Ali and Dane will provide far more in depths information with regards to what is specifically happening in the region.

Before we begin what or who is REN21? REN21 is a multi-stakeholder network we cut across five key stakeholder groups into Governmental organizations, Governments, Research Organizations, Trade associations and Non-profit groups. We currently have a network of about 500 experts that come from across those five sectors. These experts come together to help REN21 produce this annual status report. So, everyone brings their knowledge it's pooled together and it's presented in the form of the Global Status Report. This report was first released in 2005, when it was first released it was 30 pages in length, now in 2014 it's over 200 pages in length which is sort of an example of the development of renewables over the past ten years.

If we look at a background it's now been ten years since BOND 2004 and as many of you may remember BOND 2004 was the first International Renewable Energy Conference that looked only at renewables. Now ten years on where do we stand I think? I think it's fairly safe to say that the status of renewables really has surpassed all expectations. Renewable power capacity

has seen a seven fold increased and that's excluding hydro power. Cost for most technologies have decreased significantly and supporting policies have continued to spread throughout the world a number of scenarios that projected levels of renewable energy for 2020 were already surpassed by 2010.

We've also seen the positive knock on our additionally effect of renewables in the form of increased and improved energy security, the mitigation of greenhouse gas submissions, but also social and economic benefits it's most notably in the job sector. It's safe to say that renewables were here, the deployment of renewables is increasing and the challenges really now is how can we best increase the current paste of renewable energy uptake. That's just a very quick overview of where we've come over the past ten years.

So, where do we stand today? Renewable energy at the end of 2013 provided an estimated 19% of global final energy consumption, excuse me by the end of 2012. Despite this share of renewables in final energy consumption the total amount remained above level with 2011 this is due to two factors; because of the continued use of unsustainable biomass we're getting slow migration away from traditional biomass and we're also getting a continued rise in total global energy demand, hence the reason why the numbers are remaining fairly even with previous years.

If we look at renewables by country we can see that in terms of absolute figures China, the US, Japan continues to be leaders. However if we look at investment relative to GDP we get a complete different list of countries. Most of these countries are developing or emerging economies which clearly highlight the rapid advancement of renewable energy in developing countries. If we break it down by technology we see that this slight variation there with the United Arab Emirates being a leader in concentrating solar power. When we look at total capacity by technology we start to see different countries emerging with regards to the Middle East and North Africa region we see that the UAE in Algeria are leaders in the CSP, we see the emerges of Israel for solar hot water heating. If we look at the bigger picture so if we pull out from the regional perspective, when it comes to total renewable capacity installed per capita the EU is leaving 42% of global non-hydro renewable capacity in Europe compared to less than 17% of global electricity demand. These high renewable shares also explain the needs for increased attention on the integration of variable renewables in the energy system.

If we look now at the various energy sector we can see the most significant growth have really occurred within the power sector where we have global renewable power capacity now exceeding 1560 gigawatts, this is an increase just over 8% from 2012. We're starting to see that variable renewables are achieving high levels of penetration in several countries, for example throughout 2013 wind power met just over 30% and 21% of electricity demand in Denmark and Spain respectively. Denmark had 32.2% of wind power and met their electricity demand and just under 21% met their electricity demand in Spain. In Italy Solar PV met 7.8% of its total annual electricity demand.

What's of interest is that in 2013 China's new renewable power capacity surpasses the new fossil fuel and nuclear capacity for the first time. Which is a very clear signal that China is starting to migrate or at least diversify its energy mix? Looking at heating and cooling, heating and cooling increased by about approximately 10% over the course of 2013. The use of modern renewable technologies for heating and cooling is still limited relative to their vast potential. If we look specifically in the MENA region we saw that renewables met more than 20% of final energy demand for heating in Israel and the UAE relied on used renewable heat for industrial purposes.

For transport, we see that liquid biofuels met around 2.3% of total transport fuel demand. There is growing interest in other renewable energy options in the transport sector. One of those being renewable electricity, we're seeing an increasing use of renewable electricity to power vehicles this is in part in response to the very strong penetration of renewables in the power sector, but also because it starts to address the issue between land use for food security versus fuel issues. Now if we give a quick look by technology in 2013 we see that there was about 40 gigawatts of new hydro capacity was commissioned in 2013, leading to an increase of total global capacity to around 4% which is about a thousand gigawatts. Global hydro power generation during the year was estimated to be 375o terra watt hours.

We're starting to see the modernization of the aging hydropower facilities as a growing global market but we're also seeing that in some countries they're trending towards smaller reservoirs and multi-turbine run off river project. What is good to see is there's also an increase in recognition of the potential for hydropower to compliment other renewable technologies such as variable wind and solar power. Solar Photovoltaic (PV) had a spectacular year in 2013 for the first time a more PC capacity was added then went—we saw by the end of 2013 39 gigawatts was added so we now have a total of approximately 139 gigawatts of PV. Asia passed Europe to become the largest regional market for the first time in the last decade.

We also see that a solar PV is starting to play a substantial role in electricity generation in some developing countries basically the lower prices are opening up new markets in the Middle East and elsewhere particularly in Africa and Asia. Wind had a strong year more than 35 gigawatts of wind power capacity was added in 2013. We are now at a total of above 318 gigawatts. However over the past couple of years the wind market has come down by nearly 10 gigawatts compared to 2012 this is reflected primarily because of the steep drop in the US market. Offshore wind however did have a recorded year added at about 1.6 gigawatts most of this currently resides in the European countries, countries in the European unions.

In the MENA region Morocco added 0.2 gigawatts of a new capacity. What we are seeing globally is that by the end of 2013 wind power capacity is meeting about 3% of total electricity consumption. Bio energy steadied growth in heat power and transport sectors a total primary energy consumption of biomass reached approximately 57 exajoules in 2013, almost 60% of that however was traditional biomass so we still have a way to go on

the biomass issue, sixty percent traditional biomass versus 40% for modern bio energy. Heating accounted for the majority of the biomass use so we saw an increase in modern biomass heat capacity rising about 1%. Europe continue to be the world's largest consumer of modern bio heat in 2013 it was also the largest consumer of wood pallets burning over 15 million tons in 2013.

Concentrating on solar power of particular relevance and interest to the Middle East and North Africa it was up nearly 0.9 gigawatts it's about 36% in 2013. So, we're currently at about 3.14 gigawatts being generated through CSP. While the US and Spain remain the market leaders, markets did continue to shift in 2013 to developing countries with high levels of insulations so beyond the leading markets capacity nearly tripled with projects coming online in the United Arab Emirates in India and in China. We're starting to see an increasing range of hybrid CSP applications and thermal energy storage also continued to gain importance.

The trend towards larger plants was still seeing a trending towards larger plants primarily to take advantage of economies of scale while also improving the design and manufacturing techniques to reduce cost. As I mentioned just a moment ago the CSP marketing expanded particularly across Africa and the Middle East. We saw additions in the UAE for the 100 megawatt chance one plant we also saw a pledge of over 600 million US dollars in 2013 to support a handful of countries notably Algeria, Egypt, Jordan Libya, Morocco and Tunisia to bring in more than one gigawatts of CSP to the regional market. Early 2014 we see construction underway in Morocco about 160 megawatts as well as in Egypt at a hundred megawatt. We've also—further construction have$ also been planned schedule to take place in Saudi Arabia, Kuwait and Israel.

The geothermal on steady addition section like the biomass sector about—when I say biomass sector I mean the steady additions that are occurring about 530 megawatts of new geothermal capacity came online in 2013. The net capacity growth of 4% compares to an average growth annual rate about 3% for the two previous years—2010 through to 2012. Solar thermal heating and cooling again still starting to—we are still seeing steady growth in the past years China was the main driver accounting for more than 80% of the global market. Demand in key European markets continue to slow but we are seeing market expansions in countries such as Brazil where solar thermal water heating is cost competitive. The trend towards deploying domestic systems continued as it growing interest in the use of solar thermal technologies for district heating cooling and industrial obligations.

If we look at the contribution of renewable energy sector to the employment sector it continued to grow. Job creations from any country has really come to the forefront of the policy making debate and we saw that by the end of 2013 there was about 6.5 million people worked directly or indirectly in the renewable energy sector. So this is up one million from the previous year and by all predictions that increase is the growth in the job market from renewables is expected to increase. China currently remain as the largest

employer in the sector with about 60% of employment concentrated in the PV sector, but what we are starting to see in China but also elsewhere is a shift from the production of PV into the installation segment of the value chain.

If we look at investment in renewables, I've been speaking now really about the increase in the capacity and installation of renewables across all the various technologies and sectors but, there was a decline in investment in 2013. Global renewable investment and renewable power and fuels not including hydropower greater than 15 megawatts was estimated to be just over 214 billion US dollars which was down from the record level in 2011. However having said, net investment in new renewable power capacity outpace fossil fuel for the fourth year running so we are still seeing very strong investment.

The reason for this sort of second consecutive year in decline was partially due to the continuing uncertainty of policies particularly in Europe and the US, but also to the reduction in technology cost. Here we see that reduction in technology cost but increase in investment in the PV sector. These steep cost reduction throughout the last year as seen here in PV and also in wind make renewables attractive for new, markets in developing countries where there is a strong need for new electricity generation capacities and where energy demand is increasing.

This colorful slide snapshot gives you overview of Global investment in renewables worldwide. So, despite the overall downward trend there were significant exceptions at the company's level. While Europe’s investment was down 44% from 2012 for the first time ever China invested more in renewables than all of Europe combined. The most notable levels of investment was in Japan where investment in renewable energy excluding research and development increased by 80% relative to 2012 levels. China invested as I mentioned early more in renewable power capacity than it did in fossil fuels. We saw from an investment in Africa in the Middle East actually came down, from 10.4 billion USD in 2012 to 9 billion. Israel interestingly did increase its investment in renewables.

With regards to policies and targets we saw some very positive movement particularly in the MENA regions and specifically in the Arab states, for example targets, Algeria met its target of 10 gigawatts of added capacity in 2013. Egypt and Libya increased their targets Egypt had the addition of 700 megawatts per PV and 2.8 gigawatts of CSP their target is for 2017. Libya has a 20% renewable energy target to meet by 2020. Saudi Arabia set a near term target for 6 gigawatts of solar PV by 2020 and Haiti set a goal of generating 25% of electricity from renewables by 2020.

The development policies also in the middle region, Algeria extended its field and task support for solar and wind power. Egypt launched a tender for its project solar PV plant by 200 megawatts. In Iran there was a fund established to support renewable energy electricity project and Tunisia extended to 2016 into low interests loans for solar water heaters and began providing a 30% investment credit for solar thermal process heat systems. It’s a very encouraging development in the targets and policies. If we look at distributed

this is—renewable energies that are not connected to the grid. We see that there's an increased use of distributed renewable energy technologies linked with increasing energy access. This particular graph is rather interesting because it shows that on all developing continents, except Africa the growth in population electrified is bigger than the growth in total population. However in Africa we're seeing that the population growth exceeded the rate of electrification with the result that there is still only about 43% of the population electrified on that continent.

Part of the reason for this interesting increase in electrification is that we're seeing new business in finance models for renewable energy markets has the potential of rural and decentralized energy market is being recognized. We can also thank technical advances that are enabling the integration of mini-grids and also the application of ICTs for power management and end user services.

So in conclusion I think it's fairly safe to say that the global perception of renewables have shifted considerably. You can even have a look at this cover of this New Yorker that really showed sort of the home drawn everyday application of renewables of the rooftop in New York renewables are now a part of our landscape as our other elements of the built environment and as the figures presented in the global status report clearly document things were moving, but we also need to more quickly and more deliberately and I would just like to say in closing that the barriers really are not in the technology nor the financial side but they are really political and if we are serious about moving—making energy transitions with renewables anytime soon we must have closer collaboration between all actors from the public and private sectors.

That's it thanks for your attention this 'World Wind Tour' of our renewables across the world. If you're encouraged or interested in obtaining more details of what I've presented today there are two web-links listed one for the global status report this is the full report, a 200 page report that I mentioned at the beginning, you can download it in the PDF form or you can read it online with an electronic reader. So thank you very much for that and look forward to your questions.

Sean Ali just a reminder that you are still on mute so you'll have to unmute. Hi Ali you'll just have to unmute your microphone we still can't hear you. Ali and Dane if you can hear me your microphone is still muted you'll just have to hit that microphone button to unmute yourself.

Sorry we seem to have some technical difficulties but we'll try again to work theses out. Laura perhaps you could go ahead until they can work out their audio with their slides.

Laura Okay, as you can see on this first slide both Ali and Dane are going to present the information more specifically on the MENA region so let me see if I can move through the next slide. As you can see here this is the Middle East in the North Africa region on this particular map here you can see very clearly where the emergence of renewables is occurring. As I have mentioned

in my presentation most of the development that were seen for concentrated solar development in the renewable energy field is predominantly in PV and solar power CSP. This map clearly shows you how those developments are evolving and this is a market that is anticipated to increase significantly over the coming years, particularly in correlations with other applications for example the desalination that is very energy intensive.

If we look at this slide here we have net gas import along the X axes and power generation from oil. We are looking at it seems like from what we are looking at here is the bringing in renewables into the energy mix and the priority of those sources in relation to fossil fuels. If I read this correctly I'm not quite sure what the red dot is meaning it looks like—we've got quite a lot of spread across the various countries. So, with interest for cost reduction and particularly for the need of energy security its open for the implementation of renewables as we can see here we're looking at the percent of total generation across the MENA region in 2011. Very high dependence on gas and oil but we're starting to see the emergence of renewable complimenting that energy mix.

Ali Hello?

Laura Yes, Hello

Ali Yes, sorry again for the difficulties. We'll start by the first slide here. Thanks in the beginning for REN21 & the Clean Energy Solutions Center for organizing this webinar and giving us a chance to give our views on the status of renewables in the MENA region and to also the International Renewable Energy Agency board member of REN21 and the home of Masdar, the UAE has a special interest in renewable energy. We started the renewable energy programs in 2009 the first in the GCC it was controversial in the beginning as many critics inside and outside the MENA region doubted that renewable energy make sense or could even make sense in a hydrocarbon territory. Fast-forward to 2013 and 2014 the story has completely changed. Renewable energy is no longer talked about as a possible but enviable overnight the MENA region and especially the Golf have become some of the most attractive renewable energy markets in the world. Today we will give you a view on the drivers for the stewardship and their sustainability. Can you please get to the second slide? Let's talk about looking at the regions recent renewables energy landscape the most crowded in its history and the UAE must have brought online the hundred megawatts trans one CSP project one of the largest in the world and Dubai at 13 megawatts of PV were commissioned and another hundred megawatt was tendered. In Morocco 200 megawatts of wind were completed and a 160 megawatt of CSP started construction. In Egypt despite the market situation a hundred megawatt of CSP continued construction and 200 megawatts of wind to tender. A number of other projects implemented Renewable Energy first for the MENA countries including Mauritania and Kuwait. On the productive side we also saw action most notably Jordan instituted a viable active feeding pattern kicking off a number of very significant projects including the 117 megawatt wind form lead by Masdar.

Second slide please. The question is what's behind all of these activities? To put it simply there is now a business case for renewable energy in almost every MENA country. The biggest factor is the dramatic drop in renewable energy cost the other factor is the continuing increase in gas and oil prices. These two projects have now crossed resulting in three categories of financial justification for renewable energy. First is the country that uses oil for power, second would be countries that import gas and third would be countries that export gas.

Forth slide please. If you look at the power sector in particular you can see the rationale all it means is that roughly quarter of the mass representing a huge course to government and consumers. Jordan for instance is at almost 75% oil, fire generation despite having no oil. Gas also widespread and each country is either an importer or exporter or about to change from one to another. Coal is absent except in Morocco and while nuclear is coming in the UAE and probably in Saudi the rest of the region is unlikely to host major projects. So effectively renewables aren't the only option and thankfully also the best option to address hydrocarbon dependencies. Here I'll give it over to Dane to carry on the rest of the presentation.

Dane

Thank you. Next slide please. So, we'll now walk through these three categories of financial justification that Ali has and is probably the most compelling case for renewable energy in the countries that burn crude for power. For importers oil are firmly above a hundred dollars a barrel and this mean that they either face very high energy cost, sometimes at scripting levels or a huge subsidy bill for governments. Research has already shown us that renewable energy is cheaper as a source of new supply and potentially even as a replacement for oil. So it makes perfect sense that you see countries like Jordan and Morocco aggressively decline in renewable energy.

For exporters it’s a very interesting and somewhat paradoxical situation and so as local demand in the GCC grows rapidly export potential is being hurt quite admirably for instance which happened in countries like Saudi Arabia that came out couple years ago showed that the current domestic consumption used at the same rate in Saudi, it would become a net importer by 2038. So that's what sort of a big scary piece of news for the region. At the same time if you aren't consuming this oil at home you can export it at over a hundred dollars a barrel this is a very attractive preposition. For instance Bloomberg New Energy Finance estimated that if you build solar plant in Saudi today, it would $ make a 20% return just on the oil for made for export. So, Saudi Arabia would be the first country in the region to act on this oil justification, that’s rational for their 54 gigawatts of renewable energy and we see it making a lot of stance for additional countries like Kuwait, Libya, Iraq and Oman who are both facing threats in domestic imports or export and have a strong revenue generation potential from renewable energy.

Next slide please. For Gas importers especially those who import LNG this is a pretty new and potentially exciting topic , when we solve the oil case for renewable energy being a big story of 2013 and we're thinking that gas could be the story for 2014. So gas has been very cheap for a very long time

especially here in the Golf and it isn't anymore. So we knew that the local gas structure is estimated at almost 500% more than we had in the past and if you don't have enough gas and you need to import LNG you're looking at possible price increases of 1500%.

Even if you get the shell gas from North America that everyone says it probably wouldn't arrive at the local prices and it will result in sort of 500-800% increases. So, it's a pretty urgent situation for a country to have to import gas and renewables are presenting themselves as quite a buyable opportunity there. The latest research from Milestone Institute in the region indicates that if you're paying over $8/MMBtu for gas today you are better off investing in renewable energy and if you are building cheaper units or single cycle of a gas plant, you're already better off with renewable energy at $4/MMBtu. So we are really expecting to see this gas trend make a big difference for renewable energy deployment and for anyone who is importing or thinking of importing LNG like the UAE we're saying Kuwait and Oman this is a special big news.

Next slide please. The reverse logic applies to gas exporters this is a special that also Egypt, Oman and UAE. So, they often sell LNG to Egypt about $15/MMBtu and if you consider this $8/MMBtu threshold that Milestone Institute read and identify, you're looking at a very high opportunity cost if you're consuming the gas at home instead of exporting it, so this is another category of countries that could be brought into the renewable energy storage because of hydrocarbon related finance value.

Next slide please. It's worth zooming into the GCC a little bit because the considerations are felt very acutely here on both oil and gas and there's also considerable capital to do something about it. It's also a microcosm of the mind-set. So the original case which is pioneered by the UAE in late 2000 was about diversification, job creation, decarbonization and environmental impacts. So these are all explant reasons for renewable energy but they're really public good investments and renewable energy at that time most activity required patient capital, you really had to be in it for the long game and it's really the reason why in 2008 there was no renewable energy in the GCC when the UAE opened a PD plant 10 megawatts in 2009 it was seen as those Emirate is being very eccentric. Now in 2014 we have over 60 gigawatts of project announced in the Golf countries and the messages are really clear, you don't have to be visionary to invest in renewable energy anymore you just have to be entrusted in the financial case.

Next slide please. One other really interesting aspect of renewable energy in the MENA region is the overseas investment angle. So it's not just about countries building renewable energy practice at home but being active investors and developers overseas. The GCC in particular represents a large pool of capital that is looking for sharp opportunities. Renewable energy is now firmly on the radar as it becomes such an appealing energy choice in so many countries around the world. We have a number of specialised funds for acquiring energy investment here in the UAE.

The most famous being Masdar and we're seeing additional wealth funds such as Taqa and IPIC which were historically focused on hydrocarbons coming into the renewable energy market. Saudi Arabia also has a very notable renewable energy investor ACWA power which won the CSP project bid in Morocco. This is a group of investors that have no doubts about renewable energy and have money to spend on it. This investment also have a positive feedback effect with the local market so the more experienced they have with renewable energy the more likely they are to push renewable energy projects both at home and overseas.

Next slide please. An angle that we're particularly proud of and excited about here too is also the emergence of renewable energy as a form of development systems from MENA countries and actually in MENA countries as well. So in the UAE it was about last year was a landmark year for us we allocated over 500 million dollars of grant and loans exclusively through renewable energy projects into the developing countries. So, we're active on three continents and brought online more online projects like Mauritania, Seychelles and Soldar en Tonga and we're also seeing new interest from other GCC donors. So, notably Islamic Development Bank last month housed a 180 million dollar fund for energy access projects that used renewable energy. IRENA being headquartered in Abu Dhabi has also made a big difference as it brings the profile of renewable energy and the development system angle much closer to home and I'll hand over to Ali for the concluding slide.

Ali

So, in conclusion renewable energy is so promising why isn't the park-line bigger? This is a fair question and we get it increasingly as a business case becomes public knowledge. In overview we have already seen a major and expected ship in the MENA countries compared to where we were five years ago and this is a revolution. But is true that that there is lack. For many stakeholders in the region renewable energy is not only new but it’s still associated with high cost and technical challenges. The regulators, the utilities, the banks and the consumers they all need to gain familiarity with the renewable energy before using investment as scale matching the opportunity. We need to move up the learning curve the projects coming online will make a major difference. Saudi will launch its first round of tenders in the next several years which will really itinerate and accelerate the shakeup. Morocco has already shown that renewable energy can be done which helps its next budget and Egypt and Jordan are clearly on their way. They also benefit from GCC funding that allows them to handle strategically investment. LNG importation will furthermore have a much motivating impact as it makes the cost differentials concrete. So while the local industry is in its early stages the message is clear renewable energy is now repairing and it is coming and at scale. Thank you for your attention.

Sean

Thank you both and Laura for the presentations. Now we will move on to the questions and answer session, portion of the webinar and just a reminder to the audience if you have any question for the panelists you can type those into the question pane and I will present them to the panelists and so the first question that we have asked, are there any plans for the MENA countries to establish their own solar industries?'

Dane It's mixed so the most famous would definitely be Saudi Arabia which is at an 85% local content requirement for all of its projects meaning that they very much intend to an establish industry. For a lot of the other countries their markets are at a disappoint a little bit too ,small to really attract development or to justify a strong state push for it but it's something that could happen as more and more MENA counties set targets and actually implement projects.

Sean All right thank you Dane. Next question we have ask, if you're familiar with the IID project and if you know what the current status of that is?

Dane Actually we're not, familiar with that particular project.

Sean That's fine I didn't have any more contacts for that question, but if the attendee that asked that has any more details they could send those in and I could check with the panelists to see. Moving onto the next question it asks why is it MENA interested in nuclear power.

Dane The main issue is actually fewer diversifications so we only have hydrocarbons here and there's a concern by many governments that they're too exposed. So nuclear is obviously a great base provider and at the time of a lot of decisions it was cheaper than renewable energies, because renewable energy has now dropped so much in price you'll see a much bigger opportunity there and we're quite interested to see how that national discussion policy played out in countries as they choose their popularity or diversification away from hydrocarbons.

Sean Great thanks again Dane and Laura this question is for you it ask, if REN21 did look at hydrogen in its report as a storage and or as fuel for transportation?

Laura Thank you. We don't, I mean hydrogen we don currently look at that aspect. Hydrogen as a storage has really not, I mean it's developing but is not something that has really penetrated into the renewables arena, but storages is an issue that we're facing increasingly and is, I would say the next big challenge in the renewables field in the sense that, you know with renewables now reaching great parity and the variability of the renewables how can we address the storage issue. So, I anticipate that will come up on the agenda and we'll certainly over the years, probably the next couple of years it will be a more prominent element in our report but at the moment it is not.

Sean Thank you Laura and this question is for all the panelists it asked, have you seen a growth in off-grid distributed renewable energies in the MEANA region?

Laura I can answer just a little slightly but I'm sure Dane and Ali have better information of the Golf state of the Arab state. We're seeing a lot of off-grid in Northern Africa particularly for communities that are too far away from the—connected to the grid given both wind and PV capacity. So if we're looking at remote communities in the North African states we're seeing that it's not off-grid it hasn't reached the same levels as it has in other parts of the world in part because electrification rate are so high in those North African

countries already and there's a big push or desire for many communities to really be connected to the grid. There's a perception that grid distributed power is more reliable so there's a real need to—greater education needs to occur to demonstrate that off-grid in these remote communities in North Africa can have the same access and reliability to electricity as on-grid systems, but I'll leave it for Ali and Dane to comment on the other parts of the MENA region.

Dane Actually, I'll just comment that due to the high electrification rate in the region in most of these countries, they weren't immediate to see substantial upload activities.

Sean Great thank you everyone and next question ask, if renewables are cheaper over the long term for countries like Egypt, do you have any insight into why they continue or planning or tendering more oil and gas plants?

Dane There's quite a mix of reasons; one demand is high and so there's a desire for urgent solutions and then part of it too is a little bit of the mind-set lag that we talked about where most people who are making this decisions have worked with hydrocarbon their whole career this is what they're familiar with, this is what they know and the story coming out that renewable energy might be cheaper sounds a bit risky and a bit uncertain and so they stick with the old ways. So, our view is that it probably takes several years for this message to come through that renewable energy is a good choice for them and we think that the projects coming online over the next couple of years will really bring people up to the learning process.

Laura Just to add to that, the example of Egypt is a good example about why policies and targets are so important. There is an increasing desire as we've proven that renewables are a good investment mechanism. There really is a lot of interest to invest in renewables but companies and firms are not going to do that if they don't have a stable policy environment, if they don't know that they might have some heeding time or if there's going to be some support in place. So it is changing the perception about the role of renewables they're not just additional fund elements, that they are serious contributors to a countries energy mix but it's also the other side of the equation, creating the right policy framework that gives that stability that market investors require in order to push investment in those technologies versus the traditional fossil fuel technologies.

Sean Great thank you everyone and next question ask, do you anticipate seeing new policies in the MENA region that are focused on public awareness in rewards for using renewables in homes?

Laura As an organization that promotes renewables and uptake of renewables we would love to see that. I think the educational component should not be underestimated as has been demonstrated in these two presentations. Once the numbers are there, once you can actually prove that it's a viable technologies that really bring an added value in addition to the energy services they provide, then uptake should increase but energy is a very controversial, it's a very emotional issue I think if you were at a dinner party and you said energy

everybody would have an opinion as to what that means so the educational component is huge. How that can be carried out in the MENA region? I'd have to differ to my colleagues on that not really being aware of the cultural approaches that should be followed in such an educational outreach.

Sean Yeah the question was, have you anticipated seeing new policies in the MENA region that are focused on public awareness in rewards for using renewables in residential homes?

Sean Sorry gentleman we seem to be having issues with your audio, its breaking in and out.

Dane Apologies.

Sean There it is much better now, go ahead.

Dane I was just saying that any sort of an education drive to subsidiaries will probably be related to a policy framework coming on line and any differences in that majoring decision, right now it's really focused more on the sustainability benefits and the applicant of university level to build skills for the longer term market.

Sean Thank you Dane in this question also for Dane and Ali it asked, it seems that the MENA region is focusing more on CSP as oppose to PV is there any reason for this, has the capital expenditure for PV has decreased significantly faster than for CSP?

Ali Actually we're now just focusing more on PV now due to the reduced cost recently and the focus on storage.

Dane The CSP is probably more of a long-term interest now a lot of countries now recognize that there's a that storage value and PV so attracted financially that it's kind of the talk of the town and the focus of a lot of new tenders.

Sean Okay great so there's definitely been a shift in that perspective. In what potential do you see for wind in the MENA region and what are the main drivers and also challenges.

Dane I think, when the MENA region like it is globally is becoming increasingly attractive and certainly the more that the people in the region hear about when beating coal in South Africa and beating everything in Brazil, they will become more interested. I know the GCC the resources isn't that well understood so one of their key initiative is for renewable energy atlas from Arena and partnership form Milestone Institute which actually highlights where you can get these kind of eight meter per second type resources in the region and we're hoping that stimulates more discussion about settings and when in the policy mix.

Sean The last question I've received so far asked, what type of outreach programs do you think would be most effective for the region, as far as small scale renewables like _____ or energy efficiency?

Dane I think, the cost message is the best one that people can send, I mean there's increasingly emphasize that this is not about climate change or western ideals it's more about the financial case. So you get all these great benefits but you also get return on investment and that story is not understood that well I mean even globally it's not so the focus now will really be on educating people and the market in schools earlier on that renewable energy makes financial sense.

Laura I would also like to add to that I think that the reliability factor also has to be included in the sense that a lot of people still sort of have a perception that Oh it's PV the sun goes down and all of a sudden I don't have any power, or if the wind goes away and I don't have any power or its going to be somehow a substandard form of energy. So, I think the cost absolutely where people can see the value, but also the fact that the reliability and the energy security aspect is important particularly in regions where we're starting to see climate impacts, climate change impacting, not so much from a greenhouse mitigation perspective but in the adoptability of smaller systems renewable systems to adopt to potential change in climate, you know with regards to for example if you are a fossil fuel dependent, a region that requires the shipment of fossil fuels to come in and there's no series of bad storms or the harbor where your boats come is no longer able to accept those deliveries. Then renewables take up a premium position because the fuel is available as part of the environment so the cost aspect but also the reliability aspect I think it also needs to really be raised on people's level of awareness.

Sean All right thank you both another question came in that ask, you mentioned that the new price for domestic gas is in the range of five to eight US dollars per thermal unit what are the drivers for this increase especially as we also estimate shell gas?

Dane If you're with the GCC the main issue is the sulfur content which is hourglass and is very expensive to treat and then for a lot of other regions, I mean they basically will be starting from scratch under EMP so they will just hire a capital cost.

Sean All right thank you Dane, so at this point that's the last questions I've received so we'll go ahead and moves onto the survey that we have for the audience we just have three quick questions for you to help us evaluate the webinar. So, Andrew if you could go ahead and display that first question.

That question is; the webinar content provides you with useful information and insight?

The second question is; the webinars presenters were as effective? Then the final question is; overall the webinar met my expectations? Thank you for answering our survey and on behalf of the Clean Energy Solutions Center I would just like to again thank Ali and Dane and Laura for the presentations and for joining us today and also to our attendees for coming on and listening to the webinar we very much appreciate your time and I do invite everyone to visit the http://cleanenergysolutions.org training page if you'd like to download PDF versions of today's presentation or listen to an audio recording, additionally we are now posting audio recordings to the Clean

Energy Solutions Center YouTube channel. Please allow for about one week for the audio recordings to be posted and with that I hope that everyone has a great rest of the day and we hope to see you again at future Clean Energy Solutions Center events and this concludes our webinar.