

REN21 Renewables 2013 Global Status Report: Focus on China

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Webinar Panelists

Christine Lins Executive Secretary, REN21

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Vickie Healey Good day everyone, I'm Vickie Healey with the National Renewable Energy Laboratory and I'd like to welcome you to today's webinar hosted by the Clean Energy Solutions Center and REN21.

We are very fortunate to have Christine Lins joining us as our panelist and Christine will provide an overview of key findings of the REN21 renewables 2013 global status report and also give us a bit of a focus on the status of renewable in China.

Before we begin, just a real quick note of disclaimer, the Clean Energy Solutions Center does not endorse or recommend specific products or services and the information provided in this webinar today is featured in the Solutions Center's resource library as one of many best practices, resources reviewed and selected by our technical experts.

So before we begin, I'm just going to over quickly some of the webinar features. For audio, you have two options; 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. Alternatively, if you select the telephone option, a box on the right side will display the telephone number, an audio pin you should use to dial in. And if you have technical difficulties with the webinar, you may contact the go to webinar's helpdesk at 888-259-3826 for assistance.

And our panelists, we ask that you please mute your audio device during the time that you are not presenting and this will eliminate the possibility of any background noise. A few housekeeping items also, if you would like to ask a question, we ask that you use the questions pane where you may type in your questions and if you're having difficulty viewing the materials through the webinar portal, you will find PDF copies of the presentations at cleanenergysolutions.org/training and you may follow along as our speakers present.

Also, I'd like to let you know that I'm audio recording and copies of the presentations will be posted to the Solutions Center training page within just a few days.

So, we have a really good agenda prepared for you today that is focused on REN21 renewables 2013 global status report with a focus on developments in China. We have Christine Lins who's Executive Secretary of REN21 presenting and we also have Lee Jong Sing, President of Chinese Renewable Energy Industries Association presenting with us but he is having some technical difficulty logging in. So, we'll proceed and hopefully he'll be able to join us shortly.

But before Christine begins her presentation, I'll provide a short, informative overview of the Clean Energy Solutions Center initiative, and following the presentations, we'll have a question and answer session, closing remarks and the survey. This slide actually provides us a bit of background information on the Clean Energy Solutions Center. The Solutions Center is an initiative of the Clean Energy Ministerial and it's supported through a partnership with fuel and energy.

The initiative was launched in April of 2011 and is primarily led by the governments of Australia and the United States as well as other country partners. Outcomes of this very unique partnership include support of developing countries to enhance resources on policies that relate to energy access. We have available to governments and policy officials, no cost expert policy assistance and we also have peer-to-peer learning and training tools such as the webinar you are attending today.

The Solutions Center has four primary goals; first, it serves as a clearing out of clean energy policy resources. We also serve to share policy best practices data and analysis tools that are specific to clean energy policies and programs. The Solutions Center also delivers dynamic services that enable expert assistance, learning and peer-to-peer sharing of experiences and lastly, the center fosters dialog on emerging policy issues and innovation occurring around the globe.

Our primary audience is primarily energy policymakers and analysts from governments and technical organizations in all countries, but we also try to engage with the private sector, NGOs and civil society.

This slide speaks about our marquee feature that we offer through the Solutions Center, which is our expert policy assistance and we, call this service ask an expert. For ask an expert, we have established a broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis to all countries at no cost. So for example in the area of renewable in carbon management, we are very pleased to have Craig Hart who's an associate professor at the School of Environment and Natural Resources in China serving as one of our experts.

So if you have a need for policy assistance on renewable energy or any other clean energy sector, we encourage you to use this very valuable service and again I remind you that this assistance is provided free of charge and to request assistance is very simple, you can go to the Clean Energy Solutions Center website and on the homepage we have a form where you can enter in your information. We also invite you to spread the word about this service to those in your network and organization.

There are some ways you can become involved in the Solutions Center if you're interested, first we encourage you to explore and just take advantage of the Solutions Center resources and services on our website, including the exit policy assistance I just mentioned. You could subscribe to our newsletter and we also welcome recommendations on improvements and other resources we can include on the Solutions Center library and also participate in our webinars.

So first up, I'd like to provide just a brief introduction of our panelists and hopefully again, Lee Jong Sing can join us. But first up, we'll have Christine Lins who is the Executive Secretary of REN21 and she will provide an overview of the key findings of the 2013 global status report. And so with that at this point, I think I'll turn over the floor to Christine to begin her presentation. Christine, welcome.

Christine Lins Thank you very much, Vickie. Good morning ladies and gentlemen. Can you hear me well?

Vickie Healey Yes, we can hear you. Thank you.

Christine Lins Great. It is a great pleasure to be here with you this morning. Let me just get my presentation up and running. It is a pleasure to be here with you today and to present the findings of the global status report with a focus in China. In a nutshell, I'll take you through the global status of renewable energy but before doing this, let me brief all of you on REN21.

REN21 is a stakeholder policy network that brings together key actors in the field of the public and the private sector to promote renewable energy. With China, we have CRIA, the Chinese Renewable Energy Industry Association. We have volunteers and NGOs, people who are from academia, international organizations such as the International Energy Agency, IRENA, the UN agencies, the World Bank and the European Commission and several additional governments.

We produce an annual flagship report, the global status report that gives an overview on the global market, industry policy trends and then special focus on renewable energy in developing countries. It is based on contributions from over 500 people from all around the world and covers all renewable energy technologies as well as all sectors of power, heating and cooling and transports. It is launched together with UNEP's global

trends in renewable energy investment and every year we put the report under a specific heading.

In 2013 we had a special feature highlighting system transformation, as we see the countries with high shares of renewable need to put in place policies how to integrate this renewable energy output and technologies existing in systems and its integration component is becoming more important.

So, where do we stand? In a nutshell, renewable energy share and global energy consumption continues to increase over the years and reached an estimated 19% of global energy consumption in 2011. This year has provided modern renewable and have traditional biomass, whereas the definition of traditional biomass in energy statistics is more very precise but roughly have modern renewable have traditional biomass. And that is actually the only thing in the report that is focusing on 2011. All other figures are up-to-date and portrayed a picture at the end of 2012.

So, REN21 has a ranking of the top countries in different areas and established also the top five champions in different categories, new investment as well as new capacity investment at the end of 2012 and there you clearly see that China plays a very dominant role as a leading renewable energy player. I think this is particularly impressive, as China has managed to establish itself as the global renewable energy champion in less than 10 years.

I remember that we were invited back in 2002, 2003 to provide some advice to the people's congress on the draft renewable energy law and back then, renewables didn't really play an important role in the Chinese energy mix. This has effectively completely changed and we could see that in many areas in new capacity investment in hydropower, in wind, in solar, hot water heating and increasingly [inaudible] [0:11:52]. China is playing a leading role and is really among the top.

So, what does this global market mean in terms of the power markets? In 2012, renewables comprised 26% of global power generation capacity and about 22% of global electricity is produced from renewables and for the first time in 2012, more than half of all new electric capacity installed was renewable space, so all new power plants, more than half of them that were built in 2012 were renewable space. In the European Union for example, this figure went even up to 70%, so more than two thirds of all new power plants.

Total renewable power capacity exceeded 1470 gigawatts. That is an increase of 8.5% from 2011. Wind power accounted for about 39% of renewable power capacity added while for hydro power and solar, which each amounted for approximately 26%. In the lead is China, which in 2012 consolidated its position as the world's dominant renewable energy

market player, an increase of 22%, largely due to a massive jump in solar investment, so, also in the power market, a clear leading role of China.

As far as heating and cooling is concerned, we generally see a transition towards the use of larger systems. There is an increased focus of combined heat and power systems, both [inaudible] [0:13:36] schemes as well as provision of heat for induction purposes. We see that solar collectors nowadays are used in more than 56 countries around the world for water and increasingly for space heating. Clearly, China is in the top position there.

As far as transfer is concerned, liquid bio fuel has provided about 3.4% global world transfer of fuels in 2012 and received in more and more countries, putting in place policies promoting electric mobility and often these policies are closely paid, renewable energy support, often these policies can be found on a city level.

So, I'm taking you now to a couple of technological areas. First of all, I will start with wind. In 2012, there was almost 45 gigawatts of wind power capacity that began operation, that increased global wind capacity by 19% to 283 gigawatts. In China, wind power generation increased by 13 gigawatts, surpassing the generation from coal and passing the nuclear power output for the first time. I think that it's also quite an impressive figure and shows how quickly renewables are making their way into the overall energy mix.

As far as solar photovoltaics are concerned, 2012 was another record year. Here on the graph, you see the total global operating capacity of solar heating, reached the 100 gigawatt milestone and when you look at the graph, how long it took basically from rating close to zero to about 40 gigawatts, we took 15 years and this amount was more than doubled in just two years.

With this, prices with solar PV modules fell by more than 30% in 2012 and by the end of 2012, Australia, China, India and Japan had more than 1 gigawatt of total PV capacity installed, along with many other European countries, but with Asia Pacific countries, these four are the largest PV markets and that also brings Australia, China and Japan to the top ten markets for PV capacity in the world.

When it comes to concentrating solar-thermal power, there was also quite a significant development in the course of the last couple of years. We see clearly that interest in concentrating solar power is on the rise, particularly in developing countries, with an investment spreading across Africa, the Middle East, Asia and as well as America. China, India and South Korea have small pilot amounts in operation and global total capacity increased to 2.6 gigawatts in 2012.

As far as geothermal energy is concerned, there are technologies that are available to produce power and heating from geothermal and there we saw that there were also quite some significant development in basically all areas and there the picture is of course a bit different because the exploitation is linked to the resource. We see that geothermal electric generating capacity grew by an estimated 300 gigawatt in 2012 and two thirds of global capacity is located in the U.S., China, Sweden, Germany and Japan, so these are clearly the dominant markets. If you also see all around the world, the use of ground source heat pumps is growing fast and has reached an estimated 500 gigawatts geothermal capacity in 2012.

When it comes to bio energy, the use of bio energy in heat, power and transfer tech has increased by about 2% to 3%. Bio power capacity was up 12% to nearly 83 gigawatts with multiple increase in [inaudible] [0:18:10] and again here you see that China is number four in the top ranking behind the United States, Germany and Brazil and we had about 350 terawatt hours of electricity generated from bio energy.

So, when it comes to the benefits of renewable deployment, again you see at the top is integration of jobs in the forefront and there we see that work and renewable energy employment continues to increase, continues to rise. In 2012, according to a study provided by IRENA, the International Renewable Energy Agency, an estimated 5.7 million people was in the renewable energy sector and the employment remains concentrated in a couple of countries, among which China is there.

So, when we come to investment, here is an interesting picture in 2012 because global new investment in renewables went down 12% from the previous year's record. So it went down from \$279 billion to \$244 billion. We have to remember that this is still the second highest ever amount that was invested in renewables. At the same time, installed capacity continues to grow. I mentioned particularly about wind [inaudible] [0:19:52], 45 gigawatts of wind, about 30 gigawatts of hydro. So, they have to basically continue to grow.

Technology costs fell and what is most interesting is the dramatic shift in the balance of investment activity between developed and developing economies. And let me just show you right here, which I think I showed you a very impressive feature. Developing countries reached 112 billion, which is an increase of 34% in 2011 and this nearly represents half of total global investment and this is an unbroken, eight-year gross trend, whereas developed economies, their investment fell by 29%, mainly the case in Europe as well as the United States and it fell to a level of \$132 billion which is the lowest level since 2009.

China really hit another record, invested nearly \$67 billion in renewable energy in 2012 and yeah, that was a significant increase, as you see on the graph there on the right, which details the figures for China, and it has the highest amount that was invested in the renewable sector in China.

As far as policy is concerned, we see that more and more countries around the world have put in place renewable energy policies. There are currently about 140 countries have been put in place, renewable energy targets and about 130 of these countries have detailed renewable energy policies in place. Two thirds of these are in developing worlds and these amounts represent a doubling of the amount of countries this renewable energy power gets compared to 2005.

Despite this positive trend of more and more countries setting up renewable energy policy frameworks, some countries saw some retroactive policy changes in their renewable support policies which were detrimental for the industry and resulted in refused investment, we see it in the U.S. and in Europe and sometimes, these policy changes were put in place retroactively which of course is even more challenging in the renewable energy industry.

A quick word on the future outlook, REN21 has now produced our own scenario but work has been done, is we have analyzed a series of about 50 scenarios of the world's leading organizations and we've put them together and classified them in conservative, moderate and high renewable scenarios. We have included here with the red dot the sustainable energy for all targets. You might have heard about the initiative of UN Secretary General Ban Ki Moon in the field of sustainable energy for all, which consists of ensuring universal access to energy to all by 2030, which consists about increasing energy efficiency and doubling the share of renewables by 2030 from 18% in 2010 to 36% in 2030.

And this target is actually shown here on the slide, which is the red dot. So we clearly see that the conservative and even the moderate renewable energy scenarios won't get us to these shares, however, we also see that there are other scenarios which are putting a focus on energy efficiency and renewables indicated that this surely can actually be surprised and there were more scenarios out there in the world now that foresee close to 100% renewable energy shares in the power sector by mid-century or by 2050.

With this in mind, I think it's very important that we look on how our projections fell short in the past and there, just slide with me, in 1997, the World Bank predicted about six gigawatts of wind for China for 2020. That is the blue part in the chart and nearly 10 times of this amount, the red part, was reached nearly a decade earlier with close to 60 gigawatts installed of wind capacity in China in 2011.

So, the blue is the projection for 2020 and the actual installed capacity is the amount in red that was reached in 2011, nearly 10 years earlier. And it's not only institutions like the World Bank that got it wrong, even industry associations and International Energy Agency and many other players just underestimated with how quickly renewables will be deployed in the market.

So in conclusion, achieving this sustainable energy for all objective, of doubling the share of renewable energy by 2030 globally is feasible but that will take both policy action aimed at tripling the share of modern renewables including sustainable hydropower and produce stable and predictable policy frameworks for renewable energy are key. It will also mean that both centralized and decentralized renewables will need to be deployed. We have both on and off grid solutions and it's not a matter of deciding either/or, it has to be both ends.

You will see that the renewable sector is quite distorted. Renewable energy support is still six times less than fossil fuel subsidies and there is a need for phasing out untargeted fossil fuel subsidies around the world and I came back to one of the first points that I made at the beginning, integration of renewable energy into the energy system will be of utmost importance as the share of renewables increases.

And we are absolutely convinced that close collaboration between the public and the private sector will be essential to make this energy transition towards renewables happen globally and this is what we are trying to achieve in the framework of our activities in REN21 and with this, I would like to thank you for your attention and give the floor back to the Clean Energy Solutions Center. I thank the organization for this webinar.

Vickie Healey

Thank you Christine. That was a great overview of the global status report and you definitely hit on some key points for China and I just like to remind the audience if you have questions for Christine, to please type those in to the questions pane located on the right hand side of your screen. But Christine, I have a real quick question for you, from me actually and just looking at all of the high deployment of renewables in China, focusing specifically on the chart you showed us on wind development, what do you attribute to this great success of deployment of renewables within the country too, is it strong policies? What's actually attracting the investment into the renewable sector within China?

Christine Lins

Yes, I think it's clear that the key driver for renewable deployment in China is the policy framework. I think the government made it very clear that there is a huge interest to make energy supply more sustainable. It is clear also that China is facing increase in energy demand, constant increases in energy demand, so this project actually helped to diversify energy supply and it is remarkable to see how the renewable energy law and then the subsequent laws focusing on the renewables deployment in the different provinces, how they have really stimulated the market.

I think it's also very interesting to see that this is now all connected in the PV sector because there were some concern, I mean, as you know, China is very strong on the industry side of [inaudible] [0:29:22] modules and I think it's very encouraging to see that China has now also started to put in place policies to deploy PV technology in the country. So, it is really

absolutely phenomenal and I think it's a great lesson for the world, what the country can achieve in less than a decade with policy framework stability and these numbers I think to throw what is possible in this domain.

Vickie Healey Okay, thank you, and I have a couple of questions that have come in from the audience. The first one, Christine is, do you see the possibility of the Chinese government of possibly promoting PV rooftop deployment in the next five years and the second part to this question is, what are the biggest challenges in achieving this for the government? So this is probably a question looking at it from your perspective.

Christine Lins Yeah, that would be a great question for Li Junfeng who unfortunately cannot join us this morning. I do think that we will see diversification of policies including roof PV in the years to come. I think the price reduction of PV modules that we've seen as mentioned, the 30% in 2012, we had 42% in 2011. That really made the technology really interesting and I do believe that the Chinese government will continue to put in place policies in relating demand in the country and also putting in place such programs.

However, what we will do after the webinar, we will confirm this again with Li Junfeng maybe he can provide some additional answers for the personal questions.

Vickie Healey So I will send that question on to him and ask him to provide some further answers based upon what you just said, but thank you for that. Next question that just came in is, where do you see the major challenges and barriers for renewable energy development in China at present? So, in spite of the fact that China is doing really well on their deployment of renewable, are any specific barriers clear to further deployment such as clean technology or financing or policy?

Christine Lins I think a big challenge in China at the moment is grid stability, which will need to be the main focus in order to integrate high shares of renewable energy as they come along, and all the investment numbers effectively, they look very promising as we have seen but I think there is still some need to focus on the grid and make sure that the grid is stable enough to be able to accommodate high shares of the rival renewables.

Vickie Healey Okay good, thank you for that. And this is a question actually that I have for you and obviously, China is doing a lot that would demonstrate that they are leading by example for all of the deployment of renewables that they've done. Do you see other countries watching China closely and replicating some of the things that they've done to increase renewables in other countries.

Christine Lins Well, when you actually look at the chart of investment flows, you see that the share of investment in China went up regularly to nearly 67 billion. That brings it in the range. It's more than the United States has invested in

renewables and it's a bit less than the European Union, so I think clearly, these markets are working very closely together. There are several programs in the field of renewable energy promoting joint activities and initiatives in the field of R&E between the European Union and China, ACORE for example, the American Council on Renewable Energy had a cooperation program with China, so I think there is a lot of exchange here but we also see a lot of investment of Chinese companies in Africa and I think the world really looks at China and we can definitely learn from the stability of the policy framework that is put in place there.

Vickie Healey

Okay, thank you Christine. I don't see any other questions currently from the audience, so if anyone does have any additional questions, feel free to type them in. But at this point, if you have no other questions, I think we can move on to a survey, a short survey that we have set up for audience feedback. We just like to hear from you, a response on how we're doing and ways we might be able to improve.

So with that, the first question of our poll is the webinar content provided me with useful information and insight and please respond with an answer that represents your opinion. Thank you. Our next question for the audience, the webinar's presenters were effective. And our next question, overall, the webinar met my expectation. Thank you.

So with that, thank you to our audience for answering our survey questions and once again, we very much apologize that Lee Jong Sing was not able to join us today. I hope to have a copy of his presentation that we composed for the Solutions Center website so that you will be able to at least go back and view his slide presentation and I will follow up with him on that.

But in lieu of him not being here and again, sincere apologies for not being able to log in, I just like to say that on behalf of the Clean Energy Solutions Center, I'd like to really extend a very sincere thank you to Christine for presenting to us today on the findings of the REN21 global status reports, employing out some key factors regarding China and I like to say thank you to our attendees for participating in the webinar.

You've been a really great audience. We appreciate your time and I invite you to again check the solutions center website over the next few days if you like to view the slides and listen to our recordings of today's presentations. You will also find recordings of previously held webinars on our site. Additionally, you will find information on upcoming webinars, and we also invite you to inform your colleagues and those in your network about the solutions center resources and services including the no-cost policy support that I mentioned earlier.

With that, I just like to wish all of you a great rest of your day and we hope to see you again at future Clean Energy Solutions Center events. And this concludes our webinar. Thank you.