

REN21 Renewables 2014 Global Status Report: Europe

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Webinar Panelists

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Sean Hello everyone and welcome. My name is Sean Esterly and welcome to today's webinar which is hosted by the Clean Energy Solutions Center in partnership with the Renewable Energy Policy Network For The 21st Century also known as REN21 and today's webinar we'll discuss REN21 flagship report The Renewables 2014 Global Status Report with the special focus on the European region.

And 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 Solutions Center's resource library as one of many best practices resources reviewed and selected by technical experts.

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Panelists, we ask that you please mute your audio device while you are not presenting and if anyone is having technical difficulties with the webinar you may contact the GoToWebinars help desk at their helpline that number is presented at the bottom of the slide and it is 888 259 3826.

And we encourage anyone from the audience to ask questions at any point during the webinar. To do so simply type your question in to the 'Questions' pane and submit it through there and those questions will be presented to the panelists during the questions and answers session following the presentation.

Additionally if you are having difficulties 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 presenters present. Also an audio recording of the presentations will be posted to the solutions center training page within about a week of today's broadcast and we also I mean webinars to the solutions center YouTube channel now, where you will find other informative webinars as well as video interviews with top leaders on clean policy topics.

Now today's webinar agenda center around the presentations from our guest panelists Christine Lins and Rainer Heinrich Rahlwes. And these distinguished panelists have been kind enough to join us to discuss the launch of REN21's Flagship Report for Renewables 2014 Global Status Report.

And this 90-minute webinar, we'll be looking in detail at the European region and we will find out what renewable changes happened in Europe over the course of 2013, learn which technologies are contributing to increase power capacity and hear how changes in policies have affected investment levels in market development in the region.

And before speakers begin their presentations, I'll provide a short informative overview of the Clean Energy Solutions Center initiative and then following the presentations, we will have a questions and answers session where panelists will address questions submitted by the audience followed by closing remarks and a brief survey.

Now this slide provides a bit of background in terms on how the Solutions Center was formed. And the Solutions Center is one of 13 initiatives of the Clean Energy Ministerial that was launched on April 2011 and is primary led by Australia, the United States and other CEM partners.

Outcomes of this unique initiative include support of developing countries and emerging economies to enhancement of resources on policies relating to energy access, no cost expert policy assistance and peer-to-peer learning and training tools such as the webinar you are attending today.

And 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 policies and programs and third is to deliver dynamic services that enable expert assistance, learning and peer-to-peer sharing of experiences and then lastly the center fosters dialogue on emerging policy issues and innovation around the globe.

And our primary audience is energy policy makers and analysts from government and technical organizations in all countries. We also strive to engage with the private sectors, NGOs and civil society.

And one of the marquee features that the Solutions Center provides is the No Cost Expert Policy assistance known as “Ask-an-Expert”. The “Ask-an-Expert” program has established a broad team of over 30 experts from around the globe who are available to provide remote policy advice and analysis to all countries at no cost.

So for example in the area of finance of sustainable energy planning, we’re very pleased to have Wilson Rickerson, CEO of Meister Consultants Group serving as one of our experts.

So if you have a need of policy assistance in finance and sustainable energy planning or any other clean energy sector, we do encourage you to use this valuable service and again it is provided to you free of charge and to request assistance simply go to cleanenergysolutions.org/expert and submit your request to the online form on that page.

We also invite you to spread the word about this service, those in your networks and organizations. And in summary we just encourage you to explore and take advantage of the Solutions Center resources and services which include the expert policy “Ask-an-Expert” assistance, the database of clean energy policy resources, subscribe to the newsletter and then participate in webinars like this one.

And so now I would like to provide brief introductions for our very distinguished panelists. And our first speaker today is Christine Lins and Christine is the executive secretary of REN21 and has been since July of 2011.

And then our next speaker today is Rainer Heinrich Rahlwes the vice president of the European Renewable Energies Federation and Rainer is representing the German Renewable Energy Federation, the national umbrella organization of the renewable sector with he has been a board member for 8 years now and also the spokesperson for European and International affairs. And so with that, I would now like to welcome Christine to the webinar.

Christine

Thank you very much Sean. Good afternoon ladies and gentlemen and thanks for attending the Energy Solutions Center webinar on the key findings of the Renewables 2014 Global Status Report with the focus on Europe. It is my pleasure to take you through the global picture and then to hand the floor to Rainer Rahlwes for a more detailed insight into the situation in Europe within the European Union.

The Renewables Global Status Report was first released in 2005 and provides a comprehensive and timely overview of renewable energy markets, industries, investments and policy development worldwide. It was launched at the beginning of June this year at the UN Headquarters in New York and it enables policy makers, industry investors and civil society to make informed decisions. It relies in contributions from over 500 people throughout the world and this year's report features an overview of the last decade of renewable energy deployment as 2014 marks the 10th anniversary of REN21 which we will celebrate later this year with the REN21 Renewables Academy.

So actually when we look at how the picture of renewables as it was over the last decade, we see that the evolution of the renewables over the past decade has surpassed all expectations. And if you just look at the global installed capacity and production figures we see that they have increased substantially. Renewables power capacity for example that is given in the second line of the graph, the power capacity, excluding hydropower source, 7-fold increase during the past decade from 85 GW in 2004 to 560 GW to 2013. In the same period, costs for most technologies have decreased and supports in technologies have continued to spread throughout the world. And we have the situation that many of the scenarios in the forecast that were developed were actually reached or even surpassed and we also see that we not only have a spreading of technologies to many parts of the world but we also see that initiatives aiming at 100% renewables are being developed and are gaining prominence and credibility.

So when it comes to the status of renewable energy in the world, the final share of renewable energy that of the share of renewable energy in final energy consumption remained about level with 2011 even if the share of modern renewables has increased and this is because the rapid loss in modern renewables somehow came about but both had migration away from traditional biomass and a continued rise in total energy demand. And so when looking at the UN secretary general's sustainable energy for all initiatives, which sets the objective to double the share of renewables by 2030 from 2010 levels. That means from 18 to 36 percent. Then we see that in order to reach this, increased efforts are needed because now in two years from 2010 to 2012, we have just made a 1 digit growth and increased efforts to speed up renewables will be needed but also more action in the field of energy efficiency will be needed to current demands.

We have discussions at the moment in the European Union ongoing on targets also for energy efficiency. I tell you this is absolutely crucial if we are serious to reach ambitious renewable energy objectives. Looking in to the renewable energy champions, the situation is as follows when looking in absolute figures investment in renewable power and fuels in absolute terms. There you have the given countries such as China, United States, Japan, United Kingdom and Germany.

So two out of five coming Europe but I think very interesting for the first time this year we did calculate the share of investments related to GDP and there we see that list are slightly different. There the top five are Europe, Mauritius, Costa Rica, South Africa and Nicaragua which just shows that developing countries are really stepping up their investments in renewables. When it comes to total renewables capacity however and especially when looking into figures of installed capacity per capita we see that the different EU member states are leading. So these are these yellow lines in the graph. And we have the situation that 42% of global non-hydro renewables capacity is located in Europe compared to less than 17% of global electricity demands. And these higher renewables shares are already explained the need for increased attention on the integration of variable renewables in the energy system and they also explained why there is a situation going on with sometimes negative electricity crisis because renewables are really becoming, playing a major role in some country's energy mix.

Overall they comprise about 26% of global power generation capacity. And in 2013, 22% percent of global electricity was produced all from renewables. Renewables accounted for 56% of new installed power capacity that is the global average within the European Union. 72% of all new electricity capacity was renewables-based. And variable renewables are really achieving high levels of penetration in several countries for example, throughout 2013 wind power make 33% of electricity demand in Denmark and 21% in Spain. And in Italy, solar PV met 8% of total annual electricity demand.

China's new renewable power capacity surpassed new fossil fuel and nuclear power capacity for the first time. And yeah I think these are all because they really show that we have made a lot of progress throughout the last decade in the power sector. Now when it comes to heating and cooling, the advancement is a bit more moderate. Heat from modern biomass, solar and geothermal sources account for small but regularly rising share of final global heat demands amounting to an estimated 10%. The use of modern renewables for heating and cooling is still limited relative to their vast potential.

We have at least 20 countries in Europe that use renewables in their district heating systems with at least 20% of the EU-wide district heat generated by renewable sources. And we have encouraging best practice examples such as Denmark for example who banned the use of fossil fuel-

fired boilers in new buildings as of 2013 and aims for renewables to provide almost 40% of total heat supplied by 2020.

So there are examples, there is increased used in combined heat and power plants, renewables are making their way to district heating systems and we see a growing use of renewable heat for industrial purposes however compared to the electricity sector, renewable sector is still lacking behind and there is still more effort needed in the future.

As far as transport is concerned, liquid bio fuels make around 2.3% of total transport fuel demands. We see a growing interest in other renewable options in the transport sector and we see limited but increasing initiatives to link electric transport systems with renewables policies particularly at city and regional levels.

So now when quickly going through some of the main technological areas that are highlighted in the GSR in the field of hydropower about 40% sorry about 40 GW of new hydropower capacity was commissioned in 2013. Increase in the total global capacity around 4%. We see that the modernization of aging hydropower facilities is a growing global market and we see that there's an increase in recognition of the potential of hydropower to complement other renewables technologies such as variable wind and solar.

2013 was clearly a record year for solar PV. There were more than 39 GW of capacity added in 2013 for a total of approximately 139 GW and for the first time in history that was more PV capacity added than wind capacity.

Europe continued to operate more solar PV capacity than any other region of the world with more than 80GW total by the end of 2013. We also saw that China had a spectacular growth in 2013 accounting for nearly 1/3 of global capacity added followed by Japan and the United States. We also see that costs of solar have come down or continued to come down significantly throughout last year which of course opened new markets in different parts of the world but clearly when looking into the top countries for annual installation increases, there you see that some European countries mainly Germany, the UK, Italy are playing an important and significant role.

As far as wind is concerned, in 2013 more than 35 GW of wind power capacity was added for a total about 318 GW however for several record years the market was down nearly 10 GW compared to 2012 were reflecting primarily as deep drop in the US market. Also wind saw a record in 2013 with 1.6 GW added almost all of it in the European Union.

And globally we had a situation that wind power by the end of 2013 was enough to meet an estimated 3% of the total electricity consumption of the world with the higher figures in Denmark or Spain to which I've already referred to a bit earlier as well as not as spectacular as in solar PV and in

wind but the continued increase in the field of use of bio energy both for heat power and transport sectors. We see that the global bio power capacity was up by an estimated 5 GW to 88 GW Europe continues to be the world's largest consumer of modern bio heat and Europe was also the largest consumer of wood pellets burning over 50 million tons in 2013. CSP, also an increase in CSP to reach an installed capacity of about 3.4% while the United States and Spain remain the market leaders. Markets continue to shift to developing countries with high levels of installation beyond the leading markets capacity nearly tripled with projects coming online in the United Arab Emirates, in India as well as in China. And Spain continued to be the leader in CSP all throughout the year and we see that the transports electrical plants that are emerging.

In the field of geothermal energy, the net increase of geothermal was about 455 MW bringing the global geothermal capacity to 12 GW. We see that the use of low temperature feeds for both power and heat continues to expand. Increasing the application of geothermal energy beyond high temperature locations. As far as solar thermal heating and cooling is concerned also they are an increasing market reaching an estimated 330 GW thermal by the end in 2013. As in the past, China was the main driver for the market accounting for more than 80% of the global market but we see that the trends to develop large domestic systems that these trends continue. And we see that there's a growing interest in the use of solar thermal technologies for district heating and cooling as well as for industrial applications. The EU supports the greater diversity of uses for solar thermal technologies in any other markets. And in 2012, Europe's total operating capacity was up to 7.5% over 2011 to over 30 GW total however in 2013, Germany and Austria both long-term leaders of installations in Europe experienced market declines but we also see that in central Europe, solar thermal systems was basically gaining ground so a quite positive trend.

Now as far as jobs are concerned, job creation has come to the focus of policy making worldwide. Globally there is an estimated 6.5 million people working directly or indirectly in the renewable sector. We see that despite the fact that technologies advanced throughout the globe, employment is still concentrated in a few countries such as China, Brazil, the United States, India and the European Union.

And we see that there are some trends that can be noticed in the form of shifts along with new changed segments and from manufacturing to installation and maintenance.

Now a word on global investment in renewable energy, global investment was an estimated 214.4 billion dollars in 2013. That is a decrease compared to the previous year if we include investments in hydropower larger than 50 MW the amount reaches approximately 249.4 billion dollars. The reasons for the decline is policy uncertainties in some parts of the world mainly in Europe and the United States. In some countries, some

European countries resulting in retroactive support policy reductions but also last but not least in the reduction of technology costs. And we see that net investment in new renewables power capacity outpaced fossil fuels for the fourth time running. And the reason of decline of investment related to technology cost can be nicely seen on this slide. Even as global investment in solar PV declined 22% relative to 2012, that is the gray graph, the gray line on the graph. Newer capacity installations increased by more than 32%. So we see that for the first time we have two different trends going in different directions, main reason for this is, main low module prices and of course this opens new markets for PV especially emerging and developing countries. And you can actually see that right away in how investment is spread around the world. Here shown in world regions despite the overall downward trend in world investment, there was significant exceptions at country level.

Europe's investment in renewables was down 44% from 2012 and for the first time ever China invested more in renewables than all of Europe combined but Japan for example, increased its renewables investment by 80% relative to 2012. And we see that there are some regions such as Asia, Oceania as well as the Americas excluding the US and Brazil where investments of many Latin America where investments continued in renewables continued to increase.

When it comes to policy we have a very diverse situation by early 2014. At least 144 countries had renewable energy targets and about 138 countries have renewable energy support policies in place. Developing and emerging economies lead with about 95 countries with support policies and this is up from 15 countries in 2005. So we already see a lot of policy development that's happened in the developing country and emerging economy area. The most prominent support policies are the ones focusing on the power sector. Feed-in tariffs and renewables portfolios then that are the most popular instruments but we also see that public tendering has gained further prominence with a number of countries turning to public options rising from 9 in 2009 to 55 as already of 2014. We also have a series of countries with policies in the field heating and cooling in place as well as bio fuel mandates however 2013 was clearly also a year of increased focus on revisions to existing policies and targets and sometimes retroactive changes I guess by that really go with further details of this that has mainly happened in Europe and to some extent in the United States.

Particularly in Europe we also see new policies emerging to advance or manage the integration of high shares of renewable electricity into existing power systems. There's a lot of discussion about the new market design for the power sector including support for energy storage demands and management and smart grid technologies and I think we are probably going to see more of these emerging in the years to come. The work of distributed renewable energy in developing countries we see generally that energy excess in the use of distributed renewable energy technologies is increasing on all developing continent except in Africa. The growth in

population electrified is bigger than the growth in total population. In Africa however the population growth rate still exceeds the rate of electrification and there are only 43% of population electrified. So clearly we see despite the fact that we have available technologies I still feel or [Inaudible 00:27:48] that there is still a need to further promote this sector. There's also an emergence of new business models for more electrification. The markets are gaining in dynamic but still there's a long way to go.

And in conclusion I would say that the global perception of renewable energy is shifted considerably throughout the last decade. Today renewables have arrived in the mainstream and are preferred energy source of the general public in many parts of the world definitely in Europe but although these figures presented document advancements throughout the last decade, it is clear that we need to move faster and more deliberately if we are serious about doubling the global share of renewables by 2030 and about ensuring access to clean sustainable energy services for all by 2030.

We are still far away from having a fairly level playing field for energy sector. There's still a lot of spending on fossil fuels subsidies. I think we need to focus on long term differentiated stable policy frameworks. We have to pay greater attention to the heating and cooling and transport sector and last but not the least we need to intensify interaction between the private and the public sector something that we are trying to do within REN21 to make the energy transition with renewables a reality soon. And in this context also we are happy to work with EREF on today's webinar and then with this I would like to give the floor to our next panelist for his insights into Europe. Thank you very much.

Rainer Okay. So could somebody push my slides to the screen then I can start. So obviously I don't see my slides so...

Sean Yes Rainer we can, did you want to show the slides on your computer or did you want Andrew to show them for you?

Rainer I prefer to have it here. I want to operate them myself.

Sean Okay, then we will pass over the controls to you. You'll have to accept those.

Rainer Yeah okay so please do. Okay so showing screen, show my screen.

Sean Yup, there you go. You have to select that.

Rainer Yeah, so obviously so far I don't see something.

Host Yup, we can see your screen right now. You just have to pull up your slide.

Rainer Okay, then I will do just a minute. For the reason or another it does not work. This it will take only half an hour, no. This is strange. Okay now I can...okay.

Sean If you can actually, if you just pull up your power point we can...

Rainer Yeah I do, I do. So now I have my power point in the screen and is it visible to the others as well or?

Sean Okay we might have to have Andrew display the slides for you.

Rainer Okay.

Sean And do you have those ready?

Rainer So I see my slides on my screen but obviously you don't see it. Show my screen, I'll try again? Show my screen.

Sean There it is.

Rainer Sorry about...okay you see my screen?

Sean Yes, we do.

Rainer Okay so good afternoon from my side or to all friends in America good morning. Thanks to the organizers to have me here. Thanks to Christine that she already gave a few data about the development in Europe, technologies in Europe. And I would actually try to go in some more detail for some of the technologies and give some insight into various policy areas so we can then better compare what happened here.

First of all let's, just to make sure, I see many icons on my power point is this the same for you or is this only on my screen, because I can see the control panel covering part of my power point.

Sean We did not see that part, we just see your power point.

Rainer Okay that is fine. I go on with them on. So first a few words about EREF, the association I'm representing. EREF is the federation of associations from EU member states working with the sector of energy produced from renewable energy sources including electricity, heating and cooling and transport.

Our main focus is to be the voice of independent producers of energy from renewable sectors striving for fair market access for newcomers and this is of course why we have another focus on [Inaudible 00:34:02] non-discriminatory access to energy markets. Energy markets which are still not real markets and which are still quite distorted in many parts of the world also in Europe.

To start with I would like to give you an overview about some of the facts or some of the developments of renewable energy in Europe, for those of you who are not from Europe should be aware that the European Union back in 2009 agreed on a policy framework on a framework of targets for 2020 to have 20% renewables in the final energy consumption, to have 40% efficiency gains and at least 20% greenhouse gas reductions and of course I will focus on the renewables part of it. This 20% renewables for Europe as a whole was underpinned by national targets, differentiated national targets depending on their economic capacities on their resource capacity etc. And as I said the target year is 2030 where the European Union as a whole should have 20% renewables at least in the final energy consumption.

What you see in this slide here is the first results of a project which is run by 12 national renewable energy associations together with some European associations and some scientists and financed co-financed by the European commission where we're trying to keep on track of what is happening in the European Union where Europe actually reached the 20% target where the member states reached their national targets and the first results you will see on the next few slides I'll show you.

Here you can see in black the development of the share of the renewables in the overall energy consumption from 2005 up to 2012. This is the latest year where we have official statistics. And then in gray you see what the member states planned for the coming years. And these little gray and blue boxes show indicative trajectory which is in the official agreement on the European policies. What you see here that obviously in the overall energy consumption so far it seems that Europe is well on track towards 2020 but if you look at the different technology sectors then you'll see that this is again a mixed picture.

You see on top in blue the development so far in the electricity sector where Europe meanwhile reached the share of 25% that is projected to go up to 35% in 2020. Then you see in red the development in the heating and cooling sector where you already see a little inclination of the development curve downwards and if you extend that red line towards the other red line you will see that at the end of the day so far it seems that in the electricity sector we will make it in the heating and cooling sector. There will be a lot to be done to reach the part which is needed for the 20% share.

And in green, the bottom part, this is the transport sector you see that there is some downward and a little bit upward movement in the development still in the transport sector the predictions for the years to come are relatively negative and most experts predict that in the transport sector further development will be very, very slow. And based on this relatively good development in electricity, problematic development in heating and cooling and very problematic development in transport sector and we come up with the next slide which gives a policy projection again done by

this project of national associations and co-financed by the European commission, where we see that if no further policy changes come up, if no further policies are developed a majority of European member states will probably not reach their national targets. About half of the European member states are in this sense not on track towards 2020 targets.

All those in red and about those in orange you also see Spain which was always one of the frontrunner countries of renewables. In orange which other countries where there is a big question mark whether current policies will be the target achievement. You see among others, Germany which also is one of the frontrunner countries. And then you see a few countries if I counted well nine countries who seem to be safely on track on their 2020 targets. So again like in many other aspects, you see a mixed picture of renewables development in Europe particularly some of the old frontrunner countries, Spain for instance are dropping out, changing their policies, have implemented moratoria to slow down or to stop development of renewables. Some others as I said like Germany where there are big question marks just a fundamental revision of the Freedom Tariff Law is passing through legislation which again may slow down development. And all over Europe we can see that particularly in the heating and cooling and transport sector, a lot is missing through really push forward development to steady growth but there is light at the end and there could be light.

I show you here this picture indicating problems and where more needs to be done to reach the target. The project has discussed and recommended set of policy changes, policy development particularly in one sense we need to come back to stable and reliable frameworks all over Europe to incentivize growth of renewables instead, certainly all countries following these recommendations could reach their target and the union as a whole would be on track to 2020 in 20%.

But having said this, it's suddenly not all problematic; there is a lot of positive light still in Europe. And with this I move to the power sector which I said is the best of the three sectors but particularly in the power sector Christine mentioned that in her presentation already renewables are really performing very, very well for the 6 year in a row, renewables have contributed more than 50% of all new power plant installations in Europe in 2013. That was around 72% of all new power capacity was from renewables.

There are missed graph apart from renewables you see this yellow part which is natural gas so apart from renewables, all of the natural gas have some significant growth all other technologies are not really relevant. And discussing that in specific renewables technologies, you see that wind is constantly growing over the years with specific relatively stable figures I can produce in a minute. And in the last few years particularly solar PV installations increased drastically. So that we are close to the point where in Europe PV may even overtake wind.

To say about a few words about other technologies which are partly hidden in the graph, 5% of new installations was from biomass which is certainly in this 72% of renewables. And so we see basically in the power sector so far the tendency towards more renewable space a more variable renewable power space power system particularly focusing on wind and solar is continuing as it did the last couple of years.

Looking at it more in detail into different technologies, I first take you to the development in the, I'll show you once again an overview of power new installations distribute about the technologies and yet you can nicely see that wind and solar last year had more or less had an equal share of new capacity then there is gas and all the rest is negligible. And for the existing power mix in the Europe this led to a constellation where hydro, wind and PV plus some other renewables; geothermal, ocean etc. contribute to around 45% of the electricity already. So this is an encouraging view.

Looking to wind power now, wind power still the strongest, the most constantly growing one. The new renewable technologies you see here, the new capacity as it developed over the years. And you'll see that from 2001 until today we have a more or less constantly increasing market with some ups and downs. 2013 is slightly smaller than 2012, but the overall tendency is still is a growing market. There was 11 gigawatts of new capacity last year. You'll see on the graph that the share of offshore wind is slightly growing but still the majority of new capacity is wind, onshore and trying to distribute the new installations geographically. You'll see that there are still only a few countries with significantly high, their installations only two countries have installations of more than off close to 2 or more than 2 gigawatts. Germany last year installed about 3.2 gigawatts of new wind capacity which by the way was one of the best years in the history of wind power development. And the second in Europe was the U.K. which is 1.888 capacity new; so these are the front-runners last year. Then we have a few countries which are following with several 100 megawatts of new installation: Poland, Sweden, Romania, Denmark, France, Italy, Austria, and Ireland.

What is interesting to know is looking at the development of wind power installations among the different countries. You can see that gradually the main part of installations is shifting away from some of the front runner countries whereas Germany which is overall 34...with more than 34 gigawatts of import capacity still is the undisputed number one in Europe, the number 2 in Europe, Spain last year had close to no capacity additions so may fall back in the near future. Whereas the U.K. seems to be catching up in difference to Germany and Spain very much focusing on onshore and again we see significant shares in about 10-12 markets in Europe.

The overall capacity of wind power in Europe, this is what we see in the columns reached 117 gigawatts end of last year which shows that wind power is more and more becoming an absolutely mainstream energy

source in the European Union. But the solar PV is catching up; you saw the one of the 117 over all capacity end of last year. And wind solar PV end of 2013 had already reached 80 Gigawatts of new capacity and the annual figures of new capacity for PV in the last years were bigger than those for the wind power. So its interesting competition among these two technologies which are both the most modern ones, are both valuable ones, and obviously are the most quickly growing ones among renewable energies.

If you look...try to find out some leaders, some front runners in renewables because it's all of the question of whether you look at gigawatts then you saw the champions. If you look at per capita installations then you can see that in Europe for PV, Germany is still the front runner followed by Italy, Belgium, Greece, and the Czech Republic among these 5 front runner countries; it's still a major part of the European PV market. But policy developments and I come to this in a few minutes are very very different in these countries. In Germany development for PV-able drastically slowed down in the next years. And Italy it would slow down. Belgium is quite open. In Greece they are not so optimistic and in the Czech Republic which has nearly been brought to a hold by retroactive.

Policy changes so we see there are a few countries with high shares of solar capacity. This becomes even more clear when we look at the new capacity for PV in Europe which last year was about 11 gigawatts and there you'll clearly see it is with Germany and it is Italy and the rest of Europe distributes the rest. This is largely due to policy and certainties I mentioned already that's particularly in the PV sectors; retroactive changes were implemented. First, the Czech Republic imposed taxes of existing PV systems. Then, in Spain the complete moratorium for all the renewables in PV including solar was executed and also in Germany last year there was a drastic reduction of the Freedom tariff which reduced the new installations and this year more reduction of the freedom tariffs and the announced shift towards more premium focused and then eventually public bidding systems again will bring down the figures of new installations for the coming years.

A few minutes on other technologies, this is already mentioned by Christine. Solar...solar...concentrating solar power in Europe due to the geographic consideration is only possible in the few countries and like Spain, is leading the world in new capacities that Christine show that in her graph and certainly also the European champions but we have to be aware this at the relatively low level of something like 3.5 gigawatts of all over installed capacity. Solar heating and cooling also is continuing to grow but particularly the old champion markets Germany and Austria are slowing down. All the other technologies particularly biomass are growing but by far not at the same speed as wind and solar group. Let me now come to the policy development in the couple years to come.

First of all, I already mentioned that's obviously policy and certainty is the main reason for growth which is slowing down of course in combination with the economic and financial crisis which is still ongoing. And, I think you are well we have these targets for 2020...2020 in the energy sector from now is more or less tomorrow, some even say it's already today so that the fact that they have not yet policy agreement political decisions on where to go after 2020 is certainly is a major reason why investment in renewable energy and energy efficiency and other green technologies are slowing down. Based on this discussion started in Europe about the future framework, future targets; "Where do we want to go in 2030?" Meanwhile the process has developed end of last year the European commission proposed something which they called Travel and Energy Framework 2030 where they outlines their proposals for 2030 framework. This travel and energy framework 2030 basically continued on the following elements. They suggested domestic greenhouse gas reductions of minus 40% until 2030 always compared to 1990. Then they suggested the so-called binding renewables targets for 2030 of 27%. You may recall that the European Renewable Energy Associations had called for 45% in 2030.

So, this is very low target which is not much more than business as usual and it has to be mentioned the European commission explicitly did not propose to continue with national bonding targets as we have them today so that's another instrument to push member states who are lagging behind back on track would be missing if this proposal came through. The European commission so far on energy efficiency is somehow shifting between...let's have ambitious measures without any target at all and recently introducing the target of 27%. Again, here a lot stakeholders are asking for higher targets.

The European parliament which has always been more favorable to renewables than the member state governments and the European commission has asked for at least 30% renewables, 40% efficiency, and 40% greenhouse gas reductions. And the problematic thing is with what the commission has proposed now 40% and two times 27% on binding this would mean about 30 or 35 percent less jobs than we would have according to the commissions' old impact assessment with target of 30 or 35 percent. So obviously they gave into political pressures some other stakeholders do not propose higher newest targets other stakeholders meaning some of the old industries who fear to loose and some of the European member states will fear that a green economy would be bad for their coal based energy system so far. So obviously, there is a lot to be done until a good decision can be taken so far on the background of this old policy proposal with very low renewal's targets.

There is in parallel process going on of what they call converging or streamlining or even harmonizing policy support for renewables all over Europe which has two aspects on the one hand there is a basic understanding. We need to do more and more precise action on heating and cooling and on transport and on the other hand there is the idea to

adjust support for renewables more in the direction which some stakeholders call market based, meaning that the European commission has put a pressure particularly in new guidelines which they just published to shift support for renewables electricity away from feed-in tariffs to fixed feed-in premiums and preferably through public bidding and as an alternative to water and certificate systems. The renewal associations, renewal industry in Europe is looking at this quite skeptically because obviously so far feed-in systems in Europe has been very very effective and efficient in moving forward with high installation rates.

So, that is maybe another factor of slowing down development so low 2013 targets in the pipeline downward pressure on support systems. And obviously a missed opportunity to reap the benefits, to reap the knowledge from what we could learn from the Ukrainian crisis. For those who are not living in Europe I think I should underline that the Ukrainian crisis in Europe particularly in Eastern European countries was understood as an immediate threat for security of energy supply because there was a fear and obviously not unfounded that there will be gas supply disruptions in these contracts so that the European commission was asked and eventually delivered on something that is called energy security strategy for Europe. And I've put on this slide the main highlights of this proposal of this elaboration from the European commission which was presented end of May this year. They have very much focused on short-term measures like finding new markets for gas. They have found and highlighted a few things which are obviously useful and necessary for instance.

We need to do more in the heating and cooling sector, particularly in the heating and cooling sector the shift to renewables needs to be accelerated, administrated. Administrative carriers should be analyzed and removed and access to finance is an important part. So this a good thing of what they found and suggested in this strategy. But the downside is what you see in this box with the first to bullet points only mentioning that the 2020 targets should be pursued and not a single word on the need for mid-term targets on 2020 and if you read this first bullet point which says in order to achieve the 2020 target in the context of the marketing based approach so obviously the shift to other instruments than feed-in policies for the authors of these studies to be more important than to have a solid framework and the targets for 2020 and this goes in line with the 2nd bullet point where they emphasize the support policies for the renewables need to be more Europeanized and shifting away from national support systems.

These national support systems in the past obviously where the main elements of success, the main factors why the renewables in the electricity sector actually did quite well and by the group successfully even in the years of crisis. So I come to my deep downplaying the rest and glorifying the old system and too much focusing on non-renewables solutions. And the domestic renewables which obviously what will be the major part of the solution which are available are not so much in the focus of the

European Commission and with this I have my and computing slide we see as Christine showed in her presentation that globally renewables at least in general are continuing to grow. And there is the global uptake of the renewables where you see other parts of the world and the European share of the renewable uptake why obviously is decreasing in investment, Christine showed it, globally is decreasing but in Europe the decrease rate was even it was nearly 44 percent from 2012-2013 which is down from 86 to 48 million dollars.

Only I'm convinced the major reason for this is the fact that from two years now. Discussions have been going on how the future policy framework should look like how and some even asking if 2030 framework for renewables and efficiency should be put in place. So this lack of clarity so far proposals on the table which are insufficient and are seemingly and obviously missing political will of those who lead in the past to continue leadership in terms of renewables. Seems to be a major obstacle for further development and of renewables this is why the renewables associations in Brussels and all national associations. We all agreed that it is now is really, very important to speed up the process and what is new reliable and stable integrated [Inaudible 01:03:50] energy framework for 2030 which is particularly important, not only the targets should be ambitious but next we need mutually reinforcing ambitious binding targets for greenhouse gas reductions of energy insufficiency and renewables and not only in the European levels.

But we need these targets broken down to the national level, so the concrete obligation to member states of how much renewables capacity should be deployed until 2030 can be seen as part of the political will. So the good points in this context so far the European council so the heads of state and government of the European Union are meeting, plans to decide all the 2030 targets et cetera in October this year.

By October this year will be elected European parliaments will hopefully also be ready to take up the work the new European commission will also be reelected this year by the parliament they will also be ready so the hopefully by end of next year running to the 2015 at least policy certainly towards 2030 will be there and I very much hope will not only be certainty but a certain level of ambition and binding targets and a good framework for renewables. And with this I thank you for your patience.

Sean

Thank you Ranier and thank you Christine for the presentations, and we will move now to the Question and Answer section of the webinar. Just like to remind the audience if you do have any questions what would you like to ask either the panelists go to the question pane and go the webinar window and so Ranier now with you first question with your perspective what do you see as the potential leading technology for the next near future for the European region?

Ranier

Well, I think the main part of the answer is in the statistics in the graph I showed obviously wind and solar of those renewables technologies which are growing most steadily and most certainly and with particularly solar and on shore wind have very, very high cost decreases so that I think in whatever development of policies framework but how much real of each markets elements come on these two technologies will certainly have an excellent chance to complete certainly the potentials are there. Hydropower will continue to play a role but obviously not in as much as wind and solar you see particularly outside the electricity sector particularly heating and cooling I see continuing a big role for various forms of bio gas which are there are available but also cost development is positive and those countries have geothermal energy be it for electricity production be it for use in heat pumps will play a certain role. Apart from it until 2030 this will basically be it until 2050 we can certainly expect for some technologies like ocean, tidal may play a significant role and also sorry for me as a Northern European I always forget CSP. CSP will continue to play a role but in Europe will be limited to Spain and maybe parts of Italy, maybe part of Portugal this is due to the lack of some other places. So wind and solar will continue to grow and others will also continue to grow at the end of the day in the next decade I see us approaching something like in the electricity sector something between 40 and 50 percent over all certainly, a little bit less but also that direction.

Sean

Thank you Ranier and moving on to the next question from the audience this is heard both panelists and the question is there any sense that renewable energy is developing too fast in some countries in Europe and are they experiencing problems with grid management and security of supply?

Ranier

The smart software available and in the few cases certainly also of building some of your power lines basically the gross is final basically I would rather say, we should adjust the gross upwards and those countries which are lagging behind, so that is an overall tendency in Europe and policies could adjust in this way to have it more distributed all over Europe.

Christine

Well, maybe I can come in here, also, and Ranier is fully right, there's not too much development happened for what is needed, I still think that some of the renewable's development went so quickly that it took members states by surprise and I think the rhetoric changes we've seen for example in Spain came from the fact that probably for PV were rapidly, so rapidly growing that they were beyond and what government expected will be and then the probable cause the problems and in general I think, what, what I'm trying to demonstrate, what we see is that, that we had an even a very large shares of renewables in, in the electricity mix, in the recently I think they were half of Germany's power need was produced from PV. And then also as well the year we can see the 33% of all electricity consumed produced by wind in Denmark and 21% in Spain, this challenges the system that is mainly so based on central generation and, and I think all

the problems that are rising are coming from the situation that, so far of what, what in the last decade many countries had done they have added renewable's to the mix without really making changes overall. And I think now it is about integrating renewables in the mix and this will, will automatically also lead to the need to face out existing power capacity, we have seen this in the last couple of years, huge losses huge strength of investment of fossil fuel power generation assets of German new activities and others because in Germany there's a change. There's a program shift going on and this program shift is not going only produce winner's it will also produce loser's and I think what we've, what we're having right now is just also the back fighting from the incumbents to fight against a changing system which is going to be different, which is going to be based on in a much more decentralized approach and I think that's where the battle is coming on, coming from at the moment and but we cannot say that the development of renewables was a completely, most probably quicker than may people expected especially when looking also on, on how to keep costs coming down and also due to International competition.

Ranier

Well maybe, another short remark from my side to what Christine already basically mentioned, I think now is indeed the point where renewables are no longer growing in a niche, where renewables are recovering quite strong and in some power systems and I think this was the main reasons for or one of the main reasons for why the Spanish stopped all the renewables development they have high shares of [Inaudible 1:13:45] even the highest shares of all energy sources of even more than gas. They now have wind and gas in the Spanish power systems up a beating for grid shares, what shares of grid system back on the other hand there is still a, the systematic approach that in Spain, and in Germany and many other countries of around Europe, it is taken for granted but coal and nuclear must run, actually they are not flexible enough to have done quickly. So there is almost a lot of congestion from inflexible power plants in the system which do not work very well together with flexible and very renewables, so what is needed now, actually is policy decisions really showing the way where to go. Do we want to develop renewables and renewables developments means we develop solar then we have also to develop markets then we have to adapt the remaining power plant because we need flexibility instead of the old base load of capacity, so all this is needed and this is where we need all the politicians who dare to take decisions not to all the same time developing the renewables and at the same time nuclear is not only very expensive it also is upon to contradictory element in the grid system which certainly is not healthy.

Sean

Thank you both again, and the next question we have might be outside scope of the report, so it's understandable if don't have too much information on it but it asks if you could just discuss the status of the electric vehicles in Europe?

Ranier

So, there are some, there's a broad political will let me say, if you will take a declaration while politicians, a political will that electro mobility

should be developed, my judgment is for political reason and also for technical reasons the mainly in the sector of individual cars, there are targets of a few hundred thousands, of a few millions of 2020 and 2030 none of them binding and honestly so far, there are not really incentives going on which will encourage people to shift from petrol based mobility to electro mobility, infrastructure is not yet there, so of course we could call it the chicken and the egg problem, I know that definitely so far, the election mobility is still at the very, very low level, technically speaking the cars are there, battery capacities are developing a few hundred kilometers can all already be reached and then of course the main problem, how to guarantee that electro mobility is combined with renewables and it is not the way to use the excess electricity of outdated and conventional energy plants which certainly would not be the way forward.

Sean Alright, thank you very much Ranier and next question is what are the transient energy storage are there any promising new technologies?

Ranier I'm sorry, what is it?

Sean I'm sorry?

Ranier I was just trying to put the shift this over to Christine, so I do not have all the questions.

Sean Yup! Good thing would you like to start with this one? If you, if you have a response Ranier and would like to go ahead, why you won't go ahead.

Ranier Okay, okay, I'm definitely not an expert in storage, what I know is of course that the research is going on and some storage is available and we've all have to be aware that the oldest storage technology is pump idle and which the pump up the mountain if you have excess electricity of which you have run down this through turbines when you need it later. So technology is available, all technology there are new developments in battery technologies which I certainly cannot all enumerate, there are developments in compress air, earth storage, there are developments in power to gas technology where excess electricity wherever it's produce is combined with the natural gas, or grid, so I think all of this is going on, at present, I have the impression that for the shares of the renewables in this grid system so far which in Europe, there is no immediate and urgent need for large storage and Large capacity additions in storage in the medium perspective we will certainly need storage will be cut, need more storage and more differentiated storage will become on a much higher shares of electricity so far and a lot of flexibility can certainly be managed by smart grids on distribution and transmissions level. This is a little bit different for individual holes particularly in combination with small-scale solar insulations where direct use of the electricity. More or less only the electricity can produce on roof is desirable, so there's a lot of solutions often in the market combining the solar PV with small storage units but I

thinks this is only very rough overview and they're might be better experts.

Christine

Yeah, and just adding sorry I had my microphone on mute. So I didn't want to abandon you guys but I hoped all you realized that I'm not on. So basically to add what Ranier said European Union has a framework for research in the research and demonstration energy sector. There was a projects focusing on this topic and in addition to battery storage technologies and other things in the electricity sector. There's also ongoing research on thermal storage and I think we also had a discussion emerging of effectively how the in times of all production of electricity is that electricity can also be used to generate heat. So there is going to be more focus in the future on integration of different technologies and then also integration of different policies between the electricity, the heating and cooling and the transport sector. And then on the question before, when it comes to electric mobility; yes there are emerging nations a nation that making it happening at the city and regional level. We have some examples especially on the Scandinavian countries. There is a lot of incentive programs for example in Norway to promote electric mobility; electric cars who allowed to drive on bus lanes, etc. And we also see that have initiatives emerging in Germany where cities rely on renewables to power...renewables electricity to operate their light rails and subway service. And for example in the German state of Saarland, there Saarland's switch its local rail service 100% renewables electricity. So there are examples combining renewable support and electric mobility. They are still more in the...on couple of examples. But we will definitely see for the spreading in the decades to come.

Sean

Well, thank you Christine. And thank you Ranier for that answer. And with that we're actually running low on time. We did just get one more question come in so perhaps we could just give the response to this one no more than one minute. And the question is, if the private sector's investment is lowering could there be a role for citizen initiatives such as cooperatives?

Ranier

Well, there is a lot going on in the cooperative energy sector. So far they have been major parts of the renewables development. In Germany there are even close to a majority of the investment in the electricity sector going on. I think with cost advices for installations going down as long as great connection and technical capabilities are guaranteed. There is a bright future for citizens' cooperatives as long as the administrative server allows it. This is one of the reasons why I was quite skeptical about some of the policy changes discussed on the European level despite the fact that so far small installations are accepted. But all of these are moving away from feed-in tariffs to some so called market instruments is certainly something which makes it more difficult for cooperatives than for big players. But I think they have a bright future still.

Sean

Well, thank you Ranier. And with that we will wrap up the webinar. We do have a very brief survey for all the attendees today. We just have three short questions for you that help us evaluate how we're doing and improve for future webinar.

So, Andrew if you could go ahead and display that first question for us. The question is: The webinar content provided me with useful information and insight? And the second question: The webinar's presenters were effective? And then the final question: Is overall the webinar met my expectations? And thank you very much for answering our survey it is appreciated.

And on behalf on the Clean Energy Solution Center I would just like to thank once again our expert panelists today and also our attendees for joining us for the webinar. We very much appreciate everyone's time and I do invite the attendees to check Solution Center website. If you would like to view the slides in their PDF version and also listen to our recording of today's presentation which will be posted in about within a week of today's broadcast. Additionally you can find information on upcoming webinars and other training events.

And just a reminder we are now publishing webinar recordings The Clean Energy Solution in our YouTube channel. Again please wait about one week for those to be posted. We invite you to inform your colleagues and those on your network and organizations to stop in Solution Network Resources and Service including the No Cost Housing Support. And so with that I hope everyone have a great rest of the day. See you again in future Clean Energy Center Event and this concludes our webinar.