

## REN21 Renewables 2014 Global Status Report: Africa

Transcript of a webinar offered by the Clean Energy Solutions Center on 23 June 2014:  
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### Webinar Panelists

**Laura Williamson**      Communication and Outreach Manager, REN21  
**Ansgar Kiene**            Senior Programme Manager, Greenpeace  
**Kevin Nassiep**          CEO, South African National Energy Research Institute

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**Sean**                            Hello everyone. I'm Sean Esterly with the National Renewable Energy Laboratory. Welcome to today's webinar, which is being hosted by the Clean Energy Solutions Center, in partnership with the Renewable Energy Policy Network of the 21st Century, also known as REN 21. And today's webinar is focused on the launch of Ren 21's flagship report, Renewables 2014 Global Status Report, with a special focus on 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 Center's resource library as one of many best practices resources reviewed and selected by technical experts. And I just want to go over some of the webinar features that you have for today. For audio, you do have two options. You may either listen to your computer or call in by telephone. And if you choose to listen to your computer, please select the mike and speakers option in the audio pane. Doing so will eliminate the possibility of feedback. And if you choose to dial in by phone, please select the telephone option, and then a box on the right side will display the telephone number and also the audio PIN that you should use to dial in. And panelists, we ask that you please mute your audio device when you

are not presenting. And if anyone's having technical difficulties with the webinar, you can contact the go-to webinar's help desk number.

That number is displayed at the bottom of the slide, and it is 888-259-3826. And we encourage people from the audience to submit questions at any point, as you have done. And so to do that, simply go to the questions pane in the go-to webinar and type it in and submit it there. And also, if you're having difficulty viewing the materials at the webinar portal, you'll find pdf copies of the presentations at [CleanEnergySolutions.org/training](http://CleanEnergySolutions.org/training), and you may follow along as the speakers present. And we'll also be posting an audio recording of the presentations in the webinar to that site within about a week of today's broadcast. In addition, we are now adding webinars to the Solution Center's YouTube channel, where you'll find other informative webinars, as well as video interviews with us and thought leaders on clean energy policy topics.

Now today's webinar agenda is centered around the presentations from our guest panelists, Laura Williamson, Ansgar Keine and Kevin Nassiep. And these distinguished panelists have been kind enough to join us to discuss the launch of REN 21's flagship report, Renewables 2014 Global Status Report. In this 90-minute webinar, we'll look in detail at Africa, and we will find out what renewable changes happened in Africa over the course of 2013. We'll learn which technologies are contributing to increased power capacity, and hear how changes in policies have affected African investment levels and market development. And before the 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 question and answer session where the panelists will address questions submitted by the audience, and then some closing remarks and a brief survey.

Our slide provides a bit of background in terms of how the Solutions Center came to be formed. The Solutions Center is one of thirteen initiatives under the Clean Energy Ministerial that was launched in April of 2011 and is primarily led by Australia, the U.S. and other CEM partners. And some of the unique outcomes of this initiative include support of developing countries and emerging economies through enhancement of resources on policies related to energy access, renewal cost expert policy assistance, and peer to peer learning and training tools such as the webinar you're attending today.

There are four primary goals for the Solutions Center. The first goal is to serve as a clearinghouse of clean energy policy resources; the second is to share policy best practices aid and analysis tools specific to clean energy policies and programs; and third, the Solutions Center delivers 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. Now our primary audience are energy policy makers and analysts from governments and technical

organizations throughout the world. But then we also strive to engage with the private sector, engineers and civil society.

And one of the more key features that the Solutions Center provides is its no-cost expert policy assistance, which is known as Ask an Expert. And the Ask and Expert program has established a broad team of over thirty 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 building, we're very pleased to have Cesar Travino, leader of the Mexico Green Building Council, serving as one of our experts. So if you have a need for policy assistance in buildings, renewable energy, energy efficiency, or any other clean energy sector, we do encourage you to use this valuable service. Again, it is provided to you free of charge.

And to request assistance, simply go to [CleanEnergySolutions.org/expert](http://CleanEnergySolutions.org/expert) and you can register through the Ask an Expert form there. We also invite you to spread the word about this service to those in your networks and organizations. And so, in summary, we encourage you to explore and take advantage of the Solutions Center resources and services, which include the expert policy Ask and Expert service, the database of clean energy policy resources, subscribe to the newsletter to learn about new developments, new training opportunities, and then participate in webinars like this one.

And so now I would like to provide introductions for today's distinguished panelists. The first speaker that we'll be hearing from is Laura Williamson, and Laura is the Communications Outreach Manager of REN 21. And she will be discussing key findings from the REN 21 Renewables 2014 Global Status Report. Then following Laura we will hear from Ansgar Keine, a Senior Program Manager at Greenpeace, where he's heading the Greenpeace Sustainable Energy for All, also known as the SE4ALL program. And then our final presenter today is Kevin Nassiep, the CEO of the South African National Energy Research Institute. So now, with those introductions, I would like to welcome Laura to the webinar.

**Laura**

Hello, thank you very much. As Sean mentioned, my name is Laura Williamson and I'm with REN 21. And what I'm going to do today is give you a brief overview of the current status of renewables in the world today, with a few specific examples about Africa, which will then be further complemented by Ansgar and Kevin. But before we begin, who is REN 21? REN 21 is a multi-state culture network that cuts across five key stakeholder groups: trade associations, non-profits, governments, inter-governmental organizations and research institutes. And from these five stakeholder groups we have about five hundred experts on renewable energy that come together to help REN 21 produce this annual global status report.

So where do we stand ten years on since Bonn 2004? As some of you may remember, Bonn 2004 was the first international renewable energy

conference that focused purely on renewables. Ten years on now, we can definitely say that the renewable power capacity has increased seven fold around the world, that's excluding hydro power. Most technology costs have decreased significantly, and supporting policies continue to spread throughout the world.

Numerous scenarios that projected levels of renewable energy growth for 2020 were actually surpassed by 2010, and we've also seen some of the positive knock-on effects, the additionality that renewable energies can bring to a country through the use of improved energy security, the mitigation of greenhouse gases, and also direct environmental and social benefits, notably job creation. So I think it's fairly safe to say that renewables are here, they're a viable option, and now the challenge we lead is how can we best increase the current pace of renewable energy uptake to accelerate and achieve one hundred percent renewables.

So where do we stand today? We can see that the renewable energy share in the world, the final energy consumption, has remained relatively level with our 2011 levels. This is in part because despite market growth in modern renewables, it's been tempered by the slow migration away from traditional biomass, and from the continued rise in total global energy demand. Keeping in mind that we're talking about the Sustainable Energy for All initiative that was launched by Ban Ki-moon in New York at the Sustainable Energy for All, the objective of this initiative, which is applied globally, is to double the share of renewable energy by 2030 from 2010 levels, which means increasing from 18 percent to 36 percent. However, in order to reach this, increased efforts in renewable energy deployment are needed, as well as more action in the field of energy efficiency to curb demand. And if we really look at the breakdown of the renewable energy sources, we see that we actually need a tripling of clean renewable energy if we're to move away from the unsustainable use of biomass.

If we look at renewable energy by country, we can see then absolute figures, China, U.S., Japan, are still leading in the field. However, if we put it investment relative to GDP, we see a completely different picture. That's the second line on your screen. And here we're starting to see the emergence of developing countries, which is a very clear indicator that there is a rapid advancement of renewable energy in developing countries.

If we look at total capacity by technology, we see a slightly different picture, with the breakdown ranging across the globe. When it comes to total renewable capacity installed per capita, the E.U. is leading, the European Union is leading. Forty-two percent of global non-hydro renewable capacity is in Europe, compared to less than 17 percent of global electricity demand. These high renewable shares also explain the need for increased attention on the integration of variable renewables in the energy system.

Looking at the various energy sectors, if we look at the power sector we can see that this is where the most significant growth has occurred. Global renewable power capacity exceeds 1,560 gigawatts, and there's been an increase of more than 8 percent over 2012. In 2013, renewables accounted for more than 50 percent of net additions to global power capacity, and represented far higher shares of capacity added in several countries. We're seeing that variable renewables achieved high levels of penetration in several countries. By way of example, in 2013 wind power met 53.2 percent and 20.9 percent of electricity demand in Denmark and Spain respectively. We saw solar in Italy, solar PV met 7.8 percent of its total annual electricity demand. And a striking figure is that in 2013, China's new renewable power capacity surpassed new fossil fuel and nuclear capacity for the first time.

Heating and cooling was up by about 10 percent. Heat from modern biomass, solar and geothermal sources accounts for a small but gradually rising share of the final global heat demand. The use of modern renewable technologies for heating and cooling is still limited, however, relative to their vast potential. There are some encouraging best practices. We see in Denmark, for example, has now banned the use of fossil fuel fired boilers in new buildings. That was starting in 2013. And they aim now for renewables to provide almost 40 percent of the total heat supply by 2020. An African example I was seeing that in South Africa, renewables met 6 percent of the final energy demand for heat.

In transport, we see that liquid biofuels met around, just over 2, 2 percent of total transport fuel demand. There is a growing interest in other renewable options in the transport sector. And what we're also seeing is limited but increasing initiatives to link electric transport systems with renewable energy, particularly at the city and regional levels. This also is, in part, perhaps one way of resolving potential conflict around land use for fuel versus food issues.

If we give a quick look by technology, we can see that about 40 gigawatts of new hydro power capacity was commissioned in 2013, increasing the total global capacity around 4 percent to approximately 1,000 gigawatts. We've got modernization of aging hydro power facilities in a growing global market, and we're starting to see a trend in some countries toward smaller reservoir and multi-turbine run of river projects. What is good to see is that increasing recognition of the potential of hydro power to complement other renewable technologies, such as variable wind and solar power. Support for future hydro power development in Africa is growing with many potential sites, and we're seeing trans-border interconnections for hydro power being launched between Ethiopia and Kenya.

If we look at solar PV, this was a record year for solar PV in 2013, adding just under 4 gigawatts, coming up to a total of approximately 139 gigawatts. And what's remarkable about this, aside from the number, is that for the first time ever, more PV capacity was added than wind

capacity. China saw spectacular growth, accounting for nearly one-third of global capacity, and they were followed by Japan and the U.S. Solar PV is starting to play a substantial role in electricity generation in some countries, particularly in Europe, and with lower prices we're seeing an opening of new markets in Africa and the Middle East, as well as in some parts of Asia and Latin America.

As I mentioned, the lower prices are opening new markets in Africa, and one of the continent's largest markets to date is South Africa, and this is something that Kevin will talk in more detail about in his presentation. And this has been one of the pieces procured under a government bidding process and connected the first plant of about 75 megawatts to the grid in 2013. Ethiopia has its first large manufacturing facility, and has begun to supply the domestic market. So it's expected to see big increases in the subcontinent over the next coming years.

Looking now at wind power, more than 35 gigawatts of wind power capacity was added in 2013, for a total above 380 gigawatts. Despite this growth, the market was down nearly 10 gigawatts compared to 2012, reflecting primarily a steep drop in the U.S. market. Offshore wind had a record year, with 1.6 gigawatts added. Almost all of this, however, was located in the European Union. China saw wind generating 140 billion kilowatt hours in 2013, which was up 40 percent over 2012 levels and has exceeded nuclear generation for the second year running. Wind power, with regard to an African context, wind power has a foothold in Africa. However, there is a shortage of skilled personnel to support rapid growth.

Looking now at bio energy, sorry, not bio energy, concentrating solar power, we see that global CSP was up nearly just under one gigawatt, 36 percent in 2013. While the U.S. and Spain remain the market leaders, markets continued to shift to developing countries with high levels of installation. So we're starting to see beyond the leading markets, we're getting a tripling of capacity with projects coming on line in the United Arab Emirates, in India and in China. There's an increasing range of hybrid CSP applications. Thermal energy storage has also continued to gain in importance.

The industry operations have expanded into new markets, and global growth in the sector remains strong, but we're seeing that revised growth projections and competition from solar PV has led to a number of companies actually closing their CSP operations. But we are still seeing a trend toward larger plants to basically take advantage of economies of scale while improving the design and manufacturing techniques help to reduce costs. The CSP market did expand significantly across Africa and the Middle East and the UAE, the United Arab Emirates, we saw the 100 megawatt Shams 1 plant. There was investment of over \$600 million U.S. dollars to support markets in Algeria, Egypt, Jordan, Libya, Morocco and Tunisia to help bring more than 1 gigawatt of CSP to the regional market. And we're seeing construction occurring, mostly in North Africa,

construction underway in Morocco and Egypt, with planned construction in Saudi Arabia and Kuwait.

If we look now at bio energy, we see that demand continues to grow in this sector, in both heat, power and transport sectors. The total primary consumption of biomass reached approximately 57 exajoules in 2013, of which almost 60 percent was traditional biomass and the rest was what we call modern bio energy, solid gasses and liquid fuels. Heating was what accounted for the majority of biomass use. Global bio power capacity was up by an estimated 5 gigawatts to 88 gigawatts, and we're starting to see, not starting, but Europe is continuing to be the world's largest consumer of modern bio heat. It's also the largest consumer of wooden pallets, burning over 15 million tons in 2013.

Geothermal, sort of, there's steady additions, 530 megawatts of new geothermal generating capacity came on line in 2013, accounting for, for replacements, the net increase was about 455 megawatts, bringing the total global capacity to 12 gigawatts. And this net capacity growth of 4 percent compares to an average growth rate of about 3 percent for the two previous years.

Solar heating and thermal are of particular interest in the Africa region. Solar, water and air collector capacity exceeded over 280 gigawatts in 2012, and reached an estimated 330 gigawatts by the end of 2013. As in the past years, China was the main demand driver, accounting for more than 80 percent of the global market. Demand in key European markets continued to slow, but markets expanded in other countries, such as Brazil, which saw thermal heating is cost competitive. The trend toward deploying large domestic systems continued, as did growing interest in the use of thermal technologies for district heating, cooling and industrial applications.

If we look now at the contribution of renewables to the employment sector, we can see the growth continued. Job creation, thankfully, has come to the forefront of the policy-making debate. Globally, now, we have an estimated 6.5 million people working directly or indirectly in the renewable energy sector, which is up a million from the previous year. The bulk number of employment still remains concentrated in a few countries, namely China, Brazil, the U.S., India and Bangladesh and some E.U. countries, but it is expanding in other parts of the world. China still remains the largest employer in the sector, with 60 percent of employment concentrated in the solar PV sector. And here we're starting to see a shift towards jobs in the installation segment of the value chain. By way of another example, in South Korea there was a million new green jobs created by promoting some major green technologies in that area.

Looking at global investment in renewable energy, we saw that investment was down for the second consecutive year. This was in part due to uncertainty over incentive policies in Europe and the U.S., as well as to

retroactive reductions in support in some countries. But also, it was due to the reductions in technology costs, as we'll see in the next slide. However, despite this decline, net investment in new renewable power capacity outpaced fossil fuels for the fourth year running.

So we're looking, if you look specifically at the PV sector, we can see that even though global investment in solar PV declined nearly 22 percent relative to 2012, new capacity installations increased by more than 32 percent. These steep cost reductions throughout the last years, as we've seen in wind and PV, make renewables attractive for new markets in developing countries where there is a strong need for new electricity generation capacities, and where electricity demand is increasing.

The slide here shows investment by region. Despite, as I mentioned before, the downward trend, there were significant exceptions at the country level. So, for example, Europe's renewable energy investment was down 44 percent from 2012. There was a decline in China's investment. However, for the first time, as I mentioned at the start of my presentation, China invested more in renewable energy than did all of Europe combined, and it invested more in renewable power capacity than in fossil fuels. 2013 brought a clear shift in investment, moving east to Asia and Oceania, excluding India and China, as well as to the Americas, excluding the U.S. and Brazil. The most notable area was Japan, where investment in renewable energy, excluding R&D, research and development, increased 80 percent relative to 2012 levels. South Africa, please look at Africa, South Africa was the eighth largest investor in renewables, with just under \$5 billion U.S. dollars, excluding research and development. Kenya was the second largest investor, followed by Mauritius and Burkina Faso.

We turn now to the renewable energy policy landscape. We've seen lots of positive developments across the globe with regards to targets and support policies. So by early 2014, at least 144 countries had renewable energy targets, and 138 countries had renewable energy support policies in place. Developing and emerging economies have led the expansion in recent years, and now account for 95 of the countries with support policies in place, which is up from 15 in 2005. As in past years, most renewable energy policies enacted or revised during 2013 focus on the power sector, so we have things such as feed in tariffs, renewable portfolio standards, are the most popular instruments. Public competitive bidding or tendering is growing, with a number of countries turning to public auctions.

There was an increase from about 9 in 2009 to 55 as of early 2014. Targets and policies supporting renewable energy heating and cooling are also steadily increasing. In fact 19 countries had heat obligations or mandates in place. With regards to transport, we see 63 countries have implemented policies to promote the production or consumption of biofuels for transport. Particularly if we're looking at sort of what happened in the African continent in 2013, we've got some interesting developments.



ECOWAS has put in place, ECOWAS being a West African region, has put in place some transmissional targets.

We see the revision and expansion of feed in tariffs in South Africa and Uganda, while Ghana established rates for a feed in tariffs scheme which was adopted in 2011. Egypt launched a tender for the first solar PV plant, and South Africa set dates for the third round of its concentrating solar power tenders. Zimbabwe raised a mandate from E-5 to E-10, and South Africa set a date to implement E-2 and B-5 mandates for biofuels. And we also saw that South Africa adopted incentives to promote a domestic electric vehicle industry.

If we look now quickly at distributed renewable energy, we're seeing that energy access and the use of distributed renewable energy technologies increased. On all developing continents except Africa, the growth in population electrified is bigger than the growth in total population. In Africa, however, the population growth rate exceeded their rate of electrification, and there is still only about 43 percent of the population that is electrified.

New business models, new finance models for rural energy markets are emerging as the potential of the renewable energy market is being recognized. Also, thanks to technical advances, we're enabling the integration of mini-grids and ICT application for power management and use of services. Africa is currently still home to half of the world's population without access to electricity. But there are a lot of initiatives taking place, and both Ansgar and Kevin will talk more in detail about those.

By way of some examples of what's happening in the region, in 2013 the Africa Clean Cooking Energy Solutions Initiative was established to promote enterprise-based large scale dissemination and adoption of clean cooking solutions in Sub-Saharan Africa, and currently there are about 130 stakeholders from 26 African countries participating in that initiative. South Africa is among the leading countries for large scale off-grid renewable energy programs to promote energy access and sustainability. And we now have electrification targets in Botswana, Ethiopia, Ghana, Mali, Rwanda, South Africa, Tanzania and Zimbabwe.

So here was stand after that whirlwind tour of the current status of renewables in the world today. I think it's fairly safe to say that global perceptions have shifted considerably with regard to renewables. As you can see on the cover of the New Yorker here, where you sort of have the blend of everyday life alongside renewables. And although you know the figures, so today renewables have sort of arrived as the mainstream and are the preferred energy option for many of the general public throughout the world. I think that, sort of by way of conclusion and to lead into the other presenters, is that the barriers now are really not technological or financial, but really are more political. And if we're serious about

facilitating an energy transition with renewables, there really needs to be much more closer collaboration between all actors from the public and private sectors if this is going to be a reality.

So with that, I will close. If you are interested in getting more information about the Global Status Report, please consult our website. It's the first website listed, [Renewables2014GlobalStatusReport](#). There you will find the report available in an on-line reader format, easy reading format, or in a downloadable pdf. So I encourage you to consult it and to please come back to us at the Secretariat if you have any questions, additions, or are interested in participating in our data collection process. Thank you very much.

**Ansgar**

Yes. Welcome, everyone, and thanks, Laura, for this informative top line overview. I'm always looking forward for the Global Status Report to give us a reality check, because often the reality is outpacing the predictions and with this report, everyone knows where we are in terms of renewables. And let me stick for my presentation with a bird's eye view, now shifting to the African continent. And I'd like Heather to continue with the next slide, please.

So why are we focusing so much attention on renewables, especially when it comes to our African continent? Well, with this illustration, I'd like to highlight the opportunity to turn a devastating situation when it comes to electrification rate on the African continent, you just heard from Laura, something like 500+ million citizens on the African continent still without access to electricity, how we can turn that into an opportunity. And the case I'm trying to make here is that we should look in the past at the analogy with the telecom sector, that the majority of people on the African continent were deprived of any modern communication technology by means of telephone, because it was far too difficult, too expensive, and not perceived as a business case to lay out a network of landlines across often vast sizes of countries, not mentioning cross border.

So what happened is that with the technology revolution, by means of mobile communication being developed, aided by supportive legislation to allow private companies to enter the communication, telecommunication market, these people who were deprived of communication were now offered a reliable service, which, surprisingly to many of the community, were willing and able to pay for those reliable services. And I see a lot of analogies to the current energy situation, that the business as usual has not been able to serve the demands, the energy demands of the African population.

But now, where are we? We've heard that the renewable energy technology has matured, that what is needed now is a supportive leader framework to enable independent producers to provide the people with the energy services that are currently lacking. And again, last analogy to the telecoms, we are pretty sure that the people are willing and able to pay for

reliable energy services, as long as there is someone coming to provide them with them. And we say the opportunity is there to provide them with renewable, sustainable energy right from scratch. And that's an opportunity that we are missing. Next, please?

So again, looking at the broader picture of the development debate, we gladly recognize that the international community is appreciating the huge impact of access to energy on every idea of our daily life. And it has been highlighted that the water, food and energy matrix is something that needs to be considered when you're talking about the whole issue of sustainable development. So you can see it in that graph clearly that people who are concerned about energy also rate water and development sustainability and food quite high.

And Laura mentioned it already, the U.N. Sustainable Energy for All initiative is pursuing access to sustainable energy for all by 2030, and we're seeing now that the drafting of the sustainable development goals, which will be the successor of the Millennium Development goals, are likely to adapt a goal on energy which is close to the goals of the Sustainable Energy for All initiative. And we can argue that the letting goal of access to energy was a reason for not achieving many of the Millennium Development goals. However, if we now have a separate energy goal in the sustainable energy debate, it might not be the ideal scenario as well. It might be something that works out is if in every development aspect we are looking, where is the link to energy? And by reflecting the access to energy in health and education sustainable development goals we might be able to sustain them. So next, please?

Again, why are we so concerned about access to energy on the African continent? A recent poll by the African Development Bank among the business community clearly highlights that the lack of access to reliable electricity is the number one obstacle to the private sector in setting up businesses on the African continent. And if we see that and we know the importance of the private sector in providing jobs, especially for the growing youth population, then we know that lack of access to energy can be seen as a time bomb. Because young people need to communicate, young people need to see a business perspective, need to see a perspective for their life, and if private sector is not providing those opportunities because they fear that without sustainable provision of electricity that business will not run, then I think countries will have to wake up to provide that electricity.

With the next slide, we are again seeing why providing access to electricity and access to renewable energy is so crucial, and why the focus on the African continent. If we look at the world map, that clearly indicates that our focus needs to go towards the African continent, and despite improvements in several countries, which have been working on the energy access issue, the electrification rates are still appallingly low. And that is mainly due to we are still business as usual system that is in

place in many thinking of the political elite in the economic and political decision makers, that centralized production and consumption pattern and distribution pattern of electricity is still the model to go with. But if we reflect the last fifty years, that business as usual has not provided the envisioned results in terms of energy access, so why should they work in the future? So a rethinking of the business as usual is necessary, as well, in regards to the next slide, which shows the correlation of energy access and the human development index.

So again, an indication why focusing on energy provision is so crucial to long term sustainable development. Because if you overlap those two graphs from the African continent, it clearly shows that countries with a higher electrification rate, rate higher in the human development index. So it's a clear correlation of those two, and yeah, decision makers have to be aware of the fact that if they are drafting long term visions and plans, development plans for their country, and energy access is not a cornerstone of that concept, then it is most likely to fail in the long run. So these graphics clearly illustrate that.

If you look at the next graph, we illustrate the correlation to the climate change. Again, we see an opportunity that the producers of CO2 emissions based on energy consumption are seen in the north, and the African continent, due to its low level of energy consumption per capita, contributed very, very little to the issue of climate change, which now could result in positively advocacy work for climate finance to finance energy access on the African continent.

And with the next slide, we'll see that, as I mentioned before, some countries have made strides in providing access to energy. However, one might question who governments often have in mind when targeting to provide energy access. For example, in South Africa, 60 percent of electricity is consumed by mining and industry. That, again, fosters the business as usual, where you have centralized production and ideally, in the utility thinking, ideally only a handful of big consumers, namely mining and industry, which you have lucrative contracts with.

And the general population is missing out. So this picture can be attributed to many countries in the global south, which is the civil society asking itself, energy for whom, for what? And so we have to be a bit careful when we look into electricity production figures and energy access, into really who is benefitting from it. And especially when you look at large scale production, from hydro for example, who is benefitting at the end from the electricity produced? So there is continued effort and necessary to remind the utilities and the political decision makers in an equal opportunity approach.

And with that, I'd like to come to a quick snapshot with the next slide, which we've heard already some from Laura, and just summarizing that it is promising to see that the variety of technologies, renewable energy

technologies, are being utilized in more and more African countries, which is exactly the nature of renewable energy sources, that they occur in different regions.

And that is, as well, aiding energy independence. If a country is harnessing its indigenous renewable energy sources and ideally adding it to a mix of them, then your economy and your society will be more stable against fluctuation, for example, of oil prices if you only concentrate on that one energy source. So we've already heard that CSP, mainly utilized in Northern Africa, with Morocco trying to portray itself really as the champion for renewables on the African continent, followed now by South Africa, which has a perfect concentrate solar power regime. We see more countries moving into the wind arena, which is, as well, a very positive development, with Ethiopia now diversifying away from purely focusing on hydro to be now the leader in wind installation on the African continent.

But what makes all of those technological developments happen? It is, of course, supportive legislation, policies. We've heard two of them, which work quite well in a number of countries, which are renewable energy feed in tariffs and the auctioning system, or tendering, which is now being applied by South Africa. Because at the end, what is needed is long term financing. And there we see, as well, interesting models being developed in different countries, crowd funding or pay as you go schemes, again an analogy to the mobile sector being used to now finance renewable energy appliances.

We heard about targets, because everything starts with a target. If you do not have a defined target in your country or in your region, you do not know where you're aiming to and you do not know what kind of supportive policies you need to achieve those targets. So that's a good process that many countries have learned how to draft realistic targets and how to include them into the long term vision of their country development plans.

Yes, China being a major player on the African continent, mainly on hydro power, but moving as well into other technologies, as well. Which comes, not only with a technology, but with a huge support by the Chinese central banks, and so they have an advantage above other private project developers. We heard about, last but not least, about how geothermal now being responsible for one-fifth of electricity generation in Kenya, which is fantastic to see, because they've been sitting in the Rift Valley on those huge untapped renewable resources forever, and now are waking up to utilize them. And their development, ideally, is going to spread across the whole Rift Valley in Eastern Africa.

So in concluding, with the final slide, just mentioning again that the technology is matured, it is reliable and it is cost competitive, so I would advocate for is not to ask for another pilot, because we know that the

technology works. What we now need is scale, and to bring it to scale we need supportive policy. And what often is hindering indigenous domestic investment in renewable energies is the obstructing high interest rates of the national financial sector.

You can access low interest rate loans in an international arena much more easily than a social entrepreneur in an African country goes to his commercial bank and asks for a loan, especially recognizing the long payback periods that is the nature of the majority of renewable energy technologies. You have relatively high upfront costs, but zero to very low operational costs. And that concept, to grasp, is still difficult for many financial institutions, and they are often comparing apples with pears and not seeing that the high upfront costs of purchasing, in terms of solar PV, are purchasing the electricity produced for the next thirty years, that you do not get a monthly bill. That concept needs a lot of awareness raising and focusing with the financial institutions as well.

And in closing, with an urgency to not let loose of our constant pressure on the political decision makers because if we think we are on the safe side with a huge investment, for example, in South Africa and in Kenya, once fossil fuels are discovered, unfortunately often the attention of the decision makers often turns, and towards more short term gains against long term sustainable development, and we always have to be in caution of that. But closing, yes, 2013 was a successful year for renewables on the continent, and I'm very sure that this trend will continue in 2014. Thank you very much.

**Sean**

Alright, thank you. Go ahead, sorry.

**Kevin**

No, no, that's fine, Sean, I'll wait for you.

**Sean**

Oh no, I was just going to turn it over to you.

**Kevin**

Alright, Sean, thank you so much. And good morning, if you're in the U.S., good afternoon if you're also like us in Africa. My presentation actually follows on I think two very interesting presentations from Laura and Ansgar in the sense that you seemed periodically in your presentations reference to the strides that have made in renewable energy in Africa, and I think my presentation is really a complementary one in that it focuses really on the South African market. And I'd like to take you to some of the reasons why the industry has grown so rapidly in the past few years, and in fact, if I look at Laura's slides, one of the slides, she actually references that last year, in fact, South Africa was the fourth largest contributor in terms of share of GDP towards renewable energy. So it's a tremendous stride forward. And I want to just take you through some of the rationale behind that.

First of all, South Africa as a country, mirroring to some degree a lot of developing countries, has a dependency on fossil fuels, in particular coal.

We have committed in the past, of course, towards reducing our consumption on fossil fuels, but bear in mind that the whole sector is instrumental in creating jobs, and at the same time drives an economy which, up until now, has been very energy intensive. So it's not that easy to diversify, even though the intention and the goals are there. The solution itself, as you know, there is no single bullet, there is no silver bullet that's going to resolve this particular issue completely. But we do know that renewable energy has a proven track record and we do know that the resources are, in fact, abundant, particularly in the South African context. So from our perspective, we thought that it was very important that we look toward renewable energy, both in the short term and long term, as a solution toward the need to diversify our energy mix.

I mention to you that from a renewable energy perspective, jobs are very important. Along the way, we also look at increasing energy equity, insuring that transformation occurs at various levels throughout the infrastructure that supports the renewable energy industry. We also note that with climate change, of course, we know that South Africa is one of the single largest emitters. We have the single largest emitter of CO<sub>2</sub> on the planet inside of South Africa.

So we know that we have a role to play having to mitigate against the increasing effects of climate change. The energy diversification issue, of course, comes about because we have an imbalance of reserves at the moment. Certainly, there is enough coal to last us conceivably the next two hundred years or so, depending on the quality and pricing. But at the same time, we know that there's also a potential emerging shale gas market, which is also set to develop very shortly. So in context, South Africa wants to reduce its emissions, and thereby decides that perhaps the best means of doing that is to go down the road of renewable energy first and foremost.

Of course, there are other needs that need to be taken care of from an energy security supply perspective. And in that context, we are also looking at additional [inaudible] supply, in particularly coal, as well as possibly nuclear. But as I said earlier, renewable energy remains the primary focus, and you'll see to what degree South Africa has been pushing this for some time. In fact, if we can go back to 1997, we ratified the United Nations Framework Convention on Climate Change. Certainly from our point of view, we thought that we would be contributing in one other way. The same time that we were eligible for GEF funding, we felt that we would be able to contribute toward a wide variety of options that talked to climate change mitigation.

We then produced our White Paper on Energy in 1998, and did not set renewable energy targets. And I think even when you add the World Summit on Sustainable Development in South African in about August of 2002, there was immense pressure, I think, on all countries to try and boost a renewable energy target globally. Unfortunately, we weren't

successful in that regard, but it did open the door for countries like South Africa to start playing a more proactive role on their own.

And so after we ratified the Kyoto Protocol, we set about establishing a white paper and producing one that talks to a defined policy, together with a target. And that target of 10,000 gigawatt hours was set to be realized by 2013, and it should comprise mainly biomass, wind, solar and small scale hydro. Now really, in Laura's presentation I think we also touched on the fact that about 6 percent of renewable energies in South Africa goes towards heating, and in fact the contribution towards heating is about 6 percent. That actually comes from mainly traditional biomass, so traditional biomass in South Africa still plays a very large role in providing for the end users' energy needs. But we needed to fast track the development of wind and solar, and also small scale hydro, to grow to about 4 percent of the predicted electricity demand by 2013.

So that's the goal that we set ourselves, and if one has to reflect on that goal, no, we did not reach the goal, and there are very good reasons why not. But what we did discover along the way, and we mentioned this, in fact, in the white paper, is that the appropriate financing mechanisms and incentives have to be put in place to allow for the reduction, first of all, in disincentives or subsidies that existed at the time to support fossil fuels, and we need to obviously congregate and aggregate a lot of the type of incentives that we felt could contribute toward growing the renewable energy sector.

So then we set about to try and actually put in place various measure, starting with the Electricity Regulation Act, to assist in being able to access the grid, following that up with the Industrial Policy Action Plan to make allowances for the manufacturing of components for renewable energy. So this, in itself, gives you a sense of where South Africa was heading to as early as the early 2000's. Then we brought in a program to help define what it is that we thought we could do on the wind technology side, and worked together with governments such as Denmark to develop the South African wind energy program, ultimately culminating in the commissioning of the Darling National Demonstration Wind Farm in 2008. And also along the way, in terms of establishing the revised [inaudible] of South Africa, which is currently in its second phase. And we'll talk about that in a while.

Also, in about 2008 South Africa, just to really direct its support to reducing its impact on climate change, developed what we call long term mitigation scenarios, which was approved by our cabinet. And what it proposed was a peak, plateau and decline projectory for the country. Ultimately, we were hoping that our emissions would peak between 2020 and 2035, flatten off for a while, and then declining in absolute terms from about 2035 onwards. And that pretty much has been the philosophy that has been adopted by government. We now have what we call the national



climate change response strategy, and the philosophy is carried forward into that response strategy.

Then, in 2008 the cabinet also introduced the National Energy Act, which was approved by our parliament, promulgated by the president, and under that act it established the NEDI, which is the National Energy Development Institute, with a very specific mandate to introduce low carbon technologies into the marketplace. At about the same time, our regulator introduced the first of its feed in tariffs, REFIT, as the program was known then.

The program was then replaced by the auction process, which most of you will be familiar with, and it's, to some degree, the jury's still out as to whether we should have abandoned the REFIT program. My personal belief is that the feed in tariff's been far higher than the auction prices that were realized, created an opportunity in the marketplace to create more opportunities for local content and to further support job creation in the sector. So I think there's potentially a very good study that could be done to determine which of the two measures would have been more effective in that regard.

A very important policy planning tool is the Integrated Resource Plan. And that really fits the guide in terms of what it is that South Africa will do when it comes to increasing its capacity in the electricity sector. Certainly, the new bolt programming is coming, it's mainly at introducing new qualified generation, but the renewable energy IPP program, which is the one which manages the auction process, that, of course, has its origins inside of the Integrated Resource Plan.

And for South Africa, we put forth very ambitious targets. If one looks at the goal for renewable energy, we anticipated that by about 2050, and we would start in the period from 2010 to 2013, that we would construct of the new bolt, about 42 percent of that new bolt would have to come from renewable energy, made up mainly of wind, PV, as well as CSP. So after the introduction of the feed in tariff, there were some legal issues that were brought to our attention, mainly in the context of the role that the energy regulator plays, and it was on that basis that government introduced the auction process, the competitive bidding process, in which the evaluation criteria would look largely at price, about 70 percent being the determination, and then 30 percent being in regards to socioeconomic development, in particular looking at local content.

Along the way, our Department of Trade and Industry, to [inaudible] the Department of Energy, also felt the need to create a facilitating mechanism that will allow us to develop a critical mass of renewable energies. And so we established the South African Renewable Energy Initiative, or SARI. So this initiative is now supported by other governments, in particular Germany, where there's a lot of interest expressed in helping to create a better financing and facilitory mechanism in the context of renewable

energy. So that really creates a further platform, if you like, for the introduction of renewable energy.

Earlier, I also mentioned to you that the wind atlas was derived from the South African wind energy program. In fact, in 2012 we then launched the revised Verified Numerical Wind Atlas for South Africa. In addition to that, our Department of Environmental Affairs, also working together with our Presidency, has been looking at a green energy, or SEA initiative for wind, and the whole idea is to work with various local governments in the determination of what we call renewable energy development zones to determine and to construct very specialized areas where we can actually go out and develop small industries around renewable energy. And that's relatively new, and it will be approved by our cabinet during the course of this year.

Also, we've seen in this context that the renewable energy industry associations have also started to take shape, and we now have SAWEA representing the wind industry, SASTELA represents the CSP industry, SAPVIA the PV industry and then SABA representing the biofuels industry. So the private sector has really been able to formalize its structure very well, and they are now in a position to make a meaningful contribution to this industry.

Now just to touch very briefly on resources, I don't need to repeat what Ansgar said, but certainly we do know that South Africa is one of the best solar regimes in the world, particularly in the northern parts of the country, and in fact this is where most of the CSP plants are being built at present. But, and this is what the wind atlas is showing us, we also have an excellent wind energy resource, and that's just been confirmed at many locations around our coastlines, scattered around the coastlines. And because it's so scattered geographically, it creates an opportunity to insure security of supply.

So you've got a very good solar resource in the north, and a very good wind resource around the coastal areas, and then also world class wave energy resource. This is predominantly in our winter months, but also along the south and west coasts. Very little in the way of tidal, and also very little in the way of large hydro potential. Biomass is limited because of water availability, but also because we are in the process now of looking more and more at waste utilization, and this applies also to biomass as well. So the whole concept of waste energy is now receiving more attention, and in fact we're expecting to see quite a few programs being introduced in this regard.

So from a technology perspective, we know that wind is very mature. There's not too much happening in the country at the moment in the way of further development of the technology. We've seen that most of the technologies right now that have been secured through the IPP program are in wind energy. Similarly for PV, where we're finding that maybe the

applications are now becoming more different and moving away from large but connected systems, and talking more and more about rooftop PV top applications in the commercial sector, as well as technologies for distribute generation, particularly in rural areas.

The CSP industry is the one that offers us, obviously, the most potential, mainly because of the storage application for trucks and receiver technology, but also at the same time because we find that we can hybridize the technology, particularly for power generation, as well as in certain industrial processes, particularly around things like aluminum smelting, etc. So concentrating solar power for us, very important technology. At the same time, we also think it's the most promising medium to long term technology because we can manufacture most of the components in South Africa. There's a lot of research that's been done in wave energy converters in South Africa, and we know that there is a market for it eventually, but the technology is not mature at this stage, and so certainly it's not being considered in our integrated resource plan.

The next couple of slides really just talk to the IPP program, just to share with you some of the successes of the program so far. We've essentially contracted almost 4,000 megawatts at present, so we've actually moved quite far ahead of our initial application of 3,725 megawatts in five rounds. We've just concluded our third round, in fact. So in terms of the ministerial determination, we have actually revised it in December, 2012. The Minister had to introduce a further 3,200 megawatts of renewables, solely because of the way in which the costs were coming down, as well as a number of promising projects have been brought to the table. So it's been a very successful case study so far.

So in our first bidding round, Bid Window 1, we entered into about 28 agreements, and in Bid Window 2 about 19 agreements, and then of course now, with respect to bidding round 3, where we have received 93 bids, we had to make a decision with respect to the available allocation which was left, and so even though we received bids exceeding 6,000 megawatts, we had to reduce that down to about 1,400 megawatts in total. So now we've selected about 17 preferred bidders, and that, as you can see on the slide, that's the makeup of that 1,473, well, 1,456, but mainly, as in the case of wind, with some PV and some CSP as well. So what's also very encouraging, coming out of bid round 3, is the dramatic reduction in price from the bidders.

And if you look at it, I apologize that it's in South African cents, but just to use the context in terms of U.S. dollars, it would be roughly about, say, 7 U.S. cents a kilowatt hour for wind, and you can see it's quite dramatically down from about 11, and then similarly for PV it's about just over 9 cents U.S. cents per kilowatt hour, and that's down from quite a high of about 27 U.S. cents per kilowatt hour in wind on round 1. So it's been a dramatic improvement from that perspective. Of course, as I said earlier, the jury's still out with respect to job creation opportunities.

So this just gives you a breakdown of the various contributors for the three bidding rounds. As you can see that we've commissioned, contracted about 1,456 megawatts, which for a country like South Africa, coming off a zero base in essentially 2012. This is a remarkable stride forward in a very short period of time. So we have about 2,800 megawatts that still have to be contracted, and so we are now moving into round 4, and then followed by round 5 before further determinations will be made.

Just to touch on biofuels very briefly, this is one area where there's a slight contention with respect to the nature of the crops that will be used for biofuels. South Africa has, as early as 2008, proposed its own biofuels strategy. We've now reached the point where regulations have been passed which looks at a 2 percent penetration, 400 million meters per annum, that has to be produced in context of bio ethanol and bio diesel, and that certain food crops can be used, in particular sugar cane, sugar beets, soybeans, canola and sunflower. In the case of bio ethanol, we believe that government is more pro grain sorghum, so we're expecting more projects to be introduced that use grain sorghum as feed stock for bio ethanol. In addition to that, we're also looking at reducing the levy that's applicable to these fuels, and reducing the bio fuel levy from about 40 to 50 percent, and looking at 100 percent reduction in the levy for bio ethanol.

So historically, and this is after 2008, we did introduce some of these exemptions, and they proved to be ineffective in actually stimulating the development of the sector. What's starting to work now in our favor is that this 2 percent penetration that is being passed to regulation is non-mandatory, so you're now seeing a mandatory blend that has to be introduced around the country. And unfortunately, it has to be done that way because of the nature of the industry, where our existing oil companies get paid more in South Africa for the fuel than they do if they went outside of South Africa.

So I'm not going to spend too much time on this, other than to say that the whole idea behind the pricing is to make sure, and this was done in 2011, was to finalize the subsidy principles and to make sure that we have drafted the regulations that I've just spoken to you about. The billing regulations that we introduced in August of 2012, looked at anything from B5, 5 percent bio diesel up to 100 percent bio diesel, and a 2 percent ethanol up to a 10 percent ethanol blend being acceptable in our fuel mix. And that's been promulgated, if you like, through the presenting on the 15th of January of this year.

So we are moving towards biofuels, albeit very slowly. The whole notion, and Ansgar mentioned it, of the energy, food and water mix is a critical determinant in deciding how fast to move ahead with the biofuel sector. And because food security plays such a critical role in this African context, it's certainly something that the government is taking very seriously. So there are some barriers to more rapid deployment, and even

though we, I just mentioned to you have fast we are moving, on the policy and incentive side more has to be done in terms of localization.

That's the theme that we keep on seeing, that applies to skills, it supports for R&D, it also means that we need to pilot and demonstrate new technology, particularly in the wave energy side and waste energy, where we think that there's still some research work that's possible and needs to be demonstrated. Raising awareness, getting customers to shift to cleaner energy in terms of their own choice that they have in their electricity supply, and also to make sure that norms and standards are introduced.

One of my last slides really just looks at the renewable energy outlook, and says that based on the success of the IPP program, we need to foresee more in the way of socioeconomic development and localization, but that the rapid growth of the market has created an underlying industry which is now starting to take shape. The implementation of the Renewable Energy Initiative, SARI, is creating more and more market certainty in the country, so that's a very good, thing, because now investors are more and more keen to invest in the country. There's also more work that's been done in terms of the practical renewable energy potential, and lots of ongoing resource assessments that are now contributing to a better understanding of the resource. And now with Ministerial determinations, we have more capacity being confirmed and also reducing intermittency issues of energy storage.

Just to look at grid availability, first we have a supply constraint environment at the moment, but we needed to make sure that we have not only a steady supply of electricity from renewable energy, but that also that we could have a grid that was capable of dealing with renewable energy that introduces the smart grid's work which we proceed with. Also, to consider the fact that in a water scarce country like South Africa, we had to push very hard for a more constrained use of water, and therefore dry cooling, particularly for CSP as a preferred option. And further work that's required, of course, would be to get more policy and regulatory frameworks for self-generation, to look at the willing buyer, willing seller model, and also to look at the net metering environment, particularly when you have rooftop PV and our customers begin to sell their power back into the grid. And of course, the last twenty years, we are learning by doing, and we encourage everyone to keep doing this, because really, the only way we could develop a lot of these issues is by getting stuck into the deep end into this equation.

The last thing I want to mention to you is the whole SAIREC of 2015, I think it was on Laura's last slide, as well. So South Africa is very fortunate to be selected as the host country for the IREC, International Renewable Energy Conference next year. It follows on the success of the first IREC, which was held in Bonn in 2004, and really created a global platform for the rapid deployment of renewable energy. Previous IRECs have been held around the world, particularly in China, the U.S., India and

Abu Dhabi. We are aiming to have a global event. It's mainly government orientated, but also a multi-stakeholder event. So it will be global in its scope, but at the same time, we are looking at addressing developmental challenges in Sub-Saharan Africa and other emerging economies. And then lastly, just to note that it will be held in Cape Town, so I can't think of a better venue, from the 4th to the 7th of October. So on that note, I'd like to thank you for your attention.

**Sean**

Thank you, Kevin, and also thank you Laura and Ansgar for the great presentations this morning. And I think at this point we will be moving on to the question and answer session, where we'll address any questions from the audience. And before we begin, I just want to remind the audience that if you do have any questions for the panelists, please feel free to submit those through the question pane in the go-to webinar window. And so now we'll move on to the first questions I received from the audience. And Laura, Ansgar and Kevin, if you'd like to answer the question, please just go ahead and jump right in. If we have two people talk at once then we'll figure it out from there.

And so the first question asks, "How to get real support to start moving the renewable energy sector in African countries? Is it by developing demonstration projects, or to get funds to start real projects, especially in rural areas?"

**Laura**

Hi, this is Laura from REN 21. I'll start, and maybe Ansgar can complement it. How to get things started. It's not one magic bullet. From our side, from the REN 21 side and the work that we've been doing, the policy, the policies that are put in place are really important. The policies that establish R&D incentives or protocols, they're there in place to indicate that there's a market available for those developments, for those projects. So maybe my other two colleagues can comment on the more technical side, but at least from our perspective, it really is the national policy environment that can do a lot to get those projects up and running.

**Ansgar**

Hi, Ansgar. Maybe if I can add to that, especially as you mentioned rural areas. I would always start with evaluation of the demand, because by knowing who wants electricity for what should be your basis to develop a concept for it. And establishing, as well, within the community the ability and the willingness to pay for the energy services, I think that's another crucial element. So if you know how much electricity or energy you, it is asked for, and how much people are willing and able to pay you for that, then you have a good basis to develop your project based on that. And ideally you can then approach national and international financial institutions and project developers.

**Kevin**

Ansgar, if I can just come in there as well, just to put my little bit of wisdom into that. From the South African context, I think what I've learned over the past few years is that one of the things you need to do is set up a critical mass. I think that's the important thing for me. Because

you don't start a bonfire by lighting flares. You need to build up critical mass of technology. There are many wonderful demonstration type projects, and how many of them have never seen the light of day, and they haven't crossed the great technology value of this divide for this reason. So critical mass is important.

The second thing is, in South Africa, we look more and more at small, medium enterprises as a way to actually increase penetration of technologies into particular rural communities. So we see that as a vital component where the technology can be introduced. At the SME level, you tend to find that penetration levels are higher. And lastly, from a rural point of view, the technologies themselves, the solutions must be aspirational. For people that are living in rural areas that always aspire to live in urban areas, getting the same quality of service as those people more fortunate to live in urban areas. So one always has to consider that we don't develop proper technologies, we develop technologies that are aspirational, and people should actually aspire to want to participate and own technologies and apply it.

**Sean**

Thank you, everyone. And moving on now to the next question, this one specific to South Africa, and asks, "How can manufacturing be leveraged locally in South Africa for export to the rapidly growing market in the rest of Africa?"

**Ansgar**

Thanks, Sean. I think that's a very important question. In fact, when I spoke in my presentation earlier, I mentioned to you how we saw manufacturing as being key towards stimulating socioeconomic upliftment. And from our perspective, there are various technologies, in particular CSP, which I think offers the biggest potential to help reduce costs. We're never going to be manufacturing PV cells for the next five to ten years, nor are we going to be doing large scale blade manufacturing. I could be wrong, but from a CSP perspective, the heliostats, detractors, the towers themselves, the fluted tube heat exchangers, can all be manufactured not only in South Africa, but certainly in the region. And so a regionally integrated program is the way to go to help bring those costs down.

In fact, there are various countries, particularly in southern Africa, that can produce the low iron glass that's required in certain heliostats. So we know that the potential does exist. South Africa does see itself as a manufacturing hub because of the availability of iron and steel inside of South Africa, together with some of the glass components. So there's every reason to believe that one could set up the manufacturing hub here, put in place the necessary incentives supporting industries application here, and then exporting that into the region. On the biofuel side, we see somewhat differently. We see that the region could provide the feed stock, and maybe we set up the manufacturing of the fuels inside of South Africa, but the feed stock itself would come from the rest of southern Africa.

**Sean** Great, thank you. The next question we have is, “What are the value chains that can be exploited and highlighted for SMMEs in the African context? And then thinking along the lines of combining cutting edge mobile technology, opportunities for leapfrogging traditional energy systems and rethinking the notion of electricity generation versus energy supply?” So again, the question is, “What are the value chains that can be exploited and highlighted for SMMEs in the African context?”

**Kevin** Can I just have a go first? This is Kevin.

**Sean** Yes, go ahead, Kevin.

**Kevin** OK, I'll start it from a South African context. I think each environment is slightly unique in many ways. What I've discovered from the South African context, and borrowing to some degree from the Barefoot College experience in India, is that the whole assembly of PV installation and the maintenance around PV creates a great opportunity for SMME development. Now in the South African context, we're looking at different value chains, yes, and that would apply, for instance, to waste, where one could collect, in particular, a pots waste, which is biomass mainly, invasive vegetation, and along the way, some usable solid waste, etc., and then transport that, of course to a centralized facility where one can do various conversion processes. For instance, power specification just depends on what the requirement is. So there's definitely a mechanism when it comes to harvesting or collecting of waste, transporting that waste, and then ultimately possibly being involved in some of the transformation conversion processes. The other value chains, for instance, kits that we're looking at for the dissemination, firstly the manufacturing and the dissemination, of small wind turbines, for instance, particularly wooden wind turbines, where there are many models out there that can be used to actually construct these. So it just depends on the application and where you find the opportunity.

South Africa has just set up its own SMME department at the national government level, with the specific mandate to go out there and actually develop an enabling environment for these SMMEs. And a lot of proposals like this are being taken to them for screening so one can come up with a mechanism that could be supported with various incentives initially, or then could be taken over by the private sector and run on a competitive market base. So from our perspective, it simply depends on the type of environment it's in, and what type of technology works best in that context. And then from there, we're looking at various options. [inaudible] has been manufacturing PV cells in South Africa very soon, so we are more interested in the assembly part and then the after installation maintenance.

**Sean** Thanks again, Kevin. We have time for one more question. And the question, the last one actually that we've received is, “What are the biggest lessons around the socioeconomic development from South



Africa's renewable energy independent power producer procurement program?"

**Ansgar**

Right. Well, I think one of the important things to note is that each and every contract that is signed has got a clause in it that talks to socioeconomic upliftance. So a certain percentage of profit has to be spent on socioeconomic upliftance. That money has to go into the community which is the target community for that particular technology. So that's factored into the contract. It's a little bit early to pinpoint exactly what benefits there have been, because a lot of technologies have only been commissioned very recently, or are in the process of being commissioned right now.

Another important consideration in the evaluation side is that at least 3 percent had to come from local content. So there has been that condition imposed on projects as well. That has been somewhat less than satisfactory. And the reason for that is that a lot of auxiliary and similarly type services were included in the contracts that would be supplied by South African's legal services in some cases, and some of the consulting work, project management work, environmental studies that were required, were done by local consultants, and very little in the way of actual construction and also, along the way, in terms of the manufacturing of components. And so governments had to rethink, to some degree, its definition of local content. And because of that, we're starting to see, and you see that in our fourth bidding round, for instance, that more emphasis is now being placed on local content.

In fact, our industrial development corporation, the IDC, did not accept projects from bidders who did not have local PV in them. Now we don't manufacture, as I said, but we do have thin film technology that is being developed in partnership with Germany. That technology's available through our German partners, but could have been used in the South African context. And so they've now become more aware of the need to restrict themselves to financing projects that have a local PV component to them. So I think you're going to start seeing more and more of that moving forward. But just in short, just to conclude my response, the communities themselves haven't benefitted tremendously thus far.

There are one or two cases like the Talis River Community in the Western Cape where most of the labor force has been used on a CPV plant, a concentrated PV plant, comes from the area. So they have seen some tremendous growth in terms of jobs in that sector. But the same can't be said for all where many have been short term jobs during construction and not much in the way of longer term sustainable jobs. So I hope that answers the question to some degree. It's a little bit premature to be looking at the longer term socioeconomic benefits to the community as a whole, but I must stress that more needs to be done and will be addressed to the next bidding rounds.

**Sean**

Thank you, Kevin. Thank you to the rest of the panelists, Ansgar and Laura as well. Now we go to just wrap up with a quick survey for the audience. We just have three short questions for you to answer that helps us evaluate how we're doing and improve for our future webinars. Heather, display them. The first question please? And the question is, "The Webinar content provided me with useful information and insight." Good. And the next question. "The Webinar's presenters were effective."

And the final question, "Overall, the Webinar met my expectations." Great. Thank you very much for answering our survey. And on behalf of the Clean Energy Solutions Center, I do just want to once again thank each of our panelists for their presentations today, and for the great question and answer session, and also to our attendees for joining us today. And I'd like to remind you that if you'd like to listen to the webinar again or view the slides, or share it with others within your networks and organizations, we will be posting the recording at [CleanEnergySolutions.org/training](http://CleanEnergySolutions.org/training). And we also post our webinars now to the Clean Energy Solutions Center YouTube page. That is the bottom link, [YouTube.com/user/cleanenergypolicy](http://YouTube.com/user/cleanenergypolicy). And you can view it out there as well. And so at that, I just want to thank everyone again, and welcome you to go check out the Clean Energy Solutions Center to again view this webinar or any other webinars that we've held. And with that, I hope everyone has a great rest of your day, and this concludes our webinar.