CLEAN ENERGY SOLUTIONS CENTER
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Education and Skills Needs in the Renewable Energy Sector

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Webinar Panelists

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This Transcript

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Sean

Hello everyone I'm Sean Esterly with the National Renewable Energy Laboratory. And, welcome to today's webinar. It's hosted by the Clean Energy Solutions Center and the International Renewable Agency. And today's webinar is focused on education and skills needed in the renewable energy sector. And one important note before we begin our presentation is that the clean energy Solutions Center does not endorse or recommend any specific products or services information provided in this webinar is featured in the solution centers research library as one of many best practices resources reviewed and tested by technical experts. And I just want to go over some of the webinar features, for audio you have two options you may listen through your computer or over your telephone, but if you do choose to listen through your computer, select the mic and speakers options in the audio pane and doing that will just eliminate the feedback of any echo or the possibility of any echo or feedback. And if you choose to dial in by phone just select the telephone option and that box will provide you with the telephone number, access code, and pin name that you use to dial in. I also ask that you please mute your device while you're not presenting and if anyone has any issues with the webinar platform you can call the help desk at the bottom of that slide which is 888-259-326.

We do encourage anyone from the audience to ask questions at any point during the webinar. The attendees are muted but you can ask your questions by submitting them through the question pane. I will then present those questions to the panelist at the end of the webinar during our question and answer section. And if you're having difficulty viewing the presentation you can find pdf copies

of those at cleanenergysolution.org/training. And within about a week of today's broadcast, we will post an audio recording of the presentation to that site.

Now today's agenda is centered around the presentations from our guest panelists Nicolas Fichaux, Stephanie Pinnington, and Doctor Axel von Perfall, and feedbacks from panelist have been kind enough to discuss one of the greatest theories to that as an option of Energy Renewable Technologies which is the critical shortage of skill personnel to develop, design, build, finance, operate in the Renewable Energy products.

So before our speakers begin their presentations I just want to provide a short profound overview of the Clean Energy Solutions Center initiative and following the presentations we'll have our question answer session where the panelist will address questions submitted by the audience and then some closing remarks and some very brief surveys for the attendees. Now this slide provides a bit of background of how the solution center came to be formed and the solution center is an initiative of the clean energy ministerial and it's supported through a partnership with UN Energy. It was launched in April 2011. It's primarily led by Australia, the United States and other CEN partners. So now, it comes to this partnership in terms of support in developing countries, enhancement of resources on policies relating to energy access. No cost expert policy systems and peer repair learning and training tools such as this webinar you are attending to today and there's four primary goals for the solution center; the first goal is to serve as a clearing house with Clean Energy Policy resources and the second goal is to share policy best practices, data and analysis tools specific to Clean Energy Policy and programs. And third, the solution center delivers dynamic services that enable expert assistance, learning and peer to peer sharing of experiences and then lastly the center's dialogue on emerging policies and innovation around the goal.

Now our primary audience is energy policy makers and analysts from governments and technical organizations in all countries, but then we strive to engage with the private sector NGO's and also civil society. Now one of the marketing features that the solution center is proud to offer is its Expert policy of systems known as the X in expert. And we've established a broad team of over 30 experts from around the goal who are available to provide remote policy advice and analysis to all countries at zero cost. For example in the area of renewable electricity policy, we are very pleased to have Paul Kumar the energy education director at the Renewable and Sustainable Energy Institute who is serving as our expert. So if you have any need of policy assistance on Renewable electricity or any energy policy sector we do encourage you to use this service. Again, this is provided to you free of charge. So to request the systems you simply just submit your request by registering through the Ask an Expert feature at cleanenergy.org/expert and we also invite you to spread the words about this service in your networks and organizations. And so in summary we just encourage to explore and take advantage of the services in the research center services including expert policy assistance, data base of clean policy and energy resources, subscribe to webinar newsletters and participate in more webinars like this.

So now, I would like to provide some brief introductions for our distinguished panelist today. Our first speaker today will be Stephanie Pinnington, she's a junior professional associate at the IRENA, leading the work of Renewable

Energy Learning partnership a project which aims to increase awareness of and bought in access to renewable energy education resources and opportunities. Then our second speaker today will be Nicolas Fichaux, a program officer of resource assessment at IRENA, where he coordinated the global atlas of renewable energy and then our final speaker will be Doctor Axel von Perfall and Doctor Vonprefel is managing director at lending Renewable energy experts it's the first recruiting company in Germany with complete focus on energy and adjacent sectors. And so with those brief introductions please join me in welcoming Stephanie to the webinar. We can see your screen Stephanie.

Stephanie

Okay thank you very much for that introduction so as Sean mentioned I am a Junior Professional Associate working with IRENA and I work on a project called the IRENA renewable energy and learning partnership. Just to give you a brief introduction of IRENA it's an international renewable energy agency where our intergovernmental association mandated by countries worldwide spread to support that sustains of all forms of energy. We currently have 100 members to date and 38 states in the session. I rep the project of IRENA and that was started about two years ago with the Global increase of access to renewable energy education training, with the ultimate goal to build the highly skilled course for renewable energy sector. The first phase of our route is focused on collecting information on what sorts of education opportunities currently exist worldwide. So in doing that we've created a very large database with all sorts of information on education on training. So this includes about 2,000 courses and these are both short courses such as occupational training courses our professional developmental courses that maybe a few days or a couple of weeks but also information on associate program degrees, bachelors, masters and PhD's. We also include information on webinars. This is both archive, past webinars and upcoming webinars and at any given time we have about 50 upcoming webinars on our database. We also have training guides and internship opportunities. So I rep courses focus specifically on renewable energy, those are the programs, that's what we collect information on. We do now collect information on engineering programs which may teach skills to the energy renewable sector but don't have a specific energy renewable focus. And we are sort of limited in what we can collect due to language but we are really helped by our partners.

So we work with a range of different partners from networks to regional sectors industry associations and educational institutions. So we have partners all across the world working in the US and China in all across Europe, in Japan and they really help us to gather information from their specific regions and we've seen a huge growth of interest in this project we now have users from all over the world and we get about 7,000 users a month and a third of these users are returning which indicates to us that they're not just coming to find one program, for example University program but they're actually looking for training and internship opportunities on a regular basis and we also have established a very strong social media following, it has been very important to us to reach out very particularly to young audiences, students who are interested in this sector who have over 150,000 followers on Facebook and twitter and we invite you to join us there as well. Another important way that we gather information on education exist worldwide is through our rep global network, the global network is formed of very accomplished young individuals most are students who are recent graduates and they help us to collect information specific to their region and we would like to involve them in products that are specific interests to their research areas and in return for their expertise and their help we try to help them also get a

foot in the industry because most of these students are trying to get careers in the Renewable Energy sector. So I'll quickly run through some other resources that IRELP offers on our website.

We have an education center which includes our databases for courses and webinars, training guides and we also have some information on IRENA for educators and the IRENA scholarship program. So our course database is really assessable and online and it includes information from all across the world in multiple languages, you can use this search tool to really narrow down what you're looking for, you can search by a certain topic area, you can search by region, by country for example if you want to look specifically for a solo course in Brazil you can narrow that down even to the city where you're living. I'm highlighting just a few courses that IRELP offers, this is a very small number of what is offer on our platform, and that these maybe our some course of interests because they are free and all online. And so this is a great resource, if you're interested in renewable's but you don't want to have to pay or commit to a really long-term course you can just try it out online for free. Our webinars data base as I mentioned, we usually have about 50 upcoming webinars so we not only include the webinars that are offered by arena but are offered by our partners such as the clean energy center and others, and webinars a are a really great way to get training in the sector. Most of them are free, I'll say about 99% of what we offer on our platform are free and they really help you to see what's going on in the sector right now in current trends. We also have training guides and manuals, these aren't just renewable energy document and reports there are really focused on hands on activities and learning how to build your own diagraph digesters or how to do a civil side inspection or something of this nature.

We've recently added resources for educators as well we currently have about 20 resources, including toolkits, activities and lesson plans for teachers to get renewable's into the classroom but we are in the process of creating another database which will have over a 120 resources for teachers. And just a little bit of information about the IRENA scholarship program that has a partnership with the NASA institute of science and technology in Abu Dhabi and students can apply to the IRENA scholarship program to have a full scholarship in one and 8 masters programs that's offered through NASA institute and the students are then involved in a high level IRENA where experts come from around the world to discuss on different renewable energy topics and the students are also invited to participate in IRENA events and also to contribute to the activities in our work program. Many of them come in as interns and are hired on by arena following their graduation. They also have a career center. The career center has our internships database and some career guidance and inspirational videos of what it's like to work in the renewable energy sector and has some insights from people from the wws ring peace association, these sorts of organizations. Our internships database we're always adding new internships, I'd say about one or two a day at the minimum and many of these are ongoing programs that are continuously recruiting such as in the course database this is publicly assessable and it covers the entire world and you can narrow down your search based on your interests and expertise and when you want to do your internship and how long you would like it to be where you want to do it. So if you're looking for a career opportunity this is a great place to start.

We also have some reports on skills and job trends in the renewable energy sector to give you an idea if you're maybe studying or considering a career, what

areas might be growing or an interesting area to focus your education. We don't actually list renewable energy jobs we just list internships opportunities, we do give some information on where you can start your renewable energy job search with over 40 resources, so if you're looking for a job and you're not a young student looking for an internship this is great place to look, some sites to focus specifically on renewable energy jobs. And we do also extend a weekly newsletter with information on our upcoming courses, internship opportunities and webinars and you can subscribe to our newsletter on our homepage and you'll see a little subscription box there. So lastly, IRELP has shown that their increase in number of renewable energy programs worldwide. One thing that we've also noticed is that there is a big discrepancy in the location of this education training, you can see that the average number of programs we have in Europe vs. higher up. And over the course of the past two years since IRELP as started we have had request from institutions looking to develop renewable energy curriculum, looking for the roles that IRENA can play that's actually facilitating this discussion between those that have experience the renewable energy curriculum. And this is how we started our idea to build a community for discussion and once we started to build the community, we realized that it'd be much more than a—explain to discuss renewable energy curriculum development but actually a place where everyone can come and discuss their ideas about renewable energy. So it's a forum where people can express their questions and interests and opportunities. And I really hope that this would be a good platform for cooperation and connect people who are interested in the renewable energy sector. So I will leave it at that but if you are interested in the work of IRELP please follow us Facebook and twitter and feel free to contact us through emails that are provided and I'll hand it over to my colleague Nick.

Nicolas

Hello. First I would like to thank everyone for attending this webinar we are really delighted that the clean energy solution center can help us to this in America promote what we are doing here and having a conversation on this very important topic. Myself I would try to at least try to explain the issues that we've seen in the Energy sector doubting the supplying of us keen workers in the renewable energy sector. Today from the analysis and the IRENA jobs report we have calculated that there should be an approximate number of 5.7 million people working in the sector. Usually these users online are in view of this report. We are able to look clearly on the charts that energy sector indeed is a major assessment and as I will show in the assessment, we will see something that will grow over time in the industry. Already the renewable sector and some of the sectors you do have a shortage of the workers and this has been a growing concern for the industry and we find companies that have invested already in 25 accounts in global solutions and now that they're saying that it will help them to acquire these workers. What we sort have been the first two not many but first two days two kind of people will be looking in the sector today considering the growth that we are facing this sector.

What we see is that the jobs in the energy sector are mostly high level, high skill occupations that is required to have a degree, what's happening right now is the supply of the skilled individuals of the sector specifically the energy sector is letting the lead behind the market almost which is very strong and the forward companies are hiring individuals from other sectors and training them on the job and what we see around this sector is that most of the people we are working with are coming from a different field and only now we can see that there is a wave of young professionals that are coming that have been trained but it was not

the case in the last ten years. The IDILO organization they are filled already at start. The occupation is difficult to fill today only with the currently amount of energy with the international energy sector. What we see is that the training of the education system is reactive. It is following the market transits. It is behind the market. So the market is growing in the terms of workers and certainly with the education system response. In that particular that we see with IRELP with short courses that can be used to get the skills of an individual to stop working in the respective sectors. The roles not all of them but some of them roles require a deep understanding of the energy market or the renewable energy sector. In that case, it creates workers in the recruitment. This is an example of the different roles mentioned.

The geographic discrepancies, so what you see is the map of renewable energy the market as responded to the need of renewable energy for the best instillation that happens that you have here. But the program that we have for the future instillations because we foresee that there will be a growth in the amount of jobs in the energy and this geography in east Africa or south east Asia and they're education sector in place may not be able to provide the things needed to welcome on these sectors. Also, what we see is that the market, the renewable energy market is extremely policy and an example, I think its North America because it's very prominent. What you see in New York for example you have this table for regime that gets long-term objectives. What you also see in the growth in the market in the case but this sure of the east station rate of 2014 and instruction, we believe going by the energy we can see in Europe it is more stable for this year. In North America, what you will see for this year that there has been growth in 2012 but this year it's really a strong drop. And in Asia that's leading the market, there has been a gap but this year there are 18 back to where they were a few years ago. So why is North America is so short and stable is because there is a policy with the collaborator of financing that is the tax credit that is given in the means of the [inaudible] [00:24:42] for the 11 then the workers cannot invest in their product.

So what's happening in the market is that a very high station lack and a very low station lack for 11 and the consequence for that there is a high need for projects than there is a bill and there is a high recruitment of keen workers. But what happens, our plan is shrinking because of the discussions but what's happening is that there are a portion of workers that are laid off and this gives a very bad image to the sector but it's also a high source of jobs. So since the different amount of the energy sector highly driven they haven't been a role that has been a role between the trouble shoot and IRENA than it has been and what this book is saying that since the regime place are very high targets for renewable energy in the future but we also take into the account the level amount of skills and the level amount of need for workers for the future. And this book is part of the framework for countries to analyze the needs for workers in the future for the renewable energy sectors.

So what about the future? We know already there's a gap in the energy sector and this is for 2010 the mix of finances. So what you see you have in the power sector like 18 person. And then in the IRENA we have been working on establishing an area for 2013 and this is a category that came up and in June of what's going to happen. Each we have to devote a share for renewable energy worldwide by 2013. So IRENA has been providing preliminary findings and what we see here is that the power sector will be much more prominent and the

product for the regime reach 132 exactly, so what will happen is that the different sectors will need to solve the national workers to implement what we forecast on the picture and the question is since we already have a shortage will we be able to supply the necessary amount of people in the sector in the future. In terms of forecast, I'd say if we have 5.7 million people working together what we foresee is that we may have up 16 to 20 million people working in the sector by 2013. Which means that we need to find 10 million people working in the sector or more and these people have to come from somewhere, and the question that we are asking ourselves now is where can these people come from? And what we see in some parts of the world that there is a deficit of skilled workers in that particular professions so the numbers that we could find out for instance to these, I could not find an analysis of the initial jobs in the future and it is derived from the education sectors that seems that there is a need to look into more detail for that. What we see is that in our analyses are indicators and to show that there is an interest for the young generation to work in this particular work which is not indicate or seem to be the case in imagining the energy companies.

So maybe the debt for educated people in particular professions maybe more concerning the economy maybe and maybe also if there is a deficit this may have to come from outside policy countries. And this is a question of how are the skills for the energy sector and for the moment, it is a leer because there is no such amount of education process so a person walking into our company it seems difficult or prosper person from a different country to another country to walk in the energy solutions. And this is due to the lack of time in the sector. What we foresee is that not only will there be a need for technical workers but also for the professions that are soon to grow in energy and there in finance education institution we need to hire people, personnel's that are able to understand what this energy projects are and what it takes to invest in these technologies. And they already have a gap of keen fine institutions to be able to do so and this gap may expand in the future. Thank you very much.

Sean Thank you Nick and now I will turn the presentation over to Axel.

Axel Thank you very much Sean for this introduction. My name is Axel Vonprefel I am the managing director of a recruiting firm that is specialized in Renewable Energies and the surrounding areas like Sustainability and also Environmental technology so I might bring prospective into this webinar which revolves around the industry side, what are the companies looking for, what are the skills that are needed at the moment and also what challenges the companies are facing at the moment in certain areas of this industry. I lack this Euro-centric view starting with Germany; a country which has started very early with renewable energies and very, the figures you were showing me Nick was very impressing for what happens in the other areas of the world. I will show you some figures of the German market. The overall perspective is that Germany has been a leader in this field but I think will be overtaking in terms of numbers and what happens in the other areas of the world.

So I'm happy to share with you the Germany and European view on this because on the development scale Germany is relatively far ahead and maybe that's something the other areas of the world can be, might be interested in. Just one word about our company we've recruited meaning headhunting for permanent positions but we also provide interim experts that's a field which is developing very quickly recently and over time because more and more companies are

looking for very specialized experts but only for a short period of time. So I will get back to that a little later, and I've seen Stephanie's slides and what Stephanie shown ask an expert and that goes into the same direction of experts being searched in those parts of the world where renewable energy is developing fast at the moment. We provide on all levels from the experts to the executive and all functions form sales to engineering were based in offices, myself this morning I am in Berlin, so all this is to bring companies together with people in this field and I'll get back to that in a moment.

Now these are the numbers that I had. More than 800,000 employees for 2012 and that certainly has changed, Germany has not gone down but has been stable and will grow slightly over all in the next few years I assume that the other markets will catch up and that's really interesting development and if look at the wind industry which is a big, a very big industrialized industry and from my point of view one of the most matured industries in this field. We're talking about nearly 300,000 employees at the moment and there will also be a growth in that field going up to 250,000 also in Germany and other European countries so we'll be around 400 to 500,000 in that sector so for everybody looking for a job at the moment or looking for a decision to move or even if we have a little depression on this topic in the German market, the overall story for renewable energy is still very positive and it still makes a lot of sense to go into this market. There is a very strong amount and there will be a lot in the future. What is really popular about renewable energy, we always talk about renewable energy is that it is peak energy and so on and from a distance it might look like one industry but it's really important to understand that we're talking about very different industries and the wind offshore and along the wind industry there is a big difference between onshore and offshore. And not only in terms of product obviously but also the types of companies are different and the types of people. And we don't see a lot of transfer between for example the wind industry and the PV industry or the bio energy or the solar energy because each of those industries are very specific. So basically, if you choose a job and then most of the time you will choose one of those sectors. Bio energy or PV or whatever and you will most likely in most of the careers stay in that industry.

There are some exceptions to that if you for example work a typical staff function like finance, controlling human resources, of course it's easy to switch industries even beyond renewable energies obviously and the other sector which is prominent to all is project finance and project development because as you might know most of those industries work in other product bases so the solar part or wind firm as project you always need people who are experts in project development and project finance and that is how it is similar between the industries. So that's the only exception I see, but otherwise it is important that those industries are very different from each other and that's not only the case in Germany, I guess it's in other countries will be the case. The development is also very different. The bio energy and PV are worldwide one of the big energy of the three big players in the market. All the rest even the concentrated solar power, you read a lot about it in the press, the solar power energy, you read a lot and there's a lot of attention to it in the company part of view from the jobs point of view and the potential is not that high of the size of the industry is not that big so that is really important to keep in mind that there is a big difference in growth and size of the industry sectors.

What we've seen in the recent years in the European industry, this will probably happen to those industries in the developing market, developing in terms of renewal industries that companies spot quickly because it's usually a law, a feed which will jump start this industry in a specific country. The market will start really quickly and the companies will have to start up and grow really quickly so they will hire people like crazy work on their project and be done in the 24 hours of the day and but at some time they'll and there are many companies like that now they'll grow so fast and they need to professionalize and introduce professional processes and structures inside the company to really handle the size of the company and one thing is also the growth abroad and if your whole market is saturated you will start to internationalize, that is what many companies have been doing in recent years and then there's another trend which is for manufacturers to service. If you take the probable size in countries like Europe and other parts of the world. Most of the business have been taken over by Chinese companies who are able to produce the product at root quality and even at a better price so that is not many companies in the field which have put a strong focus on service meaning the repair and the maintenance of wind turbines, of PV systems and also the engineering services which are related to the construction of those plans and so there's more and more service around it and not only the production of the actual products but also this trends are actually something that will have an impact on the companies and to have an impact on the people those types of companies are looking for, so take the first example from childhood to adult life and in the early years you needed people who could organize the chaos and people who are capable of handling such a fast growth and now you need people who need to build structure and can find clear strategies and split up the market into different sectors and have a much more differentiated approach so the types of people the companies are looking for has change and it is the same for the two other factors I mentioned so that's important to keep in mind if you are looking for a job in this field.

Now this is the side of the employees, you need employees who want to work in renewable energy so therefore from the industry side, the company, it is important for the companies to present the industry in a way that is attractive for future employees so generally energy is a very professional level topic so generally positive but in some case it's also difficult because we also have some negative tones about the type of work in renewable energies because of the fast growth in some areas of the world you have like in the European sector you have companies going bankruptcy which showed instability or immaturity of the market and so there is still a lot to do in the company in terms of employer branding or employer attractiveness so I mentioned here a couple of points which individual companies need to take into account and also to attract the right people because at the end it's as we say a wall for talent so the really good people with the skills can choose in the market where they want to work and so the individual companies need to make sure they provide the proper atmosphere in corporate culture that helps attract those people. I'll skip this because it refers more to the company side but if anyone is interested to that part please get back to me in the Q&A session later on.

And this is how companies get in touch with potential candidates for employment and when we differentiate between national and international being new for the prospective new markets where they don't have expertise and have not yet a well-established network so the methods of acquiring people are different, but there is also a difference between top management, middle management, and the

expert and support functions. The higher you get in the hierarchy the more often you will work with headhunting companies so if you progress in your career I can only recommend you to get in touch with a recruiting firm the headhunting companies that's in our company that specialize in this field because you never know if the headhunter has at some point not immediately but maybe in a year or two has an important job offer for you which can be your next interesting career move so that is certainly something companies are working with on the candidate side, the employer and employee side I just encourage you to look for those contacts and build a network up over time the more you progress in the organization. On the expert side and the job postings are still the most common way to find a job, there are big job platforms like monster or regional platforms like off talent and there are also specialized job platforms like dream jobs so there's a huge platform and I think IRENA also provides an overview of the job platforms that are available so that's still a big point and the personal networks is still, is also very important and it is coming very important in find a job in the social networks like linked in helped a lot to build up your network and they can just encourage you from a job point of view, a career point of view but also for your industry network which will help you use those platforms to get connected to people across the globe because you never know where at some point a new job opportunity might pop up and then last but not least there are job fairs which are specialized in this field and that is also a good opportunity because you have the, usually they are face to face meetings or fairs and you have the possibility to present yourself personally to give a much better and stronger impression instead of by sending over an electronic application.

Okay I'll skip those slides and I can just, it's a list of recommended job websites which I can hand over to anybody that is interested. I'll skip that. One point that I wanted to make is regarding interim management and interim experts, we see two sides. On the company side we see more and more companies looking for experts on a project bases, especially in renewable energy, because in the underline business it's often project base, so you will have a solar parks from a German company and they build, they just required a mandate to build a solar park in Chile, in South America for example then they will not hire, if they don't have somebody on hand at the moment because they are fully, the staff is fully booked then maybe they will take on an expert maybe somebody who is already in Chile as a site manager or a project manager to handle this project. And they will just employ this person for three months or six months and after that they will not be obliged to keep this person on their payroll so the companies point of view, they have more and more situations where interim experts or interim managers are a good thing and on the other side we see more and more people who choose to be a freelancer or an interim expert because people like it's a general trend that people want to work more self-defined and with their more flexibility to work at home partially or to work on different international projects.

There are more and more people are willing to see interim experts or freelancer to see that as a career incentive so those two things come together in result of increasing interim activity. Now coming to the confusing part, for candidates I still recommend renewable energy still from drawing perspective because we've had some unhappy times for this industry but overall this is really an attractive and very important and useful industry so please to decide to come to this industry and I just encourage you to do that. In terms of functions and specializations, of course we are talking about renewable energies everybody thinks it's about engineering and tech jobs but those people are in demand of

course and all the other sectors are also important especially with rising competition. The more competition you have in the market the more sales you need, the more marketing you need. You need people who can organize in the supply chain, product management I mentioned already, those are functions and tasks which are important now and will become even more important in the future. And then one last remark and this from somebody like me who is more engaged in my daily business with people who are in the industry already and who most of our project is for we're looking for experienced people so practical from our point of view, practical experience is key and that's what the companies tell us. They are looking for people who have at least a little bit of first experience in this field because studies are important of course but at the end it's practical experience and maybe my recommendation through internships and try to get in companies and try to get first experience in the field maybe if you have a choice, maybe instead of doing another part of the study or some across or something like that maybe try to do an internship and get practical experience because that is what the companies are ultimately looking for.

Okay so far from my side just a few slides on our company, that's something you can have a look at later those slides will be distributed I guess. But yes, that's from my side and I will like to turn back to Sean to take on the moderation.

Sean Thank you Axel, and thank you Stephanie and Nicolas for that presentation and from this part we will move on to the question and answer session of the webinar and I just want to remind all attendees that if you have any questions that you would like to submit to the panelists you can submit those through the question pane in the go to webinar box on your screen. And I do have a question that we've received so far so let's start with those.

Sean This first one came in Stephanie during your presentation and it asks, "What is the best way to go about applying for the jobs and internships that you talked about?"

Stephanie Sorry can you just repeat that, what's the best way to go about apply to jobs and internships?

Sean Yes, mainly where can they go to view them and where can they go to fill out an application.

Stephanie Sure. Okay, so the IRELP website which is www.irena.com/irelp you can go into our career center and you can find our internships data base for each posting that we have there we give a description as that includes the qualifications and the tasks that you would be responsible for as well as application details so in some cases it will be an online application form which will link you to and other instances there will be directions on submitting a CV or potentially a statement of interest through email, but all those details can be found on the particular internship postings on IRELP.

Sean Great, thank you Stephanie and the next question I believe it's from Nicolas and it asks, "Is the skill gap being observed truly global or is it worse in some countries than others?"

Nicolas What we see that the fast growing sectors have the gaps and if you release to higher level people of course and it is true for some sectors that a growth rate is

very high so surprisingly in the sector for some technologies you do have growth rates that can reach to a sense that is something you can find in the kind of technologies for example and usually and not discuss it so much but usually in the sector that is what you find and this is where you have the gaps for most technologies, this strong growth rate are very localized for the moment that is correct so if you looking at a solar TV, if you are looking at wind in particular, it is happening in only a few markets now but what we see for the future that it will happen in many other markets and I'm not familiar with the wind sector but what I've seen in the wind sector is in over the last ten years we have the pre wind markets, progressively you see Latin America, Central America, South Africa and Central Africa and soon other countries or so and these gaps will be much more widespread than they have been up to now.

Sean Great, thank you Nicolas and Axel we have a number of people asking how they can get additional info, I know that there was a list in there of some other information that we passed over. What would be the best way for them to access that and is there, I can point them to the website where we're posting it, is there another website that they can visit for additional information?

Nicolas You mean about our services or regarding the trends in the industry from a candidate point of view?

Sean Well someone was interested in the list that you mentioned,

Nicolas Yeah what I can do is add that list to the pdf version of the presentation so that you can upload that to the IRENA website or to your institutes website or send it out to the panelists. Generally in our company of course we have our website which can be where we have all of our current open positions and but I think the best idea would be to add the information I've mentioned, I'll add the list of job websites to the presentation and distribute that.

Sean I think that's a great idea, we can do that and we can post it to Clean Energy Solutions Center training page along with the other presentations. We'll be sure to do that and the next question states the recent down turn in the recent in some renewable energy sectors such as solar could any elaborate on this down turn and stuff that needs to overturn these obstacles?

Axel Well I think that is a specific German and maybe a European thing, what happened in Germany is that you have an over incentivized, incentivization of this market, it was really attractive to invest in the energy sector. We really had it booming in the years like up to 2012 because of the conditions for the wind industry was very attractive and they were somehow, it was at the expense of the German, the brief of terror of distribution is not being paid, the premium which is being paid out to the solar park operators the premium is being paid by the overall, by all energy users at the end because you will have an extra fee on your electricity bill it is the attractive thing about this renewable energy fee in law it's not being paid by the state by some budget by the state but it is being distributed somehow silently between all the energy users because it is added to your electricity bill. So that made it very attractive, at some point it became very expensive that had been a big public discussion about the cost of renewable energy and the strong growth renewable energy so the government is forced to reduce that and to make the fee in terms less attractive. For like six years now, the fee for all the renewable energies have been decreased year by year which has

made it less attractive. That is one thing of the second thing that has happened and is that some industries especially in the solar business the European and US companies were really big in that business and they were the leaders and the first companies to get to develop that market and since like six years the Chinese companies picked up really quickly. In the beginning people say you can buy Chinese product but it doesn't have good quality and that might have been true in the beginning but what happened is that Chinese companies improved their qualities very quickly and offered a big process and they took a really big shell of the market where you have 80% European product at the beginning and 20% foreign products but now you have 90% Chinese products even in Germany and Europe and 10% European product and it turned it around and just made which led to a lot of bankruptcies in the Germany and European markets, because of companies with huge sells, and some big players in the market were well believed and that is what happened in the quality of this market.

Nicolas I can add something on that. Maybe there has been several challenges with the industry so some governments have the skill down in solar energy, there is an example in Spain for example where they have been cut from interesting projects and China has had an impact on the whole industry sort of. Then you can have the US market, when in doubt, so when they face with challenges that is what you see that [inaudible] [01:03:10] for most technologies where they are upfront capital. So you invest in the technology and then the cost for you to run the plant this is the front from con solar technologies where the front cost can be reduce, but then you have higher application cost. And it is for specific members, and you need to be able to access capital from a good rate to finance your project to make your project marketable and since there was a shortage in the solar market what happens is that some companies will not invest into these projects. At some point, the whole market was supported by national industries because they were financing the project on their balance sheet, [inaudible] [01:04:07] market and you saw these for the projects. So added to it the combined moments and some of the policies and solar so you have those in separate operations.

Axel And if you let me add one thing to Nicolas, that the positive thing is that in many markets, renewable energy is being financed by the project itself because in the last 5 to 10 years they were just attractive because you had these high feed interiors but see the cost of the solar turbines and the wind modules have come down significantly that you have more and more projects where the attractive from itself doesn't cost as much it's just cheaper to install a PV plant, wind Turbine, instead of having diesel or other fossil fuels and this way is kind of a break through, that is why the renewable energies are growing so quickly in Africa, North Africa, South America because we have very good conditions in terms of solar and wind and the products are more and more attractive from the financial point of view.

Sean Alright thank you Axel and Nicolas and I'm going to group a couple of questions here regarding international internships and also international jobs and the question is "In general what is some advice and how difficult is it to apply for an international internship or a job since some countries do not have a program for it and tied in to that a lot of jobs also request that people have additional language skills other than English, how important is that in your mind when applying for a position?

Stephanie Okay thank you Sean, for applying to internships internationally lots of organizations actually do encourage people from all over the world to apply and they will help in getting a visa if necessary and sometimes provide housing while others are really specific about those that can apply. Sometimes you will find companies or organizations that will only hire from their own country. Those details are always provided but generally if it's not stated that you need to be a citizen of a certain country then people are welcome to apply from any country and it'll vary whether the company organization will assist the intern in getting the necessary documents to work within that country. Definitely, for languages it is very important that an internship specifies that another language is needed that is a requirement that where it says it is preferred it is still worth to apply and see, but if it says that it is mandatory then you would need to have that language skill to apply. Did I miss anything Sean?

Sean Alright but to follow up on that though in your experience has most international, is looking at international internships separate from jobs do most of them have language requirements other than English?

Stephanie It's difficult to say, it varies for international organizations most are operating in English but then there is always that honest benefit speaking another language if you're going to work for a company and in a specific country for example China, chances are you will need to speak that language so yeah it really varies from position to position.

Sean Great thank you Stephanie and the next question ask do you have any view on the needs of policy influencers in those countries where renewable energy is only starting. Is there a transferable skill from develop economy to this area in lagging countries?

Axel Are you asking me?

Sean Yes

Axel Okay well I think I would have to turn that question back to you Sean or to Nicolas because my focus is on the industrial side of the light companies in that area that is familiar with the policy side. I guess you will need those people and there are organizations who provide international experts, there is German organization that is active all around the globe and spreading expertise also in renewable energy on the technical side but also on the policy side, but there are organizations that maybe you and your organization that you have a comment on that.

Nicolas Yes I agree with Axel, what we see in countries that are starting from scratch in renewable energy there is a need to order, there is a readiness for work that has been done in the past in other markets and there are a parts of it that can be contrary to the country. What we see or saw is, that you can't think that the policy for example is quickly and based on the country it doesn't work it used to be, and then it needs to be addressed to the local environment, however there is a sort of market for [inaudible] [01:11:08] is kind of a past example and what can we learn from it, say what can we do with our policy here [inaudible] [01:11:23] and that are transferring the best policies to countries that are willing learn from other parts of the world.

Sean Okay thank you Nicolas, and the next question that I have and it is directed towards Stephanie and it says "Since Axel says that practical experience is key does the IRELP courses focus on technical skills like installation, maintenance, things like that or are they more theoretical and does the course has an internship provision?"

Stephanie Again it really varies, we offer through our data base lots of different programs from vocational training like those really technical programs like hands on training onto professional development which might be more suited to those already working in the industry and looking to up skill or someone who is already working and looking to transfer into the renewable energy sector. For example, someone working in finance might take a course in renewable energy finance to transition into a position that focuses more on renewable energy. But we also do have bachelors, masters and PhD programs. Lots of those longer programs definitely do have internship components to them, lots of the bachelors and the masters in particular and some are even co-op style so that you would actually get some credit for taking an internship while others have that mandatory requirement in that case lots of universities will assist in placing their students in internships.

Sean Thank you Stephanie and one of our attendees asked if you can talk about the job scenario in Germany might be like especially in the wind energy sector.

Axel That is a very broad question. The job scenario in the, what we see regarding the wind industry is that offshore industry has slowed down a little bit. There was a lot of ambition about, we also did a lot of work and placed a lot of people in the offshore industry and it's very attractive because it is high technology, high investing interesting jobs and they're about, as you're hearing again it was about cost. It is very expensive to put your wind turbine at 30 meters, water depth at 40 kilometers out away from the beach and bring back the electricity for 365 days a year so that's really have been technical and the commercial issues so that has slowed down a little bit. The wind sector is still attractive and we are moving more and more towards sales and project management. I think that's a general tendency because the production policy are basically there, you will always develop your product and you will always improve and increase your proficiency but the policy basically you need to find the customers and the projects to place your wind turbines in the markets. So that's from the job perspective we're still stringing onto this year and next year.

Sean And the next question from the audience asks what is the women's role in international renewable energy looks like, do they have sort of advantage? How is the field in regards to that?

Axel I think it's more or less equal or equal opportunities and the renewable energy sectors are from the background with the ecological in sustainability and things like that are the thinking behind it, behind renewable energy is probably a more positive background for equal opportunities for maybe in other industries. I don't want to name any other industries but I think the conditions for equal employment are the same. I don't think the advantages for women, but at least they should have equal opportunities.

Nicolas On the side we can see there are programs who need more women even the program for grandmothers [inaudible] [01:16:58] micro companies or small

business and in communities where you can find that the role of women is very prominent, so the idea that there is to involve these women to set up companies and projects will grow in renewable energy and also to have education in it or to manufacture devices, so it happens, I found things in India and Africa that are very interesting and I found the role of the women is very far from what we can know from European companies of course, and there is a need for this role for women to play in this field of small business enterprise.

Sean Great thank you. The next question points out that renewable energy has been called one of the next big job industries similar to how the IT industry job would be called in the beginning but then outsource occurred in the IT industry but so far how do you evaluate the chances of outsourcing your renewable energy jobs?

Axel I think outsourcing will not happen in a way like it happened in the IT industry because IT industry and the banking industry you have many repetitive types of work and, t you don't really have that in renewable energy sector what you have and that happens already is that you have a value chain of companies which is not all in one company putting in a different way you have a wind turbine manufacturer they might produce like 20% of the wind turbine their self and all of the rest is being manufactured by external companies similar to the iPhone which is not produced by apple but by some other companies and this happens also in this industry but still the job and the job perspectives are still there not only at the big manufactures but at the roller blade manufacturers it's at the generator and electronics companies who are delivering parts to the wind turbine manufacturer so the jobs are still there but maybe not only at the OEM producers but also on the supplier side.

Sean Great and we have time for a couple more questions the next question is a short one. But I don't know if it's an easy one to answer but the question is "which country is currently leading in education in the renewable energy industry?" That can be summed up in eight countries.

Axel Stephanie, where do you have more courses in your platform?

Stephanie Probably in Germany to be honest, definitely has a large number but all over Europe would be, that and the US. I think it would be hard to say for sure but definitely Germany, US and the UK as well are offering a lot but for the most part our programs are concentrated than North America and Europe.

Sean And somebody tied that to the point made earlier about the international organizations do a lot of policy work than some of the new countries in Renewable energy. That is where a lot of them are based in Europe and North America so. And Stephanie do you offer certificate for courses or training on IRELP?

Stephanie IRELP isn't actually offering the training. Our website is a portal to find training that's offered all around the world so it varies from program to program but many will offer certificate of some sort depending on the program type but certainly yes, many will offer a certificate.

Sean Great now one of our attendees wanted to know if you could recommend any must read books on the renewable energy industry, specifically for people trying

to get into that industry or any resources or websites or any other resource that they could utilize.

Nicolas Not very good just on the news but [inaudible] [01:22:38] I think if you are looking into getting interest in the renewable energy sector it's possible to read books about renewable energy but most of these books will be about the technology or the environment etc. there is a few general things there is a report on it, it's an excellent piece of work and it gives you a good overview of what's happening but the whole thing is extremely dynamic so the best thing to do is read the news and there are specialized journals, specialized companies perhaps new streams and if you follow that it'll give you very, very good overview of what is happening in this market and it is over six months with any exception very quickly in terms of technology and geographic spread and in terms of dynamics of what's happening in between the companies, it's very interesting to follow, I would say watch the news and of course the IRENA website which has excellent communications.

Sean Great thank you. And Stephanie, one more question for you real quick before we move on to the closing remark survey. How much is IRELP trying to reach down to Africa do they have a lot courses focused on renewable energy sector there?

Stephanie That's a good question; we're currently trying to extend our database a little bit and focus more on Africa. What we found in the past it can be very difficult to find information on where education and training exists there because a lot of the information isn't available online but we are through our countries support partnership division reaching out to partners in Africa of what training is available, so that's a strong focus for us right now.

Sean Great thank you again to Stephanie, Nicolas, and Axel for the great instruction and thank you for the attendees for submitting those questions to the panelist and now I would just like to move on to a quick survey that we have for our attendees that will help us evaluate or webinars in going forward.

So Maureen if you don't mind can you display that first question for the attendees. And the question is the webinar content provided to me was useful information and insight and you can respond directly in the go to webinar. Great and the next question "was the webinar presenters affective?" and the final question overall the webinar met my expectations. Great thank you so much for answering our survey and on behalf of the Clean Energy Solution center I would just like to again thank our great panelist for the presentations and discussions and for our attendees for participating in today's webinar. I do very much appreciate your time and do want everyone to check the cleanenergysolutions.org/training website where they can find the pdf copies of today's webinar and also we will post a recording to the webinar to that site and as well will provide the list that Axel mentioned up there so that people can access that. additionally we do have information on other upcoming webinars up there as well as previous training events that you can listen to and view online and we would like you to invite your colleagues and networks about our solutions and our resources and services including ask an expert policy and support and with that I hope everyone has great rest of your day and I hope to see you again at Clean Energy Solutions center events and this concludes our webinar.