

The Global Renewable Energy Transition: Who is leading?

—Transcript of a webinar offered by the Clean Energy Solutions Center on 19 June 2019—
For more information, see the [clean energy policy trainings](#) offered by the Solutions Center.

Webinar Panelists

Laura Williamson REN21

This Transcript Because this transcript was created using transcription software, the content it contains might not precisely represent the audio content of the webinar. If you have questions about the content of the transcript, please [contact us](#) or refer to the actual webinar recording.

Matt

Hello everyone. I'm Matt Keighley and welcome to today's webinar which is hosted by the Clean Energy Solutions Center in partnership with the Renewable Energy Policy Network for the 21st Century, or REN21.

Today's webinar is focused on the Global Renewable Energy Transition who is leading today's webinar presentation, provides an overview of analysis and findings presented in REN21's newly-release 2019 version of the Renewable Global Status Report with a regional emphasis on Asia.

Before we begin I'll quickly go over some of the webinar features. For audio you have two options: you may either listen through your computer or over your telephone. If you choose to listen through your computer please select the mic and speakers option in the audio pane. If you choose to dial in by phone select the telephone option and a box on the right will display the telephone number and audio PIN you should use to dial in. This is just a gently reminder to please mute your mic when not presenting to avoid interference from background noise.

If you'd like to ask a question you may use the questions box where you can type in your question. If you're having difficult viewing the materials through the webinar portal you will find a PDF copy on the presentations at cleanenergysolutions.org/training and you can follow along as your speakers present. Also the audio recording and presentations will be posted to the Solutions Center training page within a few days of the broadcast and will be added to the [Solutions Center YouTube channel](#) where you will find other informative webinars and video interviews with thought leaders on clean energy policy topics.

Finally one important note I'll mention before we begin our presentations is that the Clean Energy Solutions Center does not endorse or recommend specific products or services. Information provided in this webinar is featured in the Solutions Center's resource library as one of many best practice resources reviewed and selected by technical experts.

Today's webinar is centered on a presentation from our guest panelist who has joined us to discuss latest data and findings on what is happening in the renewable energy sector. Joined directly from REN21's newly-released Renewable 2019 Global Status Report. Kanika will then comment on the financing the energy transition, with a particular focus on Asia.

Before we jump into the presentations I will provide a quick overview of the Clean Energy Solutions Center. Following the presentations we'll have the answer session where Vibhushree and Kanika will address questions submitted by the audience. At the end of the webinar you will be automatically prompted to fill out a brief feedback survey and we thank you in advance for taking a moment to respond to this.

The Clean Energy Solutions Center was launched in 2011 under the Clean Energy Ministerial, created in 2010, the Clean Energy Ministerial is a global forum where major economies and forward-leaning countries work together to share best practices and promote policies and programs that encourage and facilitate the transition to a global clean energy economy. Twenty-five countries and the European Commission are members of the Clean Energy Ministerial, and in total CEM members account for approximately 75 per cent of global greenhouse gas emissions and 90 per cent of global clean energy investments.

The Solutions Center provides objective analysis on policy and market mechanism options to help governments make informed decisions on policy, regulation and finance mechanisms design that support the development of advanced clean energy technologies. This support is accomplished through access to expert assistance and capacity building activities offered through a team of subject matter experts living and working in regions around the globe. The Solutions Center is co-led by the governments of Australia and the United States.

The Solutions Center provides several clean energy policy programs and services, including a team of over 60 global experts that can provide remote and in-person technical assistance to governments and government-supported institutions, free web-based virtual trainings on a variety of clean energy topics, creating partnerships with development agencies and regional and global organizations to deliver support, an online resource library populated with over 3,500 clean energy policy-related publications, tools, videos and other resources. Our primary audience is made up of energy policy makers and analysts from governments and technical organizations in all countries. But we also strive to engage with the private sector, NGOs and civil society.

The Solutions Center is a global initiative that works with innumerable international and regional partners. Several of the partners are listed above,

including REN21. The Solutions Center's marquis feature is the free expert assistance service known as Ask an Expert. The Ask an Expert services matched policy makers with one of the more than 60 global experts selected as authoritative leaders on specific clean energy finance and policy topics. If you have a need for policy assistance in renewable energy or any other clean energy sector we encourage you to use this valuable service. Again, this assistance is provided free of charge and is designed to help to provide quick responses. If you have a question for our experts please submit it through our online form at cleanenergysolutions.org/expert. We also invite you to share information about this valuable service to those in your networks and organizations.

So now I'd like to provide a brief introduction and welcome to today's panelist, Vibhushree Hamirwasia. Vibhushree is the community manager at REN21 and we are pleased and honored to have her present the findings of REN21's newly-released 2019 addition of the renewables global status report. Vibhushree, welcome. As I set up Vibhushree's slides I'd just like to quickly remind participants to submit questions through the questions pane at any time throughout Vibhu's presentation and Vibhu the floor is yours

Vibhushree

Thank you, Matt. Renewables are firing the world. Twenty-six per cent of global electricity, _____ energy 20 [audio static]. Renewable energy also accounted for two-thirds of the global investment in power generation. In all of this where does Asia fit? Asia provides 40 per cent of global energy, but it also contributes to 45 per cent of carbon emission. Energy consumption continues to grow and so does demand. However, most of these [audio static] to meet this demand continues to come from fossil fuels.

Good morning from Asia everybody, and welcome to this webinar. Thank you for tuning in. I would like to present some key findings from our recently-launched Renewables 2019 Global Status Report with some focus on what's happening in Asia, and then I will pass it over to Kanika who will present some insights on investment.

Who are we? REN21 is an international policy network made up of passionate players which belong to these five key stakeholder groups, so science and academia, international organizations, governments, associations and NGOs.

What we do is we try and provide evidence of the most up-to-date evidence on renewable energy and create knowledge to shape the global energy debate in this transition to renewables. One of our flagship publications is the Global Status Report, and this is the 14th year of its publication. This is followed by many other [audio static] on the global scale, including one for cities which will be coming up this year. Apart from regional reports, thematic reports, etc. where we also use this knowledge and evidence to try and [audio static]. One such is the REN21 Academy and another one is the International [audio static] Conference.

The Renewables Global Status Report. As I mentioned, this is the 14th year of the GSR as we call it. It includes thousands of data points and uses

hundreds of documents [audio static] experts to provide the most up to date information available. We look at advances in renewable energy markets, policy frameworks and industries globally. This production of the GSR is not something we do solely at REN21 but we quickly build on a multistakeholder community of over 1,500 individual experts who actually are the key contributors to this _____ publication.

What's happening in the world of renewable energy? 2018 was another strong year for renewable energy. Total capacity grew 8 per cent which includes hydro power, even the growth is even faster when you look at non-hydro capacity, so it grew 15 per cent. By the end of the year hydro power no longer accounted for more than half of installed power capacity _____ at 48 per cent. Meanwhile wind and solar _____ continued to—additions in wind and solar PV continued to increase, and for the first time totaled around 45 per cent.

Investment in renewable energy although fell globally, fell 11.5 per cent in 2018. It was mainly driven by a sharp decline in China. This was a result of policy changes that reduced financial support for solar PV projects in the country. However developing an emerging economies overtook _____ developed countries in investment for the first time in 2015 and it retained this lead in 2018 although it was by a much smaller amount.

Investment also declined in India but rose in the rest of Asia. When I say [audio static] it excludes India and China as [audio static] in Asia Pacific. However despite this decline in China accounted for a majority of global investment [audio static] which came in at 72 per cent. When you look at Asia-Oceania excluding India and China that was 15 per cent of global _____ so still very significant. India was somewhat smaller, about five per cent. So while investment [audio static] Asia, including India and China, [audio static] investment.

I think one of the biggest characteristics of this energy transition is renewable power where the power sector has been leading, and renewables have been supplying more than 26 per cent of global electricity. This was the case in 2018. For the first time more electricity was from solar PV than bio power and there was a strong growth in renewable generation but with the rise in demand in electricity it makes it harder and much more challenging to achieve largesses.

So renewable power now makes up one-third of global capacity. This _____ is absolutely amazing as the global composition [audio static] shift with as I mentioned hydro power is no longer more than half of installed capacity and wind and solar have been increasing, which is—when you look at the composition for the last ten years this is quite _____.

In terms of addition this was 181 gigawatts of renewable power and around 55 per cent of these new additions was solar PV followed by wind, hydro and the rest, so bio power, CSP and geothermal. 2018 was also the fourth consecutive year where more than 50 gigawatts of wind power was added.

This I think is the most encouraging slide of all where we say more renewable power capacity was added compared to fossil fuel and nuclear power. So if we look at pure installation this marked nearly two-thirds which is 64 per cent of net installation from renewable sources of energy. This marked the fourth consecutive years that [audio static] of renewable power were above 50 per cent.

If we dig deeper into technology solar PV capacity additions passed the 100 gigawatt mark. This means the cumulative capacity was 505 gigawatt, an increase of 25 per cent from 2017.

Asia was the main world market for solar PV for the sixth consecutive year, led of course by China, followed by India and then several other markets in Asia, including Japan. However in [audio static] the region's top three market were clearly China and Japan.

Asia was followed by the Americas. The top five markets were responsible for about three-quarters of newly-installed capacity.

Floating solar PV is quite an interesting technology for Asia. It's quite new, and this has been driven by rapid development of ____ solar in China and in other Asian markets, including Japan, Korea, Chinese Taipei and then also the U.K. One of the most interesting parts about this is that the first floating PV installation was a 20 kW pilot system which was in [audio static] in 2007, but just over a decade later floating systems exist in at least 29 countries, in nearly every region of the world, and are under consideration of development in many more countries. This is perhaps an interesting development for the region.

Wind power continues to increase steadily year on year and it was up nine per cent in terms of additions, so the cumulative capacity was up 591 GW in 2017. Of the additions this includes both onshore and offshore with first the majority being onshore for the moment, but offshore being quite significant as well. It was the fifth year where annual addition exceed 50 GW but also was the third year of decline following the peak in 2015.

Offshore wind has very significantly been concentrated in Europe but it's now sparking interest in other parts of the world as well. So by the end of 2018 there were 17 countries globally which had offshore wind capacity. The U.K. is a clear leader, however seven countries in Europe and two in Asia connected about 4.5 GW in using global cumulative capacity by 24 per cent last year. Europe is still very much the leader however with 79 per cent of global capacity.

Bio power continues to rise, including 6.5 per cent in 2018 and bio electricity generation increased nine per cent, most notably in China. The EU remains the largest in ____ by region but other countries included China, Brazil, Germany, India and Japan.

Hydro power. When we talk about hydro power the market in 2018 looked very similar to the preceding year in terms of capacity and concentration of

activity. It added an estimated 20 GW to _____ install capacity of around 1,100 GW. China was the clear leader with 35 per cent of new installations but this was followed quite closely by countries in the region such as Pakistan, India and of course other Central Asian and other markets.

Geothermal is another interesting technology for this region, especially since Indonesia and the Philippines are quite significant in terms of geothermal power capacity. And estimated 0.5 GW of new geothermal power generating capacity came online last year. This brought the global total to around 13.3 GW. Turkey and Indonesia, as you can see by this slide, were about two-thirds of new capacity.

Modern renewables. I think all of these slides show quite clearly that modern renewables are slowly gaining ground with _____ energy demand. But as you can see—we spoke about 26 per cent of the power sector came from renewables, but here you can see that the renewable share of total final energy consumption only 10.6 per cent. This means this is total final energy demand which includes all kinds of end use sectors and this is where we still need to [audio static].

So progress in heating, cooling and transport has been very limited, as we can see from the following slide. Heating and cooling are increasing very slowly. Heating and cooling is 51 per cent of total final energy consumption, however this [audio static] is at around 10 per cent. The demand for it is quite dismal and minimal. There is a lack of policy support in this sector, and the number of countries with regulatory policies fell from 21 to 20—the one that removed its policy support was Kenya actually. And only 47 countries had targets for renewable cooling. Bio heat is a majority component of the renewable energy in the heating sector but integration with the power sector [audio static].

The growth rate has slowed for solar water heating capacity addition. Cumulative global [audio static] capacity is 2 per cent, and a majority of this is glazed collectors, and 2018 increase was the smallest of the last ten years.

Moving on to transport sector, again, there's a lot of talk, especially in Asia and other regions of the world about electrical renewables and electric mobility. And so biofuels and EVs are growing, but the renewable [audio static] will remain the leader, and transport is 32 per cent of total final energy consumption, whereas renewable energy in that is 33.3 per cent. So extremely small. Transport also accounts for around a quarter of global CO2 emissions, and while renewable share grew a bit it's not enough. Biofuels make up the majority of this contribution but the sector is increasingly open to electrification as we see with trends in transport.

However we see that—and you can see the next slide the electric passenger vehicles stock grew over 60 per cent so the electric mobility revolution is here and it's happening and we all talk about here [audio static] talk about it. So we have about 5.1 million electric cars on the road and 260 million electric two- and three-wheelers, which is particularly interesting _____. Electric cars, however, despite this growth, it's still a small share of all passenger vehicles at just over 2.1 per cent at the year's end.

EV market is also highly concentrated—40 per cent of all EVs were clustered in just 20 cities, _____ together account for three per cent of the global population. China of course is the leader of the global EV stock in 2018, and it was followed by the United States.

What does all of this electric mobility revolution mean? You can see there's very little direct linking of EVs and renewable. EVs can play a role in increasing renewables in transport when powered by renewable electricity, and that is a very important point to keep in mind while we're all working in this transition. There was only one country with policy support directly linking renewables to EVs, whereas around 49 countries have independent targets of each other, of renewable electricity. So they're not exactly linked and while is this revolution it's not—the link is totally [audio static] quite minimum, or negligible even.

So if you put whatever we've seen so far together we see that we have to go beyond power, or 80 per cent of total _____ electricity consumption and demand comes from heating, cooling and transport. Power is only 37 per cent of this equation, and of which we are making really good progress with 26 per cent of renewable energy, however, heating, cooling and transport is where we need to speed up the transition.

Now when we look at—and then when we look at global transport energy needs where else do they come from if not renewable energy? They come at _____ and petroleum products and 0.8 of country [audio static]. So why are advances in the power sector happening so fast?

A lot of the advances have been made possible by policy support. As you can see 135 countries have power regulatory policies as opposed to 20 countries for heating and cooling. Transport _____ somewhere in between with around 70 countries, but the disparity is really large. The number of countries with heating and cooling regulatory policies fell from 21 to 20 as you might remember from one of my earlier slides. There were no new—outside the power sector renewables have policies for renewables have advanced at a really slow pace. There were no additional countries that adopted biofuel standards and no new countries that added regulatory incentives on mandates for renewable heating and cooling.

Carbon pricing policies are among the [audio static] policy mechanisms that can stimulate interest in low carbon and renewable energy technologies, but by the end of 2018 these covered only 44 countries. This means that targets are certainly uneven across sectors. Targets in the power sector, as you will see from the bottom part of the slide, the bottom graphic, are far more ambitious and far more—and will be achieved or have [audio static] for far less time, achieved in far less time versus targets for renewable heating, cooling and transport are not only less numerous but so far less ambitious. This trend has continued despite a much greater contribution of these sectors to total final energy consumption.

The 100 per cent renewable energy movement is [audio static] in the power sector but especially in the power sector whereas Denmark is the only country

with a target for 100 per cent renewables in total final energy. It's one country in all of the world.

As I mentioned, carbon pricing exists in some countries, at least 54 carbon pricing initiatives implemented by in 2018; 27 of these were emission trading systems and 27 were carbon taxes. They cover 44 countries, and they also cover only 13 per cent of global greenhouse gas emissions.

So why is this a concern? One of the biggest issues is that renewables don't operate on a level playing field with fossil fuels or nuclear. Fossil fuel subsidies, as you can see by this slide, are still extremely widespread. Global subsidies reach an estimated \$300 billion in 2017 which increased from the year before, and this was about double the estimated support for renewable [audio static] generation. Fossil fuel subsidies have remained in place in at least 115 countries in 2017 and 73 countries provide subsidies of more than \$100 million [audio static].

We strongly believe that as the renewable energy sector requires stronger policy action but now we are not on track to limit global warming to 1.5 degrees, and to achieve SDG7 goals for renewables efficiency and energy access. And these climate developments which are [audio static] call for accelerating the transition from fossil fuels to renewable energy.

If you look at this slide it tells you which countries [audio static]. I think for me personally the second _____ which says investment [inaudible]. It is in the first one you have a lot of the large economies whereas in the second row you have [audio static], Palau, Djibouti, Morocco, Iceland, Serbia, countries that normally don't show up. These show very clearly the disproportionate rate at which smaller and developing countries invest in renewable energy.

If you go on to the next slide you'll see renewable energy leaders at the end of 2018—I've marked the ones which are more relevant to Asia. Of course China and India are on many of these lists but you'll see geothermal has quite a lot of [audio static]. Solar PV _____ in Japan, India and China, and renewable power capacity [audio static] hydro power is also quite interesting [audio static].

It's important to consider that jobs are increased in 2018. The renewable energy sector employed around 11 million worldwide with solar PV being the largest employer, and the largest employer in the region was of course China, followed closely by India.

Where is Asia leading? It's the largest regional wind power market. It has an increasing number of people employed in off-grid solar and biofuels and excluding India and China it accounted for 15 per cent of total renewable investment. It increased six per cent, the highest in three years, and it has the largest per centage increase in R&D. But another very interesting point from 2017 to 2018 was the 91 per cent of the population now has access to electricity.

Asia is also leading the global decrease in primary energy intensity. This was characterized by more efficient manufacturing facilities and also the share of energy-intensive industry and commerce has continued to shrink _____ to all other economic [audio static].

Energy demand in non-OECD countries, which includes a lot of Asian countries, continues [audio static]. This is particularly relevant for Asia because energy demand is growing at a very rapid pace in the region. But a lot of this energy demand is made by fossil fuels in India with the majority of coal-fired and [audio static] have been located in the region. In addition, 200 GW of coal-fired power plants have already been commissioned in Asia and the Pacific, so this really shows a disconnect between energy demand and what it's being supplied by. Next please.

Global household electric _____ consumption increases with the most rapid increase in Asia with an average annual growth of .7 per cent. And as I mentioned, access to energy has expanded. If you look at the graph, the second box, or the box in the middle up top is about—talks about all developing and emerging Asian countries, and you can see that in the last eight, nine years or so electricity access increased quite substantially, and so did access to clean cooking. India was one of the countries where this situation is quite drastic. But all of this electricity access does not mean that it's [audio static].

Off grid solar PV is increasing. Now 150 million people across Africa and Asia benefit [audio static] 5 per cent of the population in Africa [audio break] India. Many of the [audio static] solar _____ provided electricity access to about 9 per cent of the population [audio static].

Looking at the off grid solar systems there has been a 50 per cent annual growth rate [audio static] between 2010 and 2018. Also the dynamics of the market have changed quite a bit: so _____ sales have decreased, large solar home systems have increased.

When we look at cooking production [audio static] expanded in new markets, 125 million [audio static]. However, the use of [audio static].

It's safe to say renewable energy is powering the world. You can see that increasing demand has to be met by long-term planning and supporting policies which has been one of the main drivers in the power sector, and technology and market development. I want to leave this on for about two, three seconds so you can take a look and see the power sector has created a really good system for increasing renewable energy uptake and it's reliable, mainstream and here to stay.

But what we really need in order to achieve climate and development goals is moving from an electricity transition to a system transformation. I put this graph, again, which shows you that heating/cooling/transport consumed more energy in the entire energy system. Ours is a much smaller portion, and many people continue to confuse electricity for energy but the energy system requires a much greater transformation in the electricity sector.

How can this be done? You need to create a level playing field by removing fossil fuel subsidies, as we notice, and adopting more carbon pricing, encourage more sector integration amongst all of these end-use sectors, and align policies across national, subnational and local levels. But it's also important to link [audio static] energy efficiency policy initiatives.

The transition is possible, and we have very good examples from the power sector which show how this can take place and how best practices and case studies in the power sector apply to the other end use sectors. Leadership from national governments is paving the way towards 100 per cent of renewables in countries, and cities and subnational governments are actually setting more ambitious policies than their national counterparts. As I mentioned right up top, the new RDF coming, renewables in cities, global status report will tell you much more about that, so watch out for that towards the end of the year.

Over 1,000 organizations in this talks about the private sector's contribution to renewable energy—1,000+ organizations have committed to divesting from fossil fuels and the private sector has doubled its investment in [audio static] power.

So if you look at your examples, Ireland became the first country committed to divesting its public sovereign development from coal, oil and gas, and Costa Rica, which [audio static] sources, [audio static]. So you can see there are several examples, but in order to achieve this transformation [audio static].

So what is needed to advance this energy transition? As you've seen, renewable power—and it shows really good examples and case studies which will dip into other end use sectors [audio static] and transport. We need to set more ambitious targets globally across regions, countries and sectors, accelerate investment in renewable power. So that doesn't [audio static] stop making advancements in power, but we [audio static] development of new policy strengthening existing policies required for [audio static]. We need to encourage our sector integration to happen between the other _____ sectors, and policies need to be aligned between regional, national and subnational [audio static]. We'll have to support cities in their actions as well and support local job creation and adjust to transition.

So that brings me to nearly the end of my presentation. As you can see, [audio static]. A lot still needs to happen, and a lot needs to happen very quickly actually. Please do feel free to _____ the entire report and the graphics and the presentation that I showed you is available on the microsite which is REN21/GSR. You can also _____ with us and keep track of our activities _____ newsletter. The next upcoming [audio static] of significant development for REN21 in the next six months is the launch of the new renewables in cities global status report which you will find [audio static] online.

We're also developing a regional status report for Asia and Pacific which will be launched at KIREC, the [audio static] you see on screen in the 23rd to 25th

of October in Seoul, and we'd love to hear from you because as you know, we work with this community [audio static] if you have something to contribute or if you'd like to be a part of the [audio static] please feel free to [audio static].

Thank you for giving me the opportunity to present and I [audio static] now over to Kanika.

Matt

Thanks Vibhu for a great presentation. As a reminder, participants can submit the questions through the questions pen at any time. We want to get as many questions as possible in the Q&A session after this next presentation.

Now I'd like to make a warm welcome to Kanika Chawla, who is the director of the Center for Energy Finance at the Council on Energy, Environment and Water. Kanika, welcome.

Kanika

Thank you very much, Matt, and also I'd like to congratulate REN21 on an outstanding global status report for a 14th year in a row, if I got that right.

I think there's a lot of really interesting findings that Vibhu just presented, and a lot of what I'm going to talk about now are really reactions to some of the things Vibhu presented. But given that the context of a lot of my work, as well as what I'm supposed to be speaking about today is finance I'm going to pick up on the aggregate investment flows into the renewable energy sector in Asia which stands at 52 per cent. So if you add up China, India and the Oceanic region that amounts to more than half of all of global investments in renewable energy, which sort of seems to suggest that there's a lot of activity in the renewable energy markets in this part of the world.

But that being said, when we see—break that up into the sum of its parts we realize that only 15 per cent of that money went into countries, if you were to exclude China and India. But that is not an insignificant amount. If you were to think about the total investment flow which is close to \$300 billion, slightly short of \$300 billion 15 per cent of that is not an insignificant amount of capital, especially if you were to think about the kinds of advances being made and given the declining prices of renewable energy. But even within that I think it's interesting to see how most of that capital went into power sector advances only, not so much into end use sectors. And also how it was sort of mostly concentrated in some countries in Southeast Asia rather than—and not as much in, say, countries in Central Asia. And so then to me I would like to sort of structure what that mean, include three categories.

One is around market design and what is the role that market design plays in attracting capital but also using the capital as a proxy for deployment of renewable energy and advancing the energy transition. And then how do you unlock private capital to flow into countries where the potential for renewable energy is perhaps the largest in the world, given that a lot of the countries in Asia lie between the tropics and have very high solar radiance. But also given that geography have a lot of high wind potential and have a long history as well with biomass as we've seen in Indonesia and other countries in Asia and

then recent advances being made in hydro and geothermal. So how do you attract more capital?

And then the third one is around inter linkages and regulatory environment. Vibhu mentioned this briefly around how do you think about the energy transition in a more integrated way rather than just in a way that focuses on say power sector separately and then mobility separately and industry separately—how do you sort of connect the dots and have a comprehensive view and optimize for the energy transition both in terms of the resources required both in dollar value as well as in human capital. But then also optimize for the timeliness of that transition.

What I found very interesting was when the slide suggested that 135 countries had regulatory and policy targets for renewable energy, most of them in the power sector, but 111 of those were still continuing to following the feed-in tariff regime.

The feed-in tariff regime, as you've seen in several parts of the world has been highly effective because it provides the impetus and the fiscal incentives required to drive the energy transition, but it is not the most economically-efficient way to make that transition from the exchequer's point of view. This is really interesting because as the price of renewable energy, especially if you were to think about the price of renewables electricity is declining significantly, it's now—we're now moving towards a world where the kind of policy support required continues to be large, but the kind of subsidy required is actually declining, because the economic case for renewables is much stronger in and of itself; renewables got close to parity when compared to several other sources of energy. And there is much more interest in optimizing for the most efficient fuel from an economic point of view as well as from an emission point of view. And when renewables become competitive in that space there is a declining need for feed-in tariff. So I think that for a lot of the countries in Asia where there are quite well-developed markets but their power sectors are currently at an inflection point where they're expanding and moving sort of more away from just publicly-owned generation assets to more privately-owned generation assets this transition can actually be supported through a price discovery mechanism like reverse auctions which build transparency and coherence in the market but need not actually put a significant burden on the exchequer in the form of feed-in tariffs.

The second point is around mobilizing private capital and in this space, as I was saying before, if more than half of the world's capital into renewable energy is flowing in Asia, which is only actually 40 per cent of the global energy supplied and that should mean that we're actually doing something right. But as Vibhu mentioned this is disproportionately skewed in China's favor, a lot of which is actually domestic public money from China, so how do you think about how do you mobilize private money because a lot of other countries in Asia, given that they're on a development trajectory, do not have boundless public reserves to pay for this energy transition and there is a need to crowd in private capital.

In order to do that it's important to understand what are the risks that are plaguing the flow of this capital, and that's where a lot of the issues around market design come in, how sustainable are these policies that are being deployed, but equally also what is the financial health of the utilities that are going to get involved, how integrated is the plan, and is there policy certainty. So especially in the sectors that are still emerging, whether it's sort of rooftop solar, offshore wind, new geothermal applications but also electric mobility, end use, renewables for end use purposes, these are all sectors that require a lot of policy certainty at the moment because they don't have the long history that solar and wind installations have, and therefore investments are contingent and predicated on the fact that are we providing a conducive environment for them. And is that policy certainty going to last? So if I make a long-term investment decision will I get returns on that investment?

That is in fact I think increasingly the role of policy is to ease the process of investment, is to enable long-term and integrated decision making rather than just provide subsidies or fiscal incentives to drive this transition forward. The use of public money needs to be in catalytic ways that is market-making, so it needs to be in addressing some of the risks, it needs to be in designing the types of market environment that's required, as well as in supporting R&D and underserved markets but not really in project financing but in driving in private project financing.

In order to do all of that, then, regulation also needs to keep up with targets policy and the long-term view that governments take. And often what we see—and this is especially pronounced in Asia, is that we see very large targets being announced, and political ambition being very much in keeping with less than 1.5 or the energy transition, but this does not always translate into regulation on the ground. That is in fact a huge challenge because the regulation on the ground is really what drives action in a market and creates robust markets. So in order to do that the electricity regulators, the industry regulators, the city authorities, they all need to work together. It's not enough to have a topline target, it is a need to break that down into the sum of its parts. So that would require much greater action and coordination between different ministries, between different public entities as well as we between entities and private entities whether they are industry or investors.

And so to my mind the three communities or three stakeholders that are going to drive the energy transition forward are governments across sort of international, national and subnational but then also industry and then investors. And how do you bridge the gap between the three of them and build coherence? And I think that a lot of the work that's been done in the global status report does take us some distance in building coherence but it also identifies all of the areas in which more work is required where gaps need to be filled.

And it also sort of takes stock of what works and what doesn't work. It's interesting to note that so many countries are adopting fiscal measures that act as penalties, so carbon prices or shadow carbon prices or cap and trade mechanism which is a means to price the externalities and the externalities

could in the Asian context could include everything from air pollution but also much more to actual emissions and beyond.

So I think there is significant advances the renewable energy sector has made predominantly in the electricity space but there is much greater need for better interlinkages between that and what happens in industry, end use consumption in industry for heating and cooling, for industrial processes as well as for commercial and residential use, as well as in mobility. And in order to do that there has to be a sort of multiple-pronged approach. One is going to be to take a strategic view on how much electrification of these processes are we likely to see in the coming years? Are we going to actually see a large move towards electrification of the mobility fleet, electrification of industrial processes, electric cooling, electric heating, or are we going to do a process heat sort of fuel cell based transition _____.

Countries just need to make these strategic roadmaps. And in order to do that that doesn't mean that they need to make that transition today but they're never going to be able to make it effectively if they don't plan for it in an integrated and strategic way, starting now. I think the GSR is a really good call for action and it identifies what countries need to do going forward. So I'll stop there.

Matt

Thank you very much for those thoughts. We're shifting to the Q&A session now. I'd like to remind our attendees to submit their questions through the question box at any time. We'll attempt to answer as many of these as possible, however if we don't get the opportunity to do so we'll talk to you outside of this webinar.

I've got one question here in particular that feeds directly into your points Kanika but I'll let Vibhu answer this first. And this is with an Asia focus in mind: What policies can be utilized to best address the integration of power, heating and cooling and transport? Is there one or two key overarching or holistic policies, or will a policy mix be required, and if so what would this look like?

Vibhushree

I can start and then Kanika please feel free to jump in as well from your experience. I think one good example of a region trying to do this now is the European Union with the carbonization strategy for 203. I think when we talk about a set of policies we have to think of the goal of decarbonization in mind. That's where sectoral [audio static] the end use sectors but also integration between vertical policy integration, regional, global, national, subnational, cities is required. So I think there are—when we talk about policies that's what also Costa Rica and Denmark are talking about is decarbonization of the energy system. That is what the basis of other policies need to be thought of as one energy system rather than electricity or something [audio static] or for cooling or for transport because it's really decarbonization that is the goal. That's my opinion; Kanika, do you have anything in addition?

Kanika

I think I completely agree with your—and then the EU is a very good example, but I think the answer is also partially in the question, that you need

a suite of options and also what works in one part of the world or in one region is unlikely to be exactly replicable in another region, and that's just because we have very, very—energy transition in different parts of the world is going to look different from each other. There is no one solution fits all. So I think it's important to take the spirit of the combined action and this multipronged approach and a suite of solutions kind of approach the EU is following but then tailoring that to the very specific requirements of our countries. That's a function as well of economic growth, domestic drivers and priorities [audio break] but also resource availability and the very specific institutional design.

For instance the institutional design in a country like India is significantly different from what is in China which are both very different from what is likely to be a possible solution for Laos or Cambodia. So I think we need to take the approach of coordination between different departments and between different sectors, but really then make these folk solutions for our countries and our regions.

Matt

Great Kanika. Any second thoughts on that, Vibhu, on those points Kanika made?

Vibhushree

No, I completely agree. I think that's one of the—I completely agree with Kanika, so I think both of those points, that we look at examples that exist for inspiration but really delving down to what's relevant or what's the regional situation is important. And having said that I think if the key is really to coordinate or integrate these policies across the vertical line which is in the governance systems you have _____ global, national, subnational, cities [audio break].

Matt

Thank you both for answering that question.

Similarly, but acknowledging the fact that governments and organizations sometimes have resource constraints in this environment and with enough regional focus in Asia what should countries prioritize over the next, say, five years or so, and maybe it's sort of timeline for their policies? Should they focus on renewables or should it be a much more integrated approach that they need to focus on?

Kanika

I think that for the countries of Asia the economics are so compelling, especially of more proven and lower capital-intensive technologies like solar and wind that it is really unavoidable, especially in the power sector for these countries to transition towards these technologies. And given the growing demand in a lot of the Asian economies there is the space to follow one of these, "We will do it all" kind of approaches where we will do renewables or we will continue to operate whatever thermal assets we have, and then plan a phase out. So you don't actually at the moment need to plan for the transition between thermal and renewable energy because of the growing demand in recent electrification growth in the region in Asia. Also taps into this latent demand.

As Vibhu's slides pointed out there is also growth in aspiration where you can see even in rural areas a move from pico solar to larger home systems, etc. So the demand is likely to continue growing, and that makes Asia significantly different from other parts of the world where we are seeing a plateauing of energy demand. So in that context I think that it would be unwise to delay this adoption of renewable energy any longer. Despite limited resources, given the huge decline and competitiveness of decline in price and then competitiveness of renewable energy the time is right. And the energy transition is really here and now for all of our countries, whether they're developing or whether they are slightly further ahead on that development curve or whether they are more developed but it's really a function of how efficiently we make this transition and again how do you make it timely and how do you make it one that you don't really use stopgap solutions but really sort of leapfrog to end solutions like a cleaner energy mix which is predominantly renewable energy-based.

So I would say that if you have limited resources use that to figure out grid integration challenges, use that to figure out transmission upgrades so that you can integrate more renewables into the grid and use that to figure out an integrated resource plan that looks forward, not just to 2030 but really to the middle of the century so that you can have a strategic plan to get the [audio break].

Matt

I think we just lost you there, Kanika, but just passing on to Vibhu, any question comments on that question on those points?

Vibhushree

Yes, I think everything Kanika said is very relevant for [audio break] in terms of priorities as well, like she spoke about [audio break] grid integration, etc. I think one of the key characteristics of Asia that I've been noticing for this exercise for the Asia report is that one of the biggest challenges is actually in terms of energy security and sovereignty. There are parts of the region where a lot of the current energy supply is actually imported and I think in terms of the drivers that that's one of the key drivers that countries could look to _____ the security of _____ supply but also the sovereignty because this is an interesting term I heard yesterday since I met _____ in Asia about how countries need to consider sovereignty as a priority and that could be a key driver to [audio break] integration of priorities and [audio break] resource allocation and when you are considering the energy transition.

I think this is one part, but apart from this and we've been doing a lot at REN21 is considering that a mindset shift is required and we need to start thinking of an energy system as a whole [audio break], and I mean I mentioned it several times; Kanika has mentioned it several times. I think that is the biggest takeaway for Asian countries like _____ in Asia where the situation is very different from the rest of the world [audio break] in terms of a way the economy is growing, but I think mind shift if you talk about [audio break] understand that energy underpins everything we do is important.

Matt

Fantastic and well-said Vibhu and Kanika. Thank you both for that.

We might must conclude the Q&A session there, so thank you both again for that. On behalf of the Clean Energy Solutions Center I'd like to extend a hearty thank you to both Vibhu and Kanika for their presentations and to our attendees for participating in today's webinar. We very much appreciate your time and hope in return we provided some valuable insights that you can take back to your ministries, departments or organizations. We also invite you to inform your colleagues and those in your networks about Solutions Center resources and services, including our free Ask an Expert service.

I invite you to check the Solutions Center website. If you would like to view today's slides and listen to a recording of the presentation as well as review previously held webinars. Additionally you will find information on upcoming webinars and other training events. We also post webinar recordings to the [Clean Energy Solutions Center YouTube channel](#); please allow about a week or so for new audio recording to be posted.

Finally I'd like to take a moment to invite you to take a moment to complete the short feedback survey that will appear when we end the webinar. Please enjoy the rest of your day, and we hope to see you again at future Clean Energy Solutions Center events. This concludes our webinar for today. Thank you very much.