FEMALE: Good morning everyone, welcome. I am Monica Bansal. I am with the Energy Division in E3 at USAID. I know we have some people from outside of the agency, which is great. I just wanted to thank everyone for coming. We are, obviously, going to talk about integrated resources planning. This is a topic that's important to me, and I think it often isn’t--it's not as sexy and doesn’t get as much interest. I think planning often gets short shrift in a lot of our programming across different sectors, so I am really happy to see a lot of interest in this and a lot of growing interest going forward.

So, I'm just going to talk a--I just want to get us started, get us on the same page of what IRPs are and why they're important, but I really only want to talk for a short amount of time so we can really get into some good technical, meaty content. And we have a pretty full day, so let’s get into it.

So, I just wanted to start off with--for us to have a very common, general, and very high-level understanding of what we are talking about with an Integrated

Resource Plan and, more generally, with the type of strategic energy planning that we're promoting. So, an IRP--there are a few things in this sentence that I think are important. It is a long-range planning process that often results in an investment plan.

So, the first part of this is that they're long range. I think in a lot of the countries that we work in, we'll see energy planning of some kind. It's not always--it's not often a long-range plan. This is a process. I think, this is a very typical--sorry--a very typical criticism of plans is that it ends up in this static document that sits on a shelf.

And that's really not what we're talking about with an IRP. We're talking about something that is very often updated every two to three years. And it--we're looking at something that leads into procurement and into an investment plan. These are typically utility-led with broad stakeholder participation.

However, we're--as we get into the sessions, we're going to talk about a couple of projects that we're

supporting in Tanzania and Ghana, and those look different in terms of who the primary stakeholders are. What we're doing is, we're evaluating supply and demand to meet energy requirements at a very basic level. And the purpose is to minimize present and future costs of meeting energy requirements while considering impacts on utilities, governments, and society. This part I think is important, as well, in that we're looking at different objectives, and this is a complex planning process that allows us to balance different objectives.

I'm going to talk a little bit about the South Africa example as I go through this where--it's a really great example of multicriteria decision-making, where, you know, we have, often, conflicting objectives of trying to reduce CO_2 emissions and trying, at the same time, to really focus on economic development, job creation. And also balancing other issues of, you know, security of supply, technological uncertainties, this sort of thing.

OK. So, I want to get a little bit into--the rest of this is really just to focus on why we're doing this.

Why are we interested in IRPs, why do we promote this, why do we think that this should be a major component of our energy programs going forward? But first is that, you know, this is a good-governance approach.

I think we all know that energy assets are expensive. There is a lot of potential for corruption. We see that a lot. And this is a process to have an open, transparent, and a stakeholder-led approach. It's a way to sort of take it out from these backdoor, like, negotiated deals that we don't get to see the inner workings of. I know I am going to talk a little bit more about that. But, the rest of it is, you know, risk. The industry is changing very rapidly. Prices are very difficult to get a handle on, especially over the long term.

And then, of course, climate change risk is something that's upcoming, and that's something that we're going to talk--we're going to get into a little bit more detail, since what we're adding into this is a resilience piece. There is also the long-term dynamics of the energy sector and the necessity to plan for

that. Assets are long-lived, and we really need to support an affordable, cost-reflective sector over the long term.

I am going to speak to this example later, but, often, you know, if we see a planning model where utility planners are simply projecting future demand and expanding their supply just to meet that demand, what we end up seeing is excess capacity and higher than necessary costs.

We also use--like I mentioned before--we can use this to balance multiple objectives and not just least cost. IRPs are often referred to as least-cost planning, but that doesn’t mean that the cheapest option is automatically selected. It means that we can study different alternatives, and through that, attempt to meet reliability and sustainability goals and other objectives at the lowest cost.

And lastly, it supports and enables our renewable energy and just, more broadly, our clean energy

building blocks, which I'll--I want to talk a little bit to that in some more detail.

So, an example of the point I just made on when we only look at a narrow aspect of planning, I wanted to give you this example of coal overcapacity in China. So, the end of April of 2016, they had more than 200 gigawatts of coal under construction. At the same time they already had more than half of their plants sitting idle, with waste projected at $148 billion by 2020.

So, why? Planning obviously isn’t the only reason that that happened, but it is a large driver of why they're having this issue. Not, actually, not just in coal, but with other generation technologies. They have very high curtailment for solar, which is, you know, they're dumping a lot of solar and wind, arguably, unnecessarily. With wind, they've had a curtailment rate of 40 percent in one province, 30--an upper number of 30--percent in solar. Just for comparison, in the U.S., we are under 1 percent for that, so that's just a complete waste of those resources.

So, why? In China, you know, they're working toward reforms, but at the moment, there is really no planning process to determine the right amount of generation capacity to meet reliability needs. They're really just doing a more simple analysis of this is what demand is, and this is what we want to build to meet it. There also aren’t planning processes or market price signals to guide where new investments are made.

OK, another example that we're going to talk a lot more about is Tanzania. This is--I want to use this to highlight risk, and how IRPs are a tool to get at managing risk in the energy sector.

So, in December of 2015 (that should say), despite almost 600 megawatts of capacity--of hydropower capacity--Tanzania’s hydro plants were--hydropower plants--were only generating about a fifth of that.

And TANESCO, which--their utility--which really can’t afford to do this, and not that most utilities could, were losing $230,000 a day. And I just wanted to highlight this quote that a TANESCO official made,

“There's nothing we can do, other than wait for the rains to come.” And at that point, that's true, all that they could do was to buy really expensive emergency diesel to make up for this loss. But, over the long term, you know, we're supporting them and making sure that there’s quite a bit they can do to mitigate this risk going forward.

So, I just wanted to talk also about the long-term planning and how that is--the long-term nature of this is an important piece of why IRPs are important. This is a snapshot of the 2016 IRP update for South Africa. I wanted to highlight their current situation where they're dominated by coal at about 80 percent of their energy mix. They have really aggressive climate change goals. They have economic development goals, like I mentioned. At the same time, they have some serious problems with their utility, Eskom, with their financial health, service quality, there is significant load shutting.

So, how do you meet really aggressive renewable energy targets--renewable energy goals--without a long-term

plan for doing that? And South Africa, I think, is a good example of, even when you have an IRP process from 2010 to 2016, they have been doing updates, over time, they're still running into significant problems with the utilities supporting some of their higher-level policies. And the absence of it, it seems it seems very unlikely that they would be able to achieve the high levels of new renewable capacity that they've been able to bring on.

So, I wanted to talk a little bit about how this fits into, I think, into our building blocks to scale clean energy. How many people are familiar with our--with the Agency’s building blocks to scale renewable energy? OK, I am going to talk a little bit about what they are. So, we have these six building blocks that we have been promoting as a way to scale clean--to scale renewable energy.

I've been saying to scale clean energy because I think some of these are also applicable to energy efficiency as well. We have been promoting them in more and more of our country--our mission programs. The first is

strategic energy planning, which is why we're talking about IRPs today, but I want to just briefly touch on the other four or five.

So, smart incentives, what we're talking about here are really policies and regulatory mechanisms to promote renewable energy. Grid integration, we're talking about the technical, operational, and, I guess, other solutions to better integrate renewable energy, you know, managing the intermittency of solar and wind into the grid and maintaining reliability and stability.

Renewable energy zones, where we're talking about the locational concentration of solar and wind, putting those resources where solar and wind are the strongest, where capacity factors can be highest, and also matching transmission to those areas. Competitive procurement is--what we're talking about here is reverse auctions where we--where we're finding that if we competitively procure large amounts of solar and wind, we're able to drive down the price and, increasingly, get more and more of the stuff on the

grid. And finance, which I think is a little bit self-explanatory.

I bring this up because I think IRPs are really important as a way to analyze all of these and as a precursor to some of these particularly competitive procurements. So, I want to talk a little bit about how IRPs support the other building blocks. When we talk about the building blocks, we don't really talk about them being sequential. You do one, then the other, then the other. They're all sort of, you know, you do them where they make sense in any given context.

I do think IRPs support the other building blocks in a way that you don't necessarily--you wouldn’t necessarily say of the other building blocks. And in that way, I think, it's tough for me to find an example where you wouldn’t want to do some version of an IRP or energy planning of some kind in a country.

So, I wanted to give this one example of testing smart incentives in IRPs. This is--this chart is from the Northwest Power plan, which is the Pacific Northwest

utility where they have--they set these different scenarios. They defined 67 different scenarios where they look at resource strategies, which are policies, these smart incentives over which we have control. Add on top of that futures, which are things that we don't have control over, and use that to create scenarios, which are some of these things that you see on the right.

So, what I think is interesting here, is that you can use IRPs to do these kinds of sensitivity analyses and scenario studies to see, OK, what's the impact? If we do X policy, if we do a renewable portfolio standard, if we decide to retire coal, what is the impact on the rest of the system? Or what's the impact on a specific resource that we're talking about. In this case, they're looking at what's the impact on gas, how much more natural gas will we need to add to the system if we do X, Y, or Z?

IRP is also an opportunity for grid integration. I'm not going to--I just put all of this detail on the slide so that you could look at it later--but all I

really want to say here is that we're seeing a lot more wind and solar, obviously, being added to the mix across the world, given the low prices that we're seeing.

And, I think, you know, we all know that there are characteristics of those technologies that we need to plan for to make them--to most economically and efficiently integrate them into the grid, like balancing the variability of wind and solar with flexibility in the system in different ways. IRPs can be an opportunity to start planning for some of those challenges and opportunities with integrating renewables into the grid.

This is an example of some things that were done when NREL supported South Africa in their 2016 IRP update through the 21st-century power plan--wait, partnership--power partnership?--to integrate some of these flexibility considerations into their IRP. We're also doing this in our--with ICF. We're doing a project in Ghana, and we're partnering with NREL to also integrate

some variability, flexibility considerations, or grid integration considerations, into that work.

For instance, one of the first things that we're doing is developing data templates to figure out what kind of data do you--what quality, what resolution of data do you need to integrate into your IRP if you want to be able to look at some of these flexibility issues.

OK, so I think, this is probably one of the most important points to me, that IRPs really do support large-scale energy auctions. This map shows--it's not complete, this is a work in progress--but I think it's getting there. Where the countries in green are countries that have both long-term energy plans, as well as large-scale energy auctions. Yellow are auctions only, and blue are plans only, although I will say that Kenya and Tanzania and the Philippines are all thinking about or planning auctions.

So, there are a few points to make here. One is that it's really difficult to imagine a very large-scale auction or competitive procurement program without some

kind of a planning process behind it. South Africa, again, is a great example of this, where to have five rounds of renewable energy auctions where you're bringing on 5,000 megawatts of wind and solar is pretty difficult to imagine. But there are also some other reasons that IRPs really contribute to the success of competitive procurement.

So, one of the things that auctions are really important for, is that as you do round after round, you build investor and developer confidence in that market. And, in doing so, you build up the competitiveness of that auction, which, in turn, drives down the price. What we've seen in South Africa, interestingly, is that I believe it was, someone correct me if I am wrong, but I believe it was round five that was canceled. Is that right, that was suspended?

Male: It was suspended.

Female: Yeah, sorry. It was suspended. And so, there--and there was some impact on some suppliers on wanting to

stay in the country. There’s one German supplier that I know of that closed up shop after hearing of that.

Now with the IRP--and the IRP update in 2016 signaled a renewed commitment by the government to developing renewable energy over time. And the theory there is that this is contributing to also a renewed developer confidence in the auction program going forward. I think I'll leave it at that, but this is something that I'm happy to discuss more at the end, too.

So, I just wanted to go through some example results and just some things that I think are interesting from IRPs. This is the seventh--again, the Northwest Power plan. And this is a result slide from their--2012? Sorry, I don't remember the year, but this is from their most recent IRP. So, what you can see is, they have--this is the mix of energy resources that are going to be needed to meet demand to 2035. That big green chunk is energy efficiency.

So, that--they're expecting that energy efficiency will meet 2,500 megawatts of their expected demand going

forward. It's--I'm not sure that without an IRP that actually treated energy efficiency as a resource, you would see that sort of a result, and at tremendous cost savings to the rate payers as well. And just, you know, there’s a few other--there’s tiny little slices up there of--well, natural gas is not tiny, but the other ones, too, so, I just wanted to make the point that energy efficiency is a growing part of the IRPs and we'll get into a lot more detail on that today on how that's done. I also just wanted to make a point that IRPs are a process. I mentioned this at the beginning, that they're not static plans. I think this is very important as the sector changes so tremendously in terms of price and technologies and, you know, how utilities are functioning in this changing world.

Here I just wanted to show a few slides comparing the South Africa IRP, the 2013 update, and the 2016 update. I will make the point that the 2013 update was never passed. And that, in itself, is an interesting point of discussion for us to talk about IRPs within the political context of energy development in a country. Where, you know, it not being passed was largely a

political issue of not necessarily--my South African colleagues can add some more nuance to this discussion, but my understanding is that it's really an issue of not necessarily agreeing with what was in it.

But here you see a difference from 2013 to 2016 really of the government’s commitment to solar thermal, which is very, very expensive. And having a process where you keep analyzing prices and keep analyzing the impact to your system allowed them to end what BnEF called their "costly love affair" with solar thermal.

I will say, too, that assumptions are really important. And I'll get to, actually, let’s skip to the nuclear slide. This is really the political hot point in South Africa is nuclear development.

So, in 2016, what you see is really just a pushing of nuclear development further and further out, which Eskom is not happy about. And so there is still some question of whether--of what kind of support this IRP update is going to have. But the fact that nuclear even still shows up, and why we see so much renewable

development, some, you know, some of the analysis shows that the assumptions they're making on the prices on the LCOEs of these technologies are really low. They're artificially low, likely.

So, this is something that, again, it speaks to the importance of having updates, because you get to revise these prices, these assumptions. Hopefully, you're revising these and updating them over time through stakeholder input, through public comment, through--and just through technical analysis. So, I'm going to end with that, and just say that we have a--we only have one day, today, and we are trying to cover a lot of content.

So, I did want to just open with saying that, you know, there’s an evaluation at the end. We're really open to any feedback you have on the content, the structure, the length. But, you know, we do think this is a really important topic, and so we're likely to try and give these kinds of workshops and present this information in the future, too.

So, and I also want to say that, you know, that these are--IRPs are a really big undertaking. These are not--these--you know, it's not just a study that we have a contractor do and then hand over. It requires a lot of political will, a lot of capacity building, and technical capacity of our local counterparts.

And so, to me, the objective here is for us to be able to guide our government counterparts in initial conversations on why IRPs are, what they can accomplish, and why they might be a valuable and important tool to manage the energy sector. I also want us to come away with this, understanding how we, as USAID and other USG counterparts, might approach supporting an IRP process in our partner countries.

We're going to talk a bit about, you know, what scope is appropriate for an IRP in a given context. We're not always going to do a huge modeling effort to the same degree in every single country. It's not going to look the same. What capacity is needed, and what are the best--some of the best practice components of an IRP.

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