BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE EXPANSION OF THE COOLIDGE GENERATING STATION, ALL WITHIN THE CITY OF COOLIDGE, PINAL COUNTY, ARIZONA.	Docket No. L-00000B-21-0393-00197 LS CASE NO. 197

At: Casa Grande, Arizona

Date: February 15, 2022

Filed: February 22, 2022

REPORTER'S TRANSCRIPT OF PROCEEDINGS

VOLUME VII
(Pages 1102 through 1313)

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BE IT REMEMBERED that the above-entitled and numbered matter came on regularly to be heard before the Arizona Power Plant and Transmission Line Siting Committee at Radisson Hotel Casa Grande, 777 North Pinal Avenue, Casa Grande, Arizona, commencing at 9:01 a.m. on the 15th day of February, 2022.

BEFORE: PAUL A. KATZ, Chairman

ZACHARY BRANUM, Arizona Corporation Commission (via videoconference)
LEONARD DRAGO, Department of Environmental Quality
JOHN RIGGINS, Arizona Department of Water Resources
JAMES PALMER, Agriculture Interests
MARY HAMWAY, Incorporated Cities and Towns
RICK GRINNELL, Counties (via videoconference)
KARL GENTLES, General Public (via videoconference)
MARGARET "TOBY" LITTLE, PE, General Public (via videoconference)

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CHMN. KATZ: We'll go back on the record. And I understand that there may be one or two small preliminary matters that we may need to discuss, and then I'd like to get started with whoever is our first witness today.

MR. ACKEN: Thank you, Mr. Chairman. I'll go first. I'm not sure if anyone else has a procedural item.

But there was questions yesterday afternoon regarding a settlement proposal that SRP had made to the Randolph intervenors, the settlement proposal that was rejected. Then Ms. Rickard testified to it on both the scope of that offer as it related to the community working group.

And so what we wanted to do is -- I had marked it. We have marked it as an exhibit, is SRP Exhibit No. 6. And offer if any party wants to ask questions about that settlement offer made that we would recall Ms. Rickard to answer any questions.

CHMN. KATZ: And just so everyone knows, after Ms. Rickard's testimony, I asked if she could summarize the things that she had testified to. And I then sent the typed document to Tod and asked him to distribute it amongst the Committee. And I should have said amongst everyone because you all have in advance the proposed CEC that was proposed by Mr. Acken.

I have edited it in very minor ways, and we'll end up projecting my edited version of that on one screen in PDF so it can't be changed. And on the right side, we'll have another screen. It will be in Word. And we will hear from everybody, and the usual procedure would be to review the CEC. Whether or not it's going to be granted, we want to have the conditions that would be required. And the vote on whether or not to issue that would be a roll call vote. But I don't want to -- we're not there yet.

But any further comments on this particular issue? I don't think it's that big of a deal. It's some additional conditions that we can add in our other conditions that could be added in the event that the CEC were to be granted.

Ms. Post, you've indicated to me that you have an issue that you also wanted to make a record?

MS. POST: Yes. I just received this morning a copy of the 2025 general land use plan -- land use policy from Coolidge. And in it, it zones Randolph as industrial. And I doubt that the Randolph residents had any say-so in this. It also lists a freeway that is planned, a north-south freeway. If you recall Ron Jordan testifying that he thought that when this started, that that would entail eventually a freeway going through

their property. And it's not going right through Randolph, but it is close. So I would like to -- this is Exhibit No. 33 for Randolph residents.

CHMN. KATZ: That's fine. And it was my understanding that sometime around -- I don't know dates -- that that area became industrial, basically ignoring the existence of the community.

MS. POST: Well it wasn't -- around Randolph. But now they've actually zoned Randolph.

CHMN. KATZ: That's right. I don't know the exact history of the zoning, but you're more than welcome to add that exhibit.

MS. POST: Thank you.

MEMBER LITTLE: Mr. Chairman.

CHMN. KATZ: Yes, Ms. Little.

MEMBER LITTLE: I also have one item.

Yesterday I brought up the issue of the system study, the electrical system studies. And Mr. Emedi indicated that SRP had provided some additional information about those.

And I've been unable to find that. I've looked in the docket. I've also looked in the BTA docket. And I'm wondering if he could perhaps elaborate a little on how I might find that additional information.

All I can find is a letter from Staff that

says -- makes a recommendation that these hearings be postponed until the system studies could be completed.

CHMN. KATZ: Ms. Ust?

MS. UST: Yes. I believe yesterday, Member Little's comment was referring to the Power Flow and Stability Study. Is that correct, Member Little?

MEMBER LITTLE: Yes, it is, thank you.

MS. UST: Okay. And Stephen's comments yesterday were only referring to the System Impact Study, which is not complete, but it is Staff's understanding that SRP has completed the Power Flow and Stability Study.

MR. ACKEN: And if I could just supplement that, in our ten-year filing, we noted -- excuse me, not the ten-year filing -- the 90-day filing for this project, we noted technical study reports, internal planning criteria, and system ratings are deemed confidential critical energy electrical infrastructure information, CEII, and said that that would be made available to Staff under separate cover and pursuant to confidential agreement if requested. So that information was referenced in the 90-day filing, but that information is not included in the 90-day filing because it includes that CEII information. And so that offer was made to Staff.

And just to follow up on what Ms. Ust said, we're talking about two different things. What is it -- again, the System Impact Study versus the transmission studies that is part of that 40-360.02 that you referenced yesterday.

MEMBER LITTLE: What exactly -- I'm unclear. What is the System Impact Study?

MR. ACKEN: You know, we will have a witness available on rebuttal to answer questions about that, probably Mr. McClellen, who can do a better job than I can.

System Impact Study, I will just say now is a FERC requirement. It is a requirement for interconnection for any interconnection, but it is not a prerequisite for either a CEC filing for either a transmission line or generation project. So I think that's where that confusion lies.

MEMBER LITTLE: Thank you very much.

CHMN. KATZ: In just a minute, we're going to go off the record for a second. I'm getting absent-minded. I want to go get a glass of water in case I get a dry mouth. So I'll be back in about 30 seconds, and we'll call our first witness.

Kindly, Leonard Drago is getting me my glass of water. So that's my birthday present for the day. So

thank you all.

Who's going to be our first witness this morning?

MR. RICH: Good morning, Mr. Chairman, Members of the Committee. Sierra Club is calling Rob Gramlich, and he is joining us via Zoom.

Great. There he is. Let's test your volume really quick. If you could say something, Rob.

MR. GRAMLICH: Morning. Can you hear me?

MR. RICH: Yes, we can. I think the Chairman will swear you in first, and then we'll proceed.

CHMN. KATZ: And do you prefer an oath or affirmation? We can do either.

MR. GRAMLICH: I'm sorry. Are you asking me? I'm fine with either.

(Robert Gramlich was duly sworn by the Chairman.)

CHMN. KATZ: Thank you very much. You are sworn, and we may begin questioning.

ROBERT GRAMLICH,

called as a witness on behalf of Sierra Club, having been previously sworn by the Chairman to speak the truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. RICH:

Q. Good morning. Would you state your name for the record, please.

A. Sure.

Rob Gramlich.

Q. And, Rob, where do you work -- by whom are you employed and can you give us your work address?

A. The consulting firm that I own and run as president is called Grid Strategies, LLC.

Q. And can you tell us a little bit about your background, please.

A. Sure.

I've been in the power sector for 30 years. I spent eight years at the Federal Energy Regulatory Commission, a couple years as the PJM grid operator for the mid-Atlantic region as senior economist. And now, for the last five years, I've worked at my own consulting firm on power systems and transmission and power markets

related to clean energy integration into the grid.

Q. Great.

And we've got in front of us on the big screen in the room is a presentation that we've shared with SRP before this and that we've premarked as Exhibit SC-34. I'll note on the cover of this, it says Michael Goggin. Do you want to just clarify for the record the situation there and why you're here in that situation.

A. Sure.

And I want to thank the board for allowing me to replace Michael. Michael is my vice president at Grid Strategies and partner. His wife went into the hospital Thursday night and has been there since. And they have a three-month-old baby, and it's a complicated situation. He's out for two or three weeks, so I'm filling in today.

Q. Thank you for your flexibility and for being able to be here.

I'm going to ask you to sort of summarize your testimony and begin taking us through these slides that you have worked on with Michael.

If we can go to Slide No. 2, and please, Rob, give us a summary.

A. Sure.

So as an overview, if SRP had fairly evaluated the alternatives, it would have found battery storage to

be more cost effective and reliable than the Coolidge Expansion Project, which I'll call CEP.

SRP's economic analysis overstated the need for clean resources by a factor of 3 or 4. So, of course, if you have an inflated estimate of the quantity needed, then the cost will be very high. So the economic analysis was distorted by overstating the capacity needed for the renewables and storage.

A battery would have been more economic than CEP. Batteries also provide a range of services better than CEP. And what happens is as solar comes on and expands in the territory, then the length of time that you need to run the batteries shortens and it moves from the afternoon into the evening period, which basically allows those batteries to be very effective and to keep contributing their capacity, essentially the reliability and the ability to make sure a load is served in all hours. It keeps that ability of batteries very high for a number of years into the future.

So -- and a battery, of course, installed today keeps that capacity value for the decades that it's in service. So that is, we think, a more economic option, and we don't think SRP has demonstrated a need for new capacity or other reliability services based on data from NAERC. That's the continental reliability authority.

And based on information about imports in the region, resource adequacy is really a regional concept, and there are resources around the region and the relatively new Energy Imbalance Market across the West, which enables load to be met, and SRP is one of many utilities that take advantage of that opportunity.

So that is the summary of my testimony today.

Q. Great. Thank you.

So let's move forward, and I'll ask that we move to Slide No. 3. And if you could explain to us your perspective if SRP has adequately evaluated the alternative to the CEP expansion.

A. I don't think SRP meaningfully assessed the alternatives. And had it done so, it would have chosen batteries instead of CEP. And we can go to the next slide on that.

So this shows the 3 to 4 times that I was talking about those carbon-free capacity needed to provide similar reliability. That big long bar, the blue bar on the top, shows a very large amount of battery capacity provided by SRP in order to provide the same capacity that CEP provides, and that's the number that we think is inflated. And, of course, if you have to buy that much capacity, you have to pay a lot of money, and that option looks less attractive.

I guess we can go to the next slide.

Q. And let me just stop you for one moment and just clarify just for the record, you'll see on this slide when it was prepared, we had noted it says "confidential," and it's highlighted. This slide and a couple other slides in this deck have that notation.

We've spoken with SRP, and they have agreed to waive confidentiality of these particular figures on these slides. And so I just wanted to clarify that for the record that while they say "confidential," they are no longer subject to confidentiality. I just wanted to make that clear. So go ahead.

A. I appreciate that.

So a consultant named E3 did this analysis. My understanding is it was -- that firm was retained by SRT to study this exact question that we're talking about, which is how much solar and storage do you need to provide the equivalent reliability of CEP.

And E3, which is a very respected firm and certainly one that I'm very well familiar with -- I've, in fact, invited them to speak at a forum that I created called the Future Power Markets Forum, and they do good work on estimating this concept which is called capacity value.

And what they found is instead of that large

list of 2,000 megawatts required, E3 found that adding only 731 megawatts of battery capacity in 2026 provides the same capacity value as the 820-megawatt CEP. So, in fact, batteries have a higher capacity value than the natural gas plant expansion. And so from my perspective, the E3 number is very credible based on modeling, not just their work around the country, but specific to Arizona, because Arizona is relatively unique, and it's obviously a tremendous solar resource. And as we'll talk about a little bit more, solar and batteries have a great deal of synergy together. So the more of one increases the value of the other.

We can go on to the next slide, Court, if that makes sense.

MR. RICH: Slide 6, please.

Q. BY MR. RICH: Just for the record, to catch up on where we're at, we're looking at 5 -- we will be looking at Slide 6 of Sierra Club's Exhibit 34.

A. Right. So the upshot of that is SRP's alternatives analysis ignored a real alternative available to the utility. It built 4 times more alternative resources than needed by understating the capacity value of storage.

SRP also assumed the replacement portfolio included a high-cost renewable fuel CT so, essentially,

the alternatives to CEP wound up with a mistakenly high cost, and that tended to make the CEP option look better.

Q. So, Rob, let me ask, I guess, how does that work? So you're saying that -- I guess the question is, did SRP accurately value the alternative for solar and storage?

A. Right. So they did not accurately value because they overstated the amount of storage you would have to buy to provide the equivalent capacity.

And then, actually, the other half of that answer would be on Slide 7, the next side, which is about the costs.

And so the storage, you can see on the bottom right, is 1242 million over 20 years, and the CEP is 1774, quite a bit higher. So you're paying more for CEP than the storage. And as we just discussed on the previous couple slides, the batteries are providing more value.

So the CEP option relative to the battery option we think is not as attractive, again, based on the E3 analysis that SRP purchased from that consultant.

Q. Can you --

A. The assumptions are noted here, and they're in exhibits for reference.

Q. Can you talk, Rob, about the synergies between

solar and storage.

A. Sure.

So, essentially, when you have -- and there's a nice picture later on, but when you have a lot of solar on the system, you can keep getting a lot of output through the late afternoon period. So you really don't need the batteries until after dinner, until 7 to 11 p.m. So you can save it for that, and that becomes a shorter time frame than without solar on the system. So a typical four-hour-duration battery can very well provide that.

Now, I say four-hour-duration battery. That sometimes is misinterpreted, so let me clarify that. These lithium-ion batteries that are used on the grid by SRP and many other utilities now, they're being deployed all over the country at an incredible pace. They're called four-hour batteries, but that doesn't mean you have to dispatch -- discharge them at the full speed, which is what would take four hours. You can just start discharging more slowly over a six- or eight-hour period, and it's just a choice how to operate them. But for shorthand, to simplify, we call them four-hour-duration batteries.

But the synergy, to answer your question, is that solar, in particular, and this type of lithium-ion

battery are very complementary. So the more you have one, the more you're able to integrate. Of course, it works in the other direction too. If you have a whole lot of batteries on a system, then you can run more with solar because without the batteries, you might just have way more energy than you need at 2 in the afternoon.

And so at a certain point, adding more solar doesn't help you very much because you already have more than you can use when it's operating and less than you need at night. But with the batteries, you can integrate a lot more solar and be part of a reliable system. So that's the synergy.

Q. Let's go to Slide 8, I guess. Is there anything else on that that you want to speak to with regard to synergies?

A. Yeah, so this is -- it shows the idea that in different months, you have to actually curtail, meaning you have certain periods where you've got more than you need. And, of course, that's wasteful. But the great thing about storage is instead of essentially spilling solar energy, you can store it. You can put it in a tank, effectively, and use it later. So at different times of the year, it becomes -- you know, that happens at a different amount. But the point is that storage and solar are very complementary.

Q. And the CEP doesn't do anything to help with the midday solar output issue, correct?

A. Correct. And that's important because, a -- let's pick a number. A 100-megawatt battery is actually providing 200 megawatts of ramping, of moving power from one time to another. You can be fully charging the battery at, say, 3 p.m., and then at 6 p.m., you can be fully discharging. So the net difference from negative 100 to positive 100 is 200. So that battery is essentially providing that full 200-megawatt range, whereas, any fossil plant or any conventional generator like natural gas-fired power plant is only going from zero to 100.

Q. Let's move to Slide 9, and I'd like you to talk about some of the additional benefits of batteries and explain this chart that's on there.

A. Sure.

Well, first of all, natural gas plants and batteries both provide a lot of reliability value relative to other resources that may be nondispatchable and slow-moving. So, for example, coal plants are hard to just turn on and off and ramp up and down. Nuclear plants are hard to move. Basically, they're on the run, but they're not flexible like natural gas and batteries.

So the main thing is these sort of columns in

the middle where you see storage hydro and natural gas, hydro is also very flexible and dispatchable. Those three are much more solid circles, meaning they're providing a lot of these reliability services relative to the other bars.

For example, nuclear, while it's available when it's on, it's not providing these flexibility services. And so just to describe without going into details of all of the rows, these are reliability services in terms of how much power might be needed from a subsecond time frame, nearly instantaneous, to seconds, minutes, hours, days. These are different services, and power quality features like reactive power both are supporting the voltage of the system. These are all essentially services that the grid operator needs to keep a whole system reliable.

And grid operators, if given the choice, would love to have any of these sort of three technologies, gas, hydro, batteries, because they just can do so much for you given whatever might happen on the grid. But that said, the batteries are extremely fast and flexible. They are literally at a moment's notice, and they can instantaneously, you know, sort of go from zero to 60 very fast. They can ramp up and down and go any direction. So they're extremely flexible and valuable to

a system operator.

Q. Let's go on to Slide 10 and have you explain what we see there.

A. Yeah. So kind of zooming the lens out to the country to put this situation in context, what we see all over the country is utilities and independent developers building a tremendous amount of wind, solar, and storage. That's really dominating the new generation. It doesn't mean conventional or existing generation is all being closed at the same rate. In fact, there's a lot of natural gas plants that expect to have good, long lives to balance power systems. But there's not a lot of new gas generation, there's almost no new nuclear generation, and there's no new coal generation.

So the conventional generation of the past of nuclear, gas, coal, and large hydro, those are not really being expanded. Nobody is building those. It's just not -- they're just not cost effective or they bring risks to the utility based on future fuel prices or carbon regulation or health requirements.

So what you see on the graph here is in the Western region, on the left side -- this is from Lawrence Berkeley National Lab, where I used to work, actually. And they have wind is the blue. You can see a lot of wind being developed. Solar is the yellow. Standalone

storage is the green.

So that makes up -- you can eyeball it, but it looks like 95 percent or so of the new generation connecting to the queues, the discussion before about System Impact Study, that's what's done. You file to interconnect your generator, do a System Impact Study. So this is in public record of who is trying to connect to the queue and what type of generation it is. And, again, almost all the new generation is renewables and storage. Barely any is gas, and none of it is nuclear or coal.

Q. Let me ask you, Rob, there's a bullet point on here, the second bullet, says: SRP's 2020 solar RFP did not allow hybrids with storage.

We heard testimony from SRP that it did not do an RFP for this before announcing it and moving forward. Can you comment on that.

A. Sure.

Well, clearly it's best practice in the industry to have an RFP for whatever is needed. To say here on the reliability services or capacity or energy that I need now, anybody come in and, you know, bid your price to provide those services.

But one great advantage of that is that you get the latest market information about these options because

the cost has been coming down dramatically for solar, storage, and wind, for example. So you want to do that and have an up-to-date RFP and bidding process. But another advantage is you get the benefit of all of the options that you might not have gotten if you had just said, you know what, I've decided I want to have a gas plant or I want to have a solar plant or whatever type of preference.

And a really popular option these days is a hybrid storage and solar project. There are some benefits listed here in the third bullet about how the tax credits work. Also the interconnection, you can just interconnect once rather than having to do it separately for the solar and the storage project, and that's a great efficiency and there's economies of scale in shared equipment.

And so, to sort of highlight that, the bottom right chart in the green shows the amount of paired solar and storage there. And then on the left is solar, and the hatched portion, I guess, of the blue and green, the blue and green are different years, but the hatched portion shows the significant growth in hybrids and the growth in popularity of hybrid projects, which, it's my understanding, that was not considered as an option here as an alternative to the CEP.

Q. Let's turn to Slide 11, and I'd like you to talk to us a little more about capacity value.

A. Sure.

So this is a key concept here. For a typical 100-megawatt plant that may be entering -- no type of generation, whether it's nuclear, coal, hydro, gas, wind, solar, storage, no type of plant has a full capacity value of that full 100 megawatts because, at the time it counts, and this is an analysis that utilities and their consultants do, when it counts, when the system might be short, no plant is 100 percent available. They have forced outages, they're mechanical machines, they break. Or if, you know, the wind isn't blowing, the capacity value of wind, for example, is probably under 20 percent in Arizona, not 100 percent.

Now, gas and storage are more in the 80 to 90ish percent range in terms of their capacity value relative to the nameplate. But as I mentioned before, it turns out that at this point in time, adding storage provides more capacity value than CEP. So the equivalent in 2026 of the CEP on the left chart there is 731 from batteries.

So this hangs on -- now, there's a couple dynamics to talk about with capacity value. And we've been working with this effective load carrying capability concept for quite a while. I see SRP started using it

in -- well, I'm not sure if that information came from confidential information or not, so I'll just say they're using it now.

And one dynamic of ELCC is that as you add more of a resource, the capacity value tends to decline. So it's like your first pair of shoes is really valuable to you, but your ninth pair of shoes is less valuable. And so there's that saturation effect over time. And people understand that I think generally across the industry.

What's I think only recently being appreciated across the industry, you know, even though people like the National Renewable Energy Lab has been writing about this for 10 or 20 years, is that there are interactions between the resources. So that saturation effect is actually not very significant in places where there's a lot of sun when you're talking about the capacity value of batteries because of this synergy that we discussed before about the times of day that you would need it.

So when you add a lot of solar, you don't need to operate the batteries so much in the late afternoon. You can shift it to the evening for a shorter period of time. So a four-hour battery does just fine, and that's reflected in the E3 analysis showing this high capacity value of the storage.

Q. Great.

Let's switch to Slide No. 12. And if you can talk a little bit about how storage relieves the need for the CEP.

Are you still there?

A. Yep. Can you still hear me?

Q. We lost your picture, so let's hold on one moment. We can hear you, though, but let's wait until your picture is back up.

AUDIOVISUAL TECHNICIAN: You have to give me a minute. Zoom lost the picture.

CHMN. KATZ: We can hold off just a minute or two.

MR. RICH: We're having a technical difficulty, Rob. But if you'll bear with us, they're trying to get Zoom to give us the picture back.

THE WITNESS: Okay.

MR. RICH: All right. We see you again.

Mr. Chairman, shall we continue?

CHMN. KATZ: Anytime you're ready, we'll go ahead.

MR. RICH: Thank you.

Q. BY MR. RICH: Okay. After a brief delay there, your video has been restored in the hearing room.

Rob, can you just, I guess, continue the discussion on capacity value and how it relates to

batteries and solar being able to replace the need for the CEP and take us through the next couple slides with that discussion.

A. Sure.

So on Slide 12, storage obviates the need for the CEP. This, again, is based on E3's modeling that shows that storage offers more capacity value than CEP throughout the 2020s. And from the earlier slide, the storage being slightly less costly. So being slightly less costly and providing more capacity value, the storage option we think is superior. And you get some additional reliability services to boot.

As we've discussed a little bit, increasing solar penetrations will ensure the capacity value of storage remains high throughout the 2030s. The saturation effect that I mentioned does not appear to be on the horizon. In a place like Arizona, you would have to get to extremely high penetrations of storage before that is an issue. And this concept of, you know, the first pair of shoes being more valuable than your ninth pair, the question really is about the first or second pair of shoes and that those are going to be valuable for a good long time. If the result is different in 10 or 15 years, one can certainly do an assessment at that point and compare gas to battery storage. Or at that point,

who knows, there's a lot of work being done and research on longer-duration storage types. So there might be additional options.

Moreover, there are always the Westwide markets on which to rely. And so there are other options. And, therefore, it seems unwise to make an irreversible investment of $830 million -- it should say million on the slides -- in a gas plant that may end up being a stranded asset.

Q. Let's go on to Slide 13. There are some illustrations that talk about solar and battery capacity value. Can you take us through that.

A. Sure.

So this is important, first of all, to visualize what we discussed before about batteries operating in the future, with solar penetration, operating differently; namely, later in the day and for a shorter period of time than they might be operated today. So while it may be understandable for a utility to say, this is how I operate storage plants now, and that might be represented by this middle chart with the purple area showing 8 a.m. or so until 6 p.m. being the stretch of time when the batteries are operated, in the future, with high-penetration solar and looking at the whole system as a portfolio, as utilities do, you can see that the

concentrated time of operating the batteries is around, you know, dinnertime and early evening.

So it shifts to later in the day, and it's also pointier. The shape of that purple blob is pointier on the right than the flatter blob in the middle, signifying or showing that there's a shorter time period over which you would operate the batteries, and so that shows the synergy. Which, by the way, is true in all parts of the country, but particularly true in places with a lot of solar energy.

So this is something that we wanted to quantify. It was quantified in each regionalysis. But it doesn't appear that each regionalysis of this synergy effect showed up in SRP's economic analysis.

Q. And let's switch to Slide 14, and there's another chart that helps depict this. Can you talk us through that.

A. Sure.

So looking at that same concept a different way, if you compare the lower line to the higher line in green, the higher one in green shows when batteries are applied; whereas, the lower ones are back to solar alone. PV penetration is the horizontal axis of solar PV penetration. When it goes from 0 to 5 to 15 and up to 25 percent, you have a certain amount of penetration

potential of storage. But when you're operating together, you get this much higher penetration potential.

We can just -- well, we don't have to distinguish between the 4, 6, and 8 at this time, but the point is that you can do a lot more storage reliably with batteries and vice versa. You can do a lot more batteries with solar.

Q. And SRP has testified in this case that they are adding a lot of solar to their system. Is it correct that the CEP will not have that same impact on solar, it will not increase the capacity value of that solar the way batteries will?

A. Correct. That interaction is not nearly so pronounced with gas plants.

Q. There's been a lot of comparisons between batteries and the CEP project. On the next slide, on Slide 15, can you explain what this is and how you've used this to compare the potential run time of batteries and the CEP project.

A. Sure.

So existing Coolidge generator operates for short intervals.

This is about -- this type of natural gas plant, which is a combustion turbine, simple-cycle combustion turbine. And it needs to be understood that these are

plants that operate very little. They're built to just operate for very few hours, and they tend to operate that way. It's not like a combined-cycle plant that is more day in, day out, or a nuclear or coal plant that people used to call baseload. These are really peaking plants. They really only operate for periods of time.

And so when you're comparing batteries that don't operate for super long periods to combustion turbines, you know, it's not like the combustion turbines are really operating for long periods of time. The reason in that case is because of the costs. They're very expensive in terms of their operating cost to burn the fuel because they're relatively inefficient in how they burn fuel and it's expensive to operate them, so utilities don't tend to operate them for very many hours.

Q. We see something with a lot of numbers on it on the screen. Can you give us a brief description of what it is that we're seeing there.

A. Yeah.

So this is information about how the current power plants are dispatched, are operated. And so the main number you're seeing across all of this is the number zero, which is over different hours of different days. Hours across the top, 1 through 24. Days across the side there, August 1st, August 2nd, down through the

end of August.

You just -- you can just see visually where there's a positive number, those are the hours that the units are operating. And, you know, most of the time, they're not at their maximum output. It's a lower number than the 1,300 or so that is the highest number.

Q. And so this is -- and this is during times of extreme heat and significant energy usage, correct?

A. That's right. So one would assume that this would be the -- you know, the time when it would operate the most relative to other months.

Q. And in your opinion, batteries could provide this service in place of the gas plant?

A. Correct. That -- you look across here, there aren't many extended periods, if any, where the plant is operating. So batteries can provide bursts of a few hours of energy. Or depending on how they operate, three to five or more hours of energy when needed.

Q. Let's go to the next slide, Slide 16.

A. Slide 16 shows that SRP did not incorporate what we're talking about before, which is the shifting of the battery operation to the evening period into a more concentrated number of hours. So that whole synergy effect between solar and storage appears to have been ignored in the SRP analysis .

The SRP slide here shows -- the black line going up in terms of system need over the course of the hours of the day, 1 through 24, along the horizontal axis there. Capacity on the vertical axis.

So you can see in the afternoon, the black line goes up at hours 16 through 18, you know, 4 and 6 p.m., that type of range. SRP's analysis shows in hours 19, 20, and 21, a red area there where there is unmet need. So that may be the case if one chose to operate the batteries sort of the old way of during the afternoon and into the late afternoon but not into the evening.

But in the way one would operate with a lot of solar on the system, shifting the battery usage to later, to a more concentrated time, the batteries would be available through hours 22 and 23, and that need would be met in fact.

Q. Okay. Let's go to Slide 17.

Let me ask you about if you can help explain some of the risks associated with further investment in gas resources.

A. Sure.

So we've seen some dramatic incidents in the last year, but it's not just the last year, where natural gas is not always as reliable as one may think.

In February 2nd of 2011, SRP, in fact, had to

shed 300 megawatts of load, affecting 65,000 customers after the loss of generators and supply from the Permian Basin. The Permian Basin, of course, is the gas -- oil and gas area in West Texas and Southeastern New Mexico. A lot of the Southwest gas comes from that area through pipelines that deliver to Arizona and California.

And we saw a year ago Winter Storm Uri, you know, that area had a lot of freeze-offs, if you will. The February 2021 bullet here, large scale freeze-offs of constrained pipelines. So that obviously had dramatic effects on Texas, where they lost a lot of their natural gas capability, but also it affected a lot of the West.

And as recently as a couple weeks ago, just this month, El Paso Natural Gas pipeline is experiencing a loss of supply in the Permian Basin as a result of winter weather and freeze-offs.

So just to make the point that natural gas is not always as dependable as one may think, especially in states like Arizona that depend on a state-or-two-away resource rather than having it in the state.

Q. You mentioned the Winter Storm Uri. If we can skip to Slide 18. Can you talk more about that and how natural gas played a role in that issue.

A. Sure.

Some of the -- the two reliability regulators of

the country, Federal Energy Regulatory Commission, FERC, where I used to work for the chairman there, and NERC, which has been designated by FERC as the reliability authority, they did a study after last year's outages in Texas and other parts of the country. And the result was a finding of a quite dramatic loss of generation capacity. 192,000 megawatts of nameplate capacity lost. That's an incredible amount of capacity that was lost, and the majority of it was natural gas.

And that happens for a variety of reasons, including issues at the actual natural gas power plant with freezing. It's been widely publicized that there was not always good winterization, which one might say, why, in Texas, would you have, you know, winterized the plant. But, of course, now we know these weather events can happen there but also upstream on the pipeline with compression stations, the well freeze-offs, etc., so it was up and down the gas supply chain where there were losses.

Q. Has NERC said anything about the relative risk to Arizona of gas generation?

A. Yes. So on the next slide, 19, the red areas show areas with over 400 megawatts of vulnerability. This is also from a NERC report, the Potential Bulk Power System Impacts Due to Severe Disruptions on the Natural

Gas System, and Arizona shows up in there as having a lot of gas risk.

You know, other regions like New England, for example, also have red blotches. They notably have only about a third as much natural gas planned as California, Arizona -- Southern California and Arizona. But they famously have very limited pipeline import capability into New England.

There's not quite the constraint in the Southwest, but it is also a region that is dependent on other regions for the actual gas.

Q. And Slide 20 talks more about or presents another map relative to NERC's findings. Can you explain that.

A. Sure.

So, yeah, the map on 20 kind of shows the pipeline network. You can see where, again, Arizona gets a lot of its gas from the Permian Basin there in West Texas.

And the effective capacity is shown in the blue bar chart. So California has some vulnerability, but Arizona does as well. This is also from NERC's report about vulnerability to the gas system.

Q. Is it your understanding -- or -- let me strike that and start over.

Do you know whether or not SRP accounted for the risks that are correlated to gas outages in analyzing this project?

A. It doesn't look to us like SRP accounted for the risk of correlated gas outages. And let me define that term.

So correlated gas outages -- and we can turn to Slide 21 for this. Correlated gas outages are the phenomenon where multiple power plants are affected by the same thing.

So the clearest example, just to explain it, is in Texas, all these natural gas plants were affected by that same Winter Storm Uri. And that's an example of how one cause can affect multiple power plants.

And this idea of whether it's weather, whether it's heat, whether it's cold, whether it's other kinds of weather or maybe the failure of a pipeline, a loss of a compressor station can affect many gas power plants in the same way at the same time, which decreases the gas plants' reliability contribution. That is not something that it appears SRP took account of.

Now, they're certainly not alone in that. There is a lot of research that's beginning to come out because a lot of academics, national labs, government agencies, etc., are noticing that we're relying a lot on natural

gas for our electric power system, and maybe we haven't considered all of the vulnerabilities.

So this quote here from one recent article shows this issue of the important limitation of current resource adequacy modeling, which is distilling the availability history of a generating unit to a single value, which is incomplete.

And they say: Only by incorporating the full availability history of each unit can we account for correlations among the generator failures when determining the capacity needs of a power system.

So, in other words, correlated failures, you're talking about something that affects more than one generation or maybe many generators in the same way at the same time because the standard practice, and the practice it appears SRP used, was to consider that every gas generator was completely independent of every other.

So, you know, one could have a mechanical failure and go down. And that's fine. And that by itself isn't a reliability problem because it's independent. Every other gas power plant would presumably be fine. But the problem becomes when some single event, whether gas pipeline delivery, etc., affects many generators, then you can have a significant loss of reliability. So that's what it appears was not

taken into account.

Contrast that with batteries. Batteries aren't relying on a pipeline for supply, and they've been robust to weather.

Now, any individual battery can fail and just shut down just like any other generator can. It's called a forced outage. And a nuclear plant or coal plant, you know, it happens. You don't read about it in the newspapers because the system has enough other resources, and it's built to withstand the loss of any one element like that. But with batteries, these losses are truly independent of each other. They don't have the correlated risk that you would have with a natural gas plant.

Q. Let's switch gears and talk about the need for the capacity and reliability for this plant in the first place.

And maybe we can go to Slide 23. And can you explain what's there and your thoughts on this.

A. Sure.

So this idea of having enough supply, including enough supply to withstand the loss of any one element there is in the electric industry concept of reserve margin. So we have enough cushion or reserve margin to still be able to meet load even if any one generator

fails because all of them can fail at one time or another for any number of causes. So this system is built to add some cushion against that. So the primary basis for adding new power plants is to make sure that future peak loads are being met and with an ample reserve margin.

So in NERC's most recent long-term reliability assessment, NERC, again, the reliability authority, they show anticipated and prospective reserve margins, which are the second to the bottom row and third to the bottom row, ample, well above the reference margin level, which is, you know, around 10, 12 percent. So reserves seem to be strong through most of this decade.

Obviously, the situation gets murky later. Nobody really knows exactly how much generation will retire, new generation will come in, you know, five or ten years in the future. But, of course, one can make decisions five or ten -- you know, at that point in the future or review this assessment every couple of years. But it appears that the region has ample capacity for the foreseeable future.

Q. Can we go to the next slide, Slide 24.

Please describe how this geographic diversity, the spreading out of the solar and the battery storage, provides a benefit.

A. Sure .

Well, just in case anybody's concerned about the reliability of solar energy, you know, I get this question a lot: What happens when clouds come through? How do you depend on solar energy for your -- for much of your power?

And it's important to understand that multiple solar projects across -- spread out in a geographic area are actually providing fairly steady and predictable power output, much more so than, say, any given solar panel, let's just say the solar panel on your roof.

Let's say you had a house and a panel on your roof. You might be looking at the red line. If you looked at the meter on your own solar panel, you might see that over the course of the day, and this is hours of the day, just some random day, you can see the output, which is the vertical axis. The red line goes up and down and up and down and, you know, that could be clouds coming through. So this is a day that has clouds coming through. And sometimes you're producing a lot, and then, you know, 20 minutes later, barely any. And it goes up and down like that. It doesn't go down to zero. You can see in the lowest -- you know, in the middle of the day, the lowest red line is still over 200. But, you know, that's one-sixth of what it is at the sunniest time.

So that's what happens at one location. If you

take the blue one, and just take five sites, like call up your five neighbors across some area maybe within, you know, some neighborhood or section of town, the blue line is steadier because you're aggregating the output across five different areas that are relatively close by and becomes a more steady output. And then, if you spread across a larger area, then the power becomes steadier still.

So I understand when E3's analysis was done, for example, they were looking at different sites around the state of Arizona. And, of course, if you're aggregating across that wide an area, then you're going to have a much more steady supply of solar output.

Q. Great.

If we could look at the next slide, you talked more about the West markets and how they can meet the needs for capacity. Can you talk more about that.

A. Sure.

So in recent years, the whole Western region has put together much more and better trading of energy. And that provides a further opportunity to get this geographic diversity benefit that we were talking about on the last slide. And you can quantify this by showing the whole region compared to just individual states.

So the whole region is the blue line. And what

we're looking at here is penetration level of renewable energy and the percent increase in variability. So, you know, you might think, oh, when we were adding variable renewable sources, then our overall system variability is going up.

Well, in fact, if you do that for WECC, that's the Western region, the Western electrical region, you can go up 30 percent penetration of renewables, and you're really not adding to the overall variability of the system. And that's because of that geographic aggregation effect we were looking at on the previous slide. Now, if you were only looking at Arizona or New Mexico or Nevada, you wouldn't get quite that same flat effect. You would start seeing system variability go up.

So it just goes to show that larger aggregation reduces variability, and the happy news is that there is strong and robust and growing regional trading across the entire West.

Q. And SRP is a member of the Energy Imbalance Market today. Have you had a chance to look at how that's impacted the need for ramping?

A. Correct.

So on the last slide, Slide 26, we can see that this variability for which utilities need to add what's called flexible ramping, this variability goes down now

that so many utilities are part of this Westwide Energy Imbalance Market.

So you can see that about half of the variability is taken care of because you have this regional market. So they -- just looking at the first column there, July Up, just to understand the numbers, it's 1,317 megawatts saved, and the sum of the requirements is 2,600. So about 50 percent there is saved because of the trading geographically of this energy across the West.

And then you can look across the other columns and see that it's sometimes up to 64 percent. It's in that range of around half of that need for flexible ramping caused by variable renewable energy as well as load and other factors that create uncertainty. But, certainly, when you add renewable energy, you need to pay attention to system variability.

It turns out, now that we have this Westwide Energy Imbalance Market, you have to worry about it half as much because the market reduces that need for flexible ramping by 50 percent.

Q. Thank you for taking us through those slides. I have a couple of additional questions for you.

Given the situation in Arizona and the West and nationally with these new technologies and a move towards

renewable energy, what should the utilities do to evaluate and make investments in these situations? How should they look at that?

A. Well, I do applaud retaining an expert like E3 to look at the capacity value. You do need to obviously look at your load growth, as they have done, and you need to look at your capacity needs as well as your energy needs and the overall cost of energy capacity and those reliability services.

But when you find in your particular situation that you have incredibly good capacity value that holds on for a good long time, certainly over the life of the asset for batteries along with all of the solar PV, that seems to me to be a great investment; whereas, sinking money, irreversible capital investments, into a resource that is not all that dependable and that has a lot of risks related to emissions regulation that could affect it in the future as well as risks from volatile gas prices -- you know, gas price as a commodity is twice as high as it was a year ago nationally.

And if any of us had predicted that, we could be rich. But, you know, the smartest traders don't know this. Nobody really knows it. Gas prices are inherently uncertain. So to invest in a natural gas plant when you have this more economic opportunity that provides equal

and better reliability value, I think you go with that solar-storage combination.

Q. And there's been some discussion during the hearing about the comparison of the relative emissions from -- or related to the mining and manufacturing of solar and batteries as that compares to the lifetime emissions of mining gas and then burning it for fuel at a project like the CEP.

Do you have any information that can help the Committee understand the comparisons between those two?

A. Well, sure. I mean, everything -- nothing comes for free. Nothing comes with complete -- with zero impact, right? So there are emissions associated with the production of just about everything.

That can be quantified, though. The numbers I've seen from like the National Renewable Energy Lab, you can quantify life cycle emissions from different energy sources. And I think any of the fossil resources, natural gas, coal, will show up as much higher than batteries, wind, or solar.

Q. Okay. Great.

And I think with your testimony and throughout the slides in Exhibit 34, SC-34, you had references to studies you relied on and other documentation on which your presentation was based.

I want to just call out Exhibits SC-7 through SC-18. Are those the documents and studies on which you based your opinions and which you reviewed in preparing for this testimony?

A. Yes.

Q. And then we have added your and will be filing your CV as Exhibit 35. You can attest that that is an accurate copy of your CV?

A. Yes.

Q. Is there anything else you want to say before I turn you over for cross-examination?

A. I don't think so.

MR. RICH: Great.

Mr. Chairman, I'll make the witness available.

CHMN. KATZ: That's fine. Mr. Acken.

MR. ACKEN: Thank you, Chairman.

EXAMINATION

BY MR. ACKEN:

Q. Good morning, Mr. Gramlich. I am Burt Acken, counsel for Salt River Project in this matter.

Can you hear me okay.

A. Yes, I can.

Q. And I said good morning to you, but I didn't catch where you are located, so maybe I should ask that

question first.

A. It's just after noon here in Washington, D.C.

Q. Well, then good afternoon.

Have you ever operated an electrical utility generation system?

A. No.

Q. Have you ever been responsible for ensuring reliability for a load-serving entity?

A. No.

Q. I'd like to bring up SRP-Exhibit 2, Slide 51 and Slide 110.

So Slide 51 is on the left screen that I hope that you can see, and it's entitled: Meeting Near-term Needs with an "And" Strategy.

A. I can see it.

Q. So do you see that SRP is planning to add 450 megawatts of battery storage by 2023?

A. Yes.

Q. And were you aware of that prior to your testimony?

A. Yes.

Q. And do you see that on Slide 110 of SRP Exhibit 2 that this shows a comparison of carbon emissions from the SRP proposal that includes the Coolidge Expansion Project with the alternative battery

portfolio? Do you see that?

A. I see that.

Q. And a prior witness for Western Resource Advocates testified that SRP, even with including the Coolidge Expansion Project, will reduce carbon emissions from a 2005 baseline by nearly 75 percent. Do you have any reason to disagree with that?

A. I haven't done that math myself, so I can't agree or disagree with it.

Q. I'd like to turn to Slide 5 of your presentation.

MR. ACKEN: If I could have that pulled on the left screen. Thank you.

And, again, that's Slide 5 of the presentation that we just had.

Thank you very much.

Q. BY MR. ACKEN: So you testified about the amount of battery capacity that ELCC -- or, excuse me -- E3 said would be necessary to replace the Coolidge Expansion Project in 2026; is that correct?

A. Correct.

Q. How much additional battery capacity did E3 say would be needed in 2033?

A. I can barely see this, but I can look at my hard copy. 1,748.

Q. And this slide clips off -- this slide, I'm referring to Slide 5 from your presentation, clips off at the year 2050. Do you know why that was done?

A. I don't.

Q. Do you know what E3's study showed as the amount of battery storage that would be necessary to replace the Coolidge Expansion Project in 2050?

A. I saw it, but I don't recall the number offhand.

Q. Does 3,511 megawatts sound familiar?

A. I don't dispute it.

Q. Thank you.

And I understand you're stepping in, so it's a tough position, so I appreciate you taking the time to go through that.

Next I want to look at Slide 7.

And, again, this shows your cost comparison only through 2026, correct?

A. So the last column says Cost over 20 years. The megawatts on the -- I see what you're saying. This is for if batteries were -- CEP added in 2026 based on the 731, which is the 2026 number. So, yeah, I see that.

Q. And, I'm sorry, I think there's a little bit of a lag.

And so, presumably, as the amount of megawatts needed to replace the Coolidge Expansion Project in later

years increases, so, too, would the cost; is that correct?

A. Well, the capital costs are projected to decline. We can see NREL's cost in 2025 lower than 2022. And, presumably, if cost trends continue, the costs keep going down.

And I'm not totally sure what you're asking because --

Q. Well, let me restate it.

A. Okay.

Q. Let me restate it so maybe I can make this clear.

SRP has testified that it also agrees that battery costs will go down over time. So that's not my question.

But regardless of whether battery costs will go down, there still will be costs associated with battery installations after 2026; is that correct?

A. Well, yeah. I mean, the contributions to a future portfolio could be different than today, but the contribution of that next battery, let's say the 731 megawatts that you put in today, would be that valuable to the portfolio. What happens in the future depends on the future portfolio.

Q. Yeah. My question is still a little different,

and it's a simple one.

Batteries added after 2026 will have some cost associated with them, correct?

A. Sure.

Q. And your Slide 7 does not show the cost associated -- any cost estimates associated with those additional battery additions, correct?

A. I guess that is correct.

Q. Next I want to turn to Slide 9.

You testified, if I understood you correctly, about all the services, if you will, that batteries can provide shown on this slide. Is that a fair characterization of your testimony?

A. Yes.

Q. And can a battery -- can a single battery provide all of these services at once?

A. At once? I'm not sure any of these are designed to be provided at once for any generating source.

Q. In your -- on the very first line, it talks about storage response within seconds versus ten minutes for gas turbines, maximizing profit. To whom are we maximizing profit?

A. I mean, it's any type of entity. This is -- this is a general slide about technologies used by commercial entities which could be publicly owned or

privately owned entities. So maximizing the value to whoever owns that resource.

Q. And do you understand -- are you aware whether SRP is a nonprofit entity?

A. Yes. My understanding, it's a public power entity, not, for example, an investor-owned utility or an independent power producer.

Q. And as a nonprofit entity, do you know whether SRP is a cost minimizer?

A. Well, I'm sure it tries to minimize cost. Whether it does or doesn't, I can't vouch for that.

Q. It certainly does not have an incentive to increase cost. Would you agree with that?

A. Not that I'm aware of.

Q. I'm sorry, that wasn't a clear response.

Do you agree that it has no incentive to increase cost?

A. I'm not aware of any incentive it has to increase cost.

Q. Next I want to turn to Slide 10. Correct me if I'm wrong, but my understanding is what you are showing are projects in the queue, so to speak, correct?

A. Correct.

Q. And can you describe what that means, "projects in the queue"?

A. Projects that have applied for interconnection to transmission owner systems.

Q. And so these are not utility commitments to acquire those resources, is it?

A. Correct, not necessarily.

Q. And in your experience, do you see renewable developers put projects in the queue in advance of having an agreement with a utility to buy that power?

A. Yes, that can happen.

Q. Are you aware of whether it does?

A. It does happen, yes.

Q. I want to go to Slide 11. You talked about forced capacity and perhaps saturation levels in this discussion.

Would you agree that battery storage also experiences saturation effects at high penetration levels due to energy limitations and duration?

A. Yes. And the definition of "high" is my understanding for a region like the Southwest, beyond 30 percent or so penetration, meaning the capacity of storage relative to the total capacity of the system. Then you start getting below around 80 percent capacity value. But up until then -- and my understanding is SRP is well below anything approaching that level of penetration -- the capacity value holds over 80 and into

the 90s.

Q. And you said that the saturation level, if you will, depends on solar penetration?

A. It does. In part, the capacity value of storage is higher with higher solar penetration.

Q. And do you know what SRP's projected solar penetration is in 2035, for example?

A. I don't know that number off the top of my head, but I imagine it is growing.

Q. I'm sorry. I didn't catch the end of it. You said it is probably ...

A. Growing. The penetration of solar is probably growing.

Q. And you don't have any specific information regarding what that number might be?

A. If you're asking the exact solar penetration in 2035 for SRP, I don't have that off the top of my head, no.

Q. I want to turn to Slide 17 next. And talk about that February 2021 event. And this was the Winter Storm Uri event you described.

A. Yep.

Q. And in the following slide, you had -- you showed all the resources that were unavailable.

Do you know how many megawatts of gas generation

in Arizona went offline as a result of the gas freeze-offs in Texas?

A. I don't think we put that in here.

Q. So you don't know what the answer is?

A. No, I don't.

Q. So it could be zero?

A. It's possible.

Q. Let's turn to Slide 21. Do you know what this study -- and the study I'm referring to is listed on Slide 21 of your presentation, the recent NERC-Carnegie Melon journal article.

Do you know what it said with respect to WECC?

A. I do not.

Q. You don't know whether the report stated that WECC was an exception for this analysis?

MR. RICH: Objection, Your Honor. He said he didn't know what it said.

CHMN. KATZ: The witness, if you can answer it, he can. And if he cannot, he can let us know.

THE WITNESS: I don't know what the report said about WECC.

Q. BY MR. ACKEN: Okay. Let's turn to Slide 23. So if I understood your testimony, we're talking about reserve margins -- or "we," I should say you, referencing the NERC study talking about reserve margins; is that

correct?

A. Correct.

Q. And in 2022, is looking at reserve margins considered best practices for evaluating reliability needs?

A. Well, traditionally, that is the metric that's used. As the future resource mix changes, it's one useful metric but not the only one.

Q. And another method would be to use probability modeling, which is what SRP and E3 used; is that correct?

A. Correct.

Q. And do you know whether the NERC report referenced in your slide expressed any opinion on the use of this plant reserve margin and its sufficiency to define reliability?

A. I don't know if it did.

Q. I'm going to turn to Slide 25. This is your discussion of WECC and Westwide markets.

Does WECC include California?

A. Yes.

Q. Are you suggesting that Arizona rely on California resources to serve loads during regional heatwaves such as what occurred in August of 2020?

A. Not specifically that, no.

Q. And do you think a prudent operator should have

sufficient resources to serve its own load?

A. I think arranging power in advance is a good idea, whether it's local or remote. And a prudent practice is also to provide some flexibility for, you know, shorter-term -- month-to-month and shorter-term transactions as well.

Q. I want to talk to you about your testimony generally regarding natural gas reliability risk.

Would you agree with me that no generating resource is 100 percent reliable?

A. Yes, with the caveat that reliability is only a systemwide concept and not a generator-specific concept, but you can, as we discussed before, measure the contribution to system reliability of the individual resources. For example --

Q. And are batteries 100 percent reliable?

A. No resource has 100 percent capacity value, and that --

Q. Would that include batteries?

A. Right.

Q. And would you agree that given no resource is 100 percent reliable, a prudent operator should have a diverse portfolio of resources?

A. Yes.

Q. And are you familiar with SRP's track record of

reliability?

A. Not specifically, but I have no basis for thinking it's not reliable.

MR. ACKEN: No further questions at this time.

CHMN. KATZ: I'd like to take our morning recess right now, and then we can continue with cross-examination.

It's about 20 minutes to 11. Let's plan on going at about 10:55 -- between 10:55 and 11:00. The sooner the better.

(A recess was taken from 10:37 a.m. to 10:58 a.m.)

CHMN. KATZ: Okay. I think we have everybody that is participating here.

And you were done with your cross; is that correct, Mr. Acken?

MR. ACKEN: I am. Thank you, Mr. Chairman.

CHMN. KATZ: And, Mr. Stafford.

MR. STAFFORD: No questions, Chairman.

CHMN. KATZ: Ms. Post.

MS. POST: No questions.

MR. RICH: Mr. Chairman, can I just make sure that the witness is back on. I don't see his picture yet.

There we go.

CHMN. KATZ: Thank you for your patience. And does the Corporation Commission have any questions?

MS. UST: Just one question.

CROSS-EXAMINATION

BY MS. UST:

Q. Are you aware of any facilities with the same battery storage capacity as the Coolidge Expansion Project?

I don't think we heard you there.

CHMN. KATZ: You're muted.

THE WITNESS: My answer is not specifically, no. Can you hear me?

MS. UST: Yes. We heard that.

Thank you. No further questions.

CHMN. KATZ: Before we go back to any redirect, does the Committee have any questions?

MEMBER HAMWAY: Yes, Mr. Chairman, I have some.

CHMN. KATZ: Yes, Member Hamway.

MEMBER HAMWAY: So we heard testimony from SRP that over time, these CTs, the combustion turbines, could be converted from natural gas to hydrogen. Does that change your opinion about this project?

MR. GRAMLICH: Well, I don't -- it's not really my role to have an opinion about the projects. I saw

that testimony. I can't vouch for that opportunity.

MEMBER HAMWAY: Okay. And then we heard that nationwide, United States nationwide, we only have 3,200 megawatts of battery storage in production. So do you think it's prudent to kind of push utilities in this direction before they're comfortable moving forward with inexperience in dealing with this and making sure all the components of the software and everything are compatible and how it works? Do you feel that they're ready to jump into something like that?

MR. GRAMLICH: Well, I think utility-scale batteries are commercially ready, proven, and deployed all over the world by utilities across the country, so I think they're commercially ready, yes.

MEMBER HAMWAY: And then I had asked the applicant what was the largest storage system singularly in the United States and in Arizona. But you can get back to me.

And then we saw a quote from NERC that basically says that the battery and the solar hybrid systems aren't ready to be deployed full tilt without some sort of alternative backup such as fossil fuels. So do you agree with that statement from NERC?

MR. GRAMLICH: Well, I think there is a lot of conventional generation still on the system. So I think

consistent with that quote, and I don't recall the exact words, but I didn't read that statement as suggesting that new conventional generation, natural gas or otherwise, would be needed.

I do personally believe that all or nearly all -- a lot of the existing gas plants that are out there will be sticking around for quite some time and the nuclear plants with their carbon-free energy, and there is a large component of generation that isn't going away tomorrow.

MEMBER HAMWAY: And then are you familiar with the term "black start" or "dark start" systems?

MR. GRAMLICH: Yes.

MEMBER HAMWAY: So is the Coolidge Expansion Project a black start or dark start plant?

MR. GRAMLICH: I don't know the answer to that.

MEMBER HAMWAY: And then these questions go to SRP's cross. I guess one question.

So how much Arizona gas that was supplied during February '21 was disrupted? I'm asking SRP.

MR. ACKEN: I'm sorry. We will address that. We can address that on rebuttal. I certainly cannot answer that question.

MEMBER HAMWAY: Okay.

MR. ACKEN: I will have a witness available to

do so.

MEMBER HAMWAY: And then a couple of years ago, this Committee had a presentation from Cal ISO about the Energy Imbalance Markets.

And I asked the question then of whether the need for imbalance markets decrease as the value and reliability of storage increases. Are they related to each other?

MR. GRAMLICH: Well, I mean, I think with the growth of renewable energy across the region, the value of that regional market is increasing every single year. Would it be greater if, let's say, we had no battery opportunities, storage opportunities? Yes, it would be greater.

So in that sense, storage and markets are sometimes substitutes a little bit, but we really need them both.

MEMBER HAMWAY: Okay. Thank you. That's all my questions.

CHMN. KATZ: Anybody else from the Committee that's present have questions?

(No response.)

CHMN. KATZ: We can now go to virtual participants. Was it Member Little that had a question?

MEMBER LITTLE: I did. Sorry for interrupting

you.

CHMN. KATZ: You're fine.

MEMBER LITTLE: Mr. Gramlich, thank you very much for being here with us today. I appreciate your testimony.

I have a question. I'm not real sure I understand how it is that additional solar can shift the need for batteries or gas until later in the day. You said something about batteries could operate with enough solar and gas -- I'm sorry -- solar and batteries that the need -- the need for the batteries could shift to 7 to 11 p.m. The solar generation starts decreasing earlier than that in the day.

Can you explain that a little better for me, please.

MR. GRAMLICH: Sure.

Well, the solar generation, if you have a very large fleet, it won't be producing at the same quantity at 6 p.m. as it does at 1 p.m., but it will still be producing quite a bit. And if there's a lot of it, you can, you know, charge your battery through all the early afternoon hours and then be ready for when it really does go away, depending on the season, let's just say 7 or 8 p.m., when it -- when the sun sets. And then you're ready with the battery at 6, 7, 8 p.m. And into the

evening, until 10, 11, you can last that long.

So is the ability to shift is a function of how much solar you have on the system. So the more you're really flooding the power system with solar all the way through the afternoon and in very large quantities in the middle of the day, the more you're able to just really hold your full battery charge, hold it up, hold that charge, and then discharge later in the day.

MEMBER LITTLE: So let me see if I've got this right. If a solar system, for example, decreases to 20 percent output by 5:30 in the afternoon, if you've got enough of it, 20 percent of a huge number is enough to cover the needs?

MR. GRAMLICH: That's right. That's right.

And there's also a dynamic here where -- let's say it's a cloudy day, so you're not charging as much, you don't have the ability to have as much solar to charge the batteries. Well, it turns out those also are the days you also need less air conditioning in the evening. It's a cooler day. So on the really sunny days, you can charge a lot and discharge a lot. And on the cloudy days, you can charge less and discharge less, but you don't need to.

MEMBER LITTLE: Thank you.

CHMN. KATZ: Any other virtual participants on

the Committee that have any questions?

MEMBER GENTLES: I have one question, Mr. Chairman.

CHMN. KATZ: Sure. Mr. Gentles, go ahead.

MEMBER GENTLES: Mr. -- is it "GRAM-lich"?

MR. GRAMLICH: "GRAM-lick."

MEMBER GENTLES: Sorry about that.

A couple days ago, SRP provided some information on the net present value on each of the alternatives, including the current alternative. Actually, from what they said, the alternatives that they had presented.

And it said that this plant had the highest net present value return for SRP. Have you seen that? And can you make a comment on those calculations based on your testimony?

MR. GRAMLICH: Yes. I believe that that is when they're comparing to a false choice. They are comparing to an uneconomic portfolio where, if they took E3's analysis, this consultant that they hired -- I think they've hired them multiple times to do different things. If they took E3's numbers, that NPV would turn out more favorably for the solar-battery combination.

I don't know if E3 did that NPV calculation for them, but I think if you took their capacity numbers and plug them in, you would get a lower -- sorry, a higher

NPV, better value, for the solar-storage combination.

MEMBER GENTLES: So with NPV, you're calculating net present value of future tax flows. So it's only as good as the inputs or the projections that you use in the NPV calculation; is that right?

MR. GRAMLICH: That's right. That's right. I mean, just to clarify the point, if someone says you need, you know, 4,000 megawatts instead of 1,000 megawatts, then you're going to have to pay 4 times more than you need. So that's the fundamental different position here, I think, that's different between E3's number and SRP's number. I don't know where SRP's number came from, but I have enough experience to trust that E3's number is pretty credible. So if E3 is saying, you don't need to buy the higher number, you can just procure the lower number, obviously, you're going to spend a lot less money if you only need to buy the lower number.

MEMBER GENTLES: Thank you.

That's all I had, Mr. Chairman.

CHMN. KATZ: I believe Mr. Palmer had a question or two.

MEMBER PALMER: Just one question, Mr. Chairman.

I'm curious. As I was thinking about costs and values, in myself or on my laptop computer, there is a lithium ion battery. And my experience tells me that

over the course of a year or two or three, whatever the case might be, that in charging and discharging that every day, that soon the battery has to be replaced or the phone has to be replaced. It no longer will charge to full capacity or hold its charge for the full capacity.

Do we know yet what is the life cycle of a lithium ion battery on a utility-scale application?

MR. GRAMLICH: The manufacturers will guarantee a certain performance, and that is certainly an issue that any buyer of batteries pays attention to. I don't know what the current warranties are doing, but that is something -- the type of thing that is factored into an NPV calculation in terms of, you know, how many cycles it can do over its lifetime, and it's based on estimates of its expected use and, you know, the cost and everything else.

MEMBER PALMER: Thank you.

CHMN. KATZ: I have one or two questions as well.

And the question by Ms. Ust from the Corporation Commission a few minutes ago, asked you if there are any battery storage facilities essentially the size of the expansion area or 100 acres.

The question that I have is a follow-up to that,

and that is, how many -- just in a battery storage situation, not a hybrid situation, do you have any idea of how many acres of land would be required to have a battery storage plant sufficient to put out somewhere between 700 and 820 megawatts? Because SRP already owns this acreage. It doesn't have to go out and buy more.

MR. GRAMLICH: Yeah. Well, I don't have the exact number right now. That is certainly a number that could be found. So perhaps I or somebody else could get you that for the record here.

I will say that batteries are very modular and that you can do a whole bunch of little ones or one big one or spread it around in different locations. They're extremely location-flexible and size-flexible. So there's not -- that I'm aware of, I haven't heard of site constraints, in other words, where developers might be unable to find a place to put them. You can put them almost anywhere.

CHMN. KATZ: But we don't know whether or not we could get 7- or 800 megawatts generated within the 100-acre site. Maybe we can, maybe we can't, but that's something that hasn't been studied or that you're aware of?

MR. GRAMLICH: Not that I'm aware of.

CHMN. KATZ: Let me ask you this, though: If we

go to a hybrid model where we're looking at solar panels and battery storage, that's going to take up considerably more acreage than 100 acres to generate the equivalent amount of power, correct?

MR. GRAMLICH: I would guess that's correct. Of course there are a lot of places to put them. So I think we're not just looking at this site, but across the entire state or even region. It doesn't necessarily have to be in the state. I would guess there's plenty of sites available for the solar and storage that would be needed even in the most ambitious renewable energy planned facility.

CHMN. KATZ: And has the modeling that you or SRP has done taken into consideration the cost of acquiring land to install solar and battery as opposed to just the cost of installing the batteries or the solar panels?

MR. GRAMLICH: It is standard practice to include the cost of land in any generation cost assessment. So without recalling specific numbers in the E3 report or SRP testimony, I would certainly imagine they included land costs.

CHMN. KATZ: I had just one last question. Going back to just battery storage for the -- instead of building the new gas generation plant, right now, there

are 12 generators at the existing site. They're not always running, as you indicated, full time.

But if we had battery storage, wouldn't we have to operate those generators at a greater capacity in order to supply the necessary power to the community as well as to charge the batteries?

MR. GRAMLICH: Actually, one of the great things about utility-scale storage is that it can charge from the grid. So the power could be coming from any resource that's on the system. And so that's why a lot of the analysis here is looking at the total system load and total system generation. And so at any rate, it wouldn't necessarily -- the existence of a battery on that site or even anywhere would not necessarily change the operation of the existing gas plants.

CHMN. KATZ: And without battery storage or some type of storage, a lot of that power in the grid goes to waste if it isn't used by consumers or industry; is that correct?

MR. GRAMLICH: Yeah, there's certainly a potential to waste a lot of renewable energy if it's not stored.

CHMN. KATZ: Irrespective of what source that energy is?

MR. GRAMLICH: True. But we find more risk of

wasted spilled energy from wind and solar than we do from other resources just because there are times with extremely plentiful wind and solar output that may be more than the load needs at a given moment.

CHMN. KATZ: Thank you. I have no further questions.

If the Committee has none further, we can go back to redirect examination.

MEMBER GRINNELL: Mr. Chairman.

CHMN. KATZ: Yes, Mr. Grinnell.

MEMBER GRINNELL: I didn't realize I was on mute, probably to the benefit of everybody here.

My understanding of the solar panel manufacturers is predominantly, actually over 90 percent, are coming out of China; is that correct?

MR. GRAMLICH: Certainly, there's Asian production. I don't know the exact numbers.

MEMBER GRINNELL: And, also, it's been testified to or agreed upon that there has been issues with the inverters. Do you agree with that?

MR. RICH: Mr. Chairman, I need to object to the characterization. I don't know that it's been agreed upon by anyone that there's been problems with the inverters.

CHMN. KATZ: Well, the witness can tell us in

response to the question whether or not he's aware of any problems with inverters.

MR. GRAMLICH: Well, I think the inverter settings are now pretty well understood, and they have tremendous capability and reliability value. You just need to set them correctly.

So NERC has looked at that, the solar industry has looked at that, and they're updating some of the inverter programming methods. It's basically software, how do you control the plant with software, and they have a good understanding how to do that.

CHMN. KATZ: On that question, are there any national standards in terms of inverters to convert the direct current to AC, or is it every plant doing things differently?

MR. GRAMLICH: I believe there are some standards and some just guidelines and industry practices. I feel like I just read something about an IEEE standard. That's the electrical engineering society.

CHMN. KATZ: Thank you.

Mr. Grinnell, were you done? I didn't mean to interrupt you.

MEMBER GRINNELL: No, that's okay.

To this end, right now, Michigan, Detroit, where

I have a place, they are running into issues in getting components, chips and things, out of Taiwan and China. And given the amount of stress there appears to be right now between the U.S. and China, what would be your concept of a backup system in the event we could no longer get these materials and critical minerals, particularly, to manufacture these panels and inverters? What would be your idea of a backup plan to supply energy to the U.S.?

MR. GRAMLICH: Well, we can manufacture more here. I mean, there's a lot of discussion in Washington about bringing a lot more manufacturing here.

I don't think this is a binding constraint on any particular state or utility's near-term plans. There's a little bit of a premium in supply chains, obviously, across the economy, and some of these technologies are not exceptions to that. But, hopefully, that will sort itself out.

But longer term, there's certainly more interest in bringing some of the manufacturing here, given the growth that just about every utility in the country is looking at massive solar storage and wind growth.

MEMBER GRINNELL: But we don't have that here today, my understand; is that correct?

MR. GRAMLICH: We have a little, but not very

much yet.

MEMBER GRINNELL: And then given the fact that -- clean energy is a good thing. There's no argument there. Renewable energy is a good thing. But aren't we going through a period of transition where there's an evolution, and it needs to be -- there's been a massive expansion of solar fields, from what I've seen in this hearing.

Would you agree that it would be prudent, as I believe Ms. Hamway addressed, to have a backup source in the event that we find throughout this transition to have a -- I guess just have a reliable backup source?

MR. GRAMLICH: Well, you know, if we were talking about closing the entire current fleet tomorrow and replacing with 100 percent renewable energy, we would have some difficult analytical questions about how do you meet load in every hour.

That's not what's being discussed here. In fact, I think it is a very gradual evolution, step by step, looking at each year and hopefully getting current market prices to see what can provide projected reliability and system needs. And, you know, a very good metric of that value is this capacity value. A very good analysis can be done by a consultant like E3.

E3, by the way, has recommended in other states

that they need to build new gas. I don't think their numbers in this case indicate the need for that and, in fact, indicate the economic opportunity to do better with solar and storage together.

MEMBER GRINNELL: Thank you, sir.

Mr. Chairman, I need to go mobile to the hospital on a personal matter we discussed. So I will be listening by telephone from here on out today.

CHMN. KATZ: That's fine. We appreciate your participation wherever you're located. Have a good day.

MEMBER GRINNELL: Thank you.

MR. RICH: Mr. Chairman, I just have some brief redirect.

CHMN. KATZ: Whatever you need.

REDIRECT EXAMINATION

BY MR. RICH:

Q. Mr. Gramlich, I wanted to follow up on a couple of issues.

First, you were just asked about inverters. Do you recall that?

A. Yes.

Q. And is it your understanding that inverters are used with each rooftop solar generating system?

A. Yes.

Q. And with every utility-scale solar system?
A. Yes.
Q. And so, to the extent that SRP has roughly 45,000 rooftop solar systems on its grid, those each are operating with inverters today, correct?
A. Correct.
Q. Are you aware of any issues either in SRP's service territory or elsewhere where inverter failures or issues have caused problems?
A. Well, I mean, the utility-scale plants that we're talking about are very different from the rooftop. And these are large commercial entities with very sophisticated controls and inverter software systems. And, you know, we're learning a lot, I think, about just all the capabilities that inverters provide because, as we discussed before, you can control to the subsecond the power output and reactor power and those sorts of things.

So it's going to be, you know, a continuing evolution of fine tuning those inverter controls for the rest of my career and beyond. So I don't want to say it's sort of all decided and set and closed up right now, but people understand how to do this and make them reliable.

Q. You were asked about -- I think the attorney for the Corporation Commission asked you about whether or not

you were aware of a battery installation of this size. Do you recall that question?

A. Yes.

Q. One of the advantages of batteries is that they can be installed modularly throughout the jurisdiction of the utility, correct?

A. Correct.

Q. And would you expect, then, that SRP would have the option of deploying a replacement project either in one location or in multiple locations?

A. Sure. You could do 100 7.3-megawatt units and get to the 730 megawatt if you wanted to.

Q. And those can be located even on the distribution grid, correct?

A. Many, many places, yes.

Q. And locating in certain geographic locations, there's an opportunity to take advantage of other benefits of avoided infrastructure costs that would need to be expended, correct?

A. That's true. You could put them closer to load.

Q. Can you explain how there could be additional benefits from avoiding transmission or distribution upgrades for battery storage?

A. Sure.

In a way, storage can operate as a transmission

asset or a distribution asset in some ways. In other words, if, let's say, there's a circuit or a part of the grid that expects a lot of consumption, let's say there's a lot of electric vehicles going in a neighborhood, if you have batteries closer to that point, then you can provide the need and you may not need as much distribution wire or transmission line to that area.

Q. And so that, then, saves ratepayers money because the utility doesn't have to make that investment, correct?

A. Correct.

Q. Let me ask -- I just have one more set of questions. If we could have from your presentation Slide 5 put on the screen.

CHMN. KATZ: And these are all in Exhibit 34?

MR. RICH: Yes.

CHMN. KATZ: And that's Sierra Club's Exhibit 34.

Go ahead.

MR. RICH: Thank you.

Q. BY MR. RICH: So you were asked on cross-examination about what E3's analysis showed in 2050. Do you recall that?

A. Yes.

Q. And in this Slide 5, we see that E3 predicted

that as far as 2040, the ELCC of the storage plant would have to be 1,140 megawatts to equal the CEP, correct?

A. Correct.

Q. And can you comment on what SRP -- their questions to you about the 2050 numbers and the relevance of those numbers and if we should be relying on those numbers that are 28 years in the future.

A. Well, I tend not to look at numbers in the 2040s. First of all, the assets we're talking about would be at the end of the lifetime that you plan on them, 28 years from now until 2050. You know, if we have batteries that last that long or the generators that last that long, you know, that's a good long life.

But the other thing is, you know, who knows what the resource mix will look like in the 2040s. I mean, imagine trying to make that assessment in 1990 about today. I mean, batteries, solar, wind, they were nowhere on any utility resource planner's radar screen at that point. So there's plenty of time, plenty of decision points in the next five years, let alone the next 25 years, to readjust and plan and build whatever may be needed.

MR. RICH: Great. Mr. Gramlich, I appreciate your testimony, and thank you for stepping in as you did as well.

I have no further questions.

CHMN. KATZ: Any reason why this witness can't be excused?

(No response.)

CHMN. KATZ: Thank you very much. And I don't know if it's Dr. or Mr., but thank you for being here with us today.

THE WITNESS: Thank you.

CHMN. KATZ: Bye-bye.

(The witness was excused.)

CHMN. KATZ: I just need to ask you all where we're at. We've only been going about a half an hour. We can work till as late as 12:30. If we do that, we can break till 1:30 rather than 1:00.

Yes, Ms. Post.

MS. POST: Mr. Chair, that was actually what I was going to suggest, because he's got his next witnesses, and they're physically here, correct?

MR. RICH: One is, and one will be on the Zoom at the same time.

MS. POST: Oh, okay. And the witness that I've got, the substitute witness, can appear between 1:00 and 2:30. So if we ran and finished his, then took lunch and started, you know, maybe even at 1:30, then we could get her in, and she could be available at that time.

CHMN. KATZ: Any disagreement, Mr. Rich, with at least getting started with your next witness? And we can continue, if you don't finish, within the hour after lunch. And Ms. Post could get in touch with her witness. We could start at either 1:30, 2:00, or whatever might work out.

MR. RICH: Yeah. I'm supportive of moving forward with our witnesses and getting them done quick.

CHMN. KATZ: Be happy to do that.

MR. RICH: Great.

So I'll call -- Sandy Bahr will be here in person at the witness stand, and then Cara Bottorff will be joining us on the Zoom.

Cara, if you're listening, we're doing this on the witness Zoom link.

CHMN. KATZ: We're doing this as a panel?

MR. RICH: Yes.

Let's test really quick. Cara, are you able to hear us, and can you say something really quick to make sure the audio is working?

MS. BOTTORFF: Sure. Can you hear me?

MR. RICH: We do.

CHMN. KATZ: And before we begin, I'll need to ask both of our witnesses whether you prefer an oath or affirmation. And you don't have to be in unanimous

agreement either.

MS. BAHR: Affirmation, please.

CHMN. KATZ: And what would you like, Ms. Bottorff?

MS. BOTTORFF: Affirmation works for me as well.

(Sandy Bahr and Cara Bottorff were duly affirmed, en masse, by the Chairman.)

CHMN. KATZ: Thank you very much, and you may begin, Mr. Rich.

MR. RICH: Thank you.

SANDY BAHR AND CARA BOTTORFF,

called as witnesses as a panel on behalf of Sierra Club, having been previously affirmed by the Chairman to speak the truth and nothing but the truth, were examined and testified as follows:

DIRECT EXAMINATION

BY MR. RICH:

Q. We'll start by identifying both of the witnesses and take you one at the same time in testimony here.

Ms. Bahr, let's start with you. Can you just state your name, place of work, and business address for the record.

A. (Ms. Bahr) Sure.

Sandy Bahr. I'm chapter director for Sierra Club's Grand Canyon Chapter. That's the Arizona chapter. And my office address is 514 West Roosevelt Street, Phoenix, Arizona.

Q. And, Ms. Bottorff, can you -- and please correct me if I mispronounce your last name -- please state your name for the record and give us your place of employment and your address, please.

A. (Ms. Bottorff) You got it. I'm Cara Bottorff. [Inaudible]

(Interruption by court reporter for audio difficulty.)

Q. MR. RICH: Let me just interrupt you really quick. Our court reporter said it was a little muddled because it was a little quick. So if you wouldn't mind -- and then we'll go back to Sandy and you can have a moment to slow down. But if you could repeat that slower. Thank you.

A. (Ms. Bottorff) Sure.

Cara Bottorff. I'm a senior electric sector analyst at Sierra Club. My work address is 50 F Street N.W., Suite 4, Washington, D.C.

Q. Thank you. That was perfect.

Ms. Bahr, I'd like you to give us a little bit of your background educationally and professionally.

A. (Ms. Bahr) Sure.

I have an associate's in applied science and civil engineering, a bachelor's in environmental studies, and a master's in legal studies.

Prior to working with Sierra Club, I was the executive director of a land trust, did contract work with a variety of nonprofits, and worked for a small engineering and land surveying firm.

I've worked in my current position with the Sierra Club for 24 years, and my responsibilities include reviewing and commenting on a wide range of proposals from government and private entities; participating and helping to lead coalitions on climate action and other issues; grassroots organizing; research; advocating for environmental protection at the Arizona Legislature, the Arizona Corporation Commission, and at both state and federal agencies; and also developing plans around our priority projects as well as managing staff among other activities.

Q. Thank you.

And what is the focus of your testimony today?

A. (Ms. Bahr) The focus of my testimony today is on the environmental impacts of the Coolidge gas project, including impacts relative to climate, air quality, public health, and water.

Q. And how did you become aware of the Coolidge Expansion Project?

A. (Ms. Bahr) I first became aware of this issue because I was participating in meetings over the summer of 2021. And they were focused on Salt River Project's integrated system planning. And at what was scheduled to be the last meeting of the summer, SRP announced that there would be an additional special meeting to look at near-term needs. And it was at that special additional meeting that SRP added that I became aware of the proposal.

At no time earlier in the summer did SRP mention this expansion nor did they mention it when they announced the addition of gas at the Desert Basin and Agua Fria plants earlier in 2021.

Q. And since that announcement, have you had the chance to go to other meetings related to the CEP project?

A. (Ms. Bahr) Yes, I have. I attended the -- again, that supplemental meeting on near-term planning, part 2 resource decisions and SRP's near-term planning on August 3rd, 2021; the Salt River Project board meeting on September 13th, 2021; and also an SRP-hosted open house on the proposed expansion in Coolidge on December 29th, 2021. I have also observed some of this proceeding and

was on the line for the public comment evening for this proceeding.

Q. And can you summarize Sierra Club's position in this case.

A. (Ms. Bahr) Yes.

Sierra Club is very much opposed to this power plant siting and the granting of the Certificate of Environmental Compatibility due to the impact that it will have on the total environmental. We also do not think this expansion is in the public interest, and we believe that there are cleaner and cheaper alternatives to this proposed project that SRP could pursue.

Q. And can you tell us and summarize for the Committee what your specific concerns are about the facility and how it will affect the environment and public health.

A. (Ms. Bahr) Sure.

First, I will say that there is no greater challenge to the planet and the climate of the Southwest than the warming of the planet and the disruption associated with it.

Each Intergovernmental Panel on Climate Change report emphasizes the need for action. The most recent IPCC report indicates that the planet is changing more quickly than had been previously predicted, and it points

to increases in extreme temperatures, drought, and flooding. And the information from that is in Sierra Club Exhibit 23, Climate Change 2021: The Physical Science Basis: Summary for Policymakers.

Here in Arizona, we are seeing firsthand the impacts of the climate crisis with more extreme heat and drought and larger wildfires according to the National Climate Assessment. And the chapter on the U.S. Southwest was submitted as Sierra Club Exhibit 24. And, of course, for those of us who live here, we have experienced these impacts firsthand.

With the changing climate also comes increased health risk as well, including heat-related deaths and illnesses and more vulnerability to chronic diseases. And I just wanted to point out just yesterday, there was an announcement about the megadrought and how it's the worst in 1,200 years. And about 42 percent of that is attributable to climate change. So a very concerning issue.

Also, Pinal County is among the counties in the U.S. at greatest risk relative to climate change when you look at the cumulative risks for heat, crop yield, economic damage, and other factors. And that's according to a climate map published by ProPublica in September 2020. And this was submitted as Sierra Club Exhibit 25.

And the title is New Climate Maps Show a Transformed United States. And the specific information on Pinal County is on page 11.

These climate impacts to our region, our state, and Pinal County are why it is essential that we move from burning fossil fuels for electricity generation and do so as quickly as possible.

While the carbon footprint for gas is not as intense as coal, and we can concede that, it is still quite intense, especially if, in addition to the burning of the fuel, the emissions from extraction, transportation, and storage are included.

Gas plants emit greenhouse gases, primarily carbon, directly into the air when they're burning the fuel. Extracting, processing, and transporting the gas to the power plant also has a climate impact and can include leaks of methane. And it can be as much as 4 percent if fracked gas is lost in leakage. And that information is included in Sierra Club Exhibit 22, The False Promise of Natural Gas.

Methane is a potent greenhouse gas, about 30 times as potent global warming potential over a 100-year period as carbon dioxide. When including the extracting, processing, and transporting portions of the process, it greatly increases the climate warming emissions

associated with a gas plant. SRP did not calculate those upstream emissions for its CEC application.

According to the global methane assessment released last year by the Climate and Clean Air Coalition and the United Nations Environment Program, human-caused methane emissions can be reduced up to 45 percent this decade. And that can help us avoid about .3 degrees C of global warming by 2045 and would be consistent with the provisions in the Paris Climate Agreement goal to limit global temperature rise to 1.5 degrees Celsius. So makes that more within that reach.

Q. If you've been following the hearing, you probably heard, and earlier today it came up, there's been discussion about the relative impact of mining materials for solar and storage and then assembling those plants versus the relative impacts of mining gas and then burning it for fuel.

Do you have any information or data to help us compare and understand the relative impacts of those two?

A. (Ms. Bahr) Yeah. It's many times more harmful to burn fossil fuels than to use solar plus batteries when you look at the life cycle impacts.

The global warming potential for gas is more than 4 times that of renewables plus storage. And according to the National Renewable Energy Lab, gas life

cycle emissions are about 6 times that for solar photovoltaic plus battery storage.

I will also add that everyone agrees that we need to do more to reduce the impacts of mining. And along those lines, I know there are increasing numbers of battery recyclers ramping up as well. And those can obviously help to reduce the impacts.

Q. So this plant will emit -- has emissions beyond just greenhouse gas emissions. Can you talk about what other emissions come from the plant.

A. (Ms. Bahr) Yes. So even if you're not moved by the impact of the earth's climate caused by greenhouse gas emissions, gas plants such as the proposed Coolidge Expansion Project release other emissions that are harmful to our health. They include sulfur dioxide, nitrogen oxide, and particulate matter, all of which can irritate and harm our lungs, putting children, the elderly, and people with respiratory issues particularly at risk.

Poor air quality has long been an issue for many communities in Arizona -- I live in one in Phoenix -- but including here in Pinal County and specifically Western Pinal County. The area for this proposed plant expansion is within the West Pinal PM10 nonattainment area. I know others have addressed that, but --

Q. Let me actually just stop you, if I could, just for a second.

MR. RICH: Could we have Sierra Club Exhibit 20, it's a map of that area, put up there on the screen.

Great. Thank you.

Q. BY MR. RICH: And maybe, Ms. Bahr, you can explain this map briefly, too, and then -- I'm sorry you cut you off, but can you answer the question.

A. (Ms. Bahr) Yes. This map shows the outline of the West Pinal PM10 nonattainment area. And I guess I could use this little --

CHMN. KATZ: Hold on just a second. I think there may be an insect crawling toward you that Len is going to remove.

MS. BAHR: I'm not really scared of insects. We'll do catch and release. I do that at home, even with spiders.

I was going to use this, but it's not ready to go, so maybe I won't.

Anyway, you can see Coolidge, and it falls squarely within the West Pinal PM10 nonattainment area. Thank you.

Q. BY MR. RICH: For the record, I was pointing the green light of the laser pointer at Coolidge on the map.

A. (Ms. Bahr) And this area is not just a

nonattainment area, but it is classified as severe for PM10. So the air quality is already poor and unhealthy.

The plant is in close proximity to the community of Randolph, a historically Black community. So, as you have already heard here, there are serious environmental justice concerns associated with this plant and its emissions as well. Unfortunately, there is no air quality monitor in Randolph.

In addition to the fact that this area exceeds the federal health-based standards for PM10 -- and, again, those standards, those National Ambient Air Quality Standards, are health-based standards for PM10 -- the American Lung Association has given Pinal County an F for both particulate matter and ozone in its 2021 State of the Air Report.

Q. And, Ms. Bahr, let me ask you -- pause you there again.

MR. RICH: Can we have Sierra Club Exhibit 21, which is that State of the Air Report, on that projector.

Q. BY MR. RICH: And can you read -- Ms. Bahr, just read what it says there in the middle of the page.

A. (Ms. Bahr) If you live in Pinal County, the air you breathe may put your health at risk.

So one of the first things you see when you look at Pinal County is that information. The grades from the

State of the Air Report are established by looking at the number of high ozone and high particulate days, respectively.

The report also points to the groups at risk from these high pollution levels. And Pinal County, the population at risk is 462,789. And of those, 203,200 are people of color, again highlighting the disproportionate impact of poor air quality on people of color. Children are also particularly at risk in this area according to the report.

The only other county in Arizona to receive an F on the report card for both particulates and ozone is Maricopa County.

According to the CEC application, annual operation emissions will be limited to 249.5 tons of VOCs, 249.5 tons of carbon monoxide, 249.5 tons of nitrogen oxides, 249.5 tons of sulfur dioxide, and 69.9 tons of particulate matter. And that includes PM10 and PM2.5.

So we know the plant will emit additional pollutants, including PM10, that the area is serious for PM10, and that the American Lung Association gives Pinal County an F relative to particulates.

Plant expansion will contribute to the poor air quality with the emissions of the additional 69.9 tons of

particulate matter. And just to kind of emphasize that a little bit more, coarse particulate matter, that's the 2.5 to 10 microns in diameter, contributes to asthma and other lung ailments and, again, is particularly a risk for children and the elderly.

And the fine particulate matter, that is what comes primarily from combustion, is even more of a public health threat as, unlike coarse particulates, we have trouble coughing or sneezing these smaller particles out. They get trapped in our lungs and can pass into our bloodstream. Exposure to fine particulates results in decreased lung function, more hospital visits, increased asthma and heart attacks, and increased numbers of deaths. Exposure to fine particulate matter can also contribute to emphysema and lung cancer.

Q. Thank you for that answer.

This plant also uses water. Do you have any concerns about that?

A. (Ms. Bahr) Yes. I'm concerned about the plant's reliance on groundwater. And while SRP indicates it won't be pumping groundwater, it will, in reality, still be pumping groundwater as the Central Arizona Project water it has stored is not stored in the area beneath the plant. So this expansion will increase groundwater pumping in this area and in a county that's

already suffering from groundwater depletion.

The Arizona Department of Water Resources modeling has found that there's a significant shortfall of groundwater to meet demand in the Pinal Active Management Area, a shortfall of more than 8 million acre-feet with 100 years of pumping. And that information can be found in Sierra Club Exhibit 26, The Myth of Safe Yield, on page 27. And that's why the Department of Water Resources is no longer allowing subdivisions that rely on groundwater to be approved in the area.

While the total amount of water this expansion will use is 250 acre-feet per year and smaller compared to agriculture and large development, it is not insignificant when considering impacts in a water-constrained area. That water will come from two wells on the property. SRP will utilize those long-term storage credits for the water, but that does not change the fact that they will still be pumping right there on the property and not where the water associated with the storage credits was stored.

The water usage is also entirely unnecessary because the plant can easily be replaced by generating sources that don't use much water at all.

Q. Are there any other concerns about the plant

that you want to share?

A. (Ms. Bahr) Yes.

I wanted to point out the significant light pollution from the existing plant, which will be increased with the expansion.

I visited the plant area at night on December 9th, 2021, and saw how much it lights up the sky. We know that light pollution has a number of impacts, including on animals. It can disrupt their migratory patterns, particularly nocturnal animals, and it also can affect our own sleep patterns. So if you're someone who lives in the area, your sleep patterns could be affected by this as well.

And this is something that SRP should have addressed in the Certificate of Environmental Compatibility as it is part of the total environmental impacts of the plant expansion.

Q. Thank you.

Is there anything else you want to add before we switch over to the other witness?

A. (Ms. Bahr) Yeah. Just, in summary, I think it's increasingly clear that gas plants such as the Coolidge Expansion Project can no longer be considered a bridge relative to the climate impacts. While the carbon emissions associated with them is less than coal, the

emissions are considerable, especially when you consider the potential for upstream leakage of methane.

I also think that locating this plant expansion in this area makes it an inappropriate bridge as it will contribute air pollution to the part of the state that already has unhealthy air serious for PM10, and it's located in close proximity to the community of Randolph, a community that has already experienced considerable environmental injustice.

I urge the Committee to reject the Certificate of Environmental Compatibility as the impact to the total environment is unacceptable and, as others have addressed, cleaner alternatives exist.

Q. Thank you.

Ms. Bottorff, let's go to you. And I know I just said it wrong, probably. I apologize.

Let me have you tell us a little bit more about your professional background and educational history.

A. (Ms. Bottorff) Sure. Let me know if I'm going too fast again. I'm happy to slow down.

(Interruption by court reporter for audio difficulty.)

Q. BY MR. RICH: Let's go back. I think I had asked you to summarize your education and professional background.

A. (Ms. Bottorff) Sure. And so let me know if this isn't working. We'll figure it out.

So I'm a senior analyst at Sierra Club working mainly on gas issues. I work within several Sierra Club campaigns which aim to transition the United States to 100 percent clean energy.

I support Beyond Coal's efforts to avoid any new power plants, with the priority for avoiding those in the most impacted communities.

We look to replace these resources with clean energy resources instead. I've worked on electric sector and gas development this year, primarily with a focus on the climate, environmental inequity impacts of gas generation resources, pipelines, and associated infrastructure.

Prior to working at Sierra Club, I worked for Key-Log Economics, which is an ecological economic consulting firm. And there I worked a lot on economic analyses for gas pipeline development and submitting comments to the Federal Energy Regulatory Commission.

I have a master's degree in public policy and leadership from the University of Virginia, and my full resume is available as Exhibit 31.

Q. Have you ever testified before this Committee before?

A. (Ms. Bottorff) I have not.
Q. Have you ever testified before a different Committee?
A. (Ms. Bottorff) Yes. I've provided prefiled testimony in a docket related to the health impact of gas plants in California.
Q. And what are your main recommendations in this testimony?
A. (Ms. Bottorff) My testimony considers the cost of the negative health impacts the planned Coolidge Expansion would have. The Commission should deny gas infrastructure where there is a viable alternative and negative health impacts.

Other testimony speaks to the viable alternative. My testimony demonstrates the significant cost of the negative health impacts to help the community balance its decision.
Q. And are you generally familiar with gas power plants and the related health issues that they cause?
A. (Ms. Bottorff) Yes. Through my work at Sierra Club, very involved in issues related to gas power plants. I track the characteristics of all the planned new gas capacity proposals in the United States and conduct alternatives analyses to demonstrate where clean energy options can provide the same services as planned

gas plants at a lower cost.

I also work closely with other environmental organizations to analyze the impact of electric sector policies and regulatory frameworks to reduce air pollution and deploy clean renewable energy.

I'm familiar with the literature and analyses on health impacts of burning gas in power plants.

In my field it's very commonly accepted to use tools such as EPA's CO-Benefits Risk Assessment Tool, which from here on out I'll just call COBRA, to estimate health impacts of changes to emissions from the electric power sector or changes to specific plants within that sector.

Q. And what's the purpose of your testimony?

A. (Ms. Bottorff) In this testimony, I'm going to outline the potential public health impacts of the proposed Coolidge gas-fired power plant expansion as estimated by the COBRA tool. I highlight the economic cost of those impacts to the state of Arizona as well as to other communities across the country where the pollution from this plant would travel.

Q. Can you tell the Committee a little bit more about the COBRA tool.

A. (Ms. Bottorff) Yes. COBRA is an EPA tool that estimates both health and health-related economic impacts

of changes in pollutant emissions for a given geography. COBRA quantifies human health impacts from reductions in a few air pollutants. Those are PM2.5, sulfur dioxide, nitrogen oxide, ammonia, and VOCs. COBRA uses a reduced form air quality model they call the source receptor matrix to estimate the effects of emissions changes to ambient PM. Using this approach to estimating avoided health impacts and monitized benefits, it's generally consistent with EPA practice used in other parts of modeling. The model translates the ambient PM changes into human health effects and then monetizes them.

Q. And why is COBRA an appropriate tool to look at when analyzing this project?

A. (Ms. Bottorff) COBRA has been used for a similar analyses many, many times in the past.

For a list of examples where COBRA has been used, you can look at Exhibit 29, which is an EPA list of publications that cite to COBRA. You'll see it's dozens of pages long. And many of the studies that are included there are looking specifically at changes to power plant emissions, similar to what was done in this analysis that we'll talk about today.

For a specific example, if you want to looking at that long list, there are two reports in there from PSE Healthy Energy. These are on page 16 of Exhibit 29.

And those both use COBRA to estimate the health impacts from coal and gas power plants in Ohio and Pennsylvania. That's just one example. There others that are included in that list as well.

Q. A few days ago, I asked an SRP witness if they had modeled any health impacts from the pollution from this expansion. SRP let us know that it did not do any health impact modeling, and the witness seemed unfamiliar with the concept.

Is the COBRA model that you're talking about, is that health impact modeling?

A. (Ms. Bottorff) Yes. COBRA is a free and public EPA tool that models human health and health-related economic impacts of changes in pollutant emissions.

Q. In your opinion, why is it important to do this type of modeling?

A. (Ms. Bottorff) Air modeling that looks at dispersion or levels of pollution, which is sort of the base air modeling that's often done, doesn't necessarily tell the full story of what the air pollution actually means.

In order to understand the magnitude and effects of air pollution coming from this proposed plant, we need to connect that to the impact on people living both near and far from the plant who would be subject to that

pollution. COBRA offers us a tool to estimate the negative health impacts of that pollution, connecting the air science of emissions to the actual on people on the ground.

Q. What were the inputs into the COBRA model that you used to analyze the CEP?

A. (Ms. Bottorff) Yeah. So there's a few key inputs.

For this analysis, we modeled avoided criteria pollutants that were found in the air permit. So the air permit provides sulfur dioxide, nitrogen oxide, PM2.5, and VOCs. We modeled all of those.

You also have to input stack height. So we based the stack height also off of the reported stack heights in the air permit.

COBRA requires users to specify an analysis year. So that's going to be what year you're actually looking look at this change. We used an analysis year of 2023 since it's the closest of the selectable years in COBRA. You can pick 2016, 2023, or 2028 with using their baseline data. And that was the closest, 2023, to the likely online date for this plant.

We employed the advance scenario capabilities of the COBRA tool for the year 2023 to model the scenario that included the proposed gas plant solutions as a

baseline, and then we modeled the control scenario that removed those pollutions, those emissions. And so that assumes if you do actually need to add more generation here, you can instead used clean energy alternatives, and those would contribute no emissions. So that's the control scenario compared to the baseline in which we said this proposed plant is built and pollutes as much as it's air permit says that it will.

Lastly, COBRA gives you the option to select between two discount rates, 3 percent and 7 percent. We used the 3 percent discount rate, which is the typical discount rate that's used by looking at health effects over time.

MR. RICH: I'm going to ask you if we could pull up Sierra Club Exhibit 28 on the screen for this next question. We'll give it a second while they bring it up.

Great.

Q. BY MR. RICH: We have on the screen in front of us Sierra Club Exhibit 28, and we'll get into that.

But I wanted to ask you, what are the impacts of the Coolidge Expansion Project based on your COBRA modeling.

A. (Ms. Bottorff) So what the COBRA model tells us is that the Coolidge Expansion would lead to total health

costs of between 9 1/2 million and 21 1/2 million in a single year. The bulk of these costs, about three-quarters, or between 7 million and about 16 million, would be borne by those living in Arizona.

Q. And can we estimate also, in addition to the yearly impact, the impact over the life of the project?

A. (Ms. Bottorff) We can.

So if we assume the plant operates for 20 years, the net present value of the total health costs is between nearly 137 million and almost 309 million. Again, the bulk of these costs, about three-quarters or between 100 million or 227 million, would be borne by those living in Arizona. And, again, the full outputs are available in the exhibit that you have up here.

Q. Okay. Just for the clarity of the record, this exhibit includes those numbers that you referenced and additional detail about the output of the COBRA model; is that correct?

A. (Ms. Bottorff) Yes.

Q. So you're calculating health costs, I think you said. What is a health cost?

A. (Ms. Bottorff) Health impacts that are monitized by COBRA, what you see in this table with dollar signs next to them, represent the sum of the values of several categories of impacts to folks who are

exposed to the pollution from this plant. Those include avoided premature mortalities; avoided illnesses of various kinds, for instance, heart attacks; and avoided lost work days and lost minor restricted activity days, is what COBRA calls it. What that means is beyond which activity is reduced but not severely restricted.

And this table, if you look at the full table, it shows you all of the different health costs that are going into these top line numbers.

Q. So in previous testimony, we heard about other sources of air pollution in the area. Essentially, we've heard that Pinal County has a pollution problem.

Why does the additional pollution from this expansion project matter when there's already other pollution in the area?

A. (Ms. Bottorff) The COBRA model that we used here includes baseline emissions from existing sources in its modeling. That means that the results reported here are additional. They're additive to the impacts that are already occurring in the area due to other emission sources.

So if the baseline there is not ideal, it's already not great, that shouldn't necessarily green light additional harm in the area, which was modeled here to be to the tune of hundreds of millions of dollars in health

costs over the lifetime of the plant.

Q. So how should we interpret the results of the COBRA model in this case?

A. (Ms. Bottorff) So COBRA is best used as a screening tool, followed by additional comprehensive health impact assessment.

SRP has performed air quality modeling, as we know, to see if they would be compliant with NAAQS. But they haven't performed a health impact assessment based on that air quality modeling such as this.

While there are limitations to COBRA, peer reviewers have found that COBRA is a valuable model useful for policy analysis and public dialogue such as what we're doing here today. COBRA provides with a high and low estimate of benefits, which I was citing there, which gives a really broad range of what these impacts could look like. So if you're worried about the exactness of the results, there's a lot of variation there that allows us to deal with uncertainty.

COBRA excludes benefits beyond particulate matter-related ones and may be conservative in that respect. This means this is not an attempt to quantify damage from climate change and is only focused on direct impacts of the particulates from the plant on human health.

This estimate also only considers emissions at the power plant, not upstream as a result of extracting, processing, and transporting the gas that would be used in this power plant. There are additional emissions upstream that cause negative health impacts that are not considered here, again, making this a likely conservative estimate. These results should be used as an estimate and to demonstrate the need for consideration of the health costs associated with building this Coolidge Expansion.

My testimony relates to the cost of the health impacts, which are significant, as demonstrated here, in the hundreds of millions of dollars over the lifetime of the plant.

A comparable portfolio of clean energy resources would emit no pollution at the sited power generation and would avoid these health impacts and associated costs.

The Commission should deny gas infrastructure where there is a viable alternative and negative health impacts of the gas power plant.

Q. Does that conclude your testimony?

A. (Ms. Bottorff) It does.

Q. Thank you.

MR. RICH: Mr. Chairman, I'll make the witnesses available for cross-examination.

CHMN. KATZ: I just had one question.

You gave the figure of 9.5 million to 21 million. Is that for the United States as opposed to Arizona? Because you gave a second figure for Arizona.

MS. BOTTORFF: Yes. So COBRA reports on different geographies. So the total is for the U.S., and then the secondary number zooms down to Arizona.

CHMN. KATZ: And I got the secondary number was what, 7 million to how many million?

MS. BOTTORFF: 7 million to nearly 16.

CHMN. KATZ: 16, did you say?

MS. BOTTORFF: Uh-huh.

CHMN. KATZ: Let me ask you this. We can go for about another 10 to 15 minutes. We can at least get started with cross, or we can take the break. What do you think? Do you want to get started?

MR. ACKEN: Mr. Chairman, I suggest we plow forward. I don't think I'll be done with cross-examination.

CHMN. KATZ: That's fine. Why don't you go for another 10 or 15 minutes. At a convenient spot, we'll break for lunch and then resume about an hour later.

MR. ACKEN: Very good.

CROSS-EXAMINATION

BY MR. ACKEN:

Q. Good afternoon to you both.

Is it Ms. Bottorff?

A. (Ms. Bottorff) Bottorff, yes.

Q. My name is Bert Acken. I'm counsel for Salt River Project.

Ms. Bahr, it's always a pleasure to see you. Good afternoon to you.

A. (Ms. Bahr) Good afternoon.

Q. So I'm going to start with you, Ms. Bahr. You have previously testified before this Committee, correct?

A. (Ms. Bahr) Yes, once.

Q. And in that case, did you testify before the Siting Committee that you could support a project using groundwater because it was taking land out of agricultural production?

A. (Ms. Bahr) I'm trying to remember. I didn't testify in a project -- the only project where I testified was a transmission line.

Q. Perhaps -- did Sierra Club intervene in a concentrated solar project in Gila Bend?

A. (Ms. Bahr) No.

Q. Okay. You testified that this project is not actually using stored water.

Do you know where SRP is storing the CAP water that it is using for this project?

A. (Ms. Bahr) I don't know -- I don't know where they're storing that water.

Q. So what is your basis for saying that they're not using it?

A. (Ms. Bahr) I -- when I read the CEC, it said we were continuing to pump from right at the facility and that the stored water was going to an irrigation district.

Q. And you referred to the CEC. You're referring to the CEC application; is that correct?

A. (Ms. Bahr) Correct.

Q. And that irrigation is the Hohokam Irrigation and Drainage District?

A. (Ms. Bahr) Yes.

Q. And do you know the boundaries of the Hohokam Irrigation and Drainage District?

A. (Ms. Bahr) No.

Q. So you do not know whether the boundaries of that district includes this project?

A. (Ms. Bahr) That's correct.

MR. ACKEN: I'd like to show what's been marked now as SRP No. 6. Thank you.

Q. BY MR. ACKEN: Can you see that on the screen to

your right or on the screen in front of you?

A. (Ms. Bahr) Are you still talking to me?

Q. I am.

A. (Ms. Bahr) Yeah, I can see it.

Q. I suspect you -- have you seen this before?

A. (Ms. Bahr) I just saw it yesterday.

Q. Have you had a chance to review it?

A. (Ms. Bahr) No, I have not. I glanced at it, but I haven't had a chance to review it carefully.

Q. I'd like to give you that opportunity to review it right now.

A. (Ms. Bahr) I've read the document.

Q. And do you have any objection to the concept of a community working group for the Randolph community?

A. (Ms. Bahr) I have no opposition to it. Obviously, it would be up to the Randolph community.

Q. Thank you for that.

Next I want to switch to your testimony regarding air quality. You testified that the nonattainment area has been classified as "severe," and you later said "serious." Which is it?

A. (Ms. Bahr) Serious nonattainment area, so I misspoke.

Q. And you understand there is no severe designation for PM10?

A. (Ms. Bahr) I do, yes.
Q. While I'm on that topic, do you know -- do you understand the difference between a hazardous air pollutant and a criteria air pollutant?
A. (Ms. Bahr) I do, yeah. There are different standards for hazardous air pollutants than for criteria pollutants. For the criteria pollutants, they established National Ambient Air Quality Standards.
Q. And do you know if EPA defines PM10 as a hazardous air pollutant or a criteria air pollutant?
A. (Ms. Bahr) It defines it as a criteria pollutant.
Q. And same question for PM5.
A. (Ms. Bahr) It's a criteria pollutant.
Q. And do you know whether there is an annual PM10 standard in effect at this time?
A. (Ms. Bahr) For?
Q. NAAQS standard.
A. (Ms. Bahr) Oh, National Ambient Air Quality Standards.
Q. Yes.
A. (Ms. Bahr) Yes, there is.
Q. For PM10. So it's your testimony that there is an annual standard?
A. (Ms. Bahr) Oh, an annual standard currently in

effect?

Q. And you may not know. I'm really not trying to --

A. (Ms. Bahr) I'm not sure on that.

Q. I'm not trying to trick you. There was testimony yesterday from another witness, and I thought perhaps you could help us clarify. But if you don't know the answer, that's fine.

Have you reviewed SRP's air quality permit application?

A. (Ms. Bahr) I've read it.

Q. And have you reviewed SRP's dispersion model?

A. (Ms. Bahr) I have not looked at the dispersion modeling.

Q. Do you understand that SRP has conducted dispersion modeling for its air quality permit application?

A. (Ms. Bahr) Yes, I do.

Q. And do you understand the modeling assumes maximum emissions from the facility?

A. (Ms. Bahr) Yes.

Q. And do you understand that EPA establishes the National Ambient Air Quality Standards to be protective of human health and the environmental with an adequate margin of safety?

A. (Ms. Bahr) I understand that they try to do that, yes.

Q. And that is EPA's charge, correct?

A. (Ms. Bahr) Yes.

Q. And EPA's decision-making goes through a rulemaking process when it establish standards?

A. (Ms. Bahr) Yes.

Q. And Sierra Club knows how to participate in air quality permit proceedings, does it not?

A. (Ms. Bahr) Yes.

Q. You also provided some testimony regarding -- or extensive testimony regarding climate change. Do you understand that SRP has provided testimony in this proceeding that this project will enable it to integrate additional renewable energy?

A. (Ms. Bahr) Yes, I heard that testimony.

Q. Do you have any basis to dispute SRP's testimony on that point?

A. (Ms. Bahr) No.

MR. ACKEN: I'd like to show Slide 10 from SRP No. 2.

Slide 110. See if I got my numbering correct.

Q. BY MR. ACKEN: Ms. Bahr, do you have in front of you on either the screen to the right or the screen in front of you the exhibit or the PowerPoint slide numbered

110 that has been part of what has been marked for identification as SRP Exhibit 2?

A. (Ms. Bahr) Yes.

Q. And do you see that it provides projected annual carbon emissions in 2035 and 2050 under two different scenarios?

A. (Ms. Bahr) Yes.

Q. And you see that the one scenario shown in blue is with the Coolidge Expansion Project?

A. (Ms. Bahr) Yes.

Q. And the alternative without the Coolidge Expansion Project is shown in yellow?

A. (Ms. Bahr) Yes.

Q. And previously, a WRA witness testified his understanding of the emission reduction from SRP's 2005 baseline to 2035 on a mass basis is nearly 75 percent. Do you have any basis to disagree with his conclusions?

MR. RICH: Objection. I think that mischaracterizes the testimony from WRA's witness.

MR. ACKEN: I don't think it does, but please elaborate why you think it does.

MR. STAFFORD: I believe he testified that for the two options, they were approximately a 72, 73 percent reduction in mass from the 2005 levels based on the numbers provided in this slide. He didn't -- the math he

did only related to the difference between what their baseline was and the mass projected here. He did not verify the calculations of what this mass figure would be.

Q. BY MR. ACKEN: With that clarification, do you have any reason to dispute his conclusion that it was a mass-based reduction of let's say 72 percent?

A. (Ms. Bahr) Yeah, I looked at the conclusions, but I would have no reason to dispute it.

Q. Thank you, Ms. Bahr.

MR. ACKEN: Mr. Chairman, this might be a good stopping point before we talk about COBRA.

CHMN. KATZ: That's fine. We're at right now about 12:32 and 12:33. And my phone says 12:30. So we can break now and come back and get started again at 1:30. And I'd ask the parties to confer with another one to make sure that we can coordinate any remaining witnesses for this afternoon.

We do stand in recess.

(A recess was taken from 12:31 p.m. to 1:31 p.m.)

CHMN. KATZ: I think our in-person witnesses are ready and here, so please -- Mr. Acken, please feel free to continue.

MR. ACKEN: Thank you, Mr. Chairman.

Q. BY MR. ACKEN: Good afternoon again Ms. Bottorff. I'm probably butchering that every time, so I apologize.

A. (Ms. Bottorff) Bottorff is right.

Q. As I mentioned earlier, I want to talk to you about the COBRA modeling info, as you would suspect.

I heard you refer to it as a reduced form model. What does that mean?

A. (Ms. Bottorff) Sure.

So reduced form model is what they call their air modeling matrix that they're using. Essentially, when they say "reduced form," it just means that it's a simplified model so that they can put it into this free, publicly available tool. It's not going to be as complicated as some of the complex air dispersion modeling that would be done for a more comprehensive air modeling.

Q. And I believe you testified that this COBRA model has limitations as a result; is that correct?

A. (Ms. Bottorff) Yep. As I stated, they suggest that it should really be used as a screener. And they provide the caveats that it has been validated against some of these more complex models. But as I'm sure you know, government, EPA especially, like to be very careful with what they say about their tools, so they do make the

point that it has limitations.

Q. And do you know whether it's EPA's position that, quote, COBRA serves as a preliminary screening tool to identify those scenarios that might benefit from further evaluation with the more sophisticated air quality modeling approaches that are currently available?

A. (Ms. Bottorff) Yes.

MR. RICH: Was that a -- I'm sorry. I didn't catch if that was a question.

CHMN. KATZ: She answered it yes, so that was intended to be a question.

Q. BY MR. ACKEN: And do you know whether EPA's user manual for COBRA states it should be treated as a screening tool that provides a crude estimate of the likely impact of a change in emissions on ambient PM2.5 levels?

A. (Ms. Bottorff) Yes. They use the word "crude," and I make the point that it does have limitations.

(Interruption by court reporter for audio difficulty.)

CHMN. KATZ: Let's go off the record and make sure that we can proceed without difficulty.

(A recess was taken from 1:34 p.m. to 1:37 p.m.)

Q. BY MR. ACKEN: Do you know whether EPA's user manual for COBRA says that it is a screening tool that

provides a crude estimate of the likely impact of a change in emissions on ambient PM2.5 levels?

A. (Ms. Bottorff) Yes. And they do use the word "crude estimate" there. One of the good things about COBRA is that it provides you a low and a high estimate. So while it is a crude estimate, you have a very wide berth for uncertainty there.

CHMN. KATZ: And that sounds much better, so let's try that. Keep this up.

Go ahead, Mr. Acken.

Q. BY MR. ACKEN: And EPA goes on to say that more sophisticated atmospheric dispersion models should be used to obtain detailed estimates of ambient air quality changes, correct?

A. (Ms. Bottorff) Correct.

Q. And EPA also refers to the COBRA model as a quick-and-dirty assessment; is that correct?

A. (Ms. Bottorff) I don't remember that wording specifically.

Q. On Exhibit 29, I believe it was your testimony that that contains a list of studies in which the COBRA model was used; is that correct?

A. (Ms. Bottorff) Correct.

Q. And you identified a few that were specific to individual power plants; is that correct?

A. (Ms. Bottorff) Correct.
Q. How many studies are on that list approximately?
A. (Ms. Bottorff) I have not counted them before. I can do a quick calculation now if you need me to.
Q. Please do.
A. (Ms. Bottorff) Probably between 150 and 200.
Q. And out of that 150 to 200 studies, how many involve modeling emissions from a specific single power plant?
A. (Ms. Bottorff) I have not counted that specifically. This list is also not a full list of every study that has ever used COBRA. It is a list that EPA has maintained. There are many studies that I know are not on here as well.
Q. And I believe you referenced two or three; is that correct?
A. (Ms. Bottorff) Yes. I referenced two.
Q. And is it fair to say that quite a number of those studies using COBRA regard rulemakings of a much broader applicability than a single power plant; is that correct?
A. (Ms. Bottorff) Yes.
Q. You mentioned stack heights. What stack height did you use for your modeling?
A. (Ms. Bottorff) COBRA includes categorizations

of stack heights. So you do not put in a specific stack height. You put it in a group of stack heights that they include based on the stack heights listed in the air permit. This fit into their low categorization.

Q. So if I understand correctly, COBRA does not allow you to model the specific stack heights planned for this project; is that correct?

A. (Ms. Bottorff) Correct.

Q. And would you agree with me that stack height affects modeling results?

A. (Ms. Bottorff) Yes.

Q. Do you know whether EPA says the COBRA model should be used to determine compliance with the National Ambient Air Quality Standards?

A. (Ms. Bottorff) I don't know.

Q. Have you reviewed SRP's air quality permit application for this project?

A. (Ms. Bottorff) Yes.

Q. And have you reviewed SRP's dispersion model associated with that air quality permit application?

A. (Ms. Bottorff) Yes. Not every single detail of it, but I have reviewed it.

Q. And do you understand that model assumes maximum emissions from the facility?

A. (Ms. Bottorff) Yes.

Q. And do you understand that EPA establishes NAAQS to be protective of human health and the environment with an adequate margin of safety?

A. (Ms. Bottorff) I understand that's what they aim to do.

Q. And they do that through their Clean Air Science Advisory Committee?

A. (Ms. Bottorff) I don't know that specifically.

Q. Ms. Bahr, do you know?

A. (Ms. Bahr) I don't know the specific name of it, no.

Q. Are you aware of whether EPA has a group of health experts that advises it with respect to what the National Ambient Air Quality Standards should be?

MR. RICH: Hold on. Who is that question to?

MR. ACKEN: Either one.

MS. BAHR: Yes, they do.

Q. BY MR. ACKEN: Thank you.

Back to you, Ms. Bottorff. Do you have an opinion -- well, let me ask you this differently. I butchered that question.

Would you agree that the air quality dispersion modeling done by SRP in support of its air quality permit application is more sophisticated than the COBRA model?

A. (Ms. Bottorff) Yes.

Q. I'm going to ask you the same question on cleanup that I asked Ms. Bahr. Do you know whether there is an annual PM10 National Ambient Air Quality Standard that is currently in effect?

A. (Ms. Bottorff) My understanding is there is not.

Q. Thank you.

MR. ACKEN: No further questions.

CHMN. KATZ: We'll go down -- Mr. Stafford, any questions of this witness?

MR. STAFFORD: I believe I have one for Ms. Bahr.

CHMN. KATZ: That's fine.

CROSS-EXAMINATION

BY MR. STAFFORD:

Q. Ms. Bahr, could you turn your attention to Slide 110 from SRP Exhibit 2.

CHMN. KATZ: Are we trying to get that put up on the screen?

MS. BAHR: I assume so. I don't have it in front of me.

MR. STAFFORD: I think they're working on it.

Thank you.

Q. BY MR. STAFFORD: Now, Ms. Bahr, to the right,

the 2050 reduction in mass, is that sufficient to mitigate climate change as discussed by the IPCC in their AR6 report?

A. (Ms. Bahr) For 2050?

Q. Yes.

A. (Ms. Bahr) I don't believe so.

Q. What about their 2035 goal?

A. (Ms. Bahr) No.

MR. STAFFORD: Thank you. Nothing further.

CHMN. KATZ: Thank you.

Anything from Ms. Post?

MS. POST: No, thank you.

CHMN. KATZ: Any re -- oh, Ms. Ust.

MS. UST: Nothing from Staff. Thank you.

CHMN. KATZ: Thank you.

Any redirect?

MR. RICH: Are there any Committee questions first, Mr. Chairman? Or I'm happy to go --

CHMN. KATZ: Thanks for reminding me.

Do any Committee Members have questions for either of these two witnesses? And then we'll go to redirect when the Committee is done.

MEMBER HAMWAY: No questions.

CHMN. KATZ: Nobody physically present in the room has a question.

Do any of our folks appearing virtually have any questions to either Ms. Bottorff or Ms. Bahr.

(No response.)

CHMN. KATZ: Hearing silence, please feel free to go ahead with your redirect.

MR. RICH: Thank you. Just a few questions.

REDIRECT EXAMINATION

BY MR. RICH:

Q. Ms. Bottorff, you were asked about the dispersion modeling and the information that SRP included in its application. Do you recall those questions?

A. (Ms. Bottorff) Yes.

Q. And earlier, you testified, and I want to make sure you still agree, that SRP did not perform any health impact modeling associated with this project that you're aware of, correct?

A. (Ms. Bottorff) Correct. SRP's modeling is a more complex air dispersion model, but they did not take the next step of translating that air dispersion model into the human health impacts of the pollution.

Q. And while COBRA may be a, quote, crude model, is it your testimony that because of the high and low bounds of potential impacts, we can be confident that within those bounds lies the answer?

A. (Ms. Bottorff) Yes. And as COBRA also says, while it acknowledges the perhaps limitations it has, they are clear that it is a useful tool for policy analysis and public discussion such as what we're doing here.

Q. Thank you.

And, Ms. Bahr, SRP asked you to read their Exhibit No. 6. Do you recall that?

A. (Ms. Bahr) Yes, I do.

Q. And you were asked whether a working group should be formed for the town of Randolph's benefit. Do you recall that?

A. (Ms. Bahr) Yes.

Q. And are you aware that SRP operates or installed a 500kV line that goes adjacent to the town of Randolph?

A. (Ms. Bahr) Yes.

Q. And that, obviously, there's an existing generating station in place across the way from Randolph; is that correct?

A. (Ms. Bahr) Yes.

Q. And so with that in mind, do you have any comments on that Exhibit 6 and whether or not SRP should have perhaps done something different along the way?

A. (Ms. Bahr) Yes. In reviewing that document, I thought, Why haven't they done this already. It seems

like the minimum. There ought to be other things. But with the existing power plant, with the kind of light pollution and other issues associated with it, the 500kV line, why haven't they done this already. And it seems to me that it's something that they should have considered when they acquired the plant originally.

Q. Great. Is there anything else you want to add on that topic?

A. (Ms. Bahr) I think that covers it.

MR. RICH: That's all the questions I have. I want to thank you both very much for being here and offering your testimony.

CHMN. KATZ: And, again, Ms. Bahr, you are welcome to remain throughout these proceedings, and so are you virtually, Ms. Bottorff, but thank you both.

MS. BAHR: Thank you.

CHMN. KATZ: You're both excused.

MS. BOTTORFF: Thank you.

(The witnesses were excused.)

CHMN. KATZ: And as you're shuffling around, what are we going to do next?

MS. POST: My witness, Adrienne Hollis, is online and ready to testify.

CHMN. KATZ: Okay. Just give us a minute or so.

And this witness -- do you prefer an -- well,

state your name and spell your last name for us, if you would, please, and then I'm going to ask you whether you prefer an oath or an affirmation.

MS. HOLLIS: Yes. My name is Adrienne Hollis. A-d-r-i-e-n-n-e, H-o-l-l-i-s. And an oath is fine.

CHMN. KATZ: Okay. Just give me a second.

(Adrienne Hollis was duly sworn by the Chairman.)

CHMN. KATZ: Thank you very much.

And, Ms. Post, whenever you're ready, you may begin.

ADRIENNE HOLLIS,

called as a witness on behalf of Randolph Residents, having been previously sworn by the Chairman to speak the truth and nothing but the truth, was examined and testified as follows:

DIRECT EXAMINATION

BY MS. POST:

Q. You've just stated your name, so can you please state your business name and address.

A. Yes. My business is Hollis Environmental Consulting Services, LLC. The address is 2113 St. Joseph's Drive in Bowie, Maryland 20721.

Q. On whose behalf are you testifying in this case?
A. On the community's behalf.
Q. Have you submitted a resume or CV?
A. Yes.
Q. And I would just point out that it is 34 for Randolph Residents.

And does this CV accurately reflect your education and experience?
A. Yes, it does.
Q. Could you give us a summary of your education and experience?
A. Sure.

I have a PhD in biomedical sciences. I focused on environmental toxicology as an environmental toxicologist. I'm also an environmental attorney, and I also work at the intersection of environmental justice and environmental racism, climate change, and public health, and everything in between.
Q. And what is the purpose of your testimony?
A. The purpose of my testimony is to provide additional context on the serious nature of environmental contamination and exposure and the importance of maintaining the history of African American communities and other communities of color.

CHMN. KATZ: Also -- this is the Chair. I just

was wondering, what was the PhD in? You gave a long list of your qualifications. But the doctorate is in what field?

THE WITNESS: My PhD is in biomedical sciences.

CHMN. KATZ: Okay. Got it.

Q. BY MS. POST: What is your knowledge and research on environmental justice and environmental racism?

A. I've been working in the field of environmental justice and, as such, environmental racism for 30 years with frontline communities, environmental justice communities, addressing issues that they face around toxic substances.

Q. And what is an environmental justice community?

A. Well, an environmental justice community typically has been considered the African American community, but other people of color, communities of low socioeconomic status that are disproportionately affected by environmental pollution and who bear the burden unfairly and unequally when it comes to living in proximity to facilities and areas that are contaminated, facilities that produce contamination.

Q. Is there a history of toxic exposure to environmental justice communities?

A. Yes, there is. There's a long history. It's

been well documented. For example, one of the best reference sources is from -- well, I knew you would ask me this -- from Dr. Robert Bullard's book, The Wrong Complexion for Protection, which talks about how people of color are disproportionately affected by environmental pollution.

Q. What are some of the negative nonhealth consequences of environmental injustice?

A. Some of the negative nonhealth effects include food insecurities, access to healthy foods . Energy insecurity, where a community is, for a number of reasons, be it the fact that they live in housing with poor infrastructure or their economic situation is such that they can't afford to pay their utility bills, they are in a position of energy insecurity. Also includes things like job loss and unsafe communities, unsafe environments for the most part, among other things.

Q. Is there a correlation between environmental exposure and adverse health effects? We have had quite a bit of testimony about that. But from your background in toxicology, could you give us maybe some specifics. I see you've mentioned disruptors and other things.

A. Yes. The relationship between exposure to contaminants, for example, air pollution or greenhouse gases, include increased asthma, increased respiratory

illnesses in general, lung cancer, heart disease, infant mortality, preterm labor and infant mortality.

And then a number of chemicals have reproductive effects. They're called endocrine disruptors. And the health effects can range from infertility to a variety of health conditions that an infant born can have.

Q. I want to turn to what is Randolph Residents Exhibit No. 4, which is the report from 1987, Toxic Wastes and Race in the U.S. Are you familiar with that report?

A. I am.

Q. Can you give us a summary of that report.

A. Sure.

It's the first report that documented the presence of hazardous wastes in racial and ethnic communities throughout the U.S. And it was commissioned by the United Church of Christ for Racial Justice. And it was found that there were clear patterns; that communities with higher percentages of minority populations had clear patterns that showed that these were the areas that were chosen as sites for toxic waist facilities, that it was deliberate.

Q. So this report, was this the first report on this issue?

A. It was the first major report, yes.

Q. And who authored this report?
A. The report was actually authored by Dr. Charles Lee from the United Church of Christ Commission for Racial Justice.
Q. Was Dr. Bullard involved in this report?
A. Yes.
Q. And who is Dr. Bullard today?
A. He is considered by some to be the father of environmental justice. He has a long history and great knowledge on environmental justice issues and the challenges that environmental justice communities face when it comes to environmental contamination.
Q. What happened after this report was released?
A. Well, what happened -- what happened included the fact that more attention -- some attention was provided to the issue of Superfund sites. The siting of facilities in communities sort of came to light. And I think people started paying more attention to the location of these facilities, although the siting of them did not cease at that point. But the recommendations of cleanup for those sites were taken into account, I think, with Superfunds under the Clean Air Act. So it had a big impact on environmental policy and legislation.
Q. One of our witnesses, Dr. Tim Collins, testified that this is what kicked off the environmental justice

movement. Would you agree with that?

A. I would.

Q. And this particular report is focusing on waste facilities; is that correct?

A. Yes, that is correct.

Q. So does that mean its importance is only limited to waste facilities?

A. It is not. No, it isn't.

The pattern that was elucidated in this study is applicable across the board.

Q. Across the board to what?

A. To environmental contamination and exposure in general in communities of color.

Q. Now, we also have had both SRP and Dr. Collins give a definition of environmental justice. What is your definition of environmental justice?

A. Well, environmental justice, in a nutshell, is equal protection from pollution. Although some people think it's equal pollution, I think what it does is calls for -- it addresses the fact that everyone is entitled to live in a clean and healthy environment.

Q. Is it important to do research in preservation of Black communities in this country?

A. Yes, it is, because it's --

Q. Why?

Go ahead. Why?

A. It's a part of our heritage, of the heritage of the United States. And in that regard, it should not be excluded. And, you know, now that we're really focusing on the issues around environmental racism and how environmental racism continues to impact the lives of people of color, it is important to talk about the role that these communities have played in I guess the establishment of this country and in contributing to that.

Q. What has been the record of the United States thus far in preserving these Black historical towns and other buildings and communities?

A. Well, that is -- I think that's an important question. Unfortunately, it hasn't been really -- it hasn't been good. The fact that only 2 percent of National -- sites on the National Historic Register are focused on Black Americans says a lot when you have more than 95,000 entries on the national register.

Q. Would it be important for Arizona to have such a town registered with the State and National Historic Register?

A. Absolutely. Arizona is one of the most diverse states in the nation; and, as such, the history of not only our indigenous brothers and sisters, Native

Americans, and Spanish-speaking populations, but the role that African Americans played is very important. And I know that currently there exists at least in the state six historic sites, six historic African American sites.

Q. When you say that Arizona is one of the most adverse in the nation, what do you mean by that?

A. Diverse.

Q. Oh, diverse. Okay. Sorry.

A. Yes. Sorry.

Q. All right. Are you aware of -- well, let me turn to what is Randolph Residents Exhibit No. 5, The fight to preserve Black Historic Places. Are you aware of that?

A. I am aware of it generally.

Q. And the Preserving African American Places, can you tell us about this organization and this historic fund, which is --

A. I can tell you that because the Federal Government and the organizations that focus on preservation have not focused on African Americans that organizations took it upon themselves to preserve these important structures and locations; and that, for the most part, under -- throughout history -- or as history progressed, the African American contribution was ignored. And when it was -- when it did become part of

the -- I guess the narrative, the structures, for example, were deteriorated to the point where they were not, in some instances, fit for addition to the national register. So these organizations took it upon themselves, which was a great thing, to sort of gather information on these facilities -- excuse me -- on these sites.

Q. Could you tell us what your organization does both in regards to environmental justice and preservation of Black spaces.

A. Sure.

Well, two things. My organization -- one of the organizations that I'm on the board of, the one that I think you're talking about, is the Chisholm Legacy Project. And part of what we do is work with freedmen's settlements. And freedmen's settlements are areas of the country that were populated or created by former slaves called freedmen.

And so these communities are -- they have a long, rich history of existing in various states. And we work with them, working to identifying them and to address the fact that some of them don't have access to water and have never been on city water. We have a community right now in Texas in that very situation.

I also, in my consulting, I work with

communities to address issues around environmental contamination and ensure that policy is focused on or incorporates the effects of pollution on communities of color and those that are disproportionately impacted by things like climate change for a variety of reasons, mostly stemming from systemic racism.

Q. Do you know if the Chisholm Legacy Project is prepared to work with the Randolph community?

A. I do. And, yes, they are.

MS. POST: I have no further questions.

I pass the witness for cross.

CHMN. KATZ: Mr. Acken.

MR. ACKEN: Thank you, Mr. Chairman.

CROSS-EXAMINATION

BY MR. ACKEN:

Q. Good afternoon, Dr. Hollis. Can you hear me okay?

A. Yes, I can hear you. Good afternoon.

Q. My name is Bert Acken. I am counsel for Salt River Project in this matter.

I see from your CV that you're a professor at George Washington.

A. I am an adjunct professor at George Washington, yes.

Q. So your classes that are listed on there are kind of fascinating. I went to GW many moons ago. I don't think that a class such as yours -- they were few and far between when I went there, so that's great to see that that's there.

I just have a couple questions for you.

You talk about the -- establishing Randolph as getting its historic designation, correct?

A. Do I talk about that? I'm sorry. I didn't understand.

Q. Did you talk about that in your testimony? You talk about working to get Randolph established as a historic designation?

A. I did not say that, so ...

Q. Okay. Maybe I misunderstood you.

But you talk about the importance of the history, correct.

A. Yes. The history of African American communities, yes.

Q. Okay. So maybe I made a leap that I shouldn't have, so let me ask it this way: Would you support efforts by Salt River Project to work with the community of Randolph to obtain those historic designations for the community?

A. That is actually a question that I can't answer

since I don't know the -- I don't know anything about the organization, about Salt River Project. I don't know if they have -- if they're qualified. I don't have any information on that.

Q. Okay. Are you familiar with Arizona State Center for Race and Democracy?

A. I am not.

MR. ACKEN: No further questions. Thank you.

CHMN. KATZ: Anything from Mr. Rich?

MR. RICH: No, sir.

CHMN. KATZ: Mr. Stafford.

MR. STAFFORD: No questions, Chairman.

CHMN. KATZ: Staff, Ms. Ust.

MS. UST: Nothing from Staff. Thank you.

CHMN. KATZ: Let me just ask the Committee.

MEMBER HAMWAY: I have one.

CHMN. KATZ: Yes. Go ahead, Ms. Hamway.

MEMBER HAMWAY: So you just said that the Chisholm -- was it some organization called the Chisholm that is willing to work with Randolph?

DR. HOLLIS: Chisholm Legacy Project.

MEMBER HAMWAY: So how do we fix this? How do we go back and help these Black communities find the history, document the history, fix up these communities? What do you recommend? How do we do this?

DR. HOLLIS: Well, you know, that's a very good question. I don't have all the answers, but I do know the first step is to work with partnership with these communities. And interestingly enough, the communities really have the historical knowledge. And I think that just one of the issues is that we don't partner with them and invite them to have their rightful place at the table. And so that would be the first step. And in that way, we can find out what is already in existence because the knowledge is there.

MEMBER HAMWAY: Okay. Thank you.

CHMN. KATZ: Any other questions from Committee Members that are present in the hearing room?

(No response.)

CHMN. KATZ: Anything from our remote folks?

MEMBER GRINNELL: Mr. Chairman.

CHMN. KATZ: Yes. Mr. Grinnell.

MEMBER GRINNELL: Doctor, thank you for your presentation and discussion.

Coming from a multicultural environmental growing up and in my own family, one of the common denominators within the minority community has been the economic status of these various communities. Would that be appropriate to say?

DR. HOLLIS: Absolutely.

MEMBER GRINNELL: And with that, do we not only try to find ways to recognize cultural contributions to our history, wouldn't it also be advantageous for the counties and the local jurisdictions to contribute to this opportunity of transition to a much more educated environment?

DR. HOLLIS: Yes. And that includes providing opportunity for jobs and opportunities for businesses to thrive in these communities and opportunities for these community representatives to be part of the actual -- to actually be part of the city, you know what I mean, be part of the work that's done at the city level or the county level or the state level.

MEMBER GRINNELL: All right. Thank you, Doctor, again for your presentation.

CHMN. KATZ: Anyone else from our Committee long distance?

(No response.)

CHMN. KATZ: Nothing further.

Any redirect?

MS. POST: No redirect. The witness may be excused.

CHMN. KATZ: Dr. Hollis, thank you very much for being present here today. Have a good rest of the day and take care.

DR. HOLLIS: Thank you.

(The witness was excused.)

CHMN. KATZ: Do we have one more Sierra Club witness?

MR. RICH: No. That's all of our witnesses.

CHMN. KATZ: Okay. Any of our intervenors have anything further to present by way of testimony?

(No response.)

CHMN. KATZ: Hearing silence, I am assuming that you have some redirect examination?

MR. ACKEN: Mr. Chairman, we do have some testimony we would like to illicit on rebuttal. Should we take like a five, ten-minute break to get it set up?

CHMN. KATZ: Sure. And I said redirect. I meant rebuttal.

But, anyway, we can take a break until about 20 after 2, and then we can get started.

And how many witnesses do you expect to call?

MR. ACKEN: Four, Chairman Katz. But it is -- we're going to do it in a panel format. Three of them are witnesses that are already sworn previously and provided testimony.

CHMN. KATZ: By the time we're done, we're probably going to fill up the afternoon with their testimony?

MR. ACKEN: We'll see. We have four because there are different subject matters we need to cover. But it's really -- I don't expect it to be an extensive direct. Obviously, it depends on the questions. An hour or so.

CHMN. KATZ: We'll see where we're at. I just don't know if it's going to make sense to try to begin deliberations this afternoon or start fresh early tomorrow morning.

We do stand in recess for about seven or eight minutes. Just let us know when you're ready.

(A recess was taken from 2:12 p.m. to 2:23 p.m.)

CHMN. KATZ: If you're ready to proceed, please do so. And I believe that three of the four witnesses were previously sworn; is that correct, Counsel? And we're back on the record.

Three of our four witnesses were previously sworn or affirmed; is that correct?

MR. ACKEN: That is correct, Chairman.

For rebuttal testimony, Salt River Project calls Bill Mcclellan, Angie Bond-Simpson, and Anne Rickard, all of whom had previously provided testimony in this proceeding, and Robert Olsen, who is a new face to the Committee in this proceeding.

CHMN. KATZ: And let me just ask you -- the

three of you are still under oath or affirmation subject to penalty of perjury, and I'll say nothing further.

And, Mr. Olsen, do you prefer an oath or affirmation?

MR. OLSEN: I have no preference.

(Robert Olsen was duly sworn by the Chairman.)

CHMN. KATZ: You may be seated.

And you may proceed, Mr. Acken.

MR. ACKEN: Thank you.

WILLIAM MCCLELLAN, ANGIE BOND-SIMPSON, ANNE RICKARD, ROBERT OLSEN,

called as witnesses as a panel on behalf of Applicant, having been previously affirmed or sworn by the Chairman to speak the truth and nothing but the truth, were examined and testified as follows:

DIRECT EXAMINATION

BY MR. ACKEN:

Q. We're going to start with Mr. Olsen.

And since you are a new face, please state your name and business address for the record.

A. (Mr. Olsen) My name is Robert Olsen. My business address is SRP. It's at 1500 North Project Drive in Phoenix, Arizona.

Q. By whom are you employed and in what capacity?
A. (Mr. Olsen) I'm employed by the Salt River Project, and I currently fulfill the role of the director of supply and trading in fuels for SRP. And in that capacity, I'm responsible for SRP's market participation. And that includes bilateral and EIM participation as well as all of our commodity transactions associated with generation, and that includes natural gas pipeline transmissions and commodity trading.
Q. Next describe your educational and professional background.
A. (Mr. Olsen) I have a bachelor's degree in mechanical engineering from Northern Arizona University. I've been employed at SRP for more than 17 years now, working in a variety of roles and responsibilities, including power generation, corporate engineering, field procurement, and my current role as director of markets.
MR. ACKEN: I'd like to bring up Sierra Club -- and, Mr. Rich, if you can confirm, I think it's Sierra Club Exhibit 34 was the slide presentation?
MR. RICH: Yes.
MR. ACKEN: So Sierra Club Exhibit 34, Slide 15.
Thank you very much.
Q. BY MR. ACKEN: On the screen in front of you, Mr. Olsen, is what has been marked for identification as

Sierra Club Exhibit 34, Slide 15. And the heading is Existing Coolidge generator operates for short intervals.

Do you see that in front of you?

A. (Mr. Olsen) Yes, I do.

Q. And were you here -- were you present for the testimony of Sierra Club witness Rob Gramlich this morning?

A. (Mr. Olsen) Yes, I was.

Q. And did you hear his testimony regarding this slide?

A. (Mr. Olsen) Yes.

Q. So this slide presents -- well, why don't you describe what the slide presents.

A. (Mr. Olsen) I would be happy to.

So this slide represents how Coolidge generator, at least one block of the existing Coolidge Generating Station, was deployed during August. And has it notes at the top of the slide, this was during what has kind of been referred to as a heat dome or a heatwave, a significant heat storm that enveloped the entire Western United States and strained the electrical operating grid as part of this time period.

To provide context for the data that you see on the slide here, as I referenced, the capacity and energy were extremely tight during the event. To provide

context to that, we saw energy prices, which will typically transact in the 50 to maybe 70 dollar per megawatt-hour range, we saw pricing go north of $1,500 per megawatt-hour, to provide some context there. That type of market move, from a pricing perspective, indicates extreme scarcity. As a result of that, we were hyperconcerned about the ability to continue to bring in or find capacity during a very tight time period; specifically, to access that capacity in the real-time markets.

It would be one thing for my team to have to work through such an event. This was extreme and difficult for many utilities across the West to deal with. However, in addition to the heat conditions that were present, SRP was also experiencing -- well, Arizona was also experiencing a wildfire in the eastern portion of the state which threatened our transmission lines which brought in a significant capacity as part of serving our load.

As a result of that, you can see that there are several zeros here that materialized around the 14th and moved forward. When we noticed that our transmission assets were at risk as well as significant concerns regarding capacity on the system, SRP did go ahead and move these resources into a condition which is known as

replacement reserve. And a replacement reserve is a resource that is on standby ready to serve at a moment's notice when either a generator or a transmission line trips out of service.

And because of our concerns regarding capacity, as indicated by the pricing as well as risk of loss of transmission, really for an unforeseen period of time as a result of that wildfire, we took the Coolidge Generating Station and placed it into reserve capacity in order to ensure that if we did lose that transmission line or any other generator, we would be able to maintain reliable electric service during that time period.

Q. Thank you.

Next let's move to Slide 18. And this slide concerns gas that was offline during Winter Storm -- is it Uri? In I believe it was February of 2021. Do you see that in front of you?

A. (Mr. Olsen) Yes, I do.

Q. Did SRP suffer any loss of generation or reliability issues related to gas constraints in that winter storm event?

A. (Mr. Olsen) No, we did not.

Q. Are you aware of any Arizona utilities having lost generation or facing reliability concerns related to Winter Storm Uri?

A. (Mr. Olsen) I am not.

Q. And why is that as it relates to SRP?

A. (Mr. Olsen) As it relates to SRP, when it comes to natural gas freeze-off events -- as previous testimony provided from intervenors, there are freeze-off events that occur from time to time. As a result, SRP has deployed a variety of techniques to help combat the risk of freeze events on the gas transportation system.

And that includes, one, deploying a diverse portfolio of resources. During the Winter Storm Uri event, we were able to kind of swift generation from gas over to coal as well as leverage market purchases in other items to help supplement.

And we also worked to diversify our gas supply. We sourced not just from the Permian Basin. We also sourced from the San Juan Basin in the Four Corners region. This helped to diversify risk of freeze events. While it can get cold in both areas, we tend to see deep freezes in one basin versus the other.

But we also diversify our transportation rights for firm transportation of gas across two different pipelines. We focus on rights that are balanced between the El Paso Natural Gas pipeline system as well as rights that are on the Transwestern Pipeline system. This really enables SRP to deploy as much flexibility as we

can, even when there's a gas event, to help to manage and redirect gas supply and mitigate the risk of any particular event.

Q. Thank you.

Now I'd like you to take a look at Slides 19 and 20. If we could scroll forward. This Slide 19 references a 2017 NERC study. And if we could go to the next slide. It also references that 2017 NERC study.

Do you see that in front of you?

A. (Mr. Olsen) Yes, I do.

Q. Are you aware of any subsequent studies done?

A. (Mr. Olsen) Yes, I am.

Q. And were those studies specific to the WECC region?

A. (Mr. Olsen) Yes, they were.

Q. And what were the conclusions?

A. (Mr. Olsen) Sure.

So, as a result of the 2017 NERC study, the WECC region, in 2018, hired a consultant named Wood Mackenzie to perform a more detailed analysis relevant to the Western interconnection.

And part of their conclusions determined that the probability for a gas event affecting the Desert Southwest as represented here was substantially lower than what was reflected in the NERC study that was

completed the year prior.

There were a couple notes that were included in that that I believe are relevant for this proceeding.

And the first one of note would be that during the time period of the study, there's a gas storage field known as Aliso Canyon. It is located in Southern California. And Aliso Canyon was out of service at the time that the 2017 and 2018 studies were performed.

WECC did perform a sensitivity with respect to the Aliso Canyon gas storage field and recognized that if that facility were in operations, were returned to operations, that the otherwise de minimis risk associated with loss of load associated with a gas event in the Desert Southwest was completely mitigated. Shortly after the WECC report was issued, the Aliso Canyon storage facility was returned to service and has been operating in substantial capacity ever since then.

In addition, the WECC study did also look and evaluate what the effects of mitigation options would be if Aliso Canyon were not in place. It identified that mitigation opportunities could exist, and they explored various options, including solar, which the WECC study very specifically stated could not mitigate any gas risk events in the region as well as battery storage. Battery storage would require more than 15,000 megawatts of

capacity installed in order to mitigate a de minimis risk of the gas system.

Q. You testified as to some of the practices that SRP deploys to mitigate risk to gas supply. Do you have anything else that you want to add on that topic?

A. (Mr. Olsen) The only other item that I would add relative to that topic is we focus very much on management of our gas supply in two particular categories.

We focus primarily on diversification of physical supply, as I discussed before. During those types of constrained events, you also have pricing risk. SRP deploys a very robust hedging protocol and program to help to further minimize and manage pricing risk associated with those types of events. So SRP is very conservative and takes a very proactive risk management perspective with respect to these gas events.

Q. Let's next turn to Slide 25 in Sierra Club 34.

So as I understood the testimony this morning, the witness was suggesting that Westwide markets reduce the need for additional capacity by any one utility. Can you provide background on requirements for Salt River Project to participate in markets such as the EIM?

A. (Mr. Olsen) Sure.

So in order to actually participate within the

Energy Imbalance Market, there are regular tests that are required to be performed -- and by "regular," they are hourly test -- to demonstrate that any utility that is participating within the market is prepared to fully serve their load as well as to bring their own flexibility to the marketplace itself.

And so while there can be benefits associated with flexibility across the entire system, the market is constructed to prevent leaning of capacity and flexibility prior to actually allowing you to participate.

So to put it a different way, SRP has to ensure that we have sufficient capacity at all times to serve our load, regardless of whether it exists in other locations. We also have to have sufficient flexibility on our own system in order to demonstrate participation and access some of the lower-cost benefits of the EIM.

Q. So in light of that, can SRP rely on a market such as EIM for the additional capacity it needs, the additional capacity that this project provides?

A. (Mr. Olsen) No.

Q. What about flexibility? Can SRP rely on the EIM for flexibility needs?

A. (Mr. Olsen) No. As I stated, while EIM provides flexibility, in order to participate, SRP has to

bring its own system flexibility as demonstrated through a pass-fail test to participate. So the short answer is no.

Q. Thank you, Mr. Olsen.

Any other comments you'd like to share with the Committee at this time.

A. (Mr. Olsen) Not at this time.

Q. Okay. Thank you.

Turning to Ms. Bond-Simpson. Welcome back.

MR. ACKEN: For her testimony, I'd like to have on the screen Slides 98 and I believe it is 108 from SRP No. 2.

Thank you very much.

Q. BY MR. ACKEN: Ms. Bond-Simpson, do you see Slides 98 and 108 from SRP No. 2 in front of you?

A. (Ms. Bond-Simpson) I do.

Q. So there was some discussion and perhaps some misstatements in the testimony this morning regarding the role of E3.

What did SRP retain E3 to do?

A. (Ms. Bond-Simpson) So we retained E3 to use their ELCC methodology and to use their own planning tools, software tools, to provide an independently derived portfolio that was reliably equivalent to the portfolio with the Coolidge Expansion Project in it.

Q. And did you conducted an economic analysis --

MR. ACKEN: I'm going to ask that that slide go back up, 108.

Q. BY MR. ACKEN: Did you conduct an economic analysis of E3's portfolio that you asked them to develop?

A. (Ms. Bond-Simpson) Yes. This is shown as the ELCC sensitivity. In the lower right-hand corner of Slide 108, this economic analysis indicated that even using E3's alternative portfolio that the Coolidge Expansion Project was the economic choice by $305 million.

Q. So does this contradict Mr. Gramlich's testimony that he believed that the economic analysis of E3's portfolio would show a net present value benefit for batteries?

A. (Ms. Bond-Simpson) It does.

Q. Mr. Gramlich also spent a lot of time talking about the year 2026 and the amount of batteries that SRP would need in 2026. Do you recall that testimony?

A. (Ms. Bond-Simpson) I do.

Q. Do you think that's a -- well, does SRP stop planning in 2026?

A. (Ms. Bond-Simpson) Absolutely not.

Q. Do you think it's a fair approach to stop

looking at what happens beyond 2026?

A. (Ms. Bond-Simpson) Absolutely not.

It's important to consider long-term plans for a number of considerations in order to meet reliability, affordability, and even our sustainability targets, we have to plan throughout a long-term horizon through 2035 and through 2050.

Q. And does Slide 98 reflect the alternative portfolio compared to the portfolio with the Coolidge Expansion Project in 2035?

A. (Ms. Bond-Simpson) It does.

Q. And can you explain again for the Committee how much more standalone batteries and solar and batteries SRP would need in 2035 without this project.

A. (Ms. Bond-Simpson) So, again, if I can reorient you to the slide, everything shown on the left-hand side in orange is indicative of what would come out of the portfolio, and everything on the right-hand side in blue is indicative of what would be needed to replace the reliability.

And we have 1,900 megawatts of standalone battery plus 400 megawatts of battery that would be paired with solar in a hybrid system. And in order to maintain reliability, we would also need 550 megawatts of a renewably fueled combustion turbine that could dispatch

on demand.

Q. And those additional battery resources and additional future combustion turbine with renewable fuel, those are what SRP would need in addition to what it is already planning to do with respect to batteries in order to replace the Coolidge Expansion Project; is that correct?

A. (Ms. Bond-Simpson) That is correct. Both portfolios will be building renewables and batteries. And what you are seeing here is the difference to maintain reliability between the two portfolios.

MR. ACKEN: Next I'd like to show on the right-hand screen what has been marked for identification as SRP No. 8.

Okay. Thank you very much.

Q. BY MR. ACKEN: Committee Member Drago had requested some additional information be provided regarding Slide 110 to SRP No. 2.

And if you would, Ms. Bond-Simpson, for the Committee, please walk the Committee through what has been marked as SRP No. 8 shown on the right-hand screen.

A. (Ms. Bond-Simpson) Absolutely.

So I believe the Committee has seen this slide several times now from its foundation. But what we're showing here is the annual carbon emissions comparison

between the portfolios, the Coolidge Expansion Project portfolio and the alternative portfolio. The Coolidge Expansion Project portfolio is shown in blue. The alternative is shown in yellow. And this is the mass reductions or the mass emissions in 2035 and 2050 as compared to the latest year, 2021.

The question I believe from our Committee Member was what would be the renewable makeup in those portfolios. And so we've included that information here. By 2035, SRP is planning on reliably delivering 9,000 megawatts of renewables in order to meet our sustainability goals. The vast majority of this includes solar energy, but there is also wind, geothermal, hydro, biomass included in this.

The difference between the two portfolios is the balancing resources needed. This includes 2,300 megawatts of additional battery storage, as indicated on Slide 98 to the left, and the 550 megawatts of renewably fueled combustion turbines.

Again, this alternative portfolio came at a cost, $637 million. And we can see that the difference in carbon emissions between the two is about 1 percent by 2035.

Q. And that difference in carbon emissions that you're referring to, it shows a 74 percent reduction from

2005 for the expansion portfolio with this project that's before the Committee and 75 percent reduction in the alternative portfolio.

Again, what is that a reduction from?

A. (Ms. Bond-Simpson) That's a reduction from 2005 levels. This is tied -- 2005 is tied to the Paris Accord. And so the levels at that time were about 18.7 million metric tons.

Q. Thank you.

Next, Mr. Mcclellan -- well, before I go to Mr. Mcclellan, Ms. Bond-Simpson, did you have any other comments that you wanted to share with the Committee before I move forward?

A. (Ms. Bond-Simpson) Not at this time.

CHMN. KATZ: Would you just repeat how much you'd have to spend if you added the increased solar.

MS. BOND-SIMPSON: The difference from net present value between those two portfolios was $637 million.

CHMN. KATZ: Thank you.

Q. BY MR. ACKEN: Mr. Mcclellan, there was a question from the Committee, and I am paraphrasing, I'm sure: Of the 3,200 megawatts of nationally installed battery capacity in 2021, how much is in Arizona?

A. (Mr. Mcclellan) Sure.

So of that 3,200 megawatts deployed nationally, in Arizona, there's about 95 megawatts of capacity that's currently installed. And that consists of seven separate projects.

I'll also add that the largest project that's currently in Arizona is about 30 megawatts, and that's the Wilmot Energy Center. And I believe that serves TEP.

CHMN. KATZ: Is that just solar, or is it solar and battery?

MR. MCCLELLAN: It's -- well, I'm not sure if it's solar and battery. I'm just referring -- the 30 megawatts is just the battery portion of that, Chairman Katz.

And then I'll go on to mention nationally, the largest battery storage projects, there's really two that are fairly large. One is a 400-megawatt capacity project in Florida. I believe that's called the Manatee project. And then also, in California, there's a project that's called Moss Landing. That's also a 400-megawatt battery project.

I'll also go on to note that -- you remember back to Mr. Smedley's testimony, I believe, SRP expressed some concerns about the amount of battery storage that we might have to add. In looking at the Moss Landing project, that Phase 1 of that project, which is 300

megawatts, has been offline since September of 2021 due to a fire at that facility. In addition, I just saw a report that Phase 2 is now offline, which is the remaining 100 megawatts. And that's due to a fire that occurred just this past Sunday night.

Q. BY MR. ACKEN: Another question from the Committee asked what country do the majority of solar panels come from?

A. (Mr. Mcclellan) Yes. So a large portion of the solar panels that are manufactured do come from China or from Southeast Asia, so countries like Vietnam, Thailand. A large portion of the manufacturing occurs in that area.

Q. Thank you, Mr. Mcclellan.

Do you have anything else to add right at this time?

A. (Mr. Mcclellan) No, not right at this time.

MR. ACKEN: Next I'd like to show on the screen what's been marked for identification as SRP No. 7.

Thank you.

Q. BY MR. ACKEN: And for this question, I'm going to turn to Ms. Rickard.

Describe for the Committee what SRP-7 represents.

A. (Ms. Rickard) So SRP-7 represents what you've heard me talk about extensively during this testimony,

which is our commitment to forming a community working group.

That will consist of five Randolph residents. We know we've gotten some who have said they would commit to that during this testimony. We're confident we can find many more. Also, a member of Pinal County Supervisors, a member of City of Coolidge, and then two members from SRP.

So what this shows is the Randolph residents will have a seat at the table. We heard that in testimony just this morning, that has been lacking. So this working group is going to do that for them.

The objective is to identify and work with that working group to meet the needs of the neighborhood. You've heard me talk about we are not going to be prescriptive in these solutions. It's working with them to identify what is going to help that community the most.

SRP is committed to retaining an independent facilitator to run these meetings. We've also heard we need to be respectful of where these meetings need to happen. The first initial one will be a night or a weekend time frame as near or in the vicinity of Randolph as we can be.

So the scope of the CWG will -- that's the

acronym for community working group -- is to start with implementing a landscaping plan that will visually screen the project and mitigate noise. Also provide landscape to common areas in Randolph.

Secondarily, reduce the impacts of the plant lighting, accommodating safety measures that are necessary within the plant for the employees that work there. But, again, we've heard that that is something that we can help mitigate.

Third, as we've also heard extensively, there is funding available through state, through federal means. We will supply a grant writer to help the residents -- again, it will be through this working group -- to identify how we can provide additional funding to this area.

And fourth, job training and skills development to the residents of Randolph. That is going -- that can start with working with what we've got available at SRP. There is extensive training program that exists. Tradesmen jobs. There is a lot of opportunity right now that exists with SRP. Also identifying areas outside of SRP where there may be appropriate places for the residents to apply as well.

There's two -- I can give two examples that we're working with right now. One is called Drive 48.

That's an organization that was started through Central Arizona College, which is a facility to help train either students or other residents to learn about the automotive trade and then create that pipeline into that industry.

Another one is with ASU, who is looking specifically to identify neighborhoods and communities of color and minority students to help them get that pipeline to access ASU. Both of those are projects that SRP is currently working on.

Q. Does this proposal which is shown as SRP-7 differ from the prior proposal that you discussed marked as SRP-6?

A. (Ms. Rickard) It's actually more extensive. The prior proposal also talked about a community working group, but the items that you see here today are in response to what we've heard throughout this testimony.

Q. Thank you.

Beyond the community working group, Ms. Rickard, are there other commitments SRP is prepared to make to assist the community of Randolph that you'd like to discuss?

A. (Ms. Rickard) Yes. I would like to also add the opportunity to extend a scholarship program to the residents there. Again, we would work with the community working group to identify who is interested in this, in

what capacity, whether it's a trade program, a community college, a university, but we are absolutely committed to providing that scholarship program.

Q. Thank you.

MEMBER HAMWAY: Could I just ask quickly, is the scholarship program just for Randolph residents who are interested?

MS. RICKARD: Yes.

MEMBER HAMWAY: So you're going to set aside taxpayer dollars, money -- or not taxpayer, but customer money to grant scholarships for just this community?

MS. RICKARD: We would. This is something, though, that SRP is not new to. We have other scholarship programs available.

MEMBER HAMWAY: Okay.

Q. BY MR. ACKEN: Ms. Rickard, anything else before I turn back to Mr. Mcclellan?

A. (Ms. Rickard) I just want to end with, again, the focus on why we are stressing this community working group so heavily. It's because we have listened, we've heard from the residents themselves, they need that voice at the table. I'm sorry if I'm repeating it, but it's something that's so important to note why there are five residents at the table in this group. They're the majority represented so that we are not becoming just

another large corporation trying to fix something or not fix it with them.

MEMBER HAMWAY: Could I ask another quick question.

How long do you think it's really going to take to implement these grants and get this community going and get the streets paved and the cutters done and the curbing done and all of that? What is your time frame on that? And do you think it's -- can we be successful, given that they have no political structure, they don't really have a fire district. So there are some huge barriers to success here.

So can you address that and how long you think all of this will take so they can -- how long will it take for them to start realizing some of these benefits?

MS. RICKARD: We're willing to start the groundwork on getting this community working group established now. It will not take long to get the commitment from the Pinal County supervisor, we heard from him earlier today, and City of Coolidge -- I'm sorry. Not today, but earlier in this hearing. That can happen within, you know, a short time frame. And I say "short," I mean within a couple of months to get that established, get time frames and schedules accommodated. That part can happen quickly.

Yes, it will take longer for some of these more monumental changes to take effect. But that's what that group will start with immediately. Setting goals, what are we trying to accomplish first. Set some short-term, mid-term, long-term, goals and put dates associated with them.

I do understand it is not a short undertaking. We're here for the long haul, though.

MEMBER HAMWAY: So if you can't get three -- was it three or five Randolph residents?

MS. RICKARD: We would like five.

MEMBER HAMWAY: If you can't get five?

MS. RICKARD: If we can't get five, we'll work with the three we have.

MEMBER GENTLES: Mr. Chairman.

MEMBER HAMWAY: One other quick question. What is the expectation that the citizens of Randolph will do other than coming to the table and telling you what they want. Is that all they have to do?

MS. RICKARD: No. We're going to rely on them for constant feedback also to know that the changes that we're making and deciding upon as a group are working. What needs to change. What may be in five years out of date that we need to adapt. But, no, not just hoping it happens. They will have an active role in it.

CHMN. KATZ: Member Gentles, I believe you may have had a question too.

MEMBER GENTLES: Ms. Rickard, does SRP have a relationship partnership with Habitat for Humanity or some other housing movement organization?

MS. RICKARD: We actually do, and I actually sit on that board representing SRP. So I've already started discussions with them, asking if that would be a potential project. I don't have an answer yet, but ...

MEMBER GENTLES: So SRP does invest in housing rehabilitation and economic development of neighborhoods, correct?

MS. RICKARD: Through our donation to Habitat, yes.

MEMBER GENTLES: Okay. So do you think that might be an appropriate item to list even though you're not being prescriptive of the needs that you believe that the community wants?

MS. RICKARD: I don't think it's prescriptive, no. I think it's definitely one that we could put as a point of opportunity and then work to Habitat to see what's feasible from their end.

MEMBER GENTLES: On the proposal that you just showed us?

MS. RICKARD: Yes. I would be willing to put

that in there as an opportunity.

MEMBER GENTLES: So the rest of the things on the list are opportunities as well, right?

MS. RICKARD: No. These are commitments. I wouldn't be able to commit to what Habitat can fund specifically without speaking to them.

MEMBER GENTLES: And I'm not necessarily asking you to commit for Habitat. We're here talking about SRP. I just asked the question whether or not you had a relationship with them as an example of housing rehabilitation partnerships that you've done in the past. So the answer I hear is that SRP has engaged in some housing rehabilitation, neighborhood revitalization projects in the past.

MS. RICKARD: We provide a contribution to Habitat, who then extends that housing opportunity.

MEMBER GENTLES: Okay. So given that this was quite the weak situation, I suspect that SRP would think their framework of ability would be creative in their efforts to supported and help this community.

MS. RICKARD: Did you say creative? Did I hear that correctly, that we would be creative?

MEMBER GENTLES: Creative and innovative. Because I've heard that SRP is quite innovative.

MS. RICKARD: Yes.

MEMBER GENTLES: So do you think that SRP would be innovative in this area as well?

MS. RICKARD: I do.

MEMBER GENTLES: Great. Thank you.

CHMN. KATZ: Thank you.

MEMBER RIGGINS: Mr. Chair, this is John Riggins.

CHMN. KATZ: Mr. Riggins.

MEMBER RIGGINS: I just had a question.

So regardless of the outcome of the CEC process, whether it's approved or denied, does SRP's offer to assist and work with the Randolph community stand, the scholarship, the working to assist with infrastructure? Is this something, since you are already existing neighbors with the Randolph community?

MS. RICKARD: Yes, it absolutely stands.

MEMBER RIGGINS: Thank you.

MR. ACKEN: Thank you.

Q. BY MR. ACKEN: Mr. Mcclellan, Member Hamway mentioned paving. And I'm sure the Committee will note that paving is specifically addressed as part of the community working group. Is SRP committed to paving roads in the Randolph community?

A. (Mr. Mcclellan) Yes.

Q. And would SRP be willing to accept a condition

to that effect?

A. (Mr. Mcclellan) Yes.

Q. And is SRP committed to paving roads surrounding the plant that the Committee went on the tour, saw the dirt roads, saw the roads in desperate need of maintenance? Is SRP willing to address those roads that surround the plant as well?

A. (Mr. Mcclellan) Yes. And really looking at Randolph Road that's on the north side of the facility, Vail Road that's on the east side, and then also Kleck Road to the south.

Q. And is one reason for not including it in the community working group is that SRP can just make that happen right away, to Member Hamway's comment about timing? And maybe I shouldn't say "right away." You've got to work with some other jurisdictions to make it happen. But is that one reason to do it separately?

A. (Mr. Mcclellan) Yes.

Q. And who would you need to coordinate with to make that -- to accomplish that?

A. (Mr. Mcclellan) I think we would certainly have to coordinate with the City of Coolidge and Pinal County as well.

Q. Another item that was on the original list that is not listed in SRP-7 was support for establishing

Randolph as a national historic district or something along those lines. Is SRP still supportive of that?

A. (Mr. Mcclellan) Yes.

Q. And does SRP envision that could be done, again, outside the community working group?

A. (Mr. Mcclellan) Yes.

MR. ACKEN: That's all the questions I have for this panel at this time. They're available for questions.

CHMN. KATZ: Begin with Mr. Rich if he has any questions.

MR. RICH: I do. Thank you, Mr. Chairman.

CROSS-EXAMINATION

BY MR. RICH:

Q. Good afternoon.

And let me start with Ms. Rickard.

So we just heard, I just want to confirm, the items on SRP-7, SRP will be providing those and moving forward with that independent of the result of this proceeding, correct?

A. (Ms. Rickard) Correct.

Q. So if the CEC is denied, the members of Randolph can expect, for example, that SRP will move forward with the landscaping improvements, correct?

A. (Ms. Rickard) Correct.
Q. And SRP will move forward with reducing the plant lighting issues if the CEC is denied, correct?
A. (Ms. Rickard) Yes.
Q. And does that include the road paving that we just heard about? Will SRP move forward with paving the roads if the CEC is denied?
A. (Ms. Rickard) Yes.
Q. And is there anything on the list or anything that's been discussed that SRP will not move forward with if the CEC is denied?
A. (Ms. Richard) I have nothing on this list, no.
Q. Other than they won't be building the power plant, correct?
CHMN. KATZ: If it's denied?
Q. BY MR. RICH: If it's denied.
A. (Ms. Rickard) If it's denied, yes, I guess we won't be building the plant.
Q. Let me -- if you could bring up SRP Exhibit -- actually, let me -- sorry, skipping around here.
Let me ask Mr. Olsen, you provided some testimony about Winder Storm Uri, correct?
A. (Mr. Olsen) Yes.
Q. And does SRP receive gas from El Paso Natural Gas?

A. (Mr. Olsen) Yes.
Q. And isn't it true that during Winter Storm Uri, El Paso declared what's called a critical operating condition?
A. (Mr. Olsen) Yes, that is true.
Q. And can you explain what that means.
A. (Mr. Olsen) A critical operating condition is when there is not enough gas in the pipe to maintain the engineered operating limits or that there's risk of that.
Q. And did SRP have gas curtailment or suffer from curtailment of the gas supplies that it would have otherwise received during that time period?
A. (Mr. Olsen) We did not experience any gas curtailments outside of our expected and planned curtailments anticipated through the event.
Q. I'm sorry. So you did --
A. (Mr. Olsen) So we did receive curtailments. However, they did not exceed what we anticipated and planned for going into the event.
Q. Okay. So, yes, you suffered from curtailments, correct?
A. (Mr. Olsen) We didn't suffer from them. We experienced them.
Q. Fair. I didn't mean to use that word in any pejorative sense?

And a curtailment meant that you received less -- you did not have access to all the natural gas that you otherwise would under existing contracts, correct?

A. (Mr. Olsen) That is correct.

Q. And did SRP -- what happened to the price of natural gas during that time period during Winter Storm Uri?

A. (Mr. Olsen) Well, the price of natural gas on the spot market rose in excess of $300 per MMBTU. However, I will note that, as I mentioned, SRP has a financial hedging program. So SRP's financial hedge has settled consistent with what we were expecting going into the month, which was closer to the $5 per MMBTU range.

Q. Did SRP end up responsible for paying any penalties as a result of gas curtailments?

A. (Mr. Olsen) We did not. SRP was one of the few shippers in Arizona that did not suffer penalties. In fact, we would have been owed several million dollars in windfalls -- in penalties had El Paso not waived the penalties for all shippers.

Q. So it sounds like you have knowledge of that. Isn't it true that some utilities in the state of Arizona were charged with penalties from El Paso Natural Gas as a result of the events surrounding Winter Storm Uri?

A. (Mr. Olsen) There were some utilities that were charged. I cannot speak to what the actual penalties applied to other utilities are, but I also cannot speak to how proactive they were regarding managing their allocation of gas during the event.

Q. And isn't it true that during that event, the State of Texas prohibited any natural gas resources from leaving the state of Texas?

A. (Mr. Olsen) That is not true.

Q. Okay. Mr. Mcclellan, you talked about the number of megawatts of battery storage installed in Arizona and other jurisdictions. Do you recall that line of questioning?

A. (Mr. Mcclellan) Yes.

Q. Do you know, before the Palo Verde Nuclear Power Plant opened in the state of Arizona, how many megawatts of nuclear power were located in the state of Arizona at that time?

A. (Mr. Mcclellan) I do not.

Q. Do you think it was zero?

A. (Mr. Mcclellan) Yes.

Q. And yet the Palo Verde Generating Station is the largest generating station in the United States; is that correct?

A. (Mr. Mcclellan) I think it is among the

largest.

Q. Ms. Bond-Simpson, now I think I would like to have I think it was SRP's new Exhibit No. 8 brought up, and I've got a question for you.

A. (Ms. Bond-Simpson) Okay.

Q. So you're familiar, I assume, with SRP's 2035 sustainability commitments, correct?

A. (Ms. Bond-Simpson) I am.

Q. Okay. And is SRP's sustainability goal consistent with this slide?

A. (Ms. Bond-Simpson) I'm not sure what you mean by that question.

Q. Okay. Let's back up.

What is SRP's -- what are their goals with regard to sustainability by 2035 in terms of the mass reductions in CO2?

A. (Ms. Bond-Simpson) SRP does not have a mass goal for 2035.

Q. Have you ever done a calculation of what the carbon intensity goal would translate to in terms of mass by 2035?

A. (Ms. Bond-Simpson) Yes, many times. It's dependent on the load forecast in the portfolio.

Q. And what are the -- when you've done that calculation, what results have you gotten?

A. (Ms. Bond-Simpson) It depends on the timing.
Q. Okay. Well, what's the last number you got?
A. (Ms. Bond-Simpson) The most recent reduction I believe has not been reported to our board yet, but I believe that's in the mid 60s.
Q. In the mid 60s, meaning that by 2035, SRP expects carbon mass reduction in the mid 60 percent range?
A. (Ms. Bond-Simpson) Yes.
Q. And what are the assumptions that were -- how does that differ from previous calculations?
A. (Ms. Bond-Simpson) Load forecast grew from those particular -- what we're seeing on Slide 1 now.
Q. Why -- if you just testified that the most recent calculation you did had that translating into the mid 60s, why does this say 75 or 74 percent?
A. (Ms. Bond-Simpson) This is reflective of the alternatives analysis that I testified to, which I did comment on that the load forecast had increased from this timing, increasing the urgency for the CEP project.
Q. I'm not sure I understand. How does that 60 percent number differ from this 75 percent number, and which one is more accurate?
A. (Ms. Bond-Simpson) The load forecast changed, which increased -- or, I'm sorry, decreased the

reduction. That load forecast would be the most recent carbon mass reduction.

Q. So that load forecast that you just referenced is the 60 -- mid 60 percent range, is more recent and more accurate than this number, then? Is that your testimony?

A. (Ms. Bond-Simpson) Yes. It is more recent than this number.

Q. Okay. So this number that's displayed in this SRP-8 does not represent a current accurate forecast for SRP, correct?

A. (Ms. Bond-Simpson) This number -- this number does not represent the load forecast increases, the most recent load forecast increases.

Q. So it's my understanding, and let me -- I guess have you previously calculated the translation between the 65 percent reduction in carbon intensity, which it is utility's goal by 2035 -- have you previously calculated that and turned be it into a mass reduction number predicting a 35 percent reduction by 2035?

A. (Ms. Bond-Simpson) Yes. That was shown in the summer stakeholder series in I believe it was either June or July in response to a question.

Q. And I guess my source of confusion is that -- so I don't understand how, in just a few months, SRP would

have gone from predicting 35 percent carbon reduction by mass by 2035 to telling this Committee here today that you're going to reduce carbon by 74 percent by mass in the same time period. Can you explain that?

A. (Ms. Bond-Simpson) Yes. We are constantly and continuously planning our system using the best available information. And when the load forecast changes, we update to understand that we have to maintain reliability to meet that customer forecast. So as the load forecast changes, we are continuously updating the resource plan to meet those needs.

Q. What are the other elements of this blue bar on Exhibit SRP-8? It's called the Coolidge Expansion Portfolio. It is everything you have in place today plus Coolidge Expansion Project, or are there other additions that are added between here and 2035?

A. (Ms. Bond-Simpson) There are other additions between now and 2035 that are consistent between portfolios.

Q. So the only difference between those two portfolios on there is the either inclusion or exclusion of the CEP project?

A. (Ms. Bond-Simpson) In terms of reliability needs, yes. The Coolidge Expansion Project and then the replacement portfolio to maintain reliability, yes.

Q. So my question is in terms of metric tons of CO2, as this chart is supposed to depict, is the only difference between those two portfolios the inclusion or exclusion of the CEP project?

A. (Ms. Bond-Simpson) Correct.

Q. I want to make sure I understand this, because it's a big difference. The mid 60 percentage to 75 percent is significantly different.

The load forecast, you said it went up; is that correct? Or it went down? I just want to make sure I got that in my mind.

A. (Ms. Bond-Simpson) The load forecast increased.

Q. Okay. And has the load forecast increased since you calculated this back in June?

A. (Ms. Bond-Simpson) The load forecast increased, yes, since this alternatives analysis was performed, correct.

Q. Since the alternatives analysis that you referenced having done over the summer in June, correct?

A. (Ms. Bond-Simpson) It was completed by May. It was done over six months in 2021.

Q. Okay. And then that -- if the load forecast has gone up since then, you would expect the carbon to come down, right? I'm sorry. You would expect the percentage reductions to get smaller, not bigger, right?

A. (Ms. Bond-Simpson) Not necessarily. So the carbon goal is an intensity-based goal, so it is pounds per megawatt-hour. And so when the load forecast changes, it changes the amount of megawatt-hours produced. And so when the load forecast goes up, it could -- it could increase our mass. And so that would decrease the percentage reduction from 2005.

Q. Okay. Did you rerun -- given your new -- your newest information that's not reflected in SRP Exhibit 8, have you also recalculated what that yellow bar would be if you used your most recent load forecast?

A. (Ms. Bond-Simpson) No.

MR. RICH: Let me just check my notes really quick, Mr. Chairman.

CHMN. KATZ: Sure.

Q. BY MR. RICH: I just wanted to make sure I understand before I leave this issue, Ms. Bond-Simpson. The load forecast has gone up, and yet you have calculated that the carbon reduction in mass will actually double. So even though the load is going up, you're going to reduce by double what you were predicting just a few months ago?

MR. ACKEN: Objection; asked and answered.

MR. RICH: It's not clear.

MR. ACKEN: Ms. Bond-Simpson -- it may not be

clear to you, but I think her testimony is that the reason that the carbon emissions --

MR. RICH: Speaking objection, Mr. Chairman.

CHMN. KATZ: Let me just have you articulate your objection.

MR. RICH: I did not object. He objected.

CHMN. KATZ: Your objection.

MR. ACKEN: That it's been an asked and answered. And her testimony was repeatedly it's because of all of the additional renewable resources that SRP is adding to the system, Mr. Chairman, which she testified about. He doesn't like the answer. He keeps asking it in different ways, but that's still the answer.

CHMN. KATZ: I'm going to allow him to ask the question even if we get the same answer.

Q. BY MR. RICH: And I appreciate that your lawyer just coached you on the answer, but I want to make sure I understand.

So you're saying that since calculated that we would have a 35 percent carbon reduction by mass over the summer or in May of last year, the load forecast has gone up. And yet you are saying that even though the load forecast has gone up, the mass of carbon reduction that you're expecting is itself doubling? Shouldn't it go -- it should go down in that scenario, correct?

A. (Ms. Bond-Simpson) Incorrect. Our emissions target is an intensity-based target, the 2035. That is in the pounds-per-megawatt-hour metric. And so when the load forecast changes, it changes the megawatt-hours our system has to produce. And so at times, it is possible that it changes our mass to where there is less reduction by 2035.

Q. You said "less reduction," but you're predicting double the reduction by 2035 that you were just a few months ago, correct?

A. (Ms. Bond-Simpson) Incorrect.

Last year we produced a mass-based emissions reduction that was consistent with that portfolio. That is not shown in this testimony. That is not shown on this slide. That has been recently updated by portfolio changes.

And what we're seeing here is the changes between the alternatives analysis that was performed and the reduction in mass due to the load forecast increase.

Q. Okay. I'll leave it.

MR. RICH: Thank you very much. I don't have any other questions for anyone.

CHMN. KATZ: Mr. Stafford.

MR. STAFFORD: Thank you, Mr. Chairman.

If I could get WRA-8 alongside SRP-8, please.

MS. MASER: I only have through 7.
MR. STAFFORD: Pardon?
MS. MASER: I only have 1 through 7.
MR. STAFFORD: All right. We'll just pull up SRP-8, then, for now.
Mr. Chairman, may I approach the witness and hand her a copy of SRP-8 and anybody else who needs one?
CHMN. KATZ: And that was the revised commitment?
MR. STAFFORD: It's the WRA-8. That's the one from SRP's presentation back -- to the advisory group back in July of 2020. It's the source for the baseline, the 2005 baseline.
CHMN. KATZ: We don't have a means of projecting that, do we? If we don't, you can go ahead and --
MR. ACKEN: I think we can. Yeah. Let me see if I can send it to Ms. Maser.
CHMN. KATZ: Carolyn, what time did we start? Was it 2:00? 3:00?
THE REPORTER: We started back at -- we took a short break and started back at 2:23.
CHMN. KATZ: Okay. We'll keep going for a little bit.
MR. ACKEN: I don't think I have them either. I know you showed them to me, but I don't know that I have

electronic versions of them.

MR. STAFFORD: Yeah, I sent them to all the parties and the Committee.

MR. ACKEN: When did you send that? I'll find it.

MR. STAFFORD: It was sent by Marcela Lopez-Lira, not me personally.

MR. ACKEN: Thank you.

MR. STAFFORD: She sent it on the 10th.

MR. ACKEN: I found it and forwarded it to Ms. Maser. She'll be pulling it up here shortly.

MR. STAFFORD: Thanks.

All right. There we go. Thank you.

CROSS-EXAMINATION

BY MR. STAFFORD:

Q. Ms. Bond-Simpson, I believe you testified moments ago that the 2005 baseline was 18.7 million metric tons?

A. (Ms. Bond-Simpson) Yes.

Q. Okay. I'm confused because looking at WRA-8, the 38.1 billion pounds, when we did the math, we came up with 17.281869 metric tons. I'm trying to figure out the discrepancy between the 38.1 billion pounds is 18.7 million metric tons.

A. (Ms. Bond-Simpson) I can't answer that specifically, but what I can tell you is that there has been a baseline revision from 2005. That was communicated with the 2035 sustainability goal advisory group. And that I believe that revision was due to calculations from a third-party independent assessment of the baseline.

Q. Okay. So then I'm not losing my mind. So it's not -- you didn't somehow convert 38.1 billion pounds into 18.7 million metric tons. That number had been revised since 2020; that's correct?

A. (Ms. Bond-Simpson) I believe the baseline has been revised and that you can see in that same exhibit the 62 percent intensity was also revised at that same time to reflect a 65 percent intensity. I believe that was the same timing.

Q. Okay. All right. Now, looking at SRP-8, that 75 percent reduction or 74 percent reduction with the CEP, that's no longer accurate based on the latest load projections and resource mix that SRP has planned?

A. (Ms. Bond-Simpson) The load forecast has changed, and there is a new mass percentage that is lower than the 74 percent reduction.

Q. And you said it was the mid 60s?

A. (Ms. Bond-Simpson) I believe so.

Q. So the total amount of mass that SRP is going to reduce its emissions by will vary depending on what the load forecast is, then? That's going to affect it, right? So you could meet the carbon intensity goal but still -- if the load forecast goes up, then the amount of mass reduction will decrease, everything else held constant, correct?

A. (Ms. Bond-Simpson) It could.

Q. And then so with this -- the latest mass-based reduction for 2035 in the mid 60s, you said, is that still maintaining the 65 percent reduction to the rate, or is the rate going to change?

A. (Ms. Bond-Simpson) The 65 percent reduction goal will not change. That is a board-established goal.

Q. But SRP can exceed that, can't they?

A. (Ms. Bond-Simpson) We would not exceed a board target.

Q. Even if you could do it more cheaply than not achieving it?

A. (Ms. Bond-Simpson) The board target is our direction. We will meet our board target.

Q. But not exceed?

A. (Ms. Bond-Simpson) It is possible that we could exceed that target. I'm sorry. It is possible that we could exceed the reduction, so we could meet or exceed

our 2035 target in terms of reductions. But we will not have a carbon -- in 2035, we will not go above the board-established target.

Q. Meaning the intensity. You won't generate power with the intensity of greater than the 65 percent reduction -- or 550 megawatts per megawatt-hour, correct?

A. (Ms. Bond-Simpson) It might be clear if I say the target is 550 pounds per megawatt-hour. By 2035, we will be under that target. We will not be over 550 pounds per megawatt-hour. Is that more clear?

Q. So based on not just SRP-8, but the updated calculations that are not shown here, will the 60 something -- is that going to exceed the rate -- the reduction that is required by the board?

A. (Ms. Bond-Simpson) Can you repeat the question, please.

Q. Okay. The intensity target is 65 percent, right?

A. (Ms. Bond-Simpson) That is correct. 65 percent reduction from 2005 levels.

Q. In the intensity.

A. (Ms. Bond-Simpson) Right.

Q. Okay. Does SRP anticipate that it will do better than a 65 percent reduction to its emission rate?

A. (Ms. Bond-Simpson) It's possible, yes.

MR. STAFFORD: Thank you.

Nothing further, Chairman.

CHMN. KATZ: Ms. Post.

MS. POST: Yes.

CROSS-EXAMINATION

BY MS. POST:

Q. Ms. Rickard, some of the things that you have in your list for the working group and which you would agree to, some of these have already been rejected by the community as menial and nonserious. Is that true?

A. (Ms. Rickard) That is what I have heard from counsel, yes.

Q. And, Mr. Mcclellan, you've talked about paving the roads. Were you here when Mr. Jordan showed his pictures of that pothole road?

A. (Mr. Mcclellan) Yes.

Q. And he said that that was caused by construction at the SRP plant. Would you be willing to fix those kinds of problems as well?

A. (Mr. Mcclellan) Yes. As part of the paving plan that we mentioned, that portion of Kleck Road would be included.

Q. He also mentioned that the trucks were driving on the railroad corridor using it as a road rather than

using the dirt road on the -- I believe it's on the east side on Vail. So what would you do about those trucks using the railroad corridor as a road and, thus, causing more dust?

A. (Mr. Mcclellan) Could you clarify what you mean by "those trucks."

Q. He said there were SRP trucks during construction that were using the rail corridor as a road.

MR. ACKEN: Was he referring to construction on the transmission lines?

MS. POST: Yes, on the transmission lines.

MR. MCCLELLAN: And -- excuse me. Could you repeat your -- what was your question?

Q. BY MS. POST: The question is, could you prevent SRP trucks during construction or the construction company trucks from using the railroad corridor as a road in order to reduce dust?

A. (Mr. Mcclellan) I would anticipate that during construction of the Coolidge Expansion Project, we could limit the amount of traffic that utilizes that road. I don't think we can commit to restricting all traffic along that road, as we would need to use it for maintenance of the high-voltage transmission lines in that area.

Q. Well, maintenance of the lines is different than

trucks just using it as a road, isn't it?

A. (Mr. Mcclellan) Yes. I would imagine that maintenance would be less frequent than construction.

Q. On the issue of economic development, let me go back to you, Ms. Rickard. Would you be willing to single-source the contractor for this plant, should it be approved, to a Black contractor should he meet the requirements that you need?

A. (Ms. Rickard) I would not be able to be the one to make that determination.

MS. POST: No further questions.

CHMN. KATZ: Ms. Ust?

MS. UST: Nothing from Staff, thanks.

CHMN. KATZ: Anything further, Mr. Acken?

MR. ACKEN: Could we take a recess right now. I still think there's some fuzzy things, and I'm hopeful maybe we can get them clarified after a break.

CHMN. KATZ: We can take about a five-minute break or so.

One thing I do want to alert all of you to is, I had Tod, with help from Michele from SRP and on his own, dig up two CECs, one that was used for the original TransCanada plant that is now owned by SRP, the CEC for that, as well as the CEC for the Ocotillo Expansion Plant of APS in Tempe in 2014.

I just wanted to compare that to make sure because those were the only two that immediately I have retrieved of power plant construction as opposed to transmission line installation. I don't know that they're radically different, but I just would ask everybody to take a look at those and also take a look at the proposed CEC that Mr. Acken had I believe sent to everyone. So I'm just giving you the heads-up on that.

MR. STAFFORD: Mr. Chairman, if I may make a suggestion. You might want to consider having Tod send around a copy of Commission Decision No. 63611. That was the CEC application on the expansion of the Santan plant in Gilbert.

CHMN. KATZ: And does that order attach the CEC number or the CEC to it?

MR. STAFFORD: I believe that the Committee's decision should be attached to the Commission's decision. I should say the Committee's recommendation should be attached to the Commission's decision.

CHMN. KATZ: Do we have that available?

MR. ACKEN: We can certainly provide it.

CHMN. KATZ: Okay. That's fine.

And we'll take a short recess, five to ten minutes, and then wrap up for the day.

(A recess was taken from 3:41 p.m. to 3:52 p.m.)

CHMN. KATZ: Are we ready to continue?

MR. ACKEN: Mr. Chairman, we are.

CHMN. KATZ: Okay.

REDIRECT EXAMINATION

BY MR. ACKEN:

Q. So I want to take another swing at this discussion about various percentages. I found the discussion and the questions and the entire dialog of it confusing, and so I wanted to take a step back and see if we could try again.

So, Ms. Bond-Simpson, there was a question for you about a 35 percent mass-based number. Do you recall -- well, there wasn't a question, there were many questions regarding a 35 percent mass-based number. Do you recall those questions?

A. (Ms. Bond-Simpson) Yes.

Q. Where does that 35 percent mass-based number come from?

A. (Ms. Bond-Simpson) That was a calculation that looked at what the mass number would be of the target, the board-established target, of 550 pounds per megawatt-hour in that current load forecast. So it was directly related to what the target was in terms of mass.

Q. And so is it correct to say that that 35 percent

number did not reflect SRP's future planning expectations?

A. (Ms. Bond-Simpson) That is correct.

Q. It was a math exercise?

A. (Ms. Bond-Simpson) Correct.

Q. Let's next talk about the 65 percent number and the 74 percent number. And why did you show the 74 percent number?

A. (Ms. Bond-Simpson) So the 74 percent was reflective of the analysis that we were presenting in testimony.

Q. And did the 74 percent number, which, correct me if I'm wrong, showed the reduction in mass-based emissions reflect SRP's load growth projections at the time the analysis was done?

A. (Ms. Bond-Simpson) Yes.

Q. And since the time the analysis was done, SRP's load growth projections have changed?

A. (Ms. Bond-Simpson) Correct.

Q. And they have increased?

A. (Ms. Bond-Simpson) Correct.

Q. And so then the mass percentage decreases?

A. (Ms. Bond-Simpson) Correct.

Q. What is the point you were trying to accomplish when you show the comparison of emissions -- carbon

emissions under the Coolidge Expansion Project and the alternative portfolio?

A. (Ms. Bond-Simpson) That the difference between having Coolidge in the portfolio versus a carbon-free option is 1 percent difference. So it's a very subtle and negligible difference in the amount of emissions.

Q. And that's a negligible amount whether it's 74 percent to 75 or 65 to 66; is that correct?

A. (Ms. Bond-Simpson) Correct.

MR. ACKEN: No further questions.

CHMN. KATZ: May these witnesses once again be excused?

MR. ACKEN: They may.

CHMN. KATZ: Do we have any more testimony -- I didn't see that.

MEMBER DRAGO: Mr. Chairman, may I go?

CHMN. KATZ: Yes, please, Mr. Drago, go ahead.

MEMBER DRAGO: Thank you.

Mr. Olsen, I enjoyed hearing your testimony.

A question I had, a couple of them. The Block C. What is that? What does the Block C mean?

MR. OLSEN: Sure.

So when it comes to the Coolidge Generating Station, we have 12 units there today. And the way that we have grouped them together from operations and

executing perspective, we have blocked them into three blocks of four units tied together. So we refer Block A, Block B, Block C. It's simply -- Block C is simply a reference to Units 9, 10, 11, and 12.

MEMBER DRAGO: Okay. Thank you.

And then you also mentioned -- and I can't be very specific on this, but I remember you saying as part of the business continuity, the plan that you were doing there, you offset with coal. So is that the coal-fired generating plants that SRP has running today?

MR. OLSEN: It is, yes. But we were able to redispatch and reconfigure our particular generation mix to focus on those units that we believed were less at risk of gas curtailment to help to actually reduce what our gas consumption requirements would be over that time as well.

MEMBER DRAGO: I've got it. Thank you.

CHMN. KATZ: Any other Committee --

MEMBER LITTLE: Mr. Chairman, I have a question.

CHMN. KATZ: Yes, Ms. Little.

MEMBER LITTLE: My question -- I'm not exactly sure who to address this to, but I'm wondering where I can find a copy of the 90-day filing that SRP did for this plant 90 days prior to the CEC application filing.

MR. ACKEN: I can answer that question.

The 90-day filing was in a different docket, so you won't find it in this docket, just as Ten-Year Plans go in the BTA docket. 90-day filings go in a separate docket.

So what I will take as an action item is to mark the 90-day filing as SRP No. 9, and we will get that circulated to the parties and to the Chairman for distribution to the Committee.

MEMBER LITTLE: Thank you.

MR. ACKEN: And we could show it on the screen right now if you would like it see it.

MEMBER LITTLE: As long as I have access to it before we vote on this.

MR. ACKEN: I'm going to ask Ms. Maser just to pull it up and see if we can address any questions you might have. And, again, this will be marked as SRP No. 9.

Please bear with us for a minute while the email goes to her and she uploads it.

And I think -- if you have questions, Mr. Mcclellan, do you have a -- well, we'll have that on the screen, and Mr. Mcclellan can speak to any questions you might have about it.

And when you do pull it up, start with the cover page.

MS. MASER: Okay.

MR. ACKEN: And, Mr. Mcclellan, I'm going to see if I can help facilitate this by asking you some questions regarding SRP-9. And we'll see if I hit the mark.

And, Member Little, tell me if I don't.

CHMN. KATZ: I think it's now up on the screen. Dated September 14th, 2021.

MR. ACKEN: Thank you very much.

Q. BY MR. ACKEN: Mr. Mcclellan, can you identify for the record what has been marked for identification as SRP No. 9.

A. (Mr. Mcclellan) This is SRP's 90-day prefiling for the Coolidge Expansion Project.

Q. And the first page is a cover letter from David Felix, SRP Regulatory Policy and Strategic Engagement; is that correct?

A. (Mr. Mcclellan) Yes.

Q. And that letter is directed to Elijah Abinah, Director of the Utilities Division?

A. (Mr. Mcclellan) Yes.

Q. And please turn to the third paragraph, and would you read that for the record.

A. The technical study report, internal planning criteria and system ratings are deemed confidential

Critical Energy/Electric Infrastructure Information (CEII). These confidential reports will be made available upon request under a separate cover once a protective agreement is executed.

Q. This references a technical study report, internal planning criteria, and system rating. Is that the power flow and stability analysis report that's referenced in A.R.S. 40-360.02(C)(7)?

A. (Mr. Mcclellan) Yes.

Q. And do you know whether there was a request made to see this information under the 90-day filing?

A. (Mr. Mcclellan) To my knowledge, there was no request.

Q. Do you know whether this same information is provided in SRP's Ten-Year Plans that are submitted to the Commission in the Biennial Transmission Assessment docket?

A. (Mr. Mcclellan) Yes.

Q. And do you know whether that information was provided in this project as part of the Ten-Year Plan update that was submitted for the High-Tech Interconnection project?

A. (Mr. Mcclellan) Yes. The Coolidge Expansion Project was included as part of that study.

Q. And it was also included in the most recent

Ten-Year Plan submitted in January of this year; is that correct?

A. (Mr. Mcclellan) Yes.

MR. ACKEN: Thank you.

Member Little.

MEMBER LITTLE: Thank you.

My question is, normally, we have a -- an opinion from Staff on whether the project impacts the reliability of the interconnection system. And we did not get such a recommendation. The letter that we got from Staff withheld that particular recommendation. And I'm wondering if there is -- I recognize the confidentiality of this.

But not having seen the study and not having that recommendation from the Staff, I'm wondering whether there is anything that Mr. Mcclellan can say about the results of the power supply and reliability studies.

MR. MCCLELLAN: Sure.

So as that power flow and stability analysis that we mentioned that was done as part of this 90-day filing, we did not identify any issues with reliability as part of that study.

MEMBER LITTLE: And can you tell me -- I asked you this question before, and you may still not know the answer, but can you tell me what was included in the

system that was -- the Western interconnect, of course, is completely interconnected. How large was the system that was looked at? Was it just SRP? Was it SRP and APS? Was it Arizona? What was it?

MR. MCCLELLAN: Well, for the power flow and stability analysis that we're talking about here, the modeling does include the Western interconnect. But for this report, we really looked at SRP's system, and it included, of course, the Coolidge Expansion Project and then other potential projects that had been committed to to look at the reliability concerns that would be associated with the Coolidge Expansion Project.

MEMBER LITTLE: Okay. Thank you.

CHMN. KATZ: Any further questions from our virtual Committee participants?

(No response.)

CHMN. KATZ: Anything that we need to do between now and 9:00 tomorrow morning, or can we recess?

MR. RICH: Mr. Chairman, since we have a minute, is it appropriate to move my exhibits at this time or when are we dealing with that?

CHMN. KATZ: We can do it now. We're also going to have an opportunity for some closing remarks.

MR. RICH: I'm happy to do it tomorrow. It just occurred to me.

CHMN. KATZ: At this juncture, it's been a long day, and I don't want to beat Carolyn up too badly.

What we'll do is either before or after you make your closing remarks, offer it by specific exhibit number that you would like to have in evidence and retained by us and the Corporation Commission. Okay?

Well, everybody relax as much as you can this evening, and come prepared to get things issued hopefully by midday tomorrow.

We do stand in recess.

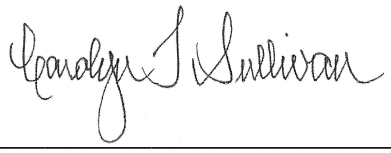
(The hearing recessed at 4:06 p.m.)

STATE OF ARIZONA)
)
COUNTY OF MARICOPA)

BE IT KNOWN that the foregoing proceedings were taken before me; that the foregoing pages are a full, true, and accurate record of the proceedings, all done to the best of my skill and ability; that the proceedings were taken down by me in shorthand and thereafter reduced to print under my direction.

I CERTIFY that I am in no way related to any of the parties hereto nor am I in any way interested in the outcome hereof.

I CERTIFY that I have complied with the ethical obligations set forth in ACJA 7-206(F)(3) and ACJA 7-206(J)(1)(g)(1) and (2). Dated at Phoenix, Arizona, this 20th day of February, 2022.



CAROLYN T. SULLIVAN
Arizona Certified Reporter
No. 50528

I CERTIFY that COASH & COASH, INC., has complied with the ethical obligations set forth in ACJA 7-206(J)(1)(g)(1) through (6).

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