BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF DCR TRANSMISSION, L.L.C. OR ITS ASSIGNEES, IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360 et. seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE 500 KV TRANSMISSION LINE, WHICH INCLUDES THE CONSTRUCTION OF A NEW 125 MILE 500 KV TRANSMISSION LINE BETWEEN ARIZONA PUBLIC SERVICE COMPANY'S DELANEY SUBSTATION UNTIL SOUTHERN CALIFORNIA EDISON'S COLORADO RIVER SUBSTATION, TO BE REFERRED TO AS THE TEN WEST LINK PROJECT.	DOCKET NO. L-21088A-19-0309-00185 CASE NO. 185

At: Phoenix, Arizona

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REPORTER'S TRANSCRIPT OF PROCEEDINGS

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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 the Phoenix Plaza Conference Facility, 2909 North Central Avenue, Phoenix, Arizona, commencing at 10:09 a.m. on the 6th of February, 2020.

BEFORE: THOMAS K. CHENAL, Chairman

JACK HAENICHEN, Public Member
KARL GENTLES, Public Member
MARY HAMWAY, Cities and Towns
JAMES PALMER, Agriculture
LAURIE WOODALL, Arizona Corporation Commission
JOHN RIGGINS, Arizona Department of Water Resources
LEONARD DRAGO, Department of Environmental Quality

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CHMN. CHENAL: Good morning, everyone. This is the time set for the continuation of the Ten West Link hearing. Started in Phoenix, came back to -- went to Quartzsite, and now we're back in Phoenix. So we have the hearing set for today and tomorrow. We've got a lot to cover in the next couple of days.

So Ms. Grabel.

MS. GRABEL: Yes, Chairman.

CHMN. CHENAL: Good morning.

MS. GRABEL: Good morning.

CHMN. CHENAL: And let's see if there's procedural issues we need to discuss with you and then with counsel for the ACC, and then we'll begin the hearing.

MS. GRABEL: Certainly. Procedurally, we have a series of exhibits that we provided to the Committee and to Staff yesterday. We also filed a notice in the docket saying which exhibits were going to be presented today. We are going to file those exhibits in the docket as well today; we're having that done right now.

I think what I would recommend doing is we have the CAISO representative here to talk to the Committee, at the Committee's request. I thought perhaps we'd let Ms. Debi Le Vine do that first, and

then we'll kind of start the hearing on our exhibits and our additional testimony.

CHMN. CHENAL: All right, that sounds good.

Ms. Scott, Mr. Arias, anything we need to discuss procedurally?

MS. SCOTT: We also have Ms. Margaret "Toby" Little here. We did docket two exhibits yesterday that she will be sponsoring today and taking questions on. We have copies also for all of the Committee Members here.

CHMN. CHENAL: Okay, good. I haven't seen those yet. I have seen the exhibits that were docketed by the Applicant. So maybe before we begin the testimony of Ms. Little, we can get copies of those passed around.

All right. Anything else we should discuss?

Member Woodall.

MEMBER WOODALL: Yes. Yesterday, at 3:03 p.m., I received a 90-page PDF that was the exhibits that you're going to be using today. And I was unable to send them to, for example, the Chairman's office or anyone else, because they were not technically in the record. And so from my point of view, it's a desirable practice to file these things in the docket, rather than make them -- rely solely on an

exhibit to a transcript, because by the time we have a transcript, everything is over.

It's conceivable that a Commissioner or, for example, the Chairman's policy advisor might want to ask questions and might want to file that in the docket, and would be unable to do so, because the first time they would see the exhibits would be when the transcript was filed.

And it's not uncommon for Commissioners to file things in the docket saying, I've looked at the Whipsnagle matter, and I'm wondering if somebody can provide more information regarding Section A or Section B, but they would not be able to do that.

So I think -- certainly I have no objection to them being exhibits to the transcript, and obviously the Chairman is in charge of procedural matters such as this, but I would strongly recommend that all applicants file them in the docket just so the public gets to see them before we're talking about them, the Commissioners get to see them before we're talking about them, and I think that would be appreciated.

I know, at least from one office, I don't know how to characterize the response, but it was like, so you're getting them before my Commissioner is getting them, and he's not getting them until after the

end? So there was an expression of being disconcerted, and I just wanted to put that in the record.

And I would make the same request of the Chairman's exhibits, that they be filed in the docket, so that the Commissioners know what they are and may have the opportunity to pose questions, you know, they can send letters, et cetera.

There is an advisory attorney that is assigned to matters in which, you know, the Staff is a party, it's a contested matter. And so potentially the advisory attorney would be available to advise the Commissioners if they had questions regarding a particular exhibit, but they can't do that in time to pose questions if it hasn't been filed in the docket. So I just wanted to make that suggestion.

CHMN. CHENAL: So your suggestion is that the exhibits be filed in the docket.

MEMBER WOODALL: Yes.

CHMN. CHENAL: And we'll seriously take that in consideration. We have a lot to cover today, so thank you for that.

Anything else?

(No response.)

(Deborah Le Vine was duly sworn by the Chairman.)

CHMN. CHENAL: Ms. Grabel.

MS. GRABEL: Thank you, Chairman. I guess -- I am not Ms. Le Vine's counsel, of course, but I'm happy to start the conversation.

DEBORAH LE VINE,

called as a witness on behalf of the Applicant, 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. GRABEL:

Q. Ms. Le Vine, would you like to talk a little bit about your role at the CAISO and introduce yourself?

A. Certainly. My name is Deborah Le Vine. I'm currently the director of infrastructure, contracts, and management at the ISO. I've actually worked for the ISO for 22 years now, having a number of positions, including the first female chief of the grid for California and the head of the market redesign technology upgrade project. I've run the markets, I've done the grid, and currently I'm in charge of all of the renewables that are interconnecting to the ISO

queue.

Prior to that, I worked for Metropolitan Water District in southern California for five years as the manager of power resources, so I ran the power system for a water company, which was very fun, since my job before that was with Los Angeles Department of Water and Power for 12 years, where I was -- had numerous jobs all the way from, in the olden days, planning how the city of Los Angeles was going to serve its customers in the year 2000. I guess that was a while ago. And then I was underground in coal mines doing coal, I did legislation, a little bit of everything.

As far as my degrees are concerned, I have a bachelor's of science degree in electrical engineering from San Diego State University, an MBA from Pepperdine University, a certificate in public policy from the John F. Kennedy School of Government at Harvard, and I have an advanced master's certificate in project management from Villanova University. I'm also a registered professional electrical engineer in the State of California.

CHMN. CHENAL: Well, thank you for -- I just want to say thank you for making yourself available today. We did have a few questions, certain of our

Members, and we really appreciate you making yourself available today and I want to just thank you for that.

MS. LE VINE: Not a problem. Glad I could help.

MS. GRABEL: So Chairman, Committee Members, do you have specific questions you would like to ask Ms. Le Vine? Would you like me to start just by asking general questions about the CAISO's involvement with the Ten West Link project and what it means for the CAISO to have operational control of the line?

CHMN. CHENAL: Let me say I think that would be a good way to start, and I think that will help form some of the questions. I know certain members, or at least one member, has specific questions, but maybe a good overview would be good and then we can take a deeper dive as we go along.

MS. GRABEL: Thank you.

BY MS. GRABEL:

Q. Ms. Le Vine, would you like to please give a general description of what the California ISO's role is with respect to the Ten West Link project and what it means for the California ISO to have operational control of that line?

A. Certainly. So the Ten West Link was a project that was chosen out of our 2013/2014

transmission planning process. And in that process, based on FERC regulations, which were underneath an open access tariff, so we make sure that all rules are applied to everyone equally. There's no favoritism at all. And in that transmission planning process, it was determined that an additional corridor between Arizona and California would be beneficial for both -- well, definitely for California, but it's also going to benefit Arizona.

As far as operational control is concerned, there's two types of operational control. So the first type of operational control is where -- originally the first were the three investor-owned utilities in California, so PG&E, Southern California Edison, and San Diego Gas and Electric, were required by legislation, AB 1890, to turn over operational control of their lines physically to the ISO. So we have the ability to ensure the flow on the lines, make sure the lines are not overloaded, we oversee -- check on their maintenance of their lines, those types of things.

The other piece of operational control is entitlements. So having previously run the power system for Metropolitan Water District, we had our own transmission lines that ran from Hoover Dam all the way down into the Palm Springs and Riverside/San Bernardino

area in order to pump water into southern California from the Colorado River. We also had contract rights on transmission lines that were owned by Edison and PG&E so that we could get power from the Pacific northwest, which was cheap, and we also purchased power through the lines that we already connected with Arizona.

So that contract entitlement can also be turned over to the ISO as operational control. But in that instance, we only have the ability to use the percentage of entitlement that has been turned over, and we run that through our markets.

Now, California is only one of two entities in the western United States and Canada and Mexico that actually have a formal electricity market. So we actually buy and sell electricity on a day-ahead basis, on a 15-minute basis, and on a five-minute basis.

Typically what happens in the day-ahead market is, at least for California, we serve about 97 percent of our load through the day-ahead market. That allows the generation to go ahead and set up, because it knows how it's going to run the following day. And then of course there's deviations. A storm will come in, a cloud will come over. So there's deviations plus and minus whatever our forecast was for

the previous day. That's what we get through the 15-minute market and the five-minute market, taking care of those deviations.

So in running the market, what we do is we go ahead and there are people who want to sell energy and there's pretty much load that wants to buy energy. And it can be load from anywhere in the western United States, it can be generation from anywhere in the western United States. We actually have 217 market participants. So as you can see, there's a lot more than just California involved in our markets.

And the reason why they come to our markets is because the way that we match supply and demand is on a least cost basis. So you're guaranteed, when you purchase generation from us, that you're getting the least cost for that generation if you're a load. If you're a generation, you're understanding that your bid is not going to be taken unless it meets the supply -- the demand requirements.

So as an example, if you bid a hundred dollars per megawatt hour in, what is this, 10:00 in the morning, at 10:00 in the morning for this hour, and it ends up -- I just looked recently. We have a cool app, by the way, if anybody wants to check us out on a day-by-day basis. We actually have the pricing on our

app. So our clearing price for the 9:00 hour was $41. So if you bid $100, $50, $45, $42, your bid is not accepted, so that generation does not run, because we have sufficient generation below the $42 in order to meet the supply requirements for this hour.

CHMN. CHENAL: Ms. Le Vine, I have a question.

MS. LE VINE: Sure.

CHMN. CHENAL: And you'll notice a lot of us will just jump in and ask a question.

MS. LE VINE: That's perfectly fine.

CHMN. CHENAL: Well, they ask me if they can ask the question. I always say yes.

So you said that a large percentage, 90-something percentage of the power is obtained through the day-ahead market; is that correct?

MS. LE VINE: That's correct. About 97 percent.

CHMN. CHENAL: 97 percent, all right. We've heard testimony in this hearing and in others about, well, for example, a solar, you know, a merchant, a plant will have power purchase agreements and they'll interconnect with a transmission line. In other words, they'll have contractual -- they will obtain, by contract, a guaranteed user of the power for that solar

plant, for example. And there are other examples like that, other gas generators, whatever. But those are contractual obligations.

And I guess I always thought that a lot of the power that is being obtained by whoever the users are, as well as the generators, are already defined by contract, and that the day-ahead market and the day market is a much smaller percentage of the actual power that's flowing through the grid, because a lot of it's done contractually.

But I guess, from what you just said -- I don't know if that makes sense. But what you just said is most of the power, I guess, in the CAISO is, and maybe it's because it's an energy imbalance market, is the day-ahead. So can you kind of explain that to me so I understand it better?

MS. LE VINE: Certainly. So let's first break apart the energy imbalance market from the day-ahead market. The energy imbalance market is only the five-minute market. So they're just balancing, at the last minute, for five minutes in advance -- well, it's actually 75 minutes in advance -- what each of the utility needs to make that deviation -- make up their deviation.

The day-ahead market, you're correct. A lot

of the power plants have power purchase agreements, but all of those power purchase agreements still have to be bid into the ISO market, because -- in one of the previous discussions I saw in the testimony that you talked about the ISO as the air traffic controller, which is absolutely correct.

We take both the contract bids, contracts that are bid in by the -- typically, the load entity will bid in, I have 100 megawatts of load, and here is my 100 megawatts of generation from this contract. And they'll probably go ahead and put it in as a self-schedule, which means I'll take it regardless of what the price is, because I already paid for this generation, so I want to make sure that it runs.

And then typically what ends up happening on the settlement side of that transaction is that if the utility bought the generation for, let's say, 30 megawatts for the first discussion, but, as I just told you, the clearing price at the moment for energy is 42 megawatts per hour, that delta -- the generator will get paid 42, but they already went ahead and are paid by the utility a lower amount, so they have to give back that money to the utility. If to the extent that they're paid above the contract amount, then that's when the utility is going ahead and making sure that

they're still getting the contract amount.

So we'll have -- the majority of it, I would say, is probably already contracted for, but there's still some out there that -- some of the generators that are still out there that are using the market to sell their generation. So it's a mix. Does that make sense?

CHMN. CHENAL: I understand, I believe, the general idea of what you're saying, and if I could just state it back to you.

The power purchase agreements still are in play, but on a day-to-day basis or a day-ahead basis the parties to that contract are still utilizing the day-ahead market --

MS. LE VINE: Market structure, yeah.

CHMN. CHENAL: -- to actually transfer, you know, load and generation. And then there's a financial clearing, I guess --

MS. LE VINE: Correct.

CHMN. CHENAL: -- you know, to make up for the delta.

MS. LE VINE: Correct. And the reason for that is, is that they don't know what's going on with the transmission system. So it could be that where the generator is and where the load is, there's an outage

in between, so the power has to be rerouted in order to get to that load. And absent the market and us overseeing the system in realtime, we need to make sure that all of -- everything is balanced.

Now, the way that the day-ahead market runs, the day-ahead market considers the topology of the system, what transmission lines are in, what generators are in, what load is being served where. All of that is included in the algorithms that we run in our computer systems. We have a whole building that just has servers in it that runs the algorithms to make sure that supply meets demand and it is deliverable.

But what can happen between the day-ahead and realtime is that a transmission line might go out, a generator that was supposed to generate might have a problem and have to go on outage, emergency outage or a forced outage. And in that instance, that's that delta that's made up in the 15- and five-minute markets.

CHMN. CHENAL: All right, thank you.

Yes, Member Haenichen.

MEMBER HAENICHEN: Did you say Le Vine or Le Vine?

MS. LE VINE: Le Vine.

MEMBER HAENICHEN: Not counting unexpected --

MEMBER HAMWAY: Push your button.

MEMBER HAENICHEN: Not counting unexpected outages of either a generator or a line, everything is running fine for this question, did I hear you say that still if someone has a PPA with a supplier, it's not guaranteed that it will be available for any portion of the time that the contract covers?

MS. LE VINE: Well, typically the contract will cover 365 days a year; if it's a solar plant, it's for the hours between sunrise and sunset. But it's also in the contract that the plant has to take an outage, it has to do maintenance. It might be that the plant's output is decreased, or it might be that they need to fix the transformer that actually connects them to the grid. If they have to fix the transformer connected to the grid, then the entire plant would have to shut down because there's no way for it to get the power to the grid.

MEMBER HAENICHEN: I understand that. I prefaced my remarks by saying not counting unexpected outages. I mean, there are some expected outages for maintenance and that kind of thing.

But the condition at the moment I'm talking about is that everything is running. Is the power -- does the power purchase agreement say that the buyer will be guaranteed to get this energy at any time,

excluding those things I mentioned originally?

MS. LE VINE: So the California Independent System Operator does not procure any of the generation through power purchase agreements. We're merely the median who takes care of buying and selling of energy. So I can't tell you what the terms and conditions are in power purchase agreements.

MEMBER HAENICHEN: Where have we heard that before?

MS. LE VINE: You'd have to talk to a utility. Every utility does them differently, so you'd have to talk to a utility to see what terms and conditions they put in their contracts.

MEMBER HAENICHEN: Okay. Assuming that this line, this project we're talking about here today, is approved, hypothetically now we're speaking, first of all, I wanted to ask, who is going to own this line? Is it the Applicant that we see?

MS. LE VINE: Yes, the Applicant owns the line. They're the transmission owner.

MEMBER HAENICHEN: This L.L.C.?

MS. LE VINE: Ten West Link, yes.

MEMBER HAENICHEN: Is that going to continue, or is this just temporarily while they build the line?

MS. LE VINE: Oh, no. They own it forever.

MEMBER HAENICHEN: They own it forever?

MS. LE VINE: Unless they sell it.

MEMBER HAENICHEN: See, one of the things that posed a great difficulty to me in evaluating this project was early on in the tome that we were given, this book, it mentions all kinds of things that CAISO has the power to do and that kind of stuff, but it was -- this is the Applicant talking, which has no legal connection with the state of California entities. Is that not true?

MS. LE VINE: I would disagree with that. Currently, the Applicant has executed the approved project sponsor agreement, so there's already an agreement between California ISO and Ten West Link whereby they are constructing this project based on our requirements and the functional specifications that we defined back in the 2013/2014 transmission plan.

In addition, to the extent that the Applicant is successful and they build it and they energize the line, they're required to execute the transmission control agreement. And the transmission control agreement, again, is with the California Independent System Operator. So I would say there are two legal documents that are contracts that would be executed by Ten West.

MEMBER HAENICHEN: Okay. Well, let's get on a helicopter and fly up to the Arizona end of this line.

MS. LE VINE: Okay.

MEMBER HAENICHEN: And now it's in operation. Who is actually -- what entity is actually putting the energy itself onto that line heading west?

MS. LE VINE: So heading west, the interconnection is at the Delaney Substation.

MEMBER HAENICHEN: I know that.

MS. LE VINE: And the Delaney Substation is owned by Arizona Public Service Company. And so they have -- Ten West Link has negotiated an interconnection agreement with Arizona Public Service Company in order to interconnect to their system. So when you say who --

MEMBER HAENICHEN: Well, what entity, I said.

MS. LE VINE: Physically?

MEMBER HAENICHEN: Yeah. Somebody has to actually introduce the energy to the line, do they not?

MS. LE VINE: So APS -- APS owns the substation.

MEMBER HAENICHEN: Right, I know that.

MS. LE VINE: Okay. So APS, in essence, would allow power based on what's been approved by them

and us to flow on the line. So you need to think about -- as far as an electrical perspective is concerned, think about a balancing authority area as a bubble, okay. It doesn't -- it doesn't know state lines. All it knows is, from an electrical perspective, where is the boundary of the bubble, okay.

Electricity has been deemed interstate commerce since the '30s, and so federally regulated we go across state lines. So for Ten West what will happen is, is that to get onto the Ten West Link line, they'll have to get approval from us. But once we give that approval to whichever party wants to use the line, they have to put in what's called a scheduling ticket, and both California and Arizona would have to approve that entity putting 100 megawatts, 20 megawatts, whatever it is, on that line. So it's a hand-off between Arizona and California at that point.

MEMBER HAENICHEN: Okay. The reason I'm asking these questions is I'm going to turn to money in a minute.

MS. LE VINE: Okay.

MEMBER HAENICHEN: APS has to find the energy somewhere to put on the line, correct?

MS. LE VINE: No.

MEMBER HAENICHEN: No?

MS. LE VINE: No. The energy that's going to be put on that line is the energy that clears in the ISO markets.

MEMBER HAENICHEN: Okay. But I mean, they have to -- each one is -- each day or each hour is different, isn't it? They have to procure the energy somewhere, so it has to be made available to them, that's really what I'm getting at.

MS. LE VINE: So not exactly. So California has a market where we match demand and supply.

MEMBER HAENICHEN: I understand.

MS. LE VINE: And in matching that demand and supply, that includes imports across the transmission lines that we have operational control over.

MEMBER HAENICHEN: Right.

MS. LE VINE: So it might be -- it might be APS, it might be Nevada Energy, it could be Canada wants to go ahead and wield generation all the way down to the Delaney Substation and have it come across California that way. It can be anybody in the western infrastructure, all the way from British Columbia, Alberta, the Rocky Mountains, down into Baja, California.

MEMBER HAENICHEN: Okay. On a given transaction, then, how does the money flow? In other

words, who -- APS has to get paid for what they do, right?

MS. LE VINE: APS is getting paid -- well, APS is getting paid to the extent that the generation is coming across their transmission system, and they're paid based on transmission rates that they charge people who want to use their transmission system.

MEMBER HAENICHEN: Okay. So now, in a case where California, through the CAISO, wants to acquire energy over this new line, now it's in operation, okay, this is hypothetical, what steps do they take -- go step by step on the steps they take. How do they determine the amount of money they're willing to pay for this, both the transmission cost and the energy cost itself? So run us through that, please.

MS. LE VINE: Let's take it step by step. So as far as the Ten West Link is concerned, California is paying a hundred percent of the cost to build the transmission line.

MEMBER HAENICHEN: I know that.

MS. LE VINE: And paying a hundred percent of the operation and maintenance over the life of that transmission line.

MEMBER HAENICHEN: I know that.

MS. LE VINE: Okay. So as far as

transmission in APS's territory, APS has a transmission rate that they charge people to use their transmission. And so they will get paid whatever rate is approved by the Federal Energy Regulatory Commission, because that's who their regulating agency is.

MEMBER HAENICHEN: But this line is not an APS line.

MS. LE VINE: That's correct, but you asked me to go step by step. So in order for the power to get to the Delaney Substation, it's got to come through the APS lines.

MEMBER HAENICHEN: Right.

MS. LE VINE: So APS will be paid for any of the energy that flows across their lines to get to the Delaney Substation.

MEMBER HAENICHEN: Hold that thought.

MS. LE VINE: Okay.

MEMBER HAENICHEN: Paid for the energy or just for the delivery of the energy? The actual kilowatt hours, somebody had to generate it.

MS. LE VINE: Well, the generator gets paid for the generation. So as an example, if APS were to generate the energy, then they would get paid. But if Nevada generates the energy or Utah generates the energy, and just uses APS's system, transmission system

to get it there, then Utah would get paid the generation price and Arizona would charge their transmission price.

MEMBER HAENICHEN: That's for the energy before it gets to the new line, right?

MS. LE VINE: To get it to the new line.

MEMBER HAENICHEN: Okay. So that's one fee somebody has to pay. The user ultimately has to pay for the energy, correct, who's going to use the electricity?

MS. LE VINE: Yes. So the load will use -- the load, in essence, is who pays for it.

MEMBER HAENICHEN: I understand.

MS. LE VINE: Okay.

MEMBER HAENICHEN: So the load, or the owner of the load or whatever you want to call it, has to pay, number one, for the electricity itself, the kilowatt hours.

MS. LE VINE: For the energy, correct.

MEMBER HAENICHEN: And somebody will figure out who should get paid for it, and that's another complicated problem because, as we know, the electricity jumbles all together. So how are we going to know whose electricity it is? That's the part of the transaction I'm trying to get at. How do they know

who to write the check to?

MS. LE VINE: We have a settlement system that has more servers than this room. We have over, I think we're up to -- okay, estimated, because I don't know the number off the top of my head. I ran settlements back in the early 2000s, so at that point in time we had about 135 charge codes. I think they're closer to 150 or 175 charge codes, but we can check on that if you're really interested.

So in those charge codes, we break up is it the day-ahead market that you're getting the energy paid for, are you paying it as an instructed deviation, so you were instructed to move, or did you just not generate enough, is it an uninstructed deviation, is it an ancillary service. There's all sorts of different charge types that we have.

We're the only independent system operator that has so many charge types that you know exactly how much money you're getting paid for each tiny increment of service that you're providing.

So the transmission charge, as an example, we haven't quite gotten to on the line yet, but once you get on the line, in California what ends up happening is that load and exports pay for the cost of the transmission. And we have what's called the postage

stamp rate.

What a postage stamp rate is, is it doesn't matter -- similar to a letter. If you mail a letter to your neighbor, say your Christmas card, you didn't want to put it in their mailbox, you've got to put the same stamp on it that you're going to go ahead and put on a letter that you send to Boston or you send to Canada or someplace else.

So our transmission rates in California are a postage stamp. There's one rate to get all the way from -- you can go to Delaney all the way up to the Oregon border for the same cost as going from Delaney to Palm Springs. So that's a separate cost. The transmission cost is separate from the energy cost.

MEMBER HAENICHEN: Well, then does this elaborate system that you described with all the computers figuring things out -- at the end of the day, they have to write -- of course, I don't know who "they" is, but somebody --

MS. LE VINE: We do.

MEMBER HAENICHEN: -- has to write checks to who they think the generators are, generator or generators are. How is that accomplished?

MS. LE VINE: So we don't think. We actually require every one of the generators that is

providing -- bidding into our markets is required to have both metering and telemetry. And the metering is revenue quality metering, and we can check that metering against the telemetry.

Telemetry, in essence, is looking at a generator every four seconds or five minutes, it depends upon the type of generator, what are you actually generating. So we can go ahead and see they were actually generating a total of 100 megawatts, but their meter data says that they were generating 200 megawatts. So we actually have a system that compares the telemetry to the meter data to make sure that it's accurate.

And then once that is determined what the accurate number is, through our clearing, which is done three days after the actual trade date, we will go ahead and pay the generator and charge the load that received the energy.

MEMBER HAENICHEN: Okay. Now, does CAISO keep records of all these transactions over time?

MS. LE VINE: Oh, yes. We're required by our tariff to keep up to three years' worth of records.

MEMBER HAENICHEN: Okay. So if -- I've got to tell you a little secret. I have been trying, for every day of this hearing, to get somebody to tell me

what the flows are on that line integrated over time east to west and west to east. And I'm told that is not possible to do.

I'm talking about a hypothetical study of the -- one of the existing lines. I wanted to know how much, what percentage of the energy is flowing -- will flow over this new line -- I mean, over the existing line, where it does flow, from east to west and what percentage from west to east. And from what you're telling me, that should be a piece of cake to get, no?

MS. LE VINE: It is public information. I believe that the witnesses after me are going to actually go through a demonstration for you and give you those numbers.

MEMBER HAENICHEN: Well, the Applicant, up until now, has been unwilling or unable to tell us what those numbers are.

MS. LE VINE: Actually, the Applicant was not aware, until they talked to me and I talked to some people within the company, they were not aware that the information was public until last week.

MEMBER HAENICHEN: So we're going to get that information now, today?

MS. GRABEL: Member Haenichen, you received it in the e-mail we sent to you last night, and we'll

be presenting it during the hearing today.

MEMBER HAENICHEN: Well, I didn't see my e-mail last night because I was sick.

MS. LE VINE: I hope you're feeling better.

MEMBER HAENICHEN: So somebody summarize it for me. What are the percentages over a given year, let's say?

MS. GRABEL: Member Haenichen, I'm going to let Ms. Le Vine talk about the difficulty in giving percentages. What we have done is show the flow over a period of time both in the CAISO system, and then we received APS's information as well and have that data to present graphically in a couple of charts.

MEMBER HAENICHEN: Okay. Well, I'll be patient and wait for that then.

MS. LE VINE: But as far as flow is concerned, flow goes back and forth over transmission lines. If we could pull up -- I have the EIM exhibit. This will give you an idea of the --

So, Chairman, you had discussed earlier the energy imbalance market. And so in the energy imbalance market, Arizona Public Service Company is a part of that market, they joined in 2016. And actually Salt River Project started parallel operations this weekend, and they're going to be joining us on

April 1st.

So I went ahead and put together a little exhibit to show you the transmission lines between Arizona and California. And in addition to that, on the subsequent page, I have what the costs are as far as through Q4 of 2019. This one. There we go. Can you move it down? Oh, just one moment.

Just go to the first -- the first page first. And then if you could increase the size. Keep going. Okay. Now just move it up so that the blue arrow is at the top. Perfect. There you go.

So what you can see from this, this is the energy imbalance market. This is the five-minute market, where utilities from throughout the western United States and Canada are participating in ensuring the cheapest resource for its ratepayers. And in so doing, what ends up happening is that there's -- I'm aware of four lines that go between California and Arizona, and I've put arrows next to them.

So up at top, there we go, is El Dorado. So El Dorado-Moenkopi is the line right there that goes across, and that line comes out -- Moenkopi goes into Four Corners. And originally we did have -- California had entitlement rights on the Four Corners-Moenkopi-El Dorado line, until Southern California Edison sold its

interest in the Four Corners Power Plant and then relinquished its transmission rights on the Four Corners Moenkopi-El Dorado line.

So currently, now, the control area boundary for that line -- it's very interesting how we come up with control area boundaries sometimes. But the boundary for that line between APS being in charge of it and California being in charge of it is the middle of the Colorado River. That's just where it happens to be for that particular line.

The next line is the -- we just talked about El Dorado-Moenkopi -- Palo Verde-North Gila is what comes across the bottom right here on your display, and that is called the Southwest Powerlink. It was built back in the '70s with APS, the Imperial Irrigation District, and San Diego Gas and Electric. That transmission line is completely underneath our control. And APS and IID go ahead and have contractual rights to it, so we have to hold transmission for them through realtime in case they want to use that line. So that's how they're ensured that they still have the rights to use the line that they've paid for.

And then the last one, which is just an APS ISO, there's 236 megawatts that APS -- that flows across from the Mead 230 line to the Mead 500 kV line.

And then there's a number of -- I understand in a separate exhibit that's already been given to you, you've already seen the WECC map.

So on the Western Electricity Coordinating Council map, if you look at that map, you can see all the 500 and 230 kV lines that go between Arizona and southern Nevada and California. It's almost a total of 8,000 megawatts is the total flow that could go between those three states, east to west and west to east.

If you could go down to the next piece, since I have it up. Probably going to have to make this one a little smaller. Yeah, there you go. Excellent.

So this gives you the total plus the fourth quarter benefits of the energy imbalance market. So you can see on this slide, Arizona actually in one quarter saved its consumers $17.37 million, whereas in the same quarter we only saved our ratepayers $2.36 million. But since APS has been in the energy imbalance market, they've actually saved a total of $140 million for the ratepayers by being able to combine all the resources from all of the EIM entities to come up with the cheapest resource to meet the consumer load.

MEMBER HAENICHEN: Okay. So that tells me, then, that if that much was saved by, in this case, an

Arizona entity, somebody else took the hit for it, right? The money was all spent still if the total amount of energy was used.

MS. LE VINE: Correct.

MEMBER HAENICHEN: So that's what I'm struggling with, understanding how those transactions decide to benefit one person or another -- one entity or another. Excuse me.

MS. LE VINE: So by going ahead and being in the energy imbalance market -- as a vertically-integrated utility, you have your own generation, your own transmission to meet your own load; that's APS, okay. So by joining the imbalance energy market, they can go ahead and turn off their very expensive resources, you know, shut down some of their coal or make their coal at a lower level output if it's cheaper to go ahead and purchase from the imbalance energy market.

So what would happen is, is that the coal plant would move from 500 megawatts down to 400 or 300. And the cost of the coal plant is, let's say, $50, and you're buying out of the imbalance energy market at $30. So you just saved the consumer $20 per megawatt hour in that one hour.

MEMBER HAENICHEN: So you're saying, then,

that somehow they found less costly energy than coal?

MS. LE VINE: Oh, yes. Oh, yes. So as an example, nuclear is cheaper than coal.

MEMBER HAENICHEN: Oh, I understand that.

MS. LE VINE: Okay. Solar, because most of it's tied up in power purchase agreements -- I don't want to get there yet, but I have another set of slides to show you. We have so much solar and wind in California that we actually have to pay people to take it or we have to curtail it.

MEMBER HAENICHEN: At certain times of day, you're talking about?

MS. LE VINE: At certain times of the day, correct. And I've got some slides that will show you. I picked three different days for you.

MEMBER HAENICHEN: But everybody who has a solar generating facility faces this problem; is that right -- not right? In other words, the sun isn't at its maximum output coincident with the maximum need by loads; is that a fair statement?

MS. LE VINE: That's correct. Especially in the wintertime.

MEMBER HAENICHEN: Who is going to be buying this, then, if nobody needs it?

MS. LE VINE: Well, for California, we have a

renewable portfolio standard that is mandated by the State of California. So we're required to have 33 percent renewable by 2020, which we actually met in 2016, and we have to have 50 percent renewable by 2030 and 100 percent renewable by 2045. So California is required to have renewable generation serving in its load to that renewable portfolio standard underneath California law, and I believe Arizona has similar requirements.

MEMBER HAENICHEN: Would you agree with the statement that if this happens, and other people follow suit, and I hope it does, because that would be good for the environment, would you not agree that unless a reliable, cost-effective storage system is developed, which in my view it has not been developed yet, is a requirement for this to work economically?

MS. LE VINE: We've been running solar plants in California since the 1980s, so I guess what --

MEMBER HAENICHEN: It's a small percentage, though. I mean, I'm talking about when it's massively deployed in the western grid, the generation.

MS. LE VINE: When we get to 2045 and we have 100 percent renewable generation in California, yes, I agree with you, we will need storage in order to make it work.

MEMBER HAENICHEN: This is one of the sticking points for me of this application, because I don't know when that is going to happen. I'm confident it will eventually, but it's a major research need to get that to happen.

MS. LE VINE: Well, actually, we currently have 10,000 megawatts of storage that's in our interconnection queue, so people that have gone through studies to interconnect storage. And the majority of the storage that we're seeing is more of a number of batteries that -- think of it as a number of batteries get put into a cargo container, the cargo container gets put at a spot next to a solar plant. And so when the solar has extra generation, you're charging those batteries. And then when the sun goes down, you can go ahead and discharge those batteries to put additional generation on the grid.

MEMBER HAENICHEN: Now, when you use the phrase 400 -- I forget the number you said -- 400 megawatts of storage, what does that mean?

MS. LE VINE: Well, I said actually 10,000 megawatts of storage.

MEMBER HAENICHEN: 10,000 megawatts of storage. What does it mean to you?

MS. LE VINE: So a megawatt of storage is the

same as a megawatt of solar.

MEMBER HAENICHEN: You can't really store megawatts, because that's a measure of power. You can store megawatt hours.

MS. LE VINE: Well, we measure it by the capacity, and the discharge is over time. So the energy underneath the curve is the discharge.

MEMBER HAENICHEN: But I think you'll agree, you cannot characterize properly an energy storage facility by megawatts only. You have to know -- megawatts, to me, about storage means that's the maximum rate at which you can take energy out of storage, but then the number of hours that that's happening characterizes the actual real energy that is being stored.

MS. LE VINE: I would agree with that.

MEMBER HAENICHEN: And this is a common mistake; it confuses everybody. They throw around power and energy interchangeably, and they're very different things. So when we get down to the details of how this project works, that's going to be very important to both Arizona and California. And I'm trying to drill down and find out what the details of that is, and hopefully these charts you're going to show us will give us some insight.

MS. LE VINE: Okay. But I agree with you, when it discharges, that's energy.

MEMBER HAENICHEN: Yeah.

MS. LE VINE: But what we -- when we talk about our peak demand, peak demand is in instantaneous megawatts. And when we study all of the generation that wants to be interconnected to our grid, we study it both based on megawatts and on its capability to discharge, whether it's a solar plant, a wind plant, or a gas plant that's base loaded.

MEMBER HAENICHEN: Well, they all have a capability to discharge, but it's how many hours can they discharge before they run out of gas.

MS. LE VINE: Correct, correct. And typically, today, the majority of the batteries are only good for a maximum of six hours.

MEMBER HAENICHEN: Yeah. And that is probably not enough to make this wonderful transformation of the grid. In my view, it has to be bigger than that.

MS. LE VINE: I agree with you. But the other thing to consider is that they don't all have to discharge in the same six hours.

MEMBER HAENICHEN: I understand that.

MS. LE VINE: Okay.

MEMBER HAENICHEN: I understand that. As a matter of fact, we got testimony a couple days ago, or I think on the first leg of this hearing, from a witness, it might have been on the phone with the lady -- what was her last name?

MS. GRABEL: Judy Chang from The Brattle Group.

MEMBER HAENICHEN: Judy Chang, yeah, it might have been from her. That the CAISO, when they were thinking about this facility that we're talking about here today -- because I have been asking questions about, well, did they consider other options other than building this line.

Because at first blush, when you look at this line, assuming the majority of the energy is going to go from east to west, which I hope we'll find out the details about from your charts, but if that's the case, this line -- we have to know the details about those transactions.

And further, it was pointed out that CAISO did a study of some options, including what they call no-lines, which is kind of a cute phrase, but -- and they determined that doing this with storage instead was not economically feasible. In fact, they said this line is going to cost $400 million, and the storage

option to achieve the same objectives would cost 700 million, so that's why they chose this one.

And furthermore, they stated, and I could be misstating it here and you can correct me, they stated that not only is it -- are those conditions prevailing, but the storage is going to wear out in 20 years. So for a line that has a life cycle of 50 years, you have to multiply that by two and a half, because every 20 years you're going to have to replace the batteries or whatever it is.

So this is the economics of the thing that I was hearing. And if I'm hearing it wrong, please correct me.

MS. LE VINE: I'm not involved in that part of the project. Oops, sorry, I lost my mic. I'm not involved in that part of the project, so I don't have those numbers. I'm sure DCRT can go ahead and give them to you. But I apologize, I came here to talk about operational control.

MS. GRABEL: And Member Haenichen, that is the California Public Utility Commission study; it was not conducted by the California ISO.

MEMBER HAENICHEN: Well, I'm sorry. Again, I made a mistake, and thank you for correcting me. Whoops, I lost mine now.

We need to know the answers, at least me. I'm not speaking for the other Committee Members. I have to know that in order to make a vote on this.

MS. LE VINE: Well, I believe the flows are going to be given to you in a subsequent testimony later on today.

MEMBER HAENICHEN: So we're really under the gun here timing-wise. Okay. Well, I'll back off for a while.

CHMN. CHENAL: All right. Ms. Le Vine, I just want to make sure -- I think I now see it better. Basically it's like you've got someone who's buying a widget in California, and the manufacturer of the widget, of course widget being electricity, is in Nevada. And they're going to use a series of transmission lines and substations to get the power from the seller to the buyer.

And the market, if you will, is this -- the market, the CAISO, where you have different offers, you know, of what we'll pay and what we'll sell it for. And when those are matched, you have a transaction. And CAISO, then, once that's matched, it acts as a clearinghouse, basically acts as the market, and then will track how much it's going to cost, the various tolls along the way to get that widget from, say,

Nevada, through the Arizona APS system, across the line over to California, keeps track of all those costs. And then once the clearing is done, will send the bill -- basically, will charge the buyer and then remit the funds to the seller.

MS. LE VINE: Correct. You have it perfectly.

CHMN. CHENAL: Okay.

MEMBER HAENICHEN: Mr. Chairman.

CHMN. CHENAL: Yes, Member Haenichen, did you have a question?

MEMBER HAENICHEN: Yeah, I do.

CHMN. CHENAL: Okay, Member Haenichen.

MEMBER HAENICHEN: I always have a question. This keeps shutting off.

So let me tell you what my concerns are. There's been a lot of talk about using renewable energy in California in increasing amounts, and that's one of your objectives connected with this project. Is that a fair statement?

MS. LE VINE: I would agree with that.

MEMBER HAENICHEN: Okay. Failing a cost-effective storage system, which is the state we're in right now by the admission of the CAISO, or maybe it was somebody else who made that, but it was a

California entity, worries me because when we start operating this line east to west, they can't fill the holes in the solar because it doesn't coincide with the usage, the need.

So I'm worried that the utilities are going to have to resort to generating the energy required for these big gaps by fossil fuel means, probably natural gas. And then that would be a detriment to this state, I believe. Because the line that's going to carry this, among other lines, I'll limit that, that you have, is going to carry this energy to California.

So if there are negative effects of doing the combination of generation, solar or otherwise, and transmission line, it could be to the detriment of this state. So that's what we're trying to determine here, and I don't know if you're the right person to do it or not, but I'm worried about it.

MS. LE VINE: I appreciate your worry. First off, APS, just like the California Independent System Operator, we are required to have open access transmission tariffs that we follow. And actually, APS's looks very much like ours, because FERC dictated to all of its entities that are regulated by it what should be included in an open access tariff.

So in that, what ends up happening is

generation is sited based on wherever the generator wants to site. We have no choice as to where a generator sites. We cannot say, no, you can't go there; you have to go over here. And APS can't -- does the same thing. They can't dictate to anybody where they want to build their project at.

All we can do is go ahead and run a study and say, well, if you site here, here is what your cost is going to be to upgrade the system so that there's enough room in the pipeline for the electricity to flow, okay.

As far as Arizona having to turn on gas and coal in order to sell to California, that would only be done to the extent that Arizona bids into our market a price that meets -- is equal to or below the clearing price of generation to serve the demand at any point in time. So I don't see them turning on their coal and -- coal and gas units in order to meet demand in California, because it's not economical for them to do it.

And actually, if we could switch over to the net generation charts, which look like these guys. Yep, those guys.

MS. GRABEL: And just for the record, because the California ISO is not DCRT's witness really, we

didn't mark these as exhibits. We weren't prepared to do so. But I think, for the record, we should. And so the document that we handed out originally that begins with the page entitled "Estimated Maximum Transfer Capacity," we will mark as Exhibit DCR-40.

And the document that you are now reviewing that Ms. Le Vine is going to talk that is the typical winter weekday, January 28th, 2020, and whatever has come subsequent to that, we will mark as Exhibit DCR-41.

MEMBER HAENICHEN: Okay, I'm through for now. Thank you.

MS. LE VINE: Okay. But can I give you some more information about the question you just asked?

MEMBER HAENICHEN: Please, please.

MS. LE VINE: Okay, great. So the charts in front of you, what ends up happening is in California we actually have too much wind and solar in order to meet our demands. So the top blue line, this aqua line, is what our actual demand is. But if you subtract out the wind and solar, our net demand is way down here, okay?

So in this period of time, we're actually going ahead and exporting generation outside of California, whether it goes to Arizona, Nevada, Oregon,

Canada, wherever, it's actually getting pushed outside of California. And in some instances, we're actually paying them in order to get rid of the generation.

Because as you discussed earlier, Member, Commissioner, you can't store electricity at the moment. And so because you can't store it, you've got to get rid of it. So other people are backing down their generation to be able to take this cheap power from California. And it could be as cheap as I'll pay you -- our floor at the moment is $150 per megawatt hour. So there are some instances where we would pay the entity $150 per megawatt hour to take our generation. Because we can't store it, it's generating, we've got to get rid of it, okay.

So this actually is a Tuesday in January. In that Tuesday, what ended up happening is in addition to selling generation externally, we also went ahead and curtailed renewables, which is -- I'm not sure you've talked about that yet. But we actually now have our renewables are bidding into our market, and they're saying I'm willing to shut down some of my wind turbines or turn off some of my solar panels if you pay me X dollars. And so on this day, we had curtailments between zero to 2,400 megawatts. And that's how we make it through the day at the moment.

CHMN. CHENAL: I just want to make a -- is this document, this DCR-41, it says January 28th, 2020. Is that January 28th, 2019?

MS. LE VINE: No, 2020.

CHMN. CHENAL: Okay.

MS. LE VINE: As in a couple of days ago.

CHMN. CHENAL: Okay.

MS. LE VINE: We actually have this cool app that you can get that has this information on it.

The other thing that you can see is that it gets really bad. On this chart, sunrise was at 7:15 a.m. and sunset was at 17:23. And so you can see what ends up happening. When sunrise comes up, all of a sudden the net generation is way low, and we have to actually make up a ramp of 11,000 megawatts between 3:00 and 6:00 p.m. in the afternoon because the sun is going down and we need generation.

So we're actually purchasing generation from anybody that's got generation that they want to sell to us in order to meet our requirements to meet our net load up at the 6:00 p.m. to 8:00 p.m. hours.

MEMBER HAENICHEN: Yeah. The problem, from the Arizona perspective, is we have roughly the same situation, obviously. So we're not needing energy in that time period either, even if it's free.

MS. LE VINE: Actually, there's a delay between California and Arizona.

MEMBER HAENICHEN: There's a delay because of the hour, yeah, I understand that, but it's still somewhat true. So this is a very, very complicated situation to understand.

MS. LE VINE: Yes, I agree with you.

If we could flip. The next one, since you have the packet, is actually a weekday -- a weekend day. So what you're seeing is that the load on a weekday in the wintertime is closer to 29,000 versus on a weekend day, Saturday, January the 4th, the peak load was a lot closer to about 25,000 instead of 29,000. So we also have, you know, differences between depending upon what the weekday and the weekend is.

And then if you could go to the third slide, this is actually our peak day of last summer. So it's August 15th of 2019. We had our peak at 5:50 in the afternoon, p.m., and the peak was 44,301 megawatts. During that time, what ended up happening was that there was some clouds in southern California, so our ramp ended up being from 4:00 p.m. to 8:00 p.m., even though in August the sun should be out until 8:30.

But because the clouds come over, and especially if the clouds have moisture in them, then

what ends up happening is the solar capability declines significantly because they aren't getting the same amount of radiation from the sun to power the solar panels.

So that's what ended up happening on this day. Even though it was hotter than heck, which is why we had our peak, if the clouds come into southern California, that's what ends up happening with having to need a ramp. So the ramp on this day in the three hours was 7,680 megawatts. In addition to that, at noon we were still importing 9,000 megawatts to just try and meet what our requirements were at noon.

So the impact of wind and solar -- what I'm trying to demonstrate here is the impact of wind and solar, while close to Arizona, is slightly off from Arizona.

The other thing to consider is that California, we actually -- the California Independent System Operator has 32 million customers in it. The state has a population of 40 million, but only 32 million are under underneath the CAISO, the California ISO. The balance are either in Imperial Irrigation District, which is its own balancing authority area, LA Department of Water and Power, which is its own balancing authority area, and then the

Sacramento Municipal Utility District. So those are the other balancing authority areas in California. So that's why we only have a portion of it.

MEMBER HAENICHEN: Okay.

CHMN. CHENAL: Member Hamway has a question.

MEMBER HAMWAY: I think I do. I'm not a hundred percent sure. So I think I read in the procedural order explaining the differences between the DPV2 line and this line was that the cost was going to be spread across CAISO customers. So the cost of the 400 million is going to be spread across 32 million customers?

MS. LE VINE: Correct.

MEMBER HAMWAY: Okay.

MS. LE VINE: And, and the people that use our lines to export generation to other states. So as an example, when we have excess generation in California and we sell it to Nevada, Nevada will pay the cost of getting it from the generator inside California to the Nevada border. So they'll pay that also.

MEMBER HAMWAY: So since there's so much discussion about the EIM market, I'm assuming that this line really benefits that EIM market in that, since California is generating so much excess, it's more

economical for you to offload it, and maybe you need a line to offload it. And so part of the justification for Arizona is that if you build it, they will come, the solar generation in La Paz County.

So my question is, if this is really about maybe offloading some of California's excess, why would the solar plants ever see the light of day in Arizona?

MS. LE VINE: Well, again, the utilities cannot determine where a developer wants to develop their project.

MEMBER HAMWAY: Right, you said that. Okay.

MS. LE VINE: And it's only short periods of time where we have overgeneration. California has been a net importer since the '60s, and we've actually had plants outside -- built outside of the state of California serving California since Hoover Dam was commissioned back in 1938.

So we have -- California has rights on Hoover, we have rights on Palo Verde, we have rights on the Navajo generation, we have rights up in Oregon on power plants up there. So there's a number of plants that were built outside of the state of California to serve California, and they're all based on what's the most economic place to build it, including the transmission cost to get it to California.

MEMBER HAMWAY: I'm just trying to follow the money, and I have trouble doing that.

MS. LE VINE: Okay. So let me try this. Let's be specific. You have a generator in Utah, okay, that wants to sell 100 megawatts to California. In order for it to get from Utah to California, they have to pay somebody in Utah to go across their transmission lines, and then somebody in Nevada or maybe two people in Nevada to get across Nevada to get to where our control area boundary is, which is El Dorado Substation, which is just south of Las Vegas. And they bid that into the ISO markets. So we'll go ahead and clear the 100 megawatts in the ISO markets.

So the way the payment works is that the generation -- or, the load that was served by that generation, let's say it's 100 houses in Los Angeles, California, is where those little electrons, if you could color code them, they go to Los Angeles, okay. So that's Southern California Edison.

So Southern California Edison would pay a hundred dollars, or whatever the clearing price is, for the 100 megawatts to the CAISO, and the CAISO would pay that generator in Utah the cost that they get for having that price and that megawatts, okay.

In addition to that, that generator, because

we don't have that transmission in Utah in this example, we don't have that transmission in Nevada, they did a side deal with UAMPS, Utah Municipal -- what's their acronym -- Utah Municipal entities have a bunch of transmission in southern Utah, and then they have to come across Nevada Energy's transmission in Nevada. So they'll pay Nevada separately.

But they've already included the cost of those two transmission prices in whatever they're bidding in our market, so that they know that they can go ahead -- once they get the money from us, they can go ahead and pay for that transmission. And then it's the load in California that pays for the California transmission to get the 100 megawatts that came in. Does that help?

CHMN. CHENAL: Let me see if I can take a stab at Member Hamway's question. I think the thrust of her question was that if California has excess energy to export --

MS. LE VINE: Okay.

CHMN. CHENAL: -- and does so to Arizona, that's going to kill the incentive for Arizona solar plants to be developed in, say, La Paz County. Because we've heard testimony that with this line there's at least three projects in the queue.

And I guess one response to that might be, well, those companies that are in the queue to build these solar plants have done an analysis, probably based on the renewable requirements that California has and will have in the future and the same with Arizona, and in their estimation, the demand will always be there for more solar. So they're still incentivized to build the solar plants in La Paz County, even assuming the fact that California may export some power into Arizona.

MS. LE VINE: Okay, I see the confusion. As far as when we export, we probably only export five-minute increments a couple hours a day, or we might have to export, you know, a half hour a day.

So it's -- California has been a net importer since the '60s, as I said. In recent years we're a net importer of close to 8,000 to 9,000 megawatts per hour. So it's only these certain times where we have oversupply. And especially before the renewable generation started bidding in, that they're willing to shut down, is when we were exporting.

So it's economical for solar plants to build in La Paz County, if that's where they're building, to build in La Paz County because they're going to be generating from sunrise to sunset pretty much 360 days

a year. So the ability to gain revenue off of that amount of generation that's being produced is much more significant than the amount of time that we're in an oversupply condition.

MEMBER HAENICHEN: Mr. Chairman.

CHMN. CHENAL: Member Haenichen.

MEMBER HAENICHEN: So let me see if I understood what you just said, and then ask you to just take an educated guess as to what's going to happen.

I think I heard you say that California does export some energy, but it's not a significant percentage of their total need, right?

MS. LE VINE: Correct.

MEMBER HAENICHEN: Okay. So then wouldn't it follow that if this line is constructed, that the majority of the energy flow will be from east to west?

MS. LE VINE: Yes. As I said, California has been a net importer since the 1960s.

MEMBER HAENICHEN: We've been trying to establish that the whole hearing, and now you're the first one that said it, so thank you.

MEMBER HAMWAY: I just have a follow-up.

CHMN. CHENAL: Member Hamway.

MEMBER HAMWAY: So is this part of the business model, for lack of the right word, to always

be an importer?

MS. LE VINE: I wouldn't say -- oh, I lost my mic. I think what it is, is you can only have three mics on at a time. And so the one who isn't talking gets disconnected, is what I think I figured out.

I wouldn't say it's a business model. I think what ends up happening is when we deregulated the electric utility industry back in 1998, generators get a choice as to where they are going to build their generation. And the incentives to build in California versus the incentives to build in Arizona or Nevada or Utah or Oregon or Mexico are completely different than the days of the vertically-integrated utility.

So it's the developer that is making the decision as to where to build, and then going to whoever they're going to interconnect with to find out what the interconnection costs are. And then if they want the power to go to California, they would also need to come to us and say, well, we're interconnecting over here, but we want to be in your market structure. What, if anything, do we have to do? So then we study them also.

So they have to take all those costs and figure out is it economical for me to build where I'm building, or it's not worth the risk exposure

associated with the cost.

MEMBER HAMWAY: Thank you.

MS. LE VINE: You're welcome.

CHMN. CHENAL: All right. Let's -- there's been a lot of questions. I don't know what the prepared testimony or what Ms. Le Vine intended to cover, and maybe she's covered what she intends to cover. But I think this would be a good opportunity to have Ms. Le Vine, you know, continue with what she wanted to say. And I'm assuming you had some prepared remarks because you had slides.

MS. LE VINE: Well, actually, I do not have prepared remarks. I came, at the request of the Committee, to answer your questions on operational control. I did have an opportunity to look at some of the previous testimony, and I saw the questions that you had. And so I was trying to bring some documents that would try to answer some of the questions that you had of previous witnesses.

CHMN. CHENAL: Ms. Grabel, do you have further questions?

MS. GRABEL: I have a couple of follow-up questions, if you don't mind, Chairman.

CHMN. CHENAL: Sure, absolutely.

MS. GRABEL: Thank you.

BY MS. GRABEL:

Q. Ms. Le Vine, just to clarify, CAISO does not -- does CAISO currently have operational control of any lines in Arizona?

A. Oh, yes.

Q. Can you name some?

A. Certainly. We have operational control of the Southwest Powerlink that goes from Hassayampa to North Gila to the Imperial Valley into Miguel, which is in San Diego. We also have operational control of the Devers Palo Verde lines. We have operational control, from a contractual perspective, for the Mead Phoenix lines that go from Mead, which is up by Las Vegas up by El Dorado, into the Perkins Substation. And we have rights -- we have rights on lines that connect to Parker and at Blythe.

MEMBER HAENICHEN: Mr. Chairman.

MS. LE VINE: And oh, one more. Moenkopi El Dorado. So that's the line that runs across the top of Arizona, and we have rights on that line to the Colorado River, which I guess is all in California at this point.

CHMN. CHENAL: Member Haenichen.

MEMBER HAENICHEN: Thank you.

Ms. Le Vine, to your knowledge, does any

Arizona entity have operational control over any California transmission lines?

MS. LE VINE: Well, first off -- third mic.

Operational control is a California term. So if you mean does anyone in Arizona have a transmission line that's in California, not that I'm aware of. I think everyone in -- all the transmission lines that are in the geographical boundary of the State of California are owned and operated by California entities.

MEMBER HAENICHEN: But considering your previous testimony today, you indicated that CAISO doesn't -- well, I'm not sure how it's phrased. But you indicated that the L.L.C. owns the transmission line, has a transmission line in Arizona, will have if this is approved. So what's different?

MS. LE VINE: So the -- I guess I'm getting tripped up with your question, so I apologize. The question that Ms. Grabel asked me is: Does CAISO have operational control of transmission in Arizona and what transmission lines are those. And I named those.

Again, operational control just means we have the ability to be the air traffic controller as to the megawatts that are flowing back and forth on the line.

MEMBER HAENICHEN: Okay. Well, I just didn't

communicate effectively with you then. What I really meant is, does the same situation exist in reverse between the two states? Does anybody have operational control over a line, no matter who owns it, in California? That's what I'm asking.

MS. LE VINE: So the answer to that would be no, because operational control is a term used by the CAISO in its transmission control agreement, and we have not had any entities from Arizona execute that agreement.

MEMBER HAENICHEN: Thank you.

CHMN. CHENAL: Ms. Grabel.

MS. GRABEL: Thank you, Mr. Chairman.

BY MS. GRABEL:

Q. So earlier in these proceedings there was some concern or apprehension about whether or not the California ISO could express preferential treatment to its California members or the members of the California ISO to the detriment of Arizona utilities. Does the California ISO have that ability?

A. Are you in reference to -- it seems the question is regarding if a generator in Arizona was providing power to California or a California generator was providing power to Arizona, could we tell that generator that they can't provide power to Arizona, is

that what you're in reference to?

Q. Correct, yes.

A. Okay. So thank you for asking that question.

Putting my system operator hat on, absolutely not, okay. And it would be stupid for us -- sorry, I shouldn't use that word. It would be inappropriate for us to actually cut off that generator from serving Arizona in a system emergency, and here is the reason.

If we're in a system emergency, we do not have the ability to cut off any of the exports to any of the balancing authority areas that are our neighbors or that we're selling to. And the reason is, what if that entity, APS as an example, is in a system emergency, and we're fine, but they cut off the generation that was flowing to California. That then puts us into a pickle, and we would be in a system emergency.

So no one cuts off the exports to any other balancing authority area, because that would jeopardize the reliability of the entire western grid, and you'd have a potential for cascading outages across it.

Q. Thank you. And just for the record, California ISO does not own any transmission or generation assets; is that correct?

A. Correct.

Q. Thank you.

A. And we don't even take title to the power; we're just the middleman.

CHMN. CHENAL: Member Gentles.

MEMBER GENTLES: Thank you, Mr. Chairman.

So I appreciate the other Members' ability to drill down and ask these very complicated questions. So then people like me, who are listening, try to simplify this. So forgive me if this question is a little too simple for the forum. I'm still trying to track a couple things.

MS. LE VINE: Okay.

MEMBER GENTLES: So from what I understand, there will be more flow to California than back to Arizona?

MS. LE VINE: The majority of the time, yes. Again, over time we are a net importer and have been a net importer.

MEMBER GENTLES: And so if California is a net importer, but they have excess wind and solar, why does that -- again, forgive the question if it's a little bit too simple -- why is that then the case?

MS. LE VINE: Because at certain times -- as you saw on the charts for the load duration curve, in the summertime our peak is way up at 44,000 megawatts,

in the wintertime our peak is closer to -- that's a weekend day -- our peak is a little bit closer to about 27,000 megawatts. So you have to build enough generation to meet the 45,000 megawatts, even though it's not used all of the time.

So the reason why there are instances where generation is sold from California out to the other entities is because we're at one of those periods of times where we're not in a high load position, but we have a lot of generation that is running.

Now, I will tell you, again putting my system operation hat back on, what we do as far as outages for generating units is we stack up their outages between October and May so that they can go ahead and -- that's when we are at our lowest demand requirements, and that way they can go ahead and do their generation maintenance during that period of time. And then from May to September 30th, most of our generation is required to be online without planned outages, only forced outages during that period, because we never know when the peak is going to hit.

Does that help explain it?

MEMBER GENTLES: Yeah, it does. And just one last question. So then the power generation will benefit California on a net basis; is that correct?

MS. LE VINE: If you color code the electrons, I would say no. But on a clearing of the market, there is a higher need for energy in California than there is in Arizona because of the population difference.

MEMBER GENTLES: So then would that stand to reason that the net financial benefit would benefit Arizona ratepayers as a result?

MS. LE VINE: Well, as I showed in my slides, in the EIM market, Arizona has already gotten $140 million benefit in just the three years they've been involved in the EIM market. And actually, it's only two years and a quarter, because they joined in the beginning of the fourth quarter of 2016. So there's definitely an economic benefit, from my perspective, to Arizona for this transmission line.

MEMBER GENTLES: All right, thank you.

CHMN. CHENAL: Member Hamway.

MEMBER HAMWAY: So does California need this line because of the aggressive environmental legislation that's come about in the last couple of sessions? I mean, is that what's driving this? I know this was proposed 13 years ago, and obviously that legislation wasn't in place then, so I'm just curious what's driving this. Is it the current legislature?

MS. LE VINE: I would say it's the -- well, it's the existing renewable portfolio standard that was actually passed in the previous governor's term. So it's not the current legislature, but the past legislature, that went ahead and established this renewable portfolio standard. That's part of the reason for it.

The other reason is, if you think about it, the transmission lines that go currently between Arizona and Nevada, a lot of those lines were built more than 50 years ago. And so while they've been maintained over time, eventually those lines are going to have to get restrung and rebuilt. And so by having additional flow between the two states is beneficial for both California and Arizona.

MEMBER HAMWAY: So that's Path 49, right?

MS. LE VINE: Yes.

MEMBER HAMWAY: Okay.

CHMN. CHENAL: All right. Anything --

MS. LE VINE: Wow, you know what Path 49 is? I'm so pleased.

MEMBER HAMWAY: Well, actually, I did some research over the weekend.

MS. LE VINE: Oh, cool.

CHMN. CHENAL: Any further questions?

(No response.)

CHMN. CHENAL: Ms. Le Vine, thank you very much for your -- it's helpful. I think we all appreciate it.

MS. LE VINE: You're welcome. I'm glad I could help.

CHMN. CHENAL: Yeah, very helpful.

MS. GRABEL: The Applicant echos that as well.

CHMN. CHENAL: Oh, I'm sorry. Excuse me. We still have Ms. Scott. I'm sorry. I apologize. There should be -- if there's any follow-up questions.

MEMBER HAENICHEN: Mr. Chairman, I have one quick question.

CHMN. CHENAL: Yes, Member Haenichen.

MEMBER HAENICHEN: Ms. Le Vine, are you planning to remain with us for the remainder of this hearing?

MS. LE VINE: Actually, Commissioner, I'm hoping to catch a 1:30 flight, if that's okay.

MEMBER HAENICHEN: I guess that answers it. Thank you.

CHMN. CHENAL: Ms. Scott. Again, I apologize.

MS. SCOTT: Thank you, Chairman.

CROSS-EXAMINATION

BY MS. SCOTT:

Q. I just have a few questions for you. I'm with the Staff, the Legal Division of the Arizona Corporation Commission.

I want to just switch from the technical issues that you've been discussing to issues involving governance. Are you familiar with those?

A. Yes, I am.

Q. Okay. I wonder if you could give us some idea about the governance of the California ISO and where that stands at this point with respect to other states.

A. So the current governance of the ISO is five independent members that are nominated by, I think it's close to eight different stakeholder groups. I can check on that number if you are -- need to know that number. But it's different stakeholder groups that are part of the market participants, that make up the market participants, that go ahead and recommend a member to be on the ISO governing board.

Those members are then given to the governor of the state of California, and the governor then picks out of that list who he wants to recommend to be confirmed by the Senate.

The EIM market, on the other hand, is not governed by the ISO governing board. It's actually governed by an independent body, the EIM board; and to be honest with you, I don't know the number of people on that board. But it's completely different than the CAISO governing board.

Q. And with respect to the EIM market and the board that oversees those operations, does that board consist of members from the various states that the EIM market covers?

A. That's my understanding, yes.

Q. And how are those members selected?

A. I don't know the answer to that question. But I do know that Rob Kondziolka from SRP was just appointed to the board. He retired from SRP, and he's now on the EIM board.

Q. I wanted to ask you a couple questions about entry and exit into the EIM. I think you've gone over a lot of the requirements for participation in the EIM. What about if a utility wanted to exit, what type of procedures would apply there?

A. I don't have that information, I'm sorry.

Q. Okay.

A. I know that to get into the EIM it takes quite a while, because we need to get their full

network model, so the topology of their entire transmission system and where their generation is. And it takes a while to get that into our models so that we're able to go ahead and incorporate their system in. So when we run the EIM market for the western United States to come up with the least cost for the consumers, we have all the right topology.

So I understand it takes six to nine months for that process to actually come to fruition, and then they're in parallel operations for two months, and then they'll go live, which is what SRP is doing at the moment.

Q. Okay. And you mentioned a number of lines in Arizona which are under CAISO oversight, correct?

A. Operational control, correct.

Q. Operational control, I'm sorry. Have there ever been any problems with the operation of those lines to date?

A. Can you define problems, what you mean by problems?

Q. Any unintended consequences or anything that wasn't -- didn't run as expected.

A. Well, there's a little thing called September 8th of 2011, if that's what you're in reference to. So on September 8th of 2011, APS was

working in the switchyard at North Gila and hit a piece of equipment that resulted in a blackout, cascading blackout all the way from Arizona through California, up to San Onofre Nuclear Generating Station, we were able to stop it there.

And it took us -- that was one of the longest days of my life. It took us a total of about 15 hours to get the power back up to all of the different entities. In that instance, it was a mistake made by a contractor that had a detrimental impact to everyone. And because they hadn't followed the procedures for disconnecting the equipment first, before they did the work that they were supposed to be doing, I would say that was a problem, because we shouldn't have had a cascading outage. But outside of that, I'm not aware of any problems.

The entire western United States are all electrically interconnected, and we know that we need to work with each other to make sure that the power flows at the right place at the right time, we're not overloading somebody else's equipment, and we aren't leaning on each other.

Leaning is where your equipment or your generation is insufficient, so you kind of just take some of somebody else's generation. And then you'll

see the frequency -- you know, so we like all of our computer equipment at like 60 hertz. But if somebody is kind of leaning on the system, you might see a little bit of a dip, because somebody is taking somebody else's generation, so they can't hold up their 60 hertz.

So that's part of how the whole system works together. I mean, we work very closely with APS and SRP and Western Area Power Administration, that all have transmission lines in Arizona. We're on the phone with them at least daily, if not multiple times per day.

Q. Okay. Would you say that there would be more of a concern with cascading blackouts when you have a regional entity such as the EIM or less concern?

A. I would say no difference. Yeah, no difference. It's kind of apples and oranges. It's all -- the cascading outages are all based on the actual operation of the grid, versus the EIM is an energy imbalance market that matches generation and demand, so the generation and the load, not necessarily the transmission. So it's kind of apples and oranges.

Q. Okay. As far as your discussion earlier about transmission charges, do those apply to the day-ahead market?

A. Yes, day-ahead and realtime.
Q. So the five-minute and the --
A. 15-minute, right.
Q. -- 15-minute as well?
A. Right.
Q. The EIM?
A. The EIM is different. What's happened in the EIM market is that everybody has agreed that they wouldn't charge transmission costs, which makes it much easier. So you're just going ahead and matching supply and demand, and not having to worry about transmission in the EIM market. Does that help?

MS. SCOTT: Yes. Okay, I think that's all we have. Thank you.

MS. LE VINE: Thank you.

CHMN. CHENAL: Member Woodall has a question.

MEMBER WOODALL: Let's assume that someone in Arizona, some utility, some generator, doesn't like some action that CAISO takes in its role as the operational control. How would they express their concerns? Do you have some sort of dispute resolution process?

MS. LE VINE: Yeah. So every generator, in order to participate in our market, has executed some type of participating generator agreement. And in that

participating generator agreement, similar to actually the transmission control agreement, there's a dispute resolution process. We do use ADR, alternative dispute resolution, so we go through arbitration first.

The arbitration, in most instances there's very few contracts that make it binding. And to the extent that they still don't like the answer and want to take it to the Federal Energy Regulatory Commission, they have that right.

MEMBER WOODALL: And may I inquire, in your experience, have there been few, relatively few, many such disputes?

MS. LE VINE: I am only aware of -- I've been involved in one arbitration, and I've only been involved in -- and the company, I think -- I was involved in one settlement conference over a dispute at FERC, and there was a second one. So over 22 years, a total of two at FERC and, you know, maybe probably maximum of five that went through arbitration.

MEMBER WOODALL: Thank you very much, ma'am.

MS. LE VINE: Thank you.

CHMN. CHENAL: All right. Any further questions from the Committee?

(No response.)

CHMN. CHENAL: Ms. Scott, any further

questions?

MS. SCOTT: No. Thank you, Chairman.

CHMN. CHENAL: Ms. Grabel.

MS. GRABEL: None from me. Thank you, Chairman.

CHMN. CHENAL: Thanks, Ms. Le Vine. Hopefully you have time to catch your flight, and we appreciate you coming out and your testimony was very helpful.

MS. LE VINE: Thank you. Glad I could help.

CHMN. CHENAL: Really appreciate it.

MS. GRABEL: The Applicant would actually like to echo that on the record. We really appreciate your assistance.

MS. LE VINE: Thank you.

CHMN. CHENAL: All right. It's a quarter to 12:00. We have a lot to cover today. What is the -- it's time for a break, that's for sure. Do we want to do a short 10-minute break or do we want to break for lunch, or maybe a 10-minute break, come back, and then go to 12:30 and take a half-hour lunch break? I mean, I think we've got a lot to cover today, so we're going to have to push it a little.

MS. GRABEL: I agree with you, Chairman. So I'm fine with a 10-minute break, starting, and then

taking a short lunch.

CHMN. CHENAL: Let's do that. Let's come back in 10 minutes, and we'll plow through the rest of it. Thanks.

(Off the record from 11:49 a.m. to 12:12 p.m.)

CHMN. CHENAL: All right, everyone. We have most of the Members; but given that we're pressed for time today, I want to get moving on it.

So Ms. Grabel, I think you have -- your next witness is Mr. Amirali.

MS. GRABEL: That is correct. And also, we're going to have Mr. Peter Mackin. If you could, perhaps at the appropriate time, put him under oath, because he is going to run a flow model that we put together for you that shows how the flows work throughout the southwestern grid.

I don't know that we need to do that right now, because the very first thing I'd like to do is actually get into the record the exhibits that were sent last night and filed in docket this morning.

CHMN. CHENAL: Very good, thank you.

MS. GRABEL: Okay. I'm going to introduce these through Mr. Amirali.

ALI AMIRALI,

called as a witness on behalf of the Applicant, 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. GRABEL:

Q. So Mr. Amirali, you are still under oath. Do you have in front of you Exhibit DCR-7F?

A. Yes, I do, ma'am.

Q. Do you recognize this document?

A. Yes, ma'am.

Q. What is this document?

A. It is a letter of support from APS for the Ten West Link project.

Q. And was this filed in the docket in this matter?

A. Yes, ma'am.

Q. Thank you. What does Arizona Public Service Company say about this line?

A. APS supports the -- supports the project because of the values that it brings to the western states.

Q. Does it say that it will enhance the

reliability of the transmission system?

A. Yes, it does, ma'am.

Q. Thank you. Could you please look at Exhibit DCR-31?

A. Yes, ma'am.

Q. Have you seen this document before?

A. Yes, ma'am, I have.

Q. Is this document publicly available?

A. That is correct.

Q. Please describe the document.

A. It is the estimate by APS for participation into the EIM markets.

Q. Was this a press release from Arizona Public Service Company?

A. That is correct.

Q. Thank you. Will you please look at Exhibit DCR-32?

A. Yes, ma'am.

Q. Do you have that document?

A. Yes, ma'am.

Q. And what is this document?

A. It is the press release by Tucson Electric Company regarding the participation in the EIM market, and the estimated savings that they will receive from this endeavor.

Q. And just to correct, this isn't a press release. Is it an article about Tucson Electric Powers' participation?

A. That is correct. Yes, ma'am.

Q. And is this document publicly available?

A. Yes, it is.

Q. Will you please look at Exhibit DCR-33?

A. Yes, ma'am.

Q. Do you recognize this document as a news release issued by the California ISO and SRP?

A. Yes, it is.

Q. And what is this press release regarding?

A. It is regarding SRP's participation in the imbalance energy market and the estimated savings that they will receive from it.

Q. And is this document publicly available?

A. Yes, it is.

Q. Thank you.

MS. GRABEL: And I realize I'm going through this quickly, Committee Members. During the comparison to DPV2 and Ten West Link, I do quote from these. I just want to make sure they're in the record so there's something to refer to when you go through that portion.

BY MS. GRABEL:

Q. Will you please turn to Exhibit DCR-34.

A. Yes, ma'am.
Q. What is this document?
A. It is a -- it is a release -- it is a news article regarding Arizona Public Service's announcement for their goal for achieving 100 percent carbon-free energy serving.
Q. Is this document publicly available?
A. Yes, it is.
Q. Thank you. If you would please turn to Exhibit DCR-35.
A. Yes, ma'am. I got it.
Q. What is this document?
A. This document is a summary of the total savings associated with the participation of different entities into the EIM market, along with the breakdown of what each participant -- the savings that has been realized by each participant until the end of 2019.
Q. What does this document say about Arizona Public Service Company's savings related to the western energy imbalance market?
A. The document states that the Arizona -- to date, from the day of starting participation in 2016 until the end of 2019, Arizona Public Service Company has saved over -- has saved over $140 million because of their participation in the EIM.

Q. Thank you. Will you please turn to Exhibit DCR-36?

A. Yes, ma'am.

Q. What is this document?

A. It is a news release by California ISO for the gross savings associated with the energy imbalance market for all participants in the market.

Q. And is this document publicly available?

A. Yes, it is.

Q. Thank you. If you could turn to Exhibit DCR-37.

A. Yes, ma'am.

Q. What is this document?

A. This is a memorandum addressing the questions regarding the -- regarding what type of generations can be connected to the Ten West Link project or, for that matter, any other transmission projects -- regulated transmission line, and the limitation and the federal regulations associated with it.

Q. Was this memorandum prepared by you or under your direction and control?

A. Yes, ma'am, it was.

Q. It was the direction and control thing, right, because my firm prepared this one.

MS. GRABEL: And the Chairman, at one point,

asked me to basically summarize what the conclusion was in this. I don't know if you want me to do that now.

CHMN. CHENAL: Yes, I would. And I did read it, and I think it was well done, and I think it will answer a number of questions on conditions that we might be considering restricting what kind of generation go on the proposed line.

MS. GRABEL: Certainly. Thank you.

So the reasoning behind this, actually, is relevant to some of the things that Ms. Le Vine talked about during her testimony today, and it's because electricity is determined to be a component of interstate commerce that you actually do violate the Dormant Commerce Clause if you place a condition on the type of generation that then interconnects to the line. So that's a Dormant Commerce Clause analysis which makes it unconstitutional.

There's actually a second component, which is because the Federal Energy Regulatory Commission has basically usurped the field when it comes to interstate transmission lines, it's actually a violation of the Supremacy Clause to have a state condition that undermines any component of what FERC has already regulated.

And if you have any questions specific to the

memo after you've had a chance to review it, I'd be happy to answer them.

CHMN. CHENAL: All right, thank you.

BY MS. GRABEL:

Q. Mr. Amirali, if you would please turn to Exhibit DCR-38.

A. Yes, ma'am.

Q. Have you seen this document before?

A. Yes, ma'am, I have.

Q. And what is this document?

A. It is the presentation that I will -- that I will be doing today for presenting the ISO markets, and also providing the benefits of EIM and the flow data -- flow data for the last year on different transmission lines between Arizona and California, and just from the major transmission lines in Arizona.

Q. Was this document prepared by you or under your direction and control?

A. Yes, it was.

Q. And are the contents of Exhibit DCR-38 true and correct, to the best of your knowledge?

A. Yes, they are, ma'am.

Q. Thank you. If you would please turn to, I think the final exhibit, Exhibit DCR-39.

A. Yes, ma'am.

Q. Have you seen this document before?
A. Yes, ma'am.
Q. And what is this document?
A. At the request of the -- Mr. Chairman and the Committee, DCR -- DCRT has done a comparison, as well as identified the differences and the -- associated between DPV2 line and have categorically addressed the findings of fact from the DPV2 decision and how -- and the benefits of Ten West Link, along with the conditions that do not apply to Ten West Link because of change in conditions.
Q. Was this document prepared by you or under your direction and control?
A. Yes, it was.
Q. And are the contents of Exhibit DCR-39 true and correct, to the best of your knowledge?
A. Yes, ma'am, they have been.
Q. Thank you.
MS. GRABEL: At this point, I think I'd like to move the admission of all of the exhibits that I've introduced into the record.
CHMN. CHENAL: That would be fine, Ms. Grabel.
MS. GRABEL: So those would be Exhibits DCR-1 through DCR-41.

CHMN. CHENAL: Yes. And 40 and 41 were just provided this morning, and those were exhibits that Ms. Le Vine testified about, correct?

MS. GRABEL: Correct.

CHMN. CHENAL: So there's been a motion to admit DCR Exhibits 1 through 41. Are there any objections?

(No response.)

CHMN. CHENAL: Okay. DCR Exhibits 1 through 41 are admitted.

(Exhibits DCR-1 through DCR-41 were admitted into evidence.)

MS. GRABEL: Thank you. At this point, I would like to have Mr. Amirali go through his presentation, which has just been marked as Exhibit DCR-38.

And in the interest of time and in directly addressing Member Haenichen's interest in information about the flow data, we would like to start midway through that presentation and go up until the Committee decides it's a good time to break for lunch. And that -- we'll turn to the WECC grid and power flows portion of Exhibit DCR-38.

And perhaps, Chairman Chenal, this might be a good time to put Mr. Mackin under oath while we're

bringing up that portion of the presentation.

(Peter Mackin was duly sworn by the Chairman.)

CHMN. CHENAL: Let me also state, for the record, I passed out, as I do in every case -- we'll have to make it an exhibit number, but I'd like it to be an exhibit number after the ones that were from the Applicant. I took the Applicant's proposed form of CEC and, as I do in every case, I made some changes to it, some -- with track changes for discussion. And the conditions that you will see that were added are from -- predominantly from the Southline CEC, but also from the SunZia, for the most part, CEC.

So tomorrow when we begin deliberations, we will have both -- we will have a document, let's, for argument, say it's Applicant's 42, and next to it will be the same document, 43, on the right-hand side of the screen, as we've done in every case. We will go through and in realtime make changes to the document on the right screen, and we will discuss as we go through. And then at the end, we'll vote; and depending on the vote, that would become the CEC.

And we can talk about it, but I wanted to get that information out to you as soon as possible. I will file that in the docket. And I just want to make

that clear. So that's kind of the standard procedure as we've done in the last 10 cases or so.

Okay. Ms. Grabel, whenever you're ready.

MS. GRABEL: Thank you, Mr. Chairman.

ALI AMIRALI AND PETER MACKIN,

called as witnesses on behalf of the Applicant, having been previously sworn by the Chairman to speak the truth and nothing but the truth, were examined and testified as follows:

DIRECT EXAMINATION

BY MS. GRABEL:

Q. Mr. Amirali, whenever you're ready.

A. (BY MR. AMIRALI) So during the meeting at La Paz County, we had received requests regarding the -- regarding providing a map of the western transmission grid. Also, as Member Haenichen has repeatedly asked for, providing different type of flow datas.

The section of the presentation that I'm going to provide right now addresses most of these -- addresses most of these questions. If they don't, please do ask so we can complete all requests today.

Also, as a part of this, one of the -- one of

the items that we will present is a model of the western transmission grid. It is a realtime flow model which demonstrates how the flows on different transmission lines work on the western interconnected grid, and it will hopefully address some of the questions that have been asked regarding how the -- how the flows will split on Ten West Link after it is online.

The model is also very good because it provides -- it provides a realtime -- it provides a simulation of how the reliability of the grid will be improved by the interconnection of the -- by the construction of the Ten West Link. We will give you more details when we show the demonstration.

All right. So getting into the western transmission grid, so this is a transmission of -- this is the transmission map of the western transmission grid. You heard from Ms. Le Vine that the whole west is interconnected and when she stated that power can flow from north -- in the northwest all the way to the southwest, and it can do it using multiple paths.

I would like to point out, if you look at this map, in the technical terms we call it the western doughnut. And the reason you have got a doughnut -- okay, we are not very creative, so it does look like a

doughnut, and you can see a little bit of a gap. This is where the desert is. So in Nevada, basically, you've got Nevada, you've got Reno, and then nothing, all right. Utah connections to Nevada. And this is the northwest. So it's literally the western doughnut.

And the western doughnut is entirely interconnected with each other. They have the ability to share resources, and has had that since the '60s, since Kennedy administration when these transmission lines were like -- the big interstate transmission lines were built.

So this is a map of western doughnut. The pink lines that you see are identification -- are identifiers of different transmission paths. During the presentations in the last few weeks, we keep on talking about Path 49, Path 46. These are the different transmission paths. And as you can see, it basically acts almost like a super highway of flow of energy in the western U.S.

So we have -- also, now we drill down a little further into the two states that we are talking about, Arizona and California. And this is the transmission -- bulk transmission grid of Arizona. The Palo Verde area is right there.

You heard Ms. Le Vine talk about the

different -- different transmission lines where ISO either co-owns this, has some rights on it. This is the SWPL that she talked about, DPV, this is the proposed Ten West Link. The lines going to Nevada that goes from West Link that she talked about, Mead Phoenix Line and the Moenkopi Line. So basically, those were the lines that she talked about. When we go through the flow model, I will have this map up and we will be pointing to individual lines when we discuss on the flows about them.

Similarly -- Would anybody mind if I move my name out of there? Okay. Similarly, if you take that from California, this connection comes right here, right, and the other connection is in this area. So this is the California maps, and we will point to the individual sections. This is actually Devers, I believe, right there. So anyways, just more of a transmission map, and I will leave that up on the slide when we go through the flow model.

One of the things that we heard a lot about was, you know, is there generation in California? As the California -- as the California load has changed and increased, has there been a growth of generation in California? This slide shows how the generation in California has continued to increase.

California -- California generation -- and this is from 2000 all the way to 2018. As you can see, there has been a steady increase of generation, and the magnitude of it is quite large. In fact, right now we have 71 gigawatts of active generation request proposing to connect to California -- into California ISO only. And when Debi talked about that California ISO, still does not include LADWP and SMUD, Sacramento Municipal Utility District. So those are the entities in California that are not a part of the California ISO balancing authorities. These are only the generation in California ISO balancing authority.

CHMN. CHENAL: So real quick question. I see gas, natural gas, makes up a huge percentage of the power as recently as this past year -- or, 2018. I thought we had had testimony that gas was not going to be permitted in California at some point in the near future. So why are interconnections -- these are -- oh, this is in-state generation --

MR. AMIRALI: This is in-state generation, sir.

CHMN. CHENAL: -- not interconnection requests. So it's existing, but that's basically going to be going down in the future, obviously, because they're not going to be permitted with natural gas?

MR. AMIRALI: Mr. Chairman, that is not accurate, okay. Gas generation -- I will point to two things. One, there is actually a -- first of all, a lot of the gas generation that was built in California was built in the '70s and '80s, so there has been a natural retirement of those resources.

There is also another regulation that was a cooling regulation, and a lot of the generation is retiring because of that. It's just old technology that is getting replaced with newer technology. In fact, PG&E just finished -- Pacific Gas & Electric just had an RFP for newer generation that can be connected directly to their substations that can provide reliability, and most of it is going to be gas generation.

So the gas generation development is continuing. California's regulation indicates that it has the -- it has to provide clean generation, so the older generation is getting replaced with newer generation. And as time goes by, more and more -- the gas generation is only going to be providing reliability and capacity services, and the predominant energy is going to be provided by carbon-free resources.

CHMN. CHENAL: All right. But in the future,

is there a point in time when California will no longer allow natural gas generation?

MR. AMIRALI: Mr. Chairman, as they say, you know, predictions are very difficult, especially about the future.

CHMN. CHENAL: But I thought there was -- I thought there was -- I thought I heard that by 2040, 2050 it all has to be renewable energy.

MR. AMIRALI: Sir, renewable energy and capacity are two different things. And there has been no law that has been signed in that says that there will be a full moratorium. It may come, but I am not aware of that.

CHMN. CHENAL: Okay. Well, what's the difference, then, between the energy and the capacity in terms of natural gas energy in the future for California?

MR. AMIRALI: So, sir, if you look at the energy and capacity differential, energy is what you use at all -- any given time, and there has to be a perfect balance between the energy consumed, megawatt hours, as Member Haenichen had pointed out -- megawatt hour consumed and megawatt hour produced have to have a match all the time.

However, you have to have capacity available

to provide balancing, as well as to make sure that just in case there is an outage, there is an unforeseeable event, that the system can come to a new stable point, a new quiescent stable point following a disturbance. That is the capacity aspect of the project.

Now, those can be -- in the future, those are going to be provided -- those can be provided by a fast responding gas unit and predominantly storage, and that's why California has a -- started a new goal for 3.3 gigawatts of new storage. And as --

CHMN. CHENAL: Before we go too far, Mr. Amirali, is natural gas -- is there going -- is there a requirement set for 2040, 2050 in California that will require nothing but renewable power? Did I hear that wrong in the testimony?

MR. AMIRALI: There is a requirement for satisfying all California's energy needs using renewable energy by 2045.

CHMN. CHENAL: Okay, 2045.

MR. AMIRALI: Yeah.

CHMN. CHENAL: So it has to be renewable.

MR. AMIRALI: No. Carbon-free.

CHMN. CHENAL: Okay, carbon-free.

MR. AMIRALI: Yes.

CHMN. CHENAL: Gas is not carbon-free.

MR. AMIRALI: That is correct.

CHMN. CHENAL: So I'm just stumbling over that point. Isn't it true, therefore, that by 2045, California will no longer allow natural gas as a generation source, and therefore, the percentage that's shown on the chart will decrease as we get closer and closer to 2045?

MR. AMIRALI: I can only speculate. And I can state that I do not know that there has been a regulation passed that they will not allow any generation, but I can say that the amount of -- amount of gas generation inside California will continue to decrease.

CHMN. CHENAL: Well, if the goal of no-carbon-energy is to be reached in 2045 in California, then that goal will require that there will be no gas generation, natural gas generation. It seems obvious to me, but obviously I'm not seeing something here.

MR. MACKIN: Ali, do you want me to take a shot at it?

MR. AMIRALI: Yes, please, Peter.

MR. MACKIN: Okay. So this is Peter. I guess -- maybe I can answer the question that I think you're asking. So Ali -- as Ali stated, there's a

requirement for all the energy used in California to be carbon-free by 2045. However, as Meghan delineated in her memo, there's -- you cannot prevent generation from interconnecting to the grid based on their energy source.

So what that says to me is that you could have natural gas-fired generation request interconnection to the ISO, and actually build and connect and generate; however, the utilities in California couldn't buy it because they are prevented from buying it because they have to have all of their energy served by renewables. So the generation could be natural gas in California, but then they would have to sell out of state.

CHMN. CHENAL: All right, that explains it. Thank you.

MR. MACKIN: Yeah.

CHMN. CHENAL: That explains it.

MR. AMIRALI: Always have people smarter than you working with you.

CHMN. CHENAL: Well, okay. Yes.

MR. AMIRALI: On the same token, as the new generation is being built, as the systems are changing, California is definitely improving the transmission system as well. New transmission projects, large

long-distance new transmission projects are already either in construction, in development, and are in planning in California.

The value of the transmission lines -- or, the usage of these transmission lines is associated with building -- you know, facilitating the development and interconnection and integration of new generation, improving transmission system reliability, reducing congestion, and to provide voltage support as well into the system, and finally, to improve system economics.

And California has been -- and this activity has continued since the early '90s -- since the early '90s, and it expanded in 2000s and is continuing throughout right now. So getting to the -- getting to the generation and California usage, as Debi pointed out, Ms. Le Vine pointed out, California has been a net importer of generation since the '60s, and it is how the system was actually designed. California is one of the participants of Palo Verde Nuclear Plant. They were a participant in the -- California utilities were participants in the development of the Navajo project, they had generation from Navajo. California have -- LADWP has generation in Intermountain Power coal project.

So this system was designed in such a way

that California has been a net importer of generation. But that does not mean that California -- that's all California does.

You can see that this is the import line, the amount of imports in California since 2002, the in-area generation, and the total demand, which should be the aggregate of the two. This is amount of energy that is consumed in California. It has fairly stayed constant, in fact, a little dip. And that is predominantly because of energy efficiency. Even though the number of people is increasing, the amount of energy that we are using actually as a consumer is going down because the devices are become more and more efficient.

Also, you can see that the levels of imports have fairly stayed constant. So some of the imports are coming from -- you know, they are importing less gas, less coal, but more renewables. So it has stayed fairly constant.

On the same token, Arizona has been a net exporter; again, the system was designed as such. This has been the Arizona load, again, stayed fairly constant in gigawatt hours. And the total generation in Arizona, same story. This has been the net exports coming out of Arizona.

And again, this is how the system was

designed. Arizona built resources, in conjunction with other participants, so that, you know, that energy has been flowing out, and it has been providing value to Arizona consumers.

In the olden days, sir, if you recall, larger generation was better because of the economies of scale. And by pooling resources between utilities, it was more beneficial to build larger facilities so that dollar per megawatt installation cost went down, and that was the motivation for building the system the way it was designed.

All right. Now we are going to get to the real fun part. So if the Member -- the Members of the Committee will indulge me, I will move over to the other side. And let me backspace, Peter. And I will -- I will leave -- I will leave this map up here because we will point, and it should give reference to the transmission lines that we are discussing.

Okay. So what you see in front of you on the left screen is a single line diagram of the western transmission grid. This is the transmission grid between -- bulk transmission grid between Arizona, Nevada, and California. It will be easiest if we will point that -- oh, come on. Way too quick with the button.

All right. So what you will see, sir, as Peter will talk, I will be using the arrows to point in between the two. And in the power flow models we use a single line diagram, which is a visual representation of the interconnected transmission grid. They're not always geographically accurate; but as far as the connectivity and the lines are concerned, they are an accurate representation of the transmission network.

So Peter, why don't you start, and I will point to different elements.

MR. MACKIN: Okay. So the first thing that we want to do is go over the diagram and just explain what everything on it is so it's clear.

So each of the -- I'll use my mouse. So the dark, the black lines that are -- most of them are horizontal, but some of them are vertical, those are basically bus bars or substations you could think of them as. And then the circles here are generators, and there's generators on the different buses to simulate the generation within the different areas.

So what we've modeled in this simulation is Arizona, we've split Arizona into a north and south; and we have Southern California L.A. and San Diego, so there's two pieces to California. So San Diego is down here, Southern California Edison L.A. is here. And

then we have Nevada up here.

So as Ali said, it's not geographic, but it's fairly -- relatively directional-wise, you know, you can kind of -- if you go north, you get to Nevada, that kind of thing.

We have transmission lines. The transmission lines are shown here with the green arrows. On each transmission line there is a meter, a circle in the middle, and the circle shows you the percent loading on the line, basically a percentage of the flow as it relates to the rating of the line.

As the rating increases, the color of the meter changes. So as long as it's below, I think it's about 80 percent, it's going to be blue. If it gets to between 80 percent and 100, it will be orange. And then when it gets to 100 percent or more, it will be red. And then red is basically don't do that, that's not good.

We also have transformers here and here and some other places. They are basically devices that change the voltage from one level to another. And we have these transformers in this model because the paths that we're representing -- we're representing, as Ali discussed earlier, we have Path 49 and 46, and those paths are represented by these purple or violet lines.

So this is Path 49 here, and it shows the lines that are cut by that path. So you can see the lines that are involved in that path. And then Path 46 is over here.

And we also have, lastly, for areas, we included a simple model of the Imperial Irrigation District.

So that is -- oh, and one other thing I forgot, the customer demand. So the customer demand are these arrows right here.

And then we wanted to show you in the model where -- the lines that I think everybody is most interested in. And so this bus here is Delaney, so this line from here to here is Ten West Link. And the line just below it is the Palo Verde to Colorado River line or Devers Palo Verde, either way.

And then -- oh, one last thing, just to point this out. This is a model of the Palo Verde generator, and that's why we were able to get the little nuclear sign in there for you.

Okay. So what we're going to do is this model was built with PowerWorld software, and the nice thing about PowerWorld is it has all these features. I've already pointed out some of them. But it makes it visually easier to display and discuss concepts that,

you know, typical engineering software would just be impossible to describe.

So we're going to go ahead and get this thing moving. And so as it's running, the arrows, you know, indicate direction of flow, and the size of the arrows indicate magnitude. So as the flow increases, the arrow size will increase. I believe the speed actually will increase a little bit too.

So what we wanted to do was demonstrate -- so this simulation right now, what's running, is the system with the Ten West Link in line -- or, sorry -- with the Ten West line in, so after construction.

So what we're going to do is we're going to say -- so this one, this simulation looks pretty good. But the whole purpose of transmission planning is to say, well, it can look good in the steady state like this, but it also has to look good after elements go out of service.

So the first thing we're going to do is we're going to take the Ten West Link out of service. And when the line goes out of service, the little X shows up because there's no flow on it. And now this is the -- this would be the situation of today's system, okay. And now we need to take contingencies on today's system and see if there are any issues.

So let's go ahead and take out, for example, Devers Palo Verde. Okay. Now you see these meters went red, because these two lines are now overloaded.

MR. AMIRALI: So on the -- geographically, it is the Moenkopi line and the El Dorado line that's called the Mead Phoenix line.

MR. MACKIN: Yeah. Actually, Ali, it's the Mead Phoenix and this one is the Liberty Peacock.

MR. AMIRALI: Oh, Liberty Peacock. Sorry.

MR. MACKIN: So those lines are overloaded. But now let's say for the same system conditions the Ten West Link was actually available. Turn it back on, and the lines are not overloaded anymore. So that shows you the benefit of having additional transmission in the system that, for the same set of system conditions, a situation that was not good today is good with the line.

All right. So let's take this line back out, put this line back in, and we'll look at another contingency. Let's take out the Southwest Powerlink, or SWPL, the line to San Diego. And again, we have problems. Now we have actually more problems, because we have problems here, we also have a problem over here on this 230 line to Southern California. But if we build the Ten West Link and it's in service, there are

no problems.

All right. So let's put the SWPL line back in.

And feel free to stop at any point if you have questions.

Okay. So now we'll take Ten West out again, and we will look at -- let's say we want to take out the Mead Phoenix line. So again, we have a problem with the Liberty Peacock, the 345 line, now it's overloaded. So we'll build the Ten West Link, put it in service, and -- did I do something wrong? Okay, no, because this is now -- it's red, but it's 100 percent. And 100 percent is actually okay. If you're right at the limit, it's an acceptable condition.

And so the purpose -- so basically what this is saying is that for this simulation, under these conditions, we are, with Ten West Link, right at the limit that we can serve as far as transfers. We can't go higher than this.

All right. So let's take this out and put this line back in. Okay, so now we're back to steady state without Ten West Link. And we've got another simulation we want to look at, the outage of Navajo Crystal. And that's the line, as Ali can point out on the other side -- yeah, there. It goes over to Las

Vegas.

And so if that line -- if that line were to go out, and we still have -- we have another problem. We have the Moenkopi El Dorado line now overloads because there's not enough transmission. But if Ten West Link is available, then there are no overloads.

Okay. And then the last simulation that we want to do is -- let's see. I think I've got everything in.

MR. AMIRALI: Ten West out.

MR. MACKIN: Well, no, we don't want Ten West out, because this is going to be the generation outage.

So now let's say Arizona is short of resources. Let's say for some strange reason Palo Verde is gone. Now, what's going to happen when I do this, you're not going to see any overloads because what's going to happen is if Palo Verde is gone, Arizona has less generation, which means generation has to come from someplace else; California, for example. So when the generation comes from California, the flows, they're still going to be going to California, but they're going to get a lot smaller.

So let's go ahead and take Palo Verde out, and you can see how the flows went down. It was about -- on the Southwest Powerlink down here, it was

about 70 percent; now it's only 45. So that shows the benefit of having an interconnected system and being able to rely on resources from different areas under emergency conditions.

So that's basically the demonstration. If there are any questions, I'm available. And I realize that this was like a graduate-level course in power system planning in five minutes, so...

CHMN. CHENAL: That was very helpful.

Member Haenichen.

MEMBER HAENICHEN: So here is my take from your presentation. First of all, it talked about outages. And I agree those are bad things, but those are not everyday occurrences.

MR. MACKIN: Well, actually, they are. Actually, they are.

MEMBER HAENICHEN: Well, I mean, very serious ones, the ones like you were talking about. For example, Palo Verde going out; it's never gone out, to my knowledge.

MR. MACKIN: The whole plant has not gone out, but two units have gone out simultaneously at one time. That's a critical contingency for operations.

MEMBER HAENICHEN: Okay, I'll accept that. But still, all of the benefits or 90 percent of them, a

big percentage of them, of having the new line in or not in, seem to accrue to California, as far as I can see.

MR. AMIRALI: Member Haenichen, that's not entirely accurate, because these lines that were overloading were -- are owned by -- some of them are owned by APS, some of them are owned by SRP, some of them are joint ownership lines. So it is the benefit to the interconnected grid and to the balancing authorities.

Remember, it is not a -- it is not -- western U.S. or the transmission system is not an island. You can't look at it by saying, oh, if this thing goes out, then the benefit is only to one entity. It is not entirely an accurate statement.

So all the members -- all of the members of the interconnected utilities, they work together in a spirit of collaboration under operating agreements and under the oversight of FERC to provide a reliable service to all of the participants of the interconnected grid.

And if the -- let's, for example, say Mead Phoenix line -- because of an outage of Devers Palo Verde line, which is owned by Edison, Southern California Edison, the Mead Phoenix line burns down or

has a damage to it. It is the responsibility of the owners of that line to fix that. And then there is -- and then there are inter-utility agreements between the two regarding who pays for it and what. But at the end of the day, the whole system suffers. So making a statement that, oh, all the benefits are going towards California is not entirely an accurate statement.

MR. MACKIN: And this is Peter too. And I think Judy Chang, in her testimony, also discussed the benefits that Arizona gets from this line.

CHMN. CHENAL: Let me ask a question, and Member Haenichen may have additional ones.

The flow analysis we see on the left screen, which is very interesting and good, it still shows the power flowing from east to west. Are you able to show the reverse of that from -- the power flows from west to east?

MR. MACKIN: Okay. Well --

CHMN. CHENAL: To the extent there are.

MR. MACKIN: Well, I don't know if we can get it to flow from west to east in actual flows because, I mean, first off, the paths that we pointed out here, 46 and 49 -- or was it the other way around? No, this is 40 -- yeah, it's 49. Yeah. They're actually only rated in the east to west direction.

So to have physical flows go west to east is very difficult. But economically, you can have transfer. So if the predominant flows are still east to west, you can still have back schedules that allow for economic exchange of energy between California and Arizona.

MS. GRABEL: If I could interrupt for a moment, Chairman Chenal. The next two slides that Mr. Amirali will go through actually show specific lines and the flows on that line. This was just a representation of how the entire system works. And I think the question that Member Haenichen asked is more directly addressed on the next two slides.

CHMN. CHENAL: Right, and we can do that. I just -- is it fair to say these are -- kind of think of it as net flows? I mean --

MR. MACKIN: Yes.

CHMN. CHENAL: -- yes, it's predominantly east to west because Arizona is an exporter and California is an importer. So the net flows are, yes, east to west. But if it was not going to be net -- maybe you're going to get into this in a minute -- there are obviously flows going the other direction, from west to east.

MR. MACKIN: Right. Correct. This is

showing the actual flows, but you could have schedules both ways, yes.

CHMN. CHENAL: All right, thank you.

MR. MACKIN: And just to clarify, the reason I was a little hesitant on trying to do that demonstration is -- I don't know if anybody else saw it, the Cybertruck reveal -- I just don't want to have the window break.

CHMN. CHENAL: That's fine. All right. What's next in the presentation? Is it going to be the flows that --

MR. AMIRALI: Just the two slides, sir.

CHMN. CHENAL: And how much time do you think that will take to go through that?

MR. AMIRALI: I can go through it in two minutes, sir.

CHMN. CHENAL: All right, let's do it.

MR. AMIRALI: Unless there are questions.

CHMN. CHENAL: And then we can maybe break at that point.

MR. AMIRALI: So there have been questions -- so there have been questions regarding the flows on different lines. And what we did was we went and approached Arizona Public Service Company to have flows on all of their lines for the last -- all of the major

transmission lines on their system for the last -- for the last 12 months, so from January to December 2029 -- 2019, and also the lines between Arizona and California.

So I will go through each one of them. Basically, what it will show you is the direction of the flow. So the direction of the flow -- oh, that's amazing. Okay. The direction of the flow is always going to be from the two bus -- from the first bus name to the second bus name.

This is the flow on Palo Verde to Colorado River, which also used to be called Palo Verde Devers line. And you can see the net flows on that line. Again, these are real flows, not schedules, and this is the net flow on that line. So there could be schedules going both directions, but the net actual flow on the line is right here.

CHMN. CHENAL: Mr. Amirali, I guess I don't understand what a net flow means in relation to this chart.

MR. AMIRALI: Okay. Mr. Chairman, imagine that you have got a generator on -- there's a generation connected to -- connected to Arizona, there's generation connected in California, and imagine a boundary, which is the Palo Verde Devers, which is

just a boundary, right. And a supply -- and a load in California is buying 2,000 megawatts from a generator in Arizona. And a load in Arizona is buying 500 megawatts from a generator in California.

The net flow is the total flow that happens, which will be 2,000 minus 500, which is 1,500. That's the net flow. So when you see in realtime, even though there are transactions going both ways, in realtime you will only see flows going from Palo Verde towards Devers.

CHMN. CHENAL: Okay. That, I understand. But I'm not -- this chart we're looking at, is it meant to show how much is going from east to west and how much is going from west to east? That's the part I don't see in the chart.

MR. AMIRALI: It is only flowing from east to west, Palo Verde towards Devers, that's -- basically, if there was -- if it had gone negative, that means it is going from west to east. Since it is not going negative, but you can see it is dropping very close to zero or even touching zero, that means there are times when there's no flow on that line. That means that the net is balancing each other out.

CHMN. CHENAL: So that means, in your example, it's a thousand generated in California, a

thousand generated in Arizona, and then they net each other out to almost zero?

MR. AMIRALI: Absolutely accurate, sir.

CHMN. CHENAL: All right.

MR. MACKIN: Chairman Chenal, another option for that or another explanation could be -- okay, never mind.

CHMN. CHENAL: That sounds like you're getting into something we shouldn't hear about. Mr. Amirali told you not to answer the question.

MR. AMIRALI: No, Chairman Chenal, that's not accurate. But, you know, Peter, if you want to get into it, please do.

MR. MACKIN: I was only going to say the line could actually be open, forced out, or on maintenance.

MR. AMIRALI: However, this is the realtime data and that's not the case because it happened over a very long period of time.

Same on the North Gila line. And actually, if you look at it, fairly similar things are happening on the other lines as well around the same period. So this is North Gila towards Imperial Valley. And this one is Hassayampa towards North Gila. Hassayampa North Gila, North Gila Imperial Valley is actually the same line all the way from Hassayampa, which is Palo Verde

hub, all the way to the Imperial Valley, which is the California border.

And again, net flows, there are times when they are zero or almost negative, indicating the same thing, that they are either -- the net schedules are balancing out. Same is true here.

CHMN. CHENAL: Mr. Amirali, let me ask you a question. So let's look at Palo Verde Colorado. It seems like the closer to zero, to where the net -- they balance each other out, flows east to west and west to east, are during May, June, and July. Why is that?

That seems to be the summer months, where it's hottest, where we're using the most power, which would stand to reason we'd be exporting less because we need it more in Arizona. I don't understand that.

MR. AMIRALI: Mr. Chairman, actually, you just gave the best explanation for it. You have the highest load, but we also have the highest generation to export at that time because of what Ms. Le Vine pointed out to you, because of the amount of summer months and summer generation. So yes, you are -- you would be exporting, but you are also buying from us, so the net flows are zeroing out.

CHMN. CHENAL: What I'm not understanding is, why would Arizona generators be exporting in the middle

of the summer, when the power demands -- well, May, June, July, when it's hot in Arizona? I can understand why we'd be importing; but why would we be exporting? Wouldn't we be using our own power?

MR. AMIRALI: Sir, going back to Ms. Le Vine's example. You have the highest demand; California has the highest generation. Arizona has a choice: They can either buy cheap generation when California is giving it away, or they can generate their own and pay for it. So Arizona utilities are maximizing the value for that. At that time, most likely there are schedule flows coming in or Arizona has either backed down their generation so that each entity is pretty much satisfying their own needs.

CHMN. CHENAL: Well, that's what I would have thought, and that's why I would have expected to show -- the graph to show something differently, because here the exports and imports net each other out.

MR. AMIRALI: Yeah.

CHMN. CHENAL: But I think you just said that Arizona would buy the power from California because it's cheaper, so they would be actually importing more, so the flows -- the net would be much higher.

MR. AMIRALI: Mr. Chairman, maybe I'm --

maybe I'm just being dense and not accurately characterizing.

What you are saying is absolutely accurate. But just because Arizona is buying doesn't mean that -- so Arizona is buying more, California is selling more, but California is still -- there are schedules going still in both directions, so the schedules -- if the schedules go to zero, the lines start to what we call float. That means there is very little loading because both of the entities are actually balancing the resources.

CHMN. CHENAL: So Arizona generators are selling to California at the same time, you know, the loads -- we're buying from California because it's cheaper?

MR. AMIRALI: No. Arizona is backing down their generation and buying from California, so the net flows become zero.

CHMN. CHENAL: Okay. I'm dense, then. If we're not generating, and therefore selling and pushing power from east to west, but we are buying from California and the flows go from west to east, I'm not understanding the chart. It seems like it should be -- the net would be extreme. You know, to use your example, 2,000 minus zero is 2,000, so you'd be way

high on the list, not to zero. I'm not understanding.

MR. MACKIN: Chairman Chenal, this is Peter. I think I'm -- one thing that maybe we're not considering here is that California entities do have shares of some Arizona generation, so like Palo Verde, for example. So they're going to always be having that import from Palo Verde.

But in situations where, as Ali mentioned, the solar generation in California is dirt cheap or actually they're paying people to take it, then that schedule is going to net out. So that's why in the summer months you may see an import -- or, an export into California because of Palo Verde. But in the spring, when we have lots of excess solar, but not as much load, then we would -- there would be counterflows into Arizona and then it nets to zero.

CHMN. CHENAL: Okay, that makes sense. Thank you.

MR. AMIRALI: Again, people smarter.

CHMN. CHENAL: Go ahead. We're about at time to take a break, but --

MR. AMIRALI: This will be one minute at max, sir.

CHMN. CHENAL: Okay.

MR. AMIRALI: These are just the flows on the

other lines that are coming out of Palo Verde or are the major transmission lines into -- Arizona transmission lines.

As you can see, there is -- as you can see, Palo Verde -- there's flows from Palo Verde into Westwing. So from central Arizona into, you know, eastern Arizona, Palo Verde -- there are two Palo Verde Westwing lines. And since they are impedance match, this is a good way to see how -- when you have impedance matched on two parallel lines that are both going from Point A to Point B, how the flows on them split fairly evenly. So a good way to see that. So if I took this and put this chart right there, it will actually superimpose each other.

This is -- the two other lines is the Perkins Mead line that Peter talked about in the flow model, and the Hassayampa to Hoodoo Wash line.

Again, flows in this, you can actually see the flows going negative, so both directions. But these are just internal Arizona lines indicating that Palo Verde hub is not sending everything to California, there's also flowing from Palo Verde into different parts of Arizona as well.

CHMN. CHENAL: All right. Anything further, Mr. Amirali, on that point?

MR. AMIRALI: No, sir.

CHMN. CHENAL: Okay. And I appreciate that. We can ask any follow-up questions now, or we can take our lunch break and then come back and ask questions then. Might give everyone a little time to think this through a little. Everyone I see, by the expressions on their face -- let's take a half-hour lunch break and we'll come back in a half hour and resume the hearing. Thank you.

(Off the record from 1:12 p.m. to 1:52 p.m.)

CHMN. CHENAL: Good afternoon, everyone. Let's proceed with the hearing after our lunch break.

I think we left off with a couple witnesses discussing power flowcharts.

But Ms. Grabel, do you want to proceed with your next witness?

MS. GRABEL: Thank you, Chairman.

CHMN. CHENAL: Or a continuation of the testimony of Mr. Amirali.

MS. GRABEL: Sure. The rest of Mr. Amirali's presentation, if we started from the beginning, is actually largely redundant of the testimony we received from Ms. Le Vine this morning, Le Vine, whatever, the CAISO representative. It was going to talk about the California Independent System Operator, their various

markets, and energy imbalance markets.

I think, in the interest of time, I would rather spend the time -- that was to respond to Chairman Chenal's request for information about those subjects. If it's okay with the Committee Members, I would prefer to move on. Instead of addressing those again, which is largely redundant, and move on to the DPV2 comparison, walking through Exhibit DCR-39. So if the Committee would indulge us, I'd prefer that.

CHMN. CHENAL: Yes, let's do that. And if there's time today, we'll come back to this and see if there's any questions, Mr. Amirali could run through quickly the first half of that exhibit. But let's proceed with distinguishing the two lines.

MS. GRABEL: Thank you, Chairman. So I have, at the witness table for this presentation, Mr. Amirali and also Mr. Rogers, both of whom remain under oath.

I think the most expedient way to go through this document, though, and probably the more thorough way, is I will actually read what we have put together. Much of it has citations to items that are already in the record. And if the Committee Members have questions, I'll then allow the witnesses to answer them so that it's evidence and not just a lawyer talking. Is that okay with the Committee?

CHMN. CHENAL: Yeah, that's fine. If we have questions, we're not bashful.

MS. GRABEL: Okay, thank you.

So what we did in Exhibit DCR-39 was we took the actual order, the Decision Number 69638, which was the order denying a CEC for Southern California Edison to build the DPV2 line, and in red bold we identified how Ten West Link differed with respect to each of the findings of fact in that matter.

And so although we have reference, in Pages 1 through 6, to the findings of fact sections that are applicable to the discussion section, I think we'll turn to the findings of fact, which begin on Page 7, and walk through those step by step.

So on Page 7, again, I'm referring to Exhibit DCR-39, the first finding of fact in denying the DPV2 project was, 1, the Applicant purports the project will enhance resource adequacy for Arizona and Arizona ratepayers.

That's distinct from this project because on Page 2 of Decision Number 69638, which is this order that we have modified, beginning at Line 18, the Commission discusses its resource adequacy concerns and concludes that the DPV2 line would impair Arizona's ability to provide for its growing energy demands

because it would export to California the excess capacity available at the Palo Verde hub needed for Arizona, thereby requiring Arizona utilities to build additional generation and transmission resources to fill the gap.

This concern does not exist today. In fact, many of the natural gas facilities that interconnect to the Palo Verde hub have been unable to contract their generation resources to Arizona or California and are facing potential closure. This is because, as we heard Staff witness Ms. Little testify, there is today "A growing emphasis on and reduced cost relative to options for renewable resources, and the regional energy imbalance market has provided the opportunity for Arizona utilities to buy and sell energy on a short-term basis."

So the fact that certain of the power plants available to provide energy at the Palo Verde hub are currently unable to secure long-term contracts for their capacity demonstrates that the Commission's historical concern about Arizona's limited excess capacity in that area doesn't apply to the present system conditions.

CHMN. CHENAL: I would just ask, Ms. Grabel, just for the benefit of the court reporter, if we could

slow the speed down a little.

MS. GRABEL: Oh, certainly. Sorry, Kathryn. It's not the first time I've been accused of fast talking. Not in a bad way, just in a quick-talking way.

As testified by Staff witness Ms. Little and discussed in the report, economic benefits of the Ten West Link to Arizona, which was prepared by The Brattle Group, and that's Exhibit DCR-14, the type of resources required to ensure an adequate, reliable, and economic supply of power to Arizona has changed significantly since 2006, when DPV2 went through the line siting process.

The increase in demand for renewable generation over the past 10-plus years, and the expected future increase in carbon-free resources, as evidenced by APS's recent announcement of the goal to deliver 100 percent of clean carbon-free electricity to customers by 2050, which is found in Exhibit DCR-34, requires an integrated and flexible power system that will allow Arizona utilities access to a diverse mix of resources that can satisfy their demand for energy during every hour of the year.

A highly interconnected transmission grid also provides operational flexibility to the balancing

area authorities in Arizona and California, which includes APS, among others, so that they may effectively implement new market structures, such as the energy imbalance market, or the EIM, and the potential future energy day-ahead market, or the EDAM.

Participation in these markets allows Arizona utilities to cost effectively address the intermittency and oversupply conditions caused by renewable generation, as we'll discuss in further detail with the response to Finding of Fact 2.

So in this context, it is undisputed that Ten West Link helps fill Arizona's need for an adequate and economic supply of power. As noted in the Brattle report, Ten West Link will fill Arizona's need for an adequate and economic supply of power by: Facilitating the interconnection of new solar and solar plus storage resources; expanding regional access to a diverse supply of low-cost, clean energy resources; and enabling opportunities for regional coordination.

Staff witness Ms. Little also confirmed during the hearing that the solar and solar plus storage resources that are in the queue to interconnect directly to Ten West Link can satisfy the energy needs of both California and Arizona. Specifically, Ms. Little testified that "they will be used when

they're needed in Arizona. When they're not needed in Arizona, they will be excess and available to be sold in California."

Importantly, Ms. Little also agreed during the hearing that Ten West Link: Results in a net benefit to Arizona ratepayers; that Ten West Link will enhance Arizona utilities' ability to access the EIM, thus providing an economic supply of power to Arizona utilities; that Ten West Link reduces congestion and contributes to the reliability of the southwest transmission grid; and that Ten West Link helps fill Arizona's need for an adequate, economic, and reliable supply of power, which is exactly the legal standard that CEC applicants are required to meet.

Staff's analysis was opposite in the DPV2 proceeding, in which Staff expressed significant concerns about the reliability risks to Arizona related to the DPV2 line. As Staff confirmed, those concerns do not exist in this case.

Does the Committee have any questions with respect to our response to Finding of Fact Number 1?

CHMN. CHENAL: No questions.

MS. GRABEL: Okay, thank you. Then I'll move on to Finding of Fact Number 2.

So in the DPV2 matter the Commission stated,

as a finding of fact, that the evidentiary record indicates that the need for the project is less compelling for Arizona and Arizona ratepayers than for California and CAISO ratepayers.

So Ten West Link's response is that the evidentiary record in this case is nothing like the record in the DPV2 proceeding. In a brief filed by the Utilities Division Staff with the ACC in the DPV2 matter, Staff characterized the DPV2 proceeding as a "case of first impression" because SCE "asks the Commission to approve DPV2 based primarily on the economic need of California ratepayers, with citation to an Arizona Court of Appeals case holding that the Commission could consider interstate need to fulfill the need requirement contained in A.R.S. 40-360.07(B)."

Staff characterized the question before the Commission with respect to DPV2 as quite simple. Should the Commission approve a project that will create economic benefits for California ratepayers and economic costs for Arizona ratepayers?

The evidence in this case, for Ten West Link, is far different. DCRT does not rely on any assessment of California's need for the project, although we could under the same case, but justifies Ten West Link solely on the economic benefit and need that applies to

Arizona alone.

The record in the DPV2 proceeding indicated that CAISO ratepayers would incur $650 million in costs associated with the proposed line and reap $1.1 billion in savings, while the line would result in rate increases for Arizona ratepayers because it would drive up spot market prices at the Palo Verde hub.

In this case, Ten West Link has the opposite result in Arizona, producing a net savings to Arizona ratepayers of at least 2 to $7 million annually, or approximately 31 to $122 million over the life of the project.

As the Brattle report discusses, this savings occurs because: First, spot market prices at the Palo Verde hub will be lower during the times Arizona utilities are buying power from California; and second, spot market prices at the Palo Verde hub will be higher at the time Arizona utilities are selling power to California.

Staff witness Ms. Little testified that she had conducted a critical and thorough examination of Brattle's analysis, found the assumptions to be reasonable, and had no reason to disagree with its conclusions.

CHMN. CHENAL: All right. I have a question

and, I don't know, I can wait until the end, but I might forget it, so I want to do it now.

We saw this morning a lot of exhibits that went to how much money APS is benefiting from the imbalance -- from the energy imbalance market, let's say, and that this line, Ten West Link line, would add something in the neighborhood of 650 megawatts of net benefit, even though it's rated much higher.

I guess in light of the numbers that we saw this morning, and the ability of this line, the Ten West Link line, to carry that net increase in power, these numbers that you just referred to of 2 to $7 million a year seem really small.

Now, is it because Ms. Chang did not include the energy imbalance market analysis in the 2 to $7 million numbers, is that my recollection? I see Mr. Amirali moving his head up and down vociferously. Is that the reason?

MS. GRABEL: Yes, Chairman. In fact, the next bullet addresses just that.

As Staff witness Ms. Little corroborated, the production cost savings to Arizona customers will be greater than determined in the Brattle report because the economic production cost analysis -- oh, in the production cost analysis because that analysis did not

include the cost savings associated with the additional access to the EIM that Ten West Link will provide to Arizona utilities.

And the savings is significant and it's also real. And I'm going to quote portions of the exhibits that we saw this morning. As APS announced in an October 2017 press release, which is Exhibit DCR-31, one year after joining the EIM, participating in the EIM "allowed APS to garner efficiencies that weren't possible a year ago. We've lowered production costs and the cost of integrating renewable resources like solar, and we've taken advantage of negatively-priced surplus power from other states. Participating in the EIM is one of the many ways we're providing customers with a cleaner and smarter system to meet their changing energy needs."

The release further reported that participation in the EIM saved Arizona customers more than $30 million in the first year, a total savings that has now risen to over $140 million and is growing.

SRP signed an agreement with the CAISO to join the EIM in 2020, projecting to save SRP customers $4.5 million annually, and that's in Exhibit DCR-33. As SRP executive John Coggins stated in the article, "The EIM can help save money for SRP and its customers

by providing realtime access to the lowest cost resources across a significant portion of the western grid."

A May 2019 press release from Tucson Electric Power Company similarly states that TEP's participation in the EIM beginning in 2022 "will save the company and its ratepayers $13 million annually" by expanding TEP's realtime access to renewable power and other low-cost energy resources across the western grid. And it specifically points to the ability through the EIM of accessing negatively-priced power from California. And that's in Exhibit DCR-32.

So Ten West Link will provide Arizona with the enhanced ability to access resources outside of Arizona, which is valuable for two reasons. First, with uncertain weather patterns and system contingencies, Ten West Link provides Arizona with improved system reliability and options to operate a flexible grid, particularly when the system experiences unexpected conditions.

And second, with longer-term uncertainties around future load growth, technology costs, and fuel prices, Ten West Link provides Arizona a pathway to access the diverse resources that exist in the western interconnection as a whole.

The Brattle Group's conclusion that Ten West Link will result in a 2 to $7 million in economic production cost savings to Arizona ratepayers also does not include the additional economic stimulation benefits expected to accrue to Arizona, which Brattle estimates to total $810 million, $470 million of which will benefit the rural and largely low-income communities in La Paz County.

CHMN. CHENAL: Let me stop you there, because one of my questions was going to be the following. These benefits for Arizona utilities joining the EIM are without the Ten West Link line. I mean, they've already accrued to APS, and they will accrue to the other utilities without this line.

So how much additional benefit will the EIM market -- how much additional benefit will accrue to Arizona with the Ten West Link over and above what they've already enjoyed and would normally enjoy without the line? I guess what you just read answers that in part. Additional economic stimulation benefits expected to accrue to Arizona, which Brattle estimates to total 470 million in low-cost communities.

I guess I'm rambling a little there. I'm not sure she answers the question. So how much more benefit will accrue to Arizona in the EIM market with

versus without the Ten West Link?

MS. GRABEL: First of all, Chairman, the economic stimulus benefits are not related to the benefits experienced from the EIM. The actual benefits from the EIM, and I'll let Mr. Amirali or Mr. Rogers, either one, testify to this momentarily, very difficult to quantify, because you don't know how much additional access they'll have to this system. We just know they're going to be greater than the 2 to $7 million.

ALI AMIRALI AND LOWELL ROGERS,

called as witnesses on behalf of the Applicant, having been previously sworn by the Chairman to speak the truth and nothing but the truth, were examined and testified as follows:

DIRECT EXAMINATION

BY MS. GRABEL:

Q. Mr. Amirali or Mr. Rogers.

A. (BY MR. AMIRALI) Ms. Grabel, that is very accurate. It is hard to quantify because, one, it provides enhanced -- the Ten West Link would provide enhanced access. But also there is -- there is -- currently, there is curtailment happening on the renewable energy because of the amount of energy that

they can sell out during over-gen condition, so they just have to curtail that at that time. Those curtailments go away with enhanced access. So it is hard to quantify, but it is available, and it can be demonstrated.

CHMN. CHENAL: Congestion, Mr. Amirali, is that what you're saying? Because the congestion will go away, that will allow additional export and import to the benefit of Arizona on this line?

MR. AMIRALI: It is. Congestion is just one of them, sir, but it is more than that. The case would be when -- currently they are curtailing when they have oversupply, which the situation will continue because of the RPS goals of California, and also in the other states. As these supplies are -- they end up curtailing that because they do not have a mechanism to move it out. Those things go away, and that's...

CHMN. CHENAL: 2 to 7 million just seems like a small amount of benefit, given the numbers that we're hearing, but anyway.

Member Haenichen.

MEMBER HAENICHEN: Given the discussion that just took place, I think the key to this appearing to be a good project for Members of the -- at least for me, is to do a better job of explaining how the EIM is

enhanced by this line.

Because clearly, that's where the benefits are coming from now is the EIM, and I think you need to do more explanation of exactly how this line is going to benefit the EIM advantages to this state, and also quantify those things and don't let it be another $7 million thing. That's my take on this so far.

MR. AMIRALI: Member Haenichen, in the presentation that I have, I have a couple of slides on EIM. If you don't mind holding your question to that, I'll be more than happy to get to it. And please feel free, if I don't address your question at that time.

MEMBER HAENICHEN: Thank you.

CHMN. CHENAL: Member Hamway.

MEMBER HAMWAY: So in the DPV2, the ratepayers would incur 650 million and reap 1.1 billion. And I get why you left out California economics in this; it was a loser in the last case, so why bring back something that didn't work the first time.

But I am curious, so Arizona's benefit without the EIM -- and I'm assuming this was without the EIM. They were reaping almost two times what the cost was. Arizona isn't paying anything, and we would reap 7 million. I'll give the highest number. So I

was still curious, with the Ten West Link, how much does California benefit without the EIM market?

I know that's not part of this, and I get that, and maybe you don't want to share it, but it's curious to me.

MS. GRABEL: Certainly.

Mr. Amirali.

MR. AMIRALI: Member Hamway, this information is a part of our public testimony in California filing. As we have stated, and Ms. Grabel will go over it, the project provides adequate benefit for California to justify the incurrence of cost. At this time, based upon our calculation, our benefits are in the range of -- let me get the exact numbers from you. One second, please.

MEMBER HAMWAY: Not from me.

MR. AMIRALI: For you. My expert is not here, so I will confirm then. But in the range of 1.7 to 1.8.

MEMBER HAMWAY: Billion?

MR. AMIRALI: No. 1.7 to 1.8 benefit to cost ratio. So the benefit to cost ratio is in the range of 1.3 to 1.8, but I will get you the exact numbers as soon as my expert shows up.

MS. GRABEL: Are you looking for a savings or

is the ratio sufficient?

MEMBER HAMWAY: No, I was just trying to figure out, you know, we're spending nothing and get 7 million; they're spending 400 million and getting X. And I know it's spread across 32 million ratepayers, so hardly anyone will notice that.

MR. AMIRALI: We will get that number for you, but -- we will give you the benefit to cost ratio, which is exactly what Ms. Grabel was communicating in the last time, because the projects are justified based upon their benefit to cost ratios.

MEMBER HAMWAY: Okay.

MS. GRABEL: And that's relevant to the last bullet in this finding of fact. Given that the cost of the project will be borne by CAISO customers, it is unsurprising that California customers are expected to receive enough cost benefits to justify the project. However, there is no evidence in this case indicating that any such benefits to California are to the detriment of Arizona, as was perceived to be the case in DPV2. Arizona benefits from the project in this case, as discussed above and as Ms. Little confirmed.

The third finding of fact in the DPV2 order was that the Applicant's plan to absorb Arizona's excess generating capacity will force the installation

of new generation in Arizona sooner.

Ten West's response to this is as follows. As discussed in response to Finding of Fact 1 above, the Commission's concern about the excess generating capacity in 2006 was focused primarily on the natural gas generation feeding into the Palo Verde hub. Due to changes in the policy and regulatory goals in California since 2006, which are higher renewable portfolio standards and more stringent greenhouse gas rules, California load serving entities are not seeking to contract for gas resources in Arizona to satisfy the resource adequacy requirements.

This is evidenced by the fact that several existing natural gas generation resources connected to the Palo Verde hub have remained uncontracted for the past several years by any of the California load serving entities and are facing financial difficulties, as acknowledged by Staff witness during the hearing, even though the CAISO is currently facing a shortage of capacity over the next several years. Thus, the historical concern expressed in the DPV2 order, that California will absorb Arizona's excess capacity, thereby forcing Arizona utilities to build new generation resources, is unfounded today.

To satisfy its local capacity needs, the

CAISO is focused on retaining existing gas resources located in California and adding new renewable energy with battery storage capacity. The California Public Utilities Commission, the California Energy Commission, and the CAISO are currently working on regulatory structures to ensure that resources located in California will continue to provide California's local capacity needs.

To that point, one California utility recently issued an open solicitation to secure additional gas-fired capacity at critical locations within California to satisfy that utility's local capacity needs.

California has also announced a goal of building 3.3 gigawatts of additional in-state storage to provide reliability services, meet California's own resource adequacy requirements, and to facilitate renewable integration.

Looking at California's energy supply plan as a whole clearly demonstrates that California is not relying on Arizona's resources generally or Ten West Link specifically to meet all of California's resource adequacy needs at the expense of Arizona. To the contrary, Ten West Link will enable the addition of new and clean renewable generation assets in Arizona.

Specifically, it will facilitate new development in the rural and largely low-income La Paz County, an area that has not been previously attractive to solar development primarily due to lack of available cost-effective interconnection opportunities. Ten West Link opens up those opportunities. And, as Staff witness Ms. Little confirmed, these new renewable resources will serve both Arizona and California load.

There has also been some testimony that solar development will come to Arizona irrespective of Ten West Link. While Ten West Link will facilitate unique development opportunities in La Paz County not likely to occur without the project, the fact that solar and solar plus storage development is projected to occur in Arizona even without the project undermines any concern that new generation will have to be built sooner in Arizona because of Ten West Link. That fear, which was expressed with respect to DPV2, is not applicable here.

Does the Committee have any questions about that response?

CHMN. CHENAL: Member Haenichen.

MEMBER HAENICHEN: Ms. Grabel, yes, I do. Whoops. Yes, I do. The language you just used regarding renewables, so specifically solar, continues to address a problem with storage, and I don't see any

guarantee that there's going to be a short-term solution to that problem. So that's why -- maybe 30 years from now there will be, but there's nothing on the horizon.

Do you or any of the witnesses have any light to shed on what's going on in that field so that we can make intelligent votes?

MS. GRABEL: Mr. Amirali.

MR. AMIRALI: Member Haenichen, thank you very much for asking, and you are asking a very prudent question.

So energy storage has been the holy grail of the power system analysis for a very long time. It is the lack of ability to store electrical energy that makes it different from any other commodity. Historically, pumped storage hydro was the only known mechanism for doing the energy storage.

However, there has been significant advancement in the field of energy storage, and I will allude to just a few of them where there have -- where it is proving not only technically viable, but economically feasible to do energy storage as well.

Right off the bat, the biggest -- the biggest investments have been in the form of lithium ion batteries. Most of these batteries, as you have so

eloquently and accurately pointed out several times, they have a capacity of -- you know, they have a capacity -- when you say 3.3 gigawatts, it is the capacity, but it's the energy that you also have to worry about.

Most of these batteries are in the range of -- have the capability to produce the maximum capacity for four to six hours. These have been used for a few things. One, for providing -- for providing ramping. Because of their ability to discharge their full capacity instantaneously, they are an excellent source of ramping. They provide frequency response, as well as regulation capacity. So they are a very good capacity, and to a certain extent, energy systems. They have also been very good when it comes to doing energy arbitrage, storing it at the time when it's very cheap, like negative pricing time, and then discharging it when the price is high or when the ramp is required.

The next area of the -- the next area is from six -- they are viable from six- to 10-hour or 12-hour batteries. There has been significant advancement in the going on in the field of flow batteries. Those have not received that much publicity thus far because they are still in the early stages of deployment. However, several utilities in the northwest are now

doing test projects with that technology. The technology is being deployed in other countries around the world.

The other areas that we are seeing a lot of activity in is the storage in the form of the cave storage where they are storing energy in caverns. They are looking at those projects in Texas right now. There are a few projects that are in advanced stage of development in Texas, and some in Utah. And of course, we always have pumped-storage hydro.

We are -- as an investor, we see a lot of those activities across the country. Solar plus storage has become pretty much the word of the day. In fact, all of the projects that are in the queue on Ten West plus in APS, most of them have a very large component of storage associated with them.

So I appreciate your skepticism on this matter; however, we are confident that that is economically viable. And this is just -- I'm just talking about the southwest.

Let's go to Texas. Texas energy storage projects are so viable because of the -- because of the price fluctuation, some of them paid for themselves in less than a year. And those were just doing frequency regulation. There have been energy storage projects in

PJM where pretty much all of the frequency regulation -- once FERC Order 755 came out, almost all of the frequency regulation was being provided by energy storage devices.

Other entities in California, such as SMUD, LADWP, are all doing large energy storage.

And I wonder if my colleague wants to add anything to it.

MR. ROGERS: No, you wrapped it up really well. Thank you, Ali.

MEMBER HAENICHEN: You're going to comment or no?

Okay. Well, first of all, the frequency regulation usage is not as tough on the batteries as raw storage, so I don't think that's a really good argument for it.

But how do you handle the testimony we heard, I believe it was on the phone with Ms. Chang, regarding the -- when the question was asked about why hasn't CAISO considered alternatives to this line? And the comments that apparently they made to her were, and correct me if I'm wrong, it's not economically viable, storage I'm talking about, for this type of storage, this usage. And furthermore, the capital cost is much higher than this line, which achieves the California

objective as well.

So they're very skeptical about it. Why should we be optimistic?

MR. AMIRALI: Member Haenichen, I believe you're mixing ideas here. No-wire solution, if you do a pure no-wire solution -- every component has its own -- has its own value proposition associated with it.

Let's say, for the sake of argument, you are trying to commute from Point A to Point B on a daily commute. You can do it in a Prius or you can do it and you can just decide that you're going to buy a Hummer to do it, okay. Prius may be cost effective for that particular commute. But if your commute is -- and Hummer will get you from Point A to Point B as well, but it's a gas guzzler so it's a lot more expensive of a proposition.

So the same is true in this case. California Public Utilities Commission did an analysis on that very matter, because it's a part of their -- part of their CEQA requirement to do a no-wire alternative. And they found out that, for that particular purpose, so the economic benefits to the costs that are provided to the ratepayers, the line is more cost effective in this situation.

Lowell, do you want to add anything to it?

MR. ROGERS: Yeah. I think the comparison of maybe a Hummer to an economy car, maybe I'd like to take a different approach.

The analysis that the CPUC did is more equivalent to a supertanker carrying fuel instead of 2,000 dinghies. That's really what we're dealing with here is the scale of the transfer doesn't lend itself to putting that equivalent energy storage in California. However, if you couple storage with solar in a more distributed fashion, it's much more effective.

So we're really looking at two completely different goals in those two applications. The CPUC looked at a non-wires alternative as a replacement or a substitute for Ten West Link, and that was found to be half the life span or more, much more cost, and doesn't provide all of the other benefits that Ten West brings.

So when you look at the storage not being feasible as a direct replacement for Ten West, sir, it's not an equivalent comparison. But if you do recognize that solar plus storage in a more distributed fashion is very good for the grid, and that's why we're seeing those as more or less the sole economic marketplace right now for these new developments.

MR. AMIRALI: Member Haenichen, just adding

one more thing, as you -- as Ms. Grabel pointed out, California -- one of California's major utilities did an RFP for providing capacity inside their own service territory, and they looked at gas-fired as well as standalone storage projects to do so.

Ten West Link does not provide that benefit, so you cannot say that, oh, instead of putting 3,000 megawatts of distributed generation that provides local area benefits, you can replace it by a major transmission line. That's not -- so it is not -- for the purpose that you're serving, you'll spend much more -- it will be much more expensive to build transmission upgrades across the system rather than building the distribution. Same is true in this case.

MEMBER HAENICHEN: Well, this sounds negative to the future of storage to me. I don't know. I'll just tell you what my belief is. I think without storage, large solar, and I'm not talking about rooftop solar, installations are doomed. And I don't believe they're doomed, because I believe that problem will be solved. My issue is it's going to take a long time to solve it. Because if you get into the chemistry problems and all involved with this, it's very, very difficult.

MS. GRABEL: Member Haenichen, if I may for a

moment. In DCR Exhibit 34 is APS's announcement of when they're going to attain their clean energy future. And just here at home, they predict energy storage solutions of almost a gigawatt of large-scale energy storage. And that actually, I think, is online by 2025. So that's not 30 years into the future, that's five years from now.

MEMBER HAENICHEN: That's their estimate, but I'm not quite as optimistic.

MR. AMIRALI: Member Haenichen, I just have one comment, and that is, the market realities right now are not reflective -- are inconsistent with what Ms. Grabel stated, and there is so much activity on the energy storage front that the factories can't even manufacture fast enough. They are building factories across the world at a rapid rate just to keep up with the demand.

And the best testament of the energy storage comes from the most conservative group in our industry, and that is the operators. The day operators truly accept energy storage as a viable capacity resource is the day that, you know, it has truly arrived. And there has been an acceptance by the operators.

California, Arizona, Nevada, Pacific northwest, Ontario, large energy storage projects are

being developed all across. So I can only tell you what the market is reflecting where the flow of money is right now.

MS. GRABEL: Okay, thank you.

CHMN. CHENAL: Member Woodall.

MEMBER WOODALL: My understanding is that the integrated resource plans that would normally be filed, and Staff can confirm this or tell me I'm all wet, that would normally be filed in April of this year, that the utilities have requested extensions of filing their plans.

It's further my understanding that each of the utilities, when they put in their resources, that battery storage is a resource that they consider. And my understanding of Staff's review of this is that they look into the various resources that each utility is proposing to use and then make -- the Staff will write a report, make recommendations, and then the Committee will either acknowledge or not acknowledge the plans that have been filed.

So my sense is, is that there is already a process that the Commission will be overseeing, with assistance of Staff, to deal with resources; and if among those resources are batteries, I'm sure that during the back-and-forth process these topics will be

discussed extensively. And Ms. Little can either confirm or -- she's nodding her head, so I must not have done too horrible of a job.

So I just wanted to reflect that understanding on the record that, in fact, the Commission is going to be looking at this for their 10-year plans. So thank you.

CHMN. CHENAL: All right. Let's proceed with testimony. I just want to remind everyone we've got a lot of material to cover yet today.

MR. AMIRALI: Ms. Grabel, before you move forward, I have the numbers for Member Hamway. It was 1.3 to 2.3 for the benefit to cost ratio for California.

MEMBER HAMWAY: 1.3 to 2.3?

MR. AMIRALI: It's a range, depending upon the scenario.

MEMBER HAMWAY: Okay, thank you.

MS. GRABEL: So moving on to Finding of Fact 4. In the order, the Commission wrote that Staff in the DPV2 matter testified that Arizona electric utilities will not own enough generating capacity to meet all their loads in 2010, and therefore will have to rely on merchant power plants, particularly those located at the Palo Verde hub.

Ten West's response is that unlike in DPV2, Staff raised no concerns with the Ten West Link project, and, in fact, agreed that "Ten West Link helps fill Arizona's need for an adequate, economic, and reliable supply of power." Indeed, Staff witness Ms. Little specifically distinguished Ten West Link from DPV2 in this regard.

Moreover, by facilitating the development and interconnection of new solar and solar plus storage resources, and enabling the delivery of energy and capacity from these resources to the area's load centers, Ten West Link will help bring new and clean renewable generation assets into Arizona, which will be used to supply energy to both Arizona and California.

This is evidenced by the 4,150 megawatts of active interconnection requests on Ten West Link, a number that does not include 900 megawatts of active interconnection requests at the Delaney Substation in the APS interconnection queue.

Clearly, Ten West Link will not jeopardize Arizona utilities' ability to meet their load demands, which was a concern underlying this finding of fact with respect to DPV2.

In addition, from an Arizona resource perspective, through recent procurement activities,

Arizona utilities have signaled a preference to primarily execute long-term contracts with solar, wind, and battery storage resources, rather than conventional gas-fired generation, both existing or new. Specifically, on January 22nd, 2020, APS announced a goal to deliver 100 percent carbon-free electricity to customers by 2050.

APS's goal also includes a nearer term 2030 target of 65 percent clean energy, with 45 percent of their resource portfolio coming from renewable energy. That's in DCR-34. Such evolution shows that Arizona's electric utilities are not relying on the merchant natural gas power plants located at the Palo Verde hub, further rendering the concern underlying Finding of Fact 4 in Decision Number 69638 obsolete.

Does the Committee have any questions about that response?

CHMN. CHENAL: Clean versus renewable, is nuclear the difference?

MS. GRABEL: Carbon-free, yes, sir.

CHMN. CHENAL: Carbon-free.

MS. GRABEL: Finding of Fact Number 5. The Commission finds the project will not improve the resource adequacy for Arizona and Arizona's ratepayers, and could have a deleterious effect on it in subsequent

years. That was the finding of fact in the DPV2 matter.

Ten West Link's response is that, basically just refer back to Finding of Fact Number 1, because we already went through that, it basically alleged the same concern. And far from having a deleterious effect, Ten West Link will provide a net benefit to Arizona ratepayers, as we discussed in detail in Finding of Fact 2.

Is there any further questions?

(No response.)

MS. GRABEL: Finding of Fact Number 6. The applicant in the DPV2 proceeding, the Commission found, purports that Arizona and Arizona ratepayers will receive considerable economic benefits from the project.

That's actually true in this case, we believe. The undisputed evidence in the record demonstrates that Ten West Link will save Arizona ratepayers a minimum of 2 to $7 million annually at no cost to them. As discussed in detail with respect to Finding of Fact 2, this estimate is conservative and does not include the cost savings benefits that Arizona utilities will experience by the increased access to the EIM market that Ten West Link provides, cost

savings that are both real and significant, as demonstrated in Exhibits DCR-31, 32, 33, 35, and 36.

And in addition to the production cost savings that Ten West will bring to Arizona ratepayers, Ten West Link will provide an estimated $810 million of economic stimulus benefits to Arizona, 470 million of which will benefit the rural and largely low-income communities in La Paz County. And again, we talked about that with respect to Finding of Fact 2.

Finding of Fact Number 7 in the DPV2 order was that the evidentiary record indicates that the project is designed to meet the economic needs of California and CAISO ratepayers, not the needs of Arizona and Arizona ratepayers.

Again, this finding of fact is very similar to Finding of Fact 2, and we'll apply the responses to Finding of Fact 2 here. Ten West Link was designed to meet the needs of the region and bring value to both California and Arizona.

Finding of Fact Number 8, the DPV2 order says that the economic benefits to California and CAISO ratepayers have been quantified and documented by the applicant.

Ten West Link's response is, in this case, the record is clear that Ten West Link was justified as

an economically-driven project by the CAISO. The economic reliability and public policy benefits that accrue to CAISO customers by virtue of Ten West Link are sufficient to justify the costs that CAISO will spend to construct, operate, and maintain the line. This fact does not undermine the significant operational benefit and cost savings that Arizona will experience at no cost to Arizona ratepayers, as discussed in response to Findings of Fact 1 and 2.

The ninth finding of fact in DPV2 was that the economic benefits espoused by the applicant to Arizona and Arizona ratepayers can be characterized as temporary, indirect, illusory, or speculative.

Ten West Link's response is that unlike the evidence presented by SCE in the DPV2 proceeding, The Brattle Group's economic production cost analysis, which identified a savings of at least 2 to $7 million to Arizona ratepayers annually, was found by Staff witness Ms. Little to be reasonable and no more "hypothetical or speculative than any utility's forward-looking integrated resource plan."

In this matter, DCRT is not relying solely on the economic stimulus benefits to which this finding of fact referred in the DPV2 proceeding, although such benefits are estimated to total $810 million, half of

which benefits La Paz County, bringing needed revenue to that county's rural community.

The benefits to La Paz County associated with this project were raised by each of the three county supervisors during the January 27th, 2020 public comment session in this matter.

CHMN. CHENAL: One quick question. Your first bullet point says that -- talks about the savings of 2 to 7 million. The second bullet point talks about economic stimulus. But the third bullet point would say, the benefits do not include the benefits as a result of the EIM market, right?

MS. GRABEL: That's correct. That's why we said at least 2 to $7 million of production cost savings. Because the EIM would be part of the production cost savings if we had been able to quantify them and add it to the 2 to $7 million.

CHMN. CHENAL: But that was not done and that is not included in that number?

MS. GRABEL: That is not included in that 2 -- that's why it's at least that amount.

CHMN. CHENAL: Okay.

MS. GRABEL: Finding of Fact Number 10. In the DPV2 matter, the Commission found that the economic costs to Arizona and Arizona ratepayers have been

quantified and documented by the applicant.

And Ten West Link's response is that unlike in DPV2, Ten West Link will not result in any economic costs to Arizona and Arizona ratepayers. The significant benefits discussed in response to Findings of Fact 1 and 2 will accrue to Arizona ratepayers at no cost to them whatsoever.

As Staff witness Ms. Little confirmed at the hearing, "Ten West Link could result in lower Arizona utility ratepayer rates relative to what they would be without Ten West Link." And Finding of Fact Number 2 has additional detail that we've already discussed.

Finding of Fact Number 11. In the DPV2 matter, the Commission found that Staff testified that spot wholesale prices at the Palo Verde hub are estimated to increase by at least 5 percent if the project was approved and constructed.

In the Ten West Link case, however, the Brattle report shows that the impact of Ten West Link on prices at the Palo Verde hub varies throughout the day to Arizona's net benefit. Prices are expected to be lower during the day, decreasing on average by 30 to 50 cents per megawatt hour in 2028 dollars, due to an increase in imports to Arizona from California during solar peak production hours, and to be higher,

increasing on average by 10 to 70 cents per megawatt hour in 2028 dollars, due to the increase in energy exports from Arizona to California during the evening or overnight hours.

So put another way, Palo Verde hub prices will be lower when Arizona is a net buyer and higher when Arizona is a net seller, thus providing an overall cost savings to Arizona utilities. And during her testimony during the hearing, Staff witness Ms. Little acknowledged that the approach used by Brattle to quantify these benefits is reasonable and based on reputable models.

CHMN. CHENAL: Just, again, so I'm clear, the numbers you read about the 30 to 50 megawatt hour decrease and the 10 to 70 cent megawatt hour increase, those are not included within Ms. Chang's 2 to $7 million benefit to Arizona?

MS. GRABEL: No, Chairman, those are the 2 to 7. Those are the reasons for the 2 to $7 million.

CHMN. CHENAL: Those are the 2 to 7?

MS. GRABEL: Yes. It's the changes in spot market prices that allow Arizona utilities to benefit from this line. So that's the direct production cost savings that we were able to quantify. That does not include the benefits of increased access to the EIM.

CHMN. CHENAL: Because the same -- I thought that was the benefit of the EIM market, you can acquire -- well, at least acquire and sell power at better rates.

MS. GRABEL: So the benefit of the EIM market, sir, the testimony has said that -- Arizona utilities have their own generation resources that they can, you know, operate at whatever cost to them. If it's more cost effective for APS, for example, to not operate their coal plants or not operate their fuel plant, and instead take power, cheaper resources from elsewhere in the west, they can ramp down their own resources and import it in from the lower cost resources elsewhere.

CHMN. CHENAL: Isn't that the cost savings that's listed here?

MS. GRABEL: No, sir, that's not.

Mr. Amirali, would you like to take a shot, or Mr. Rogers, at explaining?

MR. AMIRALI: Ms. Grabel, your response is accurate. That's a part of the savings that are associated with the 2 to $7 million for the benefits -- for production cost benefits.

So imagine, Mr. Chairman, that what happens is in the -- let's say it's a condition where there

is -- let's say the prices at Palo Verde hub on a given day is $25 at a given hour. And the Palo Verde hub -- and a California entity is buying generation from the Palo Verde hub at that time and they are paying.

So the spot -- so Arizona generator will be getting paid $25, and California utility will at that time be paying, let's say, $27, because they pay the LAP price, okay? And I will cover that a little more in detail in my presentation during the congestion management and everything.

So building this line, what it does, it eliminates the congestion, reduces the losses, and what it does is it basically drops the price for the California utility and increases the price for the Arizona seller. So the utility -- California load-serving entity pays less, Arizona utility gets paid more. So the net benefited -- both the seller and the buyer benefited from having the transmission line.

CHMN. CHENAL: Yeah, but isn't that done through the EIM?

MS. GRABEL: Chairman Chenal, I think -- Ms. Ruht gave me a good idea of how to distinguish these. One is the difference in spot market prices, which is distinct from the EIM market. They're two different markets. So the spot market prices set at

Palo Verde are set in a totally different fashion than a EIM market is operated. Does that help you?

CHMN. CHENAL: So the spot market is today -- okay. What's the difference between spot and the EIM?

MR. AMIRALI: Timing. Spot market prices, sir, are set in the hour-ahead or in the 15-minute basis. EIM is realtime, it's five-minute prices. And as Ms. Le Vine testified, EIM has no transmission component associated with it. So the price is -- basically, the price you pay is the price that it is -- I am giving it to you with no congestion or any price -- no congestion or transmission charge. And as such, it is just purely an energy transaction.

So that's why the spot market prices are a little bit different. And of course, EIM prices are only available to the EIM members, whereas spot market, all the participants -- all the market participants can participate in it. So that's another difference.

CHMN. CHENAL: Well, let's just keep going. I'm going to have to get a better understanding of it. I mean, sell low -- buy low, sell high, that's what's done day in, day out on the EIM market.

MR. AMIRALI: EIM actually is a little bit different. It's not just buy low, sell high. It's buy in realtime based upon what pricing. And, sir, if

you'll indulge me in my presentation, I'll cover that.

CHMN. CHENAL: All right, we'll wait. Let's keep going.

MS. GRABEL: On a break we'll confer as to a better way to communicate this to you.

Finding of Fact Number 12. In the DPV2 matter, the Commission found that Staff testified that Arizona ratepayers would suffer a net economic loss of $242 million over the life of the line.

Here, no such testimony exists. And then please refer to Findings of Fact 2 and 10, as we've just mentioned, for a discussion of the net savings that Arizona will experience because of the Ten West Link project.

Finding of Fact 13 in the DPV2 matter is that the Commission finds that the economic benefits accrue predominantly to California and CAISO ratepayers, while economic costs accrue predominantly to Arizona and Arizona ratepayers.

And Ten West Link's response is that the evidence in this record in this proceeding would not support such a finding. Rather, the undisputed evidence is that the Arizona ratepayers will not bear any economic costs related to Ten West Link, and will benefit from a production cost savings of at least 2 to

$7 million annually, or 31 to $122 million over the life of the project, a net present value figure that does not include the material and real savings associated with the enhanced access to EIM that Arizona utilities will have as a result of Ten West Link.

As more Arizona utilities join the EIM, the economic need for Ten West Link will continue to increase. As Staff witness Ms. Little confirmed during her testimony at the hearing, Ten West Link will enhance Arizona utilities' ability to access the EIM, thus providing them with an economic supply of power.

APS is already enjoying the economic benefits associated with the EIM, having saved over $140 million to date. And SRP and TEP will realize the cost savings associated with the EIM market once they join in 2020, see Exhibit DCRT-33, and 2022, see Exhibit DCR-32, respectively. These benefits will increase with Ten West Link because the line increases transfer capability between Arizona and the rest of the western states.

The fact that California and CAISO customers also benefit from the project for which they are paying does not undermine the significant value of the line to Arizona.

Hearing no questions, I'll move on.

In the DPV2 proceeding, in Finding of Fact 14, the Commission found that the Applicant purports that the project will strengthen the southwestern transmission grid because congestion will be reduced on Path 49 between Arizona and California.

Ten West Link says that this finding of fact does apply to this case as well. As the Brattle report describes, by increasing the transfer capacity on Path 49 between Arizona and California, Ten West Link will strengthen the southwestern transmission grid and reduce congestion between the states. Staff does not dispute Brattle's conclusion in this regard.

CHMN. CHENAL: Member Hamway.

MEMBER HAMWAY: So Path 49 is also labeled EOC, east of the Colorado. So Path 49 doesn't even really go to California; it goes up to Nevada, right?

MR. AMIRALI: Member Hamway, Path 49 consists of six lines between Arizona, California, and Nevada. So the lines actually -- it doesn't stop like -- you know, it's not a toll booth. It doesn't stop over there. So the lines continue, but it's just like a cut plane. So as we showed this morning, if you took all the lines going from California -- from Arizona to Nevada, Arizona to California, and basically drew a line, that's Path 49. So the lines do continue,

though.

MEMBER HAMWAY: Okay. It's a little confusing.

MR. AMIRALI: Member Hamway, that was our goal to do so because, you know, us engineers need a job in life.

MEMBER HAMWAY: And the attorneys too.

MS. GRABEL: That's right.

Moving on? Okay.

In the DPV2 order the Commission found that Staff contends that the Applicant's proposed special protection schemes or remedial action schemes for the project could actually weaken the reliability of the grid.

In this case, the design of Ten West Link does not propose any special protection scheme or remedial action schemes. Staff specifically distinguished Ten West Link from DPV2 in this manner by noting that "Ten West Link design eliminates the need for the special protective schemes and the remedial action schemes." And in addition, as an added bonus, the changes that are proposed to the Delaney Substation as a part of the Ten West Link project will increase the reliability of that substation.

Ten West Link will add a new high voltage

transmission line to the path between two critical buses in Arizona and California, thus reducing stress on existing transmission infrastructure. As such, Ten West Link will improve the reliability of the interconnected transmission grid under normal and emergency operating conditions.

Unlike in DPV2, in this case Staff witness Ms. Little testified that provided the project is constructed in accordance with good utility practice, Ten West Link will result in no negative impacts on reliability and safety. Ten West Link will be built in compliance with all applicable construction standards for high voltage transmission lines in Arizona and use good utility practices.

Further, Ten West Link will be operated and maintained according to applicable NAERC standards, the same requirements that apply to Arizona utilities in operating their transmission networks. The line thus poses no risk to reliability, but improves it.

Hearing no questions, I'll move on.

The DPV order says, in respect to Finding of Fact 16, that the Commission has the authority to establish reliability standards higher than the minimum requirements established by regional and national reliability associations or organizations.

Ten West Link's response is this finding of fact was made to justify conditions proposed by Staff in the DPV2 CEC proceeding to create reliability benefits for Arizona. In this case, as discussed in response to Finding of Fact 15, Staff does not believe that Ten West Link will impair the reliability of Arizona's electric system, and that changes proposed at the Delaney Substation will increase the reliability of that substation. This finding of fact is thus not relevant to the Ten West Link case.

And just for the record, DCRT does not oppose the conditions that Staff has proposed in this proceeding, which have already been included in DCR's draft CEC, which was DCR-24.

Finding of Fact 17 in the DPV2 order. The Commission found that the conditions originally proposed by Staff were intended to create sufficient reliability benefits for Arizona and Arizona ratepayers.

In this case, Staff did not propose any conditions in this case that were intended to enhance the existing reliability benefits associated with Ten West Link in Arizona, and this finding of fact is therefore irrelevant to these proceedings.

Staff recommends in this case that Conditions

17, 18, and 19, that are contained in Exhibit DCR-24, which is the draft CEC we had filed, be included in any CEC issued, and DCRT does not object to that recommendation.

Finding of Fact 18 is that the Siting -- in the DPV2 order, the Commission found that the Siting Committee did not adopt Staff's conditions as proposed, which would have provided sufficient reliability benefits to offset, partially, the lack of economic benefits for Arizona and Arizona ratepayers. Again, this finding of fact is not relevant to Ten West Link, as discussed in the response to the Findings of Fact 16 and 17.

Finding of Fact 19 in the DPV2 case. The Commission found that even if the Siting Committee adopted Staff's conditions as proposed, the economic cost to Arizona and Arizona ratepayers simply outweigh the modest transmission and commercial enhancement to the western grid that are derived from the project.

Ten West Link's response is that this finding of fact is not supported by the evidence in this record, and we refer you to the response to Findings of Fact 1, 2, and 10, which we've just discussed at length.

Finding of Fact Number 20 in the DPV2

proceeding was that the Commission finds that the record in this case shows that the negative environmental impacts associated with constructing a power line that further partitions Kofa includes a diminishment of the visual esthetics of Kofa, damage to recreational opportunities valued by numerous Arizonans, and deleterious and irreparable impacts to the wildlife in that area.

Ten West Link's response is that the proposed route for Ten West Link completely avoids the physical boundaries of the Kofa National Wildlife Refuge, a fact that was underscored by Staff witness Ms. Little during her hearing presentation. The Applicant will comply with the mitigation measures identified by the BLM for the small portion of the project that will be located in the vicinity of the northwest corner of the Kofa boundary, thus further minimizing any potential environmental impact.

And beyond impacts to the Kofa, the Ten West Link route avoids many of the environmental concerns raised by opponents to the DPV2 project. Unlike with DPV2, the various environmental stakeholders and the Arizonans who use the area for recreational purposes support the proposed route for Ten West Link.

This positive outcome was the result of the

extensive stakeholder outreach conducted during the NEPA process, during which the BLM, in concert with the Applicant, designed a route that would address stakeholder concerns. Visual impacts associated with the DPV2 proposal have also been addressed in the Ten West Link proposal, as discussed at length in the environment panel through the undisputed testimony of Brian Lindenlaub and Lowell Rogers.

The additional findings of fact essentially balance the evidence in the record. So the Finding of Fact 21 in the DPV2 matter was that the evidence in the record is not sufficient to weigh the balancing of the public interest in favor of granting a CEC in this matter, when all of the factors set forth in A.R.S. 40-360.06 are considered, along with the need for an adequate, economical, and reliable supply of power.

So Ten West Link's response is that the evidence in this case would not support such a finding. Staff's witness agreed that Ten West Link helps meet Arizona's need for an adequate, economical, and reliable supply of power. There's no evidence in the record that's to the contrary.

The proposed route and the mitigation measures required of DCRT with respect to Ten West Link minimize the impact of the line on the environment and

ecology of Arizona, and there has been no testimony to the contrary.

Finding of Fact Number 22. In the DPV2 proceeding the Commission found that the conditions placed upon the CEC by the Arizona Power Plant and Transmission Line Siting Committee are not sufficient to weigh the balancing of the public interest in favor of granting a CEC in this matter, when all the factors set forth in A.R.S. 40-360.06 are considered, along with the need for an adequate, economical, and reliable supply of power.

Ten West's response is that this finding of fact is, first, premature at this time, given that the Committee has not yet imposed any conditions, and second, unsupported by the record in this case, as discussed with respect to Finding of Fact 21.

Finding of Fact 23. In the DPV2 order the Commission found that the record compels balancing the competing public interests in favor of protection of the environment and ecology of the state of Arizona by denying applicant a Certificate of Environmental Compatibility.

Ten West's response is that the record in this case does not support such a finding. Staff's witness agreed that Ten West Link helps meet Arizona's

need for an adequate, economical, and reliable supply of power, and there is no evidence to the contrary. Again, the proposed route and mitigation measures required of DCRT with respect to Ten West Link minimize the impact of the line on the environment and ecology of Arizona, and there has been no evidence or testimony to the contrary.

Finding of Fact 24 is that the -- in the DPV2 matter, the Commission found that the CEC issued by the Siting Committee should not be confirmed and approved by the Commission.

And again, Ten West Link's response is that the record and evidence in this case would support the issuance of the CEC for Ten West Link for the reasons discussed with respect to the Findings of Fact 21 through 23.

And finally, Finding of Fact 25 in the DPV2 matter is that the Commission's findings 1 through 24 herein, as well as the findings addressed in the Commission's discussion above, serve as the Commission's findings of fact and conclusions of law in reaching its decision.

And our response is that the responses to Findings of Fact 1 through 24 explain how Ten West Link differs from DPV2, and why the Committee in this case

should recommend approval, and the Commission should thereafter approve a CEC for Ten West Link notwithstanding this DPV2 order.

Does the Committee have any further questions as to how we're different? I told you it would be exhausting -- or, exhaustive.

CHMN. CHENAL: I can't remember when we started. I want to say it was around 1:30, maybe 1:45.

MS. GRABEL: 1:50.

CHMN. CHENAL: All right. Any questions from the Committee? That doesn't mean there won't be any. It's just for now. It's like the spot market, for now; but in the 15-minute market, there might be questions about this.

While I'm thinking about it, Mr. Rogers, the CEC that I submitted earlier today that includes some proposed conditions for discussion tomorrow, a lot of them are environmental and refer to environmental agreements, documents, requirements, and such that involve ecology -- I mean, the environmental matters. And I'd like to ask you to just be prepared to maybe discuss some of those, not so much that you agree or disagree, but to make sure that the documents that are referred to in that are documents that will be applicable to this project.

I just want to make sure we're talking apples and apples, and those do come from similar long line -- transmission line CECs we've issued in the past. But because we were going to have -- we're trying to get a lot done today, I might want to ask you a few questions of that later in the day before we break, maybe five minutes' worth of questions. So when we deliberate tomorrow, we've already established that, yeah, these documents are -- will be part of this project. I want to rehash that tomorrow. What do we have at --

Oh, Member Hamway.

MEMBER HAMWAY: Yes, this is for Mr. Rogers. So in the EIS, did you provide simulated visuals on -- what I'm getting at are the photos that were presented by Golden Bear and Rain Bear, I may have their names wrong, but you know who I'm talking about, the residents who spoke in Quartzsite. And they showed pictures of the sunsets and all of that kind of stuff. So did the EIS provide simulated visuals of how this line would affect those vistas?

MR. ROGERS: Yes, they did. They looked at -- I forget the exact number, but at least a couple dozen different KOPs, or key observation points, that were established by the BLM and their cooperating agencies. Not by us, but by them. And there are

before and after comparisons, simulations. I'm sorry, I don't remember the photo that you're referring to that you mentioned, but --

MEMBER HAMWAY: She just held up her phone and it was this beautiful sunset. And so I guess what I'm getting at is, we didn't see any of those, correct?

MR. ROGERS: Right. So one specific matter to address that, we have a mitigation measure that directs us to avoid skylining where possible. Skylining is that effect, I think I talked about it, about a structure being above the horizon. I would offer that that would be a situation that would affect a sunrise or a sunset, and we are already obligated to minimize that and avoid that to the extent possible, and we have taken that into account already in our design.

MEMBER HAMWAY: Thank you.

MS. GRABEL: May I follow up?

CHMN. CHENAL: Yes, sure.

BY MS. GRABEL:

Q. Mr. Rogers, after the public comment session did the DCRT team speak with those public commenters?

A. (BY MR. ROGERS) Yes, we did.

Q. Were a lot of their concerns addressed just in that initial conversation?

A. (BY MR. ROGERS) We talked about this matter of skylining, we talked about where the line was, there was some confusion about exactly where it was, and we committed to meet with them in the future.

CHMN. CHENAL: Ms. Scott.

MS. SCOTT: Thank you, Chairman, Committee Members. The Staff does appreciate all the work that the Applicant went to in putting this comparison document together; however, the document was filed late last night, and Ms. Little -- there were a lot of statements regarding Ms. Little's testimony and what she stated. And Ms. Little did not have an opportunity to review the document, and has just seen it now really for the first time.

In talking to her, she believes that some of the statements that were referenced were stated with qualifications. And she would like an opportunity, at least for purposes of this document, to go back to the transcript and find those qualifications to ensure accuracy. She also -- we also thought that some of the statements may have been made in a particular context, which may not be set forth in this document.

So I guess what we would say regarding the characterization of Ms. Little's testimony is right now it should be viewed as the Applicant's interpretation,

and not necessarily something that she would agree with, absent her review of the transcript.

MS. GRABEL: And Ms. Scott, I'm fine with that. I want you to know, we did put references to the transcript and citations, and the quotes only where we actually had verbatim quotes from the proceedings. So of course, Ms. Little can go through and validate as necessary.

MEMBER HAENICHEN: Mr. Chairman.

CHMN. CHENAL: Member Haenichen, one second.

When can that be done, Ms. Scott?

MS. SCOTT: Let me just suggest something. These statements that I made now were meant to apply to this comparison document that's been produced. However, for purposes of tomorrow and deciding what's to go in the CEC or not, Ms. Little will be here all day. So she can appropriately cast her own testimony or what she meant by it, if needed.

CHMN. CHENAL: It seems like every time Ms. Little is involved in this case, it's always ASAP. I mean, when her testimony had to be created, then there was the PowerPoint I remember, and she was gracious enough to do that in quick order.

So, I mean, we're going to be deliberating this tomorrow, and, you know, we kind of need to get

the benefit of any clarifications by tomorrow, if necessary. I know there's been some transcript references, but -- that might help, but we'd certainly give every opportunity to Ms. Little to qualify any of the comments that are listed there in the document that Ms. Grabel just went through.

MS. SCOTT: And Chairman, Committee Members, I think her being here tomorrow, she will be able to do that tomorrow.

CHMN. CHENAL: Okay, fine. And does your witness, Ms. Little, does she have access to -- easy access to the transcripts, such that she could refer to the various cites that were in the document that Ms. Grabel just read from?

MS. LITTLE: Only the draft.

CHMN. CHENAL: Yes, the draft. Yes. Well, that's all we have at this point, I think.

MS. GRABEL: We do have finals.

CHMN. CHENAL: We do have finals?

MS. GRABEL: They're posted on the project website, and they were sent to Staff maybe two days ago.

MS. SCOTT: So we'll make sure that she has a full set of those.

CHMN. CHENAL: Okay. I just -- you know,

it's just that time of the hearing where we're running to the finish line to get this deliberated tomorrow. But we'd certainly like to hear any qualifications that Ms. Little has as we go through.

I will note that -- I mean, it's helpful to have the distinguishment between the two projects, and I think there's enough in the record without the quotes, you know, the statements from Ms. Little, to establish that. So I don't think it's -- whether it's qualified or not is dispositive to show those differences. But to the extent we can have the benefit of that, I think it would be good for the record.

MS. GRABEL: And if I may speak to that, Chairman.

CHMN. CHENAL: Yes.

MS. GRABEL: One of the reasons we did include so much reference to Staff is because a lot of the Commission's order was relying on Staff's recommendation in that case, whereas their recommendation in this -- they don't really have a recommendation, but their testimony has been much different.

CHMN. CHENAL: That's fair.

MEMBER HAENICHEN: Mr. Chairman.

CHMN. CHENAL: Yes, Member Haenichen.

MEMBER HAENICHEN: This is a question I guess primarily addressed to you, and that is regarding the -- oh, I'm sorry -- the mandate of this Committee, which is a little foggy to me right now, and I want you to clarify it.

Tomorrow we're going to be deliberating this project and hopefully come to a conclusion as to how we can vote on it. My understanding is we have a responsibility to consider two things primarily, one of which is environmental considerations, and the other is need.

Now, I need to know when that word "need" is put there, does that mean Arizona need or overall need by other parties? That's a very different thing.

CHMN. CHENAL: Well, Ms. Grabel, I have a response, but you seem like you want to comment on it. So let's hear what you have to say.

MS. GRABEL: Member Haenichen, Chairman, I would say that the answer is both. I think that there is -- we have established in this case that the line fills Arizona's need for an economic, adequate, and reliable supply of power. The Arizona courts, though, have held that interstate need is also relevant to the determination. And so to the extent that California -- it fulfills California's needs for power, you may also

consider that in determining the need component of 40-360-07(B).

MEMBER HAENICHEN: And I read that thing too about other states. But I'm wondering, as a Member of the Committee, what percentage of our acknowledgment of that is -- should be devoted to Arizona -- and I know you can't answer this, but I'm just throwing it out there so people can think about it -- and what to other states or to the general good of the whole western system. So that's one thing.

The environmental also probably has implications for other parts of the region. So I just was trying to get some clarification on what we should -- what our thought process should be with regard to these two factors.

CHMN. CHENAL: Let me comment on that, Member Haenichen. I think technically the Committee is charged with reviewing the factors that are set forth in the statute, predominantly environmental factors.

Under case law, the Committee can consider need, and we do, we do in every case. And you will note that the conclusions of law in every CEC that we've issued does address the need. So we do have that option.

The Commission, on the other hand, has the

obligation to consider need. So we can consider it and we do, and yes, I guess we can consider both Arizona and other states' needs. But obviously, if there's no benefit or no need to the project for Arizona, I'm not sure -- you know, I mean, that's certainly an important factor in whether a Committee Member is going to vote in favor or not, even if there is benefit in another state, which, again -- and I agree with Ms. Grabel, is something we also can consider when need is considered.

So interestingly, we've never had a case that I can recall, at least when I've been involved, where there hasn't been benefit and an Arizona need for that CEC. I mean, whether this benefits California, this project arguably benefits California more than Arizona, I guess is something that can be considered.

But, you know, I think, again, back to the question of need, Arizona -- I mean, we've never considered a case where there hasn't been any benefit or need for the state of Arizona.

MEMBER HAENICHEN: Thank you.

CHMN. CHENAL: Member Riggins.

MEMBER RIGGINS: Thank you, Mr. Chairman.

Along those same lines, and Mr. Amirali, maybe you can weigh in, if there's a benefit to another state, because it's a regional market, wouldn't there

also then be kind of a correlated benefit to the state of Arizona? I mean, it's not that one benefits more than the other. If everybody is in a market, essentially, everybody in the market benefits.

MR. AMIRALI: That is accurate, sir.

MEMBER RIGGINS: I mean, that's a very general statement. But just looking at DCR-31, which is the APS customers saved, that's a savings because they're in a regional market, so...

MR. AMIRALI: Member Riggins, that is accurate. However, the magnitude of savings -- the EIM market has totally opened up a whole new world of savings to all participants. And a testament of that is that today there are nine EIM participants. There are 11 waiting to join pretty soon, or it's going to be 10 participants and 10 waiting to join as soon as SRP goes through.

The reason is the EIM -- and I will go through that further in my presentation as well -- that before that, even though there has been interstate commerce existing between states since the '60s when we started building the interconnected transmission grid, the boundaries at which the transactions happened, there was a timeline beyond which you could not do it. So for example, all the trades were happening at the

end of the hour or the top of the hour. EIM has basically made those boundaries a dotted line, and they allow now the free flow of energy in realtime.

So truly each state or each balancing authority first had the requirement to satisfy their own needs, and they can do it, but they can only rely upon so much from outside; they had to satisfy it themselves. EIM just made everything a large bubble. And because of that, the value proposition has just astronomically increased. Large transmission, robust transmission grid is the key factor towards an EIM, towards the success of EIM.

So for example, right now if Arizona, as Ms. Le Vine was pointing out, if Arizona wants to buy energy from the Pacific northwest, it has to go through Nevada or Utah, bring it all the way around the horn, keep paying the transmission charge, okay, of each utility it touches. So imagine that they are paying a toll on every point. In EIM, they don't have to, because it's free.

BY MS. GRABEL:

Q. So Mr. Amirali, the answer to the Member's question is yes, right?

A. (BY MR. AMIRALI) 100 percent, yes.

CHMN. CHENAL: And thank you, Ms. Grabel.

MR. AMIRALI: You're getting me excited.

CHMN. CHENAL: Okay. Contain your excitement, Mr. Amirali, given the amount of time we have left today.

How many more witnesses do we have? We have Mr. Amirali, we have Ms. Little.

MS. GRABEL: That's correct. And that's the end.

CHMN. CHENAL: And I'm going to have a few questions of Mr. Rogers.

Does the Committee have any further questions of Ms. Grabel or the witnesses regarding the testimony or what was put into the record by Ms. Grabel?

(No response.)

CHMN. CHENAL: Ms. Scott, anything further?

MS. SCOTT: Staff does not. Thank you.

CHMN. CHENAL: Okay. Is this an appropriate time for a short 10-minute break before we get to the next witness? And who will the next witness be?

MS. GRABEL: The next witness, I believe -- let us kind of --

CHMN. CHENAL: Okay.

MS. GRABEL: -- strategize here, and then we'll talk about that after the break.

CHMN. CHENAL: Let's take a 10-minute break,

and then we'll jump right in.

(Off the record from 3:19 p.m. to 3:40 p.m.)

CHMN. CHENAL: Let's get back on the record, and we'll resume the hearing this afternoon.

Ms. Grabel, I think your next witness is Mr. Amirali and Mr. Rogers, maybe.

MS. GRABEL: Yes. Thank you, Chairman. We will have Mr. Amirali do the first half of the presentation that he began this morning. And then if you have any questions for Mr. Rogers, he is also still at the witness table. I know you indicated you might have some environmental-type questions for him.

CHMN. CHENAL: Very good.

BY MS. GRABEL:

Q. So Mr. Amirali, why don't you go ahead and begin your presentation that you began this morning.

CHMN. CHENAL: And could you remind us what exhibit number?

MS. GRABEL: I was just looking for that. DCR-38.

MR. AMIRALI: Thank you, Ms. Grabel. In the interest of time, if there is no -- if it pleases the Members or the Staff and Mr. Chairman, I would like to skip the part about the CAISO, which was so thoroughly covered by Ms. Le Vine.

I would just add very quickly a definition of what a balancing authority is, which was covered by Ms. Le Vine, but then it will become important in the further part of the presentation.

So a balancing authority could be one utility or a combination of utilities that have a responsibility of maintaining the reliability of that particular region, and make sure that the resources -- resources required -- that there are adequate resources, that is energy and capacity, available to satisfy the need of that particular region, as well as there is adequate transmission to serve it in a reliable manner.

There are 39 balancing authority areas in the western U.S. California ISO is one of them. That's the largest one in California, but there are two other balancing authorities. One is SMUD and one is LADWP inside California. APS, SRP are all their own balancing authorities inside Arizona.

So when it comes to California ISO, they are operating three major markets. The day-ahead market, the hour-ahead or the -- which is the hour-ahead market, but it is more realtime -- it's also called realtime market, and the EIM.

And the main difference between the day-ahead

market and the hour-ahead market is the timing. The day-ahead market schedules can come anywhere from the -- anywhere from the day before -- seven days before the operating day to one day before the operating day. The hour-ahead schedules are 75 minutes before the operating hour. But aside from that, everything else remains the same.

In the day-ahead market, the ISO -- ISO's role is to match the suppliers and -- supplies and demands wherever necessary. They also facilitate all the bilateral transactions that are happening between buyers and sellers or suppliers and load serving entities. They are making sure that the transmission is available and there's adequate capacity to ensure reliability.

One of the things -- the questions that were asked about was the pricing differential. The spot pricing that was talked about was the pricing that is associated with the day-ahead type of a market, which is a forward-scheduling market, which is a little different than EIM market, which is the realtime -- which is a subset of the realtime market.

CHMN. CHENAL: So Mr. Amirali, when I had a series of questions about the savings per hour, cheaper versus more expensive, and the cost -- and the savings

to Arizona that Ms. Chang estimated would be 2 to $7 million, that was based on the day-ahead market; is that correct?

MR. AMIRALI: That is correct, sir.

CHMN. CHENAL: Okay. And the EIM benefits, if you will, are the realtime benefits that were not included in her analysis.

MR. AMIRALI: That is correct, sir.

CHMN. CHENAL: Thank you.

MR. AMIRALI: The realtime market, as I indicated, is -- it's a 15-minute market that starts 45 minutes before the operating hour. A subset of the realtime market is the EIM market, or the five-minute market. The difference -- the primary difference is that in an EIM market, there is no transmission charge associated with it, and that is a significant savings.

Now, if you look at the EIM participants across the western U.S., the key component to know is, as you are -- as each of these entities can transact, they are -- they can do it without involving California.

EIM, one of the main things about EIM is, first of all, it is not purely a western concept. It is applicable in all organized markets across the U.S. They just don't call it EIM. They just refer to it by

a different name. But that concept is in every organized market across the U.S.

Second, California ISO is only the -- and they call themselves the manager of the EIM. That means that they do not -- they do not own it, they just are the ones who are making sure -- keeping track of all transactions and managing the flow of cash.

CHMN. CHENAL: Quick question. EIM, I believe Ms. Le Vine said today something like 95 percent of transactions are handled on the -- I can't believe it's the EIM market. Can you remind me what she said and what percentages is day-ahead versus realtime?

MR. AMIRALI: Ms. Le Vine indicated that 95 percent of all of the transactions that happen in California in the ISO are happening in forward markets, that is forward market is day-ahead market. EIM is truly what is called imbalance. If you have 95 percent imbalance, we have a grid problem.

CHMN. CHENAL: All right, thank you.

Member Hamway.

MEMBER HAMWAY: This is something I've been kind of confused about. So once APS joined the EIM, all their lines are now part of the EIM, or do they get to -- are you all in or all out, or do you kind of get

to choose I want this one in and this one out?

And then are those ones that join the EIM, are they managed or operated, what's the right word, by CAISO?

MR. AMIRALI: Member Hamway, very good question. By joining the EIM, the participants do not hand over control of anything that they do to the CAISO. So they maintain full control. Let me get to my next slide, and it will become a lot easier.

Before EIM, think of each balancing authority as its own state, okay. Each state has a requirement of satisfying the needs of their customers or their citizens.

Now, the state can do it two ways. One, they can internally produce everything, or they can buy and have commerce with their neighboring states. Prior to EIM, the issue was that because of the rules of how transactions happen on the ties, this door used to close before the hour ahead. So they could go back and forth, but imagine that in realtime this door between them closes.

What EIM did was it basically made them all into one gigantic bubble. Each balancing authority controls their own transmission. They have got full control over it, they do not hand over anything. At

the tie points, what they do is they forego -- they have agreed to forego the transmission access charge. In other words, any realtime transaction happened, you're not paying any toll on it, which makes EIM the most economic construct for energy transaction there can be.

Now what it has done is, now each -- instead of each balancing authority carrying reserves individually or satisfying its own needs, what they do is now carry them as a collective and truly share amongst each other. That's the true value of EIM.

MEMBER HAMWAY: What does a utility give up to be in the EIM, anything?

MR. AMIRALI: It is purely a voluntary participation right now.

MEMBER HAMWAY: So in the future, they'll give something up?

MR. AMIRALI: No. Participation is voluntary. You can enter it voluntarily, you just have to -- you just have to agree to build the systems that are required for the realtime transactions. As I mentioned, prior to EIM, you don't have to have -- you don't have to provide visibility, the level of visibility that is required.

Because as you know, it adds another level of

complication for the operators, and the operators have to be able to see in realtime what is going across the ties and what everybody is producing to make sure that the grid reliability is maintained. So it is more of a responsibility on the operator, and to satisfy that responsibility they have to have high level of visibility and communications.

MEMBER HAMWAY: So in California, that operator is CAISO. In Arizona, those operators are TEP, APS, and SRP, and that other little one up at the top.

MR. AMIRALI: That is correct. And they are all now talking in realtime. Before that, they were talking on the hour-ahead basis and 15-minute basis. Now they are always in communication. But this communication is more electronic, and it is through visibility.

Actually, the only thing I've got left is the EIM benefit, which you have already seen. So unless there are any questions, I can pretty much sum this up.

CHMN. CHENAL: Yeah, please sum it up.

MR. AMIRALI: And I'm done.

BY MS. GRABEL:

Q. Mr. Amirali, before leaving the slide, quickly -- oh, I'm sorry.

MS. GRABEL: Member Haenichen, did you have a question?

MEMBER HAENICHEN: Just quickly. Can we get a copy of your flows? I think they would be helpful.

MEMBER HAMWAY: We have it.

MEMBER HAENICHEN: Oh, we do? Okay, I didn't know. Sorry. Is that something we got today?

MEMBER GENTLES: DCR-38.

MEMBER HAENICHEN: Okay, thank you.

BY MS. GRABEL:

Q. Mr. Amirali, from this slide, can you ascertain how much benefit Arizona has received relative to other participants in the EIM market, and explain why Arizona benefits to the extent that it does?

A. (BY MR. AMIRALI) I'll be delighted to, Ms. Grabel. First of all, Arizona has benefited for total since -- APS -- when I say Arizona, I should qualify. It is APS only. And APS has benefited to the extent or to the amount of $140 million. They are one of the larger beneficiaries of the EIM. You know, the largest one is the PacifiCorp, and that's predominantly because of the hydro that they have available.

The diversity of the resources available in Arizona make them one of the most ideal candidates. In

addition, the strong ties that it has with California and Nevada makes it also a very -- makes them one of the greatest beneficiaries of the EIM market.

CHMN. CHENAL: Yes, Mr. Gentles.

MEMBER GENTLES: How long has the EIM market been around?

MR. AMIRALI: Member Gentles, they've been around since 2014.

MEMBER GENTLES: Oh, thank you. That kills my second question.

MS. GRABEL: I have one follow-up, Chairman Chenal.

CHMN. CHENAL: Yes.

BY MS. GRABEL:

Q. So Mr. Amirali, Member Haenichen asked us to quantify the benefits that Ten West Link will bring because of additional access to the EIM. Is that something that we are able to quantify?

A. (BY MR. AMIRALI) Ms. Grabel, it is very difficult to quantify that particular benefit. It's basically the benefits of a -- the benefits of EIM are directly proportional to the ties that different balancing authorities, different members have with each other, as well as the size of the market.

So the larger the size of the market, the

better the benefits. The stronger the ties that the different market participants have, the larger the benefits. However, it is very difficult to quantify. In fact, if you looked at the APS's -- APS's -- or, DCR Exhibit 32, I believe, with APS.

Q. It's DCR-31.

A. (BY MR. AMIRALI) 31, thank you.

APS estimated their benefits to be approximately $30 million from participating in the EIM, and they have blown through that estimate and it is significantly more, because -- simply because of the size of the market and the value that they have ascertained. So it is difficult to quantify those benefits.

Q. How do we know that Ten West Link specifically will increase the benefits that Arizona will experience in the EIM market?

A. (BY MR. AMIRALI) Ten West Link enhances the ties between the -- sorry, let me backtrack.

As I had stated in my testimony previously, Ten West Link strengthens the tie between Arizona and California. It facilitates the delivery of energy between these -- between these two markets, but not just those. It also allows for other energy to flow from other states and get it in a more easier access

for Arizona to access the energy that is available, for the sake of argument, say Pacific northwest. And that energy has to flow through California's balancing authority, California transmission grid, and get to Arizona.

The way power flow works, as we demonstrated in our presentation this morning, everything is connected. So a stronger transmission system will directly benefit Arizona from the EIM from the realtime market perspective.

MS. GRABEL: Thank you.

CHMN. CHENAL: All right. I think I understand better, Mr. Amirali. I'm still surprised, if you will, at the low benefit that this project will provide to Arizona in the day-ahead market, now that I understand that 95 percent of the power is procured in Arizona in the day-ahead market.

And yes, I appreciate that the EIM market, which is, I guess, roughly 5 percent, has generated substantial revenue savings for the Arizona utilities. We saw the exhibits that were entered into the record this morning. And that's without the Ten West Link line.

I will concede that 2 to $7 million is a benefit. But I'm just still a little surprised that

when the line will allow for a net increase of something in the magnitude of 650 megawatts of additional transmission capability, that it's only 2 to $7 million, when the differences in the cost, cheaper power to buy by Arizona utilities and more expensive power to sell by Arizona generators, as was reviewed by Ms. Grabel, is pretty significant.

I mean, the math -- I mean, I accept the math works up. I accept that the numbers come out to that. It just still surprises me that it's not a higher number. And I guess it's math, so it is what it is, but it just surprises me.

There's still benefits that I see. I'm just saying the amount of economic benefit seems small in comparison to the other numbers we've seen and what you would think with a magnitude of 650 megawatts would allow for more savings, I guess. Maybe that's a comment, not a question.

MS. GRABEL: May I ask a follow-up?

CHMN. CHENAL: Sure, absolutely.

BY MS. GRABEL:

Q. Mr. Amirali, would you agree that that remaining 5 percent of realtime is some of the most important and costly resources that would add to that benefit?

A. (BY MR. AMIRALI) That is correct. That's why it's disproportionate. The magnitude is quite disproportionate because of that.

Q. And if I may correct something that Mr. Amirali said with respect to DCR-31, that's the APS press release discussing its savings in the EIM. Would it refresh your recollection that APS projected annual savings of between 7 and $18 million a year for customers, but it actually realized $30 million per year? So its projections -- even if we were to give you a projection of what the EIM benefits would be, the APS experience blew its own projections out of the water by a 400 percent magnitude, correct? To make that a question.

A. (BY MR. AMIRALI) You are correct, Ms. Grabel.

CHMN. CHENAL: Okay, for now. Like I said, this is the realtime market you're in, and you're stepping into the imbalance market here, imbalance market to the -- the day-ahead market.

MR. AMIRALI: Mr. Chairman, my time has been bought and paid for, so I'm here.

CHMN. CHENAL: Good. Yes.

Mr. Arias, do you have any follow-up questions for the panel?

MR. ARIAS: There's just one clarifying question.

CROSS-EXAMINATION

BY MR. ARIAS:

Q. Outside of the EIM transactions, if there's just normal Arizona buying or selling power over this line, there's still going to be a transmission access charge that has to be paid by Arizona utilities, and thus ratepayers, correct?

A. (BY MR. AMIRALI) Not in case if Arizona is selling.

Q. Okay. Just when they're buying power they have to pay a --

A. (BY MR. AMIRALI) They pay a TAC, but it is not -- it has to be very clear that it is not line specific, it is just a peanut -- it is just going to be a charge that is associated with the transmission access charge of California, but it's not line specific.

MR. ARIAS: Okay, thank you.

CHMN. CHENAL: Couple follow-up questions, Mr. Amirali. There will be service interconnection agreements with this Ten West Link line, I assume, with the generators?

MR. AMIRALI: That is correct, Mr. Chairman.

CHMN. CHENAL: What is a transmission service agreement?

MR. AMIRALI: It is not a transmission service agreement. Transmission service agreements is only signed in situations where you have a -- where a generator is buying access to transmission. APS actually does that. And in California -- for any generator that connects to California transmission grid, they only sign one agreement with the transmission owner, and that is the large generator interconnection agreement. Once a generator is interconnected, they have got access to the California transmission grid.

CHMN. CHENAL: What is a transmission service agreement versus an interconnection agreement?

MR. AMIRALI: Transmission service agreement is typically an agreement that either a generator or a load signs with the transmission provider to reserve their capacity on a transmission path. That construct exists in APS, SRP, which is individual transmission owners. It does not exist in California because it is a network model.

So anybody who once has the interconnection, has the ability to deliver that energy to any direction

and any load center, and we cover all of that in one agreement.

CHMN. CHENAL: Okay. We have had, in previous cases, a condition that says basically that the applicant will provide the service interconnection agreements, a copy, with docket control, and a separate condition that says, and it's in my proposed ones, that's why I'm asking, that the applicant will file any project-related transmission service agreement to the docket.

So at least in those other cases with large transmission lines, there were those two separate agreements that were relevant to those lines. I'm asking you in this line, you're suggesting that the interconnection agreements, yes, will be entered into by the Applicant, and I'm trying to drill down into the service agreement and make sure that I'm clear on what your testimony is as to that.

MR. AMIRALI: There will be no transmission service -- separate transmission service agreement. There will only be one agreement with the participating transmission owner, that will be us, and that will be the large generator interconnection agreement. And it's a three-party agreement between California ISO, DCRT, and their developer.

CHMN. CHENAL: Okay. Now, you mention on the transmission service agreement that that's generally between, say, the generator and customer.

MR. AMIRALI: Generator and transmission provider.

CHMN. CHENAL: Okay. This line will be a transmission line that will be transmitting power sold by a generator. So why wouldn't the Applicant be a party to that three-way agreement you just described?

MR. AMIRALI: Sir, because in California, for any lines that are under CAISO operating control, you don't sell transmission service. So may I get -- let me separate that out, okay?

CHMN. CHENAL: Okay. But I mean, some of this is going to be power coming to Arizona from California.

MR. AMIRALI: It doesn't matter. They will sign their agreement -- if they have to sign an agreement, they can come -- okay. Any generator connecting to Ten West Link can deliver energy either towards California or to Arizona, or take it all the way to the border from California all the way to Pacific northwest to California. Anywhere in California ISO system they can deliver without requiring a transmission services agreement.

That construct in California ISO does not exist for going outside California. So, for example, if they want to wield their power through APS and sell it to, let's say, PNM, Public Service of New Mexico, for the sake of argument, then they have to engage in a transmission services agreement with APS and maybe some other utility. That's a separate transaction for them altogether.

CHMN. CHENAL: I understand that. But you just said, I think, before that the service transmission agreement is a three-way agreement.

MR. AMIRALI: Large generator interconnection agreement that we sign will be a three-way agreement.

CHMN. CHENAL: Okay. And the service agreement --

MR. AMIRALI: We don't sign and we don't need a transmission services agreement. It's not required.

CHMN. CHENAL: Okay, it's not required.

MR. AMIRALI: Yeah. Yeah, that's a California ISO -- because California ISO is a network model, there is no transmission -- you don't have to acquire firm transmission to deliver from Point A to Point B. You already have the ability to do so.

CHMN. CHENAL: I'm not understanding, therefore, why Southline, for example, would have no

objection to such a condition in their CEC.

MR. AMIRALI: Sir, Southline is a merchant line, whereas Ten West Link is a regulated transmission asset. It's a much different construct.

May I add one thing, sir?

CHMN. CHENAL: Sure.

MR. AMIRALI: If you want to flow on -- let's say that you are a generator connecting on one end of the South Line and are trying to deliver energy, say, to APS. And you have -- the way Southline makes money is by taking money from those who are using it, utilization charge, okay. The difference between the Southline and Ten West is Ten West is a line that was built by the state of Arizona, whereas Southline was a toll road.

CHMN. CHENAL: So is it because it's regulated, is that the answer?

MR. AMIRALI: One is regulated; one is an independently owned.

CHMN. CHENAL: Is merchant, and therefore you have a service agreement, whereas with Ten West Link, being control by CAISO, it's regulated, and that obviates the need for a transmission service agreement?

MR. AMIRALI: And the charge has been paid for by the -- it's peanut buttered across all the

users.

CHMN. CHENAL: Ms. Grabel, do you agree with that?

MS. GRABEL: Yes, sir.

CHMN. CHENAL: All right. I have no further questions of Mr. Amirali, but I will have some questions of Mr. Rogers, just brief questions. And then maybe we should finish up and then we can get to Ms. Little.

Okay. Mr. Rogers, do you have my -- we'll give it an exhibit number tomorrow. We seem to be adding exhibits periodically, so I want to make sure we have the correct number, because it will be second to last.

If you look at Paragraph 25 on the bottom of Page 12, and I know the Committee has that document in front of them, it refers to a Record of Decision issued by BLM, requires the Applicant to prepare a Plan of Development outlining and detailing design, construction, mitigation, restoration, and compliance requirements. Do you see that?

MR. ROGERS: I see that.

CHMN. CHENAL: First question: In this case, there will be a Plan of Development the Applicant will be required to follow, correct?

MR. ROGERS: On federal lands, at this point, yes.

CHMN. CHENAL: And you understand we're going to be considering a condition that will make those requirements on federal land applicable to state and private land, correct?

MR. ROGERS: I understand that's the conversation right now, yes.

CHMN. CHENAL: Yes. So if you look on Page 13, and in particular Paragraph 26 -- or, Condition 26. I'm not going to read it, but it basically says that there will be an Historic Properties Treatment Plan for archaeological and historical sites and a Paleontological Resources Monitoring Plan for paleontological sites, both of which will be developed pursuant to the Plan of Development.

I guess my question is, will the Plan of Development in this case contemplate the existence of the Historic Properties Treatment Plan and then the Paleontological Resource Monitoring Plan?

MR. ROGERS: It's my understanding right now that the HPTP will be required, but not as part of the POD. It's a requirement of the Programmatic Agreement that the BLM, the Arizona SHPO, the CRIT, and some

other entities have signed. And that Programmatic Agreement outlines the Class 3 survey protocols, it outlines the travel participation agreement, and the Historic Properties Treatment Plan. It does not address a paleontological resource plan.

And furthermore, it's our understanding that the way this is currently written, the HPTP would be required before construction would begin -- or, could begin. Under the PA, it seems to allow for us to proceed on a limited basis in areas of the project that we have not identified any cultural sites on.

We've already completed our Class 3 survey, which is well in advance of most other projects at this point. So we're able to, you know, advance that portion of the project.

So the way this is written right now, we would like to put the approval for us to proceed in the hands of the Arizona SHPO, but really the BLM. They're the lead agency on this, they're responsible for executing it. So I would ask that you consider that they have the discretion to allow us to begin construction in certain portions of the project.

CHMN. CHENAL: Yeah, there's a lot we just covered there.

MR. ROGERS: Yes, sir.

CHMN. CHENAL: It's complicated. I'm going to need some help from the Applicant to help redraft these, then, to make sure that these agreements are complied with as a condition.

And again, my preference, and I know we've done this in the previous cases I've just referred to, we have -- a lot of these requirements are only applicable to federal land, but a lot of this line is going to be on state land and private land. And I will tell you that my pitch tomorrow to the Committee is going to be that the requirements for federal land, to the extent applicable, such as historical and paleontological items otherwise covered by those two agreements, apply to state and private land.

But if we need to rework some of these provisions, I'm happy to do that. And I will ask the Applicant's assistance in that, your assistance, Mr. Rogers, so that it makes logical sense.

I'm handicapped because I don't understand, we didn't really get into this too much in our testimony, and these are taken verbatim from at least the Southline case and the SunZia case that were very similar.

So I'm very open personally to, like the comment you just made about, you know, starting with

the approval of, say, SHPO, even though construction can start, you know, in some ways, and I know this is a little more restrictive than that.

All right. Back to the Programmatic Agreement. There will be a Programmatic Agreement?

MR. ROGERS: There is a Programmatic Agreement. It exists now, it's executed, and we're proceeding with cultural reviews in accordance with that agreement.

CHMN. CHENAL: And that, you said, covers the HPTP?

MR. ROGERS: Yes, it outlines the requirements of developing the HPTP, the travel participation plan, and a host of other plans are all rolled up under that contract or agreement that we have signed.

CHMN. CHENAL: Okay. And again, that, at this point, only extends to the federal lands, is that correct, those obligations?

MR. ROGERS: It does include private lands. It addresses private lands in how we conducted our Class 3. Are you familiar with a Class 3? It's a walking survey of the area. Private lands we have to get permission on; that is sometimes a challenge. So we -- we're allowed to conduct our survey to a good

faith effort to cover everything we need to, and that's outlined in the PA.

CHMN. CHENAL: What about state land?

MR. ROGERS: I believe Arizona State Lands is a signatory. They've been in -- they've definitely been part of the process. We've surveyed on state lands, we've executed this on state lands.

CHMN. CHENAL: Member Woodall, we'll get to you, but I've got a series of questions here.

MEMBER WOODALL: You're reading my mind, because I wasn't waving at you or anything, but I did want to say some things.

CHMN. CHENAL: Let me just go through my series of questions here.

So there is a Programmatic Agreement already, and that does address the HPTP. But let's go back to the one that -- the Paleontological Resource Monitoring Plan. I'm just going to say the PRMP for now. I'm tired of saying the darn word. The PRMP. What document basically authorizes or requires that document, if it's not the PA?

MR. ROGERS: It would be the PA, typically. So what occurred here for Ten West is, as part of the EIS, there is a high-level paleontological review that's done, and an outcome of that review was that

this further study wouldn't be required.

I do not remember the specifics of why the BLM landed in that position, why the Arizona State Historic Preservation landed in that, the Arizona State Museum, but they didn't require it. And I believe it's because the probability of the situation of where we are didn't lend itself to requiring it.

CHMN. CHENAL: So there is no PRMP with respect to this project; is that correct?

MR. ROGERS: There is none required.

CHMN. CHENAL: None required.

MR. ROGERS: Yes.

CHMN. CHENAL: Could there be one required, depending on what's uncovered during the course of construction?

MR. ROGERS: I believe that would be covered by the Historic Properties Treatment Plan, and the -- and the -- oh, what's it called -- the monitoring and discovery plan. There's lots of plans.

CHMN. CHENAL: But those plans are all required by what document?

MR. ROGERS: The PA.

CHMN. CHENAL: The PA.

MR. ROGERS: The Programmatic Agreement, yes, sir.

CHMN. CHENAL: And the PA is required ultimately by what document, the Plan of Development or the Record of Decision or what?

MR. ROGERS: Section 106 of the federal code.

CHMN. CHENAL: Okay. So...

MR. ROGERS: And if I could interrupt, this was as a result of government-to-government consultations between the BLM and tribes, it's the result of engagement by the Arizona State Museum and the Arizona Historic Preservation Office. We were an observer, I'd say, in some of these discussions. We talked about, you know, effects of the project. But really, the PA is written by those signatory parties.

So in conclusion, I would say that those parties seem to have deemed it fitting for the project.

CHMN. CHENAL: All right. Well, my goal here is to have conditions that basically are applicable already to the Applicant because of the Record of Decision, the Plan of Development, Section 106, the basket of requirements that govern how the Applicant constructs, maintains --

MR. ROGERS: I understand.

CHMN. CHENAL: -- you know, removes all those requirements that apply, apply equally to state and private land, so we don't have different standards

applicable, you know, for different landownership. If there's a gold standard for federal land, I personally want to see that standard applied to state land and to private land. And we have adopted that in previous cases. And this is the language that we've used, so maybe we have to make some modifications here, which I think is fine.

MS. GRABEL: May I interject for a moment?

CHMN. CHENAL: Sure.

MS. GRABEL: So Chairman, if I understand your question, you're concerned that we didn't include the PA in this list of documents. But my understanding, and I would like Mr. Rogers to confirm, is that the PA is actually an attachment to the Record of Decision. So the condition you have here that references the Record of Decision would include the requirements of the PA.

CHMN. CHENAL: Yeah, but it's not really -- I'm going to propose that we have these conditions, but there's a couple of changes, modifications to this language. For example, I note that Mr. Rogers said with Condition 27, on the bottom of Page 13, Line 25, he says, Applicant shall comply with any HPTP developed pursuant to any Programmatic Agreement entered into to ensure that preconstruction, and then it goes on.

And you indicated that, you know, because of SHPO, you're allowed to go ahead and not necessarily preconstruction, but you're allowed some limited construction. So we might want to take out preconstruction there.

MR. ROGERS: Because of the PA, which SHPO is a signatory to.

CHMN. CHENAL: So in that case, we'd take out the word "preconstruction," for example.

MR. ROGERS: Or perhaps take out reference to the HPTP and just have us be bound by the global PA, which we are already bound on.

CHMN. CHENAL: And then are you saying that there's no PRMP in this case, Paleontological...

MR. ROGERS: I just looked through the PA and I didn't find reference to it, no. My understanding is that we don't need to produce that.

CHMN. CHENAL: Okay. Well, maybe there's only a couple changes, then, to the language here that I'm proposing.

MR. ROGERS: Could I talk to a couple specific ones?

CHMN. CHENAL: Yes.

MR. ROGERS: On the next page it says, the Applicant shall share results of any archeological --

CHMN. CHENAL: Where are you reading, sir?

MR. ROGERS: The top of Page 14.

CHMN. CHENAL: And what line?

MR. ROGERS: 3.

CHMN. CHENAL: Okay.

MR. ROGERS: Applicant shall share the results of any archaeological work and findings with the appropriate tribes.

The way the archaeological work is performed, it's performed by an archaeologist that is under permit to the BLM or to the state SHPO to conduct -- well, I mean, obviously we paid for it, but they conduct these reviews, according to those permits, on behalf of the agencies for their government-to-government consultation.

Typically, we do not see the specific work product that comes out of that. In this case, we lobbied and were granted, under confidentiality agreement, a select number of our team to see these for the express purpose of being able to review them and avoid them. Typically, that's not the case.

But my point is, I don't know if that is actually within our ability to share those with the tribes. I would ask that you leave that to the governmental entity to have those consultations with

the tribes.

CHMN. CHENAL: Okay.

MR. ROGERS: On Line 8 of the same page, I couldn't find reference to an APP.

CHMN. CHENAL: That's Avian Protection Plan.

MR. ROGERS: Okay. And that's identified in our Section 7 biological assessment.

CHMN. CHENAL: Okay. Well, we're going to get into this tomorrow, but if you have any further thoughts or suggestions on these and that you have now, if you want to share them --

MS. GRABEL: So Mr. Chairman -- I'm sorry to interrupt you. We just received this today. If you could give us the evening to revise this, and in the morning come back with a redlined version for your consideration.

CHMN. CHENAL: Right. But the redlined version, I'm looking at maybe some minor tweaks, not wholesale changes. Because these -- for discussion purposes, I want to stay as close as possible to the conditions we used in Southline and SunZia. So I'd be looking for maybe removing a reference to the PRMP, removing a reference to preconstruction, removing any reference to sharing results with the tribes, but the rest of the bulk of the language I'd still like to see

in here.

MR. ROGERS: When you referenced the Plan of Development, that's actually not a condition. We have to write one, you know, to then construct according to. But the POD essentially documents how we're going to comply with the myriad of stipulations and requirements that we have.

CHMN. CHENAL: Right.

MR. ROGERS: What does the POD do in this case, since I'm not sure how it --

CHMN. CHENAL: Well, I think the understanding from the previous cases is what I referenced a couple times now. It defines on what your obligations are for construction, maintenance, all that, of the project in federal property, right. And we want that to apply -- I want that to apply to the construction on state and private land.

MR. ROGERS: I think the difference between Ten West and the other projects that you reference is, it's my understanding those other projects had a component of intervener review of the POD. We don't have that component here of intervenors, from what I understand, wanting to review our Plan of Development. I mean, the BLM right now will.

So I can understand in those other cases why

you'd want to see the final result, so the intervenors could also see that their input was captured. Does that apply to Ten West?

CHMN. CHENAL: Well, help me out in understanding this. The Plan of Development has requirements on including mitigation factors; is that correct?

MR. ROGERS: Not requirements. It has our compliance, how we plan to comply.

CHMN. CHENAL: Okay. And those compliance requirements, how you plan to comply, I mean, is a Plan of Development, it's a plan of how you're going to develop the project, and it's only applicable to federal land.

MR. ROGERS: Presently.

CHMN. CHENAL: Presently.

MR. ROGERS: Yeah. Right now we would only -- we only need the right of POD for federal land.

CHMN. CHENAL: Yes.

MR. ROGERS: That's the way it is currently situated.

CHMN. CHENAL: But it will require certain mitigation measures?

MR. ROGERS: It documents how we are going to comply with mitigation measures on federal land. It

doesn't necessarily stipulate what the requirements are. I mean, it is captured in just the writing of it.

CHMN. CHENAL: And as in these other cases, we've wanted those, for example, mitigation measures that apply on the federal land to apply to, for example, the state land.

MR. ROGERS: It still does. And I would submit that --

CHMN. CHENAL: How does it -- if it only applies to federal land without a condition, how does it apply to the state land?

MR. ROGERS: Perhaps when you refer to the FEIS and you refer to the ROD and capture the mitigation requirements, Avian Protection Plans, the visual mitigation requirements, other things, those -- you could simply say they apply to private lands or state lands, and then they would apply.

It's irrespective of what's in the POD. The POD is -- that shows that we did comply, and I believe that there's reporting processes outlined in here that we need to show that we comply.

CHMN. CHENAL: Well, if the FEIS has requirements on the Applicant to do certain things, like how it's constructed, how the mitigation is supposed to work, how the reclamation is supposed to

work, and you then create a plan as to how you're going to do those things, we're going to put in these avian mitigation factors, we're going to reclaim the land by doing certain reclamation work, you know, and it only applies to federal land, I'm not understanding what the problem is as to a condition that says thou shall apply same, you know, requirements in federal land on state land, for example.

MS. GRABEL: So Chairman, it really would be nice if our whole team was able to kind of talk through the conditions that you discussed as a team and then come back. And we will do our very best to make them as minimal as possible. But if they do need to be a little bit more extensive, given the condition, I hope you would understand that.

CHMN. CHENAL: Sure.

Member Woodall.

MEMBER WOODALL: Okay, Staff, pay attention. I would like you to look at the Chairman's version of the CEC and confer, perhaps internally, look at Conditions 23 and 24. And during the deliberations, let me know, or let us all know, whether or not Staff is actively supporting their inclusion, why they would be useful to Staff, and if Staff would like these conditions to be included in subsequent CECs related to

transmission lines.

If I had that information, I think it would save a lot of time when we deliberate. Because I typically say these are not relevant because they don't relate to environmental matters. But if Staff is telling me that they're reading these and they serve a useful purpose and they explain what that purpose is, I will be blessedly silent regarding these two conditions from now until the dawn of time.

CHMN. CHENAL: Wonderful.

MEMBER WOODALL: I knew you'd be thrilled, Mr. Chairman.

CHMN. CHENAL: Member Grabel -- or, Ms. Grabel.

MEMBER HAENICHEN: You've been promoted.

MEMBER HAMWAY: Not really.

CHMN. CHENAL: No.

Yes, take a look at it. We'll talk about it tomorrow. But I still want to go back to the main point. This was discussed ad nauseam in SunZia, ad nauseam in Southline. We all -- at least I had a very clear understanding of the purpose and intent of these conditions, and the idea that we were going to require the Applicant to construct the entire project using the same standards on private land, on state land, as was

required on federal land, and there was no real misunderstanding there.

So I'm a little confused, but we'll give the Applicant time tonight. And certainly -- I'm certainly very open to, you know, some tweaks and things like this to make it more, you know, more custom fitting to the Applicant's project, and for some of the reasons that Mr. Rogers has already noted.

I have to make a comment, though, about Member Woodall's comments. We have had those provisions in just about every CEC where there's been a transmission line with interconnections, and at least the interconnection agreements. And I appreciate the distinction with transmission service agreements.

But going back, that was a request that Staff had made in a previous case. And I remember in the SunZia case we had a lot of discussion about it with a couple representatives of the Corporation Commission that actually testified in the case, and we went through that in some detail is my recollection.

So anyway, we'll talk about that tomorrow. We'll also talk about these provisions, you know, that we've just discussed. And hopefully it won't take as much time tomorrow, but I think a lot of these provisions we have seen in previous cases. They are

being proposed by the Applicant, so I hope we're not going to have a lot of time, you know, to spend on provisions that we've seen repeatedly in past CECs, and maybe we won't take too much time to have to go through those. I think a little more time may be involved with the ones I'm proposing for discussion.

MEMBER WOODALL: The only two I'm concerned about is if Staff tells me they want to see them forevermore, that's meaningful information to me. The fact that they've been included in other CECs is not as helpful to me as if Staff says, yes, we want to see these in all future CECs.

Then there's no question in my mind that it's relevant to Staff and it's for a useful purpose. I don't look at that which has gone before; I look at what is in front of me now, and that's why it would be helpful to me. And then I'd never have to talk about it again.

CHMN. CHENAL: Thank you.

MEMBER WOODALL: That was a heartfelt thank you.

CHMN. CHENAL: Okay. So it's 4:30. Ms. Little --

Are there any further questions -- I should ask, Ms. Scott, if you have any questions of Mr. Rogers

on this?

MS. SCOTT: No, we don't. Thank you.

CHMN. CHENAL: Any further from the Committee?

(No response.)

CHMN. CHENAL: Ms. Grabel, any further?

MS. GRABEL: No, Chairman.

CHMN. CHENAL: All right, thank you.

Thank you, Ms. Little. You're still under oath. I appreciate you making yourself available today, coming down from Flagstaff, and I understand you'll be here tomorrow.

MS. LITTLE: Yes, I will be.

CHMN. CHENAL: So Ms. Scott or Mr. Arias, can you indicate what you've just provided us? Mr. Arias.

MR. ARIAS: Yes, Chairman. These are the exhibits to answer some of the questions that you posed to Ms. Little two weeks ago, and I'll address those right now -- or, address the exhibits.

MARGARET "TOBY" LITTLE,

called as a witness on behalf of the Staff, 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. ARIAS:

Q. Ms. Little, you're still under oath. I think the Chairman just covered that.

A. Yes.

Q. You have a document in front of you marked Exhibit ACC-3?

A. Yes.

Q. Could you please identify that document?

A. That is the links to the reliability standards for transmission line construction.

Q. Was ACC-3 prepared under your direction or control?

A. Yes.

Q. Are there any changes you'd like to make to ACC-3?

A. No.

Q. You have another document that's marked Exhibit ACC-4. Could you please identify that document?

A. That is some energy production and resource information for the years 2007 and 2018, also in response to the question that was asked by the Chairman when I testified on January 24th.

Q. Was ACC-4 prepared under your direction or control?

A. Yes.

Q. Are there any changes you'd like to make?

A. No.

MR. ARIAS: Chairman, I think I jumped the gun two weeks ago, but now I'd like to move for the admission of ACC-1 through 4 into evidence.

CHMN. CHENAL: Can you remind us again what 1 and 2 are, ACC-1 and ACC-2?

MR. ARIAS: 1 and 2 were our prefiled testimony and Staff's PowerPoint presentation.

CHMN. CHENAL: Very good. Any objection to ACC-1 through 4?

(No response.)

CHMN. CHENAL: Hearing none, ACC-1 through 4 are admitted.

(Exhibits ACC-1 through ACC-4 were admitted into evidence.)

MR. ARIAS: Thank you, Chairman.

BY MR. ARIAS:

Q. Toby, I'll let you go ahead now and explain Exhibit 3 and 4.

A. Okay. Starting with Exhibit 3, they're just two links there, which are the links to the

reliability standards that we refer to when we talk about good utility practice and applicable reliability standards in transmission design and construction and operation, actually.

They're long, and there's a lot of information in there. But if anybody wants to take a look at what kinds of things they include, those are the links to the standards.

ACC-4 lists some information about energy production and nameplate capacity for generation that was installed in Arizona in the years 2007 and 2018. This information came from the U.S. Energy Information Administration, and the links to that website are also included there.

Basically, in 2007 I've included energy production. And I'd like to note here that the production includes energy -- it's basically the energy that was produced by the generators in the state of Arizona, and it includes both the load in Arizona and also sales.

For both 2007 and 2018, there are two capacity numbers given there for each year. One is the nameplate capacity for the generators, and the second is the summer rating for the generation. In the summertime, when it's hot, the generators actually are

rated lower because they cannot produce as much when they're hot -- when it's hot out.

Also, the number of facilities in each year, and I've indicated the number of renewable generation facilities in each year. Note that in 2007 there were no wind plants in Arizona and only five solar plants; whereas in 2018 there were 72 solar plants and five wind generators.

CHMN. CHENAL: Excuse me, I'm sorry.

Member Hamway.

MEMBER HAMWAY: Maybe she's going to get to it. Why is energy production in 2018 less than in 2007?

MS. LITTLE: I looked at not only energy production, but I also looked at the load, the sales. Not the production at the generator that was used in Arizona, because we don't have those numbers or I was unable to find those numbers, but the actual sales, energy sales in Arizona went up slightly between 2007 and 2018.

Energy has not -- energy usage in Arizona and pretty much across the country, but certainly in Arizona I know, has not gone up as much as the peak demand has gone up because of energy conservation, generally speaking.

The fact that it is 111,000 gigawatt hours, as opposed to 113,000 gigawatt hours in 2007, part of that is due to just a reduction in sales that year of off-system sales or out-of-state sales. The actual sales to customers in 2007 was 77,193 gigawatt hours, whereas in 2018 it was 78,346 gigawatt hours. So it was a little higher in 2018, the usage, actual usage in Arizona.

The other thing that I would like to point out is that wind and solar nameplate capacity is not necessarily comparable to thermal nameplate capacity because of the fact that it is not available a hundred percent of the time. And in addition, when you've got a solar plant or a wind plant, you have to have firm backup for that plant.

So when you start adding renewable resources to your system, you have to have resources that can back that renewable generation up. So even though it appears that we have a great deal more capacity now on the system than we did in 2007, the two numbers are not necessarily completely comparable because of the fact that we do have a significant amount of solar and wind now compared to 2007.

Am I done?

MR. ARIAS: Chairman, I have no other

questions.

CHMN. CHENAL: Questions from the Committee?

MEMBER HAMWAY: I have a technical question, but I don't know that it really relates, and maybe it's better posed to Mr. Amirali.

But we've done two merchant lines, Southline, which I think was a WAPA line, in conjunction with WAPA, and then we did SunZia. So my question is, once these are built, can they be turned over to ISO for operation? And number two, can merchant lines be put into the EIM?

MS. LITTLE: Well, transmission lines -- sorry. Transmission lines themselves are not turned over to the EIM.

MEMBER HAMWAY: Okay. Let's go with the first one. Can ISO take over operation of it?

MS. LITTLE: I don't know the answer to that question. I would guess so, if the merchants were to choose to do that.

Do you know?

MR. AMIRALI: May I?

MEMBER HAMWAY: Please.

MS. LITTLE: Please.

MR. AMIRALI: I thought I was out.

MEMBER HAMWAY: I know.

MR. AMIRALI: Member Hamway, the answer is a very large maybe because, one, when it comes to the development of transmission, as we have testified through this proceeding, the ISO has the -- the ISO -- any new lines that are built, the ISO has to put it through the FERC 1000 process. So that's the process they have to follow.

However, for existing lines, the ISO has to see a benefit for incorporating any transmission systems. Typically the ISO has, in the past, has only incorporated large transmission systems into their area rather than individual transmission lines. For example, four years ago Valley Electric brought their 230 kV system, which is a cooperative in Nevada, brought their transmission system and put it in the part of the CAISO. And CAISO accepted that and included that, only the large transmission to the rate base.

Last comment is, several of these transmission owners have tried to put their system into the CAISO, and the CAISO has refused it. That includes TransWest Express Line. They have been wanting to make their transmission system a part of CAISO, and CAISO has not accepted it. So the answer is, it could happen, but very highly unlikely.

MEMBER HAMWAY: And so that also is -- if the L.L.C. or whoever, you know, is not a utility, but how does that work with the EIM market?

MR. AMIRALI: What L.L.C.?

MEMBER HAMWAY: I mean, the owner of the merchant line. So would they ever be able to participate in the EIM market? Because they're not a utility necessarily. I don't know what I'm asking.

MS. GRABEL: I think I know a clarifying question.

MEMBER HAMWAY: Okay.

MS. GRABEL: So Mr. Amirali, would the Southline or SunZia, when built, would those transmission assets -- could they be used for participants in the EIM market to access the EIM market?

MEMBER HAMWAY: Thank you.

MS. GRABEL: Sure.

MR. AMIRALI: Ms. Grabel, SunZia is -- and I would not -- I use this word tongue in cheek, so please -- I'm just trying to make an emphasis point here. It's a glorified gen-tie line. It is moving generation from a very large generation pocket towards a delivery point.

So electrically there is no -- even though

the generation is located in New Mexico, typically it is delivering at the point where it connects with Arizona. So they don't have to participate in the EIM market, they just -- it is the generation that participates in the EIM market, and there's no load on that line, so it is kind of pointless to have that.

MS. GRABEL: Let me ask it a different way. Could APS bring power that it procures through the EIM over SunZia?

MR. AMIRALI: Absolutely.

MS. GRABEL: And could it do so over Southline?

MR. AMIRALI: Absolutely.

MEMBER HAMWAY: Okay. I guess that's the question. Thank you.

MR. AMIRALI: Thank you.

MEMBER HAMWAY: Sorry, I know I got us off track.

CHMN. CHENAL: I think we were close to being finished. I'm just trying to think of an intelligent question to ask of Ms. Little, and I'm having a hard time with it.

It's striking that there's so many new facilities that's renewable power. So it's gone in 2007 to 2018 from five to -- well, it says, in terms of

renewable generation, 5 to 77. And I guess if the power -- if the energy production is roughly the same, I guess that fills in the decommissioning of the coal plants. But maybe you can comment on that, Ms. Little.

MS. LITTLE: In part, I would say. There has been other generation that's been built in Arizona also, particularly gas generation, between 2007 and 2018. As you can see, the total number of facilities went up from 59 to 132. And yes, 79 of those were -- or, 72 of those were renewable generation facilities. But yes, to some extent, the renewables have definitely replaced the coal plants.

CHMN. CHENAL: Well, if there's a lot of -- if the number of facilities went up substantially, more than doubled, and the energy production is roughly the same, somewhere some of the energy that had been produced and generated fell off the -- fell out of production.

MS. LITTLE: That's true also, yes.

CHMN. CHENAL: And would the majority of that be coal, would you say?

MS. LITTLE: Yes, and the less efficient other thermal plants.

CHMN. CHENAL: Member Haenichen, any questions?

MEMBER HAENICHEN: Well, yeah, along the same line of inquiry you were just exploring.

Is it not likely that new large solar generating facilities, at the current state of the yard of the storage system, as we've been hounding on all day long, isn't it likely that many of those additions will be backed up by conventional gas-fired --

MS. LITTLE: Yes, yes.

CHMN. CHENAL: Any further questions from the Committee?

(No response.)

CHMN. CHENAL: Any further questions from the Corporation Commission Staff?

Oh, Member Woodall.

MEMBER WOODALL: I just wanted to say, my request to you that you provide your assessment of these two paragraphs, I anticipate that you will do that during deliberations, and that you may require consultation within Commission Staff in order to provide a position on it. So that's what my expectation is.

So that's why I'm not asking Ms. Little that, because she just got the document and I just posed the question. So sometime tomorrow if somebody from Staff can tell me that, that would be great. Thank you.

CHMN. CHENAL: All right. Ms. Grabel, any further questions of Ms. Little?

MS. GRABEL: No, sir. Thank you.

CHMN. CHENAL: And Ms. Little, will you be here tomorrow?

MS. LITTLE: I will be.

CHMN. CHENAL: Okay. Because I think it would be helpful, in case we get into certain aspects of the conditions, that it would be helpful to have your expertise.

MS. LITTLE: I'll be here.

CHMN. CHENAL: All right, thank you.

Well, I'm surprised. It's a little before 5:00 and we're finished, I think, with the testimony.

Are there any -- so let's discuss. Are there any more witnesses that the Applicant's -- or, testimony the Applicant is going to provide?

MS. GRABEL: Not unless the Committee requests it. No, Chairman.

CHMN. CHENAL: Okay. And attorneys for the Corporation Commission, Mr. Arias, Ms. Scott?

MR. ARIAS: Staff has nothing further.

CHMN. CHENAL: Okay. Does the Committee have any further questions, homework assignments?

(No response.)

CHMN. CHENAL: It doesn't look like it, other than what's already been noted.

MEMBER WOODALL: Mr. Chairman, I'm assuming we're going to follow the same typical practice of having a CEC on one screen, and then a working copy on the other screen, and then we'll be making amendments, so we'll be doing that. And we'll be working off of what you've distributed here today; is that correct?

CHMN. CHENAL: That's correct. And I think there will be a few modifications to that, but maybe those are the sum of the modifications we'll work with on the right screen.

So yes, traditionally what we've done is we start with what I've provided on the left screen, and then as we work through -- and the right screen we'll have the same document, okay. And then we work through, you know, paragraph by paragraph, condition by condition, and we make changes as we go along. We modify, pick up scrivener's errors, we make changes.

And then at the end of the proceeding, we then vote on what the final document looks like on the right, which is different than the document we started with. They'll both have separate exhibit numbers, so we'll refer to the exhibit number as we're speaking on the record so the record is clear.

And then we do a vote on what we end up with on the right-hand screen, and that then becomes, assuming it's passed, the final version, and then it's dressed up, you know, accept the changes and, you know, and then it's finalized and then that's what's signed. So that, I think, is the easiest way to follow it on the record.

So we'll do that tomorrow. We'll have any closing remarks from the Applicant and Staff, certainly. There may be some questions that, you know, we have to address tomorrow. But with any luck, you know, we can get into the deliberations after the closing comments, statements, and, you know, we can get through it.

I'm encouraged that we completed so much today. I didn't think we were going to be able to do that, but that's good we were.

So are there any more procedural issues we should discuss tonight before we break for the evening and meet tomorrow?

Ms. Grabel.

MS. GRABEL: Chairman, I just wanted to put on the record that Member Woodall did compensate the Applicant for lunch today.

MEMBER HAMWAY: What time are we starting

tomorrow?

CHMN. CHENAL: 9:00 a.m. tomorrow.

MEMBER GENTLES: And what time will we end?

CHMN. CHENAL: Well, Member Gentles, I mean, we'll end when we end, okay.

MEMBER HAMWAY: I think he was being facetious.

CHMN. CHENAL: It could be midnight tomorrow, but we'll finish when we finish.

MS. GRABEL: And we will have a phone available so that if Member, I think, Villegas needs to call in, he can do so. And we will also have some of our staff on the phone too.

Apparently, we need e-mail addresses for anyone who wants to participate telephonically, because we go through an internet website, and we need to e-mail the access information to those individuals, or we can just e-mail them to Marie, who can then forward them on.

CHMN. CHENAL: You've lost me a little on that last aspect.

MS. RUHT: We are using the same system we used in Quartzsite, which is called Zoom. And so it's just easier if you make a meeting and everyone calls in, as opposed to having one number and trying to

figure out that, since we're not in a normal conference room.

Did one of the Committee Members still want to call in? I think we had on the record last week that that was the case.

CHMN. CHENAL: Well, Member Villegas is actually under the weather. But I said in spite of his not feeling well, if we need him, he's going to be available, whether he likes it or not, if we need him. And we'll call him and have him if we need him for a vote if for any reason we're lacking a quorum. But short of that, I don't see anybody else on the line.

MS. GRABEL: Just our own team.

CHMN. CHENAL: Your own team, okay, very good.

So anything further that we need to discuss before we adjourn for the evening? Going once, going twice.

(No response.)

CHMN. CHENAL: Sold. See you tomorrow at 9:00. Thank you.

(The hearing adjourned at 4:58 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 11th of February, 2020.

KATHRYN A. BLACKWELDER
Certified Reporter
Certificate No. 50666

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