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BUSINESS MEETING

BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)
	)22-BUSMTG-01
Business Meeting	)
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REMOTE ACCESS ONLY

Public comment is accepted solely through the Zoom platform.

The California Energy Commission's (CEC) January 26,2022 Business Meeting will be held remotely, consistent with Assembly Bill 361 (Rivas, Chapter 165, Statutes of 2021) to improve and enhance public access to state meetings during the COVID-19 pandemic and future emergencies by allowing broader access through teleconferencing options. The public can participate in the business meeting consistent with the direction provided below.

Please note that the CEC aims to begin promptly at the start time and the end time is an estimate based on the agenda proposed. The business meeting may end sooner or later than the time indicated depending on various factors.

Pursuant to California Code of Regulations Title 20 section 1104(e), any person may make oral comment on any agenda item. To ensure the orderly conduct of business, such comments will be limited to three minutes or less per person. Any person wishing to comment on information items or reports (non-voting items) shall speak during the general public comment portion of the meeting and have three minutes or less to address all remaining comments.

WENESDAY, JANUARY 26, 2022

10:00 A.M.

Reported by:
Peter Petty

APPEARANCES

Commissioners (Via Remote)

David Hochschild, Chair
Siva Gunda, Vice Chair
Karen Douglas
Andrew McAllister
Patricia Monahan

Staff Present: (Via Remote)

Drew Bohan, Executive Director
Linda Barrera, Chief Counsel
Noemi Gallardo, Public Advisor
James Qaqundah, Assistant Chief Counsel
Lisa Worrall, Staff Project Manager
Jennifer Baldwin, Staff Counsel
Leonidas Payne, Staff Project Manager
Jeff Harris, Lead Project Counsel
David Stein, Lead Environmental Consultant

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I N D E X

P R O C E E D I N G S

NOVEMBER 15, 2021 10:02 a.m.

(Start of Introductory Video.)

MS. MURIMI: Welcome to the California Energy Commission's Business Meeting.

Zoom's closed captioning feature has been enabled to make Energy Commission business meetings more accessible. Attendees can use this feature by clicking on the "Live Transcript" icon and then selecting either "Show Subtitle" or "View Full Transcript." Closed captioning can be stopped by closing out of the live transcript or selecting "Hide Subtitle." Those participating solely by phone do not have the option for closed captioning.

The Energy Commission will continue to post the transcript of this Business Meeting rendered by a professional court reporter in the docket system and on the Business Meeting webpage.

Consistent with Assembly Bill 361, today's business meeting is being held remotely through Zoom to improve and enhance public access to state meetings during the COVID-19 pandemic. The public can participate in the Business Meeting consistent with the instruction for remote participation found in the notice of this meeting, and as set forth in the agenda posted to the Energy Commission's

website.

Pursuant to California Code of Regulations Title 20 section 1104(e) any person may make oral comments on any agenda item.

Once the public comment period begins if you'd like to speak, please raise your hand by clicking on the "Raise Hand" icon at the bottom of your screen. Please note that if Zoom were to shut down, we would switch to the Verizon phone line at (888)823-5065. The pass code is "Business meeting." Public comment would then be accepted through Verizon.

To ensure the orderly and fair conduct of business, public comments will be limited to three minutes or less per person for each agenda item voted on today. Any person wishing to comment on the information items or reports, which are non-voting items, shall reserve their comment for the general public comment portion of the meeting. And shall have a total of three minutes or less to state all remaining comments.

If you're joining by phone press *9 to raise your hand and *6 to unmute. After the Public Advisor calls on you to speak, spell your name, and state your affiliation if any.

Welcome to the California Energy Commission's Business Meeting. The meeting will now begin.

(End of Introductory Video.)

CHAIR HOCHSCHILD: Well, good morning and welcome friends. I'm David Hochschild, Chair of the Energy Commission. Happy New Year to all again, and we'll call this meeting to order. Joining me today are Vice Chair Gunda, Commissioner Douglas, Commissioner McAllister and Commissioner Monahan. We have a quorum. And we'll proceed with the business meeting starting with Commissioner McAllister to lead us in the Pledge of Allegiance.

(Whereupon the Pledge of Allegiance was recited.)

CHAIR HOCHSCHILD: Thank you, Commissioner McAllister.

I'm happy to announce that at today's Commission meeting we are seeking approval for over $20 million in grants at this business meeting, all of which will help support our economic recovery and continued progress on climate solutions.

So let's turn now to Item 1, the Consent Calendar. Are there any public comment on Item 1, Madam Public Advisor?

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees, if you would like to make a public comment, please use the Zoom raised-hand feature, it looks like a high-five. If you are on by phone, please press *9 to raise your hand and *6 to unmute.

I'm looking for hands now. I do not see any, Chair. We can proceed.

CHAIR HOCHSCHILD: Unless there is Commissioner discussion, Vice Chair Gunda, would you be willing to move the item?

COMMISSIONER GUNDA: Yeah, thank you, Chair. I move Item 1.

CHAIR HOCHSCHILD: Commissioner McAllister, would you be willing to second?

COMMISSIONER MONAHAN: I second Item 1.

CHAIR HOCSCHILD: All in favor say aye.

Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: And I vote aye as well. That item passes unanimously.

Let's turn now to Item 2, California Energy Demand 2021-2035 Forecast of Natural Gas and Electricity Consumption. Let's start with Nick Fugate to present.

MR. FUGATE: Hi there. Good morning,

Commissioners. I'm Nick Fugate with the Energy Assessments Division. And I'm here today to propose adoption of the California Energy Demand Forecast, for years 2021 to 2035. I have a brief presentation covering the purpose of this forecast, a recap of our process this year, notable changes that we've made over previous vintages, and some high-level results. Next slide, please.

Demand forecasting is one of the Energy Commission's charter responsibilities. And if adopted today, the forecast will be incorporated into Volume IV of the 2021 IEPR. The demand forecast is also a critical planning tool that lays the foundation for a number of statewide planning and procurement efforts including transmission and distribution planning, integrated resource planning, resource adequacy and other activities aimed at keeping California's energy clean, affordable and reliable. Next slide, please.

We refresh our forecast every year, vetting it within the CEC's annual IEPR proceeding. In 2021, we held five workshops presenting and soliciting stakeholder feedback on our inputs and assumptions, on proposed methodological changes, and on our draft forecast results. We also held a number of demand analysis working group meetings to discuss specific technical elements of the forecast and to review the forecast results in more detail.

We routinely engage with JASC. This is a working group intended to promote coordination between the IEPR forecast and its dependent processes at the CPUC and ISO. Each of these venues provides valuable feedback to staff during the development process. And I'd like to thank all of our colleagues and stakeholders who took the time this year to participate in these discussions and provide input.

Our final workshop to present draft results was held in early December. I want to note that we made two subsequent adjustments to our forecast in response to stakeholder comments. The first was a slight correction to our EV charging profiles within the hourly forecast. And the second was a downward adjustment to our original 2021 weather-normal peak estimate for the CAISO control area. Next slide, please.

2021 was a full forecast cycle. This means that not only did we refresh our inputs and assumptions and conduct a new set of model runs, we also made some analytic improvements. With an eye toward California's long-term decarbonization goals we extended our forecast horizon by another three years, so out to 2035.

The extreme heat events of Summer 2020 highlighted the challenges around determining normal weather conditions within a changing climate. This is a critical step in forecasting peak demand. And so this

forecast gives greater weight to recent historical weather patterns in order to better account for increasing temperature trends.

This forecast also includes estimates of incremental behind-the-meter PV and storage adoption in the commercial new construction sector expected as a direct consequence of the CEC's recently adopted Title 24 standards.

Finally, in coordination with the CPUC's latest potential and goals study process we not only refreshed our Additional Achievable Energy Efficiency Savings scenarios, but we also, for the first time, developed scenarios around potential building electrification impacts. We're calling these "Additional Achievable Fuel Substitution."

The purpose of these additional achievable scenarios is to demonstrate a plausible range of incremental impacts that might occur from future standards and programmatic efforts which, while reasonably likely to occur in some form, have too much uncertainty around their timing and implementation to be explicitly quantified and embedded directly within our baseline forecasts. Next slide, please.

This is our statewide baseline forecast of electricity sales. The spread between the scenarios reflects different assumptions around economic and

demographic activity, retail rates, climate change impacts, as well as photovoltaic system and electric vehicle adoption.

New behind-the-meter PV installations, including those now required by Title 24, are expected to reduce sales by about 38,000-gigawatt hours in the mid-case by 2035. Working in the other direction, electric vehicle charging is expected to add more than 24,000-gigawatt hours over the forecast horizon. Overall, mid baseline sales grow at a rate of 1.1 percent annually, slightly higher than our previously adopted forecast.

Now while these baseline scenarios alone do not reflect the impact of additional achievable efficiency or fuel substitution, some of our additional achievable scenarios were intentionally designed to be paired with our baseline forecasts. And such pairings are meant to create managed forecasts which can be used for planning. Next slide, please.

So here's an example, this is our managed annual peak forecast for the California ISO.

PV additions have less of an effect on system peak as the peak hour shifts later in the day when PV output is reduced. But also load growth from electric vehicle charging is not as significant since the bulk of that charging is expected to occur outside of time-of-use

peak windows.

All scenarios begin from a weather normalized estimate of 2021 peak load, which is higher than previously forecast. A commonly used managed scenario includes the mid baseline forecast paired with mid additional achievable scenarios for both efficiency and fuel substitution. This specific combination is depicted here by the solid blue line with the triangle markers. And this scenario grows at a rate of 0.9 percent annually, again slightly higher than our previously adopted managed forecast.

All of these scenarios were presented and discussed at various workshops throughout last year, with final presentations at IEPR workshops on December 3rd and December 16th. Next slide, please.

So my previous slide depicted a number of managed scenarios, each comprised of different baseline and additional achievable scenario pairings. This suggests that the forecast is not a single forecast, but actually a set of forecasts comprised of baseline and additional achievable scenarios, each containing annual, hourly, and peak projections. Additionally, our peak forecast has different variants to account for extreme weather.

All of these projections have been docketed along with a notice of availability, which describes the complete set of forecast products being considered today for

adoption. For a specific planning purpose, the appropriate selection of a baseline scenario, weather variant, and additional achievable scenarios from among the entire forecast set depends on the need of that specific use case.

There is an agreement between leadership at the Energy Commission, the Public Utilities Commission and the California ISO, referred to as the Single Forecast Set Agreement, which describes the current commitments at each organization to use a particular combination of forecasts for a particular planning purpose. And for the sake of transparency that agreement has been updated and will be memorialized within Volume IV of the 2021 IEPR. Next slide, please.

And finally I want to take just a moment to offer my thanks, specifically to the load serving entities who made the effort this year to provide detailed responses to our IEPR data requests, to our stakeholders who took the time to participate in our workshops for DR presentations and results and provide feedback, to the numerous CEC contributors across the entire Energy Assessments Division. Developing the forecast is really a team effort, and specifically to the handful of staff who stepped out of their normal role this year and put in a lot of hours to make sure we could present the forecast here today. And of course to the EIPR team for their unwavering patience and

support.

And with that I'll conclude my presentation by recommending that the Commission adopt the California Energy Demand 2021 to 2035 Forecast.

CHAIR HOCHSCHILD: Thank you, Nick, appreciate that. Noemi, do we have any public comments on Item 2?

MS. GALLARDO: Let me check. This is Noemi Gallardo, the Public Advisor. If you would like to make a public comment, please use the raised-hand feature on the screen, it looks like a high-five. If you are on by phone please press *9 to raise your hand, *6 to unmute.

I'm looking for hands. I do not see any, Chair. We can continue.

CHAIR HOCHSCHILD: Okay, let's turn to Commissioner discussion, starting with Vice Chair Gunda.

VICE CHAIR GUNDA: Thank you, Chair. I just want to begin by just saying a big thanks to the forecasting team as Nick generally noted, but I want to give credit to Nick and Lynn specifically. And to a number of others who worked really hard to step in to make this forecast happen, given (indiscernible) of resources in terms of staff, but also the changes and the last-minute requests a from number of us, including myself. So I just want to say thank you sincerely to Nick and the team for making this happen year after year.

But also as Nick noted, thanks to the stakeholders. I think without the stakeholders, especially the LLCs, (indiscernible) participants in developing the forecast as rigorously as we currently do is impossible. So I just want to note thanks to all the stakeholders who put in an enormous amount of time to help guide this forecast. And bring it to the Commission for adoption in a way that all of us are generally an agreement on where we landed, so that's a huge boon to the process. I just want to thank everybody.

I also want to specifically note Jeff Webers. As Nick notes, we have CAISO, CPUC, CEC and CARB that meets regularly on a weekly basis to go through the forecasting improvements. That's a lot of effort done by the staff. And want to note the leadership at CPUC, Simon Baker, and Delphine Ho at CAISO for their leadership within their organizations, helping pull this all forward. And obviously the leadership in the Energy Assessments Division, Aleecia Gutierrez and specifically Matt Coldwell and Heidi Javanbakht. So overall it's a huge team effort and I just want to say thank you and thanks to the IEPR team as well.

I want to say a couple of things that are important as we move forward that this is not a static process, the forecasting. It has improved enormously.

There has been some process changes that have been implemented, including what we now call a request window, where there is an opportunity for a lot of our regular collaborators to provide input on what changes are to be made outside of the Commission's public meetings, which is great. And I just want to commend the forecasting team for that.

And also that has been more and more focused on providing insights into how to plan for reliability, that's a huge output. And again, thanks to Nick and the team for providing that information internally, also to the Appliances Office to help develop those stack analysis and such. So there's a lot happening behind the scenes.

I'm also grateful for the staff to keeping me updated regularly and just kind of helped me understand the changes.

So with that I'm completely in support of adopting the forecast and just commend the staff for all the work they do and continue to improve our analysis to help meet the goals of the state.

CHAIR HOCHSCHILD: Thank you, Vice Chair Gunda.

Are there comments from other Commissioners?

COMMISSIONER MCALLISTER: Yeah, I had a comment.

CHAIR HOCHSCHILD: Go ahead.

COMMISSIONER MCALLISTER: Great. Well, first of

all I wanted to just second all the thanks from Vice Chair Gunda. And actually amplify those toward him, Vice Chair Gunda, for your leadership helping this team take increasingly well-defined and capable shape as we move forward. And as you said these products are going to continue to evolve and respond to the needs of the reliability discussion and become increasingly sophisticated and sort of data-rich. And I think that helps the state and the west even begin to grapple with these broader issues around reliability, more generally even.

And just this work really does form from a central platform for insights about our energy systems as a whole, but particularly the focus has obviously been on electricity. So anyway I'm in full support. I want to thank the staff for also keeping me up to date and answering questions when I have them.

And I guess among the whole group I just want to particularly shout out to Matt Coldwell and wish him the best as he heads over to the PUC and I think we'll all miss him, but that's the nature of the beast. When you do good work, you get noticed. And we have this broad multi-agency team that will continue to function well, and firing on all cylinders and it's a really nice to see, so good luck to Matt.

CHAIR HOCHSCHILD: I second those comments about Matt, thank you for your service.

Commissioner Monahan? Yeah, go ahead.

COMMISSIONER MONAHAN: Well, I'll be brief. I just want to also say I really have appreciated the evolution in the modeling on transportation, which is a work in progress. I mean by 2035 what the world will look like, there's a lot of speculation. And we're using good data in partnership with the Air Resources Board on the vehicle deployment side. But I do think like this is an area of where we need to continually be creative and recognize that our models are going to be imperfect, because we can't prognosticate what the future will look like. And if batteries in particular really continue on this trajectory of price reduction, what that will mean especially in the medium- and heavy-duty space. I think it's just worth a lot more analysis and deliberation.

And just you know, Matt has been great. So, Matt, I wish you all the best at the PUC. We're really going to miss you. And Heidi has been really helpful and now Quentin is a thought leader in this space. So just given as you said, Vice Chair Gunda, the opportunity for resilience, more distributed energy resources brought in and how do we make sure that transportation is part of that, especially in the medium- and heavy-duty space. Just

a lot of rich topics for an analyst for, I would say at least a decade to come, good job prospects go into that space.

So I look forward to approving this and just again, appreciate the team and their thoughtful partnership on this.

CHAIR HOCHSCHILD: Thank you.

Commissioner Douglas, go ahead.

COMMISSIONER DOUGLAS: I just wanted to very briefly add my thanks to the team, and to Commissioner Gunda. This is one of our core work products. It's a critically important effort, the level of internal analysis and also external coordination to bring forward a product that really is what the state needs. It is easy to underestimate, and this team's done it again. And I just appreciate it.

CHAIR HOCHSCHILD: Go ahead, Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, I wanted to say an additional thanks to Matt, but I didn't know if I should. But now that we talked about Matt leaving to CPUC or moving to CPUC or another family I just want to say, Matt, you've done incredible work.

I think, Matt, my close association with you over the last four years working together I just appreciate your thoughtfulness, your integrity, and just your ability to

develop relationships. We'll miss you a lot, but hope you being at the CPUC will help from the other end in improving our relationships and working more and more collaboratively. So sincerely we'll miss you. All the best, I look forward to working with you in your new role. Thank you.

CHAIR HOCHSCHILD: Thank you, Vice Chair.

With that, Vice Chair Gunda, would you mind moving Item 2?

COMMISSIONER GUNDA: Absolutely, Chair, I move Item 1.

CHAIR HOCHSCHILD: And Commissioner McAllister, would you be willing to second Item 2?

COMMISSIONER MONAHAN: I second Item 2.

CHAIR HOCSCHILD: Okay. All in favor say aye.

Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: And I vote aye as well. Item 2 passes unanimously. My thanks again, congrats to the

staff for all their work.

And let's turn now to Item 3, Information Item on Russell City Energy Center Joint Agency Working Group Regarding the Steam Turbine Explosion in Summer of 2021 Operations.

MS. HUBER: Happy New Year, and good morning, Chair, Vice Chair and Commissioners. My name is Elizabeth Huber. I manage the Office of Compliance Monitoring & Enforcement in the Siting, Transmission, and Environmental Protection Division.

With me this morning to present on this item is Nika Kjensli, Program Manager with the California Public Utilities Commission's Electric Safety and Reliability Branch. And Kelly McAdoo, City Manager for the City of Hayward. We also have here from STEP's Engineering Office, Manager Geoff Lesh. And from the Chief Counsel's Office, Assistant Chief Counsel James Qaqundah. Also present is CPUC's Lead Engineering Investigator Jim Cheng, STEP Deputy Director Shawn Pittard, and his CPUC counterpart, Lee Palmer, Director of CPUC's Safety and Enforcement Division, who are also available to answer questions at the end of the presentation.

We're here in response to your July 15, 2021, directive to provide updates on the ongoing investigation concerning the May 27th, 2021 steam turbine overspeed

explosion and fire at the Russell City Energy Center. And to update you on the multi-agency communication and coordination process that will ensure that the Hayward community receives pertinent, real-time health and safety information.

Together, CPUC Program Manager Kjensli and Hayward City Manager McAdoo and I will present this non-voting, informational item about the facility's operation in a temporary simple-cycle mode during the summer of 2021, the efforts of the CPUC and CEC regarding the ongoing investigation, and the activities of the Joint Agency Working Group with the City of Hayward and the Hayward Fire Department. Next slide, please.

To refresh your recollection, I'd like to provide background and context for today's update. On May 27th, 2021, Russell City Energy Center experienced a mechanical failure of a steam turbine generator that resulted in an explosion that hurled dozens of pieces of equipment off the project site and resulted in an onsite fire requiring response by the Hayward Fire Department. The steam turbine generator was damaged.

In addition to the immediate public health and safety threat this incident resulted in a loss of 600 megawatts of generating capacity. In response, Russell City Energy Center had submitted a project change petition

for a temporary modification to operate the undamaged combustion turbine generators in a simple-cycle mode, generating up to 350 megawatts when called upon. This petition was approved by an Order of the Commission at the July 15, 2021, Business Meeting.

In addition to approving the requested change the Commission Order required Russell City Energy Center staff to meet with CEC staff and the Hayward City Fire Department to discuss any needed modifications to their standard operating procedures for first responders and to implement when responding to onsite incidents. Next slide, please.

Along with the Commission Order, the Bay Area Air Quality Management District also approved a temporary air permit allowing Russell City Center to operate in simple cycle through November 9, 2021. With these approvals and modifications in place the CEC staff verified the Russell City Energy Center complied with all laws, ordinances, regulations, and standards and issued a certificate of completion, allowing the facility to operate under a temporarily modified license.

Between August 10th and September 23rd, 2021, the California Independent System Operator called upon Russell City Energy Center on 11 occasions for a total of 103 operating hours to help meet summer peak demand.

During the month of October 2021, the facility

started up on seven other occasions specific to Black Start and safety valve testing only. Next slide, please.

To investigate the Russell City Energy Center incident, both the CEC and CPUC inspection units established a Joint State Agency Investigation team. The joint team's efforts to date include meeting weekly since October 2021, inspecting the explosion and fire sites on nine different occasions to date, reviewing and independently analyzing Structural Integrity Associates' Root Cause Analysis Report as commissioned by the power plant owner, Calpine Corporation. Submitting formal Requests for Information for more than 100 documents including maintenance reports, operation records, and other agency site visit reports such as from the Occupational Safety and Health Administration, then reviewing and analyzing those 100 plus documents and reports. Interviewing more than a dozen onsite witnesses and first responders, verifying that more than a dozen smaller pieces of equipment were hurled from the facility in addition to the two large pieces of equipment as reported at the July business meeting. And hiring third-party independent expert consultants.

As a result of these efforts, the joint team has recently notified Russell City Energy Center and its owner of our intent to conduct an additional onsite inspection of

the facility in early February. During the additional inspection, the joint team and our independent consultants from Aspen Environmental Group and West Peak Energy will conduct a thorough examination and independent review of the facility and independently assess the findings of the Root Cause Analysis and supplement any gaps in RCA Report. The joint team will focus its site inspection on the equipment involved in the accident, the heat recovery steam generator system, and any facility operations and, maintenance, and management practices that may have contributed to the potential of this incident to occur.

Now, I would like to introduce CPUC Program Manager, Nika Kjensli. She will provide additional information about information specific to the CPUC's work to support the gap audit of Russell City Energy Center. Next slide, please.

MS. KJENSLI: Good morning, everyone. Good morning, Chair and Commissioners. My name is Nika Kjensli, and I'm going to talk briefly about the Electric Safety and Reliability Branch of the Safety and Enforcement Division at the CPUC. And I'm also going to go over some components of our audit process.

So the Electric Safety and Reliability Branch of the Safety and Enforcement Division, what we do is we enforce CPUC rules and regulations to ensure that power

plants and utility companies run a safe and reliable system, electric system.

We regularly conduct audits and inspections and investigate safety incidents as well as system problems, such as reliability concerns over the summer. And we advise the CPUC on these matters. For CPUC-jurisdictional power plants and electric generation facilities, we ensure compliance with General Order 167-B. Our audits are a main component of how we enforce GO 167-B. There are three phases to our audit process that I'd like to briefly go over with you all, just so that you're aware of how we conduct it and then also understand how the CEC folks that are going to be joining us on this task, what they are going to be observing as well.

So we have a planning phase part of our audit. This takes place -- this is when our engineers, they prepare for that audit through research and review of a selected power plant. And then we review their outage history, safety-related incidents that have occurred at the plant in the past, performance data as well as their maintenance and operation summary plans, and any procedures that are relevant.

If there's any problems, we will also take a look at those problems that they've had in the past and we usually follow up with some data requests and inquiries to

plant staff about those.

The second phase of our process is really a plant visit, and this is where we actually go onsite to the facility, and we spend about a week there looking over the plant to evaluate its programs and its procedures for compliance with GO 167-B. This where we conduct the bulk of the field work and looking at the plant's equipment. And then also doing any sort of inspections, and then also interviewing plant staff and personnel that are onsite. And actually reviewing real time their operations and the practices that these plant staff carry out.

The final phase is after we've conducted the actual onsite visit, we look at the reports and we draft a report and also any follow-up actions with the plant and with plant staff. So this includes looking at and drafting our findings into a confidential report that our team reviews to show the compliance with GO 167-B.

And then we actually issue a note, the report to the plant staff and ask them, give them 30 days to respond. And this report, it has all of our findings so if there's any corrective actions that we want them to implement those are noted in there and they have 30 days to respond to show us that they are either in compliance or that they have opened up a work order to ensure that that will be resolved.

We assign an engineer that issues this preliminary report, and then a final report once it's been reviewed by both our staff, our management and then also the plant staff and management.

We do post these on our website so that folks and the public have an opportunity to review them. If there's anything that's redacted, of course, we do publish a public version of it on our website, so anything that's confidential is shared just with us.

So for our upcoming review of the Russell City Energy Center, we're going to be basically conducting a similar phase. We've already been in the planning phase. And as Elizabeth mentioned we've sent out along with CEC staff a ton of data requests and document requests, have done a lot of interviews with plant staff. We do have this upcoming audit scheduled for the week of February 7th. And then following from that we will be producing a report, as will the CEC a separate report of course that goes over our findings.

So we are mostly going to be ensuring compliance, again with GO 167-B, looking at any sort of contradictions or whatnot that appear at the plant versus what was reported in the Root Cause Analysis Report. And then conducting a thorough review of the facility and the equipment and their operation procedures.

And now that was a brief overview of the SRB (phonetic). I'll turn it back to Elizabeth so that she can continue with the presentation.

MS. HUBER: Thank you, Nika. Next slide, please. And I think we need to move to one more slide, please.

I would like to now focus on the work of the Joint Agency Working Group, a partnership established by the CEC with the City of Hayward and includes representation from the CPUC and the Hayward Fire Department. The working group has been meeting every two weeks since July 2021 and has successfully implemented and/or supported several initiatives including the establishment of a Local Safety Action Plan.

At this time I'd like to invite Hayward City Manager, Kelly McAdoo, to provide for you an overview of these activities.

MS. MCADOO: thank you Elizabeth. And good morning, Commissioners, it's good to see all of you again. Thank you for having me this morning and for continuing to include the city of Hayward in this important process and investigation.

I just wanted to add on the upcoming audit that will be occurring in February, our fire department hazardous materials staff members will be participating in that audit, along with the CPUC and CEC staff so we're

grateful for that partnership.

We have been continuing to work as Elizabeth mentioned with the Joint Agency Working Group and have had some specific conversations with local Calpine staff to work on developing what we're calling a local Safety Action Plan and also working on some additional follow-up actions that were discussed by the Commission last July.

We did request with Calpine, and they have now completed a post incident analysis of hazardous materials that were released during the explosion and the fire so that we could determine potential exposures for fire department personnel and other personnel on site. We do have a copy of that report and City staff are reviewing that.

And then we are working with Calpine to determine the appropriate mechanisms for our compensation, for our repairs, and other damages resulting from the incident.

In terms of the local Safety Action Plan, this is sort of forward looking and what we will be continuing to do as we move forward.

the first element of that is that Calpine will notify the fire department in advance with hopefully at least two weeks' notice, maybe more, of any planned emergency drills or tabletop exercises that would be performed in compliance with their emergency action plan.

And that Calpine will coordinate with the fire department on at least two general emergency drills and one mock rescue drill annually.

And then that Calpine will also invite the fire department to participate in any roundtable discussions that take place following those drills.

I will mention that consistent with directions from the Commission las summer when Calpine was dispatched by CALISO they did notify both the City Manager's Office and the Fire Chief in advance of all of those ramp-ups and we will continue that process going forward.

We intend to have annual meetings with the city, Calpine, and fire department staff to discuss any operational changes that may be occurring at the plant. And then to continue to coordinate on any outstanding issues.

And then as needed conduct any community outreach or tours during the maintenance season of the plant.

In terms of community partnerships we are still working on the possibility to acknowledge the history behind the naming of Russell City and the displacement of that community. I did have a preliminary meeting with some of the descendants of that community. It was very interesting, just wanted to share some of that preliminary feedback. They indicated that there was some irony as that

was a community that was very energy insecure and didn't have reliable energy for a power plant to now be named after that community. And so we were going to continue that conversation about what we can do to continue to acknowledge the impact of what happened to that Russell City community and how we move forward going in, in the future. And so just continuing that conversation.

And just want to thank Calpine for their openness and partnership on that. We will be having probably a meeting with Calpine staff and some of the Russell City descendants in the near future.

And then I just wanted to take a moment and thank all of the Commissioners for their visits this past summer and also for just ensuring that this incident continues to get the attention that it needs. And I do want to thank Elizabeth, Nika, and the CEC staff and the CPUC staff who have all dedicated countless hours to ensuring that this incident has been investigated thoroughly and completely. And we are incredibly grateful for that and for the continued work on it. And so with that I will hand it back over to Elizabeth. Thank you.

MS. HUBER: Thank you, Kelly. And we concur. We thank you for your collaboration over the last six months.

With that, this concludes our presentation. With too many names to mention I would like to thank everyone

for their hard work to date and the continued commitment to understanding what caused this major incident so we can assure the community that this will not happen. There's still a lot of work to do and the team is available to answer any questions. Thank you. Next slide, please.

CHAIR HOCHSCHILD: Thank you, Elizabeth. Oh, is there more?

Ms. Huber: Nope, that was it.

CHAIR HOCHSCHILD: Okay, thank you, Elizabeth.

Let's turn now to Commissioner discussion, Commissioner Douglas.

COMMISSIONER DOUGLAS: Yes, thank you. And I wanted to thank the staff and CPUC and certainly the city, Russell City, just for this really great set of presentations. I just wanted to -- City of Hayward, I'm sorry -- I just wanted to reflect that it's been a long road since this summer. And I really appreciated the visit that I had to the power plant and with the city and just having the opportunity to reset and think through the communication, the relationships, the efforts that we all need to put forward here. And I know that the collaboration since some of those meetings, and even leading up to some of those meetings, has been very strong and I really appreciate it.

I know that the staff investigation separate from

the Root Cause Analysis is also proceeding and I've probably got a question or two about that as we go, but without a doubt these regular updates help us and provide the city and its residents and other stakeholders with the visibility into all of our efforts around this incident.

And I also wanted to call out the coordination between the Energy Commission team and the CPUC staff. And I know there's been a lot of work behind the scenes to improve the communication between these two programs. And also, beyond just communication looking at how to really leverage the strengths of what both what the Energy Commission brings in this case and with power plants under our jurisdiction, and what the CPUC, what capabilities and resources the CPUC brings in this area.

So I certainly look forward to the conclusion of this investigation and learning more about its findings. And appreciate the swift work and hard work between the agencies, the city, and Calpine to enable the Energy Center to be ready to restart in simple-cycle mode in August last summer when we really did need that electricity and to support summer reliability.

I guess, just in terms of a question, Elizabeth, if you could speak a bit more about the focus and timing of the staff investigation and what we should expect to see from that, that would be really helpful.

MS. HUBER: Absolutely. I'm also going to ask our lead mechanical engineer and manager, Geoff Lesh, to join in. Our timeline is as he's getting online, is to the first week of February. We have notified Calpine and Russell City that we'll be down there the week of February 7th, so that entire week. Our independent consultants from Aspen and West Peak Energy will be there, along with our colleagues at the CPUC. And as I mentioned in the report we are going to be looking specifically at the damaged equipment, the process, the design, from the Herzigs (phonetic) to the steam turbine generator. And then looking at all the maintenance and operation practices that are set down there.

Geoff, do you want to get into a little more of the nuts and bolts?

MR. LESH: I think you summarized it well, Elizabeth. The root cause analysis, I think as Elizabeth mentioned earlier, focused on equipment and the sequence of equipment failures that contributed to the overspeed event that led to the accident. We're continuing to look into the -- well we're validating those aspects of it as well as looking into, as Elizabeth mentioned, the total operations package that may have helped set the stage for these failures, to lead to the accident that they did.

So in that sense this gap analysis and the onsite

visit will allow us to discuss and view operations practices, maintenance practices, and things that weren't directly addressed in the root cause analysis. And so we want to supplement that so we get a total picture and then we can look at the proposed changes to the power plant and bringing it up to see that that package is sufficient and complete to give us the best chance of never seeing a recurrence.

COMMISSIONER DOUGLAS: Thank you. And in the spirit of never seeing a recurrence maybe a last question, what are the steps being taken to consider the possibility that other power plants under our jurisdiction or in California -- we'd have a similar enough design that we should notify them or Calpine should, if it's one of their facilities, to look into improvements?

MS. HUBER: That's a great question, Commissioner Douglas. And without stealing their thunder we are collaborating with the CPUC on a joint letter. And if Lee or Nika would like to speak to that specifically, since they took the initiative to do the first draft.

MS. KJENSLI: Sorry, this is Nika Kjensli. I couldn't find my unmute button. Yes, as Elizabeth said, we are conducting or we are in the rough draft phases of we've kind of compiled a list of plants that meet those operating the same, they have the same operational characteristics as

Russell City Energy does. And we've identified those plants and the CPUC and CEC are and we're drafting a letter that will reference them back to some of the public information that Calpine made regarding the incident and what could potentially be a -- what we've noticed is a notice to potential safety concern that we plan to send out to all those facilities to kind of just notify them of the incident.

We're in no way endorsing that that is the actual root cause at this time because, as you all know, our investigations are open and ongoing at this time, and we still have our upcoming audit scheduled for the 7th of February. So we don't want to conclude anything that will come out of that, but we do want to give them a heads-up, so to say, of this concern and of the incident and what happened in the equipment that was involved in that and leave it up to the generators to process that and then make any sort of adjustments or amendments to their facilities that would ensure that something like that doesn't happen at their plants.

COMMISSIONER DOUGLAS: All right, well thank you all for the work. I think the idea of the regular drill with the city to just make sure there's preparation for any event that could ever occur there, just thinking through our practices with regard to other local jurisdictions,

doing that outreach to potentially similarly situated power plants, any of that is just really good to see. So I think at this point I'll step back and see what questions others have. Thank you.

CHAIR HOCHSCHILD: Thank you, everyone. Unless there are other comments from Commissioners.

Oh, go ahead, Commissioner Monahan. Please.

COMMISSIONER MONAHAN: Well, first I want to thank City Manager McAdoo for your participation and the Fire Chief and the Mayor. I just feel like you guys have been really a team in working with us to ensure that your community is safe. And I know I speak on behalf of all the Commissioners that we were just appalled about the situation. And no lives were lost, but they could have been. We recognize that. And so ensuring that we're doing all we can to make communities safe as we provide power is just sort of a core value of all of us.

I am curious, I'm glad about the gap analysis. I mean, one of the challenges is that the root cause analysis of course is confidential, so it's shared, not public. And I appreciate that Calpine did share it with us, the city, others, that there has been that communication. I'm curious, Elizabeth, in terms of the gap analysis, what the confidentiality is on that? Is it a docket? I mean, is it available to the public upon

request? What's the --

MS. HUBER: Historically, and I see Linda jumping in, historically we do docket it when it's final and approved. But Linda, I'll turn it over to you.

MS. BARRERA: Good morning, Commissioner Monahan, Commissioners. I'm Linda, with the Chief Counsel's Office.

Calpine for Russell City has submitted about four applications for confidentiality, but the Chief Counsel's Office is reviewing a final determination as the confidentiality of some of part of the documents has not been completed. Usually the process is that the Applicant for requesting confidentiality submits an application to a confidentially docket. And an attorney in our office with my assistance reviews that request. We apply the law and then we make a recommendation to the Executive Director who then submits the letter or replies to the application.

So at this time a determination has not been made.

MS. HUBER: And, Commissioner Monahan, that's specific to Calpine's Root Cause Analysis Report. So to answer your question the work that the Commission does -- and I believe I won't speak for the CPUC -- but the gap analysis, we are coordinating together. But we're doing two separate final gap analysis reports and ours historically have always been docketed once it's been

approved for public consumption.

COMMISSIONER MONAHAN: Yes, as we learn more just if there's any question about that, if you could bring that back to the Commissioner Board. I mean a business meeting.

MS. HUBER: Absolutely.

COMMISSIONER MONAHAN: I don't know why I'm spacing on that word. That would be great. I think we all are very intensely curious on that about that and really want to do all we can to be transparent with the public, with the city, and with other stakeholders.

MS. HUBER: Oh, absolutely.

CHAIR HOCHSCHILD: Are there other Commissioners wishing to make comments? If not what I'd like to do -- oh go ahead, Vice Chair Gunda, please.

VICE CHAIR GUNDA: Yeah, I'm going to keep it very short. I think both Commissioner Douglas and Commissioner Monahan raised a number of things that are important to all of us.

So specifically again, thank you to City Manager McAdoo, Mayor Halliday and Chief Contreras for all the work that you've done in engaging with us.

I think I just want to leave with one sentiment. I think after the incident, as Commissioner Monahan mentioned, it was a lot of we were all stressed out. We were all unhappy about the way it all played out. That's

kind of putting it mildly. And we all kind of tried to figure out the best course forward. I think the best course forward was the spirit of ensuring that we build trust and help collaborate. And I'm incredibly thankful to the staff for helping build that trust and collaboration and for Calpine's openness in being a part of that process.

But as Commissioner Monahan mentioned in her comments, I think that trust has to be continued to apply, and the collaboration has to continually improve, and transparency is a critical element of all that. So I just hope that we continue to push forward for that and raise any issues that might come about along the way. And I think one of the promises we made to the community, especially the City of Hayward, is that we're going to ensure and do everything we can to make it and maximize the transparency. I understand that there are sometimes things that needs to be kept confidential, but let's just give our best effort. And to you and Nika and your entire team, thank you so much for all the efforts that you put in to make this an example on how to do things moving forward, so thank you so much.

CHAIR HOCHSCHILD: Thank you, Vice Chair.

I think at this point all the Commissioners have been to visit the facility. I will share, again, I think the important thing here is that we all work together to

prevent an incident like this from ever happening again. I did have the opportunity to go to that residential group home facility and saw the hole in the ceiling where this chunk of metal had flown through their kitchen. And we're just extremely fortunate not to have any fatalities or injuries. And obviously all committed to, during the weekend, to prevent such an incident from happening again.

Under our rules we typically don't take public comment on non-voting items. However, today I just want to make an exception to that and open up the line in case there are any members of the public wishing to speak or anyone who's already spoken who'd like to make an additional comment before we close this item, given the importance of this issue.

So Madam Public Advisor, can you just open up the line and see if anyone else would like to make comments on this item?

MS. GALLARDO: Yes, definitely. Thank you, Chair. This is Noemi Gallardo, Public Advisor. If you would like to make a public comment, please use Zoom's raised-hand feature, which looks like a high-five on the screen. If you are on by phone, you can press *9 to raise your hand and then *6 to unmute.

I do see a couple of hands raised. I will begin with Claire Warshaw. Claire, a reminder to please restate

your name, spell your name and indicate your affiliation, if any. And your line is open, you may begin.

MS. WARSHAW: Hi, my name is Claire Warshaw. I'm a member of the public.

The question I have regarding this incident is that this power plant was in a populated area. And I know hydrogen power plants, things like that are conceptual right now for probably a lot of planners and designers. Do you think that it's possible that they will make some rules about power plants being near residents, so that there's no danger like this for nearby homes and businesses?

That's, I guess, just food for thought. I know you don't have to answer my question, but I do think it might be good, especially in terms of future power plants to think about how these things could happen easily the same so that could be prevented, I guess, with a barrier and land or something like that. That's my comment, that's it thanks.

CHAIR HOCHSCHILD: Yeah. I'll just speak briefly to that to remind everyone we are all operating under SB 100, which requires the state to move to 100 percent carbon-free electric generation we're about two thirds of the way there at this point. And, obviously, as you move to wind and solar and geothermal and hydro and storage, the thermal fleet over time will reduce.

Now, it's not to say there's no risk with any of those others, every technology has some risk, but this kind of thing is not something we see with many those other technologies. But again that's over time. So let's go to the next comment.

Thank you, Claire, for that comment.

MS. GALLARDO: All right, next is Melissa Yu. A reminder to please restate your name, spell your name, and indicate your affiliation if any. Melissa, your line is open, you may begin.

MS. YU: Hi, Commissioners. My name is Melissa Yu. I am with the Sierra Club and I'm here today -- well first of all I want to thank you for this conversation. I would like to say that the facility should not be allowed to operate as this investigation goes on. The facility is now actually operating, from what we know, at a lower than permitted efficiency level. And they shouldn't be allowed to operate until they fix the turbines that were damaged by the explosions. The residents of Hayward are already disproportionately impacted by pollution. And Hayward actually has hotspots for, I'm sure as you all know, for asthma and the fatalities associated with the air pollutants related to vehicle emissions and also with the power plant emissions.

And on top of that, as you all know, we are

already locked into the climate crisis for at least the next three decades. And we have also a lot of extreme weather events that we need to avoid that are heavily affecting frontline and low-income communities of color.

So we ask you to, and urge you, not to allow the facility to continue to operate until these turbines are fixed. And we do appreciate the time that staff and this Commission is taking to investigate this. Thank you.

MS. GALLARDO: Thank you, Melissa.

MS. HUBER: If it's okay, I just wanted to comment that the facility, the last time it was dispatched was September 23rd, Melissa. And there's an expiration on their temporary permit to run in simple-cycle mode and that expired on November 9th, so it has not operated since the end of October.

MS. GALLARDO: This is, Noemi. Thank you, Elizabeth, for the clarification.

Chair, I do not see any other hands raised at this time.

CHAIR HOCHSCHILD: Okay, and then I just did want to offer the opportunity for any of the folks who've spoken already, if they have any -- Kelly or others -- any additional comments? (No audible response.) Okay, seeing none we'll conclude this item.

Thank you all for the work. Elizabeth, thank you

for all your work on this item today.

Let's turn now to Item 4, Information Item on the Draft Order to the PUC on Supply-Side Demand Response. Erik Lyon.

MR. LYON: Hello, Chair and Commissioners. My name is Erik Lyon from Vice Chair Gunda's Office. And I will be presenting an informational item on the Draft Interim Report to the CPUC on Demand Response Qualifying Capacity. Next slide, please. Thank you.

Demand Response, or DR, is the practice of reducing electricity consumption when it is expensive and polluting, particularly during times of great strain, and can include shifting that consumption to other times when it is relatively inexpensive and clean as shown in the diagram.

DR provides many benefits, including grid reliability, avoided costs of high-priced energy, reduced fossil fuel consumption, alignment of electric demand with renewable availability, and lower need for new power plants and transmission lines. Next slide, please.

Last year the CPUC asked the CEC to investigate a number of issues that can really be summed up by the question, "What is the best way to measure DR's contribution to reliability?" Or in more technical terms, "What is the capacity value of a DR resource?" The CPUC

has been working on this question for a number of years and there is no perfect solution, in part because you first must estimate a customer's behavior in the absence of a DR event, which can be challenging on its own, and then apply those estimates to uncertain future conditions.

The CPUC asked the CEC to form a working group, which I will talk about next, and CEC staff have developed a report containing findings and recommendations from this process that we're hoping to submit for adoption in its final form next month. Next slide, please.

CEC staff spent much effort ensuring a robust stakeholder process with weekly meetings that were open to the public and included utilities, DR and storage providers, energy consultants, and staff from the CPUC, California ISO, and CEC.

The process kicked off with a workshop in July. To begin, we created two working groups: one to develop principles to evaluate candidate methodologies, and a second to begin cataloguing and fleshing out the various proposals to be evaluated. These met on alternating weeks, but in practice most stakeholders joined both working groups, meaning they were participating every week.

When it became clear that it was time to bring the work of the two groups together, we merged them into a single combined working group. It was about this time that

stakeholders brought some issues to our attention that made us rethink our process and eventually decide to pursue an interim solution, but I will return to that point later. Next slide, please.

We organized our findings into three categories. First, we found a set of interrelated challenges for DR to participate in capacity solicitations and to support in California's electric grid reliability. While the CPUC decision requesting the CEC working group did not address all these directly, we have found they must be addressed holistically to allow the DR market to reach its full potential.

Second, as I alluded to before, the original timeline planned turned out to be infeasible for making actionable, permanent recommendations for RA compliance year 2023.

And third, we found that two stakeholder proposals were viable for temporary adoption and can materially contribute to California's near-term reliability.

I will now cover each of these categories in additional detail. Next slide, please.

The challenges identified here come from both background in the CPUC's decision and from stakeholder feedback in the working group itself. The first issue with

crediting really informs the CPUC request for reexamining the qualifying capacity methodology, which is why we've put it first here. Crediting refers to the practice of treating certain IOU resources, which make up the majority of Demand Response capacity in California as a reduction in demand rather than as a truly supply-side resource. In the language of the Resource Adequacy program these resources are not shown on supply plans and are not subject to the ISO's reliability rules. CEC staff agree with the ISO that these supply-side resources should accordingly be shown on supply plans.

Second, the QC methodology is at the heart of the CPUC's ask to the CEC. The current QC methodology is based on the Load Impact Protocols, or LIPs, and the idea is to apply actual measured load impacts to conditions when reliability needs are greatest. The CPUC has stated unequivocally that this methodology is intended to reflect DR resources' contribution to reliability. While we agree with that assessment, we also recognize that the approach has significant room for improvement to do so, especially for resources with variability and other limitations like Demand Response. CEC staff see improving the methodology to better reflect contribution to reliability to be a core goal of the working group.

Third, there are two sides to the issue with

incentive mechanisms. On the one hand, the penalty for resources that provide capacity was not designed for resources with variability and limitations like DR. On the other hand, the vast majority of DR in California has no performance incentive mechanism in capacity markets, either because they are credited as I mentioned before, or because DR resources can be grouped into aggregations below the threshold for the penalty to apply. So while we do not think the current penalty is appropriate, we believe some incentive mechanism is needed.

Fourth, "settlements" refers to the actual calculations of load impacts in the ISO's energy markets. Critically, to settle Demand Response transactions we must first estimate Demand Response participants' load in the absence of the event, this is known as a baseline. Until recently there was no appropriate baseline for weather-sensitive resources like smart thermostat programs. We believe that before we can measure a contribution to reliability, we must be able to measure the load impacts of individual Demand Response events.

We note that the California ISO has introduced a comparison group methodology that meets these criteria, but it does need to be implemented successfully before it can fill this role.

Last, but certainly not least, stakeholders have

been clear that this process is difficult and time-consuming. And we found these perspectives credible and affirm that the process is likely undermining California's ability to deploy and rely on DR as a clean resource.

Additionally, the process requires performance data that can be two years old by the year it is contracted for, so the values cannot be adjusted as portfolios change. Whether the capacity grows or shrinks, California has an interest in the most accurate, up-to-date information on its DR portfolio. Next slide, please.

The CEC working group encountered two issues with the resource adequacy process timeline. The first is that the QC process for Resource Adequacy year 2023 was already underway by the end of 2021. And by the time a decision is reached on the CEC's recommendations, it would have been too late to apply to 2023.

On the other hand, the Resource Adequacy reform track working group was started around the same time as ours and is expected to propose significant changes to the RA program for 2024. That could have left us in the uncomfortable position of providing recommendations that were too late for 2023, but incompatible with 2024. This finding largely informed our decision to submit an interim report on an expedited timeline. Next slide, please.

Throughout the working group process we

identified two proposals that can each address a subset of the key issues I identified previously.

First, PG&E proposed a Load Impact Protocol-informed Effective Load Carrying Capability proposal, or LIP-informed ELCC for short, and that's a methodology that they have been collaborating closely with the ISO to hammer out. An ELCC-based approach essentially imagines a "perfect resource" or amount of "perfect capacity," which is a hypothetical generation resource that never requires maintenance, never loses efficiency in warm conditions, and can change its output instantaneously. Then ELCC then asks, "How much of that perfect capacity can a real-world demand response resource replace without increasing the likelihood of outages?"

Second, the California Efficiency and Demand Management Council proposed an incentive-based approach modeled off other Independent System Operators and regional transmission organizations in the U.S., nicknamed the "PJM/New York ISO" approach. This approach relies on a system of performance penalties modeled after California's Demand Response Auction Mechanism to ensure compliance rather than an upfront oversight system. The idea is that DR providers know their resources best and have the most up-to-date information on those resources, so we can expect them to offer as much capacity as they can reliably deliver

as long as they know how they will be evaluated and penalized for underperformance. Next slide, please.

Today we are introducing a number of recommendations for the interim year of 2023, as well as a few for the long-term path for the qualifying capacity of DR resources.

So first in the interim we are recommending the Load Impact Protocol-based methodology that is the status quo be accepted in the interim because there is insufficient time to require DR providers use alternate methodologies.

We recommend the CPUC adopt the LIP-informed ELCC and incentive-based PJM/NYISO approaches in the interim.

We recommend that third-party and IOU DR providers alike can choose between the status quo and either of the two proposed interim methodologies.

We recommend the CPUC request that the ISO provide an exemption from the Resource Adequacy Availability Incentive Mechanism, or RAAIM, for resources that qualify with the LIP-informed ELCC.

And we recommend the CPUC direct IOUs to move their DR portfolios onto supply plans, effectively ending crediting as initially proposed by the ISO.

However, given the tight timeline to implement the new LIP-informed ELCC methodology, we are also

recommending the CPUC maintain a contingency plan that would provide credits for IOU DR programs in the events that satisfactory LIP-informed ELCC QC values are not able to be produced. Next slide, please.

In the long term we recommend that CPUC request the CEC to continue holding the supply-side DRQC working groups into the third quarter of this year, with a report to be provided by the fourth quarter.

We recommend the CPUC explicitly request that the working group address holistically the five challenges I outlined previously when developing a permanent solution and to ensure that it aligns with the resource adequacy framework.

We will also recommend that the CPUC continue collaborating with CEC staff on this effort. Next slide, please.

So the next steps for this process we are currently accepting feedback on the draft report until February 4th, at which time we will consider revisions to the draft report. We will then request adoption of the final report at next month's business meeting, publish the report, and submit it to the CPUC for consideration. Next slide, please.

That concludes my presentation. Thank you so much for your time.

CHAIR HOCHSCHILD: Erik, thank you. That was terrific and I look forward to discussing.

Let's start the Commissioner discussion with Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, thank you Chair.

And I want to just begin by, as usual, on these kinds of efforts just acknowledging the amount of effort that goes into this. So I'll start with Erik. I always appreciate both his integrity, thoughtfulness, but also the way he's able to present. That's a very good presentation. Two years ago I would not have tracked any of what he just said. (Inaudible.) all of that together. So thank you for kind of demystifying as much as you can.

The second kind of high-level point is to just thank Tom Flynn as well as David Erne, who are other leads from CEC on this effort for their contribution in the working group.

And most importantly and it's just the stakeholders, I think, without the stakeholder's participation in this process and really putting their trust in developing, investment in this process to figure out some solutions, we cannot make any meaningful progress. So just want to thank all the stakeholders for taking the chance and putting additional time into this working group to continue to develop solutions.

And kind of finally to CPUC, it's I think the request from CPUC to have CEC work on this very important issue is really kind of a testament to the way we all work together and help inform important issues. And I think that was a strategic move there by CPUC to provide this particular topic to incubate the ideas, to incubate outside the regulatory process, and allow for candid discussions and provide a venue for that so just want to thank CPUC's former director Ed Randolph and now the interim director Simon Baker for kind of putting that together.

So overall I just want to complete my thanks first and then go into kind of the more next-steps issues.

So, Erik, based on the conversations we had internally and some of the engagement I had with the stakeholders ultimately, I think our hope here is to move the conversation forward with some sort of an interim solution that can continue to emerge into more permanent solutions down the lane and really increase the number of methodologies that we consider for the long-term solution.

So I'm just going to say that from all I see that I think that's a good approach. I feel strongly that I know making some meaningful next steps on this DR accounting is a good thing.

The second thing I ask is like just reflecting on what CPUC's explicit ask was to us, which is if we can't

put something collectively as a working group on to something tangible it's almost impossible for CPUC to consider that in their proceeding, given the condensed timeline. So I just want to encourage everybody, including CEC, CPUC staff who are participating in the world group, but also CAISO and the stakeholders, to ensure that our conversations are not broken down in this next two to three weeks. As I mentioned before on those meetings my office is absolutely open and available to meet with anybody to kind of continue to talk through and resolve any issues, we might have with the aim that we continue to move forward with a proposal.

I also appreciated a number of the meetings from the stakeholders in flagging issues that I didn't understand and then kind of helping me and my office to really dig into areas that we were not thinking through. So again, I'm just looking forward to hearing some feedback and really welcome written comments as we take this preliminary report into adoption in about three weeks.

So with that again Erik, thank you so much for all your work and patience with this. I know we threw you right into this. And then you rose to the occasion, so pretty grateful for your work and the entire team.

CHAIR HOCHSCHILD: Thank you.

Let's go to Commissioner McAllister.

COMMISSIONER MCALLISTER: Great, well thank you. I second all that that Commissioner Gunda just said. And also just commend you, Vice Chair, on your leadership on this. This is a complex topic.

I remember back to the 2013 IEPR when I was new to the Commission and sort of -- maybe not easily in retrospect -- sort of jumped into this wanting to make quick progress. And it did move the ball forward and resulted in kind of bifurcation and some additional complexity, I think. But this topic sort of merits this level of complexity and deep thought and discussion.

And I think many of the points, overall the points that you made, Erik -- and I agree demystifying DR is a Sisyphean task -- and you've done it really, really well.

The outcome of this is really an appreciation of the baseline question to start, really, as a platform for being able to get the answers expeditiously that we need to characterize this resource and really allow it to grow and become more robust and predictable.

And hopefully with continued collaboration with the PUC and the CAISO we end up with a system that builds on that platform. And automates it as much as possible and sort of get the cost down and really pragmatically in the real world allows this resource to sort of have its day.

And become a wedge in our stack that helps optimize and lower costs and all that stuff that we know and enhances reliability.

So I want to just thank also Erik and Tom and David. I've gotten a number of briefings along the way, and paying attention, listening to stakeholders as I'm sure all my colleagues have as well. And I want to thank the stakeholders for all their participation, incredible diversity of opinion and positions in the marketplace. And it is quite difficult to resolve all that, and so I think I definitely agree with keeping the conversation going and leveraging this platform that we've built. We've built in some of the ongoing trust that's I think emerging along the way, which kind of forms the basis for finding solutions.

And then I guess I would just point out that from my perspective on the kind of demand side -- energy efficiency, distribution resource side of things -- and I guess that I'd just say the permanent load shift, or the forecasting impact of demand-based resources is sort of the reflection of this conversation that we're talking about now. And so I think one of the learnings out of this, sort of in the context of all the other conversation we're having about load management standards and flexible appliances and building decarbonization and evolution of the building standards themselves, I think being able to

parse out these various resources and really locate them in the right places. Because I think there's a lot of value in having improved load factors at the consumer, at the home and business across the state, and influencing that with rates or whatever else in that sort of demand side is also really important, and we need to balance the two kinds of flavors of Demand Response.

I kind of think, just to wrap up, "Demand Response" kind of needs an evolution as a term, it's a little to generalized. It's kind of outlived its usefulness in a way, so I think these resources are actually different quantitatively and qualitatively. And so maybe we can sort of update the lexicon, because I think "DR" is many things to many people. And so if we could maybe make that part of the conversation to sort of tune up our terminology about these Flex resources generally that would be a useful addition not just to California, but beyond.

So thanks again to the whole team and the PUC for tasking us with this.

CHAIR HOCHSCHILD: Yeah, "Flex resources" might be one of the terms or I just think about it also just in terms of energy resilience to the grid. I had a few comments, but I wanted to go -- let's go first to Commissioner Monahan.

COMMISSIONER MONAHAN: Well, Erik, you gave me a great briefing. If Vice Chair Gunda was confused last year, what chance do I have?

But I look forward to -- we discussed how there weren't really any transportation interests at the table. And while there's not much right now in the transport space there's going to be more in the future, so just integrating especially some of the companies that are thinking about this VTG capability, so beyond just DR. We want to make sure that whatever signals we set, and technologies are adopted, that it's something that could be used for transportation, something that could be used for buildings. That we just have, I think as we all want, this terminology that is across all; economy-wide terminology that works for every sector.

CHAIR HOCHSCHILD: Thank you, Commissioner Monahan.

So I just want to say first of all, Erik, that was a terrific overview. I think the take-home point for all is we are not done. We have a lot of work to do, a lot. And this is still a very immature field, one that I think has great potential.

And it's funny I think about like Apple as a company, right? It used to be a computer company. Now they're a phone company. And people didn't see how big the

phones can be. And I feel that way about Demand Response actually. It's something, really the vision of everything that connects to the grid being a good citizen of the grid, and I mean that is what we're about. And we're going to be putting in a billion dollars into building decarb. You think about electric heat-pump water heaters as an example, and you have flexibility when in the day are they charging, and to align that and make it easy to do.

And I came out of the solar industry. That's where I was before joining the Energy Commission. There were so many very specific needs that that market required, right, interconnection standards and tax credits and permitting, net metering and redesign and a bunch of other things. But there's an incredibly focused effort to meet those needs and it's paid off enormously. And now we have 1.3 million solar roofs, we're adding 400 a day. It's a really meaningful part of our energy portfolio.

I really feel the same is needed for Demand Response. And I think we've got the ball rolling, but we're just getting started. This still feels like early days.

I really want to thank and recognize also our R&D investments through the EPIC program in this space, home-connect and others, and really the chorus of folks who care about this issue stepping up and getting smart about

it.

This is not a luxury. This is a necessity for grid reliability as we are electrifying more and more. And so we need to treat this as a resource with enormous potential and bring the kind of focus, Erik, that you're bringing, and Vice Chair Gunda, Commissioner McAllister, and everyone at the Energy Commission. And bring that focus to maturing this whole sector, because we're going to actually really require it to provide the grid security and resilience that we need.

So I just want to add my thanks and encouragement. And mind you, we're going to still continue to engage and support the policy modernization that's going to be needed for us to be successful as a state at this. And I do think we can also bring more investments into the state on innovation. And Texas just raised another $100 million on that last year and there's more to come. And we want to be the thought leaders on this in the country, but we have a long way, long way to go. I just want to be clear on that.

Any final comments? Vice Chair Gunda, yes.

VICE CHAIR GUNDA: Yeah, Chair, thank you.

Two points I just wanted to quickly make. I think first of all thanks to you for pulling this info item as general agenda topics. It's really helpful to have this

cross-cutting conversation on emerging areas, and especially those things that are moving very rapidly through our process is really helpful to check in with the Commissioners, so just want to thank you on that.

And also, I think your points and Commissioner Monahan's and Commissioner McAllister's, I think the importance of DR as a part of our grid design and grid modernization cannot be overstated. And I think to the extent that I think you really put it really well, which is if we do not put in place the necessary tools to make that successful, we can't make it successful. And that includes accounting, that includes any other barriers to that that we might have to deal with.

So I'm again thankful to CPUC for recognizing the importance of this and really coordinating with us and having CEC expand that conversation and then continue to move this forward.

I think we're, as you said, we're in the early days. We're talking about quadrupling a grid by 2045 on the electricity side, and a big, humongous amount of renewable resources that are intermittent. And without a large amount of DR, and really flexible and dependable DR, it's almost impossible to conceive how we're going to get to that goal.

So thank you for the support across the

Commission, all Commissioners who behind the scenes advise the staff but also continue to forward this conversation of areas like building electrification, transportation, all sorts of things. That's why I say thank you before we go to public comment.

CHAIR HOCHSCHILD: Great. And I just want to add my thanks as well to President Reynolds at the PUC. I know he's very supportive this, and Elliot Mainzer at CAISO. We really have a visionary and collaborative leadership now to work on this.

Erik, I just wanted to go back to you one final time. Is there anything else you wanted to add or respond to from what you heard?

MR. LYON: I just would like to echo everybody's thanks to Tom and David and our team, to the CPUC for giving us this opportunity to participate in this conversation, and certainly to all of our stakeholders who have been giving us two hours of their time every week since the summer. So thanks to everyone who's participated.

CHAIR HOCHSCHILD: Okay, thank you, Erik.

And with that we'll move now to Item 5. What I'd like to do is we'll take comment.

VICE CHAIR GUNDA: Chair, I think we have some public comment. I think we have Simon Baker joining us and

providing comment.

CHAIR HOCHSCHILD: Oh yeah, we can accommodate from other agencies to comment on this if there are any. Madam Public Advisor, do we have a PUC comment?

MS. GALLARDO: This is Noemi, the Public Advisor. I do see someone by the name of Simon Baker raising his hand, so we can unmute him?

CHAIR HOCHSCHILD: Yeah, please open his line. Thank you.

MS. GALLARDO: Will do. So, Simon, if you could restate your name and indicate your affiliation, we'll open up your line. If you want to unmute on your end you can begin.

MR. BAKER: Hi. Good morning, Chair Hochschild, Vice Chair Gunda, and all of the Commissioners. My name is Simon Baker and I'm currently acting as the Interim Director of the California Public Utility Commission's Energy Division. And I'm here speaking on behalf of staff, not the Commission, as this is a report that will be formally considered in the Resource Adequacy proceeding.

I just want to say that we really appreciate the Energy Commission's willingness to work on this report for us. it's really good for us to have some fresh eyes and some dedicated attention brought to these complex issues. And from our observations the working group process has

been very well executed, with excellent participation and engagement from all the stakeholders, and in particular we really appreciate the Energy Commission's willingness to be flexible with us.

There was a point at which we realized that we needed to get this report into our process sooner than we initially thought, and so we asked to accelerate the timeline for the development of the report. And you folks were willing to do that, so thank you so much for working with us on that.

These are really challenging issues as Erik's presentation touched on. And we think the draft report accurately characterizes the key DR challenges that are there. And I agree with the comments earlier that Erik's presentation did a great job of really explaining these issues in a common-sense way, so congratulations on that.

We understand and appreciate the reasons for issuing an interim report that pertains to 2023 RA and then continuing the working group process to provide recommendations for 2024 and beyond. As regards to the interim recommendations staff will be assessing those recommendations for implementation feasibility, particularly as regards the LIP-informed Effective Load Carrying Capacity methodology, which will involve a modeling effort that our staff will be conducting. And it

remains to be seen in terms of how complex that process could be, but we're hopeful that that can be executed.

And then the other proposal in there for the PJM/NYISO-based incentive model, there are a lot of implementation details that need to be examined and worked out. And we are on a tight timeline in the RA proceeding for new rules to be implemented for the 2023 RA year, so staff is going to be looking at those from the implementation feasibility perspective.

We do have some precedent in the Resource Adequacy Proceeding for different counting rules for different DR resources. For example, the Demand Response Auction Mechanism has a different set of counting rules than the utilities, DR programs, which use the load-impact protocols, so that the optionality element of the interim recommendations it essentially kind of expands on that which does introduce more complexity to the RA framework. And so the Commissioners will need to consider the policy aspects of that in the proceeding.

I just want to thank the stakeholders for their dedicated effort and extensive participation and time commitment in the proceeding. I know a lot of work went into this and really thanks to the Energy Commission staff leads on this as well, Tom Flynn, Erik Lyon, David Erne. This has been an excellent collaboration and we really

appreciate the work done on this.

CHAIR HOCHSCHILD: Thank you so much for sharing those thoughts, Simon, and for your work on this. I know personally you're really committed to it and we're eager to continue the robust partnership with the PUC to really bring this fully to fruition, because I think there's a lot of potential here.

So unless there are other comments from Commissioners, we'll turn now to Item 5, Pecho Energy Storage Center. What I'd like to do is take the presentation and comments on this together in order with Item 6. And then we'll move to discussion after we've heard the comments, public comments on both of those, and presentations on both. So we'll reserve Commissioner discussion and votes until after we've heard both items. So let's start with Item 5.

MR. KNIGHT: Good morning, Chair and Commissioners, I am Eric Knight. I am the Manager of the Siting & Environmental Office of the Siting, Transmission, and Environmental Protection Division. With me today are Staff Project Manager Lisa Worrall; Staff Counsel, Jennifer Baldwin; and Engineering Office Manager Geoff Lesh. Next slide, please.

Staff is here today asking for your approval of a proposed order. And that's in the matter of Pecho Energy

Storage Center, Docket Number 21-AFC-01.

On November 23rd, 2021, Pecho LD Energy Storage, LLC, a joint venture of Hydrostor, Incorporated, and Meridiam Infrastructure Partners, filed an Application for Certification, or AFC, with the Energy Commission seeking approval to construct and operate the Pecho Energy Storage Center.

By adopting the proposed order, the Commission would: 1) find the Application for Certification incomplete; 2) adopt the list of deficiencies identified in the Executive Director's recommendation; 3) direct the applicant to file additional information and staff to file a response; and 4) appoint a committee to oversee the Pecho filing and any proceedings arising from it. Next slide, please.

The Pecho Energy Storage Center would be a nominal 400-megawatt, 3200 megawatt-hour advanced compressed air energy storage facility. Although it has "storage" in its name, and as will be explained later, this facility meets the definition of a thermal plant power plant down in Warren-Alquist section 25120.

The project's major equipment includes four all-electric air compressor trains, four 100-megawatt air-driven powered turbine generators, heat exchangers, thermal heat storage, an underground compressed-air storage cavern

and an above-ground water reservoir.

The project is proposed at 2284 Adobe Road in unincorporated San Luis Obispo County, just over one mile east of the city limits of Morro Bay. It would be located on an 80-acre portion of a 303-acre parcel that is currently planted in row crops and zoned "Agriculture", by the county, mapped as "Prime Farmland" by the California Department of Conservation, and under a Williamson Act contract.

The facility would provide electricity to the grid via a new transmission line to the Pacific Gas and Electric Company's Morro Bay Switching Station. The preferred transmission line route is 3.4 miles long. The project would be located within the coastal zone designated by the California Coastal Act. Next slide, please.

This is the first time the CEC has received an application for a thermal power plant that would use compressed air energy storage technology, so I would like to take a moment here to briefly explain it. A more detailed discussion of the technology will be given by the applicant at the end of staff's presentation.

Pecho would use off-peak or surplus electricity from the grid to compress air into a purpose-built underground cavern. The air would be kept in the cavern under hydrostatic pressure maintained by a water column

(phonetic) from an onsite, aboveground water reservoir. The heat generated by compressing the air would be captured and stored in the aboveground thermal storage system.

Here is where the thermal power plant aspect comes in. When the grid requires electrical power from the facility pressurized compressed air would be released from the subsurface storage cavern, heated using the thermal energy storage during compression, and allowed to expand to above-ground turbine generators to produce electricity.

As specified in the Warren-Alquist Act, a "thermal powerplant, meaning any stationary or floating electrical generating facility using any source of thermal energy, with a generating capacity of 50 megawatts or more."

With the Pecho project the hot compressed air is the expanding gas driving the power turbine in the same way that hot compressed combustion gases drive the power turbine of a combustion turbine generator in a natural gas-fired power plant.

Staff reviewed the application to determine if it contained the information required under California Code of Regulations, Title 20, section 1704 and Appendix B. And note on December 22nd, 2021, the Executive Director filed his recommendation with this Commission, finding the AFC incomplete in 12 of the 23 disciplines.

The Executive Director's recommendation is to not accept the application as complete for purposes of starting the 12-month certification process until the additional information specified in the data adequacy worksheets attached to the recommendation is provided by the applicant.

The Executive Director's recommendation also indicates that staff will be investigating whether the project qualifies for an exemption from the Notice of Intention, or NOI, process. The Warren-Alquist Act identifies which types of projects are exempted from the otherwise required 12-month NOI process, and thus may proceed directly to the AFC process. The NOI process is essentially an alternative site analysis that's done before an AFC can be submitted. An NOI application must include three sites, one of which can't be located within a coastal ground. At its conclusion, the CEC determines on which site or sites an applicant can file an AFC.

Then if the AFC is filed within one year the decision on the NOI to the CEC is required to render a decision on the AFC within 12 months.

All applications filed with the CEC in the last several decades, except for one, have qualified for the straight-to-AFC process under Warren-Alquist Act, section 25540.6, subdivision (a)(1) as either co-generation,

natural gas-fired, or solar thermal facilities. The one exception was the Hydrogen Energy California project that qualified as a demonstration project under subdivision (a)(5) in the same section under the Warren-Alquist Act.

Staff believes this could be a pathway for this project to qualify for the straight-to-AFC process under 25540.6(a)(3) as "a thermal powerplant which it is only technologically or economically feasible to site at or near the energy source," but more investigation is needed.

The proposed order would direct the applicant to file information supporting an exemption from the NOI process and direct staff to file a response to the applicant's information in the form of an Executive Director's recommendation to be presented at the March 9th, 2022, business meeting. We recommend the applicant be required to file their additional information on this issue by February 10th, 2022, to allow staff's time for a review.

Typically, staff would not request a committee assignment until the Executive Director makes his recommendation and AFC is complete, however the Commission may want to consider assigning a committee to the Pecho filing as a juncture to the NOI AFC question. The possible appointment of a committee was included on today's agenda and is included in staff's order. Next slide, please.

Before I conclude my presentation, I'd like to

highlight another issue that will require resolution. And this was identified in the Executive Director's recommendation memo to the Commission. The Pecho project would be in Chorro Valley, an area that the Coastal Commission has designated as unsuitable for thermal powerplants due to its high scenic value.

The Coastal Commission has filed a letter in the docket outlining the issue and the process by which the Coastal Commission would review information from the applicant and subsequently provide its findings regarding the suitability of this site for the project to the CEC as part of the AFC process.

I'd like to note that Tom Luster with the Coastal Commission is here on the line and available to answer any questions that the Commissioners may have about this.

In conclusion, staff requests your approval of the order. As I noted at the beginning of the presentation staff recommends the Commission adopt the list of deficiencies noted in the Executive Director's Recommendation and not accept the AFC as complete at this time.

In addition, staff requests the Commission direct the applicant to provide information in support of an exemption from this NOI.

And then finally the Commission consider

appointing a committee for the Pecho filing and any proceedings arising from it.

I'd now like to turn it over to Curt Hildebrand with Hydrostor and David Stein with Golder Associates for the applicant's presentation. Thank you.

CHAIR HOCHSCHILD: Thank you Eric.

MR. HILDEBRAND: Good morning and thank you, Eric.

My name is Curt Hildebrand, Senior Vice President with Hydrostor. It's my pleasure to be able to speak with you today. A brief overview of my presentation, I'll begin with a introduction to Hydrostor; move into, secondly, a discussion of our advanced compressed air energy storage technology; and lastly, conclude with project overviews for both our Pecho and Gem Energy Storage Center projects. Next slide, please.

Hydrostor was founded in 2010. We are headquartered in Toronto, Canada. We do also have offices in the San Francisco Bay Area and in Australia. Over the last 12 years we've been busy developing our Advanced Compressed Air Energy Storage, or A-CAES technology, advancing it through a demonstration facility that we built in Toronto about eight years ago and subsequently followed up with a commercial small-scale facility that's in operation today outside of Toronto.

If we could go back one slide, that facility is called the Goderich Facility, it's on our title slide. There it is. That is currently in operation. It's a small-scale facility, but it is operating today, doing very well and providing energy and reliability and passkey (phonetic) services into the Ontario Independent System Operator. We've secured -- next slide, please.

We've secured upwards of 12 patents to date, and we have an additional 20-some patents pending. So we are again advancing our technology forward through demonstration, early commercial, and full commercial deployment.

We announced earlier this month, a $250 million investment in Hydrostor from Goldman Sachs. And we believe that to be the largest investment to date in a pure play (phonetic) long-duration energy storage company.

The company currently has a 900-plus megawatt pipeline in California, through our Pecho and Gem projects. I'm pleased to report that we're making very good commercial advancements with prospective customers, we have a high level of commercial interest in our projects. And again, just to highlight, our technology utilizes only water-pressurized air and commercially proven equipment. And we do not have any ambitions associated with our operations. Next slide, please.

CHAIR HOCHSCHILD: By the way, do you mind just clarifying the correct pronunciation? Is it "Payco or Paycho?"

MR. HILDEBRAND: We pronounce it "Payco." I've heard it pronounced "Paycho" as well in other arenas. We could have the Commission vote on formal pronunciation. I'm open to that.

CHAIR HOCHSCHILD: Well, it's your project, so just tell us how to say it. Payco? Okay.

MR. HILDEBRAND: We've adopted Payco as our Hydrostor pronunciation.

As far as advanced compressed air energy storage technology what we've set out to do is really marry the best aspects of both traditional compressed air energy storage technology and pumped hydro technology while eliminating some of the more problematic aspects of each. More specifically, traditional compressed air energy storage technology utilizes natural gas to reheat the air upon expansion, so it doesn't freeze up in that process into solid chunks. We've eliminated natural gas from our process.

Secondly, most traditional large-scale compressed air energy storage facilities are located at existing salt caverns or existing underground caverns. We've been able to adapt our technology to flexibly site our facilities by

constructing purpose-built subsurface caverns. And those caverns are much smaller in volume and footprint than more traditional compressed air energy storage projects to date.

In terms of pumped hydro aspects we utilize a small fraction, typically 10 percent of the water utilized in pump storage, we have a very modest water usage in comparison to pump storage.

We also have a significantly smaller footprint. Our projects again are, the two proposed before the Commission, are on roughly 80-acre sites. A pumped hydro project of similar capacity would be an order of magnitude or two larger than our facilities in terms of footprint. And obviously, the environmental impacts we believe will be significantly lower than a pumped hydro facility as well.

There is a four-minute video on YouTube that I would highly recommend folks to view if they have an interest in our technology. It explains how this operates much more simply than my verbal description. But as Eric described earlier, our first step is compressing ambient air at the surface using air compressors and capturing the waste heat from that process. We store that in above-ground tanks using water as our working fluid.

The third step is that air is sent into the subsurface caverns, displacing the water in those caverns up to the surface. That water serves to provide a constant

hydrostatic head. Our caverns are typically 1800 to 2000 feet in depth.

And when we go, step four, when we go into generation mode we reverse that cycle, the air is pumped back up out of the caverns, sent through compressors, reheated by our stored energy at the surface. And we produce electricity on demand.

Again, this is a long-duration facility as opposed to more standard two- and four-hour projects that have been cited around the state.

Our projects are designed for eight hours of storage capacity and can be expanded through additional -- to accommodate larger and longer durations.

We utilize off-the-shelf equipment. This stuff has been in operation for many, many years. Underground caverns have been purpose-built for similar, typically hydrocarbon storage all over the world for upwards of 100 years. There are numerous similar applications that we'd be happy to share examples of. Our round-trip efficiency is on the order of 60 percent. Next slide, please.

Some of the real attributes of long-duration energy storage: Fossil fuel plant replacement, where our projects are typically large scale and they do provide very analogous generation attributes to typical fossil fuel plants, synchronous dispatchable generation.

The site, we can flexibly site our projects where they make the most sense from a grid and load perspective. And as we've developed our technology, we've been able to make it commercially competitive with alternatives.

A second benefit of long duration storage is transmission deferral. It is a feasible alternative to building new wires. We are capable of displacing those opportunities on a cost-effective basis. One example is in Australia. We bid a project into a bid process in Australia that was looking to build a long new transmission facility. Our A-CAES advanced compressed air energy storage project actually was found to be a low cost, better-fit solution for the transmission provider than building these new transmission lines. So we have proven that long-duration storage can be a better solution than new transmission lines.

And obviously renewable integration: we all want to maximize the output from our carbon-free renewable generation resources in and around California. Long-duration energy storage, such as Pecho and Gem will greatly facilitate that opportunity going forward.

As Eric mentioned Pecho is designed to be 400 megawatts for eight hours. Gem in Kern County, that we'll be talking about as well, 500 megawatts for eight hours of duration. Next slide, please.

Some of the statewide benefits I won't go through these in specific detail, but the generation attributes of our facilities are very analogous, as I mentioned, to typical gas-fired facilities. They have synchronous generation with very fast ramp rates up and down.

We also are very consistent with the California climate policies and being an emissions-free generation resource. And it is also consistent with RPS objectives in order to maximize renewable generation and not have those solar and wind facilities curtailed during peak and during low demand periods. Again, we use know fossil fuel, no emissions.

One very unique aspect of our technology we actually do produce fresh water out of thin air during our operations. When we are in compression mode we condense the ambient humidity in the air into fresh water, we collect that. And we intend to utilize that for beneficial use in the future, be it through municipal needs, agricultural needs, groundwater recharge, whatever makes the most sense. So that is a fairly unique aspect of our technology, we are producing fresh water out of thin air.

We will displace older, less efficient, more polluting generation. And as I mentioned our capacity will be very analogous to the highly flexible gas and other facilities that are in operation and supporting the grid

today. Next slide.

Moving on to our Pecho Energy Storage Center I appreciate the introduction, Eric. Some of this will be duplicate, so I'll go through it quickly. This is another visual rendering of our facility in San Luis Obispo County. Again 400 megawatts, eight hours, our point of interconnect is into the PG&E Morro Bay Switchyard, and our target commercial operation date is early 2027.

The green building for reference is the turbine hall, turbine and compressor hall. The tanks to the south side of the project site are thermal storage tanks where we store our hot water for reuse during the generation cycle. You can see the water reservoir in the background. And we intend to utilize covers or other options to minimize evaporation losses in that facility. Next slide, please.

This is a bit duplicative, so I will not spend too much time on it. Again, we're located approximately two miles east of the city of Morro Bay in San Luis Obispo County.

And we do have numerous potential transmission corridors into our point of interconnection. These are all existing transmission corridors that we would parallel into that facility. Next slide.

Some of the local benefits, the facility will go a long way in repurchasing a lot of the county-elect

electrical infrastructure. It will also help replace the generation that's being lost from Diablo Canyon Nuclear Power Plant. The local feedback has been very positive in that regard. The loss of that Diablo Canyon facility is going to have a dramatic impact on the county and the prospect for new generation investment in the county has been very well received to date.

Also importantly with regards to Pecho the project is a very symbiotic fit with the proposed offshore wind development that's being proposed in and around San Luis Obispo County. The facility would be very beneficial in maximizing the future generation from those offshore wind facilities by storing their off-peak generation and producing that during peak periods of demand.

The installed cost for the facility is on the order of $750 to $900 million. We'll have a very significant construction workforce. It is a fairly long duration construction cycle about a little over four years, peak construction workforce of 450 people, and a construction labor total of about 1.6-million-man hours for this facility. And to help put that in perspective if this were a similar sized combined-cycle natural gas facility it would be about half that number of man hours, so this is a very labor-intense operation that we're proposing here in terms of construction.

We expect 25 to 40 full-time jobs in the community, very significant economic positive impact over the lifecycle of facility. And we intend to partner closely with the local community to establish ourselves as a long-term and respected participant in San Luis Obispo County. Next slide. There you go.

That concludes my introduction for Hydrostor, our technology, and Pecho. I do have a short presentation as well on our Gem Energy Storage Center in Kern County.

CHAIR HOCHSCHILD: Thank you, Curt, I appreciate that.

Noemi, we had Tom Luster on; is that correct?

MS. GALLARDO: I'm not sure if he was a possible public comment. Let me see if -- let me give the instructions to everybody.

This is Noemi the Public Advisor. If anyone in our audience would like to make a public comment, please raise your hand by using the Zoom feature, it looks like a high-five on the screen. If you're on by phone press *9 to raise your hand, *6 to unmute. And it looks like we do have Tom here raising his hand. Tom please restate your name, spell it and indicate your affiliation. Your line is open, and you may begin.

MR. LUSTER: Good afternoon, Mr. Chair and Commissioners. I'm Tom Luster with the California Coastal

Commission. I don't have any comments. I'm mostly here to answer any questions you might have about the c Coastal Commission's involvement. We did provide a memo, we docketed that earlier this month, that summarizes the Coastal Commission's role in this process.

CHAIR HOCHSCHILD: Okay, thank you.

Noemi, do we have any other public comments on Item 5?

MS. GALLARDO: Let me check for hands. I do not see any Chair.

CHAIR HOCHSCHILD: Okay, with that let's go ahead and move on to Item 6, and then we'll open up to Commissioner discussion.

MR. KNIGHT: Hello, Chair and Commissioners, Eric Knight again. With me this time is Staff Project Manager Leonidas Payne; and then again Staff Counsel Jennifer Baldwin; and Engineering Office Manager Geoff Lesh. Next slide, please.

Staff is requesting your approval of a proposed order in the matter of Gem Energy Storage Center, Docket Number 21-AFC-02. I think we can all agree that there's no question that Gem is the correct pronunciation for this project.

On November 1st and 2nd 2021, GEM A-CAES LLC filed an Application for Certification, or AFC, with the CEC

seeking approval to construct and operate the Gem Energy Storage Center. By adopting the proposed order, the Commission would: 1) find the Application for Certification incomplete; 2) adopt the list of deficiencies identified in the Executive Director's recommendation; 3) direct the applicant to file additional information and staff to file a response; and 4) appoint the committee to oversee the Gem filing and any proceedings arising from it. Next slide, please.

The Gem Energy Storage Center would be a nominal 500-megawat, 4000-megawatt-hour advanced compressed air energy storage facility. The project would be located in unincorporated Kern County approximately one mile northeast of the community of Willow Springs and seven miles west of Rosamond. The 71-acre project site is bounded on the north by Sweetser Road and on the west by Tehachapi Willow Springs Road, with a physical address of 8684 Sweetser Road, Rosamond, California.

To orient you to the area, Willow Springs is roughly equidistant from the town of Tehachapi to the north, and the city of Lancaster to the south. Edwards Air Force Base is to the east. And there are several renewable energy projects in the area, including the Tehachapi wind project and several small photovoltaic projects. Next slide, please.

Gem would consist of five 100-megawatt all-electric air compressors and associated power turbine trains, an underground compressed air storage cavern, miscellaneous aboveground support facilities, and a 10.9-mile-long interconnection to Southern California Edison's Whirlwind Substation. Operation of the facility would be similar, or the same I should say, as was described for Pecho.

The Gem facility meets the definition of a thermal power plant down in Warren-Alquist section 25120.

Staff reviewed the Gem application and on December 30th, 2021, the Executive Director recommended to the Commission that it find the AFC inadequate in 12 of the 23 technical areas.

As discussed for the prior item information is needed to support a finding that the project qualifies for an exemption from the Notice of Intention, or NOI, process.

The proposed order would direct the applicant to file information supporting an exemption from the NOI process and direct staff to file a response to the applicant. Information in the form of an Executive Director's recommendation to be presented at the March 9th, 2022, business meeting.

Again, staff recommends the applicant be required to file the additional information on this issue by

February 10th, 2022, to allow for staff's review.

In addition, although not typical, the Commission may want to consider assigning a committee to the Gem filing at this a juncture to the NOI AFC question. The possible appointment of a committee was included on today's agenda and is included in the draft order for Gem. Next slide, please.

In conclusion, staff requests your approval of the order. As I noted at the beginning staff recommends the Commission adopt the list of deficiencies noted in the Executive Director's memorandum and not accept the AFC as complete at this time.

In addition, staff requests that the Commission direct the applicant to provide the information in support of an exemption from the NOI.

And finally, that this Commission considers to appoint a committee to the Gem filing and any proceedings arising from it. And again I'd like to turn it over to Curt Hildebrand with Hydrostor for a presentation on the Gym project. Thank you.

MR. HILDEBRAND: Thank you, Eric. I neglected to mention earlier I'm also joined today by Jeff Harris our Lead Project Counsel and David Stein our Lead Environmental Consultant with Golder for questions should they arise.

I appreciate the introduction, Eric. Our Gem

Energy Storage Center, again, is located in Kern County. Next slide, please.

The facility is being designed to be a 500-megawatt net output 8-hour storage facility. Our point of interconnect is into the Southern California Edison Whirlwind Substation at 230 kV. Both our projects are in Cluster 13 at the Cal ISO and Phase II study results are expected in early Q2 of this year. The commercial operation target date for Gem is identical Q1, 2027. Next slide, please.

One mention I do want to make, the reasons we have selected the sites, specifically that we have for both Gem and Pecho, while we do have a very good level of flexibility in citing our projects, we do like to locate those near surface manifestations of suitable geologic formations. In Pecho's case that is the volcanic outcroppings that form the Nine Sisters of San Luis Obispo County. In the case of Gem, we are abutting a Willow Springs Butte. That is, again, we believe to be geologically favorable for the construction of our subsurface caverns at depth. That does require exploratory drilling to confirm the subsurface geology. And so we do have reasons for siting our facilities at the locations that we have selected. And again, those are based on projected subsurface geologic conditions.

Eric described our project location. The City of Rosamond is located about 7 miles to our southeast and Whirlwind is located about 11 miles to our west, southwest. We are in Kern County. The Los Angeles County-Kern County line is approximately 10 miles to our south. Next slide, please.

Some of the local benefits of the project we are located in the greater Tehachapi renewable resource area, one of the largest wind resources in California. It is just to our north and there is a proliferation of large solar projects in and around the project area as well. It's a very prolific and growing renewable resource area. A large capacity long-duration storage facility will greatly enhance the next generation from those facilities by being able to store that energy during off- peak demand periods and utilizing during high on-peak demand periods.

The installed costs for the facility at Gem is expected to be between $900 million and $1 billion.

The workforce is similar to Pecho, all be it somewhat larger, given its incrementally larger size. We do expect a total of about 200 –2 million man-hours associated with the construction over about a 4 1/2-year construction timeline.

We expect also a similar number of O&M full-time equivalent positions created by the facility and also very

significant direct and indirect regional economic benefits accruing to Kern County in the region.

And one important aspect from the county we do not have any current state-imposed special property tax treatments that solar PV and other projects do currently enjoy, so that is an important benefit for the county as well. Next slide.

That concludes our presentation today. We're happy to answer questions.

CHAIR HOCHSCHILD: Thank you, Curt, really helpful.

Let's go first to public comment. Madam Public Advisor do we have any public comments on Item 6?

MS. GALLARDO: Thank you, Chair. This is Noemi, the Public Advisor. If anyone in the audience would like to make a public comment, please raise your hand by using this Zoom feature, looks like a high-five on the screen. If you're on by phone it's *9 to raise your hand, *6 to unmute.

Chair, I do not see any hands raised.

CHAIR HOCHSCHILD: Okay. Let me just say at the outset what we're going to do here is have a discussion and then a vote. And then we'll break for lunch and continue with the rest of the agenda.

I do not see a need for us to go into closed

session unless any Commissioners would recommend that. I'm happy to do it. And I'd turn first to Commissioner Douglas if you feel that's needed.

COMMISSIONER DOUGLAS: I agree with you Chair Hochschild. I don't believe a closed session is needed.

CHAIR HOCHSCHILD: Okay, what I propose to do, let me just read my recommendation and then we can talk it through. So my proposal, we direct the applicants for the Pecho and Gem projects to file information supporting an exemption from the NOI process by February 9th, 2022. And then direct staff to file a response to the applicants' information in the form of an Executive Director's recommendation no later than February 23rd, 2022.

I also want to add to the Pecho order that we're appointing a committee consisting of Commissioner Karen Douglas as Presiding Member and Commissioner McAllister as Associate Member to preside over the Pecho Energy Storage Center proceeding.

In the Gem order let's add that we're appointing a committee consisting of Commissioner Douglas as Presiding Member and Commission McAllister as Associate Member to preside over the Gem Energy Storage Center proceeding.

And then finally I'll just have Chief Counsel Barrera read any additional edits she has to what I just wrote, and we can just talk that through.

MS. BARRERA: Thank you Chair.

So the proposal to the Pecho order to add under the section labelled "Findings," in the third paragraph a sentence after the second sentence ends in Section 1203. And I sent the proposed language to the Commissioners, and this will be documented as soon as we are firm on what the language will be. So the sentence begins as following: "the scope of the Committee shall include managing the conduct of all aspects of the proceedings required for thermal powerplants, including but not limited to the qualification of the Pecho filing for an exemption from the Notice of Intent process, the data adequacy of the filing, and the Notice of Intent or the Application for Certification proceeding itself as appropriate. And making recommendations to the CEC on final actions in these proceedings, including on findings of an exemption from the Notice of Intent process, data adequacy of the filing, and whether to approve or deny the Notice of Intent or the Application for Certification."

So those are the proposed edits as to the Pecho Order. And that's 21-AFC-01.

Then I'll proceed to proposed changes to the Gem order. Should I do that, Chair?

CHAIR HOCHSCHILD: Yeah, can you just read it out, then we can discuss it.

MS. BARRERA: Okay, so it's the same change also under the Finding paragraph at the third paragraph after the second sentence at the following sentence.

"The scope of the Committee shall include managing the conduct of all aspects of the proceedings required for thermal powerplants, including but not limited to the qualification of the Gem filing for an exemption from the Notice of Intent process, the data adequacy of the filing, and the Notice of Intent or the Application for Certification proceeding itself as appropriate. And making recommendations to the Energy Commission on final actions in these proceedings, including on findings of an exemption from the Notice of Intent process, data adequacy of the filing, and whether to approve or deny the Notice of Intent or the Application for Certification." Those are the changes.

CHAIR HOCHSCHILD: Okay. Thank you, Linda.

So that's the proposal. Let's open it up for Commissioner discussion, starting with Commissioner Douglas.

COMMISSIONER DOUGLAS: So a couple of brief comments, first I want to thank Eric for the presentation and the staff team that contributed to the data adequacy recommendation. They both do a really good job of explaining how this proposed facility is a thermal power

plant within the meaning of the Warren-Alquist Act.

And I also appreciate this preliminary inquiry into whether the facility qualifies for the Application for Certification process and identification of topics that staff believes warrant supplementation by the applicant. I definitely am looking forward to learning more about both topics in the staff's next data adequacy recommendation memo for the project.

Also, as staff pointed out, and I appreciate the Coastal Commission participating today but for the project in the coastal zone we will be working closely with the Coastal Commission. And it will require important determinations by the California Coastal Commission.

So let's see here, I'm fully on board with the proposal that with a siting committee that is proposed and the directive in the proposed order in terms of how the applicant and when the applicant would file on the Notice of Intent process, so I'm prepared to make a motion on this item when we're through with Commissioner discussion.

CHAIR HOCHSCHILD: That'd be great. Yeah, we'll come back to you. I do have some questions for the applicant, but let's just go to other Commissioners.

Commissioner McAllister?

COMMISSIONER MCALLISTER: Yes, thank you. And ditto on what Commissioner Douglas said and I'm certainly

on board with being Associate Member on a committee if that is the outcome here.

I think just from a technical perspective this is a really interesting sort of application of thermodynamics and some lookout, looking forward to looking at things through that lens. And along those lines I do have a question. So we're shuffling a lot of heat around in the compression and then the decompression. And I guess I was just kind of wondering, sort of big picture, the stored thermal energy would be used to reheat the air that is coming up from the storage below. And it's sort of that heated compression would roughly at least --would presumably roughly match the cool that is generated on the on the decompression.

And I guess I'm wondering -- other than maybe the round-trip efficiency, some additional heat there -- but I guess I'm wondering sort of what that process looks like, sort of how hot is it that you anticipate the air to get? And sort of what that energy balance looks like in just gross terms.

MR. HILDEBRAND: The specifics are summarized in our AFC application middle, Commissioner. I don't have the specific picture off the top of my head. David, if you're on the line?

COMMISSIONER MCALLISTER: Leonidas might, or one

of the staff might, actually.

MR. STEIN: Unfortunately, I don't have that.

COMMISSIONER MCALLISTER: No? No worries, it's a little -- I'm sorry if I catch you off guard, kind of this is a novel application of our thermal sort of statute. And it's going to be really interesting to work through, and make sure that that we're ground shooting (phonetic) with the physics of it. So just really, I'm excited to sort of dig into those.

I guess I'm also wondering are there any -- so presumably you're using some advanced drilling technologies to open up the caverns. I guess I'm wondering do you, particularly in the coastal zone, when do you anticipate any sort of, I don't know, integrity issues in terms of geology and being near faults and things like that?

MR. HILDEBRAND: We do not anticipate those. We will submit --

COMMISSIONER MCALLISTER: Oh, you're muted.

MR. HILDEBRAND: Oh, I'm sorry. Can you hear me now?

COMMISSIONER MCALLISTER: I'm still not hearing you.

MR. HILDEBRAND: I'm showing unmuted.

MS. GALLARDO: Commissioner McAllister this is Noemi. I am hearing Curt.

CHAIR HOCHSCHILD: So we're hearing him fine, Noemi.

MS. GALLARDO: Yeah, I wonder if there's an audio issue on your end Commissioner McAllister? Can you hear us?

COMMISSIONER MCALLISTER: Actually, my -- are you hearing me?

CHAIR HOCHSCHILD: Can someone test him? We're having a problem. We can hear you, but I guess you can't hear us. Sorry, Curt, go ahead. Were you going to say something?

MR. HILDEBRAND: Yeah. The underground caverns, we will conduct very detailed seismic assessments of the subsurface formations. The bores holes used to build those caverns will be fully lined with cement casing, a large diameter cemented in place. And the only geologic formation that would be satisfactory in order for us to build out our project is a very solid bedrock formation that is absent of high levels of porosity, permeability or fractures.

CHAIR HOCHSCHILD: Okay.

MR. HILDEBRAND: But for a very solid bedrock formation we will not be in a position to construct our facility nor operate it.

CHAIR HOCHSCHILD: Okay. I did have a question.

I just wanted to make a couple of comments, but wanted to check with my colleagues. Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, thank you, Chair. Again, I just wanted to say in a couple of points from a policy standpoint, Curt and David, thank you for the presentation and Eric, thank you for yours.

As we march towards the climate goals, I think the long duration storage is critical, but just I'm incredibly excited about this potential project and how it all plays out.

So just a couple of technical questions. Again, these are not something we need to discuss, we could follow up after. So when we talk about the round-trip efficiency of 60 percent are we talking about the efficiency, taking into account, when you do your cycle of compressing the air and recovering the heat do you anticipate that recovered heat to essentially be contained for a long period of time? Or do you anticipate losing some of that heat and then having to recharge, for lack of better words? And then how does that affect the efficiency? That's one point, one question.

Second is just at a high-level, the dispatchability and response, I mean I've looked at your website because I was super-excited about this. I know there are some projects in Canada that's being currently

used for both peak support as well as ancillary services. I just wanted to understand the response rate. And also if I understand it right, the project in Ontario is much smaller. And how are you thinking about scaling? And what do you see as potential things that you will have to work through as you build this?

MR. HILDEBRAND: Thank you for your questions, Vice Chair.

As far as the round-trip efficiency we're currently projecting a floor of 60 percent. And that is inclusive of all thermal losses throughout the system be it at subsurface, be it on the surface. We do have electric heaters that we will employ in the event that we have a charged system that is not discharged for a long period of time. There will be additional heat loss on those surface storage facilities that are storing our thermal energy on the surface, so we are able to reheat that. With all those factors rolled in we are expecting for every megawatt hour we consume in charge mode we expect to be able to produce .06 megawatt hours of production at the other end.

We are still finalizing the design and equipment specs and in order to improve that and we do expect our round-trip efficiency in the final designs will be somewhere between 60 and 65 percent all in, but for today's purposes we're looking at something closer to 60 for a

floor.

Our response rates, we have listed some of those in the AFC. They are very analogous to a gas turbine, if not better, because we don't have to reheat the thermal cycle that a gas turbine (indiscernible) the combustion cycle so they're very analogous in terms of response times, spinning reserve, ramp up, ramp down. We are every bit as good if not better in most regards to traditional combustion turbines, given that we just have air. We do have thermal aspects of our system, or we do need to accommodate those operations as well, but simply put they're very analogous to a traditional natural gas facility in terms of response and ancillary services.

The last question, I'm sorry I didn't jot it down.

VICE CHAIR GUNDA: Yeah. It's just the scale. I think of the project that you have.

Curt Hildebrand: Great. In terms of scale, the main equipment that we're utilizing consists of air compressors, turbo expanders, and heat exchangers. We've been in discussion for years now with the leading folks in these sectors; Halliburton, there's a number of providers. Actually some of those folks are investors in Hydrostor, original investors. They have 100-megawatt turbo expanders, air compressors that they have been utilizing in

various applications around the world for decades. We are obviously working with them closely to adapt those pieces of equipment to best suit our needs.

But these are not off the shelf per se, but proven technologies in operation for decades. We do not have a 100-megawatt A-CAES facility train built and operating today, but that virtually identical equipment inclusive of the heat exchangers have been proven in operation at refineries and other applications around the world for decades.

So as I mentioned earlier, we're taking proven technology and equipment and applying it in a different way, but not adapting new technology, per se. You know, heat exchangers, air compressors, turbo expander, they've been around for a long time. We're repurposing them in a new set of applications. So we're confident our scale-up will meet the needs for the project.

VICE CHAIR GUNDA: Yeah. Thank you so much, Curt. Again, I'm very excited about this project and looking forward to watching you implement and learn from this as California gets towards its goals. Yeah, I think David you were going to say something, but I don't have any further questions.

CHAIR HOCHSCHILD: Yeah, unless Commissioner Monahan has a question? (Shakes her head no on camera.)

No, okay.

I did have a few questions. First of all, this is indeed something of a milestone. We've never had a project in this technology category apply for certification. And of course it's much needed, particularly losing Diablo and the OTC plants in the coming years as we're electrifying so much. What is the fastest -- is there a possible timeline, the best (Indiscernible) or you would expect these projects to actually be online?

MR. HILDEBRAND: We are targeting the first quarter of 2027. We do have that's assuming a fairly -- not expedited but not prolonged -- AFC review and approval process at the Energy Commission for each project. And then a roughly 52-to-56-month construction cycle for each facility. And again, we are doing everything we can to compress the schedule on the construction side, but it is a very fairly significant undertaking and we're looking at early 2027 for CODs for each facility.

CHAIR HOCHSCHILD: Okay. Yeah, it may be easier to compress the air than the schedule. I was also just curious, roughly ballpark, what the Cap-X is for a project of this scale?

MR. HILDEBRAND: Yeah, in round numbers we're expecting something approaching $800 million for Pecho. And for the Gem project a proportionately higher Cap-X of

almost $1 billion or upwards of $1 billion.

CHAIR HOCHSCHILD: Okay. And then just on a PPA basis like help us understand where this stacks up versus other long duration technologies, flow batteries: iron chromium, vanadium, or iron-air, or other potentially similar storage chemistries and projects. I mean, how do you kind of compare and contrast to your peers, in that sense?

MR. HILDEBRAND: Well, I obviously can't get into too many commercial specifics, given the nature of our ongoing discussions with prospective customers. We are very encouraged by this. We bid both projects into ongoing RFPs by all the LLCs (phonetic) that have issued RFOs to date, for both long duration and traditional storage. We've gotten very positive feedback.

I would just highlight in terms of our commercial positioning, the $250 million investment by Goldman Sachs speaks volumes as far as where we and a large successful investment firm views our commercial opportunities in the future. I think we're well positioned to secure offtake agreements in the near future, and we can tag you if that does happen.

CHAIR HOCHSCHILD: Okay, super helpful. Well with that I would welcome a motion from Commissioner Douglas, unless there's other comments from Commissioners

on the items as proposed. And Commissioner Douglas, are you willing to move those recommendations?

COMMISSIONER DOUGLAS: Yes.

CHAIR HOCHSCHILD: Okay.

COMMISSIONER DOUGLAS: Yes, so maybe I'll start with Agenda Item 5 and just ask the Chief Counsel, would you like to read or reread the proposed edits to the order? Or do you think I can just reference what you read previously?

CHAIR HOCHSCHILD: I don't think we changed anything since it was read.

COMMISSIONER DOUGLAS: I don't either.

MS. BARRERA: I'd keep it a bit more simple, because the revised order was docketed in the business meeting docket.

COMMISSIONER DOUGLAS: Okay.

MS. BARRERA: So yes, you could proceed and say that the proposed order with the Chief Counsel's edit was discussed during this business meeting, as reflected in the revised order that was just filed in the docket for the business meeting.

CHAIR HOCHSCHILD: Can we take up both items together, Linda, or just do we --

MS. BARRERA: You should do it separately.

CHAIR HOCHSCHILD: Do it separate. Okay.

MS. BARRERA: Yes.

COMMISSIONER DOUGLAS: All right. So then for Item 5 I move the proposed order with the modifications read by the Chief Counsel.

CHAIR HOCHSCHILD: Commissioner McAllister, would you be willing to second that?

COMMISSIONER MCALLISTER: Yes, apologies I had some glitches on my --

CHAIR HOCHSCHILD: Sure, no problem. Okay. Thank you.

COMMISSIONER MCALLISTER: -- earlier setting. So I will, yes, second this item.

CHAIR HOCHSCHILD: Seconded by Commissioner McAllister. All in favor say aye.

Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: And I vote aye as well. Item 5 passes unanimously.

CHAIR HOCHSCHILD: Commissioner Douglas, do you

want to move Item 6?

COMMISSIONER DOUGLAS: Yes.

I'll ask Linda, do you want to restate the changes for Item 6?

MS. BARRERA: I suggest that you move to adopt the proposed order with the modifications read by the Chair and by the Chief Counsel as reflected in the revised order that was just docketed in the business meeting docket.

COMMISSIONER DOUGLAS: Thank you. All right, Linda.

MS. BARRERA: I just want to make sure that it's available to the public as well, all the changes that were discussed during that, by the Commissioners and the Chair.

COMMISSIONER DOUGLAS: Thank you, that's fantastic. Okay, so moved.

CHAIR HOCHSCHILD: And Commissioner McAllister would you be willing to second?

COMMISSIONER MCALLISTER: Seconded.

CHAIR HOCHSCHILD: All in favor say aye.

Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: And I vote aye as well. And Item 6 passes unanimously, as modified.

So with that let's take a break for lunch. Why don't we reconvene at 1:30? See everybody then.

(Off the Record at 12:36 p.m.)

(On the Record at 1:30 p.m.)

CHAIR HOCHSCHILD: All right, welcome back from lunch everybody. Let's turn now to Item 7, EV Ready Communities Phase II Blueprint Implementation.

MR. BRECHT: Yes. Good afternoon, Chair, Vice Chair and Commissioners. I'm Patrick Brecht from the Fuels and Transportation Division. Today staff is seeking the approval of two new agreements and one amended agreement under the Electric Vehicle Ready Communities Phase II Blueprint solicitation.

The purpose of the solicitation was to fund projects developed and identified in Phase I. Phase I advanced and supported communities in building a framework for their transition to zero-emission vehicles. This second phase will be implementing those frameworks. Funding is provided through the Clean Transportation Program. The original solicitation provided $7.5 million to four projects.

Now in September 2021 the CEC added over $9 million to the original solicitation by utilizing funds from the Clean Transportation Program Investment Plans Recovery and Reinvestment funding category from Fiscal Year 2020-2021. This allowed the full funding of three additional projects and to fund one project that was originally only partially funded. Three projects are seeking approval today, with the fourth project seeking approval at next month's business meeting. Next slide.

The benefits to California are to improve accessibility to charging infrastructure by accelerating towards California's zero-emission vehicle infrastructure goals. This will also reduce the barriers to zero-emission vehicles. And the workforce component will create green jobs. Next slide.

The first project seeking your approval is with the San Francisco Department of the Environment for just under $2.4 million. This project will add new datasets and functionalities to their Blueprint Mapping Tool from Phase I.

The project will establish an EV Ombudsperson to facilitate installations of 100 levels 2 and 25 DC Fast Chargers in the city, along with other tasks.

Another objective with this agreement is to open three public fast-charging plazas, one within or adjacent

to a disadvantaged community.

This project will also design and implement a program to get app-based delivery workers to use e-bikes.

Lastly the project will ensure knowledge transfer of project results and best practices among stakeholders, professionals, and municipal colleagues. Next slide.

The second project is with the County of Los Angeles Internal Services Department for $2.5 million.

This project will deploy light-duty EV infrastructure, through a disadvantaged community electric vehicle infrastructure project, a broader EV infrastructure planning streamlining pilot project, and a direct multifamily housing EV charging installation incentives project.

The project outcomes include the following: The Public Agency Disadvantaged Communities Program goal will be to install 130 Level 2 Chargers.

The Multi-family Program goal will install 60 Level 2 Chargers.

This project will provide a holistic approach to the regional transportation electrification issues, a detailed analysis of primary market sectors, preliminary considerations for regional EV infrastructure planning, and next steps for the region, as well as data and analysis to support development of a comprehensive and replicable

blueprint to transition to an EV-ready community. Next slide.

The final project seeking your approval is with the Kern Council of Governments, which will increase original funding of around $700,000 to $2.5 million.

The project, if fully funded, will install a minimum of 32 Level 2 and DC Fast Chargers at a minimum of ten sites throughout Kern County.

The project will expand and support the MioCar electric carsharing business to reach more communities within Kern County.

The project will install additional chargers to support workforce development at Bakersfield College.

This project will also conduct outreach and education activities including hosting two symposiums and three public EV workshops.

And lastly, it will update the Kern Council of Governments community EV blueprint, which was started in Phase I with the CEC's blueprinting solicitations. Next slide.

Staff is seeking your approval of these three projects. Staff has also determined that these projects are exempt from CEQA. And I'd like to thank you for your time and consideration for these items. Thank you.

CHAIR HOCHSCHILD: Thank you so much, Patrick.

Let's go to public comment on Item 7.

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees if you would like to make a public comment, please raise your hand using the icon on the Zoom, it looks like a high-five. If you're on by phone please press *9 to raise your hand, *6 to unmute.

I'm looking for hands. Chair, I do not see any hands at this time.

CHAIR HOCHSCHILD: Okay let's turn to Commissioner discussion, starting with Commissioner Monahan.

COMMISSIONER MONAHAN: Well, I am excited about these projects that really focus on this issue of how do we make sure that EV charging infrastructure is equitable? And I think all three of these projects have this strong focus on multifamily dwellings on disadvantaged communities on making sure that there's access through a car-sharing program to zero-emission technology that also is affordable. So these are really great examples of first we do the planning and then we fund the implementation. And I just appreciate the leadership of San Francisco, Los Angeles, Kern in applying for and look forward to being able to see these programs on the ground, so I strongly support them.

CHAIR HOCHSCHILD: Thank you, Commissioner.

Yeah, I will just second that, love the diversity of these approaches. And I would just highlight that the governor released a statement today on this $10 billion ZEV package that he's been championing and which we're working with CARB to implement and just how big the opportunity is here. And this is really putting meat on the bones of that effort. And I just really want to commend Hannon Rasool and the whole staff, Patrick and the rest, all who worked on this, and Commissioner Monahan for your incredible leadership.

Just looking to see if there's any other comments from Commissioners wishing to speak on this item. If not, Commissioner Monahan, I welcome a motion from you on Item 7.

COMMISSIONER MONAHAN: I move to approve Item 7.

CHAIR HOCHSCHILD: Commissioner McAllister, would you be willing to second that?

COMMISSIONER MCALLISTER: Second.

CHAIR HOCHSCHILD: Okay all in favor say aye.

Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Then we'll turn now to Item 8, Santa Clara Valley Transportation Authority.

MS. ODUFUWA: Good afternoon, Chair and Commissioners. My name is Esther Odufuwa, Energy Commission Specialist with the Fuels and Transportation Division.

Today we are seeking approval for one grant agreement resulting from the Zero-Emission Transit Fleet Infrastructure Deployment Solicitation. This solicitation supported deployment of electric vehicle charging and hydrogen refueling infrastructure that is necessary to reach ambitious targets for large-scale conversion of transit bus fleets to zero-emission vehicles.

Seven projects were recommended for award from this solicitation, including three hydrogen refueling infrastructure projects and four battery electric infrastructure projects. Three of those projects were presented at an earlier business meeting and three remaining projects will be presented at a future business meeting.

Today I will present one proposed project focused on deploying charging infrastructure, renewable generation, and stationary storage as part of a microgrid to support battery electric bus charging. Next slide, please, next

slide.

The solicitation and proposed awards will bring multiple benefits to Californians and their local transit agencies transitioning to zero-emission technologies.

Investments that are made through this solicitation will provide best practices and key lessons learned to increase replicable solutions that can help other transit agencies across California to transition to 100 percent zero-emission buses.

The project proposed today is estimated to reduce greenhouse gas emissions by nearly 1000 metric tons CO2 by year, and this will also help reduce particulate and criteria pollutant emissions, leading to air quality and health benefits to pollution-burdened communities.

Last, the project includes distributed energy resources and microgrid capabilities to increase site resilience and also enable continued transit operations even during electric grid outages. Next slide.

This proposed agreement is with Santa Clara Valley Transportation Authority, otherwise known as VTA. And the project will deploy electric bus charging infrastructure to support up to 34 battery electric buses. This will be at the VTA's Cerone Zero Emission Bus Infrastructure and Microgrid project, which is part of VTA's strategy to convert its entire fleet of 120 buses to

zero-emission vehicles. And to support this conversion the project will install a solar and storage microgrid, enough energy to charge around 10 of the buses when the grid is down. And also dependent on the time of the year the outage occurs the solar can produce enough energy for as many as 30 buses in a day at that yard without any reliance on grid power. Next slide.

VTA operates routes on routes that provide transportation services and opportunities for disadvantaged, low income, and opportunity zone communities. And the local bus route services are also provided in the urbanized unincorporated areas of the county. There are several route stops in low-income areas in its southern reach and low income and opportunity zones in its northern reach as well. There are other routes that connect to the disadvantaged communities, low-income communities, and opportunity zone areas of the cities of Gilroy and Morgan Hill to the urbanized areas and opportunities available in San Jose as shown on the map. Next slide.

This project will utilize its solar canopy where buses will park under and charge using two Proterra 1.5 megawatt Proterra central Power Control Systems chargers, with 34 charging dispensers that are part of the solar canopy structure. The dispensers will use the Society of

Automotive Engineers, SAE, J1772 Combined Charging Systems, CCS 1 plugs and dispensers, and this is universally compatible with any vehicle that meets this standard. In this case, it's the electric buses.

Solar energy that is generated from the solar canopy, combined with other solar installed and generated onsite as part of the project, will be used in conjunction with stationary battery storage used to form the microgrid and that will be used to charge the fleet of electric buses. Next slide.

The project will also install a 4-megawatt hour or 1 megawatt of Battery Energy Storage, which is charged by onsite solar PV during the day and then discharged into the buses when electricity prices are higher. This energy storage system can discharge its whole 4-megawatt hour between 3 to 3.5 hours.

In addition, the project will install an overhead inverted pantograph that uses SAE J3105 promotes the safe conductive power transfer systems for electric vehicle charging and recharging buses and heavy-duty vehicles. The dispensers have low-profile overhead pantographs that are attached to the carport solar structures. And the power is automatically routed from the 1.5-megawatt Proterra power control system to each dispenser and that is according to the vehicle's charging schedule. Next slide, next slide.

Shown on the left is an aerial view of VTA Cerone bus yard and this is about 122-acre tract of land that includes both bus operations and the bus maintenance facilities.

Again, the project will deploy infrastructure that can support more than 34 battery electric buses that each all these buses contain a large battery with nearly 450 kilowatts of storage capacity, and that is approximately 10 times larger than an average residential storage system. Charging of these buses is a function of the amount of energy that needs to be charged on the bus, but if you're looking at the high level you could consider that a bus with a standard 405 kilowatts of useable energy that charges at an average rate of 130 kilowatts would charge between 3 and 3.5 hours.

Today there are about 11,500 transit buses that operating across California. So if all the buses deployed in this project are capable of actually discharging electricity to the grid there is potential for this to be able to provide both mobility and electric services.

In addition, if all these transit buses in the state were bi-directional and also capable of discharging through an average dedicated 60 kilowatts bidirectional charger, combined they represent nearly 700 megawatts of flexible capacity that could support the grid during times

of peak demand. And this capacity is roughly enough to power nearly about 700,000 California homes. Next slide.

Staff recommends approval of this grant award and adoption of staff's determination that this project is exempt from CEQA. Thank you all for your time and consideration of this item and this concludes my presentation. I believe staff from VTA are available to make comments.

CHAIR HOCHSCHILD: Thank you, Esther.

Let's go to public comment on Item 8.

MS. GALLARDO: This is Noemi, the Public Advisor. Attendees if you would like to make a comment, please use the raised-hand feature on the screen, it looks like a high-five. If you are on by phone please press *9 to raise your hand, *6 to unmute. Again, if you would like to make a comment, please raise your hand using the Zoom icon or press *9 by phone.

I am looking for hands now. Chair, I do not see any hands at the moment.

CHAIR HOCHSCHILD: Okay. Let's go to Commissioner discussion, starting with Commissioner Monahan.

COMMISSIONER MONAHAN: Well, Esther, thanks for a great presentation. And I actually want to really appreciate the fact that you brought out sort of what the

potential if every electric school bus were a DER what that could mean for the state of California in terms of resilience, which connects to an earlier conversation we were having.

And this is the second type of this type of grant. We approved one last year for LA Metro. This one, just this idea that the Chair, I love this quote of, "How do we make EVs good citizens of the grid?" And this is one strategy for both making them good citizens of the grid, and a more resilient energy system. So like the fact that if the grid goes down, they could use renewable energy to charge up to 30 vehicles, so 10 from the battery storage and then an additional 20 is just incredible. And I would really, once it's actually up and running, this is another one of those projects I would love to see in action. It just brings together electrification, mobility, resilience in a perfect way.

So I just want to thank Esther and thank Elizabeth John for her leadership and Michelle Vater and the whole team. These are the kinds of projects that really bring together equity and clean transportation in a perfect way. Thank you.

CHAIR HOCHSCHILD: Okay, great.

Unless there's other comments from Commissioners, I would -- oh, go ahead, Vice Chair Gunda.

VICE CHAIR GUNDA: I wanted to say, even on the previous presentation, I just wanted to commend both these presentations. And Esther, a great job on describing the benefits. As Commissioner Monahan mentioned, just seconding everything she said, I think this is just really innovative, kind of the way we are envisioning the future. These demonstrations are really making it seem feasible, so just really looking forward to the success of this program. And thank you for the presentation.

CHAIR HOCHSCHILD: Great. Well at this point I'd welcome a motion on Item 8 from Commissioner Monahan.

COMMISSIONER MONAHAN: I move approval on Item 8.

CHAIR HOCHSCHILD: Okay. Vice Chair Gunda would you be willing to second?

VICE CHAIR GUNDA: Yes, second.

CHAIR HOCHSCHILD: All in favor say aye.

Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: And I vote aye as well. Item

8 passes unanimously.

Let's turn now to Item 9. However, we will not be considering Item 9c, Greenfire, which will be set for another commissioner meeting, so this is only Items 9a, b, d, and e, Bringing Rapid Innovation, Development to Green Energy.

MR. FERREIRA: Good afternoon, Chair and Commissioners, my name is Michael Ferreira and I work in the Energy Research and Development Division. I'm here today seeking approval for five new grant agreements that resulted from our BRIDGE 2020 solicitation. BRIDGE is one of a series of programs we've established to enable clean energy startups, with this funding opportunity having the specific purpose of bridging the gap between public and private funding opportunities. Next slide, please.

One main benefit of BRIDGE is advancing the clean energy economy by funding promising technologies that can enable the transition away from fossil fuels.

Some of the specific benefits of the agreements being discussed today include improved grid resilience and reliability through reduced peak demand as well as lower costs from technologies that will enable increased renewable energy production. Next slide, please.

The first agreement is with Swift Solar, who will continue to develop their perovskite tandem PV technology

and demonstrate new applications. Today's solar cell products are limited in both their efficiency, with current cells around 23 percent and a practical ceiling being around 25 percent.

In this project Swift will work to improve the efficiency of their cells to over 28 percent and then develop modules that are curved and durable enough to be integrated into electric vehicles so they can demonstrate onboard solar charging in an operational environment. With onboard solar charging EVs can greatly expand the range and the time between charges, with the final product expected to be 50 to 100 percent of a typical California commuter's charging needs by adding an additional 17 to 21 miles per day of range.

In addition to saving on charging costs, reducing charging needs could also help avoid increased peak load caused by EVs being plugged in to charge by owners returning home from work. This should also reduce peaking capacity requirements leading to overall system cost savings.

Beyond the $1 to 2 billion EV market in California, Swift has identified aerospace, electronics and solar roofing applications as target markets. Next slide, please.

The next agreement is with Intertie incorporated

to develop an advanced power electronics module that enables fast charging using a low amperage circuit.

In order for EVs to be widely adopted a convenient network of fast chargers is required. Unfortunately, most fast chargers connect directly to the AC grid and have higher power requirements than the spare capacity in most building electric panels or utility services, meaning costly electric upgrades and higher operating costs due to high demand charges. Intertie's EV ChargePod overcomes these issues by decoupling the charger from the AC grid.

The power electronics module being developed directly connects the fast charger to a battery, local solar if available, and a grid-tied power converter, which together make up the EV ChargePod. This allows for commercially available fast chargers to supply high power to EVs using only a 100-amp circuit, making fast charging available at almost any location. A key innovation is Intertie's in-volt battery system that locates the battery directly under the charging station. By locating the battery underground the product save space, improve safety, and efficiently uses ground temperature for thermal management, saving on operating costs and extending battery life.

The completed product will lower the cost and

accelerate the deployment of fast-charging infrastructure by avoiding the need for expensive grid upgrades. Additionally, being coupled to storage means this product can reduce peak demand by charging during off-peak hours.

Intertie estimates that at 10 percent market penetration of convenient retail such as gas stations, fast food, small retail and strip malls, would equal over 4,700 installations resulting in 750 megawatts of peak load reduction. Next slide, please.

The next agreement is with Icarus RT to demonstrate commercial readiness of their hybrid PV/thermal solar cogeneration system.

As mentioned earlier current PV technology converts only about 22 percent of solar energy into usable power, and that is at the ideal temperature of 25°Celsius. However, on hot days panels can reach temperatures above the 65 °Celsius or more, causing panel efficiency to drop to 16 percent or lower.

The hybrid PV/Thermal system in this project uses Icarus' heat exchangers, which attach to the back of PV panels, to cool panels by extracting waste heat. The system collects and stores this thermal energy and converts it into hot water on demand. By cooling panels up to 18 deg Celsisu Icarus can increase efficiency by up to 12 percent. For the 280-kilowatt system being installed in

this project, this amounts to an additional 50,000-kilowatt hours generated annually with a value of $15,000 from improved efficiency alone.

The system charges the thermal battery while boosting PV power output, unlike current battery systems, which consume PV output to charge. The results are increased power and energy production, longer panel lifetime, reduced greenhouse gas emissions, and a faster return on investment.

Initial target markets for this technology include multifamily, commercial and industrial applications, which represents a $5 billion market in California as of 2020. Next slide, please.

The last agreement is with Carnot Compression, who will continue to advance their compressor technology to commercial readiness.

Current air compressor technology is relatively energy inefficient, with industrial air compressors estimated to represent 12 percent of manufacturing electricity consumption, or about 4.9 terawatt hours in California. Also, the majority of air compressors sold today address heat using oil, requiring frequent oil and filter changes and disposal.

Carnot Compression has developed an isothermal air compression technology that solves the heat of

compression problems by using a working liquid to compress gas while actively removing the resulting heat.

The Carnot Compressor is projected to reduce energy consumption and operating costs for air compressors by 20 percent or more compared to incumbent technologies. Assuming a 10 percent adoption factor, their compressor could provide up to $22 million per year in energy cost savings in California alone. Also the compressor is oil-free air, which removes the costs of oil and filter changing and disposal and reduces down time for maintenance.

The global air compressor market is estimated at $40 billion per year by 2025 with oil-free compressors accounting for a third of that. Carnot is targeting the oil-free segment, as incumbent oil-free compressors are approximately three times the cost of similar oil-flooded compressors, providing an opportunity for Carnot to compete in a premium priced market. Next slide, please.

Staff recommends approval of these 4 grant agreements and staff's findings that these projects are exempt from CEQA. This concludes my presentation, staff is available for questions. And I believe there are some representatives from some of the companies who would like to comment. Thank you.

CHAIR HOCHSCHILD: Thank you, Michael, appreciate

that.

Let's go now to public comment, Noemi.

MS. GALLARDO: Yes, this is Noemi Gallardo, Public Advisor. Attendees if you would like to make a comment you can use the raise-hand feature on Zoom, it looks like a high-five. If you are on by phone please press *9 to raise your hand, *6 to unmute. I'm looking for hands now. I do see a hand raised, Todd Thompson. A reminder to please restate your name, spell it and indicate affiliation, if any.

Your line is open, Todd, you may begin.

MR. THOMPSON: Hi, this is Todd Thompson. I'm one of the co-founders, and the CEO of Carnot Compression. And I would just on behalf of Carnot Compression, would like to say thank you to Chair Hochschild, Vice Chair Gunda and the Commissioners for considering our project for funding.

CHAIR HOCHSCHILD: Thank you.

MS. GALLARDO: All right, this is Noemi, the Public Advisor. I am looking for hands. We have another, looks like Pat Millham, apologies if I mispronounced that. Please restate your name, spell it, and indicate your affiliation if any. Your line is open, you may begin.

MR. MILLHAM: Thank you so much. Thank you, Chairman Commissioners. My name is Pat Millham. I'm the

Chief of Staff Swift Solar headquartered in San Carlos, California. And I just wanted to thank the CEC and the governor for this opportunity of leadership and to your commitment to innovation.

CHAIR HOCHSCHILD: Thank you.

MS. GALLARDO: I'm looking for hands again. Chair, I do not see any other hands at this time.

CHAIR HOCHSCHILD: Okay. Well I'll just say I think this is a terrific mix of projects. I just want to commend all of the companies, innovators, and the staff for setting this up today.

You know, sometimes what looks like just incremental innovation can be incredibly significant. I mean, if you take just first divide it, and moving just a few percentage points higher on efficiency or allowing for a curved solar shell that can fit on the roof of a vehicle, those are actually very, very significant steps forward. And I just really feel good about this whole package of proposals to push the ball forward. And this continues a long tradition here with the EPIC program really hitting home runs, and so these projects have my full support.

I just wanted to see if other Commissioners would like to chime in? Commissioner McAllister, go ahead.

COMMISSIONER MCALLISTER: It's great. I just would second your comments and just congratulate the

companies represented here for bringing these projects to us. And really commend staff over the last few years having conceived and put in place this bridge, sort of slice, of our R&D efforts too, because it does really fill a niche that's needed in the innovation chain.

And I think all four of these projects are emblematic of that and really represent, as you said, steps forward to look for opportunities and harvest those opportunities, to really improve and just at every stage of the renewable supply chain looking for all these opportunities that aren't obvious at first glance, but can make a big difference. So that's important, this package.

CHAIR HOCHSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Yeah, I'm really excited about these. And especially, I mean well both the EV-related has been near and dear to my heart. And the idea that you could put maybe a solar panel on the roof and get enough energy to basically meet your daily needs, that's incredible, that's a game changer. And I mean if it works it really would make a huge difference in terms of being able to accelerate the transition to electric transportation.

It's kind of like actually when Mike was talking about it with me earlier, I was just like, "What? How can this be?" It is a really exciting opportunity. I mean,

we'll see what happens, but these kinds of investments in technologies that could be really game changers are just so, so exciting.

And Intertie too, that bury the battery. It has a small footprint, keeps the battery cool to make the system more resilient, I mean it's just sort of exciting technologies.

You think a lot about -- I think a lot about how medium- and heavy-duty vehicles, we want to make sure that they charge at the right times and they're optimal. And with light-duty these kinds of projects also give, unlock that potential in the light-duty sector

CHAIR HOCHSCHILD: I mean, it's interesting to think about we have all these gas stations with buried fuel tanks, and you can have buried batteries replacing them over time here.

COMMISSIONER MCALLISTER: Yeah, we're all going to have an incentive to park in the sun instead of in the shade.

CHAIR HOCHSCHILD: Yeah, that's true. They'll charge more for parking (indiscernible) in the sun. Comments from other Commissioners? Oh yeah, Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, I think I just wanted to second all of you. I think super-excited about all the

programs, all the different projects here. And also just the hybrid thermal solar system, that's pretty awesome. And I think that works with the dual application of both improving efficiency, but also the hot water.

These are just -- going back to Commissioner Monahan's comments over the last few IEPR workshops, just the integrated nature of these projects, buildings, transportation, everything's coming together and in support of the grid modernization I think, so super excited and looking forward to supporting them.

CHAIR HOCHSCHILD: Great. With that, Commissioner McAllister, I'd welcome a motion on Item 9.

COMMISSIONER MCALLISTER: I will move Items 9a, b, d, and e.

CHAIR HOCHSCHILD: Thank you. Commissioner Monahan, are you willing to second?

COMMISSIONER MONAHAN: I second.

CHAIR HOCHSCHILD: Okay all in favor say aye.

Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCHSCHILD: And I vote aye as well. Those items pass unanimously.

We'll turn now to Item 10, Approval of the December 8th Business Meeting Minutes. Any public comments on that, Noemi?

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees if you would like to comment on the business meeting minutes from December 8th please raise your hand using the icon on Zoom. Or if you are on by phone press *9 to raise your hand, *6 to unmute.

I am looking for hands now. Chair, I do not see any hands raised at this moment.

CHAIR HOCHSCHILD: Okay. Vice Chair Gunda could you move Item 10 please.

VICE CHAIR GUNDA: Yeah, I'll move Item 10.

CHAIR HOCSCHILD: And Commissioner Douglas, could you second?

COMMISSIONER DOUGLAS: Second.

CHAIR HOCHSCHILD: All in favor say aye.

Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCSCHILD: Commissioner Douglas?

COMMISSIONER DOUGLAS: Aye.

CHAIR HOCSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

We'll turn now to Item 11, Lead Commissioner Reports. Why don't we begin with Commissioner Monahan?

COMMISSIONER MONAHAN: Well, since we just had the retreat, I don't have very much to add, just two items: one is just information on purposes and the other is a slight discussion.

So I really appreciated the discussion opportunity at our retreat. So just for your information, I participated in a meeting that was pulled together by Ethan Elkind from UC Berkeley the Climate Center. And he pulls together these convenings to wrestle with challenging topics. I don't know if others have probably been involved in those meetings that he's pulled together.

But this one was on sustainable aviation fuels, and it was very fascinating. It brought in folks from the EU and all major airlines, including United and Southwest participated. And just a lot of, I would say, Chatham House Rules, so we can't attribute anything to anyone. But just a lot of interest, I think, on the biofuels has been the primary, I guess, investment by most of these companies and the attention has really been on biofuels.

Now there's just more recognition that there can be a place for ZEV in the air travel space. And the question is what is that space and how? And is it hydrogen? Is it battery electric? But that's something I would say is much more nascent. And in the proposed budget that the governor has there's $100 million for emerging opportunities, air travel is in that basket. So it might be an opportunity for some investments on zero-emission aviation in California, which would be exciting.

We started this question about hydrogen and just wanting California to get one of the federal hydrogen hubs with a real emphasis on green hydrogen. And I wanted to say maybe for discussion purposes that the federal legislation has specific language about what clean hydrogen is. And I think there's going to be interest by the federal government to kind of stick with that and not move into the categories of blue, green, pink, all the different color array that we use to describe hydrogen.

And so I think that will be one of the questions that comes up is really how much to focus just in on like electrolytic hydrogen that falls underneath a certain life cycle, GHG versus pure green, which would mean produced by renewable energy. So just I know everybody has an interest in hydrogen, and so I just want to keep you in the loop on that. And if there's any feedback or thoughts, I welcome

them.

CHAIR HOCHSCHILD: Thank you, Commissioner.

Let's go to Vice Chair Gunda next.

VICE CHAIR GUNDA: Yeah, thank you, Chair. Thanks, Commissioner Monahan, for your report.

Yeah, so as Commissioner Monahan said we very recently met. And there was a very broad discussion on a number of items, so I don't want to repeat them, which are already on the record. But I just wanted to provide in the spirit of what Commissioner Monahan was saying, one of the things we would like to do moving forward in doing these reports is an ability to discuss amongst us things that are cross-cutting and such, enough interest obviously.

So one thing that all of you are interested in, going into 2022, the summer reliability. Staff have been at work on that, we have been -- so it is a preliminary stack analysis that's completed for 2022. As some of you might recall last year during the Emergency Proclamation, the proclamation kind of referenced about a 5000-megawatt shortfall for 2022 under extreme conditions. That was revised down to 4300 by staff in fall timeframe. And the latest analysis, taking into account some of the deficiencies such as Redondo Beach, which is now available for 2022 and a number of procurements that has been done by CPUC, the shortfall has really reduced all the way down to

2100, going into 2022. So we are almost 3000 megawatts better from where we were about this time last year.

And even for the 2100-megawatt shortfall under those extreme conditions we currently have a pretty robust set of measures, contingency measures to sum up to almost 2,000 megawatts; so 2,000 to 3,500 depending on the lower end.

So I think just wanted to provide that. And overall, staff are on it working really hard, not just our staff, joint agency staff, in kind of moving the conversation forward.

There's also kind of an emerging focus, more and more so, as you all know that we've put in our mid-term Reliability Analysis last year, looking through 2026, so that's the focus now.

And under Commissioner Douglas there is a number of efforts that have started with SB 100, but also kind of just that SB 100 has precipitated a number of other things around inter-connection, how do we solve issues around transmission, bringing land-use permitting, all sorts of things. So Commissioner Douglas, thank you for your vision in kicking off those broader efforts that really started from your original SB 100 kickoff.

So we are now tracking through 2026. There are a lot of efforts in place. And the idea would be on a

regular cadence we will look ahead every year, six months ahead of time in the summer and we see how that shortfall is looking, look at the contingencies. And at that point make a kind of an informed decision that's joint agency supported to the Administration of the Governor's Office however we see fit there on any extraordinary measures that we might have to take like leveraging the Proclamation last year. So that's kind of the emerging kind of process. I just wanted to say that CARB showed us a number of briefings that they're doing right now along those lines.

The other one of interest, the Chair might mention this as well, we have been tracking the Moss Landing battery energy project, storage project. And that's important because it's 300 megawatts, but also because it's a -- as we move towards more and more reliance on batteries, we want them to be performing well, both operationally but also safely.

So we have been in regular touch with Vistra who owns the Moss Landing and they have been extremely wonderful in keeping us posted so that we are learning more and then they are trying to do everything they can to spread the word on what happened. But it's good news. I mean, their hypothesis was not that the fire started in the batteries, but more of other ancillary issues and that seems to be true now. So the Moss Landing project is

expected to come online, about 100 megawatts to 300 by February and the rest by June. So I just wanted to flag that for you.

So we kind of have other things we are doing, but I'll just keep them off for now. Thank you.

CHAIR HOCHSCHILD: Yeah, I'll just chime in on that while we're on that subject.

So that briefing was yesterday. I want to thank Mike Gravely from my team for pulling that together. And this is the largest energy storage project in the world, 400 megawatts. And it was actually very good to learn the issue they had was not a battery flaw, but a failed fire suppression system that caused the water to go on the battery to get wet. And they're fixing that and changing protocols. And so we'll have all that online by June and 200 megawatts of it online by the end of this month, so that was a very good briefing. Thank you Vice Chair Gunda.

With that, then we go to Commissioner Douglas.

COMMISSIONER DOUGLAS: Yes, thank you. I just have one report, which is that after our retreat the Chair and I were able to take a trip with a number of our colleagues to, in my case, Imperial and Coachella Valley -- and I think the Chair will report on his part of the trip.

But just for mine I had a chance to go actually with Lauren Sanchez. She's the Governor's Senior Climate

Advisor. And we went first to the Coachella Valley and met with a number of community groups, with people involved in LVC (phonetic) work. So I met with Silvia Paz the Chair of CLVC. And then together with Lauren also had a chance to meet with Leadership Council, which is an EJ group that has expressed a lot of interest and participated in a number of Lithium Valley Commission meetings.

We also went to the Imperial Valley and met with Luis Olmedo who's with the Comite Civico del Valle. And it was really great actually to go and see -- we went to his offices, because he had two EV chargers that were being installed. And he had a lot of thoughts about the eVIP program and how it should be further, just how I think we need to continue to reflect on the challenges in communities where the infrastructure is not as strong as it is in most other parts of the state. I think he ran into any number of challenges with his charging stations. And I suggested that he talk to some of our staff about that experience. Nevertheless, those charging stations are almost up and running.

And he also had a COVID-testing operation, pretty substantial one going on right in front of the office that they helped organize. So it was fantastic to see that.

And we then met up and did a couple tours of some of the geothermal and lithium efforts out at in the Salton

Sea area and had a dinner and got on the road and drove to San Diego, flew home. It was a very, very, very long day, but it was really valuable, and I want to do it again. I think there's no substitute for actually getting out and talking to people in person and really learning about the opportunities and the challenges and the partners who can make us make this work and help us realize this vision.

So that's my report and I'll pass this on to the Chair when it comes up to him, I think, because we didn't take the entire tour together. And so he's got more to report on as well. So thank you

COMMISSIONER MONAHAN: Can I just say something really quick in response?

CHAIR HOCHSCHILD: Yeah, please do.

COMMISSIONER MONAHAN: So yeah, as a result of that connection Commissioner Douglas, our Public Advisor Noemi and Mona Badie my Advisor, met with Luis. And they've already a discussion on it, so just thank you for making that connection. And I think Noemi is counting him among our clean transportation gurus that we'll be reaching out to for advice.

COMMISSIONER DOUGLAS: Well, thank you so much. I'm glad you said that. He was very quick then to make the connection. But I just thought, I just knew that he had something to say from those experiences that would help us,

so I'm really glad that worked out.

CHAIR HOCHSCHILD: Thank you.

Let's turn next to Commission McAllister. And let me just begin by saying that we'll be adjourning today's meeting in memory of Judge Gilbert Merritt, who is a distinguished Court of Appeals Judge for many years and a cousin of Andrew McAllister. So I wonder if you could in your comments just tell us a little bit about his life and legacy while you give your update.

COMMISSIONER MCALLISTER: Absolutely, well thanks Chair and colleagues, for letting me go a little bit out of order here.

I did want to just highlight, just thank staff really on a couple of issue a couple of items. The load management standards final staff report is out on the street for comment. And it's a really strong product and I think will get us off on solid footing to open up the formal regulatory process and really get it going and finalize that sometime this year fully. As you know, it's a quite an innovation and it should open up some creativity in the marketplace for DERs, demand-based resources.

And then the second, I would be remiss if I didn't just thank all of the staff that have helped put together the IEPR. This year we'll be bringing that forward in February, March business meetings in chunks, but

it's been a big lift and an important lift. And Heather and her team have just done an amazing job with lots of workshops and on the building decarbonization and the forecast and the gas volume and the reliability work, just all for lots of staff mobilized to put together what's turning out to be a really great product.

And I wanted to also thank Commissioner Gunda for really driving big pieces of that. And also our colleagues at the PUC, particularly for helping chime in on some of the stickier issues that have come up. So much more to come on that, but I just wanted to make sure to do those two things.

So Judge Gilbert Stroud Merritt, he is my mom's first cousin. They grew up together, roughly the same age. And I grew up with his kids and all in Middleton, Tennessee; Nashville, Tennessee and in Virons (phonetic). And he, as the Chair said, he was a member of the sixth circuit in Cincinnati in the Federal appellate court for 44 years. And just a huge influence in the federal system. And just lots of interesting cases, and I won't go through all of them, there are a few that are -- just a couple that I really wanted to just kind of mention in terms of the fanatic systematic emphasis.

But he was an incredibly smart man, he was sort of a fixture of both judiciary and kind of the political

scene in the Democratic Party, the big "D," in Tennessee. And through the course of the 60s, when I was born and growing up and then went off to college, kind of the southern strategy sort of played out in that whole region; went quite a bit, kind of went to the conservative end of the political spectrum. And he was a real fixture on the liberal end and liberal kind of with a big "L," not the way it's used today.

And he was appointed actually as a Federal D.A. for Middleton, Tennessee, when he was 29 years old. And really just was a public servant through and through, had been at the city of Nashville before that.

But he had a lifelong commitment to equal justice and civil rights. And just time and time again he just took a stand in ways that really weren't always popular. But he just had an ethical core, and he did it very matter-of-factly in many cases, but just really set an example. Opened up opportunities for women when there were very few women in the certainly appointed positions, but even just within the senior legal community. And he created opportunities also for African Americans, again, in a period when there were just very few and very few opportunities available. Lifelong opponent of the death penalty. And again, not always popular in that era, in that place.

But I think it's interesting these issues are still roiling in our society today. And you know, we are all sort of in a California environment, which is a very specific one. But I think if you step back and sort of locate him and what was happening in that place in the Southern U.S. during the civil rights movement it really takes on a lot of significance, kind of the example that he set.

And so just on principle he was just an amazing jurist. But also, he was just personally really quite charismatic and just a really warm human being. And I think that really helped him, both sort of really gather a team around him, just sort of be a leader in a way that was very accessible, and I think helped people come along when that was really important.

I guess one of his clerks -- he had many, many clerks obviously over the years, but one of them tells this story about he was personally very warm, and across the political spectrum it didn't really matter, he just was easy to relate to as a person. But he would say a bit. So he got along with even the most conservative members of the same bench and just across the judiciary. But about one of his colleagues, he said, "Well he's to the right of Attila the Hun, but personally I like him." And so just very emblematic of kind of his approach to being a bench, just

had a personal warmth about him.

So it was always very instructive to listen to him talk about his cases and sometimes it was pretty hilarious. But I just wanted to just call out his example, obviously because he's a family member. And my mother and his kids now, I mean, we're all sad to see him go. He died of metastatic pancreatic cancer, was in hospice for a number of weeks before that. And his kids Clark and Stroud and Eli were able to just spend a lot of time with him and manage the pandemic problems, which are difficult these days. But I wanted to just honor him and his legacy in a time where it just seemed important to do so. So really thanks for the opportunity and I really appreciate everyone's attention.

CHAIR HOCHSCHILD: Well thank you so much for sharing that, Commission McAllister.

And I think it's so important to hear these inspiring stories of people who lived lives well-lived. And by pure happenstance it turns out that this judge's son was my neighbor in San Francisco, who I knew from a common effort, we were engaged on trying to fix up the local playground. And only later realized his connection after Andrew mentioned Judge Gilbert had passed away, so thank you for sharing that.

And just an open invitation to my colleagues if

there is ever anyone that has passed away, and you'd like to adjourn a meeting in their memory, just always let me know and we'll do that and have an opportunity to hear the reflections.

So I'll just share a few things. I'd like to begin with this Salton Sea trip that Commissioner Douglas and I did. The take-home point for me on the Salton Sea side of it was that the latest estimate from CTR about what that region can produce at full capacity is 600,000 tons annually, of nothing, I just want to put that in context. The total global market today for lithium is 400,000, times okay, so this is bigger than the global right now because this market is growing rapidly and will be at 2 million times in a very short -- just a couple of years, but this is a very significant development because it's so green and the footprint is so small. It's really the greenest way to produce lithium the world, and not by little, by a lot. And it was just encouraging to really get a sense of the size of the resource. So we're working together to do a symposium. We'll have more to say about that soon, but we're aiming for the week of Earth Day, and we'll have more we'll be sharing on that as we all get that.

Earlier before that I was able to go along with Dee Myers from GO-Biz and Karen Skelton from the Department of Energy and my Chief of Staff LeQuyen to visit Mountain

Pass. So Mountain Pass is a rare earth facility just inside the border with Nevada. They produce 15 different rare earths including the most significant, which is neodymium, which you have like two pounds of that in every single electric vehicle. So they produce enough on this site to supply 20,000 electric vehicles a day and they are scaling rapidly.

We don't actually have, I learned, magnet manufacturing left in the United States; it's all gone. And so that's part of their vision is to bring that back. They've gotten a $10 million grant from the Department of Defense to support that for strategic reasons.

And they give me the full tour, it's a massive resource. The estimate was about $20 billion worth of these rare earths on this site. And it's really the best facility of its kind in the world. And when I say that I'm talking about the percentage of the ore that is actually rare earth, and it's basically 8 percent versus China, which is where most of this stuff comes from, which is closer to 1.5 percent. So it's just much less processing that you need to do, it's a really special site.

And again, we have what I call geographic good fortune in California to have some of these resources that are fundamental to the Plan B economy. And so we had opportunity to put them in touch with various incentives

and tax credits they can take advantage of them. That was really fruitful visit.

I did want to ask if I could, Dorothy if you could pull up the two slides I wanted to share? Vice Chair Gunda and I did a briefing with the Governor this past, early this week. And which we do periodically along with our sister agencies on reliability. And just to give a sense of how quickly we're adding battery capacity -- you can see this slide here -- is really inspiring actually, that it's coming on so rapidly. If you go to the next slide, Dorothy.

You can see that -- if you can zoom in, I don't know if we can make it bigger -- but basically, the batteries are being dispatched right when and where most needed. And so the batteries are coming in and really helping with peak, which is precisely what we want. And this ties to the lithium values in that what we want to be doing California is the entire ecosystem. We want to be producing lithium sustainably in an ecologically conscious way. We want to be deploying it with electric vehicles and energy storage. And we want to be making those batteries here in California.

And so just as an example, this past week SPARKZ, which is a company we've funded at the Energy Commission making cobalt-free lithium batteries, has now got a

facility in Livermore and they're scaling up their operations. And we're engaged in discussions with a number of other companies to help make more of that happen here, because there's a lot of advantages to doing it locally.

And by the way, one interesting thing that I learned and did not know in when we did the Lithium Valley visit there is actually a potentially great process savings if you could actually do battery manufacturing onsite where the lithium is produced, which is when they're producing the lithium it's in a fluid, right? And so one of the things that they have to do with the process happens is get rid of the fluid and turn lithium into a solid so it can be shipped. And of course, then the battery company gets it and the first thing they do is put it into a fluid. So if there's a way to actually have it be piped to directly, you can have a process savings on both sides of that. So it's interesting to think about and see if we can make something like that happen.

So really fruitful visit. And I just want to thank LeQuyen wo just effortlessly, magnificently pulls all this stuff together. And it was a wonderful tour, we had a great visit with some of Assemblyman Garcia, Senator Hueso and many of the other key stakeholders.

So with that, that was Item 11. And we can turn now to 12, the Executive Director’s Report. Drew.

MR. BOHAN: Thank you Chair, good afternoon, Commissioners. No report today.

CHAIR HOCHSCHILD: Okay, Public Advisor's Report, Noemi?

MS. GALLARDO: Hi there, I have a really quick report. I just wanted to let you know that we're starting to get prepared for the Diversity Report, which is one of the ways that we inform the public about the various efforts Energy Commission is doing to advance inclusion, diversity, equity, access in environmental justice. So we're very excited about that and more to come.

And then I also wanted to give you a heads-up that I'm working on figuring out an approach for our engagement with communities throughout California that's more regionally focused. This is something I've been talking to Vice Chair Gunda to about in particular, given the work that will be happening on IEPR. So whether that's remote meetings that we're doing or in-person or hybrid, I wanted to do, bring a more of an intentional approach that's focusing in certain areas. So there'll be a lot going on in the Imperial region as we've been hearing about Lithium Valley. And then also will be focused on other areas.

So that's it, quick report there. And, Chair, if you're ready I can give the instructions on public comment.

CHAIR HOCHSCHILD: That would be great, Noemi, thank you.

MS. GALLARDO: Okay, so moving to public comment this is the period for any person wishing to comment on information items or reports of the meeting agenda or any other item.

Each person has up to three minutes to comment. And comments are limited to one representative for organization. We may reduce the comment time period, or excuse me, comment time, depending on the number of commenters. Please use the raised-hand icon to indicate your interest in making public comment. If you're on the phone press *9 to raise your hand and *6 to unmute.

After you are called on, please restate and spell your first and last names, state your affiliation if you're representing a tribe, agency, organization or any other type of entity. Do not use the speakerphone when talking because we will not hear you clearly.

I will look for hands now. I do see there is a hand raised or two. We'll start with what looks like CALSSA. Just a reminder to please state your name, spell your name, and indicate your affiliation. Your line is open, you may begin. (No audible response.) And you may need to unmute on your end.

MR. TREGUB: And thank you so much. And for the

record, this is not CALSSA. This is Igor Tregub speaking in my role as the California Democratic Party Environmental Caucus Chair.

I wanted to let that the California Democratic Party last year passed unanimously as a reaffirmation, a resolution in strong support of saving rooftop and local solar in support of making solar more affordable, not less. And I just wanted to urge you to do even more.

I appreciate what you're doing now, and I wanted to urge you to do even more to weigh in to the CPUC. I'm extremely concerned about where the NEM 3 proceeding is going at the CPUC in terms of allowing us to achieve our state's energy efficiency regulations, in terms of allowing us to reach the highest echelons of what we need to do through Title 24, the residential and commercial codes, as well as the impact that it will have on meeting the state's 100 percent clean energy goals in a timely matter.

And of course I don't have to tell you that this is important to California and the rest of the nation, because we are a leader. And especially right now when the Biden Administration has been looking to California to not only be the leader but also a model for what is being proposed across the nation, this is not the time to slam the brakes on solar adoption. Particularly solar adoption for working class and middle-class folks which in 2019 per

an LBNL report represents 66 percent of all solar adopters in California.

So I wanted to let that I am joined by over 100 Democratic Party leaders from across the state, 19 Caucus Chairs have signed on to the same statement: No solar tax, not one cent. Keep the power of the sun affordable and accessible to all. Don't punish folks, hard-working families that are doing their best to try to do the right thing for the environment and for all of us. Thank you so very much.

CHAIR HOCHSCHILD: Thank you.

MS. GALLARDO: Thank you.

CHAIR HOCHSCHILD: Do we have other public comments Noemi?

MS. GALLARDO: We do. We have several hands raised. Igor, though, we do need the spelling of your name, first and last, just to make sure we get that correct.

MR. TREGUB: Sure. For the record it's I as in India-G as in golf-O as in opera-R as in Romeo. And last name is Tregub, T as in Tango-R as in Romeo-E as in Echo-G as in Golf-U as in Uncle-B as in Bible. And again, so sorry about the mishap on the Zoom account audio.

MS. GALLARDO: Not a problem, thank you.

All right, so up next, we have Cailey Underhill.

A reminder to please restate your name, spell it, and indicate your affiliation if any. Cailey, your line is open and you may begin.

MS. UNDERHILL: Hello, my name is Cailey Underhill, spelled C-A-I-L-E-Y. My last name is spelled U-N-D-E-R-H-I-L-L. And I'm calling with the Solar Rights Alliance.

I'm extremely concerned with where the NEM 3.0 proceeding is going at the California Public Utilities Commission. Both in terms of the state's energy efficiency regulations through T 24, but even more importantly, the impacts it will have on meeting the state's 100 percent clean energy goals in a timely manner dictated by science. We should be accelerating clean energy adoption not slowing it down.

As the lead agency in charge of directing the state's efforts on getting to 100 percent I'm asking you to please step in and play a more active role in keeping California on track as a clean energy leader. This is important to California and the rest of the nation. California should be a leader of progressive clean energy policy, not a source of inequitable, unjust and pro-dirty energy policy making.

The NEM 3 proposed decision should be scrapped, and the Commission should start all over. No solar tax, no

retroactive changes, clear gradual changes to NEM. Please promote low- income, middle, and working classes. Thank you for your time.

MS. GALLARDO: Thank you.

Next is Selena Feliciano. Selena, a reminder to please restate your name, spell it, indicate your affiliation if any. Your line is open, you may begin.

MS. FELICIANO: Hi everyone, thank you. My name is Selena Feliciano, spelled S-E-L-E-N-A and F-E-L-I-C-I-A-N-O and I'm calling today as a community member.

And first, I just wanted to thank you for all that you're doing in the state of California to advanced climate resiliency. I live in West Oakland, and I am part of a community that is hit hardest by climate change. We've got some of the worst air pollution in the state. We've seen what the wildfires can do from hundreds of miles away. And also are most in need of initiatives that advance our ability to be empowered to power, the way our homes are turned on and off, how we keep our food cold, and how we keep our medicines stable.

And I want to echo what has been shared by the previous two commenters around the proposed decision by the CPUC. And because my community is hardest hit by climate change we're also hardest hit by the current investor-owned utility model. So while PG&E remains beholden to

shareholders, they've caused destructive wildfires that have impacted my neighborhood where childhood asthma rates remain the highest in the state. They've caused rolling blackouts for my neighborhood. And they also continue to increase rates in pursuit of an ever-growing profit margin.

And I believe that rooftop solar when it is paired with incentives and subsidies can provide an opportunity for community members to generate their own power to lower their energy bill and to build for a future where they're no longer beholden to PG&E negligence.

Right now, this discourse is really tricky because equity is so important in the ways in which we plan for the future of energy. But I think that PG&E is exploiting the equity narrative for their own profit margin. And I think that you all as leaders can see through that this proposed decision is a blatant manipulation of narratives that exploit poor working-class families in pursuit of a corporate bottom line. And I think that frontline communities deserve better and that the people of California should be able to build a real energy democracy, and one that leverages tools like solar to grow resiliency in the face of a changing climate.

So again, thank you for your work and thank you for listening to this comment. And as much as you can please utilize your influence to help shape an energy

future that is healthy and resilient for all California communities.

MS. GALLARDO: Thank you, Selena.

So next up is a phone number ending in 688. So again, phone number ending in 688 your line is open. A reminder to please state your name, spell it, indicate your affiliation if any. And you may need to unmute on your end. You may begin.

MS. MILLER: Thanks. Thank you, my name is Lee Miller. I live in Sacramento, California. My husband and I are retirees.

You know, I find the California PUC's proposal just ridiculous. Their claims that the California PUC and the California utilities have this thought that all rooftop solar people are rich, we are by no means rich. We got a rooftop solar because we wanted to do the right thing, we want a better life for our children, better clean air for us all. And that's why we did and that's why we purchased our rooftop solar system.

The other thing that's bothering me is this cautious claim by the California PUC and also by the California utilities. In actuality, rooftop solar and battery storage helps us to reduce the cost of electrical grid, saving all of us, all ratepayers money. Each and every one of us, we pay a fixed rate. We pay a fixed fee

each month and that's supposed to go to maintenance, whether you own solar not. The continued growth of rooftop solar and battery is key to the successful clean energy transition and puts the needs of the public at the center, with lower costs, protections from blackouts, and quicker pollution reductions that if we simply double down on doing more long-distance energy.

The most detailed modeling also shows that integrating lots of local solar and storage and with large-scale renewables as part of the clean energy transition could save California over $120 billion over the next 30 years. These savings occur because local distributed energy reduces the price tag of long-distance power lines and peak demand infrastructure. It doesn't eliminate it altogether, but it does reduce the risk and expense, with major economic benefits flowing to individuals and communities.

But the California PUC and utilities, they have a different story. They claim that rooftop solar is bad for California. They're claiming that solar users impose an annual $3 billion on other taxpayers, and this is what they're calling a cost shift. And it happens because solar users don't pay their fair share in the electrical grid and that the credit we receive for our energy, that is overvalued.

In both cases that they hired this consultant, E3, we had them also do the same thing to us here in Sacramento with SMUD with the NEM 2.0 rates where they use these accounting practices that aren't really in line with what they should be doing. So, for instance, they count the energy made and used onsite, instead of buying it from the utilities as a cost to other taxpayers. That's just plain garbage. I mean, this is similar to arguing that households with vegetable gardens are forcing households without garden to pay more for food.

MS. GALLARDO: Sorry for interrupting, this is Noemi Gallardo, the Public Advisor. The three-minute time limit is up, so I apologize for interrupting.

MS. MILLER: Thank you. No, not a problem. Thank you very much for letting me speak. And California PUC is on the wrong side of this. Thank you very much and have a great day.

MS. GALLARDO: Thank you for your comments.

Next up is Joan. A reminder to please state your name, spell it, and indicate your affiliation if any. Joan your line is open, and you may begin.

MS. TAYLOR: Hello, can you hear me?

MS. GALLARDO: Yes, we can.

Ms. Taylor: Thank you. Joan Taylor, J-O-A-N T-A-Y-L-O-R, speaking for myself as a resident of Palm

Springs. Photovoltaic solar is a disruptive technology. It does not have to be tethered to wires. Let's be on the right side of history on this. The CPUC PD (phonetic) is regressive and it's a gift to the utilities and will cause overbuilding of transmission and future charges for all ratepayers. We already have the highest rates in the country, or some of them.

The PUC failed to value solar for all its benefits for local reliability and shutting down gas plants and so forth. Most importantly, the continued growth of customer-side solar is needed to meet our SB 100 goals per your agency's SB 100 report.

So please help ensure that there is a fair NEM 3 that ensures access by both low- and moderate-income customers and truly incentivizes batteries, which the PD does not. And ensures the continued growth of solar to meet the state's decarbonization needs. And thanks very much for your time.

MS. GALLARDO: Thank you, Joan.

All right next up is Jan Dietrick. Jan, apologies if I mispronounced that. Please restate your name, spell it for the record and indicate your affiliation, if any. Your line is open, and you may begin. (No audible response.) Jan, you may need to unmute on your end.

MS. DIETRICK: Right, there we go. Jan Dietrick, that D-I-E-T-R-I-C-K. I'm a resident of Ventura, California. And I'm joining Igor Tregub and Kelly with the Solar Rights Alliance and joining Joan Taylor, who all expressed the sentiment of our groups here the Ventura County Climate Hub and the 350 Southland Legislative Alliance, in our opposition to the proposed decision for the Net Energy Metering.

The NEM proceeding at the CPUC it's truly, I repeat, hard to believe in terms of state's energy efficiency regulations in Title 24 and the impacts on obviously urgent clean energy goals. The proposed decision to undercut rooftop solar just doesn't make any sense. Perhaps you can work with the governor to help the CPUC stay on track as a clean energy, for California, to be a clean energy leader.

The NEM proposed decision needs to be revisited with a proper understanding of costs and benefits, starting over in developing the policy in this proceeding. CPUC really has to fix the Avoided Cost Calculator, which becomes very obvious when you read the proposed decision.

We must be, of course, accounting for the benefits from rooftop solar and battery storage for health, for land uses, for reliability. There are clearer ways to achieve equity for all that accelerate rather than slows

down rooftop solar, including vastly more storage from batteries. Thank you very much.

MS. GALLARDO: Thank you.

Next up we have Charles Adams. Charles, reminder to restate your name, spell it for the record, and indicate your affiliation if any. Your line is open, you may begin. (No audible response.) You may need to unmute on your end Charles. Charles Adams your line is open. (No audible response.) You may need to unmute on your end Charles. Charles Adams your line is open, you may need to unmute on your end on the screen.

MR. ADAMS: Sorry. Charles Adams, Albion Power Company, C-H-A-R-L-E-S A-D-A-M-S, A-L-B-I-O-N P-O-W-E-R Company.

I wanted to I guess echo some of the comments on the Avoided Cost Calculator. We were party to the hearing. The Avoided Cost Calculator has value of the environment at four tenths of a cent, that's an issue.

There's an ongoing misrepresentation about equity that I'd like to touch on of the solar farm model versus local economies that NEM, when it was designed in 1996 was set to support local economies. Solar farms are far more -- use far more land and material than rooftop solar, so this idea that they're incredibly efficient and rooftop solar is not, is not true.

Solar farms are financed through tax equity transfers, known as sale-leasebacks. And this means that the investment banks of the world put up 40 percent of the system costs and receive 60 percent of the cost as tax credits. In this way solar farms are a tax shift towards the 1 percent. You're shifting those benefits away from local economies. You can look at Institute for Local Self-Reliance or any White Paper that says, "Local economies build local jobs, decrease inequality, increase wages, higher income growth, lower levels of poverty, civil well-being."

The idea that solar farms are much cheaper is inaccurate. Renewable energy tax equity was a $13 billion market in 2019, $18 billion in 2020. Two banks, JP Morgan and Bank of America, accounting in both years for more than half of that market. JP Morgan and Bank of America are the two largest fossil-fuel financers in the world.

I'd also encourage the Commission to take a look that NEM and rooftop solar should be considered part of 30 by 30. NEM creates a policy that put solar in the built environment and conserves land. NEM creates policy that inherently assigns economic value to the environment, and it builds local economies, as I just touched on.

Only 23 percent of the wilderness remains in the world. We built solar farms, they're pretty destructive.

California is down to 22 percent of its land remaining, so at that decline of 6 percent since 1954, 0.6 percent since 1954, all the wildernesses will be gone in 40 years.

The four tenths of a cent for nature in the ACEC, I don't even know what you guys are looking at. Industrial capitalism liquidates the largest sources of capital and employees. Natural resources don't account for them at all, calls them "income" and does not account for their permanent loss. We need to fix that if we're ever going to get out of any of this. NEM was part of that 20 years ago. That's been lost. California doesn't seem to remember why we created these policies in the first place. Thank you very much.

MS. GALLARDO: Thank you.

Next is Dan. Dan, a reminder to please restate your name, spell it and indicate your affiliation, if any. Your line is open, you may begin.

MR. HODDAPP: Hi, my name is Dan Hoddapp. One moment here, I got my text. My name is spelled D-A-N, and Hoddap is H-O-D-A-P-P. I shall be brief, thank you for your work to address our climate crisis and be a leader on this issue for California and for other states that see California as a model.

Please intervene with the disastrous PUC proposal that would effectively stop new rooftop solar. Please help

the PUC adopt a NEM 3.0 that encourages rooftop solar and a decentralized power grid that would require less infrastructure and more clean power.

I am not affiliated with any organization or part of the solar industry. And thank you for your consideration of my view on this important topic and policy, and please continue to make California a climate leader not a national embarrassment on this issue. Thank you.

MS. GALLARDO: Thank you.

Next is Ben Grundy. A reminder to please restate your name, spell it for the record, and indicate your affiliation if any. Ben your line is open, you may begin.

MR. GRUNDY: Hello, my name is Ben Grundy, that's B-E-N G-R-U-N-D-Y. And I'm the Global Warming Solutions Associate with Environment California, a statewide advocacy group that works for clean air, clean water and open spaces.

I'm extremely concerned where the NEM 3.0 proceeding is going at the California Public Utilities Commission, both in terms of the state's energy efficiency regulation through T 24, but even more importantly the impact it will have on meeting the state's 100 percent clean energy goals in a timely manner dictated by science. We should be accelerating clean energy adoption not slowing

it down.

As the lead agency in charge of directing the state's efforts on getting to 100 percent I'm asking you to step in and play a more active role in keeping California on track as a clean energy leader. This is important to California and the rest of the nation. California should be a leader of progressive, clean energy policy not a source of inequitable, unjust and pro-dirty energy policymaking.

The NEM 3 proposed decision should be scrapped, and the Commission should start all over: no solar tax, no retroactive changes, clear gradual changes to NEM, promote low-income, middle and working classes. Thank you.

MS. GALLARDO: Thank you.

Next is Jane Affonso. Jane, reminder to restate your name, spell it for the record, and indicate your affiliation if any. Your line is open, you may begin.

MS. AFFONSO: Hi, my name is Jane Affonso, J-A-N-E, Affonso A-F-F-O-N-S-O. I'm the Vice President of the Lutheran Office of Public Policy.

And as a person of faith I'm very frustrated that this body is considering a policy and using poor communities and people of color communities to justify an obvious transfer of wealth to the 1 percent in the case of investor-owned utilities and hedge funds. And it's just

it's quite frustrating. So I agree that this decision should be scrapped, and you need to start all over and not tinker around the edges. And promote renewable energy that's decentralized so we can decentralize political power as well as our energy power and promote low-income and middle-income and working-class local jobs, communities of color.

It's not rocket science. And it's clear that the public is on to what you all are doing. And it's so frustrating that we're having to do this in a state like California that we consider to be a leader on this issue. And I'm really surprised that our governor has not taken a stronger stance so far.

But I hope you're listening to this community. It's just we have so many other fights to battle and it's frustrating that we're having to spend this time and I'm sure some of you are having the same feeling. So I really appreciate your willingness to listen and open up and think about your grandchildren and the community and creation (phonetic) care as you make this decision, thank you.

MS. GALLARDO: Thank you.

Next is Susanna Saunders. Susannah, a reminder to restate your name, spell it for the record, and indicate your affiliation if any. Your line is open, you may begin.

MS. SAUNDERS: Hello, my name is Susannah

Saunders, it's S-U-S-A-N-N-A-H and last name is Saunders, S-A-U-N-D-E-R-S. I'm with the Indivisible California Green Team. I'm a member. I do not speak for the organization, but we've been working hard on this issue.

And I want to just quote from Ahmad Faruqui who was just on Canary Media doing a debate about this issue, and he said -- and he's a premier energy analyst -- he said, "I think the proposed decision is a horrible mistake and it should be thrown out. The California Public Utility Commission needs to start from scratch, get rid of the grid access charge, it is insufferable. California wants to promote clean energy. It wants to decarbonize the state. If this decision is approved, we will look really bad. I think this was an embarrassment. I hope we get over it, otherwise it'll be a terrible mark on our report card," and he is an energy expert.

I am a California citizen I'm extremely conservative where the NEM 3.0 proceeding is going at the CPUC, both in terms of the state's energy efficiency regulations through T 24, but even more importantly the impact it will have on meeting the state's 100 percent clean energy goals in a timely manner, which your office has said we need to triple rooftop solar to meet our clean energy goals. We should be accelerating clean energy adoption not slowing it down.

As the lead agency in charge of directing the state's efforts on getting to 100 percent I'm asking you to step in and play a more active role in keeping California on track as a clean energy leader. This is important to California and the rest of the nation. California should be a leader in progressive clean energy policy, not a source in an unequitable, unjust and pro-dirty energy policy making. The NEM 3 proposed decisions should be scrapped, and the Commission should start all over: no solar tax, no retroactive changes, clear gradual changes to NEM, promote low-income, middle and working classes.

Some energy experts say utilities will not be able to produce or buy enough renewable energy to replace what would be lost from the decline in rooftop solar panels, which supplied 9 percent of the state's electricity in 2020, more than nuclear and poles (phonetic) put together.

"California would need to set aside about a quarter of its land for renewable energy to meet its climate goals without expanding rooftop solar," and this is from Mark Jacobson, a professor of civil and environmental energy at Stanford. So I'm asking you to please intervene on this proposal and that there be no tax, no penalty, no decrease to the incentives for rooftop solar. Thank you.

MS. GALLARDO: Thank you.

So Chair, I do not see any more hands at this time.

CHAIR HOCHSCHILD: Okay, thank you, Noemi. Let's move on to Chief Counsel's Report, Item 15.

MS. BARRERA: Nothing, I don't have an update for today. Thank you.

CHAIR HOCHSCHILD: Okay, thanks everyone. We're adjourned.

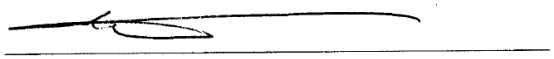
(The Business Meeting adjourned at 3:02 p.m.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th day of February, 2022.



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Notary Public

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I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th day of February, 2022.

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Myra Severtson
Certified Transcriber
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