DOCKETED	
Docket Number:	22-BUSMTG-01
Project Title:	Business Meeting Agendas, Transcripts, Minutes, and Public Comments
TN #:	242212
Document Title:	Transcript of 02-16-2022 Business Meeting
Description:	N/A
Filer:	Liza Lopez
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	3/7/2022 10:35:34 AM
Docketed Date:	3/7/2022

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) February 16, 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 as extended by Governor Newsom's Executive Order N-1-22 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 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, FEBRUARY 16, 2022

10:00 A.M. – 4:00 P.M.

Reported by:
Peter Petty

APPEARANCES

Commissioners (Via Remote)

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

Staff Present: (Via Remote)

Drew Bohan, Executive Director
Linda Barrera, Chief Counsel
Noemi Gallardo, Public Advisor
John Heiser, Lead Compliance Project Manager
Geoff Lesh, Engineering Office Manager
Eric Knight, Siting and Environmental Office
Jared Babula, Legal Counsel

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P R O C E E D I N G S

FEBRUARY 16, 2022 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.

This meeting is being held remotely consistent with Assembly Bill 361 as extended by Governor Newsom's Executive Order N-1-22 to improve and enhance public access to state agency 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, friends and welcome. I'm David Hochschild, Chair of the California Energy Commission. Today is Wednesday, February 16th, and I call the meeting to order. Joining me today are Vice Chair Gunda, Commissioner McAllister and Commissioner Monahan. Commissioner Douglas is on a delegation to the Salton Sea and will not be joining this meeting today. However, we do have a quorum and will proceed.

Vice Chair Gunda is now going to lead us in the Pledge of Allegiance.

(Whereupon the Pledge of Allegiance was recited.)

CHAIR HOCHSCHILD: Thank you, Vice Chair.

I am happy to announce that at today's Commissioner meeting we'll be seeking to approve $14 million in grants and loan today, supporting our state's economic recovery. And we are highlighting this every meeting just because the role that we are playing in the innovation economy is really critical and it's important to take stock at every meeting of the total investments, so thanking the staff for putting that together.

So with that, let's turn to the Consent Calendar. We are going to split the items. We'll take Items 1a, b, and c and e first, and then separately address Item 1d.

So Madam Public Advisor, do we have public

comment on those first items?

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees, if anyone of you would like to make a public comment, please raise your hand using the icon on the screen, it looks like a high-five. And if you are on by phone please press *9 to raise your hand and then*6 to unmute.

I do see a hand raised. It looks like Daniel Orozco. Daniel, a reminder to please spell your name, state your affiliation if any. Your line is open, and you may begin.

MR. OROZCO: Hi, my name is Daniel Orozco, D-A-N-I-E-L O-R-O-Z-C-O. I am working for Momentum, based here in Sacramento and on behalf of SSA Pacific and Joe Carrillo, who unfortunately could not join us today.

We're just extending our thanks to the Commission for this opportunity for the blueprint and we're excited to see where this goes. And so once again we're just expressing our gratitude and we're really excited to see what the results are going to be. So thank you.

MS. GALLARDO: Thank you.

CHAIR HOCHSCHILD: Thank you.

MS. GALLARDO: All right, reminder if anybody else would like to make a public comment, please raise your hand using the icon that looks like a high-five on the

screen or press *9 if you are on by phone.

MS. GALLARDO: Chair, I do not see any other hands raised.

CHAIR HOCHSCHILD: Okay, unless there is Commissioner discussion, I would entertain a motion from Vice Chair Gunda for Items 1a, b, c, and e.

VICE CHAIR GUNDA: Thank you, Chair. I move Items 1a, b, c, and e.

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

COMMISSIONER MCALLISTER: I'll second.

CHAIR HOCHSCHILD: All in favor say aye.

Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I vote aye as well. Those items pass unanimously. And we'll turn now to Item 1d. Commissioner Monahan will speak first.

COMMISSIONER MONAHAN: Thank you, Chair. Agenda Item 1d proposes an agreement with the International Council on Clean Transportation for a one-year membership in the Internationals ZEV Alliance. And I currently serve

as an unpaid advisor to the Board of the ICCT. Therefore, I will recuse myself in the vote on this item to avoid any actual or perceived conflict of interests.

I will mute and I'm going to leave my seat, but I'll leave my video on and I'll wait for the Public Advisor to tell me when to return.

CHAIR HOCHSCHILD: Thank you, Commissioner.

Madam Public Advisor, any public comments on this?

MS. GALLARDO: This is Noemi, the Public Advisor. Attendees if you would like to make a public comment please use the raise-hand feature on the screen and if you are on by phone press *9.

MS. GALLARDO: Chair, I do not see any hands raised.

CHAIR HOCHSCHILD: Thank you. Unless there's Commissioner discussion, I'd entertain a motion from Commission McAllister on Item 1d.

COMMISSIONER MCALLISTER: I motion Item 1d.

CHAIR HOCHSCHILD: Vice Chair Gunda would you be willing to second Item 1d?

VICE CHAIR GUNDA: Second Item 1d.

CHAIR HOCHSCHILD: And I vote aye as well. That passes 3-0. Thank you.

Let's move on now to Item 2 Solar Energy

Generating System, SEGS III, Petition to Amend.

MS. HUBER: Good morning, Chair, Vice Chair, and Commissioners. My name is Elizabeth Huber and I manage the Compliance Monitoring & Enforcement Office within the Siting, Transmission, and Environmental Protection Division overseeing staff's analysis of a site boundary change modification for the Solar Energy Generating Systems, SEGS, III through VII, solar thermal facility.

With me today are Lead Compliance Project Manager John Heiser, my colleagues from STEP's Engineering and Siting and Environmental Offices, Geoff Lesh and Eric Knight, and Legal Counsel Jared Babula.

Also available this morning representing the project owner, LUZ Solar Partners III through VII, is Patty Murphy, Dexter Liu, Jennifer Merrick, and their legal counsel, Scott Galati. Next slide, please.

On January 11th of 2022 the project owner filed a petition for post-certification project change requesting to remove SEGS Units III, IV, and V from the entire certified SEGS III through VII project sites. The petition requests a boundary modification to exclude the area and end the California Energy Commission's jurisdiction over that portion of the site. If approved the proposed repurpose of the decommissioned solar and natural gas power plant is to move to a photovoltaic panels and large-scale

batter storage, can begin construction and supporting our clean energy goals of California. Next slide, please.

Located within the Mojave Desert, near the town of Kramer Junction in unincorporated San Bernardino County, SEGS III through VII began operating in the beginning of 1989 providing 150 megawatts of electricity through a power purchase agreement with Southern California Edison. For more than 30 years the SEGS III through VII units were part of a 9-solar farm representing one of the largest and longest-operating commercial solar facilities until it ceased operations in the fall of 2019.

In April of last year the project owner submitted a Final Decommissioning Plan detailing their demolition and closure activities. The SEGS III through VII decommissioning and closure plan was approved at the June 9th, 2021, Business Meeting. Next slide, please.

All decommissioning activities within the areas previously occupied by SEGS units III, IV, and V have been completed in accordance with the approved decommissioning and closure plan which outlined facility components that are to be removed, components that may remain for reuse, and the method of disposal for material to be hauled away.

On December 22nd, 2021, the CEC's delegated chief building official certified that these three units have been fully decommissioned. Removing these sites from the project

site boundary will allow the project owner to repurpose the property and to begin the process of construction under the jurisdiction of San Bernardino County. Next slide, please.

Staff recommends your approval of the SEGS III through VII boundary modification. Thank you and we're happy to answer any questions you may have.

CHAIR HOCHSCHILD: Thank you, Elizabeth.

Any public comment on Item 2?

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees if you would like to make a public comment, please use the raised-hand icon on the screen. If you're on by phone please press *9 to raise your hand, *6 to unmute. I do see a hand raised. A reminder to please restate your name, spell your name, and indicate your affiliation if any. Scott Galati, your line is open, and you may begin.

MR. GALATI: Good morning, Mr. Chair, Commissioners. Thank you very much for having us and putting this on the agenda for this particular business meeting. I represent Luz Solar Partners III through VII who, and the operating agent for that particular entity is NextEra, whom you're quite familiar with.

We'd really like your approval today so that we can go ahead and get started on our PV project that we've spoken to you before about in an earlier proceeding. We're

not terminate -- or asking for a full termination of the license at this point, because we are continuing to decommission the SEGS VI and VII while we want to construct the PV project on III through V.

So what I'd also like to do is to make sure that you understand that we really work well with your staff. And your staff was extremely helpful here in helping us do something that was kind of out of the ordinary, which is to separate the license by petition for amendment before we ask for termination to keep us on schedule so that we can continue to deliver clean energy to California to meet its goals in its future. Specifically, Elizabeth Huber has been very helpful, so has Eric Knight and our project manager John Heiser. They helped us by doing a pre-review of our application for our permit, gave us some advice on what things needed to be addressed and changed, so that enabled their review to be easier. And then they worked very, very hard in the month of January, right after the holidays. We really appreciate their help.

We have several people here that are available to answer any questions that you might have. Specifically Noemi we'd like to make sure that Dexter Lou who is on can speak, and Patty Murphy, if you have any questions.

Other than that we ask for your approval of this. And we'd like to also let you know that we'll hopefully be

back in the month of May or June seeking full license termination when we complete the decommissioning of the remaining units. Thank you very much.

MS. GALLARDO: Thank you. If there is anyone else who would like to make a public comment, please raise your hand using the raised-hand icon on the screen, looks like a high-five. If you're on by phone press *9 to raise your hand then *6 to unmute.

Chair, I do not see any other hands raised.

CHAIR HOCHSCHILD: Well before we turn to Commissioner discussion and vote, thank you Scott for those comments. I did just want to again remark how important I think this SEGS project is over the years in our story of working towards a clean energy future. This was the largest solar thermal project in the world. And I believe it was constructed in the 80s and served a really important purpose of showing how renewable energy could actually be operated at scale.

The evolution we're seeing now from solar thermal to PV is happening around the world and is a function of the success of photovoltaics in reducing costs and energy storage. But I think in the history books of California's clean energy story that SEGS will feature very prominently. And, again, I give a lot of credit to the early developers who brought that project to life in the beginning, because

that was the time when nobody was doing things at that scale, so just an important piece of our energy history there.

So congrats to the staff and the whole team that worked on this. I'm happy to support this and we welcome a motion on this. Let's go to invite maybe Commissioner Monahan would you be willing to move the item?

COMMISSIONER MONAHAN: I move this item.

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

COMMISSIONER MCALLISTER: Second.

CHAIR HOCHSCHILD: All in favor say, "Aye." Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

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

Let's turn now to Item 3, 2021 Integrated Energy Policy Report.

MS. RAITT: All right, thank you. Good morning, Commissioners. Staff is requesting your approval of the three volumes and the appendix of the

2021 Integrated Energy Policy Report, or the 2021 IEPR for short. I'm Heather Raitt, the Assistant Executive Director for Policy Development and the IEPR program manager.

And before we begin, I'd just like to make a quick note of correction. The agenda item description posted in the notice, the title of this item accurately references the 2021 IEPR, but the description inadvertently included the word "update." So the agenda description in its entirety along with the backup materials make clear that the action being considered is possible adoption of the 2021 IEPR, Volumes I, II, IV and Appendix. So I wanted to make that minor clarification on the record, so that when you consider whether to move the item you'd be doing so with the word "update" removed.

And so with that I'm joined by lead authors for the portions of the IEPR that are under consideration today: Heather Bird, David Erne, Nick Fugate, and Charles Smith. The Next slide, please.

I'll just go over a little of the background of the report before we get into the content. The statute requires that the CEC assess major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. And the report develops policies and recommendations to advance a clean energy and reliable energy system with benefits to reach all

Californians. Next slide, please.

Commissioner Andrew McAllister led the overall development of the 2021 IEPR. It's comprised of four volumes and an appendix, with a Lead Commissioner for each topic.

Volume I is on building decarbonization, the focus of this year's report.

Volume II is on ensuring reliability in a changing climate.

Volume III is on decarbonizing the state's gas systems. It's not under consideration today. Staff anticipates bringing that one to the Commission next month.

Volume IV is on the California Energy Demand Forecast.

And the Appendix is on assessing the benefits and contributions of the Clean Transportation Program. Next slide, please.

The 2021 IEPR reflects input and analysis on a broad array of stakeholders. The Energy Commission sought input from industry experts, the public, sister agencies throughout the report development process. We held 21 remote access workshops. 10 of which included participation on the dais from sister agencies. And under Commissioner McAllister's leadership, we also prioritized engaging our federal partners on building decarbonization. The public

had opportunities to comment on each workshop and on the draft report that was made available in December and on the final report posted earlier this month.

The Final 2021 IEPR reflects changes made in response to public comments, market updates, and forecast results that were not available in December. Also, an errata reflecting a few further minor updates and edits in response to comments in the final report was posted yesterday. Commissioners a copy of the errata is included in your meeting materials.

We greatly appreciate the thoughtful comments received, and the time and expertise shared by the public and the workshop participants throughout the report development process.

And with that background, we'll now provide a very high-level summary of the key findings for each volume, with the lead authors presenting, and starting with Heather Bird to discuss building decarbonization. Go ahead Heather. Next slide, please.

MS. BIRD: Okay, can you see my video now?

MS. GALLARDO: Yes, we can.

MS. BIRD: Okay, great. Thank you, Heather. Good morning, Chair, Vice Chair and Commissioners. I am Heather Bird of the Efficiency Division. Next slide.

The legislature and governor have established

ambitious targets to decarbonize the state's economy in the coming decades, with much progress made in recent years on the transition to a low-carbon energy supply.

Volume I: Building Decarbonization addresses the statewide efforts needed to meet California's key climate goals of reducing greenhouse gas emissions by 40 percent below 1990 levels by 2030 and moving to a carbon-neutral state by 2045. In order to realize the long-term carbon neutrality goals envisioned by state policy it will be important to address the significant emissions associated with California's existing commercial and residential buildings and industry and agricultural processes.

The California Building Decarbonization Assessment was completed in 2021. And this IEPR picks up where that effort left off by laying out specific recommendations and action items for achieving building greenhouse gas reductions. Next slide.

Building and process decarbonization is needed to achieve state goals. The state's existing buildings are responsible for generating 24 percent of greenhouse gas emissions. Emissions from combustion appliances contribute to a large percentage of these emissions and contribute to poor indoor air quality.

In addition, as the effects of climate change become more common and pronounced with extreme heat and

wildfires, older buildings with minimal or shedding insulation, air gaps, or non-existent or low-performing space heating and cooling are not equipped to fully withstand these changing conditions and protect occupants. This is of particular concern in low-income and disadvantaged communities where residents can face a disproportionately high energy burden with limited budgets for utility bills.

In contrast to the progress being made in newly constructed buildings where regulatory tools are most effective in driving efficiency and decarbonization measures, reducing the greenhouse gas emissions of existing buildings is more challenging and greatly lags the pace required to meet California's climate goals. While retrofits to existing buildings offer the greatest potential for emission reductions, they also face more challenges such as costs, space and structural constraints, deferred maintenance, split incentives between tenant and owner, and onsite infrastructure improvements needed to support installation of low-carbon technologies. Thoughtful program design and implementation can mitigate some of these challenges.

Industry and agriculture processes are further responsible for generating roughly 24 percent and 2 percent of statewide emissions, respectively. Although

decarbonizing the industry and agriculture sectors largely involves changes in existing processes or technologies the strategies for decarbonization are the same as those for decarbonizing buildings, including efficient electrification, decarbonizing the grid, energy efficiency, reducing refrigerant leakage, distributed energy such as photovoltaics and on-site battery systems, decarbonizing the gas system, and load flexibility.

While some strategies can be implemented in a widespread manner such as decarbonizing the grid or incentivizing load flexibility and distributed energy resources, decarbonizing industry process is slowed by the diversity and uniqueness of the processes, the lack of data on emerging industry technologies, and technical and economic challenges faced by businesses. An effective decarbonization approach is for industry and agriculture sectors will require a combination of replicable and tailored solutions that consider the unique challenges and opportunities in each subsector.

The Building Decarbonization Volume proposes a list of recommendations intended to support building, industry and agriculture decarbonization efforts. Here are some of the top-line recommendations:

California has an estimated 13.7 million existing homes and 7.4 billion square feet of existing commercial

space. Acknowledging the scale of existing buildings and significant investment required to decarbonize these buildings is the first step to reducing building greenhouse gas emissions in line with economy-wide goals.

Because space and water heating equipment drives the bulk of on-site greenhouse gas emissions in buildings, heat pumps will drive progress to achieving building decarbonization. The CEC recommends a goal of installing at least 6 million heat pumps by 2030. Further, the CEC commits to working with stakeholders including manufacturers, labor, community organizations, and environmental advocates to accelerate the market to meet this goal and to push beyond it toward a comprehensive migration to heat pumps.

Affordability and equity must remain at the core of the state's building decarbonization strategy. The push to reduce greenhouse gas emissions in buildings must consider the energy burden faced by low-income residents, non-energy benefits from decarbonizing appliances, and must prioritize disadvantaged communities in program offerings. Next slide.

Continued coordination is needed to align state efforts supporting both building decarbonization and affordable housing needs.

Relevant agencies should work through community-

based organizations to identify needs and mechanisms to advance decarbonization at the local level and actively engage with workforce development entities on decarbonization priorities, seeking input to identify best practices, developing programs that meet the needs of workforce development entities, and simplifying program access.

Private market participation and private funding will be needed to meet California's climate goals.

Coordination with federal climate change efforts and funding and exchanging lessons learned with other states and countries will support our success. Next slide.

Load flexibility, including both load management and flexible demand appliances helps to optimize electricity use and is a significant strategy in decarbonizing, increasing grid resiliency, and mitigating utility bill impacts.

State agencies should support a range of commercial and emerging decarbonization technologies and strategies for the industry and agriculture sectors, including fuel substitution, demonstrations and deployments of advanced technologies, and documenting the potential benefits to California.

Reducing the embodied carbon, which is the greenhouse gas emissions directly tied to building

materials and appliances within buildings, is an emerging topic that needs to be advanced across relevant state agencies.

And now David Erne will discuss reliability. Go ahead David.

MR. ERNE: Good morning, Chair, Vice Chair and Commissioners, I'm David Erne with the Assessments Division. I'm going to be covering the Reliability Volume. So the driver for this volume really came from the rolling outages that we had in 2020. And then the follow-on activity of the CEC, CPUC and CAISO to develop a root cause analysis of what happened during those outages and the need to investigate more about reliability moving forward.

Also there was a prospect at the time of drought being potential within 2021 and we saw that happen, so that was also a key driver for this topic.

The volume -- can we go to the next slide -- the volume focused on electric system reliability and also focused on it for the next five years, or which we expect to have is a substantial amount of renewables coming online, as well as thermal plant, thermal plant retirements, making reliability a concern for us over the next five years.

The volume also focused on the effects of climate change, which were substantial and part of the driver for

what happened in 2020 and as we experienced last year in 2020, or this last year in 2021, the prevalence of extreme heat events, drought, wildfire, all affecting the generation and transmission system. So the volume goes into detail about those effects, the effects of each of those on the system, and how that relates to reliability and the need for greater planning around climate change for the electric system moving forward to make sure that we are able to support loads internally. And also taking into account that when we have situations like west-wide heat events those effect competition for resources external to California which California relies upon, which also makes for more concern for reliability.

It also highlights the need for greater planning processes throughout the state, and those are identified in the recommendations.

As a result of the RCA, the Root Cause Analysis, CEC created two new analytical products to help in that planning process that were described in the volume this year, and also subject of separate reports, and also presented at different business meetings over the course of 2021.

The first of those is the summer stack analysis. This takes a look at the impending summer, how things look relative to supply and demand, looks at both an average

year and a extreme heat year like we had in 2020, to give a perspective on how the grid might operate under average conditions, but also where we might need contingency resources as backup if there are extreme heat events. It is not meant for a procurement process, but it's meant for really additional planning for preparation for the summer.

Staff prepared a 2021 summer stack analysis and also recently prepared an update to the 2022 summer stack analysis to explain what 2022 looks like.

The second product was the midterm reliability, or the California reliability outlook, which is a midterm analysis that overlooks five years from 2022 through 2026. That analysis looked at a loss of load, conducted loss of load analysis, and identified all the challenges that were anticipated for 2022, that reliability looks like it would be fine for 2023 through 2026.

The stack analysis looked at challenges for both 2021 and 2022. In response to that the Public Utility Commission has ordered additional procurements and those additional requirements are typically expected to address some of the reliability challenges we anticipate over the next four years.

Staff have agreed to or committed to preparing the summer stack analysis and the midterm reliability analysis every year to help prepare for contingency

planning and long-term planning. Both of those products were utilized by the state, in as a result of their publishing, for contingency planning with the Governor's Office and also for CPUC's procurement process, their RFP process, for 2023 through 2026. Next slide.

Oh I'm sorry, the other topic that we covered in depth was the preliminary work prepared by CEC staff for the determining qualifying capacity for demand response. This is that a request of the Public Utility Commission. And the staff prepared a summary of the analysis that have been conducted through a working group process up to that point and prepared some preliminary recommendations as part of that.

And staff will subsequently be talking about the final report which has been brought up in Item Number 5 in our agenda today.

So first set of recommendations we organized the recommendations in four categories: situational awareness, then planning, and then I'll subsequently talk about implementation, and R&D.

So for situational awareness and planning we talked about the concept of the reliability outlooks, both in terms of the summer stack and more midterm reliability analysis to get a better preparation for what's happening over the next five years. And that supplements the SB 100

analysis which looks much further out, so we have near-term one year, midterm five years, and then long-term out for our SB 100 goals.

Also, we recognize the value of tracking projects. New projects coming online are very critical to ensuring our reliability. And so the CEC, CPUC, CAISO and the Governor's Office of Business Development, all coordinate to look at new projects that are coming online and ensuring that those are coming along smoothly, where they aren't where we can help them, move them along with our jurisdictional capabilities. To make sure that they are online and ready to provide reliability for the summer.

In planning we recognize the value and the need for additional climate change plans in our considering climate change in our planning. So the recommendation for the CEC, CPUC and CAISO to work together to have a common climate change planning approach, so that we can incorporate into all of our future planning for the system.

We also recognize the need for greater planning around transmission. This is recognized by the CAISO in their draft 20-year transmission planning, which the report just came out a couple weeks ago. And the value of looking at much longer term for our transmission planning to ensure that we're able to align the development of those transmission systems to support the growth, both within

California and within the west, and the value for California.

And lastly, with a greater emphasis in the greater deployment of energy storage on the grid we recognize that there are challenges associated with both permitting locally and addressing emergency response, to make recommendations for additional activity to improve the permitting process and the emergency response capability supporting energy storage as that deployment increases. Next slide.

Next two topics are implementation, as I mentioned previously, the demand response program is something that is providing great value to the state, but not as great as we think it should. And so restructuring the demand response program is a recommendation that we have, and we continue to work on both the CEC and CPUC in collaboration with CAISO to make that demand response program more valuable.

Heather mentioned in her volume about the load flexibility and the value of load flexibility for the state as we move into having greater deployment of automated devices, the support demand response programs creating dynamic rates are also a value, and so we make recommendations around improving both of those categories in collaboration with what was in the previous volume.

And lastly on R&D, although these topics were included in the most recent EPIC plan, we want to emphasize the need for improving zero-carbon technology, particularly those that are providing firm resources for the state, so that we can expand those capabilities and provide reliability. Increasing our load flexibility solutions through R&D. And also continuing to improve the technology around energy storage, making it safer and more reliable as it becomes a critical part of reliability for the state.

So that concludes our overview of the reliability volume. Now I'll turn it over to Nick Fugate.

MR. FUGATE: Thanks David. My name is Nick Fugate and I'm part of the Energy Assessments Division's team, responsible for developing the California Energy Demand Forecast. The forecast was formally adopted by the Commission last month and is, for the 2021 IEPR, the subject of Volume IV. Next slide, please.

The forecast is a critical planning tool which helps keep California's energy system clean, affordable and reliable. And it does this by ensuring that the state's system planning efforts, including transmission and distribution planning, integrated resource planning, and resource adequacy, all begin with reasonable assumptions.

For the sake of transparency Volume IV discusses many of these inputs and assumptions in detail, and

importantly identifies the state's major energy planning efforts conducted regularly by the California Public Utilities Commission and the Independent System Operator along with the specific components of the forecast that are used in each study. Next slide, please.

The energy demand forecast is actually a set of forecasts covering annual electricity and gas demand. And then further the electricity forecast includes hourly profiles as well as peak load forecasts under a variety of weather conditions. And across all these categories there are baseline scenarios which contain only the most firm assumptions around future program and standards impacts. And then there are also additional achievable scenarios which explore a range of plausible programmatic efforts over the forecast period.

Volume IV summarizes all these different forecasts at a high level, but then also takes a deeper dive on specific load modifiers that are highly impactful to system planning. Photovoltaic system adoption, energy efficiency, transportation and building electrification, climate change impacts, these are all discussed in detail within the volume.

Additionally, the volume calls out a notable -- which I call that notable changes to the forecast from previous cycles. This year we've extended the forecast

horizon beyond our normal ten-year planning horizon out to 2035, aiming to inform some of the state's long-term, policy-driven system studies. The CEC's SB 100 long-term demand scenarios project is a prominent example. This analysis explores the implications of economy-wide decarbonization for California's energy systems. While results from this effort are scheduled to be presented in early 2022 the project scope, approach and work to date are all discussed as a chapter in Volume IV.

The volume also describes our newly refreshed additional achievable efficiency estimates, which account for new program potential studies conducted by CPUC and CMUA. It also includes additional achievable fuel substitution scenarios, and this is a new product in 2021. These are estimates of electrical load growth and reduced gas consumption that may result from programs and standards designed to replace gas end-use. This is with electric ones.

And, of course, during the IEPR cycle the Commission adopted a new set of Title 24 commercial building standards which include requirements for PV and battery storage systems. This demand forecast includes a detailed accounting of those standards impacts. Next slide, please.

While detailed forecast results are available on

the CEC's docket and website, Volume IV attempts to summarize those results at a high level. Baseline electricity consumption describes the total amount of energy that's being used by consumers, regardless of how that energy is being supplied. This metric is closely tied to consumer behavior and it's what many of our demand models are trained on.

In the mid-baseline case consumption growth at a rate of 1.8 percent annually, reaching 340,000 gigawatt hours by 2035. A considerable portion of this growth is due to transportation electrification, which is projected to reach 35,000 gigawatt hours by 2035, or just over 10 percent of total consumption.

Sales, on the other hand, represents just the amount of energy being supplied by the utility and is therefore greatly impacted by the adoption of self-generation technologies such as rooftop solar. Our mid-range managed sales forecast grows at a much slower rate of 0.7 percent, as PV adoption and additional achievable efficiency combine to reduce load by 87,000 gigawatt hours in 2035, or just over 25 percent.

Peak load is a critical planning consideration, representing the highest level of load utilities and system operators must be ready to meet.

For the CAISO control area, the largest

balancing authority in California, our managed peak forecast grows at a rate of 0.9 percent annually, reaching 52,400 megawatts by 2035.

That concludes my summary of Volume IV. I will turn things over now to my colleague Charles Smith.

MR. SMITH: Thank you Nick. Good morning, Chair, Vice Chair and Commissioners. I'm Charles Smith, in the Fuels and Transportation Division. I'll be speaking on the Clean Transportation Program's benefits assessment within the 2021 IEPR Appendix. Next slide, please.

The Clean Transportation Program was created in 2007 to provide funding for projects that support the state's climate change policies within the transportation sector. These projects also provide co-benefits such as improving health from eliminating tailpipe emissions, reducing petroleum reliance, increasing zero-emission vehicle, or ZEV mobility, and supporting grid reliability.

Every two years statute requires that we assess the benefits of our program as part of the IEPR, with the goal of improving transparency and oversight of the program. Next slide, please.

This slide captures some of the highlights of our program funding so far. We've invested about $1 billion in projects, of which just over half has gone toward projects located in low-income or disadvantaged communities. We

have leveraged over $700 million in match funding, and we have funded the commissioning of over 15,000 EV chargers and 83 hydrogen refueling stations; both of those numbers will be increasing as our funding agreements continue to implementation. Next slide.

In quantifying the benefits from our program we've benefitted from the support of the National Renewable Energy Laboratory, or NREL. The analysis focuses on three key benefits: GHG emission reductions, air quality benefits, and petroleum displacement.

And it works through two analytical methods. First, we have the "Expected Benefits," which calculates the impact of our funded projects in direct proportion to their estimated usage. Second, we have the "Market Transformation Benefits." These represent more indirect benefits that are tougher to quantify but are no less real.

For example, by increasing the size of the EV recharging network, we not only expand charging opportunities for current EV drivers, but we have an impact on consumers' decisions about whether to choose an EV for their next vehicle.

Similarly, if we have a successful demonstration of a new fuel or technology project, we can expect that product to have broader or accelerated market deployment.

Now because there is more uncertainty with these

types of benefits, NREL assigned a "Low Case" and "High Case" to market transformation benefits. Next slide, please.

All right, this is my final slide, illustrates the estimated annual GHG reductions from both the Expected Benefits and the Market Transformation Benefits. The blue wedge at the bottom represents the Expected Benefits in terms of annual GHG reductions, while the two wedges above represent the Low Case and High Case for Market Transformation Benefits.

This concludes my presentation on the Clean Transportation Program, and I'll turn it back over to Heather Raitt.

MS. RAITT: Great, Next slide, please. Thank you, Charles.

So before concluding I'd just like to take a moment to thank you Commissioner McAllister for your guidance and leadership and also to thank Bryan Early, Bill Pennington, and Froo Fritz (phonetic) for your senior staff for their support. And I'd also like to thank Chair Hochschild, Vice Chair Gunda, Commissioner Monahan and Commissioner Douglas for your guidance.

And then, of course, developing the IEPR is a huge team effort, and so in addition to those of us presenting today there are dozens of others across the

Efficiency Division, the Energy Assessments Division and Research and Development Division who all made really important contributions to this effort as well as the Dockets team, the Public Advisor's Office, Legal Office, IT, Media and the Web team have helped make everything happen.

And then finally I'd just really like to thank the IEPR team, including Harrison Reynolds, Yolana (phonetic), who came back to help us with some of our workshops, and especially to Stephanie Bailey, Raquel Kravitz and Denise Costa, who work every day on the IEPR and make it all work, so thank you.

That concludes our presentation. And in addition to the staff presenting today, Lisa de Carlo from the Chief Counsel's Office is available to address any questions you may have.

And again, staff requests that you adopt the volumes I, II, IV, and the Appendix of the 2021 IEPR, incorporating the changes detailed in the errata. Thanks.

CHAIR HOCHSCHILD: Well, thank you so much Heather and thanks to you, David, Nick, Charles and the whole team who worked on this, really tremendous work.

So we'll go first to public comment on Item 3. Noemi, do we have public comment on this item?

MS. GALLARDO: This is Noemi the Public Advisor.

And I am seeing hands already, so let me just give instruction to everybody. If you would like to make a public comment, please use the raised-hand feature on the screen. If you are on by phone press *9 to raise your hand and then *6 to unmute.

A reminder to everybody to please restate your name, spell it for the record and indicate your affiliation, if any. We will start out with Delphine Hou. Delphine your line is open, and you may begin.

MS. HOU: Fantastic. Can you all hear me?

MS. GALLARDO: Yes.

MS. HOU: Excellent. Good morning, my name is Delphine Hou, Director of California Regulatory Affairs at the California Independent System Operator.

That's spelled D-E-L-P-H-I-N-E, last name is H-O-U. Good morning, Chair and Commissioners, the California Independent System Operator really wants to express our deep appreciation to the CEC staff for all of their hard work and really the excellent technical acumen, the California Energy Demand Forecast and the entire EIPR. The CAISO relies on the demand forecast for a variety of transmission and planning activities and appreciates the collaborative and transparent process.

Furthermore, we appreciate the reliability work that the CEC has taken on, and we really look forward to

working with the CEC more on that. It's a large team that works tirelessly on the demand forecast. And in a year of more challenges, uncertainties, and I think there was still a pandemic in there as well, so I really want to thank this excellent team: Aleecia Gutierrez, Nick Fugate, Heidi Javanbakht, Mike Jaske, Ingrid Neumann, Anitha Rednam, Quentin Gee, Heather Raitt, David Erne, and mm, yes, Mr. Matt Coldwell as well for all his hard work.

So we highly support this item. And again much appreciation to the excellent CEC team, always a great collaborative effort. Thank you so much.

MS. GALLARDO: Thank you.

Next is Jennifer Liu. A reminder to spell your name, indicate your affiliation if any. Jennifer your line is open, and you may begin.

MS. LU: Good morning, Commissioners and staff, my name is Jennifer Lu, J-E-N-N-I-F-E-R, last name L-U. And I represent SoCalGas. I appreciate the opportunity to provide public comment on the CEC 2021 IEPR. SoCalGas recognizes the hard work and dedication that the Commissioners and staff put into prepare 620 pages of assessments, tackling energy issues related to affordability, reliability and resiliency in a decarbonized economy.

SoCalGas had the opportunity to connect with Vice

Chair Gunda and his staff several weeks ago to discuss the IEPR process. We were pleased to hear the CEC is considering moving toward smaller releases, such as fewer volumes for release and longer periods for comments from stakeholders. SoCalGas looks forward to continuing to collaborate with the CEC on this important public process, thank you.

MS. GALLARDO: Thank you.

Next is Kiki Velez. Kiki if you could please spell your name and indicate your affiliation, if any. Your line is open, and you may begin.

MS. VELEZ: Thank you, can you hear me?

MS. GALLARDO: Yes, we can.

MS. VELEZ: Yeah, it's Kiki Velez, K-I-K-I V-E-L-E-Z. And I'm speaking on behalf of the Natural Resources Defense Council.

So thank you so much Chair Hochschild, Vice Chair Gunda and Commissioners for the opportunity to speak today and thank you very much to Commission staff for the great presentation on the IEPR.

First and foremost, we want to thank Commission staff for all the hard work they put into the 2021 IEPR, and to thank the Commission for your continued leadership in the effort to decarbonize California buildings.

As you know, buildings account for nearly a

quarter of California's greenhouse gas emissions. And replacing gas-fueled appliances with efficient and healthy electric alternatives is the single most cost-effective way to decarbonize the building sector. Therefore, NRDC is incredibly supportive and appreciative of the Commission's proposed goal of installing 6 million heat pumps in homes by 2030. California needs to rapidly decarbonize to meet its climate targets and the Commission's goal rises to the challenge of putting California on the path to healthy, safe, affordable and clean buildings on the timeline needed to mitigate the worst impacts of climate change.

We also support the Commission's commitment to equity, and we hope that as they progress towards the 2030 goal, they will especially prioritize heat-pump deployment in low-income households and in households in disadvantaged communities, so that all Californians will be uplifted by the clean energy transition.

So thank you again for the opportunity to speak, and we hope that the Commission adopts the IEPR today in alignment with California's pressing climate objectives, thanks.

MS. GALLARDO: Thank you. And next is Luis Amezcua. A reminder to please spell your name and indicate your affiliation, if any. Luis your line is open, you may begin.

MR. AMEZCUA: Good morning, Chair and Commissioners, my name is Luis Amezcua, that's spelled L-U-I-S A-M-E-Z-C-U-A. And I'm speaking on behalf of the Building Decarbonization Coalition. We appreciate and support Volume I of the final IEPR, which focuses on building decarb and want to echo the comments made by NRDC in that practice (phonetic) building decarbonization is necessary to meet our chemicals given that buildings account for nearly a quarter of our GHG emissions.

And in particular we really support the Commission's goal and installing at least 6 million heat pumps by 2030, which will be a critical part of that transition towards a cleaner, greener, all-electric future. We look forward to continuing to work with the Commission and supporting its leadership on this, thank you.

MS. GALLARDO: Thank you.

All right, a reminder again if anyone would like to make a public comment to please raise your hand using the raised-hand icon on the screen, it looks like a high-five. If you're on by phone press *9 to raise your hand, *6 to unmute. Chair, I do not see any other hands raised.

CHAIR HOCHSCHILD: Well, thank you Noemi. And thanks to all the members of the public giving comments, I want to especially recognize our former intern Kiki Velez, who was with us two summers ago and did terrific work on

building decarbonization. It's great to see your career flourish and see you at NRDC now, and thanks for all your hard work on this topic.

I also wanted to just take another moment here to mark the reappointment of our friend and colleague Andrew McAllister, who the governor has appointed to another five-year term. We are beyond thrilled about this development and his willingness to continue to serve to be just an incredible source of institutional knowledge and depth on this topic, the building decarbonization in particular, and doing everything he can to support the success of our efforts to BUILD a clean energy future. And it's just a really exciting moment. We did the swearing-in a few weeks ago. So with that Commissioner McAllister would you like to kick us off on the discussion?

COMMISSIONER MCALLISTER: Well sure. Thank you Chair Hochschild, and I'll start off with a little blushing here, but thank you very much. It's such a moment of opportunity and I think you've heard of all the topics and the key topics of this year's IEPR during staff's great presentation.

But we're moving forward with bold action in so many sectors, at the same time taking care to really keep our eye on reliability and the continuous pathway to get to our long-term goals. And so it's just a really gratifying

and challenging and sort of opportunistic moment to be doing what we do. And I just really couldn't imagine a more impactful place to be helping California move towards these long-term goals that will necessarily bring a lot of other states and marketplaces along with us. And I think that's just really what it's all about these days, we have to have that commitment. And I know all of you do and I just couldn't imagine serving anywhere else other than alongside all of you, so thank you very much for that.

And it's really terrific to have sort of the endorsement of the sitting governor and sort of really being in complete alignment with our state's long-term goals and be able to move forward with, in earnest.

So I will try to keep this relatively modest as I think Heather gave a lot of thank yous that are absolutely appropriate and I won't repeat all of those, I just want to thank her and the team. I'll just read out her and her team's name, but Heather and Denise Costa, Stephanie Bailey, Raquel Kravitz, it's just a small but mighty team. Harrison, I'm glad we dusted him off and bring him back. Thank you, Harrison. But that team just really gets so much done and coordinates so many different efforts, all in an overlapping way, it's remarkable how they keep so many plates spinning. And the result is invariably fantastic and really high quality, the two-plus years no exception.

So I just want to thank her for that momentous effort.

This is a foundational effort. The state sort of looks to the IEPR, many actors look to the IEPR for directionality; certainly take note of SoCalGas's comments on this sort of volume of it. But it serves many goals. It gives staff some opening to develop their knowledge and to really sort of think hard about some of these issues in a way that I think doesn't maybe happen in the day-to-day crush of short-term effort. And so there is an institutional benefit for really sort of letting staff run on some of these issues in a way that maybe isn't exactly a project that we have ending with an urgent deadline, but it is actually quite important.

And this year we tackled some critical issues, in particular, building decarbonization. You heard some speakers on that, thank you for all the public input today and previously. But reliability, the forecast and transportation, these are all just incredibly critical topics. We'll see next month the gas volume, another topic that is headed into I think a couple-decade trajectory of real, significant change and so we have to be complete here.

And also the IEPR, it's a place where we and others can point to say, "Hey the IEPR in 2021 said X," so we set goals. You heard about this, the 6 million heat-

pump goal. So it's a place to point to sort of organize our thoughts and organize our actions going forward, which I think is very valuable as a kind of a signal to the marketplace that hey, this is where we're going, and we want to work with all the actors. So thanks for that.

I want to thank the presenters today, Heather and David, Nick, Charles, thank you for your sort of spearheading being the public face of these volumes, but really dozens and dozens of people behind each of them.

In particular, on the building decarb chapter I wanted to just name a few people. The whole team is a couple dozen folks, but I wanted to just call out Heather Bird for sure, Michael Kenney, who really did a lot of the writing and heavy lifting on the document itself and pulling it all together, making sure it flowed. Jacob Wahlgren, Kristina Duloglo and Tiffany Mateo and Danuta Drozdowicz. So want to just thank all of them for being really in the center.

As the quarterback I would say Jennifer Nelson in the Existing Buildings Office, really just yeoman's (phonetic) work to pull it together and just help organize the division staff that was working on it in her office and really beyond her office as well as Heather Bird did quite a bit of that. And Christy Chu (phonetic) who early on took the lead on the building decarb chapter and since has

gone over to the PUC, so want to thank her for that as well.

The division leadership was really key on many of the sort of issues that we worked through Mike Sokol, Christine Collopy. Also in this chapter, but really across the IEPR, Aleecia Gutierrez and David Erne for the Assessments Division, Laure ten Hope and Virginia Lew from the Research and Development Division. They really pitched in and rolled their sleeves up.

And then the various advisors that were involved in the IEPR, and in particular the building decarb chapter: Brian Erle and Bill Pennington and Fritz Foo in my office, Le-Quyen Nguyen, Ken Rider, Terra Weeks in the Chair's office and Commissioner Gunda's office.

And then, finally, to the Public Advisor Noemi Gallardo, who really just helped us, helps keep us paying attention to all of the inclusivity that we just had to ensure that was part of all these workshops. And we did a lot of workshops on building decarb and many other topics through the course of the year. And just making sure to pull in voices from sort of near and far and very broadly and so that we would have diverse representation on every panel as much as we could. And so I just want to thank her for helping us do that.

And really in terms of building decarbonization

there's really no topic I'd say that for which it's more essential to have that diverse input. We're going to be moving forward in coming years helping projects happen at community level across the state. And in a state as diverse and large and variable as ours it's just critical to be able to have those structures and that trust just up and down the chain of funding and program development implementation. So want to just thank Noemi for that, and for what's to come as we put together some fairly impactful programs with federal money, with potentially the state resources, and really trying to mobilize marketplaces to get this done over the next decade or two.

And then Heather mentioned this, but I think we've seen momentous changes at the federal level, and so one of my goals in the IEPR certainly as it relates to building decarb was to create as many linkages as we could with the Biden Administration. I think we were successful in that. I think we have friends there. We have folks that are knowledgeable about what we're doing, and they come to us now to sort of coordinate and to keep each other apprised of what's going on. And I think that's super-important, especially as we have the Infrastructure Jobs Act funding coming down and then potentially whatever form BUILD Back Better takes, whatever pieces of that get across the finish line going forward, we could potentially have

additional resources.

So finally I want to just thank Vice Chair Gunda for his partnership on this IEPR and I'll certainly reciprocate that next year. But taking the lead on reliability and gas and the forecast it really feels like we're on incredibly solid ground with your leadership and I'm happy to keep contributing to that as much as possible.

And with that, I think that I will just give another thanks to the IEPR team and all of my colleagues, actually. I mean, Chair Hochschild, Vice Chair Gunda, Commissioner Monahan and Commissioner Douglas as well, all participated in a variety and diversity of workshops. And I just really appreciate, particularly, Commissioner Monahan in daring to come into the building decarbonization space and ask fresh questions. I thought that was just really helpful and adds a lot, so thank you for that. But really everyone was engaged, and I have just tremendous appreciation for your partnership on this IEPR and going forward. So with that I'll open up the mic. (Overlapping colloquy.)

CHAIR HOCHSCHILD: Great. Well, we know Commissioner Monahan is not shy, (laughter.) so maybe, let's see, Commissioner Monahan did you want to make any remarks? And then we'll go to Vice Chair Gunda.

(END OFF HERE AT 1:06 DONE ON TAPE)

COMMISSIONER MONAHAN: Well I just appreciate Commissioner McAllister's leadership and goodwill and brain trust. (Laughs.) As I'm learning a lot from him and from Vice Chair Gunda and, of course, from you Chair in this space. Well, I think I'll just focus on the transportation sector for now.

And I want to highlight that this is a report on the benefits of the program that we are required to do. And the team worked with NREL to really explore more deeply these questions about how do you value to BUILD-out a zero-emission vehicle infrastructure? And how it's a really hard area to do a cost benefit analysis, really hard, because you don't necessarily know when you BUILD a charger what that means in terms of an additional electric vehicle or a fuel cell vehicle on the road, and yet we know that's critical. And so this report kind of wrestled with some of these questions.

Also the question of like where do you attribute the greenhouse gas reduction? Do you attribute it to the low-carbon fuel standard? Do you attribute it to the investment that we made in a biofuel facility? I mean, these are hard questions. So I just wanted to thank the team, Quentin Gee was shepherding this until he made the move over to EAD. But the team, Charles, Susan, Stephanie,

they've all worked really hard on trying to be as clear as possible about what we know and what we don't know in terms of costs and benefits. So just thanks to them for being so thoughtful and diligent on this project.

And I hope going forward that we continue to explore more deeply how to value harder to measure investments that we're making, like ZEV infrastructure where cost benefit analysis is just a poor, I would say, metric.

CHAIR HOCHSCHILD: Great. Thank you. Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah. Thank you Chair. It's amazing to see this IEPR to kind of coming to a close on these three volumes. I mean, it's been a tremendous effort. And so I think I just want to start with just thanking Commissioner McAllister for his leadership. And as Commissioner Monahan pointed out it's amazing too. He's a mentor to me for a long time and now being a colleague and working on these issues is just an incredible blessing to me, so thank you, Commissioner McAllister for your leadership and thoughtfulness as usual.

And I do want to second Commissioner McAllister your comment on Commissioner Monahan presence on a number of topics, and I think it's really allowed for a very detailed conversation as something that was a new -- in

this particular IEPR -- where the perspectives of the inter-sector connections and integration were brought up and how to -- analysis to make sure they're broadly applicable. So Commissioner Monahan thank you for your input on, specifically for me on the forecast side as well as the reliability side, I much appreciate your input.

And Commissioner Douglas for her work on reliability and Chair for your unwavering guidance and stewardship on making sure we are going as fast as possible towards our climate goals, keeping in mind reliability.

So it's the thanks again, a repetition of a bunch of things already said, but I just want to thank the IEPR team and the entire Energy Assessments Division to the extent that I rely on them a lot for the reliability and the forecasting parts. And also the stakeholders and public for their participation and input to help construct the IEPR. Also want to thank the commenters at the end: Delphine Hou, Jennifer Lew, Kiki Velez and Luis Amezcua. It's just extremely gratifying to hear your recognition of the commitment and professionalism of the staff. And it's important to have that public testimony of the CEC staff and their hard work in moving this important product forward.

Commissioners typically have an opportunity to help facilitate and coordinate and set priority and policy

goals and analysis, but it really falls on the stakeholders and the shoulders of the incredibly committed and competent staff to help support the development of the vision and making sure the implementation and the vision happens, so thank you all for your efforts.

And the presenters were wonderful, Heather and Heather, David, Nick and Charles, thank you for your presentations today.

And I would just want to comment a little bit on the reliability and demand forecast. On the reliability just wanted to recognize the coordination between the agencies CAISO, CPUC, CEC and DWR. We had a lot of coordination.

Apart from that, apart from developing the IEPR we were also working to ensure 2020 (Indiscernible.) reliability in making sure we are taking care on making sure the lights are lights are on through the summer under extreme conditions. And also kind of leaning on a number of our partners and the developers, the IOUs for helping them coming to the table to help with the support of 2021 reliability. So overall, it has been a big year for CEC. And as David Erne pointed out we had a couple of new products that were launched. I think they're critical for the future of California's planning and reliability planning, so I would like to just specifically recognize

Angela Tanghetti, Chris McLean, Lana Wong, Mark Kootstra and Hannah Craig for their work on making sure can we had these two products in place to help support the reliability planning.

I really appreciate the recommendation bucket (phonetic) of situational awareness planning, implementation of R&D. I think that IEPR really provided a framework on how to think through reliability in a coordinated fashion across all the divisions, as well as all the Commissioners' leadership, so I think I just want to congratulate David to you, Aleecia Gutierrez for your leadership on making this happen.

Demand forecast, it's one of those things that was foundational for the beginnings of CEC. It's critical and a foundational element for electricity and gas planning in the state. As Nick mentioned that the team made a number of key updates and sets that are required to make sure the forecast is as reasonably projecting through 2035. But this particular year has set us on a path to bridge forecasts and scenarios and to help policy planning as we go through this incredible transition period. So just want to thank Nick for your leadership on this work, but also want to recognize Kathy Garcia, Lynn Marshall, Ingrid Neumann, Anitha Rednam, Heidi Javanbakht, Mike Jaske, and Delphine mentioned Matt Coldwell as well. We'll give him a

pass on this even though he moved to CPUC.

So the one thing I want to recognize here is that team works under a very tight timeline especially towards the end of the year, because a number of the critical inputs are not available until the end of the summer. So the staff have to pull all that together in the last minute. So just want to recognize the personal toll that it takes for a lot of staff working weekends and nights to make this happen. And it's definitely a cause for concern in terms of in burnout and such. And I just want to figure out a way with the crew to really give the forecasting people a break right after we adopt, so they can just have the time off.

And also, I want to recognize specifically comments from Jennifer Lew, and I'm going to talk about this in our Commissioner reports, but note we are going to look at bridging the two different needs which is providing an IEPR or content from CEC that's substantive and allows for the staff to develop important policy ideas. As Commissioner McAllister mentioned this writing is a great exercise in putting thoughts together, but also making IEPR a little bit less lengthy and more integrated in the summary. So we were thinking it through, and I think the 2022 IEPR will begin the process of potentially launching supplementary dockets, with staff would still have the

opportunity to write these reports and further that, but the IEPR itself could become a summary document. So we are hoping to do that.

And thank you for your comments and participation. And again, incredible gratitude for all our staff for your work. And yeah, with that Chair look forward to supporting this adoption.

CHAIR HOCHSCHILD: Oh well said Vice Chair Gunda. Thank you for those comments. And as you well know I support trying to say more with less and having a shorter IEPR.

The piece I wanted to just call out in this IEPR was the heat-pump goal, the 6 million heat-pump goal. I am a big believer in goals. I'm really encouraged that we're doing this and want to thank Commissioner McAllister and the team for doing the diligence on that.

Not so long ago in January of 2018 Governor Brown set a one and a half million zero-emission vehicle goal for the state by 2025. And at the time there were a lot of people who said that was outlandish and it was never going to happen. We've now blown by a million electric vehicles and we're well on our way to surpassing that goal. And now in fact the state goal has been raised 2 to 5 million by 2030 and now everyone's tracking beyond, far beyond that. And an interesting little note we had, I think, seven

electric vehicle ads during the Super Bowl, far more than for conventional vehicles.

But I would argue that the setting of the goal initially is instrumental to that. It does focus the market, it focuses the agencies, all the stakeholders around the objective and it can drive investment and drive innovation. And we need to do this for building decarbonization. It's a huge issue for health, it's a huge issue for climate. I have every confidence that we're not only going to reach this goal, I think we're going to surpass it ultimately just looking at the trends and the technology and what's underway and the momentum with the building and so forth. But I do think this is a significant moment for that reason.

So with that being said, my thanks again to the whole team for your professionalism, your diligence in putting together this document.

And with that I invite a motion on Item 3 from Commissioner McAllister.

COMMISSIONER MCALLISTER: I move to adopt Item 3, with the errata as stated by Heather (Indiscernible).

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

VICE CHAIR GUNDA: Second.

CHAIR HOCHSCHILD: All in favor say, "Aye."

Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan.

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I vote aye as well. Item 3 passes unanimously.

Let's turn now to Item 4, Building Initiative for Low-Emissions Development, the BUILD program.

MS. CARRILLO: Good morning, commissioners. My name is Dina Carrillo, a manager in the Renewable Energy Division. Joining me this morning are two of BUILD's technical staff. Larry Froess, and Erica Chac, and the legal team from the Chief Counsel's Office. Today, staff is recommending adoption of the program guidelines for the Building Initiative for Low-Emission Development or BUILD Program. Oops. Apologies for that.

Good morning again. Put a face behind the voice. Next slide, please.

BUILD, the Decarbonization Market Transformation Initiative designed to spur the adoption of near-zero-emission technologies and reduce greenhouse gases by supporting the development of new all electric housing, bringing clean energy homes to underserved Californians and

communities. BUILD offers both technical assistance to support the industry in designing and introducing new equipment in low-income residential construction and financial awards, and incentives to offset the cost of adopting these new technologies. In addition to reducing greenhouse gas emissions, the program supports green jobs and provides non-energy benefits, including improved indoor air quality and stronger resiliency. Next slide, please.

Senate Bill 1477 authorized two building decarbonization programs: BUILD for new residential construction [indiscernible] for existing buildings to deploy near-zero-emission building technologies to reduce greenhouse gas emissions from building. The legislation requires the PUC, in consultation with the CEC, to develop and supervise the administration of the BUILD Program.

The PUC instituted a new rule making on building decarbonization and adopted Decision 20-03-027 to establish a framework and requirements for the program. Through this process, the CEC was named administrator of BUILD and the PUC Decision target fell to low-income residential housing for at least the first two years and further focuses the scope of the program beyond equipment to a whole all electric building approach. Next slide, please.

The initial statute authorized $200 million for both pilot programs allocated from the gas corporations

under the California Air Resources Board Cap and Trade Program. Of that, the PUC decision appropriated $80 million for the BUILD program and established that $60 million would fund low-income residential projects. Project funding must be allocated to the corresponding utility territory for the first two years and may then be expanded.

In addition, the statute establishes that low-income residential projects do offer technical assistance. The CEC set aside a substantial amount of funding for technical assistance under a contract with the Association for Energy Affordability, which was approved by the CEC at the last September's business meeting. We are also recommending the set aside of $2 million dollars for a pool, for a new adopter design awards, providing up to $100,000 to eligible applicants to offset early design and architecture costs, providing meaningful support in the early design phase to further spur market transformation. The statute in PUC decision also establish metrics and a process for the pilots to be evaluated, which these funds also contribute to. Next slide, please.

BUILD is designed for new all-electric low-income residential housing with a focus on bringing near-zero-emission buildings to disadvantaged and low-income communities.

SB 1477 also requires that BUILD projects will not result in higher utility bills for residents than they would have otherwise experienced. The program models the rates of the all-electric building design in comparison to a mixed fuel baseline. This examination of utility rates and approach to the modeled residential utility cost is complex. An in depth of staff work and analysis has been simplified for stakeholders and the BUILD program's application process. Next slide, please.

In in the BUILD program, we've worked to address barriers in the complex industry of low-income residential building development. I've mentioned the significant resources committed to technical assistance in the new Adopter Award to support new entrants to the market. Affordable multifamily projects are often financed with a patchwork of funding, and BUILD is designed to be flexible and leverage other programs while appropriately safeguarding the rate payer funds.

The BUILD application process also leverages existing building requirements, including the CBECC Energy Code Compliance Freeware, HERS Raters and Interconnection Agreement, reducing duplicative efforts for the applicants. In the program's requirement for resident bill savings addresses a split incentive between tenants and owners that we often see. Next slide, please.

The incentives of our program are based on the modeled greenhouse gas emission reductions as compared to a new mixed fuel prescriptive building as a baseline. Staff has developed a BUILD incentive calculator that applicants can use early in the design and reservation phase to identify that incentive amounts available and ensure project designs meet the modeled resident BUILD savings requirements. Next slide, please.

These next two slides provide a deeper look at the incentive structure. The incentives are limited to $2 million per applicant over the program. Incentives will be available on a first come, first served basis, with the flexibility of reserving funds early in the development cycle to better impact early decision making and market transformation. And in our development of the modeled driven utility cost methodology, staff found that some buildings will need additional efficiency measures or PV installed to ensure the requirement is met in that first year of occupancy.

Staff estimates an average award of $3,000 per bedroom, depending on the building design and climate zone. There are four types of incentives that make up a total incentive an applicant can receive. The base incentive, which is based on the GHG emissions avoided as compared to mixed fuel, a building efficiency incentive based on the

percentage above code to help get to the modeled resident utility costs, as well as an incremental incentive for PV that may also be assigned to the resident to meet those needs. And fourth, our kicker incentive, which further reduce greenhouse gas emissions, and I'll discuss in the next slide. An eligible applicant will combine all of these values together for the total amount. Next slide, please.

The purpose of offering the kicker incentives is encourage equipment that reduces greenhouse gas emissions but isn't easily incorporated into the building modeling. This includes technologies that contribute to electrical grid stability, like Grid Flex and On-site Energy Storage. Low emission technologies such as heat pumps with low global warming potential refrigerants, or high efficiency appliances, such as induction cooktops and heat-pump clothes dryers, and other things like EV chargers that could actually be bi-directional. Next slide, please.

The CEC and PUC has been working collaboratively together with stakeholders to inform program goals and priorities. The program has a complex set of goals designed for requiring substantial planning and extensive communication with our stakeholders. The CEC made steady progress developing an implementation plan quickly after the initial Decision, identifying that Energy Commission as

the administrator, issuing a revised implementation plan based on stakeholder and PUC feedback, hosting focus groups with low-income housing developers providing a design proposal, draft guidelines for public input, and now the final guidelines that are brought to you today. Next slide, please.

And that brings us to today. After consideration by the commissioners, the guidelines will be submitted to the PUC via a Tier 2 business letter for formal enactment, outreach and general technical assistance has begun. And we're targeting March 1st to have our incentive application system built and ready for launch.

I'd like to thank the leadership of Commissioner McAllister, and Chair Hochschild, and their staff for their support. Bryan Early, Ken Rider, Bill Pennington, my colleagues at the PUC, Abhilasha Wadhwa and Nick Zanjani, the BUILD staff who've been very persistent and bring some amazing technical skill to this issue, our legal team from the Chief Counsel's Office and contract grants and loans, and of the decarbonization program, the issues we've grappled with have crossed divisions.

So I'd like to take a moment to thank Tiffany Mateo, Danny Tam, Maziar Shirakh, Eugene Lee and Michael Sokol from the Efficiency Division, Jeffrey Lu from Fuels and Transportation Division, and our colleagues and

Renewables: Gigi Tien, Hughson Garnier, Jordan Scavo, Geoff Dodson, Sean Inaba, Malachi Weng-Gutierrez, and Silvia Palma-Rojas. I'd also like to thank staff in our IT Division in developing our online application tool, and our media team: Lindsay Buckley, Elaine Cajon [sp] and Carol Robinson.

Finally, I'd like to recognize and thank all of the stakeholders who participated in this process. Without their direct engagement the program would not have as strong of a design as it does, and it better meets the needs of the low-income, affordable housing community. Staff is recommending that the CEC approve the BUILD Program guidelines and staff determination that adoption of these guidelines is exempt from CEQA.

This concludes [indiscernible], and my colleagues and I are available to answer any questions you may have.

CHAIR HOCHSCHILD: Thank you so much, Deana. Terrific work. I wanted to just thank you for your diligence on what has been a very, very robust and lengthy process. I do think we landed in a great place, and I recognize it's taken a while because of the complexities here with the PUC and the collaborating on this and all the back and forth as a result. But I think at the end of the day we had terrific engagement from stakeholders and have a strong program. So I just really want to thank you for all

the attention to detail, Deana, over the -- over the tenure you've got on this and all the staff you've worked with. Really appreciate that. With that, let's go to public comment on Item four.

MS. GALLARDO: This is Noemi Gallardo. Sorry Chair. Noemi Gallardo, Public Advisor. Attendees, if you would like to make a comment, please raise your hand using the raise hand icon that looks like a high-five on the screen; *9 if you are on by phone and then *6 to unmute.

I do see a hand raised. A reminder to please spell your name, indicate your affiliation, if any. Kiki Velez, you will be first. Your line is open. You may begin.

MS. VELEZ: Hello. Hi again. Kiki Velez; K-I-K-I, V-E-L-E-Z. And I'm with the Natural Resources Defense Council. Once again, thank you, Chair Hochschild, Vice Chair Gunda, and commissioners for the opportunity to speak today. And thank you so much, Deana Carrillo for the presentation on the BUILD Program.

The NRDC is so excited to see BUILD so close to launch. We know that Commission staff has been working tirelessly on the BUILD guidelines and especially on making the program attractive to affordable housing developers who've never built electric before and to future residents of these all-electric affordable housing units.

We just want to reiterate the scale of the program. BUILD will provide technical assistance and dedicate $60 million in incentives to transform the market for all electric appliances and expand access to electric housing in some of the communities that are most impacted by climate change and fossil fuel pollution. This is the exact type of program that California needs right now if we are to meet the state's fast approaching climate targets in a way that is equitable and uplifting for all Californians.

So again, we are really looking forward to BUILD launching and we applaud all the hard work that the Commission has put into the development of this program. Thank you.

MS. GALLARDO: Thank you. A reminder again, to anyone who would like to make a comment to please raise your hand using the raised hand icon on the screen or *9 if you are on by phone.

Chair, I do not see any of their hands raised.

CHAIR HOCHSCHILD: Okay. With that, let's go to Commissioner discussion, starting with Commissioner McAllister.

COMMISSIONER MCALLISTER: Well great. Well thank you, Chair. I don't have a lot to add to what you said. I totally agree just with the quality of the staff engagement and across agencies together in partnership with the PUC.

Deana, I have to reiterate the thanks to you for your persistence and attention to detail, definitely, the product is really high quality because of that. So thank you, and to the whole BUILD staff. There's been many there have been many hands on this project, particularly on the BUILD analysis and sort of making sure that we're complying with all the statutory requirements. You know, at the same time, we create a program that is relatively transparent and that has relatively low barriers to participation and balancing all of that complexity. With a program that has a public face that's understandable and digestible for people is really an accomplishment.

And I guess I just wanted to just say, you know, this is another example of the Energy Commission's developing this muscle, which is -- which is an independent muscle for you know, skill set, really for program development and implementation. And I think, you know, we have shown success in a number of these programs in the past and have, I think, a bunch of opportunities coming up to perhaps add resources to this program or other programs and develop new programs aimed at building decarbonization, transportation, and all the other, you know, battlefronts that we're -- that we're on right now.

And so I think the public process is essential for that. We have great advocates on this front. I want

to just thank NRDC and all the other advocates that have chimed in on this. It's really helped shape the program. And that sort of ear to the ground that you provide really does help us end up with a better product. And so you know that commitment to inclusivity, participation, and helping these dollars, which are precious, have the biggest impact they can have, I think, is something that we're accomplishing here.

And going forward, as we roll the program out and as we take applications, and really, as you know, Deana, as you and the team, you know the rubber hits the road here on the program and it starts to impact the world, we also need to really keep our ears open for feedback. And the guidelines process, you know it is complex with the sort of joint agency ownership, but I think we do need to you know, make sure to turn, to make changes, and be as flexible as we can going forward to make it as easy as possible and as connected as possible to the marketplace.

So, so with that, I just thank you so much, Deana, for all your effort and all the staff. It's really had nose to the grindstone for many months on this. It's really great to see it come to the business meeting and I'm going to wholehearted support.

CHAIR HOCHSCHILD: Thank you, Commissioner. Well, unless there's comments from other Commissioners.

Commissioner -- oh, go ahead. Vice Chair Gunda, please.

VICE CHAIR GUNDA: Yeah, I'm going to be very quick. I just wanted to recognize and provide gratitude to Deana Carrillo, Erica, and Larry for providing a briefing on this and helping me understand both the historical trajectory of since the bill passed and where we are, but also potential opportunities to really build off of this program and help ensure you know, long-term equity for the State.

So just wanted to thank the team and also, Deana, I think you -- your background and your professionalism kind of lends itself to a focus and diligence on ensuring coordination between, you know CEC and CPUC. And it also lends very well into, you know internalizing equity and importance of that. So thank you for your leadership. Thanks to the team and also the management team, Arland [ph] and Natalie, and also thank you so much.

CHAIR HOCHSCHILD: Thank you. Well unless there's other comments, Commissioner McAllister, I welcome motion from you on Item 4.

COMMISSIONER MCALLISTER: I move Item 4.

CHAIR HOCHSCHILD: All right. Vice Chair Gunda, would you be willing to second?

VICE CHAIR GUNDA: Second Item 4.

CHAIR HOCHSCHILD: All in favor, say aye.

Commissioner McCallister.

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda.

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan.

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

Item 4 passes unanimously. Thanks again, Deana and the whole team.

MS. CARRILLO: Thank you.

CHAIR HOCHSCHILD: With that, we'll turn now to Item 5; Report to the PUC on Supply-Side Demand Response. Erik Lyon.

MR. LYON: Hello. A quick sound and video check. Can you see me?

MS. GALLARDO: Yes.

CHAIR HOCHSCHILD: Yes.

MR. LYON: Okay. Great. Hello, Chair, Vice Chair, and Commissioners. My name is Erik Lyon from the Vice -- from Vice Chair Gunda's office, and I will be presenting on an -- on the Interim Report to the CPUC on Demand Response Qualifying Capacity that we are submitting for adoption today. Next slide, please.

Demand Response, or DR, is the practice of reducing electricity consumption when it is expensive and

polluting, particularly during times of grid 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 that result in cost savings and greenhouse gas emissions reductions for California. 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 technical terms, what is the capacity value of a DR resource? The CPUC asked the CEC to form a working group, which I will talk about next, and the CEC staff have developed a report containing findings and recommendations from this process. Next slide, please.

CEC staff spent much effort ensuring a robust stakeholder process with weekly meetings that were open to the public and both government and industry stakeholders. 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 cataloging 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. In total, we held 20 working group meetings and two public working

groups, or about 50 hours of public engagement, plus all the time stakeholders gave to the process submitting proposals and written comments outside those meetings. So a big thanks to our stakeholders out there.

When it was time to bring the work of the two groups together, we merge them into a single combined working group. It was about this time that the stakeholders brought some key issues to our attention that made us rethink our process a little bit and eventually decide to pursue the interim solution that I am presenting today, but I will return to that point later. Next slide, please.

We organized our finding into three categories. First, a set of interrelated challenges for DR to support California's electric grid reliability. While the Decision requesting the CEC Working Group did not address all of these directly, we have found that 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 was found to be infeasible for making actionable, permanent recommendations for the Resource Adequacy year 2023. And third, we found that three stakeholder proposals have the potential to materially contribute to California's near-term reliability, and 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 issue with crediting really informs the CPUC request for re-examining 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 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. We agree with the ISO that these supply-side resources should be treated as such and shown on supply plans.

The QC methodology is at the heart of the CPUC's ask of the CEC. The current QC methodology is based on the load impact protocol protocols or LIPs. And the idea is to apply actual measured load impacts to conditions when reliability needs are expected to be greatest. The CPUC has stated unequivocally that this methodology is intended to reflect DR resources contribution to reliability, and while we agree with that assessment, we also recognize that the approach has significant room for improvement to do so.

CEC staff see improving the methodology to better

reflect contribution to reliability to be a killgore [ph], excuse me, core goal of the working group. There are two sides to the issue with incentive mechanisms. On one hand, the penalty for resources that provide capacity under the Resource Adequacy Program was not designed for resources with variability and other limitations like DR. On the other hand, the vast majority of DR in California has no performance incentive mechanism in place from the perspective of the ISO, either because they are credited, as I mentioned previously, or because DR resources can be grouped into aggregations that are too small for the incentive mechanism to apply. So while we do not think that the current penalty structure is appropriate, we do believe that some incentive mechanism is needed. Next.

Settlement baselines refers to the method used to calculate load impacts in the ISO's energy market. So critically, to settle DR transactions, we must first estimate DR participants load in the absence of a DR event, and this is known as a baseline. Until recently, there was no appropriate baseline for weather sensitive resources like smart thermostat programs, and we believe that before we can measure a contribution to reliability, we must first be able to measure the load impacts of individual DR events.

Now last but certainly not least, stakeholders

have been clear that this process is difficult and time consuming. We found these perspectives credible and affirmed 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 up to two years old by the year capacity is contracted for. So the values cannot be adjusted as portfolios change. 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. So by the time a decision is -- would have been reached on the CEC's recommendations, it would have been too late to apply to 2023.

Now, 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. Now that could have left us in the uncomfortable position of providing recommendations that were too late to apply to 2023 but incompatible with 2024. And so together, these two findings 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 identified previously, but also found that these may face implementation challenges. So we also identified one that is easier to implement but might represent a smaller step forward in addressing the key challenges.

So first, PG&E proposed a load impact protocol, informed effective load carrying capability, or LIP informed ELCC, for short. And that's a methodology that they have been collaborating closely with the ISO to hammer out, and this methodology is appropriate for the investor-owned utilities, currently. An ELCC based approach essentially imagines an amount of what we call perfect capacity, and that's a hypothetical generation resource that never requires maintenance or loses efficiency under high heat conditions and can change its output instantaneously. Then ELCC asks how much of that hypothetical perfect capacity can a real world resource, such as Demand Response, 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 in the U.S. that we have nicknamed the PJM and New York ISO approach. And this approach is appropriate for third party DR providers for the interim. This proposal relies on a

system of performance penalties to ensure compliance rather than a prescriptive, upfront analytical framework. And 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 if they underperform.

Now, for those who joined last month's business meeting and saw the presentation on the Draft Report, I will note the proposed penalty structure has changed slightly based on stakeholder feedback. We are now recommending a hybrid of the -- of two existing California Demand Response Program penalty structures that is a little bit stronger than either one on its own.

And finally, since the first draft, we added a third methodology proposed by the California Large Energy Consumers Association as a backup to the first two. The -- this approach takes the standard LIP outputs and weights them by the -- relative probability of outages, formerly called loss-of-load events during each hour. This proposal incrementally improves the LIP's -- excuse me, improves how the LIPs reflect a contribution to reliability by recognizing changes to reliability value across different hours. But it does not solve some of the other critical challenges identified through this effort. So we find this

proposal appropriate if the CPUC deems the other proposals infeasible for them to implement. Next slide, please.

So 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. 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 to use alternate methodologies. We recommend the CPUC adopt the LIP informed ELCCs for IOUs and the incentive based PJM ISO approach for third party providers. But we do recognize there are significant implementation challenges for the CPUC to do so. Let's see, and then we also recommend the loss of load probability weighted LIP as a backup for either one of those in the case that they are unable to be implemented.

To reconcile the need for the status quo in 2023 and our desire to move the ball forward, we are recommending that that the IOUs be able to choose between the LIP informed ELCC and the status quo, and third parties are able to choose between the incentive based approach and the status quo.

Next, we recommend the CPUC request that the ISO provide an exemption from the Resource Adequacy Availability Incentive Mechanism for any resource that

qualifies with the LIP informed ELCC.

And finally, for the interim, we recommend that 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 that the CPUC maintain a contingency plan that would provide credits for IOU DR programs in the event that satisfactory LIP informed ELCC values are not able to be produced.

Next slide, please. Okay. In the long term, we recommend the CPUC request the CEC to continue holding the supply side DR/QC 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 last but not least, we recommend the CPUC collaborate with CEC staff on the QC counting implementation, including leveraging the analytical capabilities and data repository of the CEC for calculating load impacts and estimating capacity value.

And that concludes my presentation, so thank you for your time.

CHAIR HOCHSCHILD: Thank you, Erik. All right.

Let's go to public comment on Item 5.

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees, if you would like to make a comment, please raise your hand using the raised hand icon on the screen or *9 if you are on by phone.

I do see a hand raised. We'll start with Delphine Hou. Reminder to please spell your name for the record, indicate your affiliation, if any. Your line is open, Delphine, and you may begin.

MS. HOU: Right, thank you so much. This is Delphine; D-E-L-P-H-I-N-E. Last name is H-O-U, Director of California Regulatory Affairs at the California Independent System Operator.

Good Morning again, Chair and Commissioners. Another excellent item and the California Independent System Operator expresses our appreciation to the CEC staff for all of their efforts in facilitating these very critical conversations around supply-side demand response and providing really an excellent foundation through the Working Group Report. And we really appreciate stepping through these issues so carefully so that we can continue having those conversations.

These were not easy issues to grapple with, and it just took a significant amount of time commitment from staff under a very short timeline. But through it all, we

appreciate that the CEC team kept their eyes and reliability and were highly supportive of several of the recommendations, including the end of crediting so that investor-owned utility demand response is shown on the supply side plan so that they're part of the resource adequacy fleet visible to the CAISO and for putting forth possible solutions for the 2023 resource adequacy here.

We'd like to thank David Erne, Tom Flynn, of course, Erik Lyons for the excellent deep thinking on these issues, the facilitation and of course, Vice Chair Gunda, for your leadership on this issue.

The CAISO supports this item and the Working Group Reports transmittal to the PUC. Thank you all for your excellent work on this. Thank you.

MS. GALLARDO: Thank you. Let’s see, again, if you would like to make a public comment, please raise your hand using the raise hand icon. If you're on by phone, press *9.

Chair, I do not see any other hands raised.

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

VICE CHAIR GUNDA: Yeah. Thank you, Chair. I'm going to take a few minutes to kind of shared some thoughts on this one. So I just want to begin by, you know, the thank yous and I just want to recognize CPUC for their

openness to consider CEC as a venue to help develop a forum for this discussion. So I think you know, it takes for an issue, as Delphine just noted, as difficult as this one, to really allow another agency to create a forum and then create some solutions or ideas is not always easy and I really appreciate CPUC's, you know management and leadership's openness in kind of, you know, doing that.

This goes specifically to the CEC's unique role in the State as a forum for ideation and development of broad buckets of strategies. And I think I make this point several times, but I think it's important to really socialize the idea that given that CEC doesn't have regulatory hammer in a lot of different arenas, it really allows for an open, honest discussion, and I'm really grateful that CEC had a chance to contribute in this arena.

And it goes to just thanking Tom, David Erne, and as you know, Delphine again noted, Erik. You know, what a -- what a wonderful leadership that you've shown in this, and I just gratifying to watch you grow into this role and helping move such an important conversation forward. It's a big lift, and I really appreciate personally the three of you for your work, but all the other staff who have been working behind the scenes, including our interagency partners.

You know, thanking stakeholders for entrusting

their time and lending their experience, expertise, and ideas to the process, obviously including colleagues from CPUC and CAISO, as well as DR industry and evaluation partners. So thank you so much. Thanks for collaborating specifically on this challenging issue, devoting so much time and coming together to solutions that can help us move the ball forward, even if it meant incrementally.

It is important for us to note here that all of this work has to be done in good faith with others, with each other so that we can help develop trust as we all inevitably make concessions to our ideal approaches. And it's important too to be able to trust each other in this process. And this is where I really want to call on my mentor, Andrew McAllister, you know for his idea on the fidelity to a process and how important it is. And I'm thankful to Tom, Erik and David for keeping it as their core commitment throughout this process and helping the process play out and to solve.

And a couple of high-level points. You know, Demand Response has been and continues to be a valuable resource for ensuring reliability, reducing GHG emissions, and managing costs on the electric system, but I think we all collectively recognize that there is a lot more to be done to support DR as a whole and specifically supply-side DR. I think we as a state need to -- state need to

[indiscernible] us on a vision on the DR in a comprehensive implementation strategy that allows DR to be a resource that we can deeply depend on collectively and have the confidence in it. As we have more in transportation, electrification, more demand flexibility. and behind the meter storage, it just becomes really, really important that we all have a shared vision. So I call on our stakeholders, I call on the utilities to really help develop that vision that you all think is important for the State of California.

And obviously, measuring and valuing DR's contribution to reliability is one of the major remaining barriers. And as this process played out in developing a robust market for supply-side DR. This issue has required very close coordination, obviously, the CEC, CPUC, and CAISO as the energy entities that are all vested in making sure that reliability is kind of taken care of. So this type of work is consistent with that vision for interagency coordination, and I commend CPUC, and CEC, and CAISO staff for extending that courtesy and working together and developing solutions.

We also appreciate the opportunity to support this kind of work analytically, which is consistent with the Commission's role as a statewide hub for energy data and analytics.

Finally, I want to emphasize that the request of the working group is a big challenge and one of that many parties have been working on for many, many years. So while we might not have resolved all the things that we wanted to and we set out to in these short six months, I want to recognize the value of the progress we've made collectively here and moving the ball forward and affirm our commitment and CEC's commitment to continuing this work on these issues and then moving forward the ball as a whole for the State.

And I kind of, one addition in that is to just make sure I want to congratulate and commend the three proposals that came through and vetted. It's a lot of work for people to develop these ideas, put forward and develop the necessary analytics to defend those ideas. So to the IOUs and CAISO on the proposal, the [indiscernible], as well as CLECA for your incredible ideas and time to move this conversation forward. Thank you. And I look forward to advancing this conversation and making sure DR becomes an important element of the State's portfolio.

I don't have any questions for Erik. Erik, I have an unlimited access to Erik, so I look forward to supporting this item and we are ready.

CHAIR HOCHSCHILD: Thank you, Vice Chair. Other comment, Commissioner McAllister.

COMMISSIONER MCALLISTER: Yes. So thanks for the opportunity to chime in here, I think. So first, I want to recognize Vice Chair Gunda, you know, for your leadership on this and just building really just being a locus of collaboration, you know, and sort of building that -- an environment, that context, that that really does allow people to come together. I think our agency partners and -- really appreciate. I know they appreciate it, and I think it's really created a foundation for this kind of collaboration and trust. So. So kudos to you for that. I know -- I know, you know, our colleagues at the other agencies appreciate that as well.

In this case, you know, I won't repeat anything that Vice Chair Gunda said just because you know, you said it so well, but I did want to just acknowledge a couple of things. One, you know, the implementation of these proposals. There's a lot of work ahead for the next couple of years, right, as we make this transition in the implementation of this proposal as it goes forward is, in the near term, maybe more work than sort of in the recent past rather than less. But with this vision that we need to maintain that we get to a workable solution that really finds the sweet spot there for supply-side DR.

And we have so much technology available that can make this work. I think we just all know that sort of

intuitively and those of us you know who have been in the sort of tech side of things for years, we're just in such a -- such an amazing opportunity, this moment, to begin to apply these new technologies as they really mature in the marketplace and as the cost comes down and as people learn to use them and they get socialized, the ability to aggregate, to control and aggregate sort of in real time for grid management purposes, just really multiplies that opportunity to expand.

And so that's the idea here with the supply-side DR is to enable that as a resource that does truly substitute for traditional supply. And so I think we've got some of that, you know, in fits and starts. We've made progress. But I think really this all-encompassing vision is what's needed, and the agencies can come together and make that a reality.

And then on the flip side, I think you know, whatever it sort of doesn't fit in this new bucket that we're designing of supply-side DR, we really need to be very intentional about how that relates to the demand-side or the permanent load shifting type of demand response. And so those are reflections of each other. And so I think the -- I'm very, very interested in, as we move forward with load flexibility and the building standards and on appliance, the flexible demand appliance standards, and our

R&D efforts, that we really keep very clear the sort of various types of demand flexibility that we are promoting in the State and how they fit into our overall planning efforts, whether it's on the DR side, the forecasting, you know, and some mix of all of our various efforts.

And so I think, you know, the -- to sort of revisit this theme of the Commission's location in these discussions, I think we are developing sort of a series of products and platforms, analytical capabilities that really do allow us to help to manage and bring structure and bring clarity to these conversations as they all move forward in parallel. And just the cross divisional work will only get, I think, more intense as we move forward. And that's as it should be because we have so much integration that's going on.

So with that, I just wanted to say thanks to Erik, David, Tom, the whole team for giving me regular briefings about this and sort of the play-by-play. I know it hasn't been that easy, but the platform, that's what these discussions are. You know, people get in the room and they and -- they say their peace, and that's exactly what we need. So I think that building on that trust going forward, it's going to be very, very important. And I'm glad we've got the team on it that we do so. So thanks. Thanks again.

CHAIR HOCHSCHILD: Great. Oh, yes. Go ahead. Commissioner Monahan, please.

COMMISSIONER MONAHAN: Just really quick. Thanks, Erik. That was a great presentation. Thanks for your leadership on shepherding what sounds like a difficult project. And I have a question for you and maybe a comment.

When we met a month ago, was it, at the last -- for the last business meeting that you presented, we talked about the fact that there weren't transportation electrification interests at the table for this. And I'm curious if you've able -- if you've been able to have a transportation voice at -- in these conversations or whether that's something we still need to reach out and get.

MR. LYON: Yeah. So we really haven't met since the Draft Report has gone out. But yeah, I think we still have -- we can -- it would be great to get out and recruit some of those voices.

COMMISSIONER MONAHAN: Well, and I'm happy to have my office help with that. I really do think it's a critical piece. And as we've seen from actually the IEPR and from the 2127 Report that indicates up to 21% increase in 2030 just from transportation electrification compared to today's electricity load. I mean, that's huge.

MR. LYON: Mm-hmm.

COMMISSIONER MONAHAN: That's a huge flexible load. And as we're investing in vehicle-to-grid school buses like it would just be great if we could make sure that they're at the table. I mean, now it's small. By 2030 it's going to be a huge opportunity. So I'm looking forward to working with you to make sure that we can get some of those voices to be part of the conversation.

MR. LYONS: Absolutely. Likewise. Thanks.

CHAIR HOCHSCHILD: Thank you, Commissioner.

So with that, I would welcome a motion on Item 5 from Vice Chair.

VICE CHAIR GUNDA: Thank you, Chair. Move Item 5.

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

COMMISSIONER MCALLISTER: I second Item 5.

CHAIR HOCHSCHILD: All in favor say aye.

Vice Chair Gunda.

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister.

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan.

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

Item 5 passes unanimously.

Let's turn now to Item 6; DEKRA Certification, Inc.

MR. LU: Yeah. Good afternoon, everybody. My name is Jeffrey Lu. I'm an air pollution specialist working on charging infrastructure topics in the Fields and Transportation Division. I will be going through Item 6 of the agenda today, which is an agreement package with DEKRA Certification. Next slide.

This agreement package with DEKRA will help establish a charter testing lab here in California, and we're excited because this supports our vision for easy grid-integrated charging and will offer several benefits to Californians. Overall, this agreement will help us scale charger interoperability as EV adoption grows, meaning that a charger will be more likely to function correctly with a wide range of electric vehicle models, as well as a wide range of network providers that can manage these chargers in the cloud.

For context, today industry sorts through a lot of its charger interoperability challenges by pairing together a specific charger with a specific vehicle or specific charger in a specific network provider, and then checking that everything works correctly between them. This one by one testing approach is useful and really good

for catching edge cases, but it's simply not scalable as the number of EVs and chargers continues to rise.

This agreement will help scale interoperability by offering a consistent and repeatable lab testing process to ensure that our chargers meet a baseline level of conformance, and this will complement that round robin approach that I just described. This improved interoperability has a lot of secondary outcomes as well. It helps enable a charging experience that's even easier than the gas pump, and it helps support our ability to harness California's EVs as grid assets. We're talking about vehicles that automatically charge-up on clean and cheap solar generation during the day and vehicles that power our homes and buildings when there's an outage or even just when electricity is expensive. Finally, with interoperable hardware, we provide entrepreneurs with a low barrier platform where they can develop and meet end-user friendly charging services and products. Next Slide.

We put out a competitive solicitation for this project last year, and today we're proposing to award $1.97 million to DEKRA Certification to establish a charger testing lab for EVs, for EV chargers. This lab has a name, the Vehicle Grid Innovation Lab, or ViGIL, for Short. DEKRA has an existing facility in the East Bay already, and this grant will help them procure new equipment and staff

to convert that facility into a charger testing lab.

We expect this agreement to result in three full-time jobs at ViGIL. At ViGIL, DEKRA will provide conformance testing for industry standards and protocols related to charging. So these include ISO, 15118, open ChargePoint protocol, as well as the metering related tests based on Handbook 44 requirements.

Since ViGIL will be right here in California, it will be a local resource for the many charging providers and charger manufacturers in the state. These companies that call California home won't need to deal with hefty shipping fees to have their equipment tested on the other side of the country. And if all goes as planned, we expect ViGIL to be up and running as soon as late this year. Next slide.

Overall, ViGIL is a key component of our vision for easy-to-use, interoperable, and grid-integrated charging for all of California. And as such, I'm excited to present ViGIL to you today and heartily recommend that you approve this grant agreement with DEKRA and adopt our determination that this project is exempt from CEQA.

I'd love to answer any questions that you have, and I believe we have the entire DEKRA team called in today as well. Thank you. And this concludes my presentation.

CHAIR HOCHSCHILD: Thanks so much, Jeffrey.

Let's go to public comment.

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees, if you'd like to make a comment, please use the raise hand feature. Looks like a high-five on the screen or *9 if you are on by phone and then *6 to unmute.

I do see one hand. Reminder to please state your name. Spell it for the record and indicate your affiliation, if any. Bryan Mikesh, you are first. Your line is open. You may begin.

MIKESH: Hello. This is Bryan Mikesh; B-R-Y-A-N, M-I-K-E-S-H. I'm the Managing Director with DEKRA Certification. I'd like to thank the California Energy Commission and the ViGIL working team who helped with the DEKRA Grant Application Review.

DEKRA is honored to be selected for the proposed award. We look forward to working with the CEC in the development of the ViGIL facility in the DEKRA Concord, California, facility area. We'll be working with the CEC team members in the industry to build a competent and successful ViGIL implementation. DEKRA is working hard and is very excited to be part of this amazing opportunity to promote industry certification standards in the CEC sponsored ViGIL facility.

On behalf on behalf of DEKRA, I'd like to extend

gratitude to the CEC and highly supportive CEC team, Jeffrey Lu, Kiel Pratt, Charles Smith, and Melanie Vail. Thank you all.

MS. GALLARDO: Thank you. All right. One more reminder, if you would like to make a comment, please use the raise hand feature or if you are on by phone, Press *9.

Chair, I do not see any other hands raised.

CHAIR HOCHSCHILD: Okay. Thank you.

Let's go to Commissioner discussion, starting with Commissioner Monahan.

COMMISSIONER MONAHAN: Well, as a big proponent of having standard standardization, which helps drive down costs, and I think that actually there's nobody right now that is more steeped in this than Jeffrey. I would -- maybe Kyle, there's a few of you, but Jeffrey really has been a thought leader in the Field and Transportation Division on standardization, and I just want to thank him personally for the work he's done on that. I know it, you know we've -- this also encompasses 15118 standardization and a lot of stakeholder outreach that's been occurring around this just to make sure that we are moving forward in a way that is -- that will help accelerate transportation electrification and support industry investments in the right kinds of technologies.

So this lab, having it in California, actually

near my, kind of near my house, I really appreciate the fact that ViGIL is funding innovation in this space, and I think it'll help in terms of just driving down costs and making it easier for everybody to plug in their vehicles.

CHAIR HOCHSCHILD: I did want to ask you a question if I could, just of Jeffrey on that point. I wonder, Jeffrey, if you could just give us a quick snapshot of the state-of-play with the different charge connectors. I mean, there's been CHAdeMO, and Tesla, and TCS and just kind of the direction the market is moving, you know with respect to standardization.

MR. LU: Yeah. In North America, California included, I think there is movement among automakers to standardize around CCS. You'll see that both driven from market announcements. Nissan's upcoming SUV is going to use CCS, not CHAdeMO, unlike the Leaf that they released earlier. And then, of course, our sister agency at CARB is proposing a CCS adapter or inlet requirement as part of Advanced Clean Cars II. Tesla does use its, and continues to use its, proprietary connector here in North America. In Europe, they do use CCS II for their vehicles there.

CHAIR HOCHSCHILD: Is there anything that, anything further we can be doing at the Energy Commission to support that? And mean clearly, standardization is a good thing. It sounds like it's underway, but I'm just

curious if there's anything else that's needed.

MR. LU: I think it depends how heavy handed you want to be and how long you want this conversation to last, but I think generally aligning our requirements in any of our programs that we put out with those that are being put out by CARB is helpful. I think generally both CEC and CARB are on this track toward supporting the standardization in the market already.

CHAIR HOCHSCHILD: Great. Well, let's just stay attentive to that. I think that's a huge cost savings for everybody if we can have standardization there. I saw -- yeah, go ahead, Commissioner.

COMMISSIONER MONAHAN: It's probably -- it's probably worth a longer conversation, but I think it's worth a longer conversation. So this might be a good follow-up meeting to have.

CHAIR HOCHSCHILD: Yeah, absolutely. Whatever you recommend. Just, I mean it sounds like we're on a good path, but anything else we can be doing or funding or convening to support that.

Vice Chair Gunda, you had a question, or comment. You are muted. we're not hearing you.

VICE CHAIR GUNDA: Sorry. Can you hear me okay?

CHAIR HOCHSCHILD: Yes.

VICE CHAIR GUNDA: Okay. Yeah. I just wanted to

say thanks to Jeffrey, and I think and I just wanted to kind of reiterate, I think, Commissioner Monahan's point earlier on the previous item. And thank you, Jeffrey, for providing some notes to our office on this issue. Just like really looking forward to, looking and watching the progress, and you know thinking through how best we can integrate EVs to support grid-reliability and resiliency. So I think, you know, this is a great step in that path and looking forward to supporting it and look forward to conversations with you and the team on learning more. Thank you.

CHAIR HOCHSCHILD: Okay. Unless there's other comments, we'll go ahead and entertain a motion on Item 6 from Commissioner Monahan.

COMMISSIONER MONAHAN: I move Item 6.

CHAIR HOCHSCHILD: Vice Chair Gunda, would you be willing to second item six?

VICE CHAIR GUNDA: I second Item 6.

CHAIR HOCHSCHILD: All right. All in favor say aye.

Commissioner Monahan.

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda.

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister.

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

Thank you, Jeffrey. Outstanding presentation. Congrats to the whole team. That item passes unanimously.

So it's 12:15. I propose we take a break for lunch and reconvene at 1:00. We'll see everybody then.

(Off the record at 12:15 p.m.)

(On the record at 1:00 p.m.)

CHAIR HOCHSCHILD: All right, welcome back, everybody. We will turn now to Item 7; ChargePoint.

MS. ODUFUWA: Yes. Good afternoon, Chair and Commissioners. My name is Esther Odufuwa, Energy Commission specialist with the Fields and Transportation Division, Freight and Transit Unit. Today, we are seeking approval for about $2 million agreement with ChargePoint, Inc, otherwise known as ChargePoint. ChargePoint will innovate charging solutions for medium-duty, heavy-duty electric vehicles, particularly electric buses and powered vehicles, to the development of an automated invited pantograph charging system.

So what is the pantograph? It is a device that mounts to a structure or building infrastructure and extends a charging arm onto the roof of a vehicle as you will see the picture on the next slide. So this will mate with conductive interface to transfer power. Reliable and

innovative charging solutions are crucial to allowing medium-duty, heavy-duty fleet to rapidly transition to zero-emission in the future. This project will also reduce CO2 emissions by nearly 139,000 metric tons, which is over 12 years, and that is the designed lifetime of the pantograph.

This CO2 benefit, we actually estimated based on the number of miles that would have otherwise been driven on a conventional vehicle. But this does not assume any particular number of vehicles. Next slide.

Through this agreement, again, ChargePoint will design this automated inverter pantograph charger with a charging capacity that has a charging limitation up to 600 kilowatts compared to 110 kilowatt limited conventional combined charging system connector or CCS connector.

Just a little bit background about pantograph.

CHAIR HOCHSCHILD: I'm sorry, Esther, I missed that. How many kW was that?

MS. ODUFUWA: 600. So the limitation for the pantograph is 600 kW, but this is compared to the 110 kilowatt limited conventional CCS connector.

CHAIR HOCHSCHILD: 600. Wow. That's incredible. Okay. Sorry.

MS. ODUFUWA: Yeah. The current of pantograph hardware supports charging currents up to 600 amps, but

there are no buses that can actually accept such power and support charging rates of this magnitude. So this project will test the pantograph system of electric buses at checkpoints, Campbell California facility.

Additional information about this pantograph. They have been determined to have several advantages over traditional charging cables, also medium-duty, heavy-duty vehicles and this large or medium-duty, heavy-duty vehicles have higher capacity batteries, which require longer dwell times due to the power carrying limitations in the conventional charging connectors of the vehicles.

One thing to also note is that conventional cables are usually the first component to require replacement in the EV airspace. They can be very expensive at over $1,500 per cable, and they require skilled labor to repair them. So by removing this component, the maintenance costs of [indiscernible] EVSE will be reduced over the lifetime of the system. There will also be reduced labor costs and other benefits that come from charging applications, such as saving on real [indiscernible] costs. And you can see that in the picture, with the pantograph is just one structure, but with the charging cables, you have wires all that can cause safety issues when buses are driving within the depot.

So, in addition, in order to facilitate

interoperability amongst numerous vehicle types, ChargePoint would develop a universal smart charger interface, or USCI, which will accommodate any charger connector, whether it's the pantograph itself, or the wireless socket pin, or some type of proprietary connector. The USCI will ensure the charging infrastructure can support the fleet operators evolving vehicle mix while mitigating any concerns about stranded assets. Next slide.

Now, the primary target market for the pantograph solution is the municipal bus fleet operators in North America and Europe that actually need high capacity and quick charging options. For example, in 2018, the Air Resources Board established a mandate that California transit bus must be zero-emission by 2040. So altogether, the 200 public transit agencies operate nearly 12,000 buses statewide, and only a fraction are currently electric.

Furthermore, with the Executive Order N-79-20, which established a goal that 100% of medium- and heavy-duty vehicles in the state be zero-emission by 2045 for all operations, where feasible, and 2035 for trucks. This project will present an enormous opportunity to electrify depots and transit routes throughout the state.

Furthermore, the electric bus operators are increasingly demanding the charging solution that is actually automated, as in this case with the pentagram.

For example, we have two major California eBus operators, LA Metro and the San Francisco Municipal Transportation Authority. They've already announced the rollout of more than 3,400 eBuses, and these vehicles will require compatibility with an automatic connection device. All in all, agreement like this have the potential to rapidly increase the deployment rate of buses and their corresponding infrastructure over the next decade. Next slide.

In summary, we would like to recommend approval of nearly $2 million agreement with ChargePoint and staff determination that this action is exempt from CEQA. This concludes my presentation.

Thank you all for your time and consideration of this item, and we are available for any questions you may have. I believe Dedrick Roper, Director of Public Private partnership with ChargePoint, is available on the call as well. Thank you.

CHAIR HOCHSCHILD: Great. Thank you, Esther. Noemi, do we have public comment?

MS. GALLARDO: Let me check. This is Noemi, the Public Advisor. If anyone has a comment, you can raise your hand using the raised hand icon on the screen. If you are on by phone, please press *9 to raise your hand, *6 to unmute. I do see a hand raised here.

Reminder to please restate your name. Spell it for the record and indicate your affiliation, if any. All right, we'll begin with, it looks like Dedrick. Let's see, Dedrick, I see that you had your hand up and now have lowered it, so I'm going to open your line. Do you still want to make a comment?

MR. ROPER: Hi. Good afternoon. Can you hear me?

MS. GALLARDO: Hello, we can hear you. Yes.

MR. ROPER: Okay. Hi. This is Dedrick Roper, Director of Public Private Partnerships with ChargePoint. Esther, thank you for that presentation and just want to thank the Energy Commission staff for this opportunity and specifically for the BESTFIT Program. I can't say enough about how well structured the program is to support late stage commercialization in the EV industry. This pantograph project, while a high priority for us, it wasn't necessarily something on our immediate roadmap. We had to put it kind of on the sideline, and the Energy Commission dollars accelerated our ability to you know, prop this project up and gave us the certainty to hire the resources we'll need to complete this. So just want to highlight, you know, a significant amount of effort that went into getting us to this point. But the Energy Commission funds being incredibly critical in accelerating our ability to

move forward with that.

Again, we're really excited about this project. You know, many mandates pushing for the electrification of transit vehicles increased emphasis on Made in America and thanks again to the Energy Commission for helping us build-out our manufacturing capacity for DC fast chargers in Campbell. We are poised to capitalize on many of these opportunities. So just want to say thank you and I'm happy to answer any questions about the project site.

The rendering we had there showed both the pantograph and separately another project, which is overhead cable rail for focus on light-duty vehicles. So I know that might have been a little bit confusing, but just wanted to share a little bit more on that picture.

CHAIR HOCHSCHILD: Hey Dedrick, this is David Hochschild. Thank you for your work and for the education. I didn't know what a pantograph was, let alone an inverted pantograph. So learn something new every day.

Question for you. 600 kW is a lot of juice. Is that the biggest charger on the market today? I've not heard of a charger that powerful before.

MR. ROPER: Yeah. You know, we're planning for the future. Buses, vehicles are not requesting that kind of power today, but when you look at transit operations where they're going, both electrifying the depot as well as

on-route charging is going to be critical once we have more of the fleet electrified. So having that capability in the wild is kind of what the pantograph does, and the universal connector will enable that pantograph structure to accommodate various connector types as they come to market.

CHAIR HOCHSCHILD: Thank you. Noemi, do we have any additional public comment on Item 7?

MS. GALLARDO: Let me check real quick. This is Noemi, the Public Advisor. If anyone else would like to make a comment, please use the raise hand feature. Press *9 if you're on by phone.

CHAIR, I see no more hands raised.

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

COMMISSIONER MONAHAN: Well Chair, just to build on your question. What I've heard is that these 600 kilowatt chargers are being tested out in different places, mostly in the EU, and they're thinking about it more as like a quick burst flash charging where you just get enough juice to get you know, you maybe just for 15 seconds, but it gives you a big infusion. I mean, it could refuel the vehicle in like five minutes, which is maybe faster than diesel, actually. But you know, for the battery degradation issues, there's some -- I think they're just,

and maybe Dedrick could actually speak about this too. But there's some concerns around how frequently you can do this. That's why flash charging might be the most -- the most critical use of this, in especially transit buses.

But and just to say thanks to Esther and the team, and the whole BESTFIT Project. This has been really cool. Actually, ViGIL and BESTFIT are two of my favorite of our solicitations because it's really dealing with this. How do we -- how do we make charging you know, sort of this intersection between R&D actually and deployment and where we're really trying to tackle these big challenges in the charger ecosystem through our grants. And I too am really excited to see this come to fruition.

Just these -- the innovation happening in the charger world as we're having innovations in the battery space and innovations in transportation, electrification more broadly are just so exciting and the fact that the Energy Commission is investing in some of these really critical questions for how do we build out a charging ecosystem that is future proofed and where we're testing out these kind of innovations in the marketplace

So thanks to Dedrick and the team of ChargePoint for putting out an application that managed to pass our scrutiny and really looking forward to seeing this in action.

CHAIR HOCHSCHILD: Commissioner, just with your permission, if we could just go a little deeper on that, maybe for Dedrick and Esther, what actually is the duty cycle that's envisioned for these? Are these going to just be doing very, very short charges, and if so, I mean, how much of the battery capacity are you actually recharging?

MR. ROPER: Yeah. I think Commissioner Monahan was exactly correct. These are quick bursts on route. So think about a bus that is out for multiple hours and you just want to get that quick boost. You know, it's a -- it's a dance, right. There's an optimization of your energy costs, your fleet schedules, you know, the renewable mix of the grid. The fleet application provides such a, you know, a great opportunity to optimize all these resources. So it's another component in the fleet operation to you know, to best keep those buses operating and keep them moving.

CHAIR HOCHSCHILD: So it's kind of like a triple caffeinated cappuccino or something, a small cup. So but just so we're clear, like if -- are you actually recharging? If it's only for 15 seconds, just help us understand for a typical vehicle, what percentage of charge would that add to the vehicle's capacity?

MR. ROPER: Yeah, I think TBD on that again.

CHAIR HOCHSCHILD: Okay.

MR. ROPER: There are no vehicles that can accept that, you know, there are no buses that can accept 600 kW today.

CHAIR HOCHSCHILD: Okay.

MR. ROPER: So I think as we, you know, learn as we, you know, and this this interoperability site will give us a lot of those key learnings. Look at the battery cycles, look at how long a vehicle can sustain that high of a charge because as you know, the charge may shoot up really fast but taper off pretty quickly.

CHAIR HOCHSCHILD: Right.

MR. ROPER: So I think there's a lot we can learn from this project.

CHAIR HOCHSCHILD: Great. Okay, that's really helpful. Other questions from Commissioners.

VICE CHAIR GUNDA: Yeah.

CHAIR HOCHSCHILD: Yeah. Go ahead, Vice Chair.

VICE CHAIR GUNDA: Just a -- yeah just a quick question, comment, I guess you know, so. Again, Esther, thank you so much for your presentation. Really innovative project. Looking forward to learning from it, hopefully want to visit. So looking forward to that.

Just kind of flagging this as an opportunity for us to gather some data, especially you know, given how much the forecast is changing and then the more and more

granular geographic and temporal granularity we need for grid reliability and resiliency analysis. I think it'll be a great opportunity to think through what kinds of data might be gathered in a potentially for CEC's analysis and such. So just wanted to flag that as an opportunity here and would love to have that discussion moving forward.

MS. ODUFUWA: Yes. That'll be great. Thank you.

COMMISSIONER MONAHAN: I think actually, I'm sorry.

CHAIR HOCHSCHILD: No. Go ahead.

COMMISSIONER MONAHAN: That's a great point, Vice Chair Gunda. I was thinking, you know, about Chair, you've used this quote like, we want to have an EV happy hour, so EVs are actually running on sunshine, and I use it all the time. So thank you for that excellent quote. And this is another place where we can really explore that, right. Transit bus cycles are kind of perfect for this. When you want to flash charge in the middle of the day when you're running these long routes and it'll run on sunshine. So let, I mean, we should test out to that, not just for grid resilience, but also for integrating renewables and having a zero-carbon transportation system.

VICE CHAIR GUNDA: Thank you for that. I will take note of that as we continue to develop the project.

COMMISSIONER MCALLISTER: I'll just throw in real

quick. I mean, I think sort of building on the last two points. You know not everyone -- it sounds like the model is kind of have one of these sort of here and there and not cluster them in groups of 10 or more, you know because they're kind of along the route. But still 600 kilowatts is a lot. And I, you know, it'll be interesting to sort of map the need and the transit routes locally, say, with the local transportation planning entity, the regional training organizations, the regional transit organizations and the cogs across the state and sort of mapping the routes and the ridership to the actual, you know, to the actual, you know, essentially distribution, high-voltage distribution grid, where these things are going to be would likely be interconnected. It'll be interesting to sort of pick out the sweet spots with some intentionality.

CHAIR HOCHSCHILD: Mm hmm. I was going to say, first of all --

VICE CHAIR GUNDA: Chair.

CHAIR HOCHSCHILD: -- to, just on the EV happy hour. I do use that quote all the time. However, I did not coin it. That was Byron Washom at UC San Diego, who coined it so credit where credit's due. It's a good one. We got to come up with an iteration involving triple cappuccino, which is, I think, more when I think of it.

One point I just wanted to make is I could

envision in areas where the distribution grid is really constrained. I mean, 600 kW is a lot of juice, that something like this would co-locate with storage, right, and that that would be a great area for potential further demonstration of you know, different storage chemistries and so forth, if it really turns out that this type of application will be, you know, we see this being really instrumental to make more electric transit work or extend range and so on. So I just want to put that that out there as well.

I'm sorry. I think I interrupted you, Vice Chair.

VICE CHAIR GUNDA: Yeah Chair.

CHAIR HOCHSCHILD: Yeah, please.

VICE CHAIR GUNDA: No, no Chair. You actually framed it really well. I think that's exactly what I was going to. It's kind of like thinking through the impact on the rates, you know, the distribution upgrades, the transmission upgrades. I think this is a really wonderful project to gather information on a multitude of vectors here. I mean, like, we have the opportunity to understand just the demand ability to understand the demand flexibility, ability to understand potential by directionality. You know, I think that's opportunity.

And as Chair kind of mentioned, to the extent

that this could have beyond the infrastructure costs of putting in actual charging equipment, more about substation upgrade or such, it might be really helpful to understand how do we envision this slightly more long term. So looking forward to tracking this, I think this is a wonderful project to track. Thank you.

CHAIR HOCHSCHILD: Okay. Great. I just want to open up, any final comments, Dedrick, from you or Esther on this that you wanted to say?

MS. ODUFUWA: Yeah. I was actually going to add some points that, at least from what I read about the project, that with the power -- they have the power management software, which is one of the features for the project, that charging can occur overnight or at times when the grid is not stressed. So and they have this open ADR [INDISCERNIBLE] by your end load for receiving demand response commands. So this can be used as a mapping for designated group of EVs within maybe a particular site or within a particular zip code. So they have that. So I will definitely monitor this as the project progresses. So just want to point that out?

MR. ROPER: Yeah. This is Dedrick. I would just share that we -- I believe we do have a 12-month interoperability period where we're going to be bringing vehicles to the location --

MS. ODUFUWA: Yeah.

MR. ROPER: -- and collecting data on, you know, developing a standardized interoperability testing script and running through that and sharing that as a part of the final report. And you know we'd certainly welcome additional opportunities to use this project to learn going forward.

CHAIR HOCHSCHILD: Great. Great. Thank you Dedrick and thank you, Esther.

Okay, if there is no further Commissioner discussion, I would welcome a motion on Item 7 from Commissioner Monahan.

COMMISSIONER MONAHAN: I move to approve Item 7.

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

COMMISSIONER MCALLISTER: I'll second.

CHAIR HOCHSCHILD: All in favor say aye.

Commissioner Monahan.

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister.

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda.

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

Item 7 passes unanimously. Congratulations to

ChargePoint and the team. Thank you, Esther.

MS. ODUFUWA: Thank you.

We'll turn now to Item 8, 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 two 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 of the overall benefits of BRIDGE is advancing innovative technologies that can enable the transition to a clean energy economy. Some of the specific benefits of the agreements being discussed today include improved grid resilience and reliability, as well as lower costs through technologies that can reduce peak demand and increase renewable baseload production. Next slide, please.

The first agreement is with the auto energy to continue development of the Solar Leaf, a grid connected solar plus storage battery backup solution. Currently, the process to install batteries on commercial solar projects

is complex and expensive, with these systems typically requiring their own building with HVAC, fire suppression systems, and other complicated design elements. Also, the ability to add on storage as utility rate programs change is not straightforward when it comes to permitting and interconnection. All of this makes energy storage costs, or energy storage cost prohibitive, even with significant technological advancements.

The auto industry has developed a smart energy storage solution designed to scale with rooftop solar PV projects at about the size of a briefcase, the auto panel level panel level energy storage fits under any standard solar module, neatly integrating with the solar rack. Their technology features advanced thermal management, which maintains an optimal working temperature even under extreme outdoor conditions.

Panel level of storage brings many advantages similar to other module level power electronics like micro inverters and DC optimizers, including simplification of design, power efficiency and power optimization. Their innovation overcomes many industry challenges and minimizes cost of engineering, procurement, and construction, as well as soft costs of permitting and interconnection.

In this project, Yotta Energy will build on their existing Solar Leaf technology to demonstrate the ability

to provide battery backup, which can be used to reduce peak demand charges and overall cost for the customer and provide a resilient solution in a distributed, scalable, and affordable format. Next slide, please.

The next agreement is with GreenFire Energy to determine the commercial viability of closed-loop technology in a steam dominated geothermal reservoir. New geothermal power production is essential to help California meet its renewable energy production goals by providing reliable, high capacity baseload electricity. However, many steam -- in many steam dominated fields, such as the geysers in Northern California, any attempt to boost production by adding new conventional geothermal wells simply rob steam from the existing wells and accelerates the rate of water depletion.

GreenFire Energy has developed a steam dominated GreenLoop, a closed-loop geothermal energy system that generates power from resources where conventional systems cannot effectively operate, typically due to a lack of water or pressure. The GreenLoop being demonstrated used a down-bore heat exchanger to extract heat without consuming subsurface water and pressure. Closed-loop systems such as this one substantially reduce the cost, risk, and time needed for new projects and quickly -- and provide a quick, low cost way to fix wells that will fail over time.

The ability to produce power from steam dominated resources without losing water or pressure is crucial to the future power development of the geysers and other steam dominated resources where geothermal power production will decline -- will decline without water injection. Next slide, please.

Staff recommends approval of these two 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 Joseph Sherer from GreenFire Energy is online for comment.

CHAIR HOCHSCHILD: Great. Thank you, Michael. Do we have public comment on Item 8?

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

I do see a couple of hands raised. A reminder to please restate your name, spell it for the record, and indicate your affiliation, if any. We'll begin with Joseph Sherer. And apologies if I mispronounce your name. Your line is open, and you may begin.

MR. SHERER: Great, thank you. I hope you can

hear me.

CHAIR HOCHSCHILD: Yes. We can.

MR. SHERER: Okay. Yes. My name is Joe Sherer and it's S-H-E-R-E-R. And I'm the CEO of GreenFire Energy and am I happy to answer any questions you might have about our GreenLoop technology and project at the geysers.

But principally, I want to say thank you to everyone involved, Chairman Hochschild, Deputy Director Jonah Steinbach and to compliment and thank CEC for the BRIDGE Program itself in two particular respects. As GreenFire was awarded a prior grant by CEC back in 20 --

CHAIR HOCHSCHILD: Hey, Joseph, we are -- sorry Joe. Can you go back a little bit? We lost you for a second.

MR. SHERER: Oh. [indiscernible]. How about this?

CHAIR HOCHSCHILD: You're kind of coming in and out there.

MR. SHERER: Okay. How about -- how about that?

CHAIR HOCHSCHILD: A little better.

MR. SHERER: Okay. All right. Well, so we received a grant from the CEC back in 2017 that we applied to our technology at the Coso geothermal field, which I'm sure you know is in Southern California. And that was to show the feasibility of our closed-loop down-bore heat

exchanger approach. And we tested both water and supercritical CO2 and completed that project in 2020. And our report, by the way, to the Commission has been downloaded hundreds, if not thousands of times. So that worked out well.

And we really appreciate Elizabeth de Jong who was our manager on that one. Since then, we've actually been working to realize our technology with variations on our closed-loop [indiscernible], which is what our new proof of concept is, right. So --

CHAIR HOCHSCHILD: Okay. You're going -- you're going a little bit in and out there, but I think we got the -- I think we got the --

MR. SHERER: Oh, okay. Yeah.

CHAIR HOCHSCHILD: I think we got the gist of it. Yeah. Okay, thank you.

MR. SHERER: So thank you and thanks for the BRIDGE program because I think it's very effective and in the additional purpose of bridging the gap between technical feasibility and actually demonstrating it at the commercial level, which is what this project at the geysers is all about. In a -- in a steam dominated, we can use our technology to substantially increase the sustainability of a great resource, the largest geothermal resource in the world, and because more parts are to be used and thereby

achieve, or contribute at least, to California's clean energy goals.

So I'm here to answer any questions if you'd like and thanks to our Commissioner agreement manager as well, [indiscernible] Gilbert who has helped us to this point.

CHAIR HOCHSCHILD: Thank you, Joe. I do have a question. I'll hold it for the moment, though, and come back to you, but if you can try to get to a better cell phone situation, you're coming in out there a little bit.

Noemi, do we have any additional public comment on Item eight?

MS. GALLARDO: Yes. We have another hand raised. So Jenn Gallegos, if you could restate your name, spell it for the record and indicate your affiliation, if any. Your line is open, and you may begin.

MS. GALLEGOS: Hi, good afternoon. Thank you. This is Jenn Gallegos, Director of Programs and Communications at Yotta Energy. Thanks again for the presentation, Michael, and to the entire team that we've been working with at CEC. Thank you CEC Board members and Commission members for hearing this today.

We're looking forward to working on this project. This Distributed Solar Plus Storage Battery Backup Project for the state of California. I am happy to answer any questions that you all may have this afternoon. Thank you.

CHAIR HOCHSCHILD: Thanks, Jenn. Yeah, stay on the line. I do have a question for you, but let's just see if there's -- are there any additional public comments?

MS. GALLAGO: This is Noemi, the Public Advisor. I do not see any other hands raised.

CHAIR HOCHSCHILD: Okay. Yeah, I just had one question for each of you. Maybe I'll start with Yotta Energy, which is just, I see your fitting some things under the solar panels. And one of the things I think there's always an issue is just heat dissipation. And I'm just, with the way you're setting it up, how are you planning for heat dissipation under the solar? Is there a way to get just for the efficiency of the panels to be high and so I'm just curious how you are contemplating that in the design.

And that's a question for Jenn.

MS. GALLEGOS: Hi. Yes.

CHAIR HOCHSCHILD: Jenn Gallegos.

MS. GALLEGOS: Yes. Yes. No, that's a great question. And for our technology, we actually have a patented thermal management system, and that system is a passive system, so it doesn't require any sort of mechanics or power to make it work. And what it does is it makes sure that the batteries are operating at the optimal temperature. So during the day, as the temperature increases, there's a phase change material that works to

absorb that excess heat. There are also some strategically placed fans, or are not fans, sorry fins at the back of the product that also are working to dissipate energy. In the evening what happens once the sun goes down, that phase change material turns back into a solid material, and so it resets that process. So the next day it can do that same thing over and over.

And it's similar technology, just to bring it into the real world, it's similar technology to what's used on satellites in space. So that similar technology is what we've adapted for these batteries that are working under these solar panels on roofs. Does that help?

CHAIR HOCHSCHILD: Yeah. Very helpful. Thank you.

Then a question related to GreenFire. Just curious to the -- can you give us a little better sense of the size of the loop and the types of applications that that heat would serve?

MR. SHERER: Right. Can you hear me now?

CHAIR HOCHSCHILD: Yes. Mm-hmm.

MR. SHERER: Good. For the demonstration proof of concept project, we're using an existing steam dominated well and it's not a U-loop configuration. If you -- it's a coaxial loop, so you're going down the bore in a vacuum insulated tube and coming up in the annulus around

that vacuum insulated tube. And for many of the wells in the northwest geysers, which are all steam dominated, mostly all steam dominated and could be retrofitted with our technology or new purpose drilled wells in the northwest geysers, we could do that with coaxial drilling, which of course doesn't have the challenges of doing completions for U-loop drilling or with U -- with U-loop configuration.

And we have patents and experienced modeling both U-loop and coaxial configurations. But for one thing about this test project, such as our proof-of-concept at Coso, is using existing wells, obviates the uncertainty of drilling and of course avoids the cost of drilling new wells, just to demonstrate and show it can be scaled for commercial levels. And the overall plan is going for -- is to charge at 100 megawatts.

CHAIR HOCHSCHILD: All right. Okay. Thank you both for those answers. Colleagues, I'm sorry to take up so much time on that. Any other questions for any of these folks.

COMMISSIONER MCALLISTER: Not a -- not a question, but just a -- just a comment that you know, these -- agree that the BRIDGE Program is excellent and really commend staff, Joe and team for working, for you know, harvesting all these great projects and bringing in these

ideas so that we can fund them.

You know, obviously affordable multifamily is super important for the State to move forward on, and we need solutions, and we need to get cost down across the board, including with the onsite generation piece. And GreenFire, you know, kudos for coming up with ways to repurpose existing resources and you know, get the most out of them and take advantage of California's homegrown natural resources. So we really appreciate that effort.

CHAIR HOCHSCHILD: Great. Do you appreciate it enough to move the --

COMMISSIONER MCALLISTER: I do. I'll move Item 8.

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

COMMISSIONER MONAHAN: I second.

CHAIR HOCHSCHILD: All in favor, say aye.

Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

Item 8 passes unanimously.

We'll turn now to what may be the best name on our agenda today, which is RockeTruck. It was a close call between GreenFire and RockeTruck, but what a great name. Item 9. Let's welcome Quenby Lum.

MS. LUM: Good afternoon, Chair, Vice Chair, and Commissioners. I'm Quenby Lum from the Energy Research and Development Division. Today we're recommending one award from an epic solicitation that was focused on projects to advance technologies in mobile renewable backup generation.

Five other projects from this solicitation were approved at previous business meetings. The goal of these projects is to provide backup power using clean energy mobile units during public safety, power shutoffs, wildfires, and other grid outage events. This will help meet the growing need for clean backup power solutions to offset or replace fossil fuel diesel generators, which emit greenhouse gases and pollution. Next slide, please.

The benefits of this project include increased electricity reliability and resiliency, emergency service and response capacity, improved safety for communities during outages, reduced greenhouse gases, air pollution emissions and noise levels compared to diesel generators.

As shown on the map here, there are multiple demonstration sites located in and near a mix of disadvantaged, low-income Native American tribal lands and

Tier 3 high-fire threat districts to help support these communities during outages. Demonstrations will also take place in different climate zones and in different seasons throughout the year to ensure system performance is robust in a variety of weather conditions. Next slide, please.

The proposed awardee is RockeTruck. The project team will develop and demonstrate a mobile fuel cell generator to meet growing needs for flexible backup power solutions. This mobile system is designed to be mounted on a flatbed trailer and towed to the location needed. The system will generate up to 120 kilowatts of power by combining 60 kilowatts from hydrogen fuel cells and 60 kilowatts from lithium-ion batteries.

In this concept diagram, 150 kilograms of compressed hydrogen is stored in the hydrogen tank enclosure on the left, which feeds the two fuel cells on the bottom right. Adjacent to these two fuel cells are two lithium-ion phosphate batteries. The system will provide 35 kilowatts of power continuously for 48 hours, but the modular hydrogen and battery components can be sized to meet different needs.

RockeTruck will use green hydrogen for this project to be procured from the Hydrogen Research and Fueling Facility at California State University Los Angeles. Next slide, please.

Staff recommends approval of this grant agreement and adoption of the determination that this action is exempt from CEQA. With me today is Mike Gravely from the Energy Systems Research Office, and we're available to answer any questions you may have.

This concludes my presentation. Thank you.

CHAIR HOCHSCHILD: Thank you. Let's go to public comment on Item 9.

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. If any attendees would like to make a comment, please use the raise hand feature; looks like a high-five on the screen. You'd press *9 if you're on by phone. Again, use the raise hand feature on the screen or press *9 if you are on by phone.

Chair, I do not see any hands raised.

CHAIR HOCHSCHILD: Okay. Let's go to Commissioner discussion. This looks really compelling. I'm encouraged to see that it's actually 48 hours of continuous power. That's significant. And I just wondered, Mike Gravely, did you want to make any additional comments or color commentary before I open it up to other Commissioners?

Mike, are you with us? He may not be able to speak.

MR. GRAVELY: I'm sorry, Commissioner. Yeah.

You know, just real quick. Obviously, this is an area we were looking for. You know, we had a workshop a year ago looking at alternatives for diesel generators. And also we've been going through several summers of disturbances. And so these technologies are designed specifically to address the communities that are facing these and the services like emergency services, and fire services, and medical services that need this kind of protection and not have to bring a diesel generator and a whole bunch of diesel fluid with them.

So I think this is, as you mentioned before, there were seven grants actually announced. We've done six so far. The last will come in the future. And so I just think it's an area where we're looking at creative. All these six solutions you've seen so far are different. And so we're looking at creative ways to provide clean alternatives, but also to provide services, in particular to disadvantaged and under-resourced communities.

As an example, in this case, most of these are doing that and we're doing them through many different locations. So the goal here is to demonstrate these technologies are robust and can meet the needs and also are -- will be competitive in the future when it comes to comparing them to alternatives such as diesel generators.

CHAIR HOCHSCHILD: Yeah. Terrific.

Commissioners, any further comments?

COMMISSIONER MCALLISTER: Yeah, just a really a question. So this looks like a very cool project technologically and also, you know, clearly has a niche that we've identified and we're trying to fill with these grants. I guess I'm wondering, you know, so it says produce up to 120 kilowatts of power, 60 from hydrogen and 60 from lithium-ion batteries; I'm kind of wondering what the -- what the design kind of impetus was for having the batteries, which obviously don't produce power, they just have to get it from somewhere. So kind of wanting a little more insight into how this is anticipated to actually operate, you know, with onboard hydrogen and batteries and trying to trying to balance the two; recharge the batteries.

MR. GRAVELY: Well, I don't speak for the company, but I can just tell you in general, we had a requirement that they had to be able to provide 24 hour -- 48 hours continuous service. And so we found that the combination of the storage and the technology works better. I'm seeing, so as opposed to just this hydrogen. They may find out later that it can run without the battery or whatever. But, and I think in this case, it was for their requirement need to demonstrate their ability to operate for 48 hours continuously without any interruption. So I

think that would be the primary design criteria.

I would have to ask the company, specifically, to answer your question. We can get back to you with that answer.

COMMISSIONER MCALLISTER: Yeah, thanks. That would be helpful, and I mean, I imagine that means that the fuel cell has to recharge the batteries or there's some kind of, you know, market niche that they're looking at. So it'd be helpful to understand that. That looks like a neat project.

VICE CHAIR GUNDA: Vice Chair Gunda, please.

VICE CHAIR GUNDA: Yeah. Chair, thank you. I think maybe this is something we talked -- we discussed yesterday. Quenby, thank you so much again for the briefing yesterday. Very much appreciated the talk.

You know, we discussed this and then for the broader group, I just wanted to share, one of the things, you know, as it pertains to reliability and grid kind of overall interconnection, we were kind of discussing yesterday how we can begin to really talk about a taxonomy for the storage kind of investments that CEC's putting in and whether it's long duration storage on one end of the spectrum for grid connectivity to projects like this. So we were discussing having a taxonomy and how we think about where we see the biggest need and how best to invest in

them. So just want to flag that. And Mike and I know you were not on the call if you have anything to add, great, if not, you know, up to continue the discussion.

MR. GRAVELY: So just that we got your request, and we definitely see the value of that, and we are fortunate. With an epic program, we have a wide variety of applications and a wide variety of uses and technologies to consider, so we certainly can put that together.

VICE CHAIR GUNDA: Thank you.

CHAIR HOCHSCHILD: Unless there's other commissioner comments or questions, I would welcome a motion from Commissioner McAllister on this item.

COMMISSIONER MCALLISTER: Yes. I'll move Item 9.

CHAIR HOCHSCHILD: Vice Chair Gunda, you be willing to second? All in favor --

VICE CHAIR GUNDA: I second Item 9.

CHAIR HOCHSCHILD: -- aye.

Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan?

COMMISISONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

Congratulations to the team. I love the name.

RockeTruck is a very memorable name.

And we will turn now to item 10; Proposed Resolutions Approving Two ECAA Loans to Municipalities to Finance Energy Efficiency and Renewable Energy Projects.

MR. LOCKWOOD: Yes. Good afternoon Chair, Vice Chair and Commissioners. My name is Sean Lockwood and I'm a team member in the Renewable Energy Division. I'm here to request your approval of two Energy Conservation Assistance Act loan agreements with the cities of Eureka and, cities of Eureka and San Leandro. Please note that the Energy Conservation Assistance Act is commonly known by the acronym ECAA, and that is how I will refer to it for this presentation. Next slide, please.

The ECAA program provides low-simple interest or zero-interest loans for energy efficiency and energy generation projects. Benefits to California from ECAA loan funded projects include reducing greenhouse gas emissions, improving health outcomes in respective communities, the creation of green jobs, and saving and generating energy resulting in lower utility costs. Next slide, please.

The City of Eureka is a small city located in the northwest corner of California in Humboldt County with a population of about 27,000. The City of Eureka is proposing to finance an energy project using an ECAA 1% interest loan in the amount of approximately $1.4 million.

The project involves installing LED lighting and a 340 kilowatt solar array at the City's water treatment plant, offsetting 100% of electric use from both the water treatment plant and nearby Eureka Zoo. The project will also install a 77 kilowatt solar array at the High Tank site, offsetting 35% of the site's electric use. Next slide, please.

The city of San Leandro is located in the East Bay of the San Francisco Bay Area with a population of about 90,000. The City of San Leandro is proposing to finance an energy project using an ECAA 1% interest loan in the amount of approximately $1.3 million.

The project involves 14 city sites, lighting retrofit upgrades to LED lighting at all 14 sites. HVAC upgrades at four city sites. And a variable frequency drive for a pool circulation pump at the City's aquatic center, adding a health benefit to the energy savings. This loan provides the opportunity for the City to finish their lighting efficiency upgrades for the interior portion of their lighting as they've already upgraded most of their exterior lighting to LEDs in the last couple of years. It also allows the City to upgrade their aging HVAC systems, including a chiller at City Hall that has reached the end of its useful life. Next slide, please.

Staff has reviewed these projects and determined

they are technically sound. Each project meets the ECAA financial cost effectiveness and loan repayment term requirements. As you can see in this chart, the City of Eureka Project is estimated to save more than 525,000 kilowatt hours annually, resulting in energy cost savings projected at nearly $95,000.

The City of San Leandro project is estimated to save more than 550,000 kilowatt hours annually, resulting in energy cost savings projected at over $112,000. Next slide, please.

Staff recommend approval of these loans. Legal staff found these projects to be exempt from the California Environmental Quality Act. Thank you for your consideration.

This concludes my presentation. If you have any questions, I'm happy to answer them.

CHAIR HOCHSCHILD: Thank you, Sean. Terrific. Let's go to public comment on Item 10.

MS. GALLARDO: This is Noemi, the Public Advisor. Attendees, if you would like to make a comment on this item, please raise your hand using the raised hand icon that looks like a high-five on the screen or pressing *9 if you are on by phone and then *6 to unmute.

Chair, I do not see any hands raised.

CHAIR HOCHSCHILD: Okay. Well, these look

terrific as all ECAA projects do to us. I do have a request, Sean, for you and really maybe more for the media team. ECAA has been such a big success story for the Energy Commission. It's really, I believe it started in you know 1982 or something. If I'm remembering right and it's just under a thousand projects, I think without --

MR. LOCKWOOD: It's 79.

CHAIR HOCHSCHILD: 79. Thank you. Thank you. 79 and I don't believe we've had any defaults in the history of the program. You know, I think we should generate an infographic that summarizes, you know, the total number of projects funded, estimated savings, greenhouse gas reductions, the maybe a pie chart with the different, you know, how much is going to solar, how much is going to efficiency and so on, and maybe even a map because this program gets virtually no attention except from the people who use it. But it's really one of the crown jewels of the Energy Commission.

I'm just -- I know Commissioner McCallister and I have talked about this a lot. It's just an incredible thing. We'd love to see it continue to grow and thrive. So that's one request I have for you to take up with the communications team and see if we can come up with a good infographic and map or something that we can, just to showcase a little bit the success to each.

I don't have any comments on the items. They look terrific. Colleagues, unless there are specific comments or questions we can answer. Please.

COMMISSIONER MCALLISTER: Yeah. Well, I think I think staff is one step ahead already. They're already developing those resources and there's a lot kind of in store for the ECAA program. And I think as it's likely to get some additional funds as we get some, some pullback funds from the Prop 39 Program, that have not gotten extended at the schools. And I think there's a lot of opportunity to do a little revamp and update. Yes, the outreach and the visual and the sort of analytics behind it, characterizing the programs. But also doing kind of more business friendly or more kind of more economic analysis on these projects, as you're kind of suggesting with the technology mix and the return on investment kinds of metrics that we can really understand that program going better.

CHAIR HOCHSCHILD: Am I -- I think remembering right, Sean, correct me if I'm wrong. But I believe that last year, the Legislature expanded eligibility.

MR. LOCKWOOD: Yes.

CHAIR HOCHSCHILD: To include tribal governments and also to include EV charging as an eligible storage.

COMMISSIONER MCALLISTER: Storage.

MR. LOCKWOOD: Eligible Storage. Yah. Correct.

CHAIR HOCHSCHILD: Okay. Good. Excellent. Well, I look forward –

COMMISSIONER MCALLISTER: Yeah so --

CHAIR HOCHSCHILD: Sorry. Go ahead, Commissioner.

COMMISSIONER MCALLISTER: No. So yeah. So I think there's just a really good, even better future going forward for ECAA. And you know, zero default means not much risk, right? And maybe that means we need to sort of rethink how aggressive the -- we want might want to be with on the innovation front with ECAA. And so just one thought and then not that we're going to invite defaults, but just that, you know, obviously the program really plays it safe and maybe we want to keep that direction, but that we may be able to sort of help schools innovate in ways that they're not finding other funds to do.

And then also, you know, as interest rates start to creep up, you know, and our economy sort of enters a new phase, I think ECAA will become even more central to a lot of these public entities that aren't going to find really favorable terms for the rest of the other capital that they might have access to.

CHAIR HOCHSCHILD: Yeah.

COMMISSIONER MCALLISTER: So I think ECAA really

has a bright future and we're absolutely right to toot its horn.

CHAIR HOCHSCHILD: Yeah.

COMMISSIONER MCALLISTER: And let the world know about that. But these two projects, you know, I love the mix. I'm a big fan of doing sort of the unsexy infrastructure of these funds. You know, the HVACS and the kind of stuff that the private sector isn't tending to engage in quite as much as like solar. Lighting is relatively straightforward. But the harder stuff like HVAC, I think is really an integral part of the mix as well. So these two projects represent the diversity --

CHAIR HOCHSCHILD: Well, we think HVACs are sexy, even if we -- COMMISSIONER MCALLISTER: We absolutely do. Yeah.

CHAIR HOCHSCHILD: -- [indiscernible] this year.

COMMISSIONER MCALLISTER: Exactly. But you know, it's all about our kids. I mean, we've been focusing Prop 39 for years and our kids really need quality HVAC. So I just I really love to see this mix.

CHAIR HOCHSCHILD: Yeah.

COMMISSIONER MCALLISTER: So, yeah. So thanks to the City of Eureka and the City of San Leandro for taking some leadership on these.

CHAIR HOCHSCHILD: Yeah.

COMMISSIONER MCALLISTER: All right.

CHAIR HOCHSCHILD: Colleagues, unless there's further comments or questions on this, I'd invite a motion on Item 10 from Commissioner McAllister.

COMMISSIONER MCALLISTER: I move Item 10.

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

VICE CHAIR GUNDA: I second Item 10.

CHAIR HOCHSCHILD: All in favor, say aye.

Commission, McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: And I wrote aye as well.

Item 10 passes unanimously.

We'll turn out Item 11, the Minutes from the January 26 Business Meeting. Any public comments on that?

MS. GALLARDO: This is Noemi Gallardo, the Public Advisor. Attendees, if you would like to comment on this item, number 11, please raise your hand using the raised hand icon on the screen that looks like a high-five. If you're on by phone, press *9 to raise your hand, *6 to unmute. H

Chair, I do not see any raised hands.

CHAIR HOCHSCHILD: Okay. Vice Chair Gunda, would you be willing to move Item 11.

VICE CHAIR GUNDA: Move Item 11.

CHAIR HOCHSCHILD: Commissioner Monahan, would you second that?

COMMISSIONER MONAHAN: I second that item.

CHAIR HOCHSCHILD: All in favor, say aye.

Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister.

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: And I vote aye as well.

That item passes unanimously.

We'll turn now to Item 12, Lead Commissioner or Presiding Member Reports. Let's maybe start with Commissioner Monahan.

COMMISSIONER MONAHAN: Okay. well, I want to start by saying I've been watching some of the Olympics and it's been a little bittersweet because I don't know if you guys remember, but we signed an MOU with the City of Zhangjiakou [ph], which is where they're holding the Winter Olympics. And, you know, it's like super cold there. It's

like so cold that the snow is -- it's like very cold for the athletes. And they -- it's the lead city for hydrogen and the lead city for fuel cells. And they are moving all the Olympic athletes in fuel cells powered by 100% green hydrogen.

And it's a little sad because I, you know, relations with China are so bad for good reasons right now that it makes some of these collaborations a little bit more difficult. And yet we, you know, China, the world's biggest market for vehicles and it has been a game changer when it comes to battery electric vehicles helping drive down the price of batteries for the world. And now China is turning towards hydrogen for medium- and heavy-duty. And in fact, lead cities like Shanghai, Beijing, in addition to Zhangjiakou [ph], are all have these plans to build out hydrogen and to have more fuel cells on the road in the medium- and heavy-duty sector.

So anyway, just a little sadness on my part about the situation. There's been a number of different international just issues coming up. There's a U.S. - Mexico Electrification of Transport Task Force that's been developed, and UC Davis is part of this, as is the Ministry of Foreign Affairs of Mexico. So I'm participating in a work group around that and that -- the first meeting was just ,a couple of weeks or so ago. February 8th.

Commissioner McAllister and I have done some mining of information by other countries on industrial decarb strategies, particularly Denmark and Germany, which are, I think maybe ahead of us in the game in terms of thinking through some solutions. So really trying to map out what we could do here in California, learning from these lead countries.

Just yesterday, I testified before the Senate Transportation Committee, together with Chair Randolph. And the topic was the role of electricity, hydrogen and natural gas in California's transportation system. And there were some air districts, including South Coast Air Quality Management. They're really making a strong case for natural gas as a transition fuel. So just a really interesting, I think, discussion around the role of these different fuels. And the topic was specific to medium- and heavy-duty vehicles, not passenger vehicles. But it was a -- there was a lot of interest by the committee, a long hearing. They had a lot of different stakeholders after us presenting information. And just, I think, an example of how much interest there is in the Legislature right now on transportation. And I think as we move to support the Governor's budget that we're going to, and we're already seeing, a lot of interest by the Legislature.

So there's going to be a lot of hearings that

Hannon [ph], Russell, Drew will be involved in, and you know, it's a long road to get to the final budget. But I'm very hopeful that there will be a lot of good funding for clean transportation as well as clean energy broadly.

We had talked about the hydrogen hub piece just to kind of get folks up to speed. So the -- so GO-Biz and especially Tyson Eckerle, who is the Co-Chair of the Fuel Cell Partnership, is really going to be a point, I think, for the State of California, in terms of helping all the agencies collaborate on ensuring that California is a green hydrogen hub. And the role of government vis a vis private interests, I think is still kind of -- we're figuring this, this all out. But there's definitely, I think, across all the agencies, CARB, at least CARB, CEC and GO-Biz. We're aligned in trying to make sure that we can get a green hydrogen hub here in California.

I can't remember if I had the retreat with CARB before or after. So we had a retreat on school buses. And it was really helpful, and I think you know, everybody, we're committed to this one government approach. I'm sure I speak on behalf of Chair Randolph that the idea that we want to make sure that we hit it out of the park on school buses and we have a good story to tell to the -- to about how we're helping with kids health as we electrify school buses.

And I also am very hopeful that the ZEV dashboard is going to be expanded in the next several months to include medium- and heavy-duty vehicles, and hopefully we can line item out with which ones are school buses and which ones are transit buses. I think we're still figuring out if DMV data can parse down to that level, but more exciting changes. So I hope we'll be able to share with all of you in the next three months, two to three months, a refreshed ZEV dashboard that includes medium- and heavy-duty vehicles.

CHAIR HOCHSCHILD: Thank you, Commissioner. Let's go to Commissioner McAllister next.

COMMISSIONER MCALLISTER: Okay, well, thanks. I will try to be brief. First, I just wanted to again just say thank you, well to Governor Newsom for having faith in me to continue here in working with all of you and helping California move forward and decarbonize and do it in a way that's equitable and fair and effective. That's just job one, I think for all of us. You know, reliability, decarbonization and, you know, be mindful of costs. I think all of us, all of that, all of us are kind of involved in the same tripartite of goals. And so just really, really happy to have that runway and to be able to think long term about how I want to contribute and what conversations I want to kind of spearhead going forward.

So a lot of that has to do with building decarbonization and really making sure that we're having the breadth of conversations that we need. Obviously, lots of linkages over to the gas transition and lots of other topic transportation, lots of other topics. I think the building decarb really needs a few stakeholders that haven't been really in masse or completely intentional at the table. And labor being one of those local governments, sort of our community based strategy; I continue to think that we need to do better there. So, so really, just looking forward to having the runway to consider those topics and really develop them.

Let's see. So I just last week spent much of the week in D.C. and so for the first D.C. conference in quite a while and being very careful, of course, with the COVID exposure and indoor and masking and making sure everyone there was vaccinated. But it was at the NASEO Energy Policy Outlook Conference, which is a really great opportunity for the states to come together and kind of compare notes on what's happening. And I do try to pull in all of you and other colleagues at the Commission and beyond to the conversations where that's where it's appropriate and helpful. Do a lot of networking and a lot of evangelizing. You know California has a lot to offer, a lot of coordinating across some of the more progressive

states Massachusetts, New York. It was just a lot going on.

In particular, there's increasing interest in load flexibility, which is very gratifying. I think the lights are kind of coming on. Pun intended, I guess, in terms of -- in terms of that being a resource that has a key role to play going forward in reliability. Codes, lots of interest in our building code and lots of engagement from the DOE brass and sort of senior staff. There was some opportunities to provide input in particular to Congressional staff about some details or some things they might want to consider in some of these larger programs that are still in the mix for whatever version of Build Back Better has the opportunity to move forward, and it looks like it's going to be broken up into more bite size pieces. But there's some existing chunks of that.

The Hope for Homes Act, which has been floating around and found a home in Better -- in Build Back Better and now it's sort of maybe on its own again. But that is a building decarb effort that's integrated retrofits, is the idea, and it's really sound. And hopefully we'll find a path.

And then there's a Zero Carbon Buildings Act, which is newer but is really focused on targeted electrification. So those two need to find a way to work

together and hopefully advance in parallel together. And so the Congressional staff was really looking for state insight on what implementation might look like on both of those bills. So that was actually pretty interesting. And hopefully we'll see some of the results of that input.

Really, and now just a few a few thank yous really. So load Management Standards Rulemaking is moving forward. Last week we had the APA hearing went really well. Just kudos to Stephanie Wayland and who's our new lead on Load Management Standards. If you haven't met her, you definitely should. But the whole team Jen Nelson and Gavin Situ, David Cuffee.

CHAIR HOCHSCHILD: Hey Commissioner, just on that.

COMMISSIONER MCALLISTER: Yeah.

CHAIR HOCHSCHILD: What is the time -- what's the schedule again on?

COMMISSIONER MCALLISTER: We're hoping to finish the rulemaking by the end of the year, so we got a lot of -- we're getting a lot of really good input and pretty diverse input from stakeholders, the utilities, and CCAs, and some other stakeholders, including at the APA hearing last week. That was kind of a milestone to sort of, you know, go public with the proposal and really get solid feedback on it and we'll be getting written comments in

going forward. But hoping to resolve any issues and ironing everything out and get that rulemaking you concluded by the end of the year. Yeah.

And also, just Mike Sokol has really been a great sponsor of moving that ahead and Corrine Fishman on the -- on the process of the rulemaking itself, sort of the schedule and the process. And then Linda, and Jimmy, and CC's office have been really key, so just wanted to thank them on that.

And then on CalSHAPE, there's a really, we have a great team on that as well. And that's the water and energy efficiency sort of HVAC evaluation/upgrades in schools, in disadvantaged communities across the state. So nice workshop earlier this week about that. And Jonathan Fong has been our staff lead on that, but he's got a great team of O'Shea Bennett, David Velasquez, Houston Garnier, Ryan Kastigar have been -- did a great job at that workshop.

And then the RED leadership, the Renewables Division leadership, Natalie and Armand as well. And at CCO, Allen Ward and Matthew Pinkerton, just wanted to call out those folks for contributing to what's turning out to be a really impactful program that I think the next phases will be even more so. And just another example of the program design and implementation expertise that the

Commission has. That program was rolled out incredibly quickly and effectively and nothing but good feedback from stakeholders at the workshop the other day. So I wanted to make sure to acknowledge that quality effort by staff on that. And I will end my comments there.

CHAIR HOCHSCHILD: Thanks a lot. Okay. Let's go to Vice Chair Gunda.

VICE CHAIR GUNDA: Thank you, Chair. I think today I just want to start with acknowledging our office today, a little bit since as you all saw, Erik presented today on the DR work that he has been shepherding. Really glad to have Liz Gill back. And you know, we did not mention her name in the reliability work and the IEPR work last year, but she has been instrumental in pulling a lot of that work together. So just what I thank and express my gratitude to the two advisors at our office.

And most of you already know this, but you know, for more publicly, you know, we just want to acknowledge and welcome Ben Finkler, who has recently joined our office as Chief of Staff. He is on loan from UC Davis, but really, really glad to have the opportunity to work with him again. In my past professional career, I worked at UC Davis and closely worked with Ben and really wonderful opportunity to really work with him again.

I also want to extend my thanks to Le-Quyen for,

you know the Chair's Chief of Staff, as most of you know. She has also been supporting me for nearly a year as an interim Chief of Staff. I don't know how Le-Quyen does that, but she did it and she was able to keep all of us coordinated, so Le-Quyen, thank you so much for helping us stay coordinated. And she's going to continue to work with our office, given that IEPR 2022 is going to be co-led by me and the Chair.

And you know, finally, I want to just mentioned Mina Holloway, who you know, kind of supports our office and keeps us all coordinated. And I know she is now helping Commissioner Monahan's office a little bit. She's paying forward. So I look forward to, you know, I just want to express my gratitude. Mina is a great professional person, and she just has an ability to do, work with such grace. So thank you, Mina, for all your help.

Going back to just the policy issues at a very high level, reliability has been a little bit less of a focus than, you know, for any given month. Given that we are in January. We've kind of had a couple of milestones in December and January where we completed the STACK Analysis and kind of had a preliminary view of what 2022 is looking like. So most of the work right now on reliability has been just thinking through how do we update, what cadence to we update the analysis on. But as David Erne

pointed out earlier, really about making sure the procured resources are going to come online and how do we problem solve there. So much of the work is happening behind the scenes by STEP staff, [indiscernible] staff in coordination with CPUC, CAISO, DWR, and GO-Biz to ensure that we're moving forward.

Spend a little bit of time with CAISO, so I know over the last month or so in a couple of different areas, and Commissioner McAllister and I joined you know, in a kind of a meeting on Extended Day Ahead Market, EDAM Working Group updates. You know, just really good to understand how that is progressing and being able to have a read on the pulse of the developments there. So it's a good thing and we're still observing, trying to understand and providing feedback as best we can.

Finally, just going into IEPR 2022, we are -- our office is going to put out a Draft Scoping Order soon for the 2022 IEPR update and we should be doing that within a week. That's our hope, you know, the Scope will come out. But I think I just want to make sure I remind fellow colleagues on the Commission here and the staff so that the IEPR 2022 is going to focus on three elements.

One is just developing an equity framework. So it's going to be energy transition and equity. The outcomes, the expected outcomes as developing and adopting

an equity framework for the Energy Commission and also the restarting the conversation around the equity indicators. So that's the main thing. And I just want to thank, Noemi and the Public Advisor's Office for their help. And then they are going to put in a lot of time this year helping draft that part of the IEPR.

The second thing that, at a high level, is we talked about over the last two to three years, we've been working really hard on comprehensively coordinating all our analytical products that we do and then enhancing them. So we have the forecasts, we have the scenarios now, a couple of reliability products in the Efficiency Division. We also have from the STEP Division, land use tools that they're working on.

So what we're hoping to do in IEPR 2022 is begin to consolidate all our analytical products into a California Planning Library, so we as a Commission can adopt them. You know, it could happen as a single library or twice a year, depending on the cadence when products are done. But it's like you just kind of sending that very clear signal of being the backbone analytical entity for the State.

And finally, the third section will be, at a very high level, pieces of kind of any, any time sense and timely topics. Some of the topics have been just giving

some time in the EIPR on potentially hydrogen or kind of the EDAM regional enhancements that are happening. So we're still thinking through and then we'll get some public comment and what those topics should be.

So the second part I wanted to acknowledge on the IEPR this year, as I mentioned in our discussion on IEPR 2021 item earlier today, that this is going to be a really an opportunity for us to move the IEPR more into a summary document. And we're going to signal but direction, but then again, to Commissioner McAllister's point, we do not want to lose that vigor and the opportunity to advance these documents that are helpful. So in order to do both of them, we would have the IEPR, which would be a summary, but it will be leaning on a number of other proceedings.

For example, Commissioner McAllister right now has a number of different proceedings that broadly are under building decarb. Similarly, Commissioner Monahan has on transportation. So what we want to do is have these standalone OIIs or Instituting Investigations where staff can do multi-year work and it's not rushed in a given IEPR. But at the end of the year, we can have a clear milestone of a document and that could be summarized in a IEPR.

So with that, we are going to put it in front of the Commission. OIIs, we're kicking off two separate dockets. One will be on the gas evolution or gas planning,

gas transition; that's going to be one element. And the second element is going to be around the DR/Reliability. So those are the two that we're going to launch so we can have multi-year goals. The DR will obviously subsume some of the DR work we are doing, so we can have multi-years of progress there and then continue to integrate them in the IEPR as a Commission, together. So that's our hope.

So with that, again, grateful to the staff for all the work. I am hoping to come to full throttle. I think the vacation is still on me. I haven't really come back to full form yet. So hoping to come to my 100 mile an hour days. So, with that, our pass it to our Chair.

CHAIR HOCHSCHILD: Great. Thank you so much. Vice chair and second you thanks especially to Le-Quyen Nguyen, who's been phenomenal in her efforts to keep everything moving and coordinated on so many levels. I also wanted to just begin with thanks to Natalie Lee, who is stepping down as the Deputy in Charge of the Renewable Energy Division but will be staying on for some time to assist Commissioner Douglas on Lithium Valley and other issues. Natalie has been just a tremendous asset to the Energy Commission. And when I was Lead Commissioner for Renewables, she was Deputy. In fact, she said, you know, you've got to go out for lunch with this guy, Siva Gunda, a few years ago. That was really how we got connected and

look who's Vice Chair of the Energy Commission. So I just want to say thank you, Natalie, for your service, not just to the Energy Commission, but to CARB before that for standing up so many of our new initiatives from REAP to BUILD and just getting things organized in so many ways. Very grateful.

A couple updates I wanted to share. Commissioner McAllister and I did a visit to Lawrence Berkeley National Labs, which is terrific, spent a full half day there, going through a whole host of issues with those guys and really, really fruitful discussions. I also just want to share the work with Lithium Valley is taking off like a rocket right now. It's super exciting. There's a ton of engagement, a ton of new investment coming. Commissioner Douglas is on her way down there today. I went two weeks ago. I'll be going back and just an incredible amount of attention that it's getting from Washington, D.C. from the media and really favorable movement. I met with the CEO of Berkshire Hathaway last week who was in town talking about their investment there and just a lot of -- a lot of positive signs pointing towards a robust future for that whole effort to build out the lithium ecosystem, so thanks to all the staff were involved at all levels at the Energy Commission in supporting that.

I did want to give one update to my colleagues,

that Vice Chair Gunda is up to speed on already, but Vistra, which is the company doing energy storage at Moss Landing. You may recall that's the largest energy storage facility in the world. They had 400 megawatts online and then in October they had an issue. We thought it was a battery issue. Happily, it turned out not to be a battery issue, but it was a fire suppression system that was faulty. It went off and then the batteries got wet. They had an issue. That has happened again, about three days ago. We had a briefing with them yesterday and I'll be going down there to do another site visit to get that sorted out.

So this is not a problem with the batteries, but with the fire suppression system. But it's happened two times, so we're concerned enough to do a trip down there and going to be working to ensure those protocols get set the way they need to be. We're deploying a ton of storage and that's the right thing for the State, but this is the kind of thing that we've got to get sorted out. It's definitely in the realm of a of a solvable problem. I think it's actually very good news. This is not a flaw at all with the battery, but it is a concern, nonetheless. So I'm going to be spending some time on that and I will stop there.

So let's turn now to Item 13, Executive Directors

report.

MR. BOHAN: Thank you, Chair. I'm having some system issues, but I've got my phone, so if I go off, I will -- video -- I'll at least have the phone. A couple of quick things. Wanted to thank you, Chair for acknowledging Natalie Lee. Indeed, she's been with us for a number of years and about the last four as the Lead for the Renewable Energy Division. She is thankfully stepping away, but not away from the organization, as you noted. In addition to REAP and BUILD, which she deserves a lot of credit for, standing up. She also led the standing up of CalSHAPE, which is a big one. She was also the Chief Steward of the RPS, Power Source Disclosure, and the ever growing equipment list, panels, inverters, etcetera. And then the wind down of our Prop 39 Program, which is extremely successful, as well as NSHP, both of which delivered really mightily on their goals. So I just want to underscore and add to your thanks.

Pandemic is moving us in different directions. The incredible building we all sort of virtually moved in. We now are able to move in, I think, with much more -- being much more deliberate about it. So we're having conversations about how to do that. We just kind of are almost completing the telework, collection of telework agreements from folks who do want to telework. But I think

opportunities are unfolding for us going forward on that.

State and federal budget. Just want to mention briefly, I think all of you are aware of what is in the Governor's budget that directly impacts the California Energy Commission. As Patty noted yesterday, she was excellent. She didn't say this, but she was excellent in the committee hearing she attended. And we have on March 2nd, the Senate(2) hearing that a number of our staff will be attending. And then on March 9th and 16th, there are two Assembly (3) Committee hearings on all of our different budget items.

Finally, on the federal side, the IIJA, the Infrastructure Investment and Jobs Act, or just commonly referred to as President Biden's Infrastructure Bill, we are continuing with the leadership of Jen Martin-Gallardo and Linda Spiegel trying to identify precisely which pots of funding the State of California should go -- should attempt to receive, and then more specifically, the Energy Commission. With that, I will close. Thank you.

CHAIR HOCHSCHILD: Thank you, Drew. Let's go to Public Advisor's Report.

MS. GALLARDO: So this Noemi Gallardo. I have just quick things to say. First, I'm going out to the Lithium Valley this week and I'm really excited that we're doing so much on the ground. One-to-one engagement with

both tribes out there, community based organizations, and other leaders who are in that region.

And then also very excited about the IEPR and its grounding in equity. So thank you Vice Chair Gunda, for letting me contribute to that. I really appreciate that.

And then finally, I just wanted to give you a heads up that we are gearing up for the Clean Energy Hall of Fame. So we are having the awards ceremony this year, hopefully in person, and we will start the nomination process shortly. I just wanted to get you all excited about that.

That's it for my report. Thank you very much.

CHAIR HOCHSCHILD: All right, thanks. Let's go to public comment, Item 15.

MS. GALLARDO: This is Noemi again. I'm going to give instruction on a public comment. So 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 per organization. We may reduce the comment time depending on the number of commenters. Use the phrase 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 state and spell

your first and last names. State your affiliation if you're representing a tribe, agency, organization, or any other entity. Do not use the speaker phone when talking because we will not be able to hear you clearly.

So I will now look to see if there are any hands. I do see there is one hand raised, Clair Warshaw. Your line is open, and you may begin.

MS. WARSHAW: Hi. My name is Claire Warshaw; C-L-A-I-R-E, W-A-R-S-H-A-W. I'm a member of the public, no state affiliation. I wrote an email to the appliance staff regarding what I'm about to talk about. It's kind of complicated. I don't know if I'll be able to fit it into the three minutes, but it's related to the 6 million heat pumps that suggested in the IEPR as a goal, which I think is great. Fantastic idea. I've had a heat-pump where I've lived ever since I've moved in, which was late in 1993. And the last one went out. Apparently the air exchanger coils were going bad. Maybe the auxiliary heat was being used too much and that's what this is about.

They don't, fortunately, through SMUD on a low-income program, they installed a new heat-pump in 2021 with a smart thermostat, which I had never had a smart thermostat before. And the auxiliary heat is set at a freezing temperature, and I don't think my old system was. And with the new system, though it functions, it's on for a

lot longer. And I think it's because of that auxiliary heat setting, which might be what you guys are aiming for. The other auxiliary heat is, as resistant to heat, I understand that's not what you want. You want it to operate as a heat-pump, mostly, but it's on a lot longer.

So that's why I wrote this email to the Appliance staff because I don't know if this is what is being gold, and what people consider efficiency in terms of the machine efficiency, is what is being spoke about most of all, rather than the task efficiency, which would be cooling or heating the home.

Fortunately, in California, the temperate environment's been fantastic for this situation. I am not complaining with the new system. I really needed something, and the air filtration is something that I feel has helped me a lot with my health. But I think that investigating that auxiliary heat setting, what is actually supposed to be with the smart thermostat and having that known might make a difference for how people react to their heat-pump systems.

So I guess that's mostly, you know, what I wanted to cover and thank you for letting me speak.

Also, maybe I'm considered spam in the email system with the CEC. I don't know how else to ask this. I've asked on social media a lot of different, in a lot of

different ways and not gotten a good answer, so.

CHAIR HOCHSCHILD: Well, thank you for sharing those. Claire, maybe Noemi can assist and someone from the Appliance shop at CEC could respond to you. Thank you for sharing this.

Noemi, do we have any further public comment?

MS. GALLARDO: Real quick, Claire, you can feel free to reach me at publicadvisor, one word. Advisor has an o, @energy.ca.gov, or you can reach me on my direct email. And we'd be happy to help you find a subject matter expert who can try to respond.

So I am checking again for hands and do not see anyone else chair.

CHAIR HOCHSCHILD: All right. Thanks, let's go to the Chief Counsel's Report, Item 16.

MS. BARRERA: Good afternoon, Chair and Commissioners. Linda Barrera, and I don't have an update for today. Thank you.

CHAIR HOCHSCHILD: All right, we are adjourned. Thanks, everybody.

(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.

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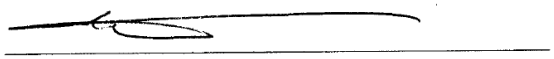

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