DOCKETED	
Docket Number:	22-BUSMTG-01
Project Title:	Business Meeting Agendas, Transcripts, Minutes, and Public Comments
TN #:	242945
Document Title:	Transcript of 04-26-2022 Business Meeting
Description:	N/A
Filer:	Liza Lopez
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	5/6/2022 11:08:33 AM
Docketed Date:	5/6/2022

BUSINESS MEETING

BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)
	)22-BUSMTG-01
Business Meeting	)
_____	)

TUESDAY, APRIL 26, 2022

10:00 A.M. – 3:30 P.M.

In-person at:
Warren-Alquist State Energy Building
1516 Ninth Street
Art Rosenfeld Hearing Room
Sacramento, California 95814
(Wheelchair Accessible)

Option for Remote Public Access via Zoom.

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.

Reported by:
E. Hicks

APPEARANCES

Commissioners

David Hochschild, Chair
Siva Gunda, Vice Chair
Andrew McAllister
Patricia Monahan
Kourtney Vaccaro

Staff Present:

Drew Bohan, Executive Director
Linda Barrera, Chief Counsel
Jared Babula, Chief Counsel's Office
Kirk Oliver, Chief Counsel's Office
Dorothy Murimi, Public Advisor's Office
Ben Sinclair, Advisor to Vice Chair Gunda

	Agenda Item
Heather Raitt	2
Elizabeth Huber	3
Geoff Lesh	3
Dian Vorters	3
Shawn Pittard	3
Molly O'Hagan	4, 5
Anthony Ng	4, 5
Rachel Salazar	5
Molly Mahoney	5
Rhetta deMesa	6
Esther Odufuwa	7
Hieu Nguyen	8
Larry Rillera	9

Also Present	Agenda Item
Other Presenters	
Nika Kjensli, CPUC	3
James Cheng, CPUC	3
Peter Allen, Legal Counsel CPUC	3
Kelly McAdoo, City of Hayward	3
Garrett Contreras, Fire Chief, City of Hayward	3

Public Comment

	Agenda Item
Jeffery D. Harris, attorney for Calpine Ellison Schneider Harris & Donlan, LLP	3
Mike DelCasale, Senior VP, Calpine Corp.	3
Claire Warshaw, Self	3
Steve Guttmann, Self	3
Andy Wilson, CalPilots	3
Varner Seaman, Clean Power Association-CA	6
Mailon Rivera, C4GS, LLC	5
Alan Woo, City of Santa Ana	5
Casey Harris, Jamboree Housing Corp.	5
Cheryl McMurtry, Architectural Nexus, on behalf of Mutual Housing and Fairview Terrace Project	5
Colleen FitzSimons, San Diego Green Building Council	5
Kirsten Berquist, FHCSD	5
Debarshi Das, ConSol	5
Matt Winter, LPA, Inc.	5
Stephan Groce, Self	5
Evelyn Ng, AC Transit	7
Rolando Cruz, Culver City Transportation Dept.	7
Michael Brown, California Grinding Inc.	8
Dennis Balakian, California Grinding Inc.	8

I N D E X

I N D E X (Cont.)

P R O C E E D I N G S

APRIL 26, 2022 10:03 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 a recording of this Business Meeting on the Business Meeting webpage, in addition to posting a transcript of this Business Meeting rendered by a professional court reporter in the docket system on the Business Meeting webpage.

To increase access to the California Energy Commission's proceedings, this meeting is being held in-person and is also available for remote participation. The public can participate in the Business Meeting consistent with the instructions for remote participation found in the notice for this meeting, and as set forth on 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 to indicate you would like to give a comment in person, please use the QR codes shown in the room and fill out the form.

For remote participants, please raise your hand by clicking on the "Raise Hand" icon at the bottom of your screen. If you are joining by phone press *9 to raise your hand and *6 to unmute.

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 comments for the general public comment portion of the meeting. And shall have a total of three minutes or less to state all remaining comments.

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, welcome back. It has been over two years since we've been in this room together,

and it is nice to be back. I want to thank everyone for setting up this first in-person meeting. We are still awaiting some final AV upgrades in the new building and will be eventually holding our Commission meetings over there across the street, really excited for that facility. But in the interim, we'll continue to meet here, so it's good to be back in person. And thank you everybody who showed up here in the room, it's nice to see. So it's in-person again.

So today is Tuesday, April 26th. Joining me are Vice Chair Gunda, Commissioner McCallister, Commissioner Monahan, Commissioner Vaccaro. And we are going to begin, if we could, with the -- did I say Commissioner McCallister -- so we have a full quorum today and it will begin with the Pledge of Allegiance led by Commissioner McCallister.

(Whereupon the Pledge of Allegiance was recited.)

CHAIR HOCHSCHILD: Thank you, Commissioner.

And before we get to our voting items today a few announcements to make. As I mentioned our first in-person meeting in over two years. I do want, if you're comfortable, just greeting the person next to you with a handshake or a fist bump or an elbow bump; please feel free to do that. It's good to be back together and we want to welcome you all.

So we are going to be considering grants, the

total of about $26 million today, which again will be supporting our state's economic recovery.

And with that we'll move on to the Consent Calendar. Do we have any public comment on Item 1 the Consent Calendar?

MS. MURIMI: I'm going to read some instructions. So for individuals that are in the room if you'd like to make a public comment, to the back of the room you will see QR codes on the wall. And also the Public Advisor, members of the team of the Public Advisor's Office are there with blue cards as well if you'd like to use those.

For individuals that are on Zoom, go ahead and use the raised-hand feature. It looks like a high-five at the bottom of your screen or device. And if you're calling in by phone press *9 to raise your hand.

Going to give that one moment. I'm seeing no comments, Chair, back to you.

CHAIR HOCHSCHILD: Okay, thank you.

Just before we move to items, I wanted to just introduce Ben Sinclair in the back if you want to just stand up since we're in-person. For folks that don't know Ben is the new Advisor to Vice Chair Gunda, so for folks now we can put a face to the name. Are there any other advisors who have not been introduced in-person in the room? Okay. But anyway welcome, Ben. It's great to have

you at the CEC.

So is there any Commissioner discussion on the Consent Calendar? Hearing none, Commissioner Vaccaro, would you be willing to move Item 1?

COMMISSIONER VACCARO: Yes, I move this item.

CHAIR HOCHSCHILD: Okay. Commissioner McAllister?

COMMISSIONER MCALLISTER: Second.

CHAIR HOCHSCHILD: All in favor say aye.

(Chorus of ayes.)

CHAIR HOCHSCHILD: All right, so wait I guess we'll just go through roll call, sorry.

Commissioner Vaccaro?

COMMISSIONER VACCARO: Aye.

CHAIR HOCHSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Aye.

CHAIR HOCHSCHILD: And Commissioner Monahan?

COMMISSIONER MONAHAN: Aye.

CHAIR HOCHSCHILD: Oh we're going to, I think, continue to do that as a huge number of people are online still, so we can hear our individual votes. And I vote aye as well. That item passes unanimously.

Let's turn now to Item 2, Order Instituting

Informational Proceeding. Heather Raitt, thank you.

MS. RAITT: Good morning, I'm Heather Raitt. Can you hear this okay? Great. I'm Heather Raitt, Assistant Executive Director for Policy Development. Staff is asking for the Commission's approval of an order instituting informational proceeding to gather and assess information needed to develop the 2022 Integrated Energy Policy Report Update, which I will refer to as the 2022 IEPR Update. Next slide, please.

The Commission is required to prepare an IEPR every two years that provides an overview of major energy issues and trends facing California, with an update on the intervening year. Adoption of this order will allow the designated Commissioners to hold hearings and workshops and to collect information that is needed to complete the 2022 IEPR Update, but is not identified in the Commission's data collection regulations. Next slide, please.

Vice Chair Gunda is the Lead Commissioner for this year's proceeding. He issued the scoping order for the report on Friday April 22, identifying the topics and general schedule for the 2022 IEPR Update. This year's proceeding has three tracks.

The first track and focus of the year is establishing a framework to center equity and environmental justice throughout CEC efforts. The framework will help

the CEC continue to contribute to remove barriers and increase opportunities for all Californians to live with dignity and to achieve prosperity. The framework will be accompanied by an assessment mechanism and action plan to help ensure that the CEC's work is being completed with an equity and environmental justice lens.

We also plan to revisit the Energy Equity Indicators tool developed as part of the SB 350 Barriers Study to see if it should be updated, reimagined, or kept the same.

The second track is creating a California Planning Library. The aim of is to centrally locate and make readily accessible the various energy planning tools developed by the Energy Commission and that are widely used by stakeholders.

Finally, the third track is addressing emerging topics to provide situational awareness and address policy questions of interest. Examples include the role of hydrogen in California's clean energy future and evolving regional energy markets. Next slide, please.

Under Vice Chair Gunda's leadership the IEPR is taking a fresh approach this year in response to comments from the public and sister agencies. There is a preference for the report to be more concise and serve as a summary document. At the same time, other state energy agencies

have expressed a need for analysis referenced in IEPRs to serve as a thorough record that they can reference and to avoid duplicative work.

Further, there are often important issues that need attention and analysis that may not fit into the typical timeframe of a single IEPR cycle.

Because of these needs earlier this year the CEC launched additional Order Instituting Informational Proceedings on decarbonizing the gas system and on distributed energy resources. This will enable deep analyses that extends beyond the annual reporting period of the IEPR.

The 2022 IEPR Update will incorporate and report on developments from those proceedings and those parallel proceedings will continue and may be used to inform future IEPRs.

Summarizing the findings of such ongoing and in-depth proceedings that last beyond a single IEPR cycle is intended to be the model for IEPRs going forward. Next slide.

So to recap I'd like to request your approval of this order instituting informational proceeding for the 2022 IEPR Update. And Kristen Driskell from Legal Office is available to help answer any questions. Thank you for your consideration, and that concludes my presentation.

CHAIR HOCHSCHILD: Thank you, Heather.

Any public comment on Item 2?

MS. MURIMI: Again, individuals who are on Zoom go ahead and use the raised-hand feature. It looks like an open palm or a high-five, and it is at the bottom of your screen or device. Individuals calling in press *9 to indicate you'd like to make a comment and individuals in the room can see the Public Advisor.

Seeing no hands on Zoom or in the back, back to you Chair.

CHAIR HOCHSCHILD: Okay. Thank you, Dorothy.

Let's turn to Commissioner discussion starting with Vice Chair Gunda.

VICE CHAIR GUNDA: Thank you, Chair. It's really nice to see everybody in person, a lot of hugs this morning. Hopefully that was safe.

So I just wanted to take a moment to thank Heather and her team for continuing the leadership on IEPR. As Heather kind of mentioned there is a couple of key elements that we're trying to socialize and move forward with in IEPRs. So the first one, obviously, is to try to figure out a way to make the IEPRs more of a summary document. Thanks for all the comments from the stakeholders last year, the IEPR was about 600 pages and it's not easy to go through every page of that. So

hopefully this model will sustain a more policy-focused discussion, moving forward on key elements.

The second thing is just kind of thinking through how to integrate the parallel proceedings. So we have the gas transition as well as the DERs, but we also have the reliability proceeding that we started, SB 100. So there's a number of different proceedings that are happening right now that can help support as a summary into the IEPR. So we'll continue to learn and evolve that.

But most of all I want to thank -- I don't know if I see Noemi here, but the Public Advisor's Office, for really helping make equity and environmental justice a centerpiece for the IEPR this year. We have been doing really good work at the Energy Commission, but there's always more to do. So having taken the time to really think through what a framework would look like that could help make our efforts more coalesced around broader goals of California and the state at large would be really helpful. So I'm really excited to continue that conversation.

I'm also really looking forward to this idea of the planning library. We have a workshop coming up this week, so really thinking through how can we take all the different planning assessments that CEC does and put them in a structure that allows for broad access, but also gives

better information to our sister agencies on other assessments that we do that can be used for their planning.

So really looking forward to it, and all my Commissioners, to work with them this year. So with that back to you, Chair.

CHAIR HOCHSCILD: Thank you.

Any other Commissioner discussion? Yeah, Commissioner Vaccaro.

COMMISSIONER VACCARO: Thank you. So first of all thank you, Heather, for the presentation. And Vice Chair Gunda I have to say I am excited about this IEPR. I've always been interested in the IEPRs, but I'm excited because it reflects a responsiveness to feedback.

The accessibility of information is so important, especially as we're talking about communities that we're trying to reach throughout California. I think the plan that you've rolled out for us to have IEPR workshops throughout California is something so unique and novel. We've had workshops throughout California, but we haven't brought the IEPR around California in this way. And I've seen the invites on my calendar, I'll be joining you for some of this.

And just really pleased too, that we're going to be taking like a more cohesive approach to all of the efforts. We have a lot of threads right now at the Energy

Commission. We've long been prioritizing equity and (indiscernible) under-resourced communities, but this is really going to bring it all together. And I think the planning library is going to be a really effective tool. So I'm truly excited to join you on the tours and to do whatever my office can and whatever I can to support this effort.

CHAIR HOCHSCHILD: I really appreciate those comments, Commissioner. It is actually an important milestone to take the IEPR on the road.

Yeah, Commissioner McAllister.

COMMISSIONER MCALLISTER: Yeah, just I wanted to sort of briefly highlight a couple of reasons why I just want to congratulate Heather, thank Heather. And congratulate Vice Chair Gunda for sort of reimagining the IEPR a little bit. And I think two things really. These multiple themes are sort of the equity focus, but having multiple themes that have multiyear relevance I think is really setting up these OIRs (phonetic) that can outlive an individual, one-year IEPR, and sort of continue on and create that continuity.

The IEPR was every other year and then it kind of morphed into basically every year, the forecast still every other year. But basically kind of there was a certain amount of reinventing the wheel that sort of was forced to

happen with each IEPR cycle. And so I think sort of avoiding those inefficiencies and making sure there's some continuity for these key themes going forward, whether it's various aspects of our decarbonization journey, equity, or other aspects that really are with us for the long term, I think, having this new structure. And sort of reimagining that is a really, really welcome innovation and necessary innovation, so thank you for that.

COMMISSIONER MONAHAN: I'm just going to do a hear-hear. Also I had a question for you, which is can you elaborate a little on the planning library and what you're envisioning that will look like?

VICE CHAIR GUNDA: Yeah, absolutely. I mean it's so strange to talk here without the Zoom call. I'm like, "How do I focus my attention?" So this is great, so I think it's going to take a little bit of time to adjust.

Thank you, Commissioner. I think the planning library would be, first of all, looking at all the things we are set up to do like the forecasts and all, so having possibly an inventory of things that we do by mandate that are required for our sister agencies. But also those products we are developing, which could be helpful for planning.

For example, we just did the demand scenarios. And the demand scenario is not officially adopted by the

CEC to then be able to use in a DRP, like distribution-type planning or the IRP planning. So what we would want to do is figure out a way to funnel them into this library structure and then which ones do we want to adopt and in what cadence, so that they become an important element. So we have a preliminary framework set up for that and the staff are going to present in two days from now on how do we gather information, how do we structure, which ones we adopt, which ones we don't, and what is the cadence of that of that.

CHAIR HOCHSCHILD: Unless there's other discussion, I'd welcome a motion from Vice Chair Gunda on Item 2.

VICE CHAIR GUNDA: Yes, I'll move Item 2.

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

COMMISSIONER MONAHAN: I second.

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: Commissioner Vaccaro?

COMMISSIONER VACCARO: Aye.

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

Let's turn now to Item 3, Russell City Energy Center. Welcome Elizabeth Huber. (No audio.)

COURT REPORTER: Sorry, this is the court reporter. I'm not hearing anything.

CHAIR HOCHSCHILD: Is your mic on, Elizabeth?

(Pause for audio issues.)

MS. HUBER: Oh, my apologies.

Good morning, Chair, Vice Chair, and Commissioners. My name is Elizabeth Huber and I manage the Safety and Reliability Office in the Siting, Transmission and Environmental Protection Division. With me this morning to present on this item is Geoff Lesh, CEC's Energy Office Manager. And Kelly McAdoo, City Manager for the City of Hayward. And Hayward Fire Chief Garrett Contreras. We also have from the Chief Counsel's Office, Jared Babula and Kirk Oliver.

And from the California Public Utilities Commission's Energy Safety and Reliability Branch, Manager Nika Kjensli; and their Lead Engineer, Jim Cheng. And their Legal Counsel, Peter Allen, as well as a contingency from Calpine Corporation. Next slide, please.

We are here to present the CEC and CPUC staff

investigation and gap audit, our determination of the root cause, and the corrective actions to address the factors to the Russel City Energy Center's explosion and onsite fire as described in the CEC staff report, "Russell City Energy Center May 2021 Incident: Root Cause Gap Analysis."

We are also here in response to an Order of the Commission at the July 15, 2021, Business Meeting requiring the Russell City Energy Center staff to meet with CEC staff and the Hayward City Fire Department to discuss any needed modifications to their standard operating procedures for first responders to implement when responding to an onsite incident, including establishing a process for reasonable expenses.

The order also found that the power plant will only return to combined cycle operations when repairs and testing is completed.

The CEC staff is committed to public safety and this gap analysis is an initial review. The CEC staff will follow the facts to identify any compliance failures and will consider additional corrective actions and/or changes to Conditions of Certification as appropriate.

The CEC staff is also aware from the CEC's Summer Stack Analysis Update, which provides near-term situational awareness on the potential impacts of a west-wide extreme weather event and prolonged drought to the critical months

of July through September 2022. This analysis projects a potential need for contingency resources of up to 2,400 megawatts. These resources may be required to ensure electric system reliability for peak and net-peak hours during the summer of 2022. Next slide, please.

The Russell City Energy Center is a 600-megawatt natural gas-fired, wet-cooled, combined cycle electric generating facility. There are many different configurations for combined cycle power plants, but typically each combustion turbine has its own associated Heat Recovery Steam Generator, also referred to as a HRSG, and those HRSGs supply steam to one steam turbine. Russell City Energy Center is a power plant designed in a 2x1 configuration: two combustion turbines each, with their respective HRSGs supplying steam to the one steam turbine. This design also allows the facility to operate in a 1v1 configuration, (phonetic) meaning one combustion turbine and the respective HRSG is providing steam to the steam turbine generator.

On the evening of May 25th, 2021, Pacific Gas and Electric, PG&E, made a request to Russell City Energy Center to operate in a 1v1 configuration. Then two days later on the evening of May 27, 2021, PG&E called and instructed the power plant to be offline by midnight. During Russell City Energy Center's night shift's normal

shutdown procedures for taking the power plant offline, an incident in the steam turbine generator occurred causing an onsite explosion and fire.

The mechanical failure of the steam turbine generator resulted in an explosion that threw dozens of metal pieces off the project site and resulted in an onsite fire requiring fire department responses by the cities of Hayward and Fremont, and Alameda County. The steam turbine generator was severely damaged. Fortunately, there were no injuries and the lube oil mixed with the fire suppression water was contained, and no adverse impacts to nearby waterways.

The Project Owner, Russell City Energy Center, LLC, a subsidiary of Calpine Corporation, retained Structural Integrity Associates, SIA, an independent consultant to perform a root cause analysis of the incident.

On behalf of the State of California the field inspection units from both the CEC and the California Public Utilities Commission, CPUC, established a Joint State Agency Investigation team to also investigate the root cause. The joint investigation team conducted an examination and review of the power plant and associated documents, inspected the offsite facilities damaged by the debris, independently assessed the findings from the root

cause analysis, and investigated gaps they identified in SIA's report. Next slide, please.

This slide shows the inside mechanics of a steam turbine generator including its key components, beginning to the left of the diagram with the generator, then the low-pressure shaft connecting the generator to the low-pressure steam section, which is connected to the low-pressure steam turbine, then to the intermediate pressure shaft connecting to the steam turbine and steam control valves, which connect to the high-pressure steam turbine, which is on the far right of your diagram.

The joint investigation team initiated its investigation with an onsite inspection on June 7, 2021. The joint investigation team started at the steam turbine generator structure deck and observed that the thrust bearings for the steam turbine generator were exposed, and lube oil released.

The steam turbine generator shaft was fractured at the exit point of the intermediate pressure section to the low-pressure section, and the shaft was ejected from the steam turbine. The joint investigation team examined the turbine shaft that entered the low-pressure section and found that the shaft was twisted. The metal casing of the low-pressure section had separated, breaking bolts in the process.

The black charring and soot in the area around the casing were clear evidence that there was a fire at the exit of the low-pressure section to the steam turbine's generator. The drive shaft connecting the low-pressure section to the steam turbine generator was fractured at each end and had been thrown from the enclosure.

The various equipment on the steam turbine generator structure deck also had extensive fire damage. The lube oil feed and return lines were severed. Thus, the power plant was unable to shut down the lube oil system. Due to the immediate response by the Hayward Fire Department on the night of the incident the lube oil was contained to a retention pond and a third-party biologist later confirmed no lube oil made it off the site. Next slide, please.

The visual on this slide maps out the steam turbine debris field. If you point your attention to the intersection of the two ovals you will notice a red "X" notating the location of Russell City Energy Center's steam turbine generator. To the left of the red "X" is the location of the Hayward Water Pollution Control Facility and to the top right is the location of the Hayward Navigation Center Complex.

The joint investigation team and the Hayward Fire Department staff were back onsite August 3rd to examine the

locations where metal pieces from the steam turbine generator had landed offsite. This took the joint investigation team to the Hayward Water Pollution Control Facility and the Hayward Navigation Center to investigate where metal pieces from the steam turbine generator had landed.

At the Hayward Water Pollution Control Facility the joint investigation team met with the plant manager to examine metal pieces thrown onto the site and to inspect any damage. Some large metal pieces of varying weights up to 50 pounds were found in the facility's drying beds southwest of the power plant. The pieces consisted of turbine blade parts and a large part of the turbine casing. Some smaller metal pieces were found within the facility to the east. No injuries were reported and there was no structural damage.

The joint investigation team then inspected the Hayward Navigation Center Complex and met with the Housing Care Coordinator. The outlier of the debris field is a 12-pound piece of the low-pressure turbine blade root. The blade root was discovered in the complex, which has multiple trailers onsite serving people experiencing homelessness. The trailer used for meal preparation and eating was damaged when the 12-pound metal piece of the steam turbine generator traveled 1,200 feet penetrating

through the trailer's roof and landing on the floor. No individuals were in the trailer at the time since it was after operating hours.

These locations of the metal pieces are consistent with having been thrown from a rotating shaft. Next slide, please.

SIA's root cause analysis was released to the CEC staff on November 24th, 2021. Their root cause analysis concluded that there was only one cause for the incident stating that "The systems' inability to detect and drain excess water under pressure and at high temperatures within the reheater system is the root cause of the steam turbine generator drivetrain event at Russell City Energy Center." Though the joint investigation team concurs with this finding, the team found that SIA's root cause analysis was limited in the scope of its analysis and restoration recommendations. Both the CPUC and the CEC concluded that further investigation to capture the causal factors more broadly to the incident was needed.

The joint investigation team focused its site inspections not only on the power plant components involved in the incident, which include the steam turbine generator and the electrical generator and its associated HRSG, but also examined facility operations, maintenance, and management practices that may have contributed to the

causation of this incident.

The joint investigation team determined that there were three causal factors to the incident. Those factors included: deficiencies in the equipment maintenance and monitoring program for some critical equipment, deficiencies in control room operator interface and training, and inadequate protection from water induction.

At this point I would like to welcome to the podium, my colleague and new best friend, Geoff Lesh, to talk us through the incident as it occurred.

MR. LESH: Thanks, Elizabeth.

For the record, my name is Geoff Lesh. And I am the Manager over the Engineering Office within the Siting, Transmission and Environmental Protection Division.

Before the incident, the plant had been running for some time on a two-on-one configuration, and then subsequently changed to a one-on-one configuration with Combustion Turbine 2 and its associated HRSG in operation.

This figure I have up here shows a very limited scope. It's a focus schematic showing the areas of the HRSG that we think are most relevant to this incident. It shows towards the left here you see the two valves and the two HRSGs. And then towards the right there are a couple of check valves, and we'll talk more about those as I go forward. But the relevance here is that these two HRSGs

had both been in operation. As they switched from two-on-one to one-on-one operation. HRSG Number 1 shut down, along with this combustion turbine and then started to cool off while HRSG Number 2 continued in operation. Those, as they were at that particular time in their configuration, HRSG 2 was in full operation, HRSG 2 (sic) was off and not operating as well as Combustion Turbine 1.

So on that night as they were shutting down, and had been requested to shut down, the first problem that occurred was that when they started this one-on-one configuration, two days prior to the incident, the valve in the upper left of this diagram with the "X" on it that was supposed to be closed had experienced a steam leak over the prior two days. Which allowed a flow of high-pressure steam into the offline HRSG's reheater section.

As a result of the ongoing steam leak into the offline, and much cooler HRSG 1 over two days, a large volume of water condensed within its steam piping. And that's referenced here by the upper figure of the rectangle with the water-look in the loops. There are devices there that look like spigots. Those are our drains. I guess that's enough on that.

The second problem that occurred is as this water built up, the power plant operators did not detect the high-pressure hot water collecting within the offline HRSG.

Because the system had been running and the steam leaking into the system was very hot and under pressure, the water they collected there remained under pressure and at high temperature. The HRSG 2 was somewhat like a pressure cooker. It was stagnant and not boiling, but it was under high pressure and high temperature.

The third problem that occurred was the manual check reheat valve, shown to the right of those HRSGs, between the offline HRSG and the steam turbine was not put into a block mode configuration at the time. So it was functioning as a check valve which allowed steam to pass in one direction. In this figure it would be from left to right and would allow passage of steam or water towards the turbine, but not the other way.

So during this plant shutdown on the night of May 27th, 2021, the steam pressure being provided to the steam turbine by HRSG 2 dropped below the pressure of that condensed water in HRSG 1, allowing the water to push itself and to be drawn into the still-operating steam turbine. And what is termed by industry as a steam turbine "water induction event," the water led to a loss of speed control of the steam turbine with the overspeed causing it to fly apart. Next slide, please.

Identified deficiencies by the investigation team including equipment maintenance and monitoring program,

which allowed degradation of CRH-1 valve to occur. That's the one that allowed the steam leak to occur over two days.

The corrective actions for the equipment maintenance and monitoring program at the power plant include:

Implement a preventative maintenance and monitoring program for the cold reheat valve, its gearbox and actuator assembly that includes frequency of inspections, services, and required lubrication and submit to staff for review and approval.

Second, to reconfigure the CRH stop valve to close based on an actuator torque rather than limit switches.

And finally, to implement an annual preventative maintenance program for the steam attemperators and mixers and submit to staff for review, comment, and approval. Next slide, please.

For the second problem that occurred that night we refer to Causal Factor Number 2, which is deficiencies in the operator interface and training which prevented the operators from detecting the buildup of condensed steam. The corrective actions for the control room operator interface and training include:

Synchronize the internal clocks that generate the time and date stamps for alerts and alarms for both the

Mark VI and the distributed control system.

Consolidate the alarms generated by the DCS and Mark VI control systems into a single control system to reduce the need for operations staff to monitor multiple systems simultaneously.

Then reduce the occurrence of nuisance and false alarms by providing some "smart alarm" logic in the consolidated DCS and Mark VI control systems and provide an updated operator training that includes water induction events along with evidence of its completion to the Commission.

Finally, the last two items are to implement some control logic to alleviate pressure within an offline HRSG should it occur. And to implement control logic to discharge water from the offline HRSG should it occur. Next slide, please.

And then the third problem that occurred, we identified inadequacy of water induction protection, including lack of blocking valve between offline HRSG and steam turbine.

The corrective actions for inadequate water induction protection include:

Convert that check valve of the HRH stop/check valve from manually operated to electrically operated, so that it can be put into block mode when it is offline.

Provide an ASME TDP-1-2013 conformance analysis and provide the list of design modifications that are being implemented along with evidence of their completion. I should mention here that ASME TDP-1-2013 it is an industry standard specifically to address prevention of water induction events for steam turbines, which is periodically updated and is published by the American Society of Mechanical Engineers.

And then finally to revise operations procedures needed to accommodate all corrective actions that we have discussed and submit to staff review for approval. Next slide, please.

In summary, there are 11 corrective actions identified by the JAIT. Each one addresses an aspect of one or more of the three causal factors just discussed. This list includes and expands on the list of restoration recommendations provided in the RCA commissioned by Calpine. Staff recommends that these corrective actions be adopted and completed prior to the power plant resuming commercial combined-cycle operations.

Are there any questions? (No audible response.) In that case, I would like to call on James Cheng of the CPUC, who is serving as CPUC's Investigative Team Leader.

COMMISSIONER VACCARO: Geoff, really quickly, sorry I didn't hit my button fast enough. I did have one

question about what you just mentioned with respect to the industry standard. So is that a newer standard or was that something that was in effect when this plant was initially permitted? I'm trying to make sure I understand that you're saying that as part of the suite of corrective measures to be compliant with the industry standard. I'm just wondering was that something that was applicable throughout that?

MR. LESH: I would say that it has been around in various forms for many years. It was originally considered a voluntary standard and the extent to which different power plants adopted conditions is left to some discretion between the power plant and the builders. We are at this point making use of the most recent standard and asking them to adopt its recommendations.

COMMISSIONER VACCARO: Okay, I think I understand. So you're just saying be current. Be current and be compliant with the most current applicable industry standard.

MR. LESH: Yes.

COMMISSIONER VACCARO: Thank you.

COMMISSIONER MCALLISTER: So I will have a question, but maybe the presentations can finish, and we could see if there's any public comment. And I think we might have some additional questions.

CHAIR HOCHSCHILD: I did have one question. This is the first time in my nine years in the Energy Commission where there's been an incident like this. I'm just curious to the best of our knowledge, how often has an accident of this type happened elsewhere in the country? Is this something that's a one in a million thing or is this something we see more frequently? I have not seen anything like this in my time here, so.

MR. LESH: Historically it's not unknown. There have been, especially back in the 1960s through '90s perhaps, more water induction events to steam turbines and more steam turbine self-destructions over overspeed events.

I think in some of the resources I looked at, listed out of I think seven at the time, categorized steam turbine explosions. Maybe seven of them were due to water, and of those all of them involved an explosion.

CHAIR HOCHSCHILD: That's helpful. Unless there's other questions shall we move on to the PUC?

MR. LESH: Thank you.

CHAIR HOCHSCHILD: Thank you, Geoff, I appreciate it.

MR. CHENG: Thank you, Geoff, for the introduction and Elizabeth for that very detailed report. I too look at Mr. Lesh as a newfound friend and colleague through this experience. It's been quite a positive

aspect.

MR. CHENG: Good morning, everyone. Again my name is Jim Cheng and it's my privilege to represent the California Public Utilities Commission's Safety and Enforcement Division. I am the Lead Investigator for the May 27th explosion and fire at the Russell City Energy Center. And as a representative of the Safety Enforcement Division I can say that the CPUC enforces PUC rules and public utility codes and jump through the general order to ensure that electric and gas producers operate in a safe and reliable manner.

This Division enforces CPUC rules, Public Utilities Code, and general orders to ensure the electric and gas generators operate and provide safe and reliable service. We achieve this through audits, investigations and inspections of utility incidents and facilities. We achieve this through audits, inspections, and these types of investigations.

Throughout this investigation CPUC has worked in tandem with CEC. This work has required over 270 documents to be requested and reviewed as well as multiple onsite visits to observe the progress this plant has been making to move forward to reserve normal operations by June 1st.

This collaborative as accumulated this list of these 11 corrective actions with which PUC concurs.

Although the purpose of the CPUC's investigation was to ensure compliance with General Order 167 and other public utility codes, we believe that if this power plant follows these corrective actions they can resume full operation safely.

The hallmark to this statement is the outstanding and collaborative nature of working both with the CEC and the City of Hayward and these first responders. In my 25+ years of state service this is a first and it has definitely enhanced our regulatory authority in a cooperative and collaborative way. The depth of this report is a testament of what can be achieved through cooperation of fellow agencies.

In closing I hope that these collaborative efforts continue in the future as they can usher in a new era of agency, interagency cooperation and enforcement.

If you have any questions, in answer to that previous question about TDP-1 DA semicode (phonetic) this power plant was commissioned in 2007 and was exempt from the 2013 revision of that code. We are asking that they bring it up into current standards at this point.

And in answer to the previous question is this is a one-in-a-million event, it is very rare. In 30 years of investigation going back we have not seen such an event occur. There are NERC standards, National Energy

Regulatory Commission standards, which are guidelines primarily for nuclear power plants. But in some ways those standards are a little overreaching in this situation.

But we do believe that these corrective actions address that and that possibility. There have been standards established in our general order, which we will also hold Calpine accountable to and update those standards in their procedures and SOPs.

And with that I give the podium to Elizabeth Huber. Thank you.

CHAIR HOCHSCHILD: Thank you.

Commissioner Vaccaro, yes?

COMMISSIONER VACCARO: Yeah, I was just going to say I don't have a question, Mr. Cheng, but really do appreciate your coming and all that you've said. I think you underscored some really important points. There's still going to be time for Commissioner discussion, but I didn't want you to leave the podium without recognizing a lot of important points that you just made, one of which is the strength of the PUC, the city, the CEC all came together for a really robust analysis, which is reflected in the report. I think that's something that you were mentioning. And I did read the report, and I agree. So thank you for coming today.

MR. CHENG: It was my pleasure. Thank you for

having me.

CHAIR HOCHSCHILD: Thank you. I think we had some – was there some prepared remarks from the CAISO as well, Elizabeth?

MS. HUBER: No.

CHAIR HOCHSCHILD: All right, we'll now go to Calpine?

MS. HUBER: Yes.

CHAIR HOCHSCHILD: Okay.

MR. HARRIS: Good morning, Jeff Harris, on behalf of the --

MS. HUBER: Oh, I'm sorry we're not done, Jeff.

MR. HARRIS: Oh, I'm sorry.

MS. HUBER: My sincere apology.

Thank you, Jim. And you'll be here for questions? Jim will be here for questions at the end.

Successful completion of these 11 required corrective actions would directly address the cause of the May 27, 2021, incident and provide protective measures to further reduce the likelihood of future steam turbine overspeed due to water induction. Next slide, please.

I would now like to invite via Zoom Hayward City Manager, Kelly McAdoo and Hayward Fire Chief, Garret Contreras, to speak to their ongoing activities in preparation for Russell City Energy Center's returning to

safe operations.

MS. MCADOO: Good morning, everyone. Thank you, Elizabeth. My name is Kelly McAdoo. I'm the City Manager for the City of Hayward. It's good to see the Commissioners again. I apologize for not being in-person this morning. We have a City Council meeting this evening, so it's a busy day for us here in Hayward, so thank you for letting us participate via Zoom.

And I just also wanted to welcome Commissioner Vaccaro to the Commission. We haven't met in person. We've met everyone else in person during the site visits, but it's nice to meet you virtually, and welcome.

I wanted to, just before I made some comments to the points on the slide, just particularly thank the CEC and the CPUC staff, in particular Elizabeth Huber who has been leading and coordinating these efforts on behalf of the CEC. This effort has been, as you heard from Mr. Cheng and from the CEC staff, just enhanced by our joint agency cooperation and collaboration. And I really do want to thank both of those agencies for the preparation of the gap analysis report. I think from the City's perspective it addresses a lot of the concerns we had with the root cause analysis.

And also, I just want to say the report's fairly accessible to the lay reader. If you don't understand

PowerPoint, power plants or power plant operations, you can read the report and actually understand what the corrective actions are. And so I'm just very grateful for the CEC and CPUC staff work on this additional gap analysis report.

Just quickly we have, as you've heard, been working with CPUC and CEC staff on the Joint Agency Working Group. And then consistent with the Commission's order to allow Calpine to restart operations at the Russell City Energy Center, we have been working with Calpine staff. And the direction in the order was to discuss any needed modifications of standard operating procedures for first responders to implement when responding to incidents on site, including establishing a process for reimbursement of reasonable expenses.

So we have been meeting with Calpine's new staff representatives, the Fire Chief and I, and we are finalizing what we're calling a Hazardous Materials Resiliency and Action Plan. The Fire Chief on the next slide will talk to some of the additional training opportunities and actions that we're taking in that plan.

And then in response to the commentary about reasonable expense reimbursement, we have been negotiating with Calpine for partial funding for a fire department hazardous materials response vehicle. This would allow -- during this incident we had to rely on the availability of

response vehicles from the City of Fremont and from Alameda County and did not have that capability within our own fire department. And so with this new response vehicle it will allow our firefighters to be trained and they will be participating in drills with Calpine staff to be able to utilize that response vehicle in case of future incidents. We have been working diligently and I believe that the insurance claims for the Homeless Navigation Center are almost actually resolved. I know they've been in the process for a number of months and so that should be resolved shortly.

And then also consistent with the Commission's prior discussion, we've been having continued conversations with the Russell City descendants. And our community action group and Calpine is proposing some additional monetary contributions to those efforts in our community, so I just want to thank Calpine for their partnership. I think as we've gone through this, we've seen an improved relationship with them for sure, and really just appreciate the staff onsite and their willingness to work with the fire department and with city staff on some of these efforts.

With that I'm going to turn it over to the next slide and asked our Fire Chief, Garret Contreras, to talk a little bit about the first responder plan as we go forward.

So next slide, please.

MR. CONTRERAS: Thank you, Kelly, and good morning to the Commissioners and staff. Thank you for the opportunity to be with you this morning. I wanted to reiterate also how much we've appreciated the cooperation and collaboration, in particular, with Mr. Lesh and Mr. Cheng. Your cooperation and coordination through the investigation, it has proved invaluable for our level of comfort of things moving forward from the fire department's perspective.

In addition, all the Commissioners that came down and took an interest in our community and the situation that took place is greatly appreciated as well. And Ms. Elizabeth Huber has been instrumental in making sure that we have a level of comfort and that there's follow-through on things, so I can't say enough about how great it's been to work with Elizabeth.

And also, I want to take a moment to recognize the cooperation and collaboration with the plant staff, both Cameron White and Barbara McBride have been really accessible and very helpful through the process, and we appreciate that.

We were notified of some of the early successes, of some changes in the process and communications, and were given early notification of some management changes on

March 10th. Those were management changes at the Calpine plant. We've scheduled an annual HFD city manager meeting, with a date to be decided. Our Knox-Box, which is our lock box, so that we can gain entry during business hours or after hours, that was updated in December of '21 as well as all of the facility's material safety data sheets were updated at the same time.

Just after the explosion, we also did a, what we call our CUPA, our hazardous materials inspection. In all of the findings from that inspection at that early date were remedied within a week by the Calpine staff. They had those things taken care of so, we're really thankful to see that.

We have ongoing meetings with both our training chief, as well as Deputy Chief Eric Vollmer is our Special Operations Chief who is maintaining those constant contacts with the Calpine staff.

We have a hazardous materials tabletop drill scheduled for later this year. We haven't set the date yet, whereas we work through some of the planning stages as well as a schedule of plant tour for all of our new company officers for familiarity. And not just for familiarity with the plant, but with the people involved.

Identifying hazardous materials location, review of emergency action plans, identify possible fire explosive

areas, things that have changed on the plant since the original construction, kind of getting updated and changing our plans accordingly.

Identifying water supply locations and access points.

And then we hope later this year to have a real rescue scenario, with a downed person, obviously during a period of time where the plant is down. Obviously, it's not going to be taking place in the peak of the summer months, so most likely that confined space or delegated rescue operation will take place when the plant is not operating, most likely in the fall or early winter.

With that, I thank you for the opportunity and am available for any questions. If not, we will be passing it back to Elizabeth.

MS. HUBER: Thank you, Fire Chief Contreras, and Kelly. Next slide, please.

I have never been more proud to have the colleagues that I have, and the support of my Deputy Shawn Pittard, and his counterpart at the CPUC, Lee Palmer.

We would like to recognize all those who have been involved in the investigation root cause gap analysis. And all the complementary activities required for returning Russell City Energy Center to commercial operations safely for summer 2022. Completion of the corrective actions by

Russell City Energy Center would prevent to the degree feasible any future turbine overspeed events due to water induction by deploying redundant systems of prevention and detection.

The joint investigation team will continue to meet with Russell City Energy Center staff who have agreed to the corrective actions and have already begun implementation. The CEC staff has tasked the CEC's Delegate Chief Building Official to verify that once the work is completed that work complies with all required building codes before issuing a certificate of completion. Next slide, please

The CEC staff recommends your adoption of the identified corrective actions and to delegate to the CEC Executive Director to verify that those corrective actions have been completed. The team is available to answer any questions. Thank you.

CHAIR HOCHSCHILD: Thank you, Elizabeth. And let me just say I really agree with Commissioner Vaccaro's comments on the report, which I thought was very detailed, very thorough, but also very readable. And I think that's an important feature when we're trying to explain these events to the public and to interested stakeholders to write in a way that's really accessible. I just want to commend the whole team and their collaboration.

I think this moment is sort of in keeping with the trend of the last few years of finding opportunity inside crisis, which I would say is sort of the defining story of California in the last few years. I do think there is some good that can come out of this and has already come out of it. I want to just commend all the stakeholders for coming together: the city, Ms. McAdoo, Chief Contreras, PUC, CAISO, CEC, Calpine, everyone. Because I think we all share the same goal right now, which is for this never to happen again at this facility or any other facility and so there's lessons learned. And the knowledge transfer from this, I think, is really important. And I do feel everyone has come together in good faith to really work to ensure we're successful in that.

So with that I believe we can turn now to public comments starting with Calpine unless I'm -- sorry?

(Colloquy off mic.)

MS. MURIMI: Thank you.

CHAIR HOCHSCHILD: Yeah, we'll go to Commissioner discussion after. So let's go back to you, Jeff, I'm sorry. Go ahead.

MR. HARRIS: Good morning, again. It's Jeff Harris on behalf of Calpine Corporation. I'm happy to be here today. I've never been more happy to be in this room than I am today, so it's great to see you all in person.

I think you saw before the meeting some really good interactions, showing sort of the professionalism and the respect among all the parties that have been involved in this very serious and intensive effort for almost a year now. So I'd like to turn it over to Mr. Mike DelCasale with Calpine, he's the Senior Vice President of Operations just, to say a few words. And we'll obviously make ourselves available to answer any questions you might have, so Mike, go ahead please.

MR. DELCASALE: Good morning and thank you for the opportunity to speak to you today. My name is Mike DelCasale and I'm Calpine's Senior Vice President of Operations.

Over the past 39 years I have held various positions in all aspects of power plant operations, maintenance, design, and construction. I started my career at the U.S. Navy through the Department of Defense. I've held multiple positions in power generations across the country. My current duties include responsibility for the safe and reliable plant operations, the entire Calpine fleet of 76 power plants, including our 13 units at the Geysers.

In addition, the men and women of the Calpine Asset Thermal Performance Diagnostic Center and our power operations financial team are also in my reporting

organization.

I'm a trained mechanical engineer, having received my Bachelor of Science in mechanical engineering from Villanova University.

We want to thank the California Public Utilities Commission, the California Energy Commission, and their respective staff for their hard work and collaboration to conduct a comprehensive review of the steam turbine overspeed event at Russell City last year. And to review and determine the corrective actions needed to address the identified design issues. We are implementing all of these corrective actions to safely return to combined cycle commercial operations. Safety is a core value of Calpine. We acknowledge the seriousness of the event and the concern it caused in the community, and we remain deeply committed to the safety and wellbeing of the community, our employees, and the facility.

Our Calpine team worked tirelessly over the last year, and we are on track to safely return the facility's combined cycle operations in time to meet the State of California's summer reliability needs.

Our entire team, from our executive management to our plant staff take this event very seriously. That's why we commissioned an independent report which identified the root cause. And then another report, which identified

actions to ensure the safe operation of the facility.

We are thoroughly reviewing the CEC report that was issued Friday evening. While we are not aligned with all the aspects of the report, we do agree with all the corrective actions and will ensure they're completed prior to our return to combined cycle commercial operation. Our experienced team properly maintained and operated the facility and no change in maintenance or operational training could have prevented this event. However, the seriousness of this event resonates within our company at all levels. We are already implementing the corrective actions.

We look forward to our ongoing partnership with the California regulators, the City of Hayward, the Hayward Fire Department, and the industry experts to ensure the wellbeing of our community as we work to keep the lights on this summer. Thank you.

CHAIR HOCHSCHILD: Thank you.

Let's see, do we have other public comment, Dorothy, at this time?

MS. MURIMI: We do have public comment on the line on Zoom.

CHAIR HOCHSCHILD: Okay. Let's go to that, thanks.

MS. MURIMI: Thank you.

Again, just a reminder for individuals who are on Zoom go ahead and use the raise-hand feature. It looks like an open palm or a high-five at the bottom of your screen or device.

And we'll start with Claire Warshaw. Go ahead and unmute, state your affiliation, spell your name, and you may begin your comment.

MS. WARSHAW: Hi, my name is Claire Warshaw. I'm a member of the public, C-L-A-I-R-E and then W-A-R-S-H-A-W. I want to thank everybody for investigating this event so thoroughly and sharing it with the public.

I noticed last night and this morning, and I didn't look right before the meeting, but I have looked probably an hour before the meeting, that Agenda Item Number 3 which I think this is did not reflect this material. It reflected something that had to do with CEQA. And maybe I saw that wrong, but I think the backup material for the Zoom audience might not have this in it.

And then I just want to mention a question, because I didn't notice before when this event had been talked about that the PG&E had made a request a couple days before the event happened, if that's unusual, to the operators. That would be a concern to people that I had worked with, if I had all of a sudden received an unusual request. And I wonder if PG&E will like test them again

with the very same kind of request. And if that's -- if it's appropriate to think about how the people that were operating might perceive that or not even understand that all these things might happen. I understand all the follow-up engineering and everything, but it is difficult to be a worker and then suddenly have something unusual tossed at you. And I don't know if that's regular or not, that's my comment. Thank you again.

MS. MURIMI: Thank you, Claire.

Moving on we have Steve Guttman. That's Steve Guttmann. Go ahead and state and spell your name, give your affiliation if any, and you may begin your comment.

MR. GUTTMANN: Good morning, everyone. My name is Steve Guttmann, spelled G-U-T-T-M-A-N-N. I'm actually here as a member of a grant applicant under the next EPIC challenge, which is Item Number 5 on your agenda. But I am a practicing mechanical engineer in California, and I have a deep understanding of steam systems, and so as I listened today a question came to mind.

The Russell City Energy plant experienced a failure that apparently is not unheard of in a plant configured like the Russell City Energy Center plant. So my question is, are there other plants in California that are configured similarly? And should the action taken by the Commission not include a risk analysis of other similar

plants in California and possibly even recommendations to implement some or all of the corrective actions at any similarly configured plant? Thank you.

MS. MURIMI: Thank you, Steve, and apologies.

Moving on we have Andrew Wilson. That's Andrew Wilson. Go ahead and state and spell your name and give your affiliation, if any.

MR. WILSON: My name is Andy Wilson, A-N-D-Y W-I-L-S-O-N. I'm on the Board of Directors of California Pilots Association, or also known as CalPilots. As some background for the Commissioners we participated in the siting process for power plants as power plants began to be constructed or proposed construction near airports. And this resulted in the FAA developing their own plume analysis, thermal plume analysis, and the effect they would have on aircraft.

So the position of the RCEC power plant is about a mile-and-a-half west of the Hayward Airport. It's also under the airspace for the Oakland Airport and it's also very close to the transition height of aircraft coming in and out of the airport. This is also very concerning, because of the helicopters that are close to this area.

Now there is an FAA notice for aircraft not to fly directly over the power plant. But my comments today Center around the fact that the Commissioners have heard

about the Navigation Center, which is a housing center. But there has been no mention of aircraft in the area and how they would be affected by flying debris from the explosion.

You've also heard that this is not a one-off or an anomaly. You heard two speakers, one address the RCEC power plant and Calpine. But the other speaker brought up, "Well, what about the total risk being inclusive of all generators?" So that hasn't been addressed.

The other issue is the City of Hayward owns the airport. It's also their responsibility to bring attention to aircraft in the area.

Now the time of the explosion was such that the airport was closed, and little traffic was going into Oakland. However, if this was around peak operating times, we could have aircraft being hit by metal debris and so on and so forth. So my question is you address people on the ground, specifically navigation centers, but you have not addressed pilots in the air or aircraft in the air.

As a brief history it was the efforts of CalPilots that brought the attention to the CEC to include adding aviation to your transportation analysis on power plants. That's all I have, thank you very much.

MS. MURIMI: Thank you, Andrew.

Seeing no public comment in the room and no more

on Zoom, Chair, back to you.

CHAIR HOCHSCHILD: Okay let's go over to Commissioner discussion, beginning with Commissioner Vaccaro.

COMMISSIONER VACCARO: Thank you. So I'm going to build on I think some of the discussion that started on the dais. I don't want to be repetitive, too repetitive, but I think it bears repeating to thank everyone, the CEC staff. I know it was the Siting staff. There was support from our Legal Office, PUC, the City of Hayward, for all of the work that was put into this and the development of the report. Also I thank Calpine for the cooperation in the investigation. I think I heard a word today that really took me a bit by surprise, and I was happy to hear it from City Manager McAdoo, which was "partnership," and partnership across the board.

So such a serious incident could lead to, I think, a new model for how we look at serious incidents that might occur at power plants, how to collaborate, and how the project owners can be I think even better partners within a community in terms of being part of a solution.

I also heard from Calpine that you have maybe a few reservations about the staff report, but nonetheless you will comply with those measures that are being recommended. I think that's very important.

I want to take a few steps back because, Elizabeth, I thought you did a tremendous job in the presentation. It was very thorough, it was long, but it was rightfully so. It was densely packed, I think, with a lot of important information. If no one read the report I think what they heard today between you and Geoff and Mr. Cheng was the content of the report, easily understood, technical at the right levels. But I think it underscored a few points.

First of all, Calpine did commission an independent analysis sort of for the root cause. And what staff, PUC and the City determined is there was still more work to be done. And I think that's what the report reflects, that there was more investigation to really dig a little bit deeper into the root cause. And also to fashion, I think, even more workable, broader, and more stringent measures to ensure safety.

And I think that's really the thing that's been underscored today, employee safety, safety of the community is paramount. I understand it's important for a power plant like this to be online for reliability purposes, but not at the expense of safety. And I think what I'm hearing today and what I read is that employee and public safety were the number one priority of the investigative team in coming up with these measures that are being recommended.

So again, thank you all for the diligence and the hard work. And for transparency's sake I want to make sure that I put on the record I did get a briefing from staff on the report, so it was on this item. And I mention that because there is still a separation of functions element to this, because this report does not delve into any investigative findings that might or might not result in any other compliance recommendations by staff. That's still something as I understand that may come, might not come, but we didn't discuss that. We stuck to the report, and I think that's important.

I feel, Elizabeth, that you touched on that in the opening remarks. That there is a distinction between what we're looking at today and the possibility of more to come as staff continues its fact-finding.

That was a question that I asked yesterday. And the able legal counsel of Dian Vorters and Jared Babula kept me on the right side of separation of function as I started to ask questions. But I am satisfied that this Phase One is an important Phase 1. I look forward to what Phase 2 might look like as the fact-finding continues.

And again, thank the City of Hayward, the City Manager and the Fire Chief for their comments today as well.

CHAIR HOCHSCHILD: Okay. Let's go to

Commissioner McAllister, to be followed by Vice Chair Gunda.

COMMISSIONER MCALLISTER: Well great, well I'll just pile on to the thanks: Elizabeth, Geoff, Mr. Cheng thank you very much for presenting here today. I also got a briefing from staff, which was really complete. And thanks to Shawn and his team for playing 20 questions with me. I asked a lot of questions and got really good answers, so I was thankful for that.

And it just reflects the really long sustained effort with all the partners including Calpine, the City, to address the real fundamental issues that gave rise to this event, which I think are – well, this presentation today and just sort of throughout the year ever since we heard about this incident and we went down and visited and just talked to everybody and started piecing together, what the response had to be.

It sort of has reminded me -- I had a professor in grad school, Gene Rochlin, who read a book called, "Trapped in the Net." And it's about complex systems and how they can get away from us, and things could happen that people in the moment don't understand. And it gives examples from the financial industry, from the space shuttle -- was a really interesting one, the explosion in the space shuttle -- where just the structures there are

not there to give the information to the right person, so that they can understand it and interpret it in the moment and respond appropriately.

And so this would be a kind of an interesting case study for that kind of an approach. Because there was a long chain of events that sort of all had to take place in order for that generator to get instantaneously unloaded while there was still pressure on the steam turbine trying to move it. And so this runaway event really happened, because of I think the lack of situational awareness and kind of lack of understanding in that moment. And so certainly that there was water in the presumably decommissioned, or out-of-service steam generator.

So anyway I really appreciate the unpacking of this and really the sort of understanding of the human -- not only the equipment, yes there's lots of equipment issues here, several of them -- but the sort of human element that's interfacing with the equipment that needs to understand and have that situational awareness. I think all these lessons and the training and the remedies that have been, that are being required now I think are correct.

But there's kind of this broader institutional kind of overlay that I think is still worth thinking about as we go forward. These are complex systems. I mean there's no getting around that. And so we have to make

sure we have the equipment, or the understanding and the sort of human sort of compatibility with what are increasingly technologically dense systems as we have a lot of digital tools, a lot of computers, a lot of sensors, those have to actually all operate correctly in the moment. And the people running them have to know everything that they need to know. So I appreciate that kind of unpacking where the blind spots were and how to correct them. The procedures, I think Commissioner Vaccaro talked about kind of the new ruleset more eloquently than I can.

But again I just want to thank -- this was a long time coming. And I think the report and the collaboration really was exactly what was needed and bodes really well for managing our fleet going forward. And so again thanks to Elizabeth and Shawn and Geoff. I really appreciate your insight and sort of your just the right level of folksiness about what's that high technology, complex technology that's not accessible to most of the public, but you do a really good job of translating that.

And the teams from both Commissions, they're behind all of you. The City, Ms. McAdoo and Fire Chief Contreras, I really appreciate your sustained attention to this and your dedication to your community to really get it right. And then of course Calpine for stepping up and really partnering with all of the above. So I really,

really appreciate the moment that we're in. It's not quite a conclusion, but I think a good moment to recognize the good work that's been done and really move on with it with a real positive posture. So thank you all.

CHAIR HOCHSCHILD: Vice Chair Gunda?

VICE CHAIR GUNDA: Thank you, Chair. Great comments by Commissioner Vaccaro and Commissioner McAllister.

So I just want to focus on a few things that we started off last year. So I think it's pretty fair to say that last year when we first discussed this in the public meeting, in the Business Meeting, it was a pretty stressful meeting. I think a part of the stress and kind of how the meeting played out really came from a lack of transparency and awareness of what was happening, a lack of trust generally that we all kind of discussed that day.

And so I think for me the priorities as we were going into this process, we are continuing to improve transparency and awareness of the situation. And I think Commissioner McAllister spoke to that about how well the teams got together and kind of worked to make sure this information is accessible.

I think what I heard from the City Manager McAdoo and Chief Contreras is really from them, there is a trust-building exercise that happened. And then it seems

to appear that now we're all kind of on the same page on the information and the accuracy of information and how we are sharing it.

So I think the next kind of couple of pieces are then consensus on the problem and statement of what happened, the investigation, and the consensus of whether the remedial action that was put on is sufficient to address those issues.

And what I understand to be, and this is where I defer to the technical experts, that we have well understood the problem. I'm not as detailed in understanding that. And I defer to your experience and prudence on that. And the remedial action that you're proposing, to the extent that I understood seems appropriate, but I don't know what I don't know. And I trust your expertise on that.

Then kind of finally going to what Commissioner McAllister mentioned, which is the proactiveness of how do we take this situation and learn from it and continue to establish processes to take these best practices in moving forward into the safety.

So overall, I just want to step back and just say thank you, Elizabeth. You've really stepped into this and kind of created the atmosphere for all of us to collaborate. I really appreciate your thoughtfulness and

respectfulness in bringing everybody together, and I think a huge kudos to that that's not often said.

Geoff, to your ability to just digest this complex problem and bringing it together.

Mr. Cheng, thank you so much for being here today from PUC. I had the opportunity to discuss with you a couple times, thanks for your ability to engage on this issue the way you do. And obviously the leadership at the city including the Mayor, and also Calpine.

I think it was a tough meeting last year where we were not really feeling that we all took charge of the situation and taking and saying we're accountable for what happened. But this looks like we all came together, and I really appreciate Calpine. And it's a tough spot to be in, but coming together and being a part of the conversation and improving that. So overall just really grateful for the work of the entire team and CCL. And I think and I really hope that we make this a model to set up the future safety standards for the state.

And I want to just flag this, reliability is not going to go away. And as Commissioner Vaccaro said these are not choices we want to choose between: reliability and safety. That's just not something we want to be compromising on. So I just want to make sure that we know we're all working together towards that.

And to the extent that our gas fleet is older and older and older and going to be dependent on for reliability over and over for a little while, just really how do we suggest something to the Commission in terms of actions on continuing to be proactive on other plants that might have been a similar situation. I don't know what I don't know, but I defer to the experts in helping address that. Thank you.

CHAIR HOCHSCHILD: Thank you.

Commissioner Monahan?

COMMISSIONER MONAHAN: Well, I'm going to build on some of the remarks Vice Chair Gunda, Commissioner Vaccaro, and Commissioner McAllister have made. While this might be a rare event, we have to do all we can to make sure that it never happens again. Someone could easily have been killed by the flying shrapnel, as the report called it. The first responders could have been hurt. And I think you are hearing from all the Commissioners sort of a recognition of how life-threatening this incident was. And it's not often that we on the dais are ruling on matters of life and death and this is one of those incidents, so we're taking this extremely seriously.

And I just want to acknowledge some of the lessons learned, which I think I'm hearing from others as well, is that we have to conduct an independent analysis.

So I congratulate the team and Drew for really pushing forward. That wasn't a fait accompli at the beginning, and I think that's clearly a lesson for us is that we have to do an independent analysis. It's not enough to have a root cause analysis conducted by the facility in the wake of an incident like this. We need an independent analysis.

A clear lesson learned too is the engagement, the deep engagement with the city and the Fire Chief. And the importance of having a team consisting of the regulatory agencies: the Energy Commission, the Public Utilities Commission, CAISO, so as needed, the facility, the city and especially the Fire Department. And the fact that we're hearing from all these entities that this conversation is happening, that trust is building, that a plan is being put forth that everyone agrees will enhance safety is it gives me a lot of faith that this is a solution we should move forward with.

So just I want to come back to that this is a sober moment. We treat this as a matter of life and death and we're acting in that way. And I think the team, Elizabeth, everybody's best friend Geoff apparently, have really done a good job in working with all the stakeholders to have an agreement that works for everyone.

CHAIR HOCHSCHILD: Thank you.

Yeah, Vice Chair Gunda?

VICE CHAIR GUNDA: Yeah, I just wrote myself a note and not to forget -- and oftentimes I know not to forget -- and Shawn, thank you. It doesn't happen without the leadership of the Division. I just wanted to just thank you. I told myself not to forget the management team, which is essential, and so thanks for doing that.

CHAIR HOCHSCHILD: I'm glad you noted that. Shawn, thank you for your work.

I do want to press Calpine though on one thing you said, if I understood correctly, that there was no preventative maintenance that could have avoided this. And that seems to be directly in conflict with page 18 of the report which says, "Maintenance failure were associated with critical components and that the operation staff failed to identify manually operated stop check valve as a potentially critical blocking valve should water collection occur in the offline reads steam pipe." I'd just like your response to that.

MR. DELCASALE: Yes certainly, Commissioner. First thing I want to say is Calpine does recognize the importance here. I've been personally involved with this event since that occurred. I'm here today, because I've been working on this ever since it occurred just to let you know how serious we take this. And I'm taking it on personally.

Specific to our comments that we do not believe that any change in maintenance or operation would have changed it. Our basic premise is that the event occurred, because of decisions made during the design process around the drains. So if you start with that premise if the drains were operating properly -- and there was a decision made during the original design of the plan and it was reviewed by the CEC and Calpine's teams who implemented a program that would prevent the drains from opening to preserve energy to meet strict startup and commissioning admission conditions.

The belief is, our belief is that because that water was allowed to accumulate and we did not have a detection system as described by the investigation in the CEC report, that there was very little that the operators could have done to stop the event once the water started flowing. When you read TDP-1 it gives you very strict expectations, and this is also referenced in the report.

At the report states, you know, there's really three simple things in TDP-1, the ASME TDP-1. You know, the first thing you need to do with water is detect it. The second thing you need to do with water is to drain it, either through automatic or manual means. And the third thing you have to do with water is dispose of it properly. We did not have the detection system in position for the

operators to know about it. We will now. And our training and our training modifications that we're doing going forward is specific around the detection of water and the draining of water and pressure, so our operators didn't fail. When we designed this system, and our EPC contracting engineering firm designed the system and we signed off on it, that's where we had the failure here.

Specific to the maintenance that you asked, Commissioner, on the valve and under the valve? The overheat valve that we talked about that had the failure, we followed all of the OEM recommendations in the OEM manual, okay. Well, the failure that occurred was of a pinion bearing inside the gearbox. When that valve was taken off and sent to the shop that valve operated smoothly. There was no discernible means and methods to understand that there was a problem with the valve, so we went back in and investigated. The problem that occurred, and lies in the failure that occurred, was in the valve itself. As that pinion bearing moved or failed over time, the number of turns required to open and close the valve changed over time.

The CEC report talks about a change in torque, and it was over-torqued. The torque value on the actuator was less than 50 percent of the total capability of the torque. The actuators and the gearbox should be matched

up.

So it also talks about a range or change in work orders over time where they had to slightly increase it. If you go back through the investigation of the valve itself the torque adjustments that were required were tied to overtightening the packing. Those shafts have packing on it to prevent steam leaking, so that the periodic maintenance to go around can adjust the packing so it doesn't leak. It appears that at some point some of that packing was overtightened, which is okay, because it requires a little bit more torque open to close the valve. That's what it was. So the conclusion that it was driven to maintenance, is different than our conclusion that it was driven by a failure of a bearing inside the gearbox itself.

So the correction that we made, and we're in full alignment with our independent investigator SIA and the CEC, was to go to a torque-close versus a time-close. The way it was set up initially we had a time-close, so it just counted the number of revolutions. The way it's set up now with torque-close once it gets to a certain torque and we know it's closed we'll get feedback back to the control room.

So we are in full alignment with the change that’s being recommended here, so I hope that answers your

question.

CHAIR HOCHSCHILD: Okay, so your position is design fault. But I would welcome if there's a response, Geoff, or for anyone on staff on the basis for this finding that there was a failure of operations staff to identify some of these features. I don't know who -- is that Geoff? Would you like to reply?

MR. LESH: Yeah, I think the team considered that the OEM manual didn't call for routine maintenance of this valve. However, the evidence on its disassembly was that there was evidence of probably long-term degradation occurring as evidenced by rust. It looked like there perhaps had been some steam or water entering into the gearbox. And it looked as though this wasn't a sudden failure, but a gradual failure over time. And we had access to only two photographs, but those photographs would lead us to believe that the damage in the gearbox was consistent with long-term lack of lubrication and potentially overloading.

And it's hard to say without taking the gearbox apart ourselves to determine which failed first. But having the bearing fall apart, and that area then was severely rusted, was evidence that either steam or water had entered the gearbox. And our position is that the gearbox having not been opened or examined internally for

10 years, in spite of comments in the maintenance logs that there was, I think, one person said screaming coming from the valve as it actuated, we thought warranted a more closer look into why this was occurring.

We saw not just the gearbox, but we know that the actuator had to be replaced. Our assumption was because it had been increased in its torque value a couple of times before that, that perhaps they needed a stronger one, but we don't know that.

I think the other thing that we saw was that the actuation shaft -- this is a butterfly style of valve, so it has a shaft that goes into the pipe and then there's a plate attached to that shaft so it can turn, so the plate is either parallel to the direction of flow or it's across the direction of flow to close it. The bearings on that shaft were also evidently dried and had been for some time. And these were bushings and there was evidence of galling on those surfaces. And in our view 10 years is too long to go without a look-see inside.

CHAIR HOCHSCHILD: Thank you.

Well, all this is in the spirit of how can we prevent this from ever occurring again? I do think it's important to update maintenance protocols, given to Commissioner McAllister's point about learning as we go. It sounds like this is a very rare event, but their

findings in the report do speak to some of the maintenance protocols.

Are there other Commissioners wishing to make a comment? Commissioner Monahan, yeah?

COMMISSIONER MONAHAN: Actually just a follow-up question then, Geoff, perhaps for you. How confident are you that the revised procedures I don't know if you could say would prevent an accident like this, but would enhance the safety, would reduce the chance of an accident like this occurring again?

MR. LESH: We are confident to the extent that going to regular maintenance on all the three layers of protection now, and having the design be one where any two of those layers could fail and the incident still would not occur, we think that the likelihood of this is extremely unlikely ever again. I think we get more confidence in that assumption, because we are not relying on our own design here. But we're relying on an established industry-wide standard as in the ASME TDP-1, which is a consensus standard that involves parties in its evolution and updating every few years that are from industry and government and manufacturers and users. And so in that sense we think it's already a well-vetted, well-tried and updated according to experience standard that is better than anything we could come up with on our own. In that

sense we think this is what's needed.

CHAIR HOCHSCHILD: Thank you.

I think we had two additional questions. Commissioner Vaccaro, do you want to talk?

COMMISSIONER VACCARO: Thank you.

So Commissioner Monahan, thank you so much for the question that you just asked, because it forced me to look at my notes and I wanted to just sort of follow up, I guess, to hear from staff.

If you recall, what Mr. Guttmann the public commenter was saying, we've been talking about lessons learned. And there are a lot of things that are a very broad, generalized sense that we can apply to partnership, collaboration, investigation. There are also some lessons that we've learned about what specifically happened here. Mr. Guttmann, as I understand it, was sort of getting at, "So how do you take this information and apply it to existing power plants that may or may not be similarly operating?"

And I feel like that's really important, because it's another facet in a way I think of what Commissioner Monahan is asking. She's maybe asking in the context of this case, but I feel like it is broader. And there are some complexities and there's a sort of a little legal underlay to what I'm getting at. Because we can't just go

and say here's something we've learned in one case and now we're going to go and have all of the other Conditions of Certification and all of these other cases, certified power plants changed at the snap of our fingers.

But it goes into the industry question I asked you, "Was this industry standard in place at the time of certification?" The newer standard you're saying that this plan is now going to have to comply with, but I don't know how to reconcile all of this with existing power plants. And do we have an eye towards doing some fact-finding there, some investigation, making some recommendations beyond just the Russell City Energy Center?

And I see Kirk Oliver, our Legal Counsel. I know Linda Barrera is here, Jared Babula, and Dian Vorters, and they all might wish to say something before you do. But I think it's a fair question, because I think this is what we're hearing, there are other things beyond Russell City that we need to be mindful of.

MR. LESH: This is where we are aware that we have, I think, 41 combined-cycle plants in the Energy Commission's fleet of certified plants that are currently in operation. Those are of different vintages. And just like buildings built with building codes of different vintages, their level of designed-in-and-practiced-protection against water induction likely varies with their

vintage.

Now that we are aware of what can happen it's incumbent on us to decide how to address this and how to make for a survey and determine what's the proper response to these different power plants.

I think on the good side we're not aware of a rash of steam turbines exploding, and so we don't think the situation is at this moment dire, but there is some risk out there we take. Well, we're looking into it, I guess, is what I would say. Even in Calpine's case the way they were configured they were able to operate successfully for 10 years without an issue until one component became at the last time just too marginal and there wasn't a backup.

MS. VORTERS: I think I want to make a comment for the record, right? Can you hear me? All right. Dian Vorters, on behalf of CEC staff.

And I noted, as did I'm sure the Commissioners and other people online and listening in the room, the comment -- and thank you, nice to see you again, Mike -- what's your last name?

MR. DELCASALE: DelCasale.

MS. VORTERS: Thank you. I noted the comment that you made, that was made on the record that no change in maintenance or operations could have prevented this event. And I'll just say that that is an assertion. It's

not an established fact. This root cause analysis report, and Vice Chair Gunda I think titled it correctly, it's a problem statement. That's what this is. It identifies corrective actions that are needed to ensure safe operation and reliable energy generation going forward.

The report does not end CEC's authority to order further corrective action or changes to Conditions of Certification as needed. We will follow the facts and ensure accountability under the Warren-Alquist act for this power plant and all power plants within our jurisdiction.

MR. HARRIS: Commissioner, if I could?

CHAIR HOCHSCHILD: Yeah, Jeff?

MR. HARRIS: Thank you. First off, thank you and I'm in complete agreement with Dian's comments. This facility's on track to a safe return to combined cycle operations. And the areas of agreement here are almost – they're vast. There are recommendations that you are asking us to implement, we've agreed to all those recommendations. And I think everybody sitting here that has spoken to you today is in agreement that we are going to take those corrective actions and ensure that they're completed, and that the facility is able to return to combined cycle safely. There's lessons to be learned here.

I guess in our defense we received this report late on Friday afternoon, we're still looking through it

with our team. And Commissioner, or Chair Hochschild to your question, we owe you some direct answers to that and we will provide those. This is not the end of this dialogue or discussion at all. This is going to continue. The partnerships that have been forged here is important to us. We've created some valuable relationships that we're going to leverage to make sure that these things are known.

There's already been a statewide letter issued on this issue. We have checked our particular fleet as well. And I also want to point out that one of the things that Mike's going to do, and the Calpine team is making a presentation eventually to the sort of the premier, I guess, industry group, the AEIC on the issues here. And so the lessons learned they're going to go beyond California. They're actually going to go to that national group as well.

So we've benefited from this review. We're very thankful for the cooperation we received from all the staffs. And you've seen some good personal relationships forged through fire here. Some people have met for the first time today in-person having worked together for 11 months on this issue. So that's been one really good thing to come out of this, so that we take it very seriously.

And to your question on the standards, the project was built to the 2006 standard at the time in full

compliance. There were design decisions that can be made, but it was still compliant. And we're absolutely committed to the current standard for the work that's being done, so I don't want to leave any ambiguity about that as well. So thank you for the opportunity to provide some additional context and any other questions I'll be glad to answer.

MR. DELCASALE. I have another comment.

CHAIR HOCHSCHILD: Go ahead.

MR. DELCASALE: For the PUC perspective, we did issue a statewide alert notification to all of our jurisdictional power plants, I believe that was about 150, indicating that this overspeed did happen and how lucky we have been to not have any deaths or collateral damage that was more significant. So we too have taken this very seriously and are applying lessons learned through our Operating Standards 4 and our Operating Standard 28 and disseminating this information and ensuring that other power plants are going to be following these lessons learned in the TDP-1 application of ASME standards as we move forward. Thank you for your questions

CHAIR HOCHSCHILD: I think Commissioner McAllister had a question. Yeah, go ahead.

COMMISSIONER MCALLISTER: Well thanks I really appreciate that, and I totally agree. I mean I think we

dodged a bullet and learned a lot from something that could have been much worse and so that's maybe a slight silver lining here.

But I had a question about sort of the PG&E interconnection, the understanding sort of what the grid was doing when all this was taking place on the plant. And this might be a question for the PUC, but it actually drew power, it drew significant power as it worked through the water that was in the turbine. And then according to some operational standards sort of released at one moment. And maybe I've got that wrong, but is there any sort of lesson learned for the interaction, the interconnection sort of protocols between the plant and the grid that might minimize the possibility of this happening?

MR. DELCASALE: No, there isn't.

COMMISSIONER MCALLISTER: No?

MR. DELCASALE: These plants are not operated as an offsite thing, such as a GAO (phonetic) or sort of unmanned, these are manned stations. And there's really no way that CAISO could un-anticipate the situation at the power plant specific, it's up to the operators there. So we're confident. There were some issues with the alarm system, but we think we have that addressed as well. There were over 5,000 alarms prior, but they were believed to be unassociated with the water detection.

COMMISSIONER MCALLISTER: Oh, okay.

MR. DELCASALE: But again the cascading effect, once the water was there, was so rapid that operator intervention at that point when they were aware of it would have not prevented the overspeed at that point. The idea is to try to anticipate further ahead. And again, addressing that valve I think will take care of it.

What we have to consider too is the size of this valve, it's like a 36-inch-diameter valve and it's several tons in weight. It's attached to a very large 24-inch-high pressure steam pipes, and the maintenance of it is very difficult. And it was anticipated as Calpine has indicated, it was a sort of a design flaw and overlook. Therefore, the Commission has sort of granted this process of sort of an industry standard once they discover a deficiency, to rectify that subsequently and not see it as a total violation of any standard. It's how we learn as we move forward with lessons learned, and that is operating standard for lessons learned and the progression of this information and knowledge to other power plants.

And then we are insisting that our maintenance program now be initiated and followed very closely on all these valves, not just the singular, but in all the valves in this plant. Because this sort of overspeed and water induction could occur from any source within the plant, so

it's actually been something that has sort of broadened the scope of maintenance and illuminated us, educated us, in the process. I hope that answers your question.

COMMISSIONER MCALLISTER: Great, thanks a lot. In terms of just the electrical connection I guess I'm still feel like I want to understand that a little bit better, the protocols for how long the plant is able to pull capacity from the grid, and for how many seconds and that kind of thing. I just want to maybe dig in with staff a little bit and understand that a little bit better. But thanks for the broader answer, I appreciate that.

CHAIR HOCHSCHILD: Vice Chair?

VICE CHAIR GUNDA: Yeah, thank you for the discussion. I think just the last few questions kind of goes back to what we were talking about at least what I tried to mention, which is the consensus on actually what happened is something that seems to be mostly there, and maybe we'll find other things. But one thing that I understand is it's mostly limited to this particular problem, right? Like so the water induction problem.

So I think it's prudent for us to continue to think through. At the end of the day I think -- let me pause on that sentence and come back to it -- I think at the end of the day we want to have safe operations and safety for everybody involved. And I think what I'm kind

of hearing from fellow Commissioners, and I think just the spirit of this conversation in trying to ensure safety and accountability, how do we continue to further the kind of lessons learned or trying to understand facts to further make these facilities safe, right? So especially when we talk about we've constructed this to the 2006 standards, agreed absolutely. And then we're learning as we move forward what is the delta between a 2006 standard and today that could show up again,

I totally understand that nothing blew up in the last 10 years or 15 years, but when these things do happen it's a great opportunity for us to make sure it never happens again. So I just want to continue to just collectively think about what more can we do to proactively understand the vulnerabilities in the fleet, that we might actually depend on them lower and lower, right, for fewer and fewer hours. And we don't want to be in a situation where there isn't enough resources to really keep them safe.

Again, this is -- I mean I'm not going to accuse in negligence on any of that without understanding the facts, but I think there's an opportunity here to be really proactive and ensure safety, so I just want to press the point on.

CHAIR HOCHSCHILD: Yeah. Please, Commissioner

Monahan?

COMMISSIONER MONAHAN: And I apologize that this happened while my -- I had some computer problems -- and maybe Commissioner Vaccaro started down this road, and you Vice Chair Gunda have continued down this road. And so I ask the team, Shawn, could we have an analysis of how the lessons learned in this particular case could or should apply more broadly to the fleet?

MR. PITTARD: Yes.

COMMISSIONER MONAHAN: And that's not something I'm assuming you can answer right now?

MR. PITTARD: I can say, yes we will do that.

COMMISSIONER MONAHAN: Okay.

MR. PITTARD: And thank you, Commissioners, and Commissioner Vaccaro for your question earlier. Which is that just to let you know that we sent a letter from the CPUC, a joint letter CEC, CPUC, to all combined cycle power plants in this state, the CPUC and CEC jurisdictional, to make them aware of this incident. So that was our first step in the outreach, so it was a letter from me and from my colleagues, my counterpart Lee Palmer at the CPUC.

And as you know in our compliance monitoring and enforcement program we're always trying to figure out, "What do we need to be looking out for?" We jumped on wildfires, took care of problems there. This appears to be

the issue in front of us right now. We know there are over 100 of these combined cycle power plants in the state, so yes we will focus on that. The good news it's work plan time, I might be coming and asking for more resources. (Laughter.)

CHAIR HOCHSCHILD: Okay. Okay, unless there's no other -- of course, I would just say the reason we just spent an hour on this. and the reason that all five Commissioners went down to personally do a site visit and we focus so much, is just all in the spirit of never having this happen again and getting ahead of it.

I do want to thank everyone for acting in good faith to come together to support that goal, and I have already seen some very encouraging progress and learnings. And we're all on the same team ultimately about the safe operation of our systems.

So with that I welcome a motion on this item from Commissioner Vaccaro.

COMMISSIONER VACCARO: Thank you. I move approval of this item.

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

Commissioner McAllister: I'll second.

CHAIR HOCHSCHILD: All in favor say aye.

Commissioner Vaccaro?

COMMISSIONER VACCARO: Aye.

CHAIR HOCHSCHILD: 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. Thank you all for coming.

We're going to actually take the next item out of order, and I'd like to do it before lunch given a time pressure that Commissioner Vaccaro has. And then some issues that may come up with the Governor's Office at lunch that may delay us, so I'd like to take Item 6 now if that's all right? And then we will break for lunch after that.

So if we could welcome the staff up who are going to present Item 6, the California State Lands Commission. Hi, Rhetta.

MS. DEMESA: Hello, good morning. Can folks hear me?

CHAIR HOCHSCHILD: Yeah, go ahead.

MS. DEMESA: All right, can we get the slides pulled up for Item 6, please? While they're doing that, good morning, Chair and Commissioners. My name is Rhetta deMesa and I work in Land Use and Infrastructure Planning

Unit in the Siting, Transmission and Environmental Protection Division.

I am presenting for your consideration today an interagency agreement with the California State Lands Commission in the amount of $200,000. This agreement and the associated funding will support the State Lands Commission selection of consulting services to conduct a screening analysis of the feasibility of locating a new port along the central to southern coast of California to support offshore wind activities. Next slide, please.

California has some of the best offshore wind resources in the country and floating offshore wind is poised to be a promising source of renewable energy generation for the state. In addition to providing renewable energy the development of floating offshore wind will diversify the state's energy portfolio and provide~~s~~ an opportunity for good paying jobs and statewide economic benefits.

However, given the size and expected scale of floating offshore wind components existing studies demonstrate that California's current port facilities may not currently be equipped to support offshore wind activities. To do so would require significant investments to upgrade and expand their existing infrastructure and capabilities. To better understand how this state might

maximize the full benefits of floating offshore wind development California needs to understand what existing, redeveloped, and/or new infrastructure can be available to support offshore wind deployment.

The Energy Commission, State Lands Commission, and Bureau of Ocean Energy Management, or BOEM, are currently conducting a port inventory that builds on existing assessments to better understand the infrastructure and needed improvements at existing port facilities to support offshore wind activities. The agreement being considered today will complement the port inventory by exploring the opportunities and constraints of waterfront locations outside of existing the port system to support offshore wind development. Together these efforts will help inform offshore wind planning considerations and follow-on analytical studies.

Funds for this agreement would come from the 2021-2022 state budget as part of the interagency offshore wind budget appropriation. Next slide, please. Thank you.

Through coordination with the State of California, including an extensive outreach and stakeholder engagement process, BOEM has planned for wind energy development in federal waters off the coast of California. BOEM has initiated the next step in their process to advance into the leasing phase for two areas: one off the

north coast -- a little bit hard to see on the map there -- but near the City of Eureka, and one off the central coast near the cities of Cambria and Morro Bay. Together these wind energy areas have the potential to generate up to 4.6 gigawatts of renewable energy.

Studies indicate that the build-out of offshore wind in these areas will require ports, or a combination of ports, that can support the assembly, fabrication, installation and maintenance of offshore wind turbines and related components.

At the March CEC Business Meeting, a $10.5 million grant to the Humboldt Bay Harbor, Recreation and Conservation District was approved to support the district's plan for developing an offshore wind terminal in the port of Humboldt Bay to support offshore wind development in the Pacific and is in close proximity to the Humboldt Wind Energy Area.

However, additional work is needed to better understand the opportunities and locations for port infrastructure, both at existing and new ports and new port facilities, to support offshore wind development in the central coast so that the state can best compare approaches and tradeoffs to different infrastructure options. Next slide, please.

The Energy Commission and California State Lands

Commission will coordinate closely in selecting a contractor to conduct the screening analysis to identify potential locations for and assess the feasibility of new port facilities between San Francisco and Long Beach capable of supporting offshore wind development activities in the Pacific region and near the Morro Bay Call Area off the central coast.

Considerations for feasible locations will include but are not limited to the current use or non-use of waterland and upland space, technical, logistical, and engineering constraints, current owner and/or operational structures, as well as potential environmental and cultural impacts.

In addition to furthering the state's assessment of offshore wind opportunities and constraints as they relate to the BOEM leasing process Assembly Bill 525 requires the Energy Commission in coordination with other federal, state, and local agencies and a wide variety of stakeholders to complete a plan to improve waterfront facilities that could support offshore wind development activities. Findings from this analysis will support the development of that waterfront facility improvement plan and will support the development of an offshore wind strategic plan, helping to further the efforts of the CEC to meet their requirements of AB 525. Next slide, please.

Staff recommend approval of the proposed interagency agreement with the California State Lands Commission and to adopt staff's determination that this project is exempt from CEQA.

With that I would be happy to answer any questions. I also want to note that we have Jennifer Mattox with the California State Lands Commission also available here today to answer any question. Thank you.

CHAIR HOCHSCHILD: Thank you so much. Let's go to public comment on Item 6.

MS. MURIMI: Thank you, Chair. The instructions for individuals that are in the room, you can go ahead and use the QR code posted in the back of the room. You can also reach out to the Public Advisor at the back of the room as well and fill out a blue card or get assistance with a QR code.

For individuals on Zoom go ahead and use the raised-hand feature. It looks like a high-five or an open hand at the bottom of your screen or device. And for those on the phone go ahead and press *9 to raise your hand.

And we have Varner Seaman, apologies if I have misstated your name. Go ahead and state and spell your name, give your affiliation if any. And you may begin your comment.

MR. SEAMAN: Hi, my name is Varner Seaman, and

that's spelled V as in Victor-A-R-N-E-R and my last name is Seaman, S-E-A-M-A-N. I'm speaking today as a representative of American Clean Power Association California, where I serve as the Offshore Wind Program Director.

First, we want to thank the Commission and the staff of the Commission, as well as the State Lands Commission staff, and Jen Mattox in particular, for taking the time and the initiative to work on this near-term study of port capacity and to conduct this analysis for the path forward for creating both the port capacity that's necessary to serve the central coast offshore wind development areas. This work is both timely and it's essential for helping California being able to develop an offshore wind industry and to meet the Senate Bill 100 climate goals. We very much support the staff recommendation in taking the initiative to move forward with this early study.

With that said we would encourage the Energy Commission to consider increasing the funding that's available for these near-term studies from the proposed $200,000 to $500,000 that would match both the complexity of this work, as well as the opportunity of this moment. California does not currently have the port capacity necessary to support the construction of multiple

commercial scale offshore wind farms, especially on the central coast where there is available sea space and transmission infrastructure necessary to build at least three gigawatts of offshore wind capacity by the crucial 2030 climate action deadline and then time to address the ongoing energy reliability needs as other resources are retired.

The state has partnered with the Humboldt Bay Authority for investments in serving the north coast and the southern offshore of Oregon development area. But the Humboldt Bay area is roughly 80 hours by sea to the Morro Bay wind energy area and isn't a suitable option for central coast development. It's critical that we initiate a multiple port strategy backed with sufficient funding to support infrastructure upgrades that identifies available port areas that can support offshore wind development.

The report under consideration today has the potential to set us on a course for efficient and focused investments and upgraded over the next several years to support central coast wind energy area development.

With that said, we think that the precedent that we've seen with other studies that have been funded in roughly the same amount that we're looking at here have been appropriate for one port location. Given that we need to look at multiple port locations to support the central

coast and to make sure that we have available port capacity, and with the complexity that's going to need to take place over the next several months, we do think that there is an argument for being able to expand the resources available for this near-term study.

As well, we think that it makes the best use the funds as we look forward to the further AB 525 studies that needs to take place.

So again thanks very much to the staff on this work, we really appreciate the leadership of the CEC on an ongoing basis for offshore wind. And thank you for your time today.

MS. MURIMI: Thank you.

Seeing no other comments, Chair, back to you.

CHAIR HOCHSCHILD: Okay. Thank you for those comments and Rhetta for that presentation.

I really want to commend Commissioner Vaccaro for all the hard work on this issue. It's, I think, one of the most exciting things happening in the State of California and certainly at the Energy Commission. And this is a banner year for us having police sale (phonetic) happen, the first police sale on the west coast this fall. And then setting the state planning goal in June, and just all the hard work. I really want to acknowledge the Siting team and Eli Harland and, of course, the incredible work

Commissioner Douglas did in the last few years to get us to this point in collaboration with all of the R&D investment and work as well.

And this is precisely the kind of task that really helps smooth the path for a successful rollout. This is exactly the kind of thing. I'm really encouraged we're doing this now and I know it's got a lot of strong support, so I just want to thank everyone. And with that let's kick it over to Commissioner Vaccaro for some comments.

COMMISSIONER VACCARO: Well I share your enthusiasm. It is an exciting time, and thanks Rhetta, for the presentation. I appreciate, Chair, that you acknowledged others on the team. My Advisor Eli Harland, others who also supported I think Rhetta in moving forward with this. I see Jen Mattox in the back of the room. I really want to acknowledge Jen and the State Lands Commission for their partnership in moving this item forward for consideration today.

Normally I can shoot from the hip when I speak, but I did have some prepared remarks here, because this is momentous. And I want to get this out the right way, so just bear with me. It's brief, but I'm going to read from my paper today.

So, first of all, as Rhetta mentioned wind

development in federal waters of the California coast is poised to be a critical piece of the state's renewables portfolio. And floating offshore wind requires us to have an industrialization mindset, because of the scale of the technology and because it's unlike most renewable energy technologies that we've deployed to date. Having waterfront locations in California to support the deployment is key to ensuring that we realize the in-state economic benefits of deploying these technologies and ensuring that we can deploy the technology and capture the economic benefits requires significant analysis to compare the tradeoff with different resource buildout scenarios. That's why we have been pursuing, and we are going to continue pursuing studies of the capabilities of existing port assets in California.

So the analysis that Rhetta has been discussing presents an initial screening. That's what's involved here, is an initial screening of where a new port could be located to support floating technology in California. But to be clear, it's about exploring the concept of the possible development of a new port. What we are not doing is saying that there must be, or that we believe there needs to be a new port, and I think that's a point that really bears underscoring. So we expect this analysis to help in our understanding of the different priorities and

alternatives that can be compared alongside other potential port strategies.

And I want to note that the comment made by Varner Seaman, I mean that's something that we've heard. We've heard it from industry. We appreciate the idea that there should be more funding put forward for studies. And I think as we move forward at some point that might make sense, but at this point I think it's hard to imagine the idea of a new port anywhere on the California coast, especially for a single purpose. And so while I think that's something to keep in mind as we move forward as we sit here today, I support the funding that's being recommended for this study and ask for the support of my fellow Commissioners as well.

CHAIR HOCHSCHILD: Thank you.

Any other comments from my colleagues? Vice Chair Gunda, yes.

VICE CHAIR GUNDA: Yeah, I just wanted to say thank you to Commissioner Vaccaro's comments. I think I'm not so good at showing my excitement, but this is exciting. It's a really exciting prospect getting the SB 100 analysis kind of calls for a large amount of offshore wind development. And I think we're just taking this incremental and incredible steps forward.

And I thank you, Chair, for acknowledging

everybody who's been involved. And I just want to share my thanks to you too for advancing this conversation over the last several years. So, Rhetta, good luck, thank you for being on the team on this issue and I look forward to supporting everybody.

CHAIR HOCHSCHILD: Thank you. I would just say this is going to happen in California and I have been very fortunate, I've visited now four offshore wind projects in four different countries. I saw the one in Rhode Island, which is the first one in the United States. I went to the first floating wind project, which is in Portugal. As well as the one that's a floating wind project in Aberdeen, Scotland, and then in Denmark. And you see this stuff at scale, and it is really inspiring. And the UK, as I've noted already has 10 gigawatts installed to date and they're going to 40 and their load is only 60 gigs. So I mean it's a mature technology.

Of the marine technologies -- we get asked this a lot -- of the marine technologies, tidal and wave projects, this is by far the most mature, so it is the right one for us to focus on. I think it's really ripe for California and just very, very grateful to Commissioner Vaccaro and her team for all their diligence here and happy to support this.

So with that I'd invite a motion on Item 6 from

Commissioner Vaccaro:

COMMISSIONER VACCARO: Yes, I may have approval of this item.

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

Commissioner McAllister: Second.

CHAIR HOCHSCHILD: All in favor say aye.

Commissioner Vaccaro?

COMMISSIONER VACCARO: Aye.

CHAIR HOCHSCHILD: 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 6 passes unanimously.

Colleagues, if it's okay with everyone I'd like us to reconvene in an hour at 1:15. And we'll take up Item 4 at that time, thanks.

(Off the Record at 12:14 p.m.)

(On the Record at 1:19 p.m.)

CHAIR HOCHSCHILD: Molly, can you hear us?

MS. O'HAGAN: Yes, good morning, or good afternoon I suppose now. Good afternoon, are we ready to

dive in?

CHAIR HOCHSCHILD: Yes, please go ahead.

MS. O'HAGAN: All right. Well good afternoon, Chair and Commissioners, my name is Molly O'Hagan. And I'm with the Energy Research and Development Division. I'm here today seeking Commission approval for the 2021 EPIC Annual Report.

Like every year we take this opportunity to take stock of the program's achievements. With the past couple of years we've developed a set of program level metrics to evaluate the success of EPIC. These metrics are included in the annual report, but I wanted to highlight a couple of the more significant ones today. You'll see on -- next slide, please.

You'll see here on this slide, this year EPIC surpassed $1 billion in investment in California innovation overall. This encompasses over 400 projects across the state.

Now the EPIC framework is structured around this concept of an innovation pipeline and within this pipeline is what we call the "valleys of death," where the private sector isn't willing to invest in technologies at various stages along this pipeline. So one of the things we try to do with EPID funds is target funding towards those valleys of death.

So one of the critical metrics we use then to assess our administration of EPIC is how much private sector investment companies have attracted after initial EPIC support. As you can see on the slide, an additional $7.8 billion in private investment was raised by businesses after receiving EPIC support. And this still doesn't tell the full story, because the pathways to commercialization for many startups is through exits. These include mergers, acquisitions, or secondary transactions. And exits benefit the startups, larger companies, and repairs by accelerating scaleup. So EPIC has seen a 55 percent increase in successful exits by startup companies funded through EPIC for 2021. Next slide, please.

Additionally, 67 percent of EPIC technology, demonstration, and deployment funds have gone to under-resourced communities. Those include projects located in and benefiting disadvantaged communities and low-income communities. Those are shown on the map in orange and green respectively, and projects located in and supporting California Native American tribes, as noted by the blue boxes on the map. Next slide, please.

So here's a bit of a window into where we've kind of prioritized our EPIC investments. As you can see, we've more or less organized EPIC into six different investment areas. These include the entrepreneurial ecosystem,

resiliency and safety, building decarbonization, grid decarb, and decentralization, I&A innovation, and transportation electrification. And on this slide, you can see the total EPIC dollar amounts invested in each of these areas since the program's inception in 2012.

So now, as we've done in previous years, we've selected six projects to highlight in our EPIC report that not only maybe typify each of these investment areas but have really demonstrated some major achievements in the past year. Next slide, please.

So the first project I'd like to highlight comes from our entrepreneurial ecosystem. As we know, achieving our state's building decarb goals will require innovation. One key arena will be to increase onsite generation capabilities while also reducing energy demand. Existing PV options are predominantly roof-based, which is a challenge for tall commercial buildings with limited rooftop space. This is where Ubiquitous comes in.

Ubiquitous Energy has developed a transparent PV window coating called UE PowerTM that can harness solar energy from glass surfaces to generate electricity, all while remaining visibly indistinguishable from traditional windows. The window coating also features low emissivity and low solar heat gain, increasing the energy efficiency of the window.

So in 2019, Ubiquitous began with a 1x1 inch prototype. Now during the course of their second award from EPIC, this time with the RAMP program, and they claim to be able to manufacture a 14x20 inch solar window by the time it wraps up in 2024. So when you consider that approximately 26 billion square feet of coated architectural glass is produced and installed annually, that glass is coated in EU Power's coating, we could generate an additional 60 gigawatts.

In fact, the company estimates that their technology has potential to deliver an annual 20-terawatt hours combined energy savings and renewable energy generation to the state, so that would be roughly 10 percent of California's total electricity needs. Next slide, please.

Next from our portfolio of projects focused on resiliency and safety is this effort from Humboldt State University. In 2019, more than 1 million Californians lost electricity during the largest public safety power shutoff in the history, as you all recall.

Humboldt County customers experience longer outages than other California customers on average. Just in 2022, or 2020, the amount of time Humboldt customers experienced sustained outages was seven times that of other California customers. This is largely because the north

coast experiences frequent flooding, landslides, and wildfires, and is especially vulnerable to earthquakes, tsunamis and sea-level rise.

Roads into and out of Humboldt County are often closed by weather-related events, so this makes the California Redwood Coast Humboldt County Airport and the adjacent U.S. Coast Guard Air Station, critical lifelines to the community.

To give you a sense of the impact, the Coast Guard Station is responsible for search and rescue operations for 250 miles of mostly rural, rugged coastline there. And the county airport serves about 50,000 flights annually, including commercial, private and emergency medical flights. Both can be seriously crippled by outages.

So Humboldt State University and still the first-ever front-of-meter, multi-customer, 100 percent renewable microgrid in California. The microgrid supports 20 customer meters, including the county airport and the coast guard station, has begun to operate unmanned and fully automated on fully dispatchable resources.

Currently, the microgrid is serving as a testbed for both technical and non-technical barriers, exploring tariff models and the like that will support California's advancement of microgrid integration.

Once completed I'll add the microgrid is intended to have advanced islanding capabilities. Next slide, please.

Next, I'd like to highlight SkyCool Systems, a company founded in 2016 I believe, part of our portfolio of building decarbonization projects.

So now for the tens of thousands of supermarkets and cold storage facilities here in the U.S., approximately 60 percent of their electricity use goes into powering refrigeration systems. These are 24/7 loads. This causes facility operators to spend hundreds of thousands into the millions each year on electricity.

So while there are technologies out there that reduce electricity use for commercial and industrial refrigeration, they often require increased water usage and/or they necessitate expensive replacements of compressors and condenser equipment.

Enter SkyCool Systems. So this was originally funded under CalSEED, but now SkyCool's cooling panels exploit radiative cooling, allowing surfaces outfitted with the panels, typically rooftops, to dip below the surrounding air temperature without water evaporation. A single SkyCool panel saves two to three times as much energy as a solar panel given the same area is able to generate. And it's designed to mount with conventional

solar bracketing, so no special equipment there.

Additionally, it works effectively both day and night and can be used as an add-on to air conditioning and refrigeration units.

For refrigeration systems integrated with SkyCool panels, there's a 10 to 40 percent improvement in efficiency, all without the use of refrigerants with global-warming potential. Impressively, one grocery store owner reported $3000 a month in electricity bill savings after installing the panels.

So in 2021, SkyCool was awarded $3.5 million from the ARPA-Es SCALEUP program to help accelerate their tech. Amazingly, ARPA-E described their technology as, and I quote, "game changing in the area of cooling." Next slide, please.

So next we have RCAM Technologies, who have been working to advance wind generation via 3D printing.

So in 2020 wind accounted for over 7 percent of California's energy generation. By midcentury wind resources are projected to supply more than 22 gigawatts of electricity. But getting there will be a lot easier with taller wind turbine towers, able to tap into those stronger wind resources that are available at greater heights. The problem is turbine towers are constrained by transportation limitations like large-diameter towers that may not fit

under bridges, overpasses, or traffic signals, so conventional turbine tower heights tend to be capped at roughly 80 meters.

But RCAM, with the help of UC Irvine, has developed an innovative 3D printing manufacturing technology that has demonstrated the feasibility of segmental tower construction onsite, thereby circumventing transportation limitations and allowing for taller turbine towers that capture more energy. In fact, this increased height translates into more than a 20 percent increase in turbine energy capture when you compare RCAM turbine towers, which measure in at about 140 meters to that conventional 80-meter tower.

So this technology could enable a potential tenfold increase in the speed of wind energy deployment, a significant leap towards SB 100. And this project has garnered attention and additional funding from the National Science Foundation, the DOE, the National Offshore Wind R&D Consortium and the Carbon Trust. They look to advance the technology and its manufacturability. As it stands their goal is to actually be able to fabricate the new tower onsite in less than a day. Next slide, please.

So from our industrial and agricultural portfolio we have AgMonitor, who first began working with EPIC back in 2015. So our state proudly produces more than a third

of the nation's veggies and two thirds of its fruit as just part of the state's agricultural exports. In 2019, alone California's ag exports amounted to more than $21 billion. But as we know, our farmers are having to contend with shrinking freshwater reserves and higher water and energy costs.

So AgMonitor's software ag service is leveraging existing smart meters and using advanced data-mining techniques to provide farms and facilities with 100 percent water measurement coverage, enabling customers to manage energy costs across meters, and overall helping improve irrigation and fertigation by helping users identify problems, find solutions and track results.

With the software now tracking 120,000 acres in California, they reported that growers were able to reduce water and electricity use by an average of 9 percent and 13 percent respectively without impacting crop yields.

As of 2020, AgMonitor has also expanded the use of its technology to enable California growers to irrigate outside the peak demand times. So this tech was deployed on over 10,000 acres of farmland as part of an EPIC demonstration, and they were able to successfully achieve a permanent load shift of 3 megawatts as of August of 2021. They're also on track to achieve a full 7 by the end of 2022. Next, please. Thank you.

So lastly, from our investment area dedicated to transportation electrification we have Cuberg. They recognize that lithium-ion technology has started to plateau in some ways. Current lithium-ion batteries have limits in energy density that constraint battery performance in the automotive and aviation sectors. Unfortunately many emerging approaches to improve battery performance suffer from major challenges with scalability and/or incompatibilities with the established manufacturing processes.

But Cuberg's lithium metal battery system radically increases energy density up to 48 percent, enabling greatly increased range and capacity for electric vehicles and aircrafts. And it also opens the door for future opportunities for heavier-duty transportation.

So Cuberg has reported that their battery technology enables a 70 percent increase in range as compared to the standard EVs on the market, which is about 250 miles. And as a result of their EPIC award, Cuberg can now produce roughly 3,000 battery cells per month.

And in 2020 they were verified by the DOE's Idaho National Lab.

Excitingly in 2021, Cuberg was acquired by Northvolt, a large Swedish battery manufacturer. Northvolt holds a $15 billion agreement with the Volkswagen Group to

be their primary battery suppliers, so Cuberg is now leading Northvolt's U.S. operations from here in California. Next slide, please.

Now that concludes our featured projects for 2021, but it was a big year for EPIC in many other ways. Among them in 2021, we submitted the Fourth EPIC Investment Plan. And in the meantime the EPIC Interim Plan was approved.

With that approval we've been able to set to work on a series of funding opportunities shown here that we hope to release this year in 2022. Among them are opportunities focused on the advancement of prefabricated zero-carbon homes, opportunities to hopefully improve the evaluation of resiliency investments for the electricity sector, as well as opportunities focused on vehicle-to-building backup power, and more. I'll just note that these opportunities will be posted online on the Energy Commission website and on empowerinnovation.net as they become available. Next slide.

And with that I thank you for your time. Staff recommends the approval of the 2021 EPIC Annual Report and I'm happy to answer any questions.

CHAIR HOCHSCHILD: Thank you, Molly, that was terrific. It always gets my heart pumping seeing all the great stuff we're doing and the breadth of the work, so

that was terrific.

Let's go now to public comments on Item 4, Dorothy.

MS. MURIMI: Thank you, Chair.

So once again folks that are on Zoom go ahead and use the raised-hand feature if you'd like to make a comment. It looks like a high-five or an open hand at the bottom of your screen and/or device. Folks that are calling in, go ahead and press *9 if you'd like to make a comment. And folks that are in the room, go ahead and use the QR codes or reach out to the Public Advisor at the back of the room if you'd like to make a comment.

We'll give that one moment. Again, if you're on Zoom use the raised-hand feature, it looks like a high-five at the bottom of your screen or device. Seeing no raised hands, Chair, back to you.

CHAIR HOCHSCHILD: Thank you, Dorothy.

Well, let me just again thank the whole team, Jonah and Molly and everyone else on the EPIC team who contributed to the breadth of this work. And I really wanted to pay tribute again to Laurie ten Hope. This brings to fruition what she worked for years to do, and to get us this point of really being on the cutting edge of so many needed clean energy solutions. And last week I believe was her official retirement from the Energy

Commission. What a class act.

And Drew, I did have a request for you, which I think for younger employees coming into the Energy Commission now, particularly as we've been remote for to two years, I would love to have her come back in. And maybe you could assemble a group of other Energy Commission employees who've been here for a long time and have seen so much, Bill Pennington and others. I'm sure you could put together a little panel just kind of reflecting back on what it takes to be successful at the Energy Commission and lessons learned and highlights and stuff.

Just reflecting on Laurie this week, I'm very mindful of how much we've all benefited, and the state has benefited from her tenure. And I'm so, so grateful to have been privileged enough. I know of all my colleagues share this here. We all feel so lucky to have had the time we did working with her here at the Energy Commission, so just I hope that we can find a time to maybe bring her back.

So yeah, literally every single one of these projects, Molly, that you walked through from larger wind turbines to solar glass to everything else, this just makes me incredibly proud of the work. There's really nothing I can think to enhance it. It's really comprehensive.

The only thing I would note, interestingly, I did a visit up to -- we did some tribal consultations and

meetings, Linda Barrera and Jen Martin-Gallardo and Katrina Leni-Honig and I two weeks ago. And I learned the name "Humboldt State University" is no more. It is now "Cal Poly Humboldt." They are now polytechnic, so that was exciting to see.

So anyways, just a standing ovation here from my side on this. And I'd just open it up to other comments from Commissioners, anyone wishing to -- Commissioner McAllister?

COMMISSIONER MCALLISTER: Yeah, absolutely. So again thanks, Molly, for a great presentation.

It's so nice to sort of be a part of that team and help see all the great things you're doing and also help ideate going forward. And there's just such fertile terrain in the staff, in the R&D Division, are just so dedicated and capable.

And I would certainly second the kudos to Laurie. She is such a unique mix of clarity of thinking and care and support for staff and just respect. Just grace I guess is really the word, in everything she did, and but still being kind of very assertive and innovative and pathbreaking at the same time. And that's a pretty rare combination.

I would say before we bring her back let's give her a chance to sleep in for a couple weeks. But she

leaves an amazing legacy and it's just been -- I knew her somewhat before, I had seen her certainly in public, public speaking and just at meetings before I even came to the Commission. I went out, occasionally did work in front of the Commission. And just was always impressed from the get-go. And so that was a couple decades ago, and I think just let her legacy goes further back than that. But just really, really a solid foundation to build on. I know Jonah and Virginia and the rest of the team are doing that. And your presentation, Molly, reflected all of that groundbreaking work.

I actually did -- I was in New York last week and I'll say was at a Bloomberg New Energy Finance event. And they had a lunch gathering together of what Bloomberg's team thought were some really pathbreaking energy innovations. And there were a couple projects there that, at least at least one and I think a second, that we at some point had put some funding into.

One of them was a really innovative, is a really innovative air conditioning technology that uses saltwater and shows a lot of promise. Potentially much more efficient than standard ACs and just a better footprint and portability and all sorts of advantages, including generating a little bit of water along the way through dehumidification, which obviously we need in California as

well.

So just our net is way wider. The net we cast, I think, is way wider often than we sometimes realize, and the footprint goes far beyond California in terms of where our technologies can be most useful. Obviously, that's one that could be useful in California, but it also could be very appropriate for the Southern U.S. and other humid places, developing countries. It would be an effective AC, low energy, low power AC technology that would be very appropriate for developing countries, so a really amazing broad footprint,

So all this is to say I very much appreciate adoption of the approval of this item and the annual report, so thank you.

CHAIR HOCHSCHILD: Thank you. Any other -- Commissioner Vaccaro?

COMMISSIONER VACCARO: I (indiscernible).

CHAIR HOCHSCHILD: No, okay good.

Commissioner Monahan?

COMMISSIONER MONAHAN: Well, first I've got to pile on the kudos to Molly. That was a great presentation and really, I think we were all like inspired by each one, so thanks for doing such a compelling presentation. I'm sure that took some time to prepare and it was really great, so to the team and to you.

And I think we all just feel so much pride about the investments made in the R&D space and just this sense that we're trying to really invest in the technologies that are going to help us out of this climate crisis. And it was just really great to see the range, the breadth and depth.

And as the transportation person, I'm excited about how transportation is figuring more large as we see the DER capability of transportation electrification, so just thanks to you and the team and I look forward to approving this.

CHAIR HOCHSCHILD: Commissioner Vaccaro?

COMMISSIONER VACCARO: Thank you. So yeah, I'll pile on all the kudos and just say this presentation is one that I look forward to every year. I feel like I occupy some of the darker corners of the building and I don't always have visibility into the work of ERDD. And so whenever things are presented at the business meeting, but especially when we get this retrospective. It's just as you said Commissioner Monahan, I mean it does fill us all, I think, with pride for the work that we do.

And something that I am a bit more closer to in the ERDD, space is the work that the staff does, not only in getting the money out but really the fiscal part of it, the stewardship of the public funds. Those are things that

I have been closer to working with the legal team, working with ERDD staff really making sure that the money that's going out is spent as it should be. And when there are problems bringing that to Commissioners, Audit Committee and Drew as appropriate. And so I feel like we really have a very tight system here.

And I'm going to give this shoutout to Jonah, who although new, and although he's coming behind Laurie ten Hope, he owns his own space, and he owns it well and is showing tremendous leadership from what I've seen so far in ERDD. And so anyhow I just love this presentation and I love when we do this every year.

CHAIR HOCHSCHILD: Well said.

Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, I just want to echo everybody's comments. I similarly come from not so well-lit corners of the Commission. (Laughter.)

But I just want to say, really, congratulations to the EPIC team and I'm just going to share my thoughts on Laurie. Laurie had been a mentor to me before I joined here. I looked up to her when I was at UC Davis applying for EPIC grants and really enjoyed her coming and talking about what EPIC was doing. So just, Laurie, you've been a tremendous friend and a colleague and inspiration, so good luck to everything. And I'd love for you to come back and

continue to coach not only the new staff joining but me as well as we move forward.

And I also want to just kind of highlight the importance of the ERDD. I, both from experience of getting grants from the ERDD and Commission at large, but really what ERDD has done over time has really established CEC as the clean energy investment vehicle for the state. A trusted partner to provide this funding in a thoughtful manner as Commissioner Vaccaro said, fiscal kind of stewardship. But also like thinking through thought leadership, so I just want to thank the Chair and Commissioner McAllister's leadership of the entirety there.

And finally, Molly, a great presentation by you. It was really well put together. I also look towards ERDD for new ideas, especially on reliability, and ERDD has as a huge source of those innovative ideas always flowing out. So thank you all for your incredible work and continuing to move CEC forward and the state forward and the incredible job you do in bringing this all together. Thanks.

CHAIR HOCHSCHILD: Commissioner McAllister?

COMMISSIONER MCALLISTER: Yeah, I just want to add one thing. One element of I think the success of ERRD is their ears, they're listening. I look forward to our periodic meetings just with staff where we just spitball ideas. And they're probing, they're always sort of seeing

where the frontiers are in trying to gather ideas for the next investment plan. And they do that across the board with all these different stakeholders and innovators. And they're listening and they're putting the pieces together. And they're just as a division, have really developed this culture of openness to new ideas.

And they just sort of cogitate and put some order to and figure out how we can push these various frontiers. And that is a really highly developed skill and I think they just do that so well. And that's core to innovation and core to finding these solutions that California needs to be able to do, go where we need to go. And so I really appreciate that sort of sixth sense that they seem to have to really, really figure out which are the key ideas and really leverage those ideas and for progress, so thanks.

CHAIR HOCHSCHILD: Yeah, I'd build on that. Yeah, I think one thing to keep in mind for the past 20-plus years we've had governors in California that believe in climate and the importance of that. And we've had just great support for two decades now for this research work.

That has not been the case always with the federal government. We've actually kind of whipsawed pretty severely actually with our federal investment in this space. And so the institutional knowledge, the consistency, it's really helped keep the momentum and the

clean energy field across all these different topic areas. And I'm just very mindful of the value of that and the collective institutional knowledge that's represented.

When you think about our roles and we talk a lot about the fact we're the fifth largest economy in the world, but we're also the second fastest growing economy in the world after China, and so to simultaneously be growing at a healthy clip and be pioneering all these new water-saving, energy-saving measures and have them scale is just incredibly valuable. It's really, for me, it's why I want to work in state government. I'm not interested in actually -- I mean, this is where I think we can have the biggest impact is we can scale these things. And I just see so much potential.

Molly, just in the various technologies you walked us through today, for those to go big so thank you to the whole team.

And I did have one last question before we move this item, which is if I'm wondering if you or someone else -- Anthony, anyone else who's here to just speak to sort of how do we distribute this report? How do we get the word out? What is the strategy to get this story told effectively?

MR. NG: Good afternoon, Chair, Anthony Ng of the Research and Development Division. So the annual report is

submitted to the Legislature and the Public Utilities Commission at the end of the month following approval at this business meeting, if it's approved. And from there we work closely with the Media Office to distribute this, disseminate and distribute the report.

I think over the years we've taken the EPIC Annual Report from kind of a lengthy, administrative-type document into a much more condensed, with a visually appealing kind of eight to ten pages format. And so that is the strategy that we've gone forward this way and so that'll be I think we think a nice digestible kind of easy handout that we can spread widely.

CHAIR HOCHSCHILD: Great. Well, I look forward to hearing how that goes and working with the Media Office too. If there's an opportunity for a special media briefing on this kind of thing to make use of it. I really applaud the focus on simpler, more readable, digestible report format. And actually telling the story of the program through the lens of these different technology examples. And those measures and the visuals of them are really effective. So thank you Molly, and thank you Anthony.

With that I'd entertain a motion on Item 4 from Commissioner McAllister.

COMMISSIONER MCALLISTER: I move Item 4.

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

COMMISSIONER VACCARO: Second.

CHAIR HOCHSCHILD: All in favor say aye.

Commissioner McAllister?

COMMISSIONER MCALLISTER: Aye.

CHAIR HOCHSCHILD: Commissioner Vaccaro?

COMMISSIONER VACCARO: 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.

We will turn now to Item 5, The Next EPIC Challenge: Reimagining Affordable Mixed-Use Development in a Carbon- Constrained Future.

MR. NG: Well, hello again. Good afternoon, Chair, Vice Chair and Commissioners. My name is Anthony Ng. I'm the Manager of the Energy Deployment and Market Facilitation Office. Today I'm joined by my colleagues Molly O'Hagan, Rachel Salazar and Molly Mahoney. And we are here today requesting your approval of nine awards totaling approximately $9 million for our solicitation titled "The Next EPIC Challenge: Reimagining Affordable

Mixed-Use Development in a Carbon-Constrained Future."
Next slide, please.

Expected benefits to California from this solicitation and these projects, as we'll discuss in more detail throughout the presentation, basically boils down to we're hoping to promote replicable designs and plans for affordable zero-emission mixed-use developments. We believe that these buildings, an example that we set, can help improve grid reliability, improve and demonstrate the value proposition of emerging grid interactive technologies, as well as provide an economical pathway to develop, decarbonize high-density and mixed-use developments. Next slide, please.

So just as a bit of background we know that climate change and housing affordability present two of the starkest challenges for California today. Mixed-use developments that place residential housing with commercial uses offer an opportunity to increase the rate of housing development without promoting urban sprawl. However, decarbonizing these types of elements there is not a technical or economically feasible way to do so given today's commercial technologies and standard design and construction practices.

Our solicitation titled "The Next EPIC Challenge" is looking to address these challenges by funding a design-

build competition that seeks to challenge multi-disciplinary teams to design and ultimately construct mixed-use developments that incorporate four primary goals.

The first is that we want these developments to incorporate the latest cutting-edge clean energy technologies across onsite generation, storage and load management, leveraging the innovations and funding that we've supported in the EPIC program, for example.

We want these buildings and these developments to use innovative tools for planning, designing, and construction. Beyond the energy technologies themselves we feel like these innovations can lead to lowering the cost and time of planning and building these developments.

We want to ensure that these developments are incorporating affordability and equity from the beginning by incorporating and developing sustainable business models that ensure there's a mix of market rate and affordable housing, so that these new developments are not gentrifying existing neighborhoods and pushing out existing residents.

And lastly, we want these developments to be resistant to the impacts expected of climate change, including the potential for extended power outages. Next slide, please.

To ensure that we are achieving our goals we asked our applicants to respond with -- we established a

set of minimum site and design requirements. These requirements were developed through extensive collaboration and stakeholder input from entities such as the architects, building developers, community-based organizations, technology developers, to ensure that we were both ambitious in our requirements, but also realistic and what the industry could develop.

For the site requirements, we wanted to be sure that these developments were of mixed-use. That they combine housing with some type of retail or some type of commercial activity, be it retail, office space, or recreational activities for example. We wanted to ensure that a significant portion of the housing that was going to be developed from these plans would be designated both affordable housing, as well as reserved for low-income units, again, to ensure that affordability and equity were not forgotten about.

And lastly, we ensure that there was some sufficient density, both in terms of minimal housing units as well as residential units per acre, again, to promote the higher density developments that we are aiming for. Next slide, please.

For the design requirements, these focus a little bit more on the energy technologies that we're looking to promote through these projects. We wanted these

developments to be all-electric including all space-water heating and any cooking, including any retail cooking that might happen on the commercial side.

We wanted the buildings to have the ability to island from the grid and the ability to prioritize different loads and to power critical loads indefinitely from the available onsite resources, again, promoting the resiliency.

We wanted the building to be able to sustain its peak load demand defined as, "demand from the hours of 4:00 to 9:00" through the combination of onsite generation storage and load management. Again, we want these buildings to be good citizens of the grid.

We wanted these buildings to kind of future-proof and incorporate the ability to integrate with aggregation platforms if those continue to propagate and expand where the developments ultimately end up being.

And of course we wanted some integration of electric vehicle integration, both with the grid and what the building signals to ensure that parking that was developed as part of the development would have that capability, 20 percent, and for all other parking to be EV-ready. Next slide, please.

These agreements will be executed in a two-phase approach. The nine projects before you today are all part

of the Phase 1 design portion. We divvied up four groups geographically across the state of California. And in total twelve projects were selected, nine is before you for consideration today. The remaining three will be brought to the May business meeting.

But from these design projects in a couple of years, as they conclude, these twelve projects will then recompete for the potential to receive follow-on funding, up to one for geographic groups so that they could receive additional funding to build out the vision that they've designed in the first phase.

So with that just wanted to give a brief background on this solicitation. I will hand it over to Molly O'Hagan who will go over the first set of projects for consideration.

MS. O'HAGAN: Good afternoon, again. My name is Molly O'Hagan and I'll be managing our Bay Area agreements.

So first up we have the City of Berkeley, one of many cities in California that has only produced a small fraction of the affordable low- and moderate-income housing needed, so this has resulted in plummeting homeownership rates and widespread displacement and vulnerable populations.

The Berkeley Efficient and Resilient Mixed-Use Showcase, or BERMUS for short, the proposed six-story plus

functional green roof space, 50-housing unit, 100 percent permanently affordable all-electric ZNE building that will provide commercial and community spaces, including the new offices for the Homeless Action Center.

This project is being led by the Northern California Land Trust, a legal entity that provides affordable housing and facilities for low-income residents. This project will serve a range of families and economic brackets and will increase the amount of new low-income affordable housing available in Berkeley by 39 percent.

Furthermore, the proposed ownership models for the BERMUS units, which include below-market-rate condominiums and limited equity-housing-cooperative units will contribute to ownership and wealth-building opportunities.

So the proposed microgrid intends to deliver electricity to the grid during peak consumption hours as well. Next, please.

Okay next is the Net Positive Resilient All-Electric Affordable Housing at Pacific Station North Transit Center in downtown Santa Cruz, led by EPRI. This project is a proposed seven-story building with 94 affordable apartment units, as well a new state-of-the-art METRO Transit hub. And it'll be heated platinum, ZNE housing developed. And it's intended to revitalize a long-

depressed area linking downtown with the beach area tourism district, which has been an area that's been identified as one of the most vulnerable in the city to climate change.

The project is part of a culmination of more than seven years of community input. And additionally this will be the first of its kind of mass timber multifamily building in the central coast. The holistic decarbonization approach covers operational embodied air transportation emissions.

The proposed one-megawatt solar PV array above the bus-loading bays will provide zero-emission clean energy supply for the common areas, residential units, commercial and mixed-use spaces, electric bike stands, and electric bus charging as the Santa Cruz Metro bus fleet will eventually transition to all-electric buses.

Additionally, the design seeks to reduce the urban heat island effect with green infrastructure. And they're hoping to demonstrate the viability of a no-gas line, mixed-use commercial space with retail food service. They're examining the potential for a warming kitchen considering a range of technologies, including induction ovens or induction stoves, microwave ovens, steam trays and insulated cookware.

So with that I'll pass the baton to my colleague.

MS. SALAZAR: Okay, can you hear me? Hello,

Commissioners. My name is Rachel Salazar and I'll be presenting our project for Northern California and the Central Valley.

First, ConSol will lead the design of a 100-unit affordable housing space that will be located in Woodland's new Research and Technology Park near UC Davis. The concept incorporates state-of-the-art energy-efficient solutions, flexible load management controls, as well as a shared electric transportation program.

The team will assess the feasibility to install bidirectional vehicle-to-grid charging stations and providing energy storage batteries for each of the residential units.

This project has already garnered community support and the team will continue to engage with the local affordable housing stakeholders regarding the design and purpose for the common areas.

Some early ideas include educational services provided by the local colleges and the California Coalition for Rural Housing. Next slide, please.

Next up, Mutual Housing California will lead this infill project for the design of a four-story permanently affordable senior housing center in the historically underserved community of South Stockton. The development will include 59 units of residential and office space.

The team will evaluate advanced technologies, such as façade-integrated PV, Gradient's Comfort air conditioner and heat-pump system and innovative, interactive grid technologies.

As part of a public, private redevelopment deal a local community organization, known as STAND, has entered into a purchase-agreement option with the city for the property, and subsequently partnered with Mutual Housing to coordinate and community engagement, as well as on site management once it's built.

In response to community feedback the property is adjacent to a community health clinic as well as public transportation. And the team plans to use a third-party certification process assessed by the social, economic and environmental design network to further engage the community throughout the project.

Next, we'll hear about our projects in Southern California.

MS. MAHONEY: Good afternoon, Commissioners. My name is Molly Mahoney, and I will be presenting the project funded in the Los Angeles region.

First up Innovative Housing Opportunities, a nonprofit housing developer, will lead the design to replace an outdated office complex with affordable apartment units in Santa Ana. The mixed-use portion will

include a new office space, as well as light retail.

A key innovation is to integrate Community Electricity's mobile application for virtual power control. The app allows residents to utilize a new form of energy management to maximize onsite generation and reduce demand during peak usage times. This will be accomplished through the use of NREL's award-winning Foresee management software that would supply real-time grid data.

It will also explore the use of advanced framing systems that are more resource-efficient and offer more space for cavity installation than conventional framing and this could save floor and wall-framing costs by up to 30 percent. Next slide, please.

Next up is Jamboree Housing Corporation, a nonprofit, affordable-housing developer, that will design a mixed-use municipal center and residential facility featuring 50 apartment units in San Juan Capistrano. The project combines affordable housing with a new city hall and has the support and financial commitment from the city of San Juan Capistrano.

The apartments are intended for very low-income individuals who are at risk for being homeless or have experienced homelessness, including military veterans. The project will engage and educate residents about the building design components and emerging technologies

through direct outreach and the formation of a new resident council specifically for them to support these residents.

The project will also incorporate an island-able microgrid accompanied by onsite services that will inform residents about how to use a smart system to control their energy usage.

And with that next we will hear about the projects from the San Diego region. Thank you.

MS. O'HAGAN: Okay, hello again. And I'll be covering the projects in our last group, which covers the Imperial Valley, Inland Empire and San Diego County.

The first project, we have here is led by the National Community Renaissance of California, which is a nonprofit affordable housing developer. This will be a transit-oriented development in San Diego with 288 affordable housing units, the community center that will also act as a resiliency hub, a childcare facility, and retail spaces.

They plan for an emergency management system with transactive platforms where residents can track real-time energy use and can choose whether or not to participate in demand-response measures based on the recommendations they receive.

Lastly, the team proposes to use panelized bamboo systems that creates a cavity wall which can be fully

insulated to improve thermal performance and reduce energy consumption, although also offering the potential for time-saving during the framing process. Next slide, please.

So this project is led by Communities for Global Sustainability, which is a group of designers, architects and community leaders. It will include 120 total units, a community kitchen, a pocket park, and a public workforce training center, all located in a designated transit-oriented development zone.

The design will use a precut and packed kit of parts to reduce labor costs, waste of time, and materials. And the project will be including a building-integrated PV system that generates electricity while also serving as a weatherproofed cladding system that can be fitted on both the roof and vertical walls. Next slide, please.

Okay, the last project for today is led by Family Health Centers of San Diego and it will include 80 designated low-income units, as well as office spaces on the ground floor. The design will focus on using recycled shipping containers as well as offsite fabrication to develop a system of modular construction that is both replicable and scalable.

The site is in Barrio Logan, which is a power-constrained pollution-burdened corridor located between I5 on one side and an array of bayfront industrial facilities

and ports on the other where cruise and naval ships dock.

So addressing pollution will require electrification of local energy needs, which could enable cruise ship shore power electrification and the electrification of local industrial uses.

So by demonstrating smart grid strategies, the project will seek to demonstrate replicable measures to reduce infrastructure costs while eliminating local maritime and industrial particulate issues. Next slide, please.

So with that staff recommends approval of these grant agreements and staff's findings that these projects are exempt from CEQA. This concludes our presentation and staff is available for questions, thank you.

CHAIR HOCHSCHILD: Perfect. Let's see, are there public comments on Item 5?

MS. MURIMI: Thank you, Chair.

So instructions for everybody, for those in the room you can go ahead and use the QR codes that are located in the back of the room. You can also reach out to the Public Advisor located in the back as well. For those on Zoom go ahead and use the raised-hand feature. It looks like a high five or an open palm and it should be at the bottom of your screen or device. For those calling in you can go ahead and press *9 to indicate that you'd like to

make a comment.

We have one commenter, Cody Baig, apologies if I have misstated your name. Go ahead and state and spell your name, give your affiliation if any and give your comment. Cody Baig? (No audible response.)

We'll move on. We'll give that one moment and move on to Mailon Rivera.

MR. RIVERA: Good afternoon, everyone, Commissioners. My name is Mailon Rivera, M-A-I-L-O-N R-I-V-E-R-A. I represent Communities for Global Sustainability, or C4GS. And not only is this a glorious day in California, but this is truly a momentous day for us as a team. First, we'd like to recognize the fellow recipients who, through this EPIC grant from the CEC will also be able to continue their work in uplifting so many.

And we'd like to also thank our C4GS team. If you're listening you gave your talents, your knowledge and your time. And in so many ways you are a shining example of the power of community and collaboration.

We're proud to be part of a model of communities taking action towards innovative affordable housing and normalizing a low-carbon society. But these projects are part of a larger effort to create sustainable and intentional clean energy generating communities throughout California.

And we are grateful to the California Energy Commission for this design grant and for recognizing the need for equity and inclusion in generating new clean, sustainable energy sources. This project will also be an example for other cities to replicate.

Ultimately, we are building spaces of partnership, of hope and opportunity, a haven for members of our communities to get the support they need from their own neighbors to help stabilize and rebuild their lives, while for others it will simply, finally be a place called home.

So ladies and gentlemen of the Commission on behalf of the entire C4GS family, we say thank you. Thank you to the California Energy Commission and the EPIC team for this opportunity. And thank you for investing in a carbon-positive future. We are extremely excited and proud to be part of the next EPIC challenge. Thank you.

MS. MURIMI: Thank you.

We'll move on to Alan Woo. Alan Woo, go ahead and state and spell your name, give your affiliation if any.

MR. WOO: Yes, I am a Planning Commissioner with the City of Santa Ana. I also, for the last 25 years, have been with a community action agency that has low-income energy programs that serve low-income community to help

them to pay their bills because they overused their energy. And I also chair the Low Income Oversight Board with the CPUC.

And with that background, and also working in environmental justice and the energy field, one thing I keep seeing as a Planning Commissioner is that there is low-income housing that are being built in our City of Santa Ana that have good developers with good programs and all that. But what I see missing at the table is the empowerment of low-income community, for them to change their lives individually and also for their family and for the community in terms of being included in this green revolution and zero-based carbon living. Doing things for that community because they lack the resources, the knowledge and frankly the money to kind of be included, is troublesome to me. And just giving it to them as a passive receiver seems to be troubling.

However, with the C4 ZEV (phonetic) project they are including and empowering the residents and making them be the (indiscernible) as they learn how to use the zero-carbon technology and design in their housing. That's something that is bold, that is inclusive, and is different.

Normally, as also someone that sits on the Clearinghouse CDFI Advisory Board I also noticed that often

we investors, and we invest using tax credits, don't think of minority organization. And I hate to use that word, because we should see people for their ability. In which case knowing this group it's a very, very smart, intelligent, well thought-out group to have created many community partners.

And I do want you guys to look at them very carefully in terms of like their ability, their desire and their responsiveness to the community. I think they would really add as a demonstration that this could be replicated in other communities of color and disadvantaged communities. Thank you very much for listening to me.

MS. MURIMI: Thank you, Alan.

Moving on to Casey Harris, please state and spell your name and give your affiliation, if any. You may begin. And please make sure to unmute on your end.

MS. HARRIS: Hi, can you hear me?

MS. MURIMI: Yes, we can.

MS. HARRIS: Casey Harris: Hi Casey Harris, C-A-S-E-Y H-A-R-R-I-S and I am with Jamboree Housing Corporation. Good afternoon, Chair and Commissioners, and Deputy Director Steinbeck. I'm Casey Harris, the Senior Project Manager with Jamboree. And on behalf of the City of San Juan Capistrano and Jamboree I want to thank you for the opportunity to participate in the EPIC challenge for

Paseo Adelanto.

We're excited to design a sustainable mixed-use city hall and permanent supportive housing development in San Juan. We think this will be an innovative example for other cities to replicate, so with that I'm happy to answer any questions you might have on the development.

MS. MURIMI: Thank you, Casey.

We'll move on to Cheryl McMurtry. Go ahead and state and spell your name, give your affiliation if any and make sure to unmute on your end.

MS. MCMURTRY: Hi, I'm Cheryl McMurtry, C-H-E-R-Y-L M-C-M-U-R-T-R-Y. I just want to thank the -- I'm here with Architectural Nexus on behalf of Mutual Housing and Fairview Terrace Project. And I wanted to thank the Energy Commission and the EPIC team for the opportunity to participate in this grant. We're extremely excited about the ideas and innovations that we're proposing and learning and hearing from the other teams and groups as we all move forward to a more socially just future, so thank you again for giving us a chance to participate.

MS. MURIMI: Thank you, Cheryl.

We'll move on to Colleen Fitzsimons. Go ahead and state and spell your name and give you affiliation, if any.

MS. FITZSIMONS: Hi. My name is Colleen

Fitzsimmons, spelled C-O-L-L-E-E-N F-I-T-Z-S-I-M-O-N-S and I'm the Executive Director at the San Diego Green Building Council.

And we are super-excited to be partners in the Communities for Global Sustainability project here in San Diego. It's a great opportunity for us to build on our mission to educate and inspire and collaborate within our community. While also providing opportunities for our community to put some hands-on experience with these technologies as well as putting a pilot project into our affordable housing market that shows how we can do zero-carbon all-electric buildings affordably and replicate it across the region and the state. So thank you so much for this grant and this opportunity for our region to really shine. Thanks.

MS. MURIMI: Thank you, Colleen.

Next, we'll go to Kirstin Berquist, apologies if I have misstated your name. Go ahead and state and spell your name, give your affiliation if any.

MS. BERQUIST: Hi. My name is K-I-R-S-T-I-N B-E-R-Q-U-I-S-T. I'm an architect with Family Health Centers of San Diego, and we are a nonprofit that has been serving the San Diego County for over 50 years. Our flagship clinic is located in the Barrio Logan neighborhood, which is one of the most heavily polluted areas in San Diego

where things like childhood asthma are at a record high.

The idea of creating equitable and resilient developments is a concept embraced by Family Health Centers of San Diego as it aligns with our mission to provide high-quality healthcare and supportive services to all.

We are excited to participate in the development of a project that addresses climate change and housing affordability. The EPIC grant program will allow us the opportunity to take energy efficiency to the next level. We see this as a chance to learn about new processes to reduce our carbon footprint that we may not have been able to explore otherwise. FHCSD would like to thank Chair Hochschild and the members of the CEC for helping underserved communities strive for the achievement of a zero-emission mixed-use development. That's it.

MS. MURIMI: Thank you, Kirsten.

We'll move on to Debarshi Das, and apologies if I have misstated your name. Go ahead and state and spell your name and give your affiliation.

CHAIR HOCHSHILD: Dorothy, sorry, how many more statements do we have?

MS. MURIMI: We have one more after this.

CHAIR HOCHSHILD: Okay, thank you.

MR. DAS: This is Debarshi Das, D-E-B-A-R-S-H-I D-A-S and I'm here representing ConSol. On behalf of

ConSol and our incredible team of partners we're both humbled and tremendously excited by this, to be able to design an affordable zero-emissions mixed-use development, including 100 all-electric residential units in the Woodland Research and Technology Park located in the City of Woodland.

This project will be a multifaceted and integrative approach to resilience, mobility, education, workforce development and enablement that will empower the lower income community to truly thrive and flourish.

Our fantastic and trusted partners include the California Coalition for Rural Housing, the UC Davis Center for Regional Change, Community Energy Labs, Nuvve, Envoy Technologies, Swell Energy, Skysource, The Hodgson Company, Bardis & Miry Development and BSB Design.

ConSol and our partners would like to thank the California Energy Commission for this generous funding, and just as importantly thank the CEC staff for their tireless dedication. We know you all worked very hard behind the scenes to help our great state realize and accelerate the shared future of equitable decarbonization.

We look forward to delivering the successful design phase implementation of this project in preparation for a potential build space to follow. Thank you very much.

MS. MURIMI: Thank you. We'll move on to Matt Winter. Matt Winter, go ahead and unmute. And state and spell your name and give your affiliation.

MR. WINTER: Yeah hi, my name is Matt Winter. I'm with LPA, we're the architecture firm --

COURT REPORTER: How do you spell the name?

MR. WINTER: -- M-A-T-T W-I-N-T-E-R. We are the architecture firm that's doing the architecture and engineering for the Newton project with Family Health Centers in San Diego.

And I just want to keep this brief and say as architects and engineers we really want to be able to specify, and design engineer these emerging technologies, but it's very hard to go into this space because they are new things. And so I just wanted to express my appreciation for this grant that lets us help bring these things to the market and work, do the working-out part of it, doing the designing part of it, doing the permitting part of it, all that stuff that takes a little while for us to figure out workout. So thank you. That's it.

MS. MURIMI: Thank you.

We'll move on to Steve Guttmann. Go ahead and state and spell your name, give your affiliation if any.

MR. GUTTMANN: Well my name is Steve Guttmann, it's S-T-E-V-E G-U-T-T-M-A-N-N --

MS. MURIMI: Apologies, Steve, but we can't hear you very well.

MR. GUTTMANN: Any better?

MS. MURIMI: Yes, that's better, thank you.

MR. GUTTMANN: I'm sorry about that. So do I need to respell my name?

MS. MURIMI: No, you can go ahead.

MR. GUTTMANN: Oh, okay. First, Molly, I want to say thank you for that great presentation on this. We were hoping we're a case study in a future year. I am a Principal with Guttmann & Blaevoet, consulting engineers in San Francisco and I'm part of the Communities for Global Sustainability team. I'm also a UCSB graduate, go Gauchos. And I just want to say it is an incredible honor to hear about all these projects and be one of the potential grant recipients amongst this amazing group of people. We are all trying to bend the curve and push the envelope on these new technologies.

And you listed building-integrated photovoltaics and prefabrication as part of our project, we're doing so much more than that. Not only demonstrating some emerging and new technologies, but also the heart and soul of this project is about community engagement. I think that the planner from Santa Ana made it clear that we haven't done our job if we're not doing more than just building a

carbon-neutral building, but actually delivering a service to a community and the carbon-neutral building is sort of part of that package we're delivering.

So I want to express my gratitude and honor for being part of a team. I hope we're successful at being awarded the project and I look forward to coming back to you with an incredible design. That's all, thank you.

MS. MURIMI: Thank you.

We move to Steph Groce, apologies if I have misstated your name. Go ahead and state and spell your name and give your affiliation, if any.

MR. GROCE: Great afternoon, my name is actually Stephen, but my friends call me Steph like Curry but without basketball skills, so you're all welcome to call me Steph. That's S-T-E-P-H-E-N G-R-O-C-E, and I will be speaking today as an individual, my own person here in the City San Diego.

And as the former chairperson of the City of San Diego's Human Relations Commission, and the most recent architect of the City of San Diego's redistricting map, I want to applaud the intentionality that our San Diego bidders have put in. But specifically I'd like to call out the C4GS team, because not only have they been very intentional by looking at the complete community's initiative by this state, but really weaving in the

knowledge transfer piece, and the off-grid decarbonization that can happen within communities that have been underserved for so many years.

I just wanted to extend my gratitude and acknowledgement to Molly, great presentation on our part, thank you very much. And the Energy Commission's Commissioners for the tireless work that you do to make sure that California has a carbon-neutral future. So thank you very much, and we look forward to more innovation coming out of not only our communities but the CEC itself. Thank you.

MS. MURIMI: Thank you.

Chair, there no more comments.

CHAIR HOCHSCHILD: Okay, thank you.

Let's go to Commissioner discussion. Commissioner McAllister, please go ahead.

COMMISSIONER MCALLISTER: Well great. Well wow, okay this is awesome. I think all of us can get our hearts racing a little bit when we're doing such an amazing, compelling group of -- we're able to approve and sort of get moving such an amazing group of projects.

Thanks to the team: Molly, Anthony, Rachel and also Molly, right? Two Mollys? Okay, incredible. I really appreciate your care and presentation for this and walking us through each of these projects. They're

different, they are all moving us really steadfastly in the right direction but they're different and they complement each other and hang together really well as a group.

Thanks for everyone who called in. There is some amazing leadership just on the phone right now, piped into the Commission, and we're really grateful to have all of you involved in these --

CHAIR HOCHSCHILD: Try and move off the pipes, maybe wired into the Commission. (Laughter)

COMMISSIONER MCALLISTER: Yeah exactly, I guess we're getting away from pipes.

But really just I mean, this moment reflects so much effort and thoughtfulness in your particular communities. And it ought to go without saying, but I'll say it anyway, we are in a housing crisis. And so the dovetailing of climate response with a response to the housing crisis, and particularly getting more affordable housing built in the right ways and right places with relatively high density and proximity to services, all of that, is just a part of quality of life.

And I think it just reflects the growing understanding and acceptance that we have a series of kind of complementary crises that we have to solve simultaneously, that the climate crisis is not in a silo because we have equity, we have all sorts of issues of land

use and equity, inequality, injustice that are long-term social issues that go way far beyond energy, but that really do require some solutions if we are to get to our climate goals. And so I think that's something that's hard to overstate and it means that this is going to really take a lot of rolled-up sleeves and heavy lifting by all of us in an ongoing way.

So an amazing group of counterparts here, and grateful to see some communities that I'm relatively familiar with in here as well.

And another thing I'd like to highlight is just the -- and some of our commenters said that, and thank you very much for these observations -- I think there's also an acceptance or an understanding now as we really try to walk the walk and in this case put significant resources into sort of assisting, finding solutions of these problems including the climate one, that we cannot be successful without involvement from communities themselves and community-based organizations that already have a trust of the community. And I think that's just inherent to these kinds of multifaceted problems that we have to address.

And so those of you on the phone, you're an embodiment of that. And thank you for really being the connective tissue that allows these projects to sort of go from the state and happen at the local level, because they

just would not happen without you so lots of great expertise represented in these projects.

I'll just finally just list out the things that are particularly of importance to me. I think certainly density, the smart-wiring, the resilience, some of the details of these projects, the requirements of the notice, or the opportunity, and then also the proposal that came in dovetails really well with the BUILD Program. So we have this new program to provide some resources for all-electric new construction targeted mainly at low-income or affordable multi-family housing, so I would imagine that we could sort of be of further assistance to some of these projects at least.

It’s great to see a mass timber project and discussion, or a built-in sort of treatment of the embodied energy in carbon. Because that's the place we're going in one aspect of the building code and agency, the agency environment. Maybe not driven by the Energy Commission, but embodied carbon is definitely the next frontier for us to treat as a state.

And I guess, finally, the virtual power plant is it's kind of a buzzword at this point. But Bloomberg just came up with some data about how much investment is going into that realm and last year was $1.3 billion. And that was almost double of the previous year. So we know that

this ecosystem, these approaches are going to grow very quickly going forward, and so it's great to be future-proofing these projects along those lines as well.

So with that I just want to congratulate the team, all the bidders, all the awardees, for a job well done and really looking forward to keeping track of where these projects go. And hopefully checking some out in person at some point in the not-too-distant future. So with that I'll pass the mic back to the Chair.

CHAIR HOCHSCHILD: Yeah, thunderous agreement for all that. And I would just add Commissioner McAllister and I just had lunch and walked by the new State Office Building where the Legislature and the Governor's Office is, which is also an all-electric new building and really nice to see this kind of building decarbonization happen on state facilities. And I just wanted to give a tribute to DGS and the hard work there. So I'm pleased to support this. I don't know if there is any other comments.

Commissioner Monahan?

COMMISSIONER MONAHAN: I'll be very brief, but I just want to congratulate the team and also say when we talk about equity, I get frustrated when we say, "Oh it's located in a disadvantaged or low-income community, check the box. We've done it." And I want to say this ain't no check-the-box. These are really thoughtful, just really

exciting to see this integration of affordable housing which is so critical right now.

I mean, the situation that we're facing on the streets with a lot of families not having a place to live, I mean it is such a crisis. So the fact that we're addressing R&D, which you don't think of is like really touching people's lives in a direct and intimate way, and this does. So just great projects, really exciting.

CHAIR HOCHSCHILD: Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, I just want to thank Anthony, Molly, Molly, and Rachel. Thank you so much for the presentation. And also, I think just Eric, for your leadership over the years on the market facilitation side, thank you so much.

And these are great projects as Commissioner McAllister mentioned and Commissioner Monahan. I think it just shows the diversity of projects that can really set up a template for the future. I mean there's like so many things that go into here that are not off the shelf, so having some diverse options moving forward would really benefit our state. And I think building decarbonization is a huge, huge effort that we have. And really looking forward to continuing to learn from you all, thank you so much for your wonderful work.

CHAIR HOCHSCHILD: All right, thank you everybody. Unless there's further comment Commissioner McAllister would you be willing to move Item 5?

COMMISSIONER MCALLISTER: I move Item 5.

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

VICE CHAIR GUNDA: I second Item 5.

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.

Commissioner Vaccaro had to depart for another meeting so that item passes 4 to 0.

We already adopted Item 6, so we'll turn now to Item 7, Zero-Emission Transit Fleet Infrastructure Deployment.

MS. ODUFUWA: Yes. Good afternoon, Commissioners. My name is Esther Odufuwa, an Energy Commission Specialist I with the Fuels and Transportation Division. It's good to be here today to see everybody in person.

So today we are seeking approval for two agreements resulting from the Zero-Emission Transit Fleet Infrastructure Deployment Solicitation.

In July 2020 the CEC released the Zero-Emission Transit Fleet Infrastructure Deployment solicitation, which had about $20 million available. And this is for large-scale conversion of transit bus fleets to zero-emission vehicles. And this one was from the fiscal year 2021-2022 Clean Transportation Program funding. We received 11 applications requesting over $51 million.

Initially we were able to only fund four out of the seven passing projects given the amount of the funding that was available. But with the addition of funds from the from the fiscal year 2021-2022 general funds that was dedicated to medium-duty and heavy-duty we were able to fully fund all the 7 passing projects totaling over $36 million.

Four of these projects were presented at earlier business meetings and one remaining project will be presented at a future business meeting. Next slide.

The proposed projects will demonstrate large-scale infrastructure projects, they will demonstrate resiliency, and they will also provide best practices and the key lessons learned for future replicability at other transit agencies. These projects will help other

California transit agencies understand the technology that may best work for them, work for their applications, their routes, their environment, which will ultimately accelerate meeting and exceeding the California Air Resources Board's Innovative Clean Transit requirements, which requires this transit fleet to transition their entire fleet by 2040.

The proposed projects will reduce greenhouse gas emissions, motor vehicle emissions, they will also provide air quality benefits to transit riders and the communities that they will serve, which are often disadvantaged communities and low-income communities and also priority communities.

These projects will also potentially lead to the creation of green jobs and help contribute to sustainable economic growth and of course improve quality of life within these various regions. Next slide.

The first agreement is with the City of Culver City. And the goal of this project is to support the transition of the city of Culver City's entire bus fleet to 100 percent zero-emission fleet by 2028. And to be able to meet this goal, City of Culver City has established a multi-phased approach, or a multi-phased project as part of their zero-emission bus transition plan. So on that particular project that is funded by the Energy Commission, Culver City will install charging equipment that is needed

to support its first 36 battery electric buses.

The Culver City fleet operates annually for approximately 953,000 miles and they use an equivalent 556,000 gasoline gallon equivalents of compressed natural gas or CNG. So deploying these zero-emission buses in place of the CNG buses, which is in their existing fleet will prevent the release of the emissions, which will have a considerable health impact on the local community.

So the city will be building like an overhead structure that is used to support equipment such as a charging pantograph which will be over the bus yard depicted on this slide. And this will be able to support automated charging of the buses.

Southern California Edison will be the one doing the major vault at this site. They will do the transformer, the conduits, and the city will develop the charging specifications that is needed for this particular project. The city will procure the equipment that will meet Culver City's multiple transit bus fleet and the manufacturers. And the system will be capable of managing time of charging, charge duration, charge power, and the number of concurrent chargers in order to manage utility costs as well as support the grid's reliability. Next slide.

This map identifies the locations in the service

area identified as low-income and disadvantaged communities shown in red. Culver City bus ridership along this corridor, which is shown in the green line includes individuals using public transit for urban vocational, educational and health services destinations. And this is the primary and often only transportation option for these individuals in this particular community. Next slide.

The second agreement is with Alameda-Contra Costa Transit District, or AC Transit, and the goal of this agreement is to upgrade the existing hydrogen refueling station at the Oakland Seminary Avenue site. The existing infrastructure currently serves only about 13 fuel cell buses, but with this funding to date from this project it will enable the operation of a large fleet of up to 60 fuel cell buses. Initially, 20 of these fuel cell buses will be placed in service by 2024.

So again, AC Transit plans to upgrade the station to enable the increase in storage, there will be more frequent deliveries of fuel at that site, and there will be additional dispensers at this site. The new station will allow fueling of two buses at any time and will be capable of back-to-back fueling of the entire fleet within six to eight hours. That's a great improvement from what they currently have.

The aerial map shown on this slide provides a

visual context on where the hydrogen dispensers, shown on the upper left, and the new equipment on the lower right will be installed at the Division 4 site. Next slide.

Again, the zero-emission buses and the infrastructure that will be installed will provide a multitude of benefits for the district, and of course the riders.

One other thing to note is that the Division 4 is located in East Oakland and the fuel cell buses that are serviced in this Division provide service to 55 percent of the Disadvantaged Communities in the Oakland area. And that will make it like a lifeline for many local residents who rely on those buses for their daily necessities.

In addition, I want to say that there is a substantial number of these bus routes shown on the slide that are from this particular Division 4 yard, that will be serving several other areas that are in DACs. And the bus lines shown also provide connections to major job centers, not just in Oakland there but in San Francisco and outside San Francisco. Next slide.

So there are currently about 11,500 transit buses in California that are actually required to abide by the CARB's Innovative Clean Transit rule that requires, again, for them to transition their fleet to zero-emission by 2040.

And additionally, California currently has only 16 (sic: 76 on slide) fuel cell buses. However, the 2029 Vision document by the California Fuel Cell Partnership is envisioning a minimum growth path from 100 buses ordered in 2020 to over 25 percent of these total zero-emission buses ordered by 2029, including the supporting fueling infrastructure.

As of April 18th of 2022 there are about 58 open-retail hydrogen refueling stations in California that are funded by the Clean Transportation Program, the Volkswagen Mitigation Trust Fund, and of course the private sector. All these stations have the capability to serve more than 36,000 light-duty fuel cell electric vehicles, which exceeds the current 13,305 fuel cell vehicles.

We also have planned 179 stations that will have the capability of serving more than 245,000 light-duty fuel cell vehicles, of which at least 13 of those stations will be able to serve both medium-duty and heavy-duty vehicles.

And the hope is that as the number of hydrogen stations increase or expand station deployment should not be a barrier to the near-term fuel cell bus deployment as well as in addition to the light-duty fuel cell vehicles. Next slide.

So staff recommends approval of these two grant awards and adoption of staff's determination that these

projects are exempt from CEQA.

So thank you all for your time and consideration of these items. Staff is available to answer any questions you may have. And I believe Nick Szamet, Senior Management Analyst from Culver City is on the call and Rolando Cruz as well as Evelyn Ng from AC Transit. They are all available on the call if you have any questions. Thank you.

CHAIR HOCHSCHILD: Thank you.

Dorothy, do we have public comment on this item?

MS. MURIMI: Thank you, Chair.

Quick instructions for everyone again. If you are on Zoom, go ahead and use the raised-hand feature. It looks like an open palm or a high five at the bottom of your screen or device. If you are calling in go ahead and press *9 to indicate that you'd like to make a comment. And if you are here in person, go ahead and use the QR code or check in with the Public Advisor at the back of the room as well.

I see Eve Ng on Zoom. Go ahead and state and spell your name and give your affiliation, if any, and unmute on your end. You may begin your comment.

MS. NG: Hi. Good afternoon, Commissioners. I'm Eve Ng, last name spelled N-G, shortest last name ever. I am the Capital Planning and Grants Manager at AC Transit. On behalf of everyone at AC Transit I would like to thank

the Commissioners who described -- helped us take significant steps in our transition towards a zero-emission fleet.

As we continue to purchase zero-emission buses we also have to install for fueling or charging infrastructure in order to operate these buses. Upgrading our hydrogen station will allow us to increase our fueling capacity by about three times and also provide resiliency for the overall system. So we're really looking forward to starting this project and greatly appreciate the part you have played in getting us here.

We'd also really like to appreciate the CEC staff, Esther, and Michelle, for with working us thus far and we really look forward to working with them throughout this project as well, so thank you so much.

MS. MURIMI: Thank you.

Next, we have Rolando Cruz. Rolando Cruz, go ahead and unmute, state and spell your name and give your affiliation, if any.

MR. CRUZ: Good afternoon, my name is Rolando Cruz. The last name is C-R-U-Z. And I'm the Chief of Transportation for the City of Culver City, one of the recipients of this grant. So I want to start off with saying thank you to the CEC for selecting Culver City and supporting our transportation electrification project and

our goal of electrifying our city bus public transportation fleet by 2028.

We are a small city of 40,000 people surrounded by the City of Los Angeles, carrying over 5 million passengers a year. Our City Council is in alignment with the goal to reduce our reliance on fossil fuels and improve the air quality of the greater Los Angeles area.

Besides the environmental and community benefits we are excited about the operational costs that are anticipated to be lower than the fossil fuel buses. So with this grant it will help us build the expensive infrastructure necessary to operate the buses. So again, thank you for your vision for the State of California.

MS. MURIMI: Thank you.

Chair, there are no more comments.

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

COMMISSIONER MONAHAN: Well, first of all I want to say it's so nice to see you in person, Esther. I'm like, "Wait, you're not on Zoom screen. You're not a little Zoom square."

And you've seen these grants in the past. I just think that the electrification of transit, it's in the vanguard of heavy-duty electrification. And being able to support these transit districts as they're struggling, I

think with the impacts of COVID and a lot of other challenges facing transit districts, that this is a great investment to support them as a zero-out emissions from transportation and use this kind of innovative -- I think especially in the case of Culver City --methods of charging transit buses, so lots of good lessons learned. And I just appreciate the leadership of both of these transit districts in having really ambitious goals towards transportation electrification.

CHAIR HOCHSCHILD: Thank you.

Well unless there are other comments are you willing to move the item Commissioner Monahan?

COMMISSIONER MONAHAN: I move Item 7.

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

VICE CHAIR GUNDA: I second Item 7.

CHAIR HOCHSCHILD: 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. Item 7 passes 4 to 0.

Let's turn now to Item 8, Ultra-Low Carbon Fuel: Commercial Scale Production Facilities and Blending Infrastructure.

MR. NGUYEN: Hello everyone. Hello Chair, Vice Chair and Commissioners. My name is Hieu Nguyen with the Fuels and Transportation Division. Today staff is seeking approval of three projects that were proposed for funding under the Ultra-Low-Carbon Fuel: Commercial-Scale Production Facilities and Blending Infrastructure solicitation. Next slide, please.

Before I present the three projects, I wanted to provide an overview of Grant Funding Opportunity-20-608. Two areas of focus for this solicitation were to provide support for projects that increase the in-state fuel production and/or blending capacity of ultra-low-carbon alternative fuels, defined as a fuel with a carbon intensity score of equal or less than 30 grams of carbon dioxide equivalent per megajoule. Proposed projects must use commercially tested fuel production or blending technologies and expand their fuel capacity by 1 million diesel gallon equivalents or more per year. A total of $9 million were awarded under this solicitation.

I will now be presenting three of the projects that were proposed for funding under this solicitation. There will be two fuel production projects and one fuel

blending project. Next slide.

The agreement with California Grinding is to expand the capacity of California Grinding's waste processing facility, including the construction and commission of a commercial-scale fuel production facility. The facility will process 250 tons per day of organic waste materials to produce about 1.3 million diesel gallon equivalents per year of renewable compressed natural gas. A portion of the fuel produced from this project will be used locally by the City of Fresno's waste haulers and heavy-duty truck fleet.

The picture on this slide highlights California Grinding's anaerobic digestion process of converting the organic waste into renewable natural gas. On the left of this slide, Dairy manure, green waste and food waste are pre-processed before they are moved into the anaerobic digestion system, seen in the center of this slide. This system breaks down the feedstock to produce a raw biogas, which is then cleaned and compressed by the biogas cleanup system, seen on the right side of this graphic, into renewable natural gas that will be injected into the Pacific Gas and Electric natural gas pipeline. Next slide, please.

The benefits of the California Grinding project are to improve economic opportunities within disadvantaged

and low-income community in a series of ways. The project will provide 29 new full-time equivalent jobs and increase the supply of waste-derived low carbon or renewable fuels.

When the project is complete and operating at full capacity the project is expected to displace about 55,000 metric tons of carbon emissions annually as well as reduce criteria pollutants and toxic emissions by diverting and utilizing locally sourced organic waste.

Once the facility is complete the project will eliminate 6,000 truck trips to the landfill per year through the onsite processing of the organic waste at this facility. Next slide.

The second proposed agreement with SoCal Biomethane, LLC is to support an expansion of an ultra-low carbon fuel production facility. This project will produce about 1.6 million diesel gallon equivalents of low-carbon renewable natural gas as transportation fuel from food waste and wastewater and displace over 18,000 metric tons of carbon dioxide equivalents per year.

SoCal Biomethane will achieve this production increase by improving, expanding, and refurbishing the existing, on-site waste reception equipment; installing new equipment to increase digester throughput without constructing new digester tanks; and expanding and adding resiliency to the existing gas treatment and RNG

compression equipment.

This slide shows the SoCal Biomethane fuel production process. SoCal Biomethane will take an existing idle anaerobic digestion system and upgrade it in a few areas. The proposed upgrades are in blue, like the thickening system and additional biogas storage. They will also be expanding the biogas conditioning and upgrade system. The items in green are their existing infrastructure found on-site. Next slide.

The project will improve economic opportunity and air quality within a disadvantaged and low-income community by committing to creating 10 full time jobs and to stop the flaring of biogas and converting this excess biogas into pipeline-grade renewable natural gas at the Victor Valley Wastewater Reclamation Authority facility. When the project is complete and running at full capacity this facility will reduce over 365,000 metric tons of carbon dioxide equivalents over a 20-year period. Next slide.

Finally, our proposed agreement with AltAir Paramount, LLC will support the upgrade and retrofit of their existing fuel-blending terminal in Paramount California to increase ultra-low carbon fuel blending capacity in the state.

The project is also partially funded by a $1.5 million dollar grant under the USDA Higher Blends

Infrastructure Incentive Program.

The picture along the top of this slide show the current operation which is split between two locations. Funding for this project will be used to connect the onsite storage tanks with the adjacent Union Pacific rail line, create piping modifications, repurpose an existing tank, build spill containment, improve the biodiesel injection system and vapor recovery system at the truck-loading area, and install personnel safety infrastructure required by code.

When complete the entire operation fuel transfer process will be accomplished onsite without the need for trucking fuel to the facility. The resulting efficiency will increase throughput of biodiesel blending from 1.1 million to over 32 million gallons per year. Next slide.

In the short term this project will be supporting hundreds of construction jobs in a low-income and disadvantaged community.

In the long term, the project will eliminate 4,500 truckloads that would otherwise be transported on community streets.

In addition, when the project is complete and running at full capacity, the project is expected to annually displace over 1.5 million metric tons of carbon emissions. Next slide.

For our proposed agreement with California Grinding staff has analyzed the lead agency City of Fresno's environmental review documents and has found that with mitigation this agreement will not have any significant environmental impacts.

For this agreement staff is seeking your adoption of CEQA findings and approval of the grant award in Item 8a. Michael Brown and Dennis Balakian with California Grinding are attending this meeting remotely and are available to answer any questions.

For the SoCal Biomethane agreement staff is seeking your adoption of staff's findings that the project is exempt from CEQA and your approval of the grant award in Item 8b. Dr. Andrew Dale with SoCal Biomethane is attending this meeting remotely and is available to answer any questions.

And finally, for proposed agreement with AltAir Paramount, LLC staff has analyzed the lead agency City of Paramount's environmental review documents and has found that, with mitigation, this agreement will not have any significant environmental impacts.

For this agreement, staff is seeking your adoption of CEQA findings and approval of this grant award in Item 8c. Mohsen Ahmadi representing AltAir Paramount, LLC is also attending this meeting remotely and is

available to answer any questions.

Thank you for your consideration. This concludes my presentation.

Great, thank you. Let's go to public comment.

MS. MURIMI: Thank you, Chair.

Folks on Zoom can go ahead and use the raised-hand feature to indicate that they'd like to make a comment. That looks like an open palm or a high-five at the bottom of your screen or device. If you are calling in go ahead and press *9 to indicate that you'd like to make a comment. And for those in the room go ahead and use the QR codes in the back of the room or see the Public Advisor at the back of the room as well.

We'll move on to Zoom right now. Peter Ward, go ahead and state and spell your name and give your affiliation if -- I see Peter Ward has dropped his hand.

Moving on to Michael Brown, go ahead and state and spell your name and give your affiliation, if any. Give me one moment here. We're having technical difficulties, one moment.

MR. BROWN: Is that better? Can you hear me now okay, Hieu?

MS. MURIMI: Yes, we can.

MR. BROWN: Okay, sorry. My name is Michael Brown. And that's M-I-C-H-A-E-L Capital B-R-O-W-N. I'm the

Program Manager for California Grinding for the implementation of the proposed project. The principals of our company have been farming in the Fresno area for over 100 years, and for the last more than 20 years serving the City of Fresno, other jurisdictions, and the agricultural community with organic waste management.

As Hieu explained our project is to build an anaerobic digester, which will take a combination of green, food waste and manure and produce about 1.3 million gallons per year of RCNG. Fortunately our site, which is currently receiving these materials and processing them is adjacent to a PG&E pipeline, giving us easy access to sell the RCNG primarily to the city of Fresno and other identified users.

This project will create a number of jobs in this highly unemployed area and will improve air quality. And I wanted to point out that the American Lung Association recently published their annual survey and rank the Fresno area as the number one worst place to live from an air quality standpoint, so that air quality improvement is very important.

And also very importantly it will enable the city of Fresno and surrounding jurisdictions to meet their waste discharge, waste diversion requirements of SB 1383. So thank you very much on behalf of California Grinding and I'm happy to answer any questions if they do come up.

Thank you.

MS. MURIMI: Thank you.

Moving on to caller ending in 080, go ahead and unmute on your end, and you can do that by pressing *6. State and spell your name and give your affiliation, if any. That's caller ending in 080. Again, you can make your comment by pressing *6 to unmute on your end.

MR. BALAKIAN: Hello, hello.

MS. MURIMI: Hi.

MR. BALAKIAN: Can you hear me?

MS. MURIMI: Yes, we can hear you now.

MR. BALAKIAN: Oh, great. Thank you. Yes. Hi, Energy Commission. My name is Dennis Balakian, D-E-N-N-I-S B-A-L-A-K-I-A-N. I am with California Grinding.

First of all, I wanted to thank the California Energy Commission for your consideration and support of this project. As Michael mentioned unfortunately where this project is located, we have the worst air quality conditions in the entire nation. The American Lung Association just conducted a study and ranks Fresno as the worst in the entire country. Statistics state that over 50 percent of the children born here on our valley has some sort of respiratory problems. It's also reported that if you live in certain parts of the city, you can shave 12 years off your life.

We feel this project will not only improve the efficiency of renewable energy production, but also significantly impact the reduction of greenhouse gases and be a game-changing for waste management.

I want to thank the team members who helped us get us here today, I want to thank the Energy Commission for your endorsement and consideration of our project. I am also here available to answer any questions.

MS. MURIMI: Thank you.

Next, we have caller ending IN 403. Again, press *6 to unmute on your end and give your name and affiliation, if any. Again, that's caller ending in 403. And again, to unmute press *6 on your end. (No audible response.)

CHAIR HOCHSCHILD: Is there any more public comment, Dorothy?

MS. MURIMI: No more public comment, Chair.

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

COMMISSIONER MONAHAN: Well, just thanks to Hieu for his thoughtful stewardship of these projects.

And I will say that we have a lot of vehicles that are going to take a long time to electrify. Most of our funds are going towards accelerating our zero-emission

transition which is real and happening now. But for a lot of especially heavy-duty vehicles, they're going to be on the road for a while. And so this is very, very specific to reducing air pollution in heavy-duty engines.

I will say last week I had the pleasure of going to the AltAir Paramount facility, which is one of three refineries that's converted from an oil processing refinery in California from oil to biofuels. And they are using our grants to really scale up their operations and they say they're going to have the most sustainable jet fuel in the world coming out. And they're following the roundtable on sustainable biomass principles that are coming out of the EU, which are like the most aggressive that I'm aware of. And just really United Airlines was there. And they are really excited about these off-take agreements, so this idea of how do we create an ecosystem of investments that really helps us meet our short- and long-term goals, and these grants sit in that package.

CHAIR HOCHSCHILD: Commissioner McAllister.

COMMISSIONER MCALLISTER: I guess this is an off-the-cuff kind of question but I guess -- maybe it's more to Commissioner Monahan -- but so the aviation sector, these are the kind of hard-to-read sectors, these ones that are being worked on but not quite going to scale and are still kind of pricey, I wonder -- gas prices are really high,

there's a lot of volatility -- I wonder is your sense that that's creating some urgency? Or that's opening some space to sort of transition more quickly in, say, aviation?

COMMISSIONER MONAHAN: There's no doubt that high fuel prices are driving, always drive actually, investments in alternatives, so I would say yes in a broad sweeping way.

I would also say, though the air travel industry is particularly -- I mean, there's not easy solutions for them in the zero-emission space. They see advanced biofuels as kind of their only way for long-distance travel. I mean, surprisingly batteries can, and fuel cells can do short trips, but these long trips have to be met right now by liquid fuels. And so they are hungry for these fuels.

And what is interesting to me is that this innovation is happening in California again. When we talk about ZEV manufacturing, why is it happening here? This is a very expensive ecosystem, but it's happening here. And I think in part it's happening because of grants. In part it's happening because of the Low Carbon Fuel Standard. There's credits to be had. And so to me it's fascinating that California is the place where this is happening. And I talked a lot about it to them like, "Why here, why here," and it does seem like the policy environment that we have

is so unusual that no other place has it.

COMMISSIONER MCALLISTER: Great, that's really helpful.

COMMISSIONER MONAHAN: I mean, we're the only ones with the Low Carbon Fuel Standard. (Overlapping colloquy) And California is a big state. There are smaller states that have it.

COMMISSIONER MCALLISTER: Great. That's super helpful, thank you.

CHAIR HOCHSCHILD: Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah, thank you. First of all it's nice to see you, it's been a long time. Thanks for the presentation.

I think I just wanted to flag one thing that came up today on the SB 1383, and I just wanted to make sure or at least pass on the information that there has been a lot of grants from the CalRecycle on this topic. I wanted to just leverage our work on how we've been collaborating with CARB on developing a lot of these solicitations and see if there is an opportunity for us to continue to collaborate with the CalReycle on these kind of projects. It's just a thought, right.

MR. NGUYEN: I'll pass that on to (indiscernible) (Overlapping colloquy.)

I know that in the past when we did have a cross-

funding with CalRecycle, our funding focuses on the gas upgrading technologies, not the actual anaerobic digestion system costs. But yeah, I can definitely follow up with you, Commissioner Gunda, on that question as well. And nice seeing you again as well.

CHAIR HOCHSCHILD: Okay, unless there's any other comments, I'd entertain a motion on Item 8 from Commissioner Monahan.

COMMISSIONER MONAHAN: I move to approve Item 8.

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

VICE CHAIR GUNDA: Second Item 8.

CHAIR HOCHSCHILD: 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. That item passes 4 to 0.

We'll turn now to Item 9, Ideal ZEV Workforce Pilot.

MR. RILLERA: Great. Good afternoon, Chair and Commissioners. My name is Larry Rillera. I'm staff with

the Fuels and Transportation Division. I will be presenting Item Number 9 and seek your approval for two agreements as a result of this solicitation. Next slide, please.

The IDEAL ZEV Workforce Pilot solicitation was released in October of last year as a competitive solicitation with over $6 million in available funding.

Fourteen projects are proposed for award for a total of $6.5 million in funding. Two agreements are being recommended for funding today.

This solicitation is a partnership with the California Air Resources Board. CARB contributed $1 million to project work and is building staff capacity for clean transportation workforce training and development.

Benefits of the solicitation includes: The development of ZEVs and ZEV infrastructure career pathways, and high road training partnerships; the creation of jobs including high quality jobs; advancing the ZEV industry; and support for priority community solutions and skills development.

Next slide. Thank you.

The first project is a proposed agreement with the Community Resource Project located in Sacramento California and is a community-based initiative.

The project will develop ZEV and ZEV charging

curricula, conduct training, and facilitate job placement. Specific training will be provided in ZEV manufacturing and EV charger installation, operation, and service.

To help ensure successful outcomes and job creation, project partners include employers such as Phoenix Motorcars and ChargerHelp, as well as a suite of workforce partners such as the California Mobility Center and the Sacramento Clean Cities Coalition. It is estimated that 75 jobs will be created as a result of this project.

Staff would note that the State's CalEnviroScreen 4.0 tool ranks this project in the 93rd percentile in terms of environmental and socioeconomic impacts. Next slide.

The second project is a proposed agreement with the Kern Community College District located in Kern County and is a regionally-based training initiative. The project will develop EV charging curricula, conduct training for electricians, and facilitate jobs in electrical occupations. The project will also prepare electricians for Electric Vehicle Infrastructure Training Program or EVITP certification.

To help ensure successful outcomes and job creation project partners including the San Joaquin Valley EV Partnership, the Kern County Electrical Apprenticeships in partnership with the International Brotherhood of Electrical Workers and the National Electrical Contractors

Association.

Staff would note that the State's CalEnviroScreen 4.0 tool ranks this project in the 92nd percentile. Next slide, please.

Staff recommends approval of the Community Resource Project agreement and the Kern Community College District agreement. Staff also recommends approval of a determination that these actions are exempt from CEQA. Thank you.

MS. MURIMI: Thank you, Chair.

Instructions for everyone once again. Folks on Zoom go ahead and use the raised-hand feature, it looks like a high-five at the bottom of your screen or device. If you are calling in go ahead press *9 to raise your hand. And for those in the room go ahead and use the QR codes provided, as well as seeing the Public Advisor at the back of the room.

I see a raised hand. And just to clarify, this is for Item 9. Peter Ward, go ahead and state and spell your name and give your affiliation, if any. (No audible response.)

Seeing no comment, Chair, back to you.

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

COMMISSIONER MONAHAN: Well, first I want to thank Larry and your leadership generally on workforce issues and equity, more broadly. I just feel like you've been such a great partner, a visionary helping out on the EV Strikeforce Work Group on this and just so many ways that you've been sort of putting your values to work literally.

And we've heard, we were at Battery Day last -- was it this last week Chair?

CHAIR HOCHSCHILD: Yeah, uh-huh.

COMMISSIONER MONAHAN: And heard from so many companies that workforce is their biggest concern or one of their biggest concerns, they have several. And I think I'd love to talk with you and the team more about this. Because I do think we should be thinking more deeply about how do we expand the workforce here in California to make sure we can keep these companies here and creating good jobs in the process.

So just I strongly support these. They bring equity together with workforce development and they're really helping making sure that we have a ready workforce that will get good jobs in this that ecosystem.

CHAIR HOCHSCHILD: Fantastic. All right, and I think after this we go to our Business Meeting. And so with that unless there's other comments from Commissioners,

I'd entertain a motion. (Overlapping colloquy.)

COMMISSIONER MCALLISTER: I want to say thank you, Larry for that. It's really good to see you in person as well. It's been a long time so appreciate your leadership on this, thanks.

CHAIR HOCHSCHILD: Commissioner Monahan, would you be willing to move Item 9?

COMMISSIONER MONAHAN: I move Item 9.

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

COMMISSIONER MCALLISTER: I second Item 9.

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 4 to 0. Thank you, Larry.

We'll turn now to Item 10, the March 9th and March 24th Business Meeting Minutes. Are there any public comments on Item 10?

MS. MURIMI: I'll give instructions once more. Pardon me, one moment. So this is the portion of the

meeting where individuals wishing to make a comment on information items or reports -- oh sorry, apologies. Getting ahead of myself.

Now for individuals who are on Zoom or that would like to make a comment go ahead and raise your hand, it looks like a high-five or an open palm at the bottom of your screen or device. For individuals who are calling in go ahead and press *9 to indicate you'd like to make a comment. And for individuals in the room go ahead and see the Public Advisor at the back of the room as well.

I see one hand raised, Alan -- no, Peter Ward.

(No audible response.)

COMMISSIONER MONAHAN: Maybe press *6, you have to press *6 to unmute, so maybe Peter, try that?

MS. MURIMI: All right, seeing no comment from Peter, we can move on. No more comments

CHAIR HOCHSCHILD: Okay, good. Can we have a motion Vice Chair Gunda for Item 10?

VICE CHAIR GUNDA: Yeah, I move Item 10.

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

COMMISSIONER MCALLISTER: 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. That item passes 4 to 0.

Let's go now to Item 11, Lead Commissioner Report. Why don't start with Commissioner Monahan's end.

COMMISSIONER MONAHAN: Okay, for those of you that aren't really tracking the ZEV Dashboard, the Q1 data came in and it's 16 percent, so woo-hoo highest-ever ZEV sale shares. And that compared to 12 percent for 2021. So you can see the trajectory, which -- and hopefully soon we'll have data on medium- and heavy-duty vehicles. The staff is working on that, they just have to work through some data together with CARB before that goes live.

It'll be the first in the country to have medium- and heavy-duty data. And I give Vice Chair Gunda the gold star for having been the original, I think you were the originator of the ZEV Dashboard with your team, so Quentin, Jesse and Heidi, they've all been great.

And it just highlights the importance of what the Governor is trying to do, which is move forward $900 million for light-duty EV charging and Hannon and team and I've been helping too, we've been reaching out to various

stakeholders trying to trying to come up with the best plan possible to make sure that Californians who are hit by high gas prices have an alternative.

We had the first advisory committee meeting for the Clean Transportation Program. It was a smashing success even it was really hard to get a quorum, because it's hard with Zoom. And I feel really passionate about this idea. Like if we want to make sure small equity groups from rural areas can get access to us it's going to be through Zoom, not through these in-person meetings where we're begging people to come into the room, so we have a quorum; like comically difficult. Patrick had to like beg people or basically I'm like, "Please come, I'll make you cookies." Do you know what I mean? I spent a lot of money on cookies actually. I was too busy the night before to make them.

And I want to thank our CCO, because she and her team and that she like spent some weekends making sure that we had the right Roles and Responsibilities Document that allowed us to keep our equity group so just thank you. You're amazing.

Let's see, on industrial decarbonization -- it's fun working with Andrew, because I get to pick his big brain all the time. I spoke at an Industrial Decarb Symposium at UC Davis, which was very fun. And Virginia

Lew, Virginia really helped me out on putting together a PowerPoint, made sure that I was accurate. Thanks, Virginia.

And there was lots of interest in FTIP (phonetic) in the $210 million the Governor is proposing, and green hydrogen. Like I think this is just an area I see like a lot of opportunity for us to be leaders and really thinking through investments that can scale, migrate to other states, like what's our scale-up strategy is really what I'm excited about working on with Andrew, with Commissioner McCallister, and others.

And so on hydrogen, GO-Biz is leading that effort to get a federal hydrogen hub. And again, I think our challenge is really how do we leverage hopefully what dollars come to us through the budget to be able to put towards green hydrogen here in the state, so we can accelerate that market and support that process.

Just I've got to say the last month has been crazy travel and some of it with the Chair, some of it was with Commissioner Vaccaro, and it's been so fun to go out and see people again. These tribal visits in particular that Katrina Leni-Konig organized, amazing. I mean, really, I learned so much about I would just say siting issues. You think of siting issues you don't think necessarily of this overlay with Native Americans and yet

it's obvious that there is one. And that came to light when we met with tribes and they talked to us about their concerns and hopes for clean energy and lithium extraction, what that means in terms of what mining means to tribes which is extractive and not caring of the earth. So it was just great to have those conversations and I look forward to more of them.

We also went to the first ribbon-cutting -- and I'm sorry I'm going kind of long, because I missed the last business meeting -- but the first ribbon-cutting of an EV charger in Imperial County. And the only reason that happened is there was this one very good small NGO, Comite Civico, and led by Luis Olmedo. And he got money from General Motors to supplement our funds to be able to have the first EV charger. We need more, so to me that again highlighted the importance of going out into communities and seeing the real barriers that they face, meeting real people, and then tailoring our grant programs to support them. That's our job.

Le-Quyen? Le-Quyen are you -- she's not here. She's gone -- who we're going to miss so much. Don't cry, don't cry over there, David. She organized a trip to Rio Tinto's borax mine in Boron and that also was amazing. And we got to go to their celebration in Boron, which was really fun.

And they're looking to mine 5,000 tons per year, which compared to Salton Sea is small, but in the world of lithium is still something significant. And yeah, it's also the largest open-pit mine in the country. And I've got to say after I went there, I was tired. And I realized I think I was tired because it was overwhelming to see mining, yeah, for me. But it's just exciting also to explore the possibility of California really being a major lithium provider for the world and for the ZEV ecosystem.

Okay, the last thing I want to say is we signed on to a Memorandum of Understanding which will be coming -- I signed on to it -- it's going to come before you all to decide whether we will sign on to it as an agency on Vehicle-to-Everything. And the Chair was there. And it was a really great event organized by DOE. They had IBEW. They had the Utilities. They had the major U.S. domestic car companies. They had your V2G providers, including some that we have funded like Nuvve. And we're really trying to explore, and this intersects with you Vice Chair, around how do we leverage the possibilities of EVs to help the grid be cleaner and better and cheaper. Thank you.

CHAIR HOCHSCHILD: Thank you.

Vice Chair Gunda.

VICE CHAIR GUNDA: Yeah. Thank you, Commissioner Monahan, that was very good. It's like exhaustive. I

mean, it's good to get to hear about all the things that you are doing in terms of being out there and understanding, it just helps learning, so thank you.

So from my end just a couple of things since the last business meeting I want to highlight. I had a chance to visit with MCE, to just visit their facilities and think through with their leadership, all the cool things they're doing. There's been opportunities for hydrogen in the Bay Area in their territory. We talked about their opportunities to deploy fuel cell vehicles, and all sorts of stuff which was really great.

And I was a part of the Chair's Equity Roundtable, which was very helpful to start talking about our equity framework and getting some thoughts on how best to do regional coordination on those elements, which was great.

And I think the rest of it was just spending on emergency issues and reliability, just kind of thinking through those. And I want to just thank Drew and Gordon Schremp from the EAD on just their work on fuels, petroleum awareness on what's going on with the cost of gasoline. So thanks Drew, for your leadership on helping the state, at least leadership be aware of what's going on and how to mitigate them.

On the reliability front, I think most of you

already know, but for those of you who might not be following, there is a new DOC, Department of Commerce investigation that opened up about three weeks ago on potential solar panels circumvention from China into some of the countries that we depend on for sourcing panels for building projects here in California.

So it's a pretty big deal in the amount of projects that are at risk, so given that we already have a lot of risk on project deployment due to land use, permitting and interconnection issues this was the last thing we wanted. So it's been really the last two or three weeks I've been with the Chair thinking through what the ripple effect of this could be in terms of not just 2022, but all the way to '25-'26.

As you all know, CPUC has procured one of the -- or authorized procurement, one of the largest procurements ever, 11,500 megawatts of new NQC (phonetic) translating to almost 25-30,000 megawatts of clean energy between now and 2026. And some of that is solar and hydrogen projects, and those are at risk.

And we also have an emergency situation in China with the COVID impacts there and shut-down in Shanghai and such, which is also impacting storage alone projects. So it's been, as usual, kind of those dark, dark corners as we think out how to work on these issues.

And finally a couple of pieces -- maybe Chair will talk about this -- we had a long-duration storage workshop, which was great. Thank you so much for putting that together and thinking through the long-term trajectory and strategy for that.

And Commissioner McAllister and I have been a part of the EDAM evolution and kind of just tracking that as how that's going to evolve. So those are the main pieces, and great.

CHAIR HOCHSCHILD: Great.

Commissioner McAllister.

COMMISSIONER MCALLISTER: Well, great. I guess it's nice to have some company in the dark corners of the Energy Commission. (Laughter) You know, energy efficiency tends to be kind of insider baseball, a lot of it, and so you have my sympathies.

But having said that I mean one thing I want to just make sure to do is to thank all the staff that is really figuring out how to lead in the building decarb space. It's a tough set of challenges and I think the Division has just a lot of a great team on this. And I just wanted to just thank them directly, I mean kudos really to Mike Sokol for just keeping a lot of plates spinning.

And there are many, many fronts on that building

decarbonization enterprise. Our existing buildings just present as I kind of talked about earlier, a lot of overlapping challenges. And every building is different. Our building stock is diverse, our people are diverse, our geography and our climates are diverse. And so just a lot of challenges that that we have to hit head on, and we have to figure them out and solve them. And happily it looks like building decarbonization is kind of moving to have its moment in the sun. Hopefully it's more than a moment, and the Legislature and the Governor are thinking hard about how to provide us some resources to do that. So that's a great and we're trying to get ready for the programmatic push that will accompany that.

And so not just Mike, but Christine and Will Vicent, Jenn Nelson, Lorraine white, and just many others at both leadership and just staff levels doing lots of yeoman's work.

So I was able to, and I think I mentioned it, I went to New York City last week specifically for a conference on energy and finance that Bloomberg put on. But I took advantage to do a couple of other things. At that event I was on a panel with Phil Pettingill. And we were just talking about the western model, the west coast model, and then it sort of bled into some western issues. But Phil was sort of top man, and I was sort of bottom up,

and we complemented each other pretty well. And there was just a ton of interest in understanding our model, which I think we have and using it as a reference point and building on it.

So while I was there NYSERDA was nice enough to invite me to an event that was really a signature event that they've been planning for a long time with Mayor Hochul from New York and -- I'm sorry Governor Hochul, Mayor Adams, and then Bill Clinton, because the Clinton Global Initiative is there. And so it was on the observation deck of the Empire State Building. And just it was a really marvelous event. They were rolling out the Empire State Building Decarbonization Strategy with the Empire State Building as a marquee project really, so very impressive. We're very much on the same page.

And there's some healthy competition, I think, between the states and that's good. And also, I think there's just a lot of complementarities in our policies. We do some things that they can learn from, and they do some things that we can learn from. And together I think we can -- we're talking almost 70 million people between those two states. And so that's a market mover big time, like more than just California alone.

So we're definitely going to keep in better touch now that we can be -- honestly it helps to be in the same

room with people. I mean, we've all been saying this all meeting there's nothing like reinforcing ties, personal ties when you're together with somebody in real life and you're eating together and you're just really sharing your full life instead of your two-dimensional screen life. So I just think a lot of good things are going to come from that as we build momentum.

The other thing I did while I was there, and the reason I was really excited about going other than just the glitterati aspect of it was that part of it was getting commitments from, was announcing commitments from the largest real estate companies in builders and building owners and operators in New York City of carbon-neutrality commitments. These are huge companies. And so some of them who have large holdings in New York City also have holdings in California. And so there's a lot of stuff to build on there. And I think, again they're leading on that front and we can learn from them, so definitely going to be following up on that.

The last thing I did was I went and visited a project, or a company called BlocPower is doing in New York City. They were hatched there. They have a really kind of visionary leadership and they're managing, they're developing a business model. And it's still in development, and I think they're learning as they as they

go, but they are focused on affordable multifamily housing upgrades of existing buildings. And they're bringing private capital and they're finding ways to package projects such that building owners can get on board and sign on the bottom line and do electrification and multifaceted decarbonization projects.

And so BlocPower has an office in Oakland. And I think it's one of those models out of a number that are out there that that we need to try to really get our hands around and figure out how to support. So I think that was exciting. And lots of, as I say, lots of challenges with those projects but that's where we have to go.

And I wanted to thank Noemi for organizing an Equity and Environment and Social Justice Roundtable for the Efficiency Division team. It was really helpful just having a bunch of really knowledgeable advocates on sort of social justice, environmental justice and affordable housing communities all together, really, I think is a helpful resource to have gathered and to continue to interact with. So thank you Noemi.

While you all were in the long-duration storage workshop I was conducting a workshop on heat pumps and decarbonization, focusing on supply chain issues around heat pumps and it was also super-helpful, tons of food for thought, lots of -- informed from the manufacturers and

contractors and building departments. And just a lot of great suggestions about how we can help smooth the directory for heat pumps as a core decarbonization strategy. And hopefully bring some manufacturing to the state as we scale up. So lots of interesting pathways there, so thanks to Jenn Nelson and Kate Taylor for organizing all that.

So let's see, I wanted to just do a few thank-yous now. So Drew, and Jennifer Martin-Gallardo, and Rob Cook I just want to thank you for all the diligence and keeping, sort of running herd on all the IIJA, the bipartisan Infrastructure and Jobs Act that has a couple dozen streams of funding that we either are going to get or we could go for. And so just keeping track of all that is no small task, so thanks to Drew and the team for that.

Let's see, I wanted to thank Jason Harville. After a number of years of effort I think we're at a place where we have -- here I'm going to use the pipeline metaphor -- we have big pipes of data coming from the Utilities into the Commission in a way that is clean. That's well organized. And is really going to open up, is already opening up large gateways for analytical work. And so I think EAD is going to be the bulk of that effort, but I think it really has implications across the whole Commission. And so just Jason has been instrumental

managing contractors, doing work himself, setting it up, educating all of us, and outside this building as well. So just want to thank him; very, very low-key, very unassuming but just really, amazingly talented, so thanks to him.

I want to thank Linda, the CCO, you and your team are just providing so much value and I'm just thinking about the HERS rulemaking. It's just unpacking the regulatory kind of facts for us in a way that helps move the conversation forward and really helps staff, I think, get their heads around as they're trying to determine the best path forward in that and other arenas, just having level-headed counsel and just very ground truth at each step of the way is invaluable, so thank you for that.

Finally, I wanted to just say how wonderful, I'll just reciprocate to Commissioner Monahan, about industrial and hydrogen. It's really been great, it is great, and will be really great working with you on that as we begin to put together some programs and really, really start moving the needle in those sectors.

And lastly, I just wanted to mention a couple retirements in the Efficiency Division, the Appliances Office. Actually Todd Ferris and Pierre duVair are going to retire, both of them long-standing public servants at the Commission and other agencies. And just wanted to thank them for all of their hard work over all these years.

CHAIR HOCHSCHILD: Great. Thank you, Commissioner. All right, well I'm just going to do a lightning tour through some of the site visits I've had a chance to do the last few weeks. Starting with yesterday, I visited the largest battery storage project in the world, which is at Moss Landing. It's 400 megawatts, all of which is down now, because fortunately nothing to do with the battery but, having to the fire suppression system that misfired. And actually twice and so we've now like that's been fully characterized and resolved. It's coming back online the summer. And again, this is like lessons learned.

That facility is going to scale to 1,400 megawatts by 2025. And it's run by Vistra, which we had a good -- I went with Liane Randolph and we had a good discussion with them. They are a big operator of facilities and power plants across the country and are getting off of coal just about everywhere. We were talking about some of the dynamics around that.

And they're working also I think very strategically to go upstream and actually get into battery manufacturing in partnership with LG Cayman trying to do it. And so I was glad I was there. I connected them to Hannon (phonetic) and some of our funding that is on the street already and some that are coming, so that was good

to see. And I'm glad that that facility will be back online this summer.

A terrific day with Commission Monahan at the MOU signing. One thing we learned there that I had not realized, is that the cost to build a bi-directional EV charger is only 10 percent more than conventional. And so that's, I think, a very modest additional cost to have what I think can be a very substantial benefit. We have over a million EVs on the road in California. And we're adding 900 a day, 16 percent of new vehicle sales as Commission Monahan pointed out.

And just for scale, okay the new Ford F-150 Lightning Electric Truck, which came out yesterday, that is equivalent to a dozen Tesla Powerwalls, right. My little Chevy Volt is equivalent to six Tesla Powerwalls. So there's a huge amount of battery capacity in the car.

So I did the math last night. A typical home in California uses 16 kilowatt hours a day, so you could run your house entirely on your Chevy Volt for four days, as just a way to think about it. And of course that's extremely unlikely you need to do that. But this is part of the whole genesis I think behind this gathering was to really get us up to speed and thinking about bidirectional charging. And I am really excited for what's to come there. I think it can support the grid. It can support

that transportation electrification. And can actually save a lot of money from not having to build more capacity than we'd otherwise need to do.

So, I really want to thank Commissioner Monahan for leaning into that and allowing me to join her at that.

I also had a wonderful Battery Day. A special thanks to Terra Weeks and Mona Badie, Ben Wender and others who helped organize that. We did it at Proterra. This is an Energy Commission success. You guys, I remember it was actually a former Commissioner Janea Scott who was Lead at the time we gave Proterra their first grant. I think they had a dozen people. They have 1,000 employees now and are scaling and building electric buses and battery packs and bus charging infrastructure. And so we had this gathering, half-day gathering at their facility for battery folks. We had all for lithium developers in the state were there with us. And a bunch of other battery folks we funded, including Cuberg and others, a great dialogue about how to scale in California. And that was really fruitful.

I did also a wonderful trip with Linda Barrera and Jen Martin-Gallardo and Katrina Leni-Konig, up to the Yurok territory where we've done our solar battery microgrid and had some good meetings with the Blue Lake Rancheria, the Yurok and others, and then some tribal consultations. That was terrific.

And then I went to Iceland with about a dozen state legislators. Really the reason for me was the Director of the Capture Project, so the largest director of carbon capture project in the world has just gone online there. We were actually the first delegation to go see the facility. It's called the Orca Project and what they are doing -- the best way to think of that it's like the reverse of fracking. So they have these big machines that basically screen out CO2 airflow through them. They do this process, and they can mineralize the CO2 into rock. And we saw the rock, so it takes two years for that process to work, but it's fully proven out. And it's inert and it's permanently stored.

They use a geothermal heat for that process. They are now actively looking at a site in California at the Salton Sea. And they're actually working with the DOE on that, so I'll be following up with them on that. These guys are much further along than I had realized. They've raised over $800 million now. It costs about $600 a ton to heat. They are selling it at 1,100, because the demand in the voluntary market is greater than supply. But they believe they can get down to 100 over time. So we are going to be pushing ahead and looking to do some director air capture with some of our funds.

So I just also wanted to say thank you to our

good friend Vice Chair Gunda, who has been working double time. He was supposed to be on vacation last week. That did not happen. I know, because I was on many of these calls with him. The reliability stuff has been absolutely nonstop, and you've been doing an incredible job. I see that. Commissioner McAllister and Commissioner Monahan sees that, and your staff sees that. We're going to make sure you get an actual vacation. Obviously, the stakes are very high right now with the energy package and all the reliability needs. But we're in a much better place, because of you. So I just wanted to acknowledge your work on that. And I think I will stop there.

VICE CHAIR GUNDA: Chairman, if I could?

CHAIR HOCHSCHILD: Yes?

VICE CHAIR GUNDA: Because you kind of called on me, I have to pass it on to this team. So I think there's been an incredible team in Siting, EAD, Linda you and your team in the CCO. It's just not possible without the incredible hard work and going beyond the call of duty for so many of our staff. And oftentimes some of these requests are last minute, weekends. Just a heartfelt thanks to all of you. And I think this state is in a better place, because of us and our team. And we work really hard and oftentimes it is not visible. A lot of staff work is not visible, and I just want to -- one of

these days, I hope I have enough time to sit down and just write a big letter of thanks to every single person that has been just burning the midnight oil. So thank you, Linda. Thanks to the EAD staff, Aleecia and the team there. And Siting, Shawn and your team, thank you so much.

CHAIR HOCHSCHILD: Yeah, thank you. Well said, thank you. Thank you to everyone.

With that let's go to Item 12, the Executive Director's Report.

MR. BOHAN: Great. Thank you, Chair and Commissioners. Four items, first there's as we've been discussing today, lots of high priority time-sensitive issues. And some of our staff have really been burning the candle at both ends. And I just want to give a shout out to those public service has gone above and beyond lately. I won't mention names, because we'd be here until dark. But there's really been a tremendous amount of work lately.

The work plan process, the second item is coming up. And you will all see work plan presentations for the body of work you focus on here soon. I just cancelled, this morning, the first dry run presentation because too many things are going on. But we're just in the thick of it, and this will be for the next fiscal year the begins July 1.

Third, the budget, some of you know more about

the parts you're focused on than I do, and the Budget Office does, but I just want you to know we're being capably led here by Damien and Rob. And it's been really one of the craziest ones. I thought last year was the craziest. This may be even crazier with so many different pieces in the air. And I'm really grateful to Damien and Rob for their leadership.

And then finally the new building. We are here today. We will be here through May, but we are told -- I might write this in pencil, not pen -- but that June is when we're expecting the auditorium at the new building will be available for these and other sorts of meetings. So fingers crossed, thank you very much.

CHAIR HOCHSCHILD: Thank you.

Let's turn now to Item 13, Public Advisor's Report.

MS. MURIMI: We have nothing to report.

CHAIR HOCHSCHILD: Okay, Item 14, Public Comment?

MS. MURIMI: Thank you, Chair.

This is the portion of the meeting for anyone who would be wishing to make a comment on information items or reports of the meeting or agenda.

Each person has up to three minutes to comment. Comments are limited to one representative per organization. We may reduce the comment time, depending on

the number of commenters.

Use the raise hand icon to indicate your interest in making a public comment. If you're on the phone press *9 to raise your hand and *6 to unmute. And if you're in the room, find the Public Advisor or come to the podium, and we will open your line.

For those on Zoom, and on the phone, we will open your line. And after you're called upon, please restate and spell your first and last names, state your affiliation if any. And do not use a speaker phone when talking, so we can hear you clearly.

I'm looking at our attendees list right now. I see no comments, Chair.

CHAIR HOCHSCHILD: Okay. Thank you.

We will turn now to Item 15, Chief Counsel's Report.

MS. BARRERA: No report today. And it's good to be in person and see you in person.

CHAIR HOCHSCHILD: Yes.

All right, I think we're adjourned. Thanks everybody.

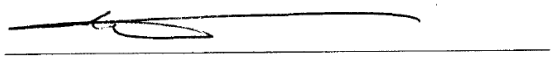
(The Business Meeting adjourned at 3:45 p.m.)

REPORTER'S CERTIFICATE

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 6th day of May, 2022.



PETER PETTY
CER**D-493
Notary Public

TRANSCRIBER'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 transcribed by me, a certified transcriber and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

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

IN WITNESS WHEREOF, I have hereunto set my hand this 6th day of May, 2022.

Myra Severtson
Certified Transcriber
AAERT No. CET**D-852