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BEFORE THE CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	
	)	
	)	
the LITHIUM VALLEY COMMISSION	)	Docket No. 20-LITHIUM-01
_____	)	

LITHIUM VALLEY

COMMISSION MEETING

REMOTE ACCESS ONLY

THURSDAY, SEPTEMBER 30, 2021

1:30 P.M.

Reported by:
Peter Petty

APPEARANCES

Lithium Valley Commission

COMMISSIONERS PRESENT

Ryan E. Kelley, Vice Chair

Rod Colwell

Roderic Dolega

Miranda Flores

Martha Guzman Aceves

James C. Hanks

Arthur "Richie" Lopez

Luis Olmedo

Frank Ruiz

Thomas Soto

Jonathan Weisgall

CEC

Commissioners Present

Karen Douglas

CEC Staff Present

Elisabeth de Jong

Richard Rojas, Legislative Manager, CEC

Lindsay Buckley, CEC Staff

Jim McKinney

Anthony Ng

Noemi Gallardo

Jordan Grimm

RoseMary Avalos

Also Present

Presenters

Cameron Perks, Benchmark Mineral Intelligence
Danny Kennedy, New Energy Nexus/CalCharge
Meg Slattery, UC Davis/Lawrence Berkeley National Laboratory

Public Comment

1. Tom Sophton, EcoMedia Compass

2. Nikola Lakic

3. William Osborn, Geothermal Resources

4. Cristina Marquez, IBEW

5. Hector Meza

6. Nicole Colwell

I N D E X

I N D E X

P R O C E E D I N G S

SEPTEMBER 30, 2021 1:35 p.m.

VICE CHAIR KELLEY: Thank you, Rosemary. So if you're joining us today, be it a smart phone or tablet, you may need to find the ellipses or "more" button to navigate to the interpreter options. Again, all attendees should select a channel, either English or Spanish.

If any members of the public on the Spanish channel have questions or public comment they will be given the same opportunity to engage in public comment throughout the Agenda at the same time that the Chair opens the meeting for public comment for all.

The interpreter will provide instructions to those on the Spanish channel to be sure that all attendees can used the raised hand feature and be called on to speak. The interpreter will assist and translate the question or public comment into English for the benefit of the Commissioners and the attendees on the English channel.

Unfortunately, the Zoom interpretation function does not work for attendees who are only joining by phone. So our attendees on the phone will hear the English channel of this meeting. The Spanish channel is intended to provide members of the public

the ability to hear the entire dialogue of the Lithium Valley Commission Meeting in Spanish and in real time.

To insure that all members of the public have access to the meeting under the Bagley-Keene, we ask that all the Lithium Valley Commissioners select and remain on the English channel for the entirety of the meeting, preferably with cameras on.

All attendees who wish to join the English channel please look for the small globe icon on the bottom of your Zoom application and select the English channel. Do not select "mute original audio."

Also, please note that the slides include some text in Spanish, which is highlighted in light gray. At this time I'll ask Elizabeth or Gina to address -- make a welcome, and also address some of the administrative items.

MS. de JONG: Great. Thank you so much. So this meeting is being conducted entirely remotely via Zoom. This means that we're in separate locations and communicating only through electronic means.

We are meeting in this fashion consistent with Assembly Bill 361, Chapter 165, statutes of 2021, to improve and enhance public access to state agency meetings during the COVID-19 pandemic and future emergencies by allowing broader access through

teleconferencing options.

The public can participate, consistent with the direction in this bill. This meeting is being recorded, as well as transcribed by a court reporter. The transcript will be posted to the electronic docket.

The recording of the meeting will be available on the Lithium Valley Commission web page. The Spanish interpretation will not be recorded or transcribed. Members of the public will be muted during the presentation, but there will be an opportunity for public comment on each Agenda item, and an additional opportunity for public comment towards the end of the Agenda.

To provide public comment please use the raise hand feature in Zoom, and to be called on to speak. When you speak, please provide your name and affiliation. If you've called in by phone you will need to dial *9 to raise your hand and *6 to unmute yourself. Before speaking, please say and spell your name for the court reporter.

There is also a Q&A window in the Zoom application, which you may use to type your questions. If you want to provide public comment but are unable to raise your hand in the Zoom application or by phone, then during the public comment portion of the meeting

you may type your comment into the Q&A window so we can relay your comment.

We'll go over these instructions again during the time for public comment. Please remember to stay muted until you've been called on to speak. We also have a chat function available for IT support, and we ask that the Lithium Valley Commissioners use the chat for IP support, as well.

Any other comments are considered substantive to the conversation and should be made publicly and orally for Bagley-Keene compliance. Meeting materials, including the Notice, presentation slide decks and resource documents are posted online and in the Lithium Valley Commission docket.

Please note that an updated -- oh, sorry. Never mind. So the updated PowerPoint presentation from last month is available in Spanish. All right. So we're going to move on to the roll call.

This is roll call of the Lithium Valley Commissioners to determine if we have a quorum. So when I call your name please respond if you are present and turn on your camera if you can.

Commissioner Castaneda; is not present.

Commissioner Colwell.

COMMISSIONER COLWELL: Present.

MS. de JONG: Thank you. Commissioner Dolega.

COMMISSIONER DOLEGA: Present.

MS. de JONG: Thank you.

Commissioner Flores.

COMMISSIONER FLORES: Present.

MS. de JONG: Thank you.

Commissioner Guzman Aceves.

COMMISSIONER GUZMAN ACEVES: Present.

MS. de JONG: Thank you.

Commissioner Hanks. I don't hear a response.

Vice Chair Kelley.

VICE CHAIR KELLEY: Present.

MS. de JONG: Thank you.

Commissioner Lopez.

COMMISSIONER LOPEZ: Present.

MS. de JONG: Thank you.

Commissioner Olmedo.

COMMISSIONER OLMEDO: Present.

MS. de JONG: Thank you.

Chair Paz is not present.

Commissioner Ruiz.

COMMISSIONER RUIZ: Present.

MS. de JONG: Thank you.

Commissioner Scott. Not present. Okay.

Commissioner Soto.

COMMISSIONER SOTO: Here.

MS. de JONG: Great. Thank you.

And Commissioner Weisgall.

COMMISSIONER WEISGALL: Present.

MS. de JONG: Great. Thank you. So we do have at least eight members. So we have a quorum. Also in attendance today from the CEC is Commissioner Douglas. So I will hand the meeting back over to you, Vice Chair Kelley.

VICE CHAIR KELLEY: Thank you, Elisabeth. So the next item is to the Agenda. The Agenda today will be as follows. The welcome and roll call, administrative items, the approval of the meeting minutes from August 26th; the informational items, media and legislative updates; the Lithium Valley Commissioner updates.

The next item is Lithium Market Opportunities Workshop where we'll have presentations on state policies and investments; Lithium Market Overview and Lithium Battery Life cycle.

Then Determination of Agenda Topics, Speakers, Presentations for Future Meetings, public comment and adjournment. And of course, in each item we will have the opportunity for questions and answers, and also for public comment.

So the first item will be the approval of the past meeting minutes. If you had the opportunity to review the minutes, are there any edits, additions or deletions? Hearing none, do I hear a motion to accept --

COMMISSIONER WEISGALL: So moved; Jonathan here.

COMMISSIONER COLWELL: I'll second.

VICE CHAIR KELLEY: A motion by Commissioner Weisgall, seconded by Commissioner Colwell. Any comment?

MS. de JONG: So before we take the vote we'll move to public comment.

VICE CHAIR KELLEY: Thank you, Elisabeth.

MS. de JONG: So I'll go ahead and read those instructions again. If you're joining us via Zoom on your computer, please use the raised hand feature, and if you called in, please dial *9 to raise your hand and then *6 to unmute your phone line.

This public comment period is regarding the vote to accept last month's meeting action minutes. All right. I do not see any comments or questions at this time.

So we'll go back to you, Vice Chair Kelley, for the vote.

VICE CHAIR KELLEY: Okay. We have a motion and a second. I'll first -- well, do we have to do roll call, Elisabeth or can we just say the ayes and nays?

MS. de JONG: Yes. So if we can go through the list of names and call on each person to ask for their vote.

VICE CHAIR KELLEY: Okay. Then I will ask Commissioner Castaneda, are you for or against?

MS. de JONG: Okay. Commissioner Castaneda is not present.

VICE CHAIR KELLEY: Commissioner Colwell, for or against.

COMMISSIONER COLWELL: (inaudible response.)

VICE CHAIR KELLEY: I believe that was a yes.

COMMISSIONER COLWELL: Yes. I'm sorry.

VICE CHAIR KELLEY: Commissioner Dolega, for or --

COMMISSIONER DOLEGA: Yes.

VICE CHAIR KELLEY: Yes.

Commissioner Flores.

COMMISSIONER FLORES: Yes.

VICE CHAIR KELLEY: Commissioner Guzman Aceves.

COMMISSIONER GUZMAN ACEVES: Yes.

VICE CHAIR KELLEY: Commissioner Hanks.

COMMISSIONER HANKS: Yes.

VICE CHAIR KELLEY: I vote in the affirmative, yes.

Commissioner Lopez.

COMMISSIONER LOPEZ: Yes.

VICE CHAIR KELLEY: Commissioner Olmedo.

COMMISSIONER OLMEDO: Yes.

VICE CHAIR KELLEY: Chairman Paz.

MS. de JONG: Is not present.

VICE CHAIR KELLEY: Commissioner Ruiz.

COMMISSIONER RUIZ: Yes.

VICE CHAIR KELLEY: Commissioner Scott.

MS. de JONG: Is not present.

VICE CHAIR KELLEY: Commissioner Soto.

COMMISSIONER SOTO: Yes.

VICE CHAIR KELLEY: Commissioner Weisgall.

COMMISSIONER WEISGALL: Yes.

VICE CHAIR KELLEY: Okay. That has it. The affirmative wins. The minutes are approved and we move on to media and legislative updates. At this time we will ask Mr. Rojas to give us a legislative update.

MR. ROJAS: Good afternoon. Can you hear me?

VICE CHAIR KELLEY: Yes.

MS. de JONG: Yes.

MR. ROJAS: Great. So yes, Richard Rojas. I'm the Legislative Manager at the Energy Commission, and the Legislative Session for 2021 has concluded, and September 10th was the last days for bills to past either House.

The governor has until October 10th to sign or veto bills. During the last several months we've looked at as many as five bills directly relating to Lithium and those have become two-year bills. So they can come up in January of next year.

One bill that indirectly related to lithium was chaptered on the 23rd of September, SB 423 by Henry Stern, and that required the Energy Commission to put together an assessment of firm zero carbon resources that support a clean, reliable and resilient electrical grid by December 31 of 2023.

It did mention in its findings and declarations that there's an urgent need for lithium to -- lithium supply. So that's a direct -- you know -- the indirect relationship to lithium. We probably will have a very short report going from now until February of next year, because they are now in interim recess, and the introduction deadline will be February 20th, give or take a few days, of 2022. And that is all I have. Thank you.

VICE CHAIR KELLEY: Thank you, Mr. Rojas.

VICE CHAIR KELLEY: Ms. Buckley.

MS. BUCKLEY: Greetings, Commission members, members of the public. There have been no media inquiries since our last meeting, but a few pieces published that were in the works; specifically, a piece from the Associated Press titled, "Lithium Fuels Hopes for a Revival on California's Largest Lake." That was published at the end of August.

And then a piece in the Guardian just this week, "In Search of Lithium Valley, Why Energy Companies See Riches in the California Desert," both pieces featuring Lithium Valley Commission as central to this issue, and several of the members encouraged folks to check that out.

They got a nice glamor shot of Luis in the Guardian piece. And then there was some local reporting, as well. The Calexico Chronicle continues to follow the story locally, reporting on IID, sending a letter to the President on Hell's Kitchen Project, as well as the county bringing on a lithium-related consultant.

And then tonight KESQ News Channel 3 will be premiering a piece on the Lithium Valley issue, as well. On the topic of the community meeting that will

be coming up in November, our office will be working with staff to develop a flyer, both in English and Spanish, to provide to members to help us get the word out, and then we'll also be promoting.

In addition to sending that out on our listers, we'll also be doing some social media outreach, and we're glad to provide some draft content to all of you to help us get the word out locally on that community meeting, as well. And that's it for me.

VICE CHAIR KELLEY: Thank you, Ms. Buckley.

I see a question in regard -- from the Q&A. And Elisabeth, I'm sure we have a -- do we have a comment period for this item?

MS. de JONG: We do, yes, and we will ask if Lindsay Buckley can help with answering that question. Thank you.

VICE CHAIR KELLEY: Okay.

MS. BUCKLEY: Yes. I'm glad to share links to those articles in the chat. We do have an issue with our docket and sharing these articles, though, just due to copyright. There's some challenge with sharing these and publishing them on our docket that I just want to make folks aware of.

So I will gladly share them in the chat, but it's not something that we're able to docket, just due

to copyright concerns.

VICE CHAIR KELLEY: Thank you. So at this time we'll open public comment for the media and legislative update.

MS. de JONG: If we can start with Lithium Valley Commissioners. I do see a hand raised from Commissioner Guzman Aceves.

VICE CHAIR KELLEY: Oh, very good.

Commissioner Guzman-Aceves.

COMMISSIONER GUZMAN-ACEVES: Thank you, Commissioner Kelley. I just wanted to check in on some of what you were talking about Lindsay. So -- and I'm sorry to have been missing the last meeting. But we have a Community Focus Meeting coming up. Is that right? Is that what you were referring to?

MS. BUCKLEY: Yes. And I -- staff can jump in on whether that date has been confirmed, but I understand that will be in November.

MS. de JONG: Yes. So we are moving ahead with plans for the November 17th date.

COMMISSIONER GUZMAN-ACEVES: Okay. And is that the next -- was -- is that the same as the next Commission meeting, or is this going to be a different -- slightly different focus?

MS. de JONG: There is a Commission meeting

set for October 28th between now and then. That will be the regular Lithium Valley Commission Public Meeting. The November 17th meeting is specifically a Community Engagement Meeting. We will have more information and a meeting notice to share with that in the coming month.

COMMISSIONER GUZMAN-ACEVES: Okay. And maybe I can channel a little bit of Chair Paz here. I know in previous meetings he's been -- well, one of the reasons we're doing this community meeting. But also, the importance I know many of you share of making sure we have all the proper outreach to get full participation.

So if there's any way -- if we can just get a quick rundown of what those efforts look like, and if there's anything -- I see some folks -- you know -- some Commissioners, like Commissioner Olmedo and others who probably could help with more specifics on the type of outreach that we need to do to get a greater community participation.

MS. BUCKLEY: Yes. I'm happy to jump in here, Commissioner. We have just recently met with our staff. So as the details of the -- that have just come together, we're developing some outreach materials.

We are intending to translate those materials,

so a flyer that hopefully catches attention, provides some basic information about the meeting and why folks should attend. We plan to distribute that through our channels, and then working with our public advisor, as well.

And we're also hoping to equip all of the members of the Commission with this information to help us do outreach. We'll be asking the members, for example, the county, does the county have a calendar, an outreach mechanism that we can leverage to help get the word out further.

So between the outreach and the materials we'll be providing through our channels, and we'll also be providing this information to the members, and then we're open to more. Certainly, the objective is to get the community engaged, but the first step is making them aware and actually making sure that they have the opportunity to come to this meeting.

And Commissioner, also welcome, you know, perhaps we can work with our colleagues at the Public Utilities Commission to leverage some of the channels through the Public Advocates Office and other offices.

COMMISSIONER GUZMAN-ACEVES: Yes. And I was really more hoping we leverage Member Olmedo and Chair Paz's community connections.

MS. BUCKLEY: Absolutely. You know, not everybody is following their favorite state agency. So what we want to do is make sure we develop some good materials, draft some content and then put that in the hands of all the Commission members who are better connected with the community members.

MS. de JONG: I do see that Commissioner Olmedo is raising his hand. Perhaps you would be willing to speak about the recent efforts with community-based organizations to plan for this event.

And if I could just jump in and add just a couple details. The event is being planned right now for November 17th, 6:00 to 8:00 p.m. As I said, more information to come. As of right now, the CEC is only able to host this virtually.

So it will be a Zoom meeting like what we have today, and we're just looking forward to the event. So Vice Chair Kelley, I'll lead it back to you, but also acknowledge that Commissioner Olmedo is raising his hand.

VICE CHAIR KELLEY: Luis.

COMMISSIONER OLMEDO: Yes. Thank you, Chairman. And thank you, Commissioner Guzman, for your vote of confidence, and rightfully so for very good reasons. It certainly is high on your radar. I do

want to, in all fairness, you know, give the team there at the CEC, that they -- it must have followed some good advice, and they did reach out and they have brought local organizations to the table to draw on their community outreach expertise.

I certainly, you know, volunteered quite a few members of my staff to help inform. So I do appreciate that and I thank them for being open to a lot of that advice. I will say that, obviously, it's an ongoing sharing and learning that needs to happen.

It's not just for this meeting, but for future meetings. There's always going to be something new that we're going to be able to learn, you know, mutually, and be able to just make them better and make them more effective, and -- but with that, I just want to just highlight that.

So thank you for bringing that up, Commissioner Guzman, and to the CEC team and Elisabeth for putting it all together. So thank you.

VICE CHAIR KELLEY: Thank you. So at this point we would open it up for public comment in regards to the Legislative and Media Report.

MS. de JONG: Great. Thank you so much. So let me go ahead and read through those instructions again. If you're joining us on Zoom via your computer,

please use the raised hand feature, and if you called in, please dial *9 to raise your hand and then *6 to unmute your phone line.

We'll start by folks who are on the Zoom application and then the phone. I have a hand raised from Tom Sephton, and you should be able to unmute yourself.

MR. SEPHTON: Thank you. Appreciate the opportunity to make a public comment. I'm Tom Sephton, current Board President of the EcoMedia Compass, a Salton City based community nonprofit. And in our social media presence in particular, and also just among people in the community, we've been seeing a lot of questions about lithium development in the Imperial Valley, and we're seeing a lot of misinformation being spread by all kinds of people in the community.

And I think there's a real problem with people not understanding the way that lithium would be brine mined in the Imperial Valley. And there's a lot of probably unneeded level of concern that the lithium operation in Imperial Valley is going to be like what we see in South America, which is very environmentally damaging and/or like some of the hard rock mining operations.

So I think it would be very useful and

necessary to share truthful information with the community about how lithium development would go forward in the Imperial Valley and to allay some of the concerns about environmental damage, because we're aware that the way lithium would be mined in Imperial Valley is much less environmentally problematic than the way it's done in other places in the world.

So my question is, do you have good information, materials available that we can share with our social media and online contacts and with our contacts within the West Shores community so that we can help people understand better how Imperial Valley will do a lithium development process?

And if you've got anything, we'd appreciate you sharing with it -- us -- with -- that with us so that we can share that with our contacts in the community and in the online community. Thank you.

VICE CHAIR KELLEY: Thank you, Mr. Sephton. I believe your question or your comment, it will be addressed during the member comments.

MS. de JONG: All right. Thank you. And then if I can just also acknowledge that there is a public comment. It's in the chat. It will remain. So if you're looking to access questions, if you could put them in the Q&A box that would be preferred.

But so the community outreach event on November 17th will be via Zoom, and it will be recorded. So the information will be available online. As we mentioned, these are usually planned -- or you know -- a few weeks ahead of the event. So more information to come on that November 17th event. Thank you.

That is all of the hands raised in public comments that I see. So back to you, Vice Chair Kelley, for the next Agenda item.

VICE CHAIR KELLEY: Thank you, Elisabeth. So at this time it's the Commissioner comments, and knowing how sometimes Commissioners can come off and on or lose connection, I'll run down the entire list, and we'll start with if Chair Paz was able to join us, do you have any comments.

MS. de JONG: Chair Paz is not present.

VICE CHAIR KELLEY: Okay. I'll defer until the end. And Commissioner Castaneda, do you have any comments?

MS. de JONG: Commissioner Castaneda is not present.

VICE CHAIR KELLEY: Okay. Commissioner Colwell, do you have any comments?

COMMISSIONER COLWELL: Yeah, thanks, Ron. I

think Mr. Sephton's comments are very, very valid. We'll share some of that information ahead of time before the public meeting about how this is, you know, the term "mining," it's not mining.

It's lithium recovery from way below the Salton Sea. So it'd be great. I think that was a very valid question, and yes, there's a lot of misconceptions out there about how this is mined, or it's mined from the Salton Sea or it's environmentally hazardous or thinking -- questions like that, which can be answered and we'd be very happy to support that.

Yep, apart from that, it's probably demand, you know, with the Hell's Kitchen Project, beyond General Motors commitment, we have more commitments than we could ever imagine, you know, in the last, you know, 12 months ago. It's just incredible.

So believe these commitments of US Auto and other sectors that are really pushing for a 2024-2025 window of opportunity before they're forced to revert back to Asia or China for to get supply.

It's -- you know -- the window is not open for sort an eternal period of time. So I think we collectively, all of us here on the Commission and the whole community have a tremendous opportunity to sort of pull together and get -- you know -- take advantage

of this great opportunity. So that's it from me.

VICE CHAIR KELLEY: Thank you, Commissioner Colwell.

Commissioner Dolega.

COMMISSIONER DOLEGA: No comments right now.

VICE CHAIR KELLEY: Thank you, Commissioner.

Commissioner Flores.

COMMISSIONER FLORES: Sure. I just wanted to update the Commission that a few weeks ago CNRA, California Natural Resources Agency, had a meeting with Senator Padilla, and we just kind of gave just general highlights on all the projects that are currently going on with the Salton Sea, the long range plans, and then we discussed some of what the Lithium Valley Commission was doing and what hopes were, and one of our topics that we'll be discussing in the future and will be, you know, keeping an eye on all of us. And that's it.

VICE CHAIR KELLEY: Thank you, Commissioner Flores.

Commissioner Guzman-Aceves.

COMMISSIONER GUZMAN-ACEVES: Thank you. Just briefly, and I can put some links in the chat, but we do have a followup decision on our Integrated Resources Plan Procurement decision that did mandate the 11,500 megawatts.

And so I'll put those in the chat. There should be a subsequent decision shooting for before the end of the year. Thank you.

VICE CHAIR KELLEY: Thank you, Commissioner Guzman Aceves. And we are extremely interested and glad to have you in attendance to give us those dates and what is being discussed.

Commissioner Hanks, any comments? Okay.

COMMISSIONER HANKS: Just a couple of them. I'm having some technical difficulties today. But at a future meeting we need to circle back and revisit water supply with the situation that's developing on the Colorado River.

And also, I think at some point in time we need to have a discussion on energy transmission pathways from the known geothermal resource area. Thank you.

VICE CHAIR KELLEY: Thank you, Commissioner Hanks.

Commissioner Lopez.

COMMISSIONER LOPEZ: No comment at this time.

VICE CHAIR KELLEY: Thank you, Commissioner.

Commissioner Olmedo.

COMMISSIONER OLMEDO: Yes. I thank you, Mr. Chairman. Just a couple of very brief comments. One

is, I am just very pleased to have disadvantaged communities, environmental justice, and you know, a lot of things that are really driving investment in creating a more equitable table.

And I'd just like to bring back, you know, just an acknowledgment of Assembly Member Eduardo Garcia and his vision, you know, much earlier than what we're seeing a lot today in terms of the comeback plan -- Come Back Better Plan, or how California's plan, you know, of investment.

And I, you know, I'd just like to encourage, you know, all those who are going to have some involvement, whether it's a regulatory or community or anyone, or any government structure that would have some influence in how the process that would help play a key component to this, that they begin to look internally at their own policies and making sure that they are updating their policies.

And you know, specifically, I'll just name two, like county and IAD's (phonetic) study. I know they're going to be very key players, but there's many others who certainly should, you know, encourage that they be looking at their policies and see how consistent they are with, you know, sort of today's expectations of equity and justice like. So that's all

I have for now.

Thank you, Chairman.

VICE CHAIR KELLEY: Thank you, Commissioner Olmedo.

Commissioner Ruiz, comments?

COMMISSIONER RUIZ: I just have a comment. This is a followup on the request by Tom Sephton. I think it will be important to have a specific docket that we can put one together, one a digital one and perhaps, you know, a printout one, as well.

I think it is important to inform the community. It would be relevant to dissipate misinformation and allow the community to be well informed. So I think that if we can probably work on them on a special docket where we can make available to community members, both digitally and in a printout form.

VICE CHAIR KELLEY: Thank you, Commissioner Ruiz. I think that's a very valuable suggestion.

Commissioner Scott.

MS. de JONG: Is not present.

VICE CHAIR KELLEY: Commissioner Soto, comments?

COMMISSIONER SOTO: Thank you. No. I just would only add that, you know, I was in Washington two

weeks ago, and there can't be anymore wind in our sails right now than the type of leadership that we have with this Commission, the CEC, the governor, Senator Padilla, Assembly member Garcia, Juan Vargas, and with the Biden/Harris administration that are viewing this discussion that we're having, probably of greater magnitude than we actually feel it may be.

So let's not underestimate our ability to affect and take that wind, and quite frankly, cast larger sails, right. And there's going to be a tremendous amount of opportunity, despite what Mr. Manchin may say.

You know, there's going to be some, you know, budget that will benefit this conversation. I think he just announced that he doesn't want to go north of 1.5 trillion. The president wants to be at 3.5 trillion.

In my discussions with folks, they believe it's somewhere between 2 trillion and 3. So let's hope that it gets bumped up a little bit more, but we should make every effort to take advantage of this very unique opportunity in our country's history.

VICE CHAIR KELLEY: Well said. Thank you, Commissioner Soto. That is exactly what I think we're all experiencing.

Commissioner Weisgall.

COMMISSIONER WEISGALL: Yeah. Good comments, Commissioners. We are looking forward to this Community Engagement Meeting.

Elisabeth, we'd be delighted to work with staff to share materials we've made public previously to help prepare for the meeting. We've met with quite a few environmental justice and community-based organizations.

And we're well aware of the misinformation, not to mention the lack of information, and I think it can be hard to reach some of these communities. So this is important. We did hold a Town Hall Meeting back in March.

We had about 200 plus attendees, but we do look forward to this -- to future meetings, both through this November 17 Community Engagement Meeting, but also one on one with EJ -- environmental justice and community-based organizations that want to learn more about our project.

It's quite clear to Berkshire Hathaway Energy that community outreach and engagement are essential components needed for lithium development in Imperial County to be successful. Thanks very much.

VICE CHAIR KELLEY: Thank you, Commissioner Weisgall. And I would only add as comments that

through our conversations, locally we are having a media day tomorrow. Energy Source is providing the venue to show their geothermal operation, and also, their site for their mineral recovery, also to take a look at some of the seismic landscape.

So there's some mud pots close to McDonald Road and Energy Source that you can see the naturally occurring event. And then we're going to have a conversation bringing media into Calipatria to talk with the city and with the school district, and let them know about the how the impact of having that energy in their neighborhood, the benefits and disadvantages or challenges of having that industry develop.

So that came from a local conversation initially with industry and with the community about doing that and getting the media to address it. And there was one article that was written this past summer where it did compare Salton Sea mineral recovery extraction to operations in Chile, and we've invited that specific reporter onto this tour. Hopefully, he will attend.

COMMISSIONER WEISGALL: Vice Chair Kelley, let me just jump in for a sec Jonathan here. I see there's a question kind of along these lines, has this project

undergone sequel review. Is there an initial study or an environmental impact report?

I do know, and I think you know, that Energy Sources, I think 1388-page environmental impact report, is publicly available and has been studied by the Imperial County Planning Commission.

So the person that's an anonymous person that's asked this question -- but you can go to the Imperial Valley Planning Division site and get a hold of that entire report. It's quite thorough. And that's a report for their lithium project called -- the acronym I think is ATLAS, if I'm not mistaken. Thanks.

VICE CHAIR KELLEY: Thank you, John.

So with that, then, Elisabeth, do we have public comments about Commissioner comments?

MS. de JONG: We do not currently have one in the Agenda for that item itself.

VICE CHAIR KELLEY: Okay. Very good.

MS. de JONG: And would -- if I could just point out, though, that we did get in the chat -- again, if Lithium Valley Commissioners could please ask their questions, either live or in the Q&A -- but we did get a question written in from Commissioner Ruiz to you directly, Vice Chair Kelley, asking if that event that you were talking about tomorrow is open to the

public.

VICE CHAIR KELLEY: Oh. So Frank, it is intended for the media to -- but if you'd like to come you're more than welcome. I can send you the information, as well. There will be other public venues for the general public to understand more about geothermal and recovery in Imperial County.

But this one is targeted, and as a result of our conversations down here about the misinformation that Mr. Sephton brought forward we wanted to make sure that what is being proposed is presented accurately, even in our local newspapers.

Okay. Then we'll move on to the Lithium Market Opportunities Workshop. That is the topic for this month. And to start, we have two five-minute presentations, one from Mr. McKinney, from Fuels and Transportation Division, and the other from Anthony Ng, from the Energy Research.

Mr. McKinney, are you ready for your presentation?

MR. McKINNEY: I am, if we can get the slide deck ready. Good afternoon, Commissioners, and members of the public. My name is Jim McKinney, and I'm with the Fuels and Transportation Division here at the Energy Commission.

My goal with this brief talk is to describe California's policy leadership on zero emission vehicles, or ZEVs. California is a significant end market for ZEV vehicles, components and batteries. More ZEVs are sold here than in most other countries.

Zero emission vehicles and components are also now our leading export. When I use the term "ZEVs" in this talk I'm going to refer primarily to full battery electric drive vehicles. It is -- also includes plug-ins and hydrogen fuel cell electric vehicles.

Slide please. California ZEV policies are based on climate change and air quality standards. The goal of these standards is to reduce vehicle-based carbon dioxide emissions that contribute to climate change, and to reduce the vehicle pollutants like NOx and particulate matter that degrade public health.

The 2006 Global Warming Solutions Act is the legislative foundation for the state's work to reduce greenhouse gas emissions from all sectors of our large economy. For decades, California has had some of the worst air quality in the country.

The state was granted a waiver under the Federal Clean Air Act to set tougher emission standards than used in the rest of the country. Some other elements for our ZEV policy leadership in California is

our strong environmental ethic.

We also have a strong history of technology innovation, cultural innovation and a zest for what is new. The rest of this chart shows the main ZEV policy targets for vehicles and charging infrastructure. And note that EO stands for Governor's Executive Order.

By 2035 all new light duty vehicles sold are to be ZEVs. By 2025 our policy goal is to have 250,000 public EV chargers and by 2045, all trucks and buses are to be zero emission. Slide please.

This chart shows a steep trajectory towards a complete phase out of fossil-based vehicle fuels. Back in 3/20/2021 we're at about 925,000 in cumulative light duty ZEV sales, but we're on our way to the 2025 policy target of 1.5 million.

In 2035 when all new car sales will switch to zero emission drive trains we are projected to be at 8 million ZEVs. It will take another 10 years of ZEV sales to reach full phase out of gasoline and diesel powered cars.

As the fifth largest economy on the planet, California ZEV policies affect policies and markets at the national and global scale. We account for nearly half of the 2 million ZEV sales in the US and nine percent of total global ZEV sales.

California ZEV policies are more aggressive than many of the Asian big economies and more aggressive than most European countries. And note that I'm comparing California to the world's leading industrial economies and not just to other states.

Section 177 of the Federal Clean Air Act allows other states to adopt California's more stringent vehicle emission standards. There are now 14 states adopting these standards, accounting for 30 percent of the total light duty vehicle market in the US

Our one million trucks represent just three percent of the total vehicle fleet, but are responsible for 21 percent of on road carbon emissions and 71 percent of on road NOx. So the state is working hard to eliminate carbon based fuels from the truck and bus sectors.

Next slide, please. Another key element of California's policy leadership is funding. Since 2008 the state has consistently authorized incentive funding as a complement to policy and regulatory actions.

The Energy Commission has a key role in the achieving the ZEV-ZEV adoption goals. ZEV drivers need to be confident that there is a vast, convenient and reliable network of electric chargers. The Commission

is responsible for helping to develop this charging network.

Since 2008 and the creation of the Clean Transportation Program, CEC's Fuels and Transportation Division has invested over $1 billion to kick start the state ZEV fueling infrastructure.

And you can see how -- the top part of this chart -- how some of this money has been invested. The early years of our program also included 55 million for 27 ZEV manufacturing projects. With the 2021-22 fiscal year the governor and legislature authorized major increases to help meet the ZEV adoption targets.

The 1 billion investment over the next three fiscal years equals the first 13 years of our funding. You can see the FTD staff recommendations for allocating this free funding. In a possible interest to LVC stakeholders we are allocating 250 million in manufacturing support funding.

RMV funding is another critical part of the state strategy, and my colleague Andrew Ng is going to address this in his talk. Slide, please. The Air Resources Board is responsible for administering the subsidy funding for ZEV cars, trucks and buses.

Since 2008, they've distributed 2 billion in vehicle support funding. Nearly 1 billion has gone to

subsidize 410,000 passenger vehicles, and another half billion to subsidize 7,000 trucks and buses. The governor and legislature have increased ZEV funding -- or funding for ZEV cars, trucks and buses, as well; 1.5 billion in FY '21-22 and another 2.3 billion in FY '22-24.

Note that on the side here I've highlighted some of the truck and bus funding targets. With regard to trucks here's a scaling example that shows the volume of lithium ion cells needed for a large truck.

Daimler is one of the world's largest truck manufacturers. Their new Cascadia Class 8 tractor with a 580-kilowatt motor will use lithium ion cells. This is the energy and power needed to haul 80,000 crate loads. In contrast, Tesla's Model 3 with its 82-kilowatt motor uses about 4,000 cells.

Slide, please. In closing, let me say a little bit more about the Clean Transportation Program's upcoming manufacturing grants. In '21-22 we're offering 118 million for projects to scale up California's supply chains for advanced battery materials and technologies.

We will host a workshop later this year, and I encourage you to monitor the CEC's website's funding page. And lastly, please note our strong commitment to

equity and diversity in all of our grant funding solicitations. Thank you. That concludes my presentation.

VICE CHAIR KELLEY: Thank you, Mr. McKinney.

And next is Mr. Ng, or I believe that this is a recorded presentation.

MR. NG: No. I'm here, Vice Chair. So I thank you for the --

VICE CHAIR KELLEY: Oh, very good.

MR. NG: Yes. Thank you. Thank you, Vice Chair, Commissioners and members of public. Appreciate the opportunity to present today. My name is Anthony Ng and I'm with the California Energy Commission's Research and Development Division.

And today, I'll be providing a brief overview of some of the investments the CEC is making in the next generation of lithium ion battery technology. So next slide, please.

So just to start off with a little bit of context, I'm sure, as many of you are aware, California has its ambitious climate and energy goals, chief of which, SB 100 most recently is requiring that all retails sales of electricity in California come from renewable and zero carbon sources by 2045.

And so in the Joint Agency Report published

earlier this year it identified that in order to achieve this goal not only are we going to need a threefold increase in the deployment of renewable generation sources, like solar and wind, but to support that intermittent resources and that clean generation we're going to need up to an eightfold increase in battery deployment.

So the demand for storage technologies and lithium ion batteries is project to increase significantly over the next several decades. Next slide, please. So just a little bit of background about lithium ion battery in general.

Lithium ion batteries have four primary components. Listed there is the anode, the cathode, the electrolyte and the separator. And currently, there are dozens of companies investigating and doing R and D on these different components.

And kind of fine-tuning different chemistries and different makeups of these components can have dramatic results and potential for improvement in the performance of lithium ion batteries.

One kind of area that the CEC is most excited about involves replacing the anode, which is one of the critical elements, which is currently today mostly made out of graphite, so carbon, and replacing this anode

with either silicon or with lithium metal.

And if this can be successfully done, you can see in the graphic there, the potential for increases in energy density is quite dramatic. So between kind of what is state of the art today in the 200 to 250-watt hour per kilogram area, we're looking at the potential for almost doubling that energy density with a lithium metal battery.

And energy density is particularly an important metric when it comes to the performance of lithium ion batteries, in that if we can really achieve this high energy density, this means that for example, if applied to an electric vehicle, this means greater range and the ability to also have a vehicle with extended range.

We're talking four to 500 miles potentially at lower cost, because we'll also reduce the need for overall amount of batteries in a vehicle. So there's really great technical potential in this area. However, of course, it's not simply as easy as just, you know, replacing one element with another within the battery -- next slide, please -- particularly with silicon and lithium. There are pretty significant technical challenges that have prevented wide scale commercialization of these technologies, particularly

with silicon as it's exposed to lithium and the electrolyte in the battery it has been shown to both expand and contract during charging and discharging.

And with lithium, as the ions move from the cathode and the anode and vice versa we have what's called a kind of the sharp, one-dimensional, stalactite type structures form called dendrites, and they have the potential if left unchecked to kind of pierce that separator which separates the two sides of the batteries, and that can lead to failure.

And so what this really shows is that while there is great potential for improving the performance of batteries, there are a lot of technical challenges, specifically with a lot of these batteries to have enough longevity, enough the -- enough ability to charge and discharge over a long period of time safely that is preventing their wide scale adoption and commercialization.

Next slide, please. So this is just a quick snapshot. These are four companies that the CEC is currently supporting to develop innovations to help address some of these challenges I mentioned, and really unlock the potential for these next generation batteries.

So just very quickly, Sepion Technologies,

based in Emeryville, is developing a new membrane separator. This is the portion that is in the middle of the battery that separates the positive and the negative portions of the battery.

They are -- they have demonstrated, again, a very high energy density with their technology. Cuberg, also based in the Bay Area, is developing a liquid electrolyte to try to address this problem. Cuberg, interestingly, was recently acquired by a Swedish battery manufacturer, Northvolt.

And Cuberg is going to be kind of heading up their R and D production line here in California, so they have pretty exciting path to kind of increasing their scale and commercialization here in California.

South Bay Technologies in San Diego is developing a liquified gas electrolyte. The unique aspect of their technology is that it opens up a really wide range of operating temperatures for the batteries using their technology.

And then lastly here, UNIGRID, also based in the Bay Area, recently announced a partnership with LG Chem, and they are developing a solid electrolyte for use with silicon anodes. And you can see, they've been able to demonstrate pretty high cycle life with their technology.

So again, this is just a really brief snapshot, but all of these companies are in active projects with the CEC developing their technology, and really driving towards larger and larger scales, so that they can hopefully integrate their innovations with the larger battery manufacturers so they get their innovations out into the marketplace. But with that, that concludes my presentation. I'll be happy to take any questions you ask.

VICE CHAIR KELLEY: Thank you, Mr. Ng.

At this point I believe we're going to have -- okay, Elisabeth. You're helping me. So we're moving on to the market overview before public comment?

MS. de JONG: Yes. So for this section we'll have two presenters, followed by Commissioner Q&A, followed by a couple more presentations, Q&A and then public comment. And public comment comes after the workshop.

VICE CHAIR KELLEY: Okay. Then Mr. Panayi, are you prepared on Lithium Battery Market Overview?

MS. de JONG: Adam Panayi's presentation is a recording. So Jordan, if you want to go ahead and press play on that recording.

(Video Presentation by Adam Panayi is Played)

MR. PANAYI: My name is Adam Panayi. I'm the

Managing Director of Rho Motion, and today I'm going to be speaking to you about some of the downstream demand issues that will be affecting lithium and other raw material demand with EVs and batteries moving forward.

But I'd say firstly, thank you very much to the Lithium Valley Commission for having me to speak, and my apologies for not being able to be with you in person or live. Unfortunately, the travel restrictions and the time difference to the UK make that very difficult, but I'm very pleased to be able to present this to you.

And also, at the end of the presentation I provide my contact details. So please do get in touch with any questions you have. A little note about Rho Motion. If you're not familiar with us, we are a research and consultancy house based in London.

We have a team now – it's grown over time, but a team now of probably 15 core members, which a dozen or so are here. We provide a membership, which is a news platform and a video platform with Lexis analysis on the EV battery's base, a multi-*54:45 subscription reports, of which I'll speak about more in a moment, our events and magazine, and also single client advisory and sponsee (phonetic) work.

On the regular reporting side we have a series

of monthly assessments that cover battery chemistry charging, battery energy, energy station storage. We also provide a number of databases. We also do a report on the motor side of the EV space, as well.

Our quality outlooks look at very much the same thing, but just have a very long-term perspective, rather than a -- more of a snapshot on a monthly level, EV battery charging, energy station storage. We also do some work on the hybrid electric side, as well.

And then we have a series of focus reports, which are less regular, but are there for clients who need to understand dynamics in the fuel cell market, like mobility and the (indiscernible). So to get into the presentation today I'm going to start by giving you an update of where the EV market is so far in 2021, and then talk a bit more about where we think we'll be going in the future and why.

We will try and keep the focus on North America, as well, because I know that's the core area of interest for the listenership today. So just to say, if you look at that chart on the right-side -- on the left-hand side, rather, you'll see that we expect sales to increase by 80 percent year-end in 2021 to around 5.8 million vehicles.

That's globally, and for all vehicle classes.

That includes buses and coaches and some of the commercial vehicle classes, as well. The reason for this really is explained on the right-hand side chart, which is the EV penetration rates for this year versus the last.

The dark purple piece shows the increase onto its (indiscernible) EV penetration rate in a growing market, as well. So when we talk about penetration rates we're talking about factory electric or plug-in half-electric vehicle sales as a proportion of the total vehicle market in a given country.

And as you had been aware, in 2020 total vehicle sales fell quite dramatically, because of the pandemic and some of the shutdowns that we saw last year. They've come back strongly this year, about eight percent half year and year globally.

But even within that context, factory electric and plug-in hard electric vehicle sales have been increasing. Looking down that list you see that the top 10 or so places are European, and that's really been a more recent phenomenon because of the CO2 legislation that's been brought into play last year into this year. It's actually slightly more strict this year.

You see China is a big player there. By

volume, China is the largest market in the world for a single country. The European Union is catching up as a whole block. And then quite near the bottom there you'll see the US and Canada, a relatively low rate of penetration at the moment. That is going to change quite quickly in the coming years, as I'll explain later.

Just looking at Europe, because it has been a stand out performer in the last two years really, what's been driving that, as I mentioned, is a CO2 standard that was -- started coming in last year, but has really fully adopted this year.

It's a 95 grams per kilometer target, fleet average emissions target that OEMs have to meet. There are some exceptions, and in that table you'll see that what the actual target is for each area and for some -- each of the bigger OEMs in Europe.

The actual final number is determined by the types of vehicles you sell, but this -- you know -- (indiscernible) too much. And what you can see in the chart below is the increase in group penetration for BV and the HEV sales for many of the major automotive groups in Europe, increasing dramatically again this year versus last year.

And 2020 was a very big step up, as well. So

in 2019 these numbers were a lot lower, and I just showed you the direction of travel and we're moving in. The European Union is effectively debating a piece of legislation now that would bring in such a strict in Europe that it would effectively mean an outright ban on internal combustion engine vehicles by 2035.

That legislation isn't passed yet, but even the current rate of legislative progress is very, very quick. Simply the US, specifically, you know, everything changed when Biden/Harris administration came into power earlier this year.

We've been keeping a bit of a watching brief on some of the announcements that have come out, you know, very bold, grand statements at the beginning, and as they've worked their way through the Congress and the House or Senate they get somewhat watered down.

But the plans are significant, 7½ billion to aid the construction of charging points in the country, 7½ billion for new electric school buses, 6 billion for battery material processing, manufacturing and recycling.

Some -- the purchase incentives, they're working their way through the houses. And also, EPA legislation, which in some respects is harder to mandate than some of these more short-term issues, but

there's stricter CO2 per mile legislation coming in that will bring the US in line with Europe, if that legislation does pass in the next year or so.

You've also got this 50 percent target by 2030 that the administration is bringing in. You know, we speak with a lot of the OEMs in the US. Most of them are pretty hopeful, frankly, with that number and it does feel like a realistic number when you compare it to what's happening elsewhere in the world.

So that 50 percent adoption target by 2030 we think is very achievable for the US, and it's a massive step forward from where we are, as I've shown you on the previous -- previous slide. Just think about this, again, at group level.

This is global numbers for the first half of the year, and on the X axis what you have there is the percentage of a group sales, battery, electrical, plug-in hardware, so clearly, Tesla 100 percent. the -- that's why the 100 percent on the right-hand side there.

And on the Y axis you have the volume of vehicles sold by that group, BEV or PHEV. Where I used to show this chart three or four years ago, or three years ago, to the right of this chart with the exception of Tesla was all dark purple.

So the dark purple bubbles are Chinese OEMs, and way up to the left, less than 10 percent penetration, much less than 10 percent penetration were the European and North American groups. What you start to see is that move across now.

Everybody is moving across to the right. The level of penetration is going up significantly. What I would say as a caveat to this is that in Europe particularly, and those numbers I showed you earlier, can be somewhat misleading, because roughly half the market in Europe, for example, at the moment are plug-in hybrid vehicles versus battery electric vehicles.

Whereas, in China it's more like 80 percent battery electric, 20 percent plug-in hybrid. In the US it's, again, about 75 percent or 80 percent battery electric to plug-in hybrid, and that's mainly because of the dominance of Tesla, who are clearly, purely BEV.

Just seeing that -- what this looks like moving forward, what we've shown here is everyone outside China of the majority area of the groups, I'll just get the by region, this is slightly misleading, because obviously, areas operate across regions in different ways.

But this shows you some of the level of commitment that's coming in the pipeline in terms of

investment for electrification. And as you'll see at the very top there, three of the bigger US areas, the North America areas, committing as much proportionately to their size as the European counterparts.

So again, the direction of travel, regardless of where you are in the world, is clear. Moving on to about battery technology now. The focus of this will be on where battery chemistries are going, maybe on the cathode side because I'd imagine that's where these sort of (indiscernible) interests are, and what this might look like in the future.

So on the left-hand side there you have EV battery demand by cathode chemistry or vehicle class. This includes buses, and that's globally for 2019 to 2020, 2021, it's a proportionate chart just to show you there.

The main story this year has really been a return of LFP, in passenger car and light utility vehicles. So really, what's been driving the LFP share of the market in the last few years has been the bus market in China almost exclusively, and that has got to go away proportionately as the passenger and light duty vehicle market started to increases, versus the bus market elsewhere in the road.

But what you're seeing this year is the return

of the -- the being deployed explicitly in passenger car and light duty vehicles, which is increasing that share. Now, that matters because as we move forward down to 2030 -- 2025 and 2030 and beyond, the passenger car market is obviously a much larger volume market than the bus market.

And if LFP is going to play a larger role in that, then that's going to affect the chemical -- or chemistry balance across the future of this market. It looks like that will be the case. Now, the right-hand side shows you the global share of LFP versus all the other chemistries for 2020, versus 2021 year-to-date, and adjusts for China in the chart below.

Now, the point I want to make here is that, really, this LFP returning story is only in China at the moment, but the reality is in this market where China leads, the rest of the world follows.

Just to prove that point or just to demonstrate that point at the time, what we have here is different OEMs and the main battery strategy, battery chemistry strategy across different parts of their products offering.

So we have shown small, medium and large vehicles moving left to right, but also, on the vertical axis, as well, we've demonstrated that by, you

know, a typical pack size for those types of vehicles.

So smaller vehicles includes micro compacts. Large vehicles includes SUVs and luxury sedans, for example, moving from 30 to 100 kilowatt hours. These are just rough guides. What you can see down in that bottom left-hand corner, primarily, European and Chinese OEMs, demonstrating that what I've said is that they will use LFP in some of their smaller vehicles.

When you move to something like midrange, it is -- again, this is mainly European and Chinese, but you'll start to see nickel -- manganese chemistries, which are to the exclusion of cobalt in many cases. But in China you'll also see an LFP deployed and that makes them more (phonetic) ready.

As you move up to the larger part of the market, the majority of that market remains and will remain nickel cobalt, manganese, because of the cathode deployments. But a significant caveat to that is that the Chinese are starting to deploy LFP in those larger vehicles, and it remains to be seen whether that'll start to be the case for the European and North American OEMs as we move forward.

Mr. Musk himself has said that LFP could be deployed in some of those larger vehicles for Tesla, and in fact, in China the Model 3 is almost exclusively

LFP now from an 80 percent -- 85 percent LFP in terms of the made in China Model 3 vehicles being sold there.

So the picture is rather more nuanced than perhaps it first appears, but one of the things I'll say is when you get up to that right-hand side of the chart with larger vehicles the battery sizes are an average three times the size of the smaller vehicles down in the left-hand corner.

So in terms of battery deployment and then raw material demand, that does have a big difference. So you know, in unit terms LFP might be -- might end up, you know, on parity with NCM, because of the number of units sold, but in terms of battery deployment it remains the case that NCM will likely be larger in terms of the overall share.

Okay. Just to really reiterate and point out where the Chinese are going and how that might affect the rest of the world, you might bear in mind that a lot of European OEMs and North American OEMs have tie-ups in China for collection there, because some of the rulings around how you can produce vehicles in China are -- have required a Chinese partner in the past. It's changing somewhat now.

And there is a lot of lobbying across from China to the western (indiscernible) back again. But

just to show you here that, you know, that the range of cathode technologies being deployed in China is much richer than it is in the western world at the moment, and the LFP shares, you can see, show roughly in the middle of the market -- of the chart there, crosses more boundaries in terms of the types of vehicles it's being deployed in.

Just want to speak to, as well, about another area that we're paying a lot of attention to, which is ESS and the grid. ESS is energy/restorage, and we see this as a key enabling technology, both for the EV transition around charging, because you are going to need some backup storage for charging networks, especially as we move to higher speed charging along highway, but more generally, around renewables and decarbonizing the grid.

Now, the point here is as with the EV market is that well, actually, all of your forward momentum in this market is created by legislation, and what you can see here is some of the decarbonization targets and renewables targets have been set by various countries around the world.

Won't dwell on this for too long, but really, again, the main message is that the direction of travel is very much towards renewable energy, and if you have

renewable energy then you're going to need battery storage at sites, at a project to support that, because otherwise it's really just not going to work.

So what we do is we track every project as it comes through with county tracking over 2,000 renewables projects, 1:09:19 projects, and these are some of the bigger ones. And actually, a thing to say here from the perspective of this audience is that, and particularly in California, but also elsewhere in the states, there's been some of the largest projects and largest batteries ever installed currently in the area that you all live in.

So this is a global phenomenon, and it's one that's going to pick up pace over time, and I'm going to show you some numbers that will reflect that momentarily. So what it shows you here is that we have done a quick analysis, really, looking at the rate of growth in the test market versus the EV market to give you a sense of how interested you should be in it from a battery point of view.

So currently -- this is global -- currently, the amount of projects for lithium ion storage to support renewables at a grid level equivalent to about 675,000 EVs. That's against a market that's roughly 5.8 million, as I mentioned.

So we're talking about 10 percent of EV demand announced to support grid operations. The other key thing to remember about the ESS market is the behind the meter B2M (phonetic), behind the meter, which is to support industrial activity, off grid, to support domestic activity, you know, where people have solar power -- panels and whatever else, you know, domestic sort of stuff is, for the charging piece, as I described earlier, and a number of other backup and 5G applications, as well, there's a significant amount of that.

And we expect behind the meter by 2030 to be at least parity with the grid deployment, and moving forward ever so slightly more than that. So we're looking out to 2030 and 2040 in the chart below, and what you can see is that by 2030 we're expecting this to be equivalent of about 4.1 million EVs in terms of the battery deployment, both behind the meter and grid applications, and then by 2040 it's roughly 13.4 million EV equivalent, based on average pack sizes looking forward.

So you know, not to be ignored and also, like I said, a significant amount of this activity now is happening in California and elsewhere in the states, so something to bear in mind. That's a bit of a

whistlestop tour of our thinking currently on the market.

Again, apologies for not being able to be with you in person or live, as well. I am available to contact, it's apanayi@rhomotion.com. If you like this sort of thing you can also follow us at Twitter -- on Twitter, rather, @RhoMotion or on LinkedIn, as well.

We post interesting pieces of data and analysis on both of those platforms. But feel free to get in touch, and thank you for listening and enjoy the rest of the meeting.

VICE CHAIR KELLEY: Thank you, Mr. Panayi.

Our next presentation is Mr. Perks.

MR. PERKS: Hi, everyone. I'm a senior analyst here at Benchmark Minerals, and I'm primarily interested in the lithium market. Just for context, Benchmark we look at everything to do with the whole EV supply chain, so primarily focus on the battery cells and those components which go into it that Adam covered lastly in some previous talks, the cathode and the anode, and also those primary minerals, which I personally am more interested in.

At Benchmark we do price-assessments. So we look at the price of those materials in the market every month. So we're talking to people in the market

and we're writing reports on what's happening in terms of pricing the market.

But we're also forecasting pricing, supply, demand, how it all relates to each other. We're tracking the cathode and anode build out here, in China, in North America. We consulting advising firms all the way through the supply chain from the mine through to the EV companies themselves.

And a big part of our business is events, and so there's a fair bit of online free material that you can pick up on our website, as well. So in tracking us on social media you'll get a lot of free information, particularly around the lithium supply chain.

Why are we talking about lithium? Well, lithium five years ago or so was primarily driven by industrial end uses, glass and ceramics and things like that to making tiles and things like that. So within the next five or six years the lithium market did a complete 180 degree turn, and now we're looking at it being driven mostly by batteries, and specifically batteries in EVs.

So if we're looking forward we're thinking -- our thinking is that it will continue that trend onwards. But sticking to where we are today and what those basic factors that are driving the industry

forward, the influencing factors are, and as others have alluded to, government policy and investment, but also macro demographic changes from people driving investments in EVs, as I mentioned, EVs and the batteries that go into them.

The resulting demand, as you can see on the right, we track battery mega factories, as we call them, or factories that produce batteries. We're looking at something like 240 mega factories currently in the pipeline.

That's up from something like 10 just a few years ago. So the industry's really picked up. And of course, also mentioned, lithium is used primarily in a cathode, and you'll notice that in terms of our cathode capacity tracking, construction and planning, and existing, most of the capacity is in China.

I think that's an important point to note for -- I'm sorry. Next slide, please. I'm so used to clicking through my own slides when I'm reading my notes. If we could get the next slide, please. Oh. So that's -- this is the -- how the demand for batteries is playing out, versus industrial end uses, but it's going back to the earlier point I had.

And then the next slide, please. Looking at the influencing factors, you'll see the 242 number

there on the right, and maybe just draw your eye down to the graph, bottom right, where primarily the color there is China.

Huge numbers; that's the bottom line. I don't expect anyone to remember those numbers, but big numbers. And most of -- some of these are free on our website, again. So next slide, please. I'll keep up with this.

This has resulted in what we're forecasting as a large deficit in demand in terms of supply. If no projects were to come on line between now and 2030 or 2040, we'd be looking at a deficit or a lack of supply greater than the entire market is today.

This is unlikely to happen. We're going to have mines come online all around the world. What we do is we forecast supply and we weight it by likelihood of a project coming online. By doing so, there is still a deficit.

There's still a big gap in supply, considering how fast this demand market is growing. We run lots of different scenarios where we can play with the likelihood of projects coming online and still, by 2030 we need as much lithium as we can.

The bottom line here is that we need as much of it as we can possibly get our hands on, which is why

Lithium Valley is being talked about. So we'll go to next slide, please. Currently, in terms of pricing we're seeing 100 percent increase year-to-date in prices, if you look at historical prices.

If you look at the last few years we've had quite low pricing in terms of lithium. This has meant the way of actually seeing less investment in the mining industry, and you need a few years at least to build a lithium ion -- lithium refining capacity.

So we would have need to have seen investment a few years ago or a could years ago, which we didn't see. So we're seeing a kind of shortage today. We might be seeing some more investment coming online today.

So we might see a bigger build out of supply in the coming few years. so we do see lithium prices increasing, but not exponentially. They're not going to continue linearly going up. There will be a point where economics come into play, as well.

But besides that, where is the lithium going to come from? It will need to come from somewhere. I mentioned costs, costs and economics, of course. Next slide, please. The cost and economics of the lithium being produced is primarily -- of primary importance.

There is lithium coming out of Australia, as

we know, China, South America, also North America, but potentially of primary interest to this audience is, is the supply chain security benefits that you'll get of producing lithium in North America; also, USG considerations, the transparency you get with producing any minerals within the US

Next slide, please. And then finally, the -- a few conclusions to draw from all of that. The scaling of the supply chain in quality and quantity is the challenge. So I mentioned that the quantity of lithium and the scaling of that is the main challenge for the industry.

But it's also the quality. That takes multiple years to mine a product for lithium, qualify it for use in battery and in the downstream. Large technical challenges come with that, and having technical expertise, having that expertise in country or in your -- in that area, currently China.

That's where a lot of their advantages come from, having a lot of that technical expertise in the geographical location. That's the biggest and one of the biggest challenges that we talk to companies about who want to invest in the supply chain or build out the supply chain in North America, where are you going to get the experts.

The slowest link in the chain is starved of investment. I talked about the starvation of investment in mining, but what maybe I didn't mention was that the fact that it takes at least five to 10 years to build a mine, going through the process of proper environmental regulation, particularly in a country like the US or Canada, Australia, where that process can take quite some time to get it right.

And it's important to get it right. The EV revolution, as I -- as we're calling it, will likely be slower going forward if we don't -- at least if we don't see the lithium supply come online. That we've currently forecast, we don't see those projects.

Now, online projects will -- which will potentially come online to fill that gap, but it's one or the other. Either we don't hit the demand, we don't hit the EV revolution as fast as we want it to be happening, or supply will rise to meet the demand.

There is no geological shortage of any key input. There's no geological -- there's lithium. It's down to the financing of those projects. And also, there is credentials increasingly, particularly if you look at who's buying the lithium, and that's EV producers, and why are they buying -- why are they building EVs emissions reductions targets, for example.

Our analysis has determined that the future battery technology will be lithium-based. Adam spoke a lot about battery technology, so I won't delve too deep. We've also learned, and of course, and we all know the lithium ion batteries are now political.

It's part of Biden's supply chain commitments, and global emissions reduction targets are closely attached to lithium ion battery, the lithium ion economy. We're calling it the economy, because it's build out from mine all the way through to the EV.

Now, this is the last point and I'm hammered at it multiple times, I think because it's important and particularly relevant for this audience, that future supply will need to consider other factors, such as ASJ emissions, water impacts, social impacts.

And the next slide, please. I'll just leave it there and to remind you of what we are able to do, and my email address up there, as well, in case anybody had any questions after the presentation, after this. Thank you.

VICE CHAIR KELLEY: Thank you, Mr. Perks. At this time we'll open up the Commissioners question and answer for the panel, Mr. McKinney, Mr. Ng and Mr. Perks.

MS. de JONG: He has a hand raised from

Commissioner Weisgall.

VICE CHAIR KELLEY: Commissioner Weisgall.

COMMISSIONER WEISGALL: Thanks. I guess this would be a question for Cameron Perks. Obviously, our Commission is looking at issues beyond lithium. We're looking at the full supply chain.

So assume you're an EV manufacturer or an anode manufacturer, some other company in the supply chain and you're looking to build your facility. What do you look at? You obviously look at the business environment of the location.

You look at I guess possible economic or tax benefits. You look at workforce. You look at quality of life, whole list of factors. The question I have is what does the proximity of the raw material, i.e., the lithium in Imperial -- in Lithium Valley, what -- how does the proximity of the raw material move the needle, or does it move the needle at all?

And I guess the followup question is, regardless of whether you answer that yes or no, what steps could you recommend this Commission looking at to encourage greater supply chain location, given the fact that Lithium Valley is moving in the direction it is?

MR. PERKS: Thanks. That's -- they're all good questions and questions that we get from people

who are looking to invest in the industry themselves. Some of these people don't understand what they should be -- the right question to be asking.

So I think the question itself is a good one. But of course, yes, location related to tax incentives and potential land understanding and the visibility around those tax and those laws or those -- the process to apply for grants and things like that are very important to the people we speak to.

And you mentioned all those things; you alluded to those. I think the ability to source a clean energy -- because again, the overall's schematic here is the reduction of emissions and to access those clean energy materials.

Another factor, of course, when we look at the traditional way things are built, and that's the battery, usually the location of the battery plant comes first in a sense of where there is demand for that and potential cost benefits.

Then the cathode, they ask the cathode manufacturer to build a cathode plant, and a cathode plant nearby and the cathode takes multiple raw materials. So other things they're looking for are the -- is there nickel present. Is there -- or in that location, potentially, cobalt, manganese.

Do you have all these raw materials and then are you able to -- and in terms of proximity to the mine, not generally. The cathode manufacturers don't really take into account where the mine site is. And you know, the most important thing for cathode production is the technical expertise and the build out there, really, and that's concentrated in China, South Korea and Japan.

And a lot of that is IP at the same time. So you need to partner with a lot of the existing firms. There aren't many. There aren't many located in North America, but there are many looking.

Those would be the main points. I'm trying to -- and emission -- in terms of emissions and proximity you don't generally see a huge impact on emissions in terms of the mine location, having to ship it to, say, China or North America.

That's not really where the biggest impacts are being made. The biggest impacts are in -- usually in when there's high heat and high temperature being used in processing. So for example, if you had a spodumene mine and then you had to refine it and you have to use high temperature processing, a lot of emissions, that's where the biggest impact is.

So you could have a mine right next door to

the refinery, right next to the cathode, and in terms of moving it, not going to make a big difference. There may be other -- and I may be geting too technical -- and there may be other advantages for co-location of cathode.

You can recycle the lithium back into the process or something like that. Then you could refine it. So you'd have that refinery capability there. Having things close by. There may be other benefits potentially.

What could be done to incentivize that whole supply chain. Looking to California, and what we'd say to other clients is, it's huge. It's a huge range and we usually do hundreds of slide decks on this question, this one question, looking at what kind of incentives they could provide, how clear they could be on making those incentives known, how they could engage, how they could play match maker with investors and the technology providers.

You know, I can be more specific if you like, potentially in a -- maybe in a written form.

COMMISSIONER WEISGALL: No. That's a terrific answer, and I -- obviously, it is a very broad question. We use your service, by the way. It's a terrific one.

MR. PERKS: Thank you.

COMMISSIONER WEISGALL: And perhaps I'll follow up off line. But Ryan, I think -- I mean, this is really one of the critical questions we're looking at. And frankly, you know, understand our company's perspective.

Our goal is to produce the lithium. It's not -- I mean, you know, if there are opportunities down the supply chain, sure, we would look at that. But it's going to be a -- you know -- a heck of a challenge just to get the lithium going.

But I know that others and the Commission itself clearly -- you know -- if all we accomplish here is producing battery grade lithium in Imperial Valley and then everything goes overseas for manufacturing, we haven't really accomplished all that much.

So I think there is a strong desire, I certainly have it, just for the overall lithium industry to see what more we can do to attract the rest of that supply chain. Thanks, Cameron.

MR. PERKS: Thanks.

VICE CHAIR KELLEY: Do we have any other Commissioner questions?

MS. de JONG: There's a hand raised from Commissioner Olmedo.

VICE CHAIR KELLEY: Commissioner Olmedo.

COMMISSIONER OLMEDO: Thank you, Chairman.

Cameron, great presentation. Actually, I take the opportunity to say how the presentation has been very informational, and now I need to take a deep dive and start breaking down all these -- start doing a lot of Googling to understand all the terminology.

But I was -- found a interesting difference over the -- in reading a report titled Lithium Ion Battery Supply Chain Technology, Development and Investment Opportunities, which looks like it was put together by Benchmark Mineral Intelligence.

This was published in 2020, and Benchmark at that time did not seem to have -- or be identifying the US, much less the Imperial Valley, as any significant player in the lithium production. Did I interpret that accurately, and if so, what has changed in the last year to what seems a more optimistic outlook?

Again, that's just my observation in today's presentation and what I see from this previous report that Benchmark had done.

MR. PERKS: Yeah, okay. No. It's a good question and it's something that potentially I could ask -- I could answer halfway, because I was with Benchmark up till the -- I began working for Benchmark

at the beginning of this year.

So I'm not familiar potentially with the report, although it makes sense in a sense that the -- if the demand scenarios were predicted to be different back then, potentially -- and look, we only can go on what data is available.

If we can go by -- oh, yeah. Thanks. I see there's a link here to the report. Okay. We can only go by what the data is at the time. So if there's only one project, just as an example, if there was only one project in North America at that time, that's the only project that we'll pop into the forecast.

In saying that -- and there is a lot of geological potential for lithium in the USA. There was hard rock lithium mining in the US. There's currently brine extraction in the US. already.

In Canada there was previously hard rock lithium extraction. Potentially, what that report was talking about there and what were found in North America at least, two problems. One would be that there's a NIMBY attitude, or there's a "not in my back yard" attitude where we want the EVs.

We want the global supply chain to be transparent, USG friendly, but we don't want it to be in our back yard. But frankly, the US is in the best

position to mine minerals because they have the best transparency.

They have the best regulation. Besides that, North American projects have in the past tended to be higher cost production and to affiliate. We saw that in Canada, but there's nothing that can't be overcome by good management, just like the environmental side of things, too.

So I can't exactly speak or maybe later we could get in touch and I could have a look at that report and see exactly why we were talking about a very low potential in the US for lithium production, but that -- those are the two main things that I could possibly think of, is potentially higher costs and, you know, historically, historically, of course, and potentially a "not in my back yard" attitude.

But there is a big obvious load of lithium. There's a big potential for lithium production in the USA., of course.

COMMISSIONER OLMEDO: Thank you.

MS. de JONG: You have a hand raised from Commissioner Colwell.

COMMISSIONER COLWELL: Yeah. I guess this is more of a generalization on why - thank you, Cameron. You're taking all the questions here. But maybe for

all the presenters, I mean, you know, just you know, firstly, this is not mine.

So just for the -- just to get that out of the way straight up. I mean, these 10-year projects, I'm very familiar with it, mining in Australia and hard rock and things like that. This is -- you know -- really recovery from brines.

And I guess, you know, these projects can sort of scale up what you need about these and scale up with demand in a 20-month period, you know, assuming all things equal. But what I really wanted to sort of ask about all the presenters, the importance of the life cycle analysis, proper analysis.

So what that means, what we're on here like Commissioner Olmedo, his points and others, is the social aspect of recovery and the sort of that side and how important that is to the -- you know -- all our sectors in the OEMs in their procurement strategies, followed closely and linked closely to ESG, because I think we can meet -- you know -- the Imperial Valley really has this opportunity to be able to hit those points on point.

But I just wanted to understand from the presenters how important real life cycle analysis, taking on board the social aspects, as well as the ESG.

Thank you.

MR. PERKS: Yeah. Rod, I think it's a good question and I could -- if I could answer first, I think Benchmark actually just today announced that we'd be -- we're -- announced an ESG arm to our company and we do life cycle analyses for companies, mining companies and other companies.

Yeah. I'm in aggreance [sic] with the term, mining. It's one I just say because I'm used to the term. Like brine extraction and brine evaporation ponds or direct lithium extraction, they're all different and potentially not mining at all, and yet there's a lot of -- potentially around that word itself, a lot of emotion.

And so it's a good distinction to be made, and of course, now, the last thing I'll say is that the conversations with have with the clients that we talk to in the OEM stage are really interested in those LCAs (phonetic). They're really interested in the ESG credentials of a project, and potentially, investments -- well, I know invest -- I've had those conversations -- I know investments are made almost primarily just on the ESG credentials of a project.

MR. NG: Yeah, Commissioner, I'll just add from the Energy Commission's research portfolio, we

haven't historically done very much like kind of life cycle analysis specifically towards batteries of EVs or lithium ion.

But I will say we are focusing more attention, especially on kind of after, you know, second -- we'll call it second life use or end of life use for batteries and the potential for either continued life outside of a vehicle or a responsible kind of recycling methods, you know, with the expectation that the increase in demand for the batteries is going to have this kind of follow on effect, you know, of years down the line that we're going to have a lot of batteries that need to -- you know -- we need to do something with responsibly.

And so that is an increasing area of research that we are starting to invest a little bit more in, in the next several years, about understanding kind of technologies and solutions to address the second use and recycling opportunities.

COMMISSIONER McKINNEY: And if I can add to what Anthony just said. You know, the Air Resources Board manages the low carbon fuel standard, and they are now quite adept at running LCAs and carboning missions through the full supply chain for fuels, and I can see batteries getting incorporated into that at

some point in the future.

COMMISSIONER COLWELL: Well, thank you, Jim. I guess my question was aimed at, you know, with the panel that's more on the S part of ESG. So environmental, yep, we get it. There's a lot of emphasis on that on the social side of our procurement decisions, you know, that how much of a bearing that has, is there a real measure for that.

I think that was where Commissioner Olmedo was heading, and you know, we're just as curious if there's any weight, you know, in those decision processes to the social justice side of procurement.

VICE CHAIR KELLEY: Are there any other questions, comments?

So I have one that I -- this may be for Mr. Ng or Mr. Perks. this is in regards to -- from your presentations -- the development -- I'm not sure which presentation it had, but you had 23 mega factories for battery production on the list now, and that increase.

Where's the predominant -- in North America where is that development focused at?

MR. PERKS: I think that was -- might have been -- well, I know in my presentation I had 242 mega factories in the pipeline that we were currently tracking. My remembrance of most of them, besides

Tesla being down there in the southwest -- if I can remember my geography -- the US, most of those mega factories that we're looking at, the north, northeast, so the Ohio corner up there where there's traditional glass manufacturing, and of course, close to the mining centers up there in Canada.

So nickel production is obviously a big one up there, but not a terrible lot of -- because there isn't -- there's a fair bit of lithium up in Canada, of course, but not in the US area.

VICE CHAIR KELLEY: Mr. Ng.

MR. NG: Yeah, the -- so I guess that sense of scale is a little bit outside of the scope of the research that we fund, the companies that we work with here in California are much earlier stages than the facilities that Cameron is talking about.

I will say, I think, the -- one of the prospects of the innovations that we're funding is to partner with the larger manufacturers and the OEMs as a means to get innovations out into a larger scale, right.

The companies that we're working with are developing really interesting science and they have a lot of potential, but then by themselves they're relatively small companies, they're startups, and so

they -- their prospects for scaling their innovation isn't to build the giga factory themselves.

It's more realistic that they partner with an OEM so that they can then incorporate their innovation into these upcoming facilities, so that, you know, the benefits of their innovation can be more spread widely.

VICE CHAIR KELLEY: And a follow up, Mr. Ng, is that there was a recent article that was -- I can't recall if it was national or if it was regional -- about the location of battery firms relocating into the Orange County area, into the Los Angeles County area.

And most of those are startups and small, but that focus, do you see that -- a center of gravity happening around battery research and development?

MR. NG: Yeah, most definitely. I mean, between the Bay Area and the L.A. region we've seen a lot of activity, just from the -- you know -- we fund a good number of them, I'd say kind of maybe, you know, a dozen or so companies and they're spread throughout.

But I think in the research and the literature that we are seeing that, you know, California definitely gets I think over 50 percent of the venture capital funding for clean tech comes to California, and batteries are -- it's a hot item right now.

You know, there's a lot of battery activities,

a lot of battery startups. You know, not a lot of companies have really nailed it in terms of the technical performance. So I think, you know, there's a lot of companies springing up to see if they have the -- You know -- the answer to the challenges, right.

So yeah, we're seeing a lot of activities in the startup space, particularly in the Bay Area and also in the L.A. region, yeah, focused on battery, battery research.

VICE CHAIR KELLEY: Thank you.

MS. de JONG: You have a hand raised, Commissioner Olmedo.

VICE CHAIR KELLEY: Mr. Olmedo.

COMMISSIONER OLMEDO: Yeah. Thank you. This question to Mr. Ng. I've had an opportunity to serve on startup funders and provide equity advice, and one thing that really catches my attention there is that they're -- although they're startup funders looking at funding a clean-tech type of projects, they pay special attention to make sure that the projects that they are essentially funding, that they have an equity component.

Sometimes, they co-benefit to disadvantages communities and so on, and I'm just wondering if in your model has the Commission built that in?

MR. NG: Yeah, definitely so. So kind of speaking broadly, not just related to battery research, but more broadly speaking, our research and development program, the largest program is our Electric Program Investment Charge.

And absolutely one of the equity. And the priority to insure that disadvantaged and low income and under-resourced communities are able to benefit from the investments that we are making is definitely a priority for the program.

And just as an example, a significant portion of our program funds a kind of technology demonstration and deployment projects. So these are kind of real world demonstrations at a real world location of innovative technologies.

And so legislatively, we have a requirement that a certain portion of that funding goes towards communities in either disadvantage or low income. You know, we treat that as the absolutely bare minimum, right.

And so we have baked into the program significant criteria to insure that, you know, when these projects are proposed to us that we require the applicants, for example, to insure that a community-based organization is part of the project team at the

point of proposal, so that we know that this is something that the project team has, you know, engaged with local community members, that this is a project that the community wants, that it's not, you know, just an outsider coming in with a new technology to kind of, you know, force it onto a community, right.

So that's just one example of the way we've integrated kind of equity and including of priorities into the program. I know Danny Kennedy here is later on in the program, and I think he's going to be talking a little bit about the CalSEED Program, which we are in partnership with New Energy Nexus, and that is focused on really early stage investments in really kind of, you know, high potential concepts, and that has equity and inclusion as a core function of that program, as well.

So I know Danny will talk a little bit more about that. But to answer the question, yes. You know, kind of the priority at the CEC is to absolutely insure that equity inclusion and insuring that benefits are spread out to the under-resourced communities is part of our mission here.

COMMISSIONER OLMEDO: All right. Thank you, Mr. Ng, and that's pretty consistent with what I've seen and I appreciate hearing that this is certainly

something that the Commission practices. And while there's always room for more, you know, and for better models, I'm just glad that you are explaining it to me.

And what I've seen and what I have really seen is beneficial and that the Commission is right on target with those types of expectations. So thank you.

MR. NG: Okay. Thank you.

VICE CHAIR KELLEY: Elisabeth, are there any other Commissioner questions?

MS. de JONG: I do not see any hands raised at this time.

VICE CHAIR KELLEY: Okay. Then we will open the public comment section, Elisabeth.

MS. de JONG: So right after the Commissioner Q&A here we were planning to go directly into the next set of speakers before going to public comment at the end of the workshop.

VICE CHAIR KELLEY: Okay.

MS. de JONG: That's your decision, and also up to you if you want to call break at any time. That's not built into the Agenda, but that is your option if you'd like.

VICE CHAIR KELLEY: I would like to take a 15-minute break. And I would -- I want to thank the first part of our workshop, and if we can return back at 3:40

and resume the presentation and workshop.

(Off the record at 3:22 p.m., until 3:40 p.m.)

VICE CHAIR KELLEY: Welcome back, everyone. We're continuing with the workshop, and our second panel will be on Mr. Kennedy from New Energy Nexus and President of CalCharge, and Meg Slattery from UC Davis and Lawrence Berkeley, the National Lab.

Mr. Kennedy are you prepared or ready to make your presentation?

MS. de JONG: If I can jump in. Actually, Commissioner Dolega does have an announcement at least to make. So if we could go to him first.

VICE CHAIR KELLEY: Oh, very good. Commissioner Dolega.

COMMISSIONER DOLEGA: Sure. Well, not so much an announcement, but I'm sure that everybody's seen the news with Ford's announcement with the investment in the new vehicle operations and giga factories that are going up in Tennessee and Kentucky.

So that announcement was made the other day with 129 gigawatt hours. So that investment being roughly about $11 billion being made jointly between Ford and SK (phonetic) to bring battery manufacturing here.

I thought maybe I could offer just some

perspective on what we can -- You know -- how the lithium sector, how we view that and how that impacts either certain decisions that we make or how we look at securing our lithium sources going forward.

I think Jonathan and Cameron kind of talked to this a little bit, and so I can expand on that and probably just answer questions towards the end when those come up. But I think I wanted to point out or reemphasize where lithium plays and where we view the ecosystem for lithium from a purchasing perspective.

So for the OEM, the mining sector is more or less a Tier 5, Tier 4 activity. What we have been currently doing is making sure that our value chains are transparent with mine side audits that are led by our ESG team.

We also have announced that Ford would be part of IRMA, which is one of the leading criteria for mining activities. So we take the ESG angle very seriously, as was mentioned earlier in the previous panel.

From the lithium perspective, the important piece I think it's important for the Commissioners to consider is that between the miners and the OEMs and the battery makers we do have the cathode piece, and as was mentioned earlier, that primarily resides currently

in Asia.

So as we look to develop a larger ecosystem here it is going to be really important that the cathode material, the cathode activity comes to the US from -- how that impacts the decision-making process about potential co-location.

I think it's important to keep in mind on the cathode side you do have the nickel cobalt, manganese, precursor element, and as well as the lithium that get combined at that process. So from a decision matrix where the materials are being pulled to and from, from a logistic, cost perspective that was kind of the idea for the Imperial Valley to have cathode co-located.

From a cost economic analysis, you are going to have some of that logistic cost being transferred to the other side of the cost structure. So you'd have to be importing nickel cobalt in to be combined with the lithium at the cathode step.

So there is a bit of a potential wash in that perspective. Of course, there are potential other opportunities, but in terms of the overall decision, that becomes a pretty -- the benefit for co-location may not be as clear.

So I'll pause there, because I do not have the presentation that I could share, given the restrictions

here, but I would welcome any questions about the overall industry and how we view the sourcing of lithium going forward.

VICE CHAIR KELLEY: Very good. Thank you. So Commissioner, you'll be available in the panel, as well, to answer the questions?

COMMISSIONER DOLEGA: Yeah. I think I can -- it would probably be easier if we -- if I could answer questions, if they're appropriate, but for sure. I think long term, of course, we're looking to secure our raw material fees, and we think North America can play a role in that.

There is a role for other parts of the value chain, however, that need to come first. You know, I think to Jonathan's point, shipping lithium overseas to be made into cathode that we would then ship back is not exactly the most efficient route that we would like to take.

So we're exploring the options to make sure that if the mining sector or the extraction sector, as Rod was saying earlier, because it's not really mining. If they do get localized here we want to make sure that it's an integrated supply line that can go from mine to battery to EV here in North America.

VICE CHAIR KELLEY: Very good. Thank you,

Commissioner.

Then we'll move on to Mr. Kennedy. Are you ready for your presentation?

MR. KENNEDY: Yes, I am, and thank you very much, Vice Chair Kelley and Commissioners. It's my great honor to be here today. I've been talking about Lithium Valley for a number of years, and just so pleased to be presenting to you all.

I've been following the Blue Ribbon Commission since it started, and I think it's wonderful work you're doing to try to have this serious conversation, involve the community at the table from the outset, chairing it in fact with Sylvia, although she's not here today, and having these really great informational conversations, which we're very pleased to add to, as far as we can.

Just the next slide, please, to explain who we are, New Energy Nexus. It's sort of the largest platform organization in the world for clean energy entrepreneurs. Sounds like a strange statement, but we run accelerators, incubators and funds in 10 countries, primarily here in the United States.

The largest chunk of our team and the greatest number of dollars and number of entrepreneurs we support are here in the US. We started in California

back in 2004, actually thanks to the Public Utilities Commission in a settlement with PG&E before Commissioner Guzman Aceves was there.

They put $30 million into a pot for a nonprofit to manage. That's us. We invested that money to help seed some of the companies that have helped the state meet some of its energy goals till now, and we're still charged with that trust as a nonprofit partner to the CEC, with the CalSEED fund that you heard about from Anthony Ng, the CalTestBed Initiative, also through CEC funds, CalCharge, which is an initiative with the National Labs in California to promote a cluster of battery innovation companies that we started in 2012, and a number of other initiatives.

We also have similar contracts with the State of New York, and the Clean Flight there is our Accelerator Program, which we just won a million dollar EDA grant earlier this year to turn into a battery product accelerator, also.

So we've sort of got the bookends of the country trying to support innovation and this ecosystem. We also run corporate innovation programs like the EV and Battery Challenge with LG Chem, one of the world's largest battery manufacturers. We've done that for a couple go rounds over the last five years.

Third Derivative, which has companies like Tex Pal. You'll hear about the news of cobalt free chemistry coming out part of Texas. That's got about 36 companies, many of which are battery related. So we basically do startups, innovation and a lot of battery businesses.

That is us to try to establish who we are and what we do. We support them. Next slide, please. I kind of want to remind you where we are in the world, and you'll have to push through this with the next button.

The world is going through a rapid energy transition, which all of the forecasts and conversations from the likes of Benchmark, all due respect to Cameron and his colleagues, have historically gotten wildly wrong for about the last 30 years.

It's going to be a much faster thing, but we disrupt, to use a kind of cliche out of Silicon Valley, the old system with a new system of renewable power, mostly solar and wind, but also geothermal.

And the next button, please, if you could push it, batteries as the linchpin technology to this transition. And the driver of battery demand, as we've heard, is EVs, at least in the outset of the century.

Electric vehicles are batteries on wheels, basically. We've got to remember that when we think about battery energy storage systems on the grid, also. They're what make our electricity cheaper. When you look at wholesale markets like the Australian market, where wind and solar penetration is exceeding expectations enormously, hitting 50 percent some days, et cetera, batteries are becoming a very big bit of that.

And the lower the cost, which follows a learning curve very similar to solar photovoltaics, the more that story will grow. And there's an optimum cost curve, which basically means we will build out several times our current generating and demand capacities and a lot of energy storage, both on the grid and with EVs.

And just to go to the next slide, again, to reinforce the point without rubbing anyone's nose in it, the forecasts are always wrong. I used to do that as a job in the '90s, trying to fix solar and silicon markets. That's why I jumped ship, to just ride the wave that I saw crashing over the globe in the early 2000s, and started my first solar company, and have done entrepreneurship since then personally, because it really is a wave coming through the world that will change a lot downstream of it.

And it's something like the internal combustion engine and oil industry at the turn of the 20th century that is now sweeping the globe and being driven by the demand in China that we heard about with EVs and lithium.

And funny story for you. The corner of California, the poorest corner of California, the county called Imperial and San Bernardino with rare earths up at Mountain Pass and some neighboring regions, have a lock on the largest resource to make that wave of innovation and transformation of the energy industry happen.

And that is the lithium under the Salton Sea in Imperial County. It's a kind of remarkable confluence of events. It's like California had oil at the start of the 20th century and didn't really know how big a deal that would be, and how much wealth and value and transformation would be created through the oil industry, for good and bad, of course.

The fun story today is we kind of have that history in California. We did have oil. It did cause a boom and a bust and a bunch of bad stuff and offshore, and oil spills and all the rest. We don't have to repeat the mistakes of the past.

Daniel Day Lewis hasn't -- doesn't have to do

a movie called "There Will Be Blood." There need not be blood in this lithium story as it rises, and we can do much better with it. And there's a really critical piece about the lithium boom that's coming, if you can go to the next slide, which is that unlike the oil phenomenon that we are sort of comparing it to in the 20th century, this industry development, which will take most of the 21st century, from 2020 through the 2070s at least to bear out, is a circular economy, ultimately.

The wisdom will be in the economics, as evidenced by Redwood's announcements a couple weeks ago to recycle right from the start, and to turn this industry and all the innovation and intention of it not to a once through resource extraction done in one sort of deal, which is what oil and fossil fuels had to do, because you burn them to get the energy out of them and then aspirate them into the atmosphere.

In this case the lithium will recycle and will go back into the system just as well as it started and be just as valuable and just as, you know, through time as rich a resource. And so the key to designing the boom, the cathedral we're going to build in that corner of California over the next decade for the several decades beyond it, is to insure that we're also doing

that refining step and we're capturing all of the materials and recycling them in situ at the same place we've recovered them from the brines in the first place.

Just to talk to the topic of, you know, my presentation, opportunities for manufacturing and innovation, if throughout this value chain we're sort of fixated a lot on the material recovery, the debate about mining and some production conversations about cathodes, et cetera, but you know, there is a refining step in here that is a big business in the world, and California could do it really well with low cost electricity, which we have actually, which with our technology and our standards we could do better than anywhere else in the world.

There's all of the components, which we deal with a lot of startups in. There's the actual cell production at scale, and there's a lot of manufacturing process innovation, which I'll talk about in a minute.

There's the battery pack assembly, the kind of bringing it together as a module, whether for a grid application or a laptop or a car or a bus or a truck, which we already do at some scale here in California, and all those battery system ancillary products, like battery management software, the biosuppression units,

the industry that is growing up around it and then the reuse of those batteries in second life and the recycling of their components so that we can do it all again without any degradation of the raw material.

It's a really remarkable gift that we have to capture here in the Golden State. Just to go to the next slide. That value chain that's represented here, you know, by another one of the analysts that we use that, you know, captures the fact that California actually is a big player in this space already, You know.

You heard from Anthony earlier about some of the CEC's bets, which have actually been facilitated by my organization and the CalSEED fund. In fact, the four companies that were featured are actually from CalSEED.

Many of these have also gone through that or our CalTestBed Program, and there's no shortage of, you know, bright minds going after this space, no shortage kind of. There will be many, many more doing it and innovating and doing new and different things.

And one of the wonders of entrepreneurship is if you unleash the genie in a concentrated place you create synergistic values, network effects, kind of creative collisions and accidental, happy -- happy

happenstance, if you will, that creates new and additional products and services.

That's what Silicon Valley became famous for, because you had a lot of the tech grows south of San Francisco and an orange orchard around Stanford working on microchips. You ended innovating out the wazoo and inventing things like the Worldwide Web with the Department of Defense support, albeit, and the Apple iPhone with Department of Defense support, albeit, and so on and so forth.

And we need to create that sort of space for those creative collisions and that synergy to emerge, which is really what the Lithium Valley opportunity is beyond a cathode, so that we've got a pull for some lithium powder that doesn't go out of Long Beach to China.

That's not enough as a vision for this Commission to really innovate and capture the value and the jobs that will be created. Next slide, please. Just to, you know, speak quickly about some of the companies here in California.

You know, these are just ones we're following and closely involved with this year. You know, there are -- there have been dozens prior to it, you know. We talk about Cimbol (phonetic) as though it were a bad

thing, you know.

And I know it may have harmed people's expectations in Imperial, but failure is a necessary part of the innovation agenda. That's what California's famous at and supporting that with a culture which says, have a crack.

It was a great idea. It was about a decade ahead of its time. The technology that they built at Cimbol is being used, without giving away any IP or anything, by at least one of the companies that's currently being talked about as in the race to crack the nut down at the Salton Sea today.

That's a necessary problem in the process of developing these companies. You know, all of these ones, well, I could tell you great stories about -- just to go to the next slide, you know, just to show you a photo of what we're talking about, if you could change slides.

These are people, mostly young, but not always. Sorry. Next slide. I can't see it changing. This is a company called Coreshell, which we haven't talked about yet. They're in Richmond, California, currently an oil refinery town, looking at going bust because, guess what, oil's going the way of the Dodo and 100-year-old refineries like Richmond are

definitely going to go down, sooner rather than later.

And this sort of company could be the kind of beneficiary of a Lithium Valley initiative here in California, which is centered in Imperial County, no doubt, but is bigger than that, in fact, like Silicon Valley, spanning the state in terms of the Zeitgeist and the opportunity that it creates.

And this is a diverse group that is cracking the nut on a drop-in substitute of all separator improvement and, you know, we know for a fact from our partners in big corporates that what they got is heart and they're going to do well, just as Cuberg did, for example, who we were the first ones to take a bet on before Boeing did, but -- and then they got acquired by Northvolt and are looking to build a giga factory right here in this good state.

So all these little seedlings, the CalSEED companies, these startups, could become very big companies, you know; apocryphal story for you, because I don't want to create too many expectations.

But my predecessors in my organization, in that first fund, CalCEF in 2004, invested in 2005 in a little company called Tesla. It was crazy at the time. Elon hadn't even joined the operating team. There was no chance that was going to disrupt all OEMs, and BMW

would be chasing them and their market capital would be greater than Ford, MGM and Chevy combined.

That was insane to say that in 15 years, and now look. They just opened another factor in Stockton with another 1,000 people. And you know, who knows which of these companies in this current crop, and who will come up in the ground that we have to seed in the Southern California inland counties will become the next Tesla and the next Tesla, because if you think about it like the oil industry over a century, it's not going to be one company.

It's not going to be four companies. It's not going to be 40 companies. It's going to be dozens and dozens of companies that dominate through times and years. Some may rise to a great height. Others may disappear, but it's going to be a fascinating churn.

Just to go to the next slide to make the point that others have made previously, the VCs are getting frothy on this. I mean, I'll tell you that it's actually irrational exuberance right now. We follow this space very clearly, because you know, we put up to $600,000 of state funds as nondilutive equity into our startups.

Many of them are closing rounds now in the millions of dollars, straight off the back of $150,000

bets. It's a hot topic and will not abate, because that supply/demand graph, which as I mentioned, will be wrong in detail, right directionally, will continue to stretch the need for new supply and new ideas and innovation.

But there is one big negative that I have to show you, which is the next slide, which is that the manufacturing capacity, as we've heard, and this changes all the time, as Cameron pointed out from Benchmark's point of view, they don't know all the known projects getting built, but we're really not doing that much here.

And good on Ford and SK, but 11 billion bucks doesn't do it. You know, it's a nice investment, and so is Tesla in Texas and in Stockton and in Nevada, but we need to be investing in this country hundreds of billions of dollars to keep pace, just to keep pace with Europe and China.

On this stuff that we innovated, we have the largest resource in California to produce, and you know, have the greatest demand through the largest economy in the world. So the manufacturing story is a problem and we've got to do better to attract that.

And to the next slide, one of the points that I will disagree with some of the previous speakers

about is that co-location of the startups and the innovators and the entrepreneurs and the inventors and the crazy scientists, with the manufacturing, with the materials production, with the large-scale big end of the town businesses, actually is a strategic advantage.

That is how we can win this. You know, there's a great company that I mentioned in my list of companies in California call Enovix. This is a slide from their white paper, which I think Elisabeth circulated to y'all on the Commission.

Enovix is building batteries for watches and advanced personal communications devices here in America, here in Fremont, in fact, just across the street from the Tesla factory. They want to build their next battery factory in California.

They have a strategic reason to do so, which is that the longest time to a new model with an advantage in an OEM's experience is going to be the manufacturing innovation to drop in a new battery cell into a production line and make it at scale to make it to cars.

You think about the turmoil that LG and Chevy are going through right now with the Volt recall. If you're doing that from Asia to America, you're time of rotation and transfer of knowledge and conversation

between engineers is months.

Whereas, if you're doing it across the street it might be days. It's literally an enormous competitive advantage, which we should focus on and attract. And also, I don't actually believe the logistics numbers. I think nickel and manganese and cobalt are not a wash with lithium in the cost structure of atana (phonetic) battery material in a cathode baking operation.

I don't think cobalt will even be an issue in the future with cobalt free chemistries. Lithium is the driver. Logistically, it makes the most sense to be building the batteries near where the lithium comes; not necessarily next to it, but near it.

And we've got to get sharp here in California about these things. So to finish, I would recommend, if you could go to the next slide, that we really turn this conversation to a kind of what Mariana Mazzucato calls a mission economy.

If you don't know her, she's the economist that has been really driving the green deal, not the green new deal, but the green deal in the European Union. She's out of Imperial College, London, but an advisor to the Italian Prime Minister and the European Union.

She has forged many of the strategies which are why Europe in 2016 didn't have a battery giga factory, didn't have a lithium production operation, didn't have a battery recycling plant. Guess what? Today they've got 12 giga factories.

They got two lithium production operations. They've got three giant recycling operations. That's five years later, and they did that as an intentional moon shot where they said, if we don't do this we're going to lost 25,000 workers or whatever it is, just in -- you know -- per annum for the next decade and Germany's going to be gutted.

So we need to fix for that and we need to create all of this. I was in the UK last month visiting with a startup that is doing brine recovery from Cornwall, where they found some old maps last year of 1700s tin and copper mines and saw signals that suggested lithium brines may run through those there rocks, and they stuck a pipe down and they pulled it out, and they're now trying to get it out for commercial recovery, which they're going to sell to themselves in Sunderland, which is about as far as Imperial is to Stockton, and they're building a giga factory with misand in Sunderland in an old depressed shipbuilding town in Northern England, for the car

mandate, which Boris Johnson has made for 2030 electric vehicle adoption.

That's what, you know, we need to leverage all of the policy incentives, the demand, the mandates that we have and get this sort of thing going. I've pulled an example from the Commission that the UK ran on the future mobility in an open innovation, industrial strategy, which to go to the final slide, is what I would strongly recommend we build here in California, that does co-locate as much of this as close to Southern California, so that we can indeed achieve uplift of the poorest communities in the state.

Certainly, that's out commitment. As Anthony mentioned, the CalSEED fund, for example, 41 percent of the funds we have deployed in the last five years, $25 million, have gone into DAC communities, into under-served communities.

We've got to that piece right. The community engagement has to be best practice, better than IRMA. Great that Ford has signed up for IRMA. This is the International Responsible Mining Assurance Guidelines, but we can do more than that in California and get a competitive advantage, because companies like OEMs do buy, according to ESG standards, as Cameron mentioned.

That will be a differentiator, as will carbon

footprint. You know, you saw that the European Union is using as a driver of its demand the requirement for certain grams of CO2. We have the lowest carbon footprint potential lithium and battery production in the world, in Imperial County with your work in Lithium Valley.

And we must make up hirers (phonetic), jobs and labor agreements, because that's how you sustain it for those 70 years, 100 years, century-long vision and get that recycling going and get everyone locked into a long-term innovation agenda, which continues to renew and create new value, as has Silicon Valley up Northern California way, for the good of the state. So that's where I'll leave you. Thanks.

VICE CHAIR KELLEY: Thank you, Mr. Kennedy.

The next presentation is from Ms. Slattery, on electric vehicle battery end of life. Ms. Slattery, are you ready?

MS. SLATTERY: I am ready. How's my audio?

VICE CHAIR KELLEY: You're good.

MS. SLATTERY: Okay. So yeah, thank you, Vice Chair Kelley and Commissioner, and thank you, Elisabeth. My name is Meg Slattery, and I'm a PhD. student at the UC Davis Energy and Efficiency Institute.

I'm also an affiliate with LYRIC at Berkeley Lab and have been following this Commission very closely in that capacity. So I'm excited to be speaking here today, although that is not what I will be talking about.

My presentation today will be a quick over of the EV battery end of life landscape. I know everyone feels this way, but there's a lot more to say about this than can fit into 15 minutes. So I want to acknowledge up front that I'm going to gloss over some important details, and that I'm happy to explain any of these topics more in depth in the Q&A.

Next slide, please. So first, I'll introduce the UC Davis Material Circularity Lab and briefly describe our research areas. Then I'm going to present an overview of the EV battery life cycle, focusing on end of life pathways.

Then the bulk of this presentation will be about the Lithium Ion Car Battery Recycling Advisory Group and our key topic areas, which are reuse, recycling and revserse logistics. And then finally, I will just highlight where I see key areas of alignment with the work of this Commission.

Next slide, please. So our team is led by Dr. Alissa Kendall, who's a life cycle assessment expert

and has published a lot of important work on the life cycle impacts of lithium bio-fuels and many other products.

And then also, Jessica Dunn, myself and Hanjiro Ambrose, who now mainly works with CARB. And I want to show this just to highlight that while I'm speaking today it's very much a team effort and we've all contributed to what I will present.

Next slide, please. So the motivation behind our work, similarly to this Commission, is the recognition that our strategies for mitigating climate change rely on material, intensive solutions, and also, that there's an opportunity as we're to carbonize these area -- fundamental systems of energy and transportation to create a myocredible (phonetic) and environmentally responsible system.

And to support that vision it's necessary to be aware of the life cycle impacts and who is affected by them, proactively avoid negative environmental consequences and ultimately strive for a more circular, as opposed to linear, extractive economy.

Next slide. So currently, we are not experiencing large flows of batteries. EV batteries are expected to last approximately eight to 10 years, although that's an estimate. So the first mass

produced vehicles are likely just now retiring.

And given that context our work is to understand what we should expect and prepare for, acknowledging the uncertainty that's inherent to studying such a rapidly evolving field. Our primary research areas are estimating to what extent we can meet future demand with recycled materials, and also understanding the practical logistics of vehicle after life.

And all of this works shapes and is also shaped by our roles supporting Cal Recycle's Lithium Ion and Recycling Advisory Group. Next slide, please. So this graphic is from the resale center at Argonne National Laboratory, who are leading a lot of work related to recycling and life cycle assessment.

A lithium battery is -- on the mining production these phases have been covered well by the previous speakers. So I'm going to start right here in the bottom right-hand corner. So when a vehicle reaches end of life the battery may be suitable for reuse in another vehicle or repurposing as stationary storage, depending on its condition.

So that's what this second use icon is here. And then ultimately, it will need to be recycled or otherwise disposed of. And what I think this graphic

illustrates really well is that where those recycled materials plug back into the value chain depends on the recycling pathway.

So pyrometallurgical recycling is this outer loop, and you can see that that's a smelting-based process and has historically been the most common pathway. But the outputs of the pyrometallurgical recycling process need to be further refined to -- in order to be used in the production of new batteries.

So then this middle loop is hydrometallurgical recycling, which uses chemical leaching and purification processes, and can produce metal sulfates like cobalt or nickel that can be reused in cathode production.

And then finally, the researchers at Argonne are also working on something called direct recycling, where the goal is to recover cathode materials intact and directly reuse them, to the extent that's possible. But this is still in the development stage.

And then finally, another pathway that's not depicted here is open look recycling, and that would just mean that the recovered materials were used in the manufacturing of other products. Next slide, please.

So this advisory group that we work with is very similar to this body. It was formed in 2019 in

response to AB 2032, and is mandated to submit recommendations to the legislature aimed at insuring that as close to 100 percent as possible of lithium ion vehicle batteries in the state are reused or recycled at end of life in a safe and cost effective manner.

And the role of our team has been to provide background documents and presentations, and we're now developing the group's final report. So we divided earlier, beginning of this year, we divided the group into three subcommittees focused on reuse, recycling and logistics, and then have facilitated discussions to generate recommendations.

Next slide. Like I said, we're currently drafting the report, which will be available in its final form on March 2022. So if this process is of interest to anyone on Zoom, all the meetings and materials are public, and I also have the link to this advisory group in this presentation.

Next slide. So this has kind of been touched on earlier in this meeting, but the principle behind reuse is that most electric vehicles will reach end of life when their range and performance are no longer acceptable to the driver, or due to a collision.

And so in some cases the battery may still be suitable for use in another vehicle, or repurposing for

stationary storage, depending on its condition. There are several early stage repurposing companies in California and elsewhere in the United States, most of whom have been supported by some of the CEC grants that Anthony mentioned earlier.

And the key benefit of reuse is extending the usable life in the battery. So on top of that reusable -- reusing batteries in vehicles could provide a more affordable battery option than exist today, and then repurposing them in stationary storage applications could also provide an affordable form of energy storage, which would support grid decarbonization goals.

Some of the key barriers to reuse and repurposing that we've identified are competing with new batteries, given the falling cost. The allocation of responsibility; so that refers to if the battery is repurposed by a different company, how to make sure that the liability and responsibility transfers from the OEM to that company.

We've also talked about the lack of transparent data surrounding the battery condition, which increases the cost of repurposing because it takes more time to test each bat cell or module, and determine whether it's suitable for reuse or not.

And then finally, the lack of volume and the decentralized nature of the vehicle after life market means that it is currently challenging for repurposers to access a consistent supply of retired batteries.

And finally, safety is also a high priority there. So there are fire codes and interconnection regulations that repurposing batteries has to comply with, including obtaining UL certification.

Next slide. So there's a sense at least when I talk to people that batteries either can't be recycled or that there are no options for recycling. In reality, there are several companies in North America who recycle lithium batteries on a pilot or commercial scale.

And has been mentioned earlier today, there's developments happening in this all the time, and a lot of venture capital, and I feel like I get press releases about new agreements very frequently. So there is a lot happening here.

Most companies that have been announced in the US or north -- or Canada use a hydrometallurgical recycling process, and that they claim can recover 90 to 95 percent of the cathode materials.

And in general, these processes use a heat or mechanical based first step that kind of separates

different component materials to generate what's called a black mass that's pictured in the bottom right.

And this black mass contains the cathode demand and materials. So then they use a hydrometallurgical process, which is chemical leaching and purification, and that they're able to recover nickel cobalt and manganese sulfate, as well as lithium carbonate and in some cases graphite through that process.

But currently, given the lack of domestic cathode manufacturing, this material will then be exported elsewhere to be reused in other batteries. I also wanted to highlight that which metals are recovered really depends on their commodity value, not so much as the technical feasibility.

So historically, lithium has not been recovered, and that's mainly because the value of lithium has not been enough to cover the added stuff of recovering it in usable form. And more often, it's contained in the slag where it can be used to produce cement.

We've also discussed the importance of insuring that batteries are recycled at facilities that mitigate the environmental impact and insure safe working conditions, particularly given the context that

many used vehicles in the United States are exported to other countries, and these places may not have the resources or regulations to recycle them safely.

Finally, there are no -- currently no recyclers in California. So the closest facilities are in British Columbia and Carson City, Nevada. Next slide. The final area we've been tackling is logistics, and that essentially encompasses everything leading up to repurposing or recycling.

So that includes removing the battery from the vehicle, testing to determine appropriate next use, although that also sort of falls under reuse, and then collection and sorting, transportation and tracking.

This is a extremely important area, partly because right now it's not necessarily well understood by everyone where batteries will end up, and particularly capturing out of warranty batteries has been identified as a challenge.

So You can see in this graphic, if an EV battery is under warranty then it will probably be returned to a dealership and kind of the OEM is able to control what happens with it and insure that it's properly reused or recycled.

Whereas, if they're out of warranty, it's just owned by the current owner of the vehicle and may also

be -- it'll likely be removed by a dismantler or a recycler, and those are typically kind of smaller, more decentralized operations.

So the -- some of the key concerns or considerations for the Logistics Committee are insuring that the batteries are removed, stored and transported safely, and then also, the cost of transporting batteries and tracking and collecting.

Next slide, please. So we've discussed a variety of policy options to address some of the barriers I just talked about, and these options have varying levels of support among advisory group members.

So some are very popular. Some are more controversial, and this is kind of a preliminary list of what is on some of what is on the table right now. One of the key areas we talk about is determining responsibility or a financing mechanism for end of life management.

There are several different, possible models that have been proposed. And then another one I'd like to draw the Commission's attention to is a policy establishing labeling requirements for batteries, and including a digital identifier.

So those would require that all batteries have a label and a QR code that would contain information

about the battery, including the capa (phonetic) chemistry and instructions for disassembly.

And that's related to the conflict of the battery passport, which is being developed by the Global Battery Alliance. So the battery passport would be a digital block chain based platform to track the battery throughout its Life cycle, and it has been proposed that this include supply chain information to assure sustainable and responsible material sourcing. So I think it's something that this Commission should be aware of.

In terms of the others, because I can't get into all of them, I think if anyone has questions about a specific barrier or a policy, then I'm happy to explain it more in the Q&A. Yeah.

And so I think just to summarize, I think that these two Commissions and our lab are aligned generally in the motivation and recognition that the most sustainable electrification pathway will maximize the use of recycled materials and insure that where mining is necessary, materials are mined in the way that minimizes negative environmental impacts and seeks to uplift the communities where material are sourced.

In addition, I think the supply chain, and specifically the role of a domestic cathode

manufacturing capacity, have been mentioned pretty frequently as an important divert to meeting the goals of both groups.

And then the tracking mechanisms under development are really irrelevant to this Commission as a means of promoting more sustainable sources of raw materials. Next slide, please. And then -- oh. Actually, can yo go to the next slide?

Yeah. So finally, I'm just leaving our contact information in case anyone has further questions, and then the link to the advisory group website. I think our next meeting is going to be held I believe we decided November 2nd.

But there's more information about those meetings, and then also, the materials from past meetings. And like I mentioned, our report is due March 20, 2022. So if that will be useful to the members of this group, then you can be on the lookout for that. And that's all I have.

VICE CHAIR KELLEY: Thank you, Ms. Slattery. So at this time we will open up the Q&A for Commissioners, for Mr. Kennedy, Ms. Slattery and Commissioner Dolega.

Do we have anyone, Elisabeth?

MS. de JONG: Yes. You have a hand raised

from Commissioner Weisgall, and then Commissioner Colwell.

VICE CHAIR KELLEY: Commissioner Weisgall.

COMMISSIONER WEISGALL: Thanks very much.

Thanks to all three of you; great presentations, as were the earlier ones. Question for Meg. What are you seeing in terms of cost structure for recycling as opposed to recovery extraction?

Probably a broad question, but at -- you know -- is there a point at which recycling will become even more cost effective? I'm guessing it's not, but you know better than I do.

MS. SLATTERY: Well, it's really hard to tell, because actual numbers about the processing cost from recycling companies are not really possible to obtain. So often, it's more calculated based on kind of what would the break-even costs needs to be, given the commodity values.

I think the general consensus right now is that cobalt and nickel are economical to recover, and then the other materials, it will kind of be driven by whether the raw material prices increase in the future.

And we've also discussed -- people have discussed, like, if there were to be a subsidy, what would that level be, and I think we don't have a clear

answer on that right.

COMMISSIONER DOLEGA: Yeah. Hey, this is Roderic. I'll just tack onto that. You -- we do have some policy examples in Europe, though, where the OEMs are going to be driven to recycle certain levels of content.

So that will include potentially even an economic metals. Right. So like to make this point, depending on price of lithium and the recovery costs, you know, it could be break even, could be at a cost.

Sometimes, policy will drive some of those requirements, regardless, on tops of the potential requirement to use certain amounts of recycled metals in the pack. I think North America may -- might be -- you know -- the direction of that policy here is probably yet to be determined, though.

MS. de JONG: So the next hand raised is Commissioner Colwell.

COMMISSIONER COLWELL: I guess this is for all. Is there, you know, the recycling, Meg, and you know, comments to any brilliant -- I mean, trying to sort of capture this circular economy in one region.

But is there a call volume you start to see, a call volume of penetration where, you know, recycling really starts to make sense? You know, so for example,

you know, 10 percent penetration, 20 percent you start to sort of get enough call volume to be able to justify that in numbers from raw materials to having enough, you know, batteries coming out of commission, say six to eight years, to be able to justify an industry?

MR. KENNEDY: Meg, do you want to go for that first?

MS. SLATTERY: Oh, yeah, sure. I saw that you were unmuted, so I was waiting. I think, yeah, the volume of retired batteries is definitely a big determinant of the economics; also, because the facilities are more cost effective to run at a high throughput.

But I'm not sure exactly what the calculation of, like, how many years or what the volume that's necessary is for that breakeven cost through to happen.

MR. KENNEDY: And I would just add, Rod, that you know, I think it's a bit dangerous to try to believe we'll get an economistic model that is correct about this. I mean, the point was made earlier, and Redwood has sort of demonstrated in the money market, cobalt recycling is good enough, at a fairly -- You know -- like small scale right now.

Like, penetration's not great. They're using laptop and phone battery supply chains to basically

feed the machine. So you know, like it's probably around now, and it's going to just take off and keep going and surprising us.

And you know, every time we try to estimate when the next threshold is we sort of underestimate it, much like the takeoff of a solar economy, which is surprising everyone. I think, you know, that that's what I'm hoping people are left with. There's an opportunity to do something ahead of that curve, rather than trailing it.

MS. de JONG: The next hand raised there is from Commissioner Guzman Aceves. Did we lose her?

COMMISSIONER GUZMAN ACEVES: I'm sorry. I forgot to unmute.

MS. de JONG: Oh. There you are.

COMMISSIONER GUZMAN ACEVES: Thank you very much for the presentations from both of the panels. I think it's been very fantastic to hear the perspectives. And I just wanted to reflect on what I think I heard that was distinct on the slightly different -- and I -- and so I wanted to give maybe Mr. Dolega an opportunity to clarify if I understood correctly.

But I heard Danny really push the benefit of co-location and manufacturing, and I heard you say

something a little different, and --

COMMISSIONER DOLEGA: We could -- yeah. We can kind of talk through that, sure. So I think -- and maybe I can ask Danny that question in terms of how far upstream from the lithium source do you see the value of integrating.

And you know, maybe there might be some semantics in terms of like co-location in terms of, you know, are the plants side by side, are they regionalized -- right -- or just, you know, how close to the proximity of a mine or the natural resources do certain parts of that intermediate value chain need to be.

And then when you start processing, you know, the first step say is cathode, that the lithium player would chip into, you know, how close do, then, the battery factories need to be to the cathode to take advantage of any logistic benefits or other benefits.

And then obviously, I think it was mentioned before, usually you do have a combination of the battery facilities with the vehicle assembly plants, because the battery are heavy to ship. So you don't -- you're not -- and dangerous to ship, potentially.

So you don't want to have that distance be great. So you see companies co-locating those

facilities. Going upstream it becomes a little bit more of a economic decision and you have to weigh certain different aspects of that value chain.

So Danny, go ahead and, you know, I'd be curious to hear your thoughts on the full value chain and where you see the benefits on the lithium side versus some of the other intermediate steps.

MR. KENNEDY: Sure. And thank you. And you know, obviously, I don't know either. I'm trying to observe some patterns and how industries develop elsewhere. And I would offer, you know, we're also not necessarily talking about power OEMs only.

You know, who knows. In 2050 we may not mostly get about in cars. We may have moved to mobility as service options and buses and autonomous vehicles and flying taxis and stuff, all of which, by the way, will be electrified and dependent on lithium batteries, lithium being the lightweight, high energy, dense element we can work those technologies with.

So we're talking about color coding lots of things, not just, you know, four factories, like refining facilities, like recycling facilities near refining facilities. All of those at the very least should be there.

As to, you know, the point about higher end

manufactured, including the OEMs making the cars or the buses or the planes or the bikes and the trikes, the wisdom of a regional agglomeration -- I don't know what the geography is in size exactly, but it is probably closer, rather than further apart, because batteries, moving them around, and it is a big cost.

And this exchange of IP, this transfer of knowledge, you know, you can be sure shooting where that growth in China is. If you looked at it in the geographic setting, it's in clusters around, you know, messy industries with nasty old furnaces from the medieval era to refine the base metals that we're talking about.

But you're in geographies around the Pearl River Delta or the Yangtzee River Delta, Citron, and we need to think like that, not think like -- in the 20th century cars were built in the Midwest. And so cars are going to be built in the Midwest and batteries are going to be maybe procured from a supply somewhere else.

You know, to me it makes the most sense that Detroit shifts to Southern California. Whether it's exactly Imperial County, I don't know whether the water would sustain that, but that industry. And there's already a whole lot of reasons to believe that's going

to happen.

Los Angeles is actually the nation's leading advanced manufacturing center. People don't realize that, but it's a huge assembly center for advanced manufactured goods. Mexicali, 10 miles south of here, has an enormous workforce trained to work in these things.

In fact, much of the automobile supply chain is currently going across that border and up to the Midwest to the auto supply chain, as we think of it, even though it's coming out of just south of Imperial.

With Rivian setting up in Arizona, just over there, you know, Tesla's just up the hill in Nevada and across the way in Tax Court, that region, you know, I don't know what the scale of it is, and as Silicon Valley is more of a concept in space and time, rather than a physical valley, I think we should think about this as that.

So I'm sorry if I'm being a bit rambly, Commissioners, but trying to say there are definite advantages, and as we race to the future and try to recapture the battery supply chain co-location to compete for that gen three battery type, we'll be well served to have the chemists close to the industrial manufacturing process engineers.

But beyond that, the innovations and things we haven't even thought of and can't think of today will come up in the 2050s, '60s and '70s because we built that community and that ecosystem to spawn them today. So this is an investment in the late 21st century.

MS. de JONG: We have another hand raised from Commissioner Olmedo.

COMMISSIONER OLMEDO: Hello again. It's a question, just part of the dialogue that's happening, both Commissioner Dolega and Mr. Kennedy here. But let me see if I can insert this comment in there.

But one of the things I noticed is the solar industry had a very difficult time building on state and federal land. So it looked like at the path of least resistance and that became agricultural land. Unfortunately, as we tried to build a job opportunities it was real clear that that didn't include the farm workers, who a lot of times may not have the -- and it's not always the case -- it's perceived that they are just slow skilled workers.

And the fact is that it's not. A lot of them, as you mentioned, Mr. Kennedy, come from Mexico, have credentials, degrees and just have, you know, difficulty finding sufficient income in their practice or in their careers.

Therefore, they look at agriculture as an option. So it's -- also, the situation about the manufacturing happening in Mexico and how the -- again, you know -- international agreements have not necessarily addressed a lot of the local issues.

And this dialogue just makes me think like, it is -- you know -- I know it's sort of this big umbrella like, oh, we're going to create jobs and we're going to create great jobs and where those jobs -- see, we're already getting into that conversation about, they're going to come from Mexicali, when the conversation is, are we going to build universities and colleges locally to be able to build that skilled labor here, right.

So we have to be really careful, you know, how we're having these conversations, because we leave a lot at the table, and we have left a lot at the table locally. The known resource area is also surrounded by agriculture, which provides hundreds, perhaps thousands of jobs just in that locality.

Creating the logistical, advantageous and economic opportunities here, yes, bring it all locally, but we have to do it in a way that it doesn't create a situation where we're not paying attention to what's creating the jobs right now, in trade for bringing other jobs.

So I would hate to see another scenario where, you know, we've seen with the solar where farm workers were just expendable. Okay. And so that's just one scenario. There are many compounding scenarios that have happened where our community was not factored in correctly, because these assumptions are being made in a very high level.

They're not looking into the micro level of what -- what the --

THE INTERPRETER: We think --

(Whereupon, the interpreter becomes audible)

MS. de JONG: Oh, sorry. I'm going to jump in --

COMMISSIONER OLMEDO: I'll take that as a cue, but I know --

THE INTERPRETER: I'm sorry.

COMMISSIONER OLMEDO: That's my comment, you know. I don't want to get too deep into it, but I just want to make sure that as we're looking in these situations that we do look at the micro situation like --

(Whereupon, the interpreter becomes audible)

MS. de JONG: Can I -- sorry. I want to -- Maria Ramirez. Sorry. You're not on the interpretation channel at this time, so we can hear you

speaking -- we can hear you speaking.

THE INTERPRETER: Well, I got this connected to you. Transfer me over, then.

MS. de JONG: Yeah. We're working on that and Rosemary will notify you when you're back.

THE INTERPRETER: Okay.

MR. KENNEDY: Can I just say, Commissioner Olmedo, thank you, and point taken, absolutely. And I don't mean to sound like that at all. And on the contrary, I think what I'm trying to get to is this could be a boom in the -- sort of boom/bust style, you know, a good opportunity for hundreds and maybe thousands, and maybe they are local and maybe they're not, depending on some policies and training and workforce development efforts taken out.

All of this could be a boon, not a boom, but like a long sustained economic opportunity, prosperity, potentially, done right, designed right at this stage, for hundreds of thousands in the region. How big that geography is, again, I'm not sure.

But you know, the state needs to get pretty entrepreneurial at this stage to make sure the stem education, K through 12, the workforce development, you know, simple sort of certificate degrees, as well as the more sophisticated, advanced chemistry, whatever

those degrees are, all that needs to happen and that's how, you know, you'll see these innovations springing up.

The talent will come from the region. The ideas will come from the region, but we could lose that, too, I agree, and we could worst of all not use it as an opportunity to empower communities that have been historically left behind.

That's the choice. Just to underscore the sort of drama of your work here at the Commission, the decision will be made in about the next five years in terms of the global provinces that will be built around this electrification of everything, lithium and silicon-based future. And either this corner of California is a big part of it or it's a bit part of it.

VICE CHAIR KELLEY: Thank you. Elisabeth, are there any other hands raised?

MS. de JONG: No. There are no other Lithium Valley Commissioners with their hands raised at this time.

VICE CHAIR KELLEY: Then I believe we are moving onto public comment for the workshop.

MS. de JONG: Thank you. So if you're joining us via Zoom on your computer, please use the raise hand

feature, and if you've called in, dial *9 to raise your hand and then *6 to unmute your phone line.

First, we'll go through raised hands in the Zoom application, and then those on the phone, followed by any written comments on the workshop. All right. I have a hand raised from Nikola Lakic. You should be able to unmute yourself.

MR. LAKIC: Okay. Hello, everyone. Can you hear me?

VICE CHAIR KELLEY: Yes.

MS. de JONG: Yes.

MR. LAKIC: Thank you. Thank you for this opportunity to say a few words. On first segment of public comment after Tom Sephton make comment I tried to raise hand, but accidentally I double click it. So it looks like my hand wasn't raised at that time. Sorry about that.

Tom Sephton said something about misinformation of the media and public and/or lack of information. Well, on -- I know some members are here representing environment, environmental justice and please listen carefully.

Public needs to know your motion, your goal of the extraction of the lithium is based on perimeter brine lake. What it means. It means destruction on

the lake. It's oncoming ecological disaster.

And you know that public does not know that. Please, if you want to be fair, tell it. Now, the -- in my opinion main problem is really mismanagement of the Salton Sea situation. We have right now lithium coalition, Lithium Valley Coalition, and then we have Salton Sea long-term plan.

It doesn't work. A, it is integral part. Be -- just be patient a little bit. I'm -- my proposal is under review of the Santa Cruz, California University right now and there is independent panel -- panel of independent reviewers.

Be patient. Wait for that report. Then we can move forward, because what I'm proposing is just make dike around your property. I'm talking directly to the Mr. Kelley right now. That way, you can have your land.

You can't harness lithium without destroying lake. There is solution, and I hope that they will work together sooner or later. I hate to be confrontational, but -- and you know, it's something that needs to be said, and public needs to know, too.

And for some reason that's -- it's not said. Public might misunderstand you about mining -- mining lithium, but in my case, yeah, I can produce about 30

tons lithium only, but that's only by importing seawater.

It's not much, but it's free byproduct by cleaning the lake, and that's in addition what you can continue doing with extraction of lithium from geothermal brine, but it has to be dike around property.

So right now, you need land. You're talking about leasing it, but that you need to shrink lake. So what I'm saying is, make dike. I will send letter to the president, whether it is government or -- to make requirement that any leasing -- you know -- any project that -- well, that require your land has to be with dike around. It's not big deal, but you don't need to destroy lake. Thank you very much for this opportunity.

VICE CHAIR KELLEY: Thank you, Mr. Lakic.

Elisabeth, do we have any other comments?

MS. de JONG: Yes. We do.

William Osborn, I have -- you should be able to unmute yourself.

MR. OSBORN: Thanks, Elisabeth. Will Osborn. I'm with Geothermal Solutions, and I'm standing in for Will Pettitt, who is the Director of Geothermal Rising, formerly of Geothermal Resource Council.

And Will asked me to remind everybody that the Geothermal Rising Conference starts this weekend, and including a lithium panel, that it is occurring Tuesday at 1:30 p.m. to 3:30 p.m., and some of those on screen will be there.

Ryan Kelley. Elisabeth will be on the panel. It's been very popular the last couple. So don't miss that. And also, this Saturday there'll be a field trip out to the Valley, I believe visiting Energy Source and some of the geologic features around. So don't miss that.

VICE CHAIR KELLEY: Thank you, Mr. Osborn.

MS. de JONG: Thank you.

VICE CHAIR KELLEY: Elisabeth, is there anyone else wishing to speak?

MS. de JONG: Yes, there are. So Cristina Marquez, you should be able to unmute yourself.

MS. MARQUEZ: Hello. Can you hear me?

VICE CHAIR KELLEY: Yes.

MS. de JONG: Yes.

MS. MARQUEZ: Great. Good afternoon, Commissioners. My name is Cristina Marquez, speaking on behalf of over 3600 power professionals and electricians of IBEW Local 569 of San Diego and Imperial Counties.

Great presentations today, all of them, especially ZEV and lithium batteries. So I know you've heard me speak before, but I just wanted to reiterate a little. We operate the State Certified Electrical Apprenticeship Facilities in San Diego and Imperial Counties.

Apprentices and journeymen have been trained in EVITP, which is Electric Vehicle Infrastructure Training Program, since 2014, and ESMTC, Energy Storage and Microgrid Training and Certification since 2017.

So I just wanted to let you know. I know in January we'll be talking about workforce, but I also wanted to get that on your radar, since you guys spoke about that today in your presentations. Our members have built over 2 gigawatts of renewable energy, and the vast majority of these clean energy projects have been built under project labor agreements.

These projects have generated good paying union jobs employing local workers, and have provided skilled training and benefits in an economically hard hit region that includes high scoring CalEnviroScreen communities.

And I just wanted to thank you for your time today and allowing me to comment. You guys have been amazing and we appreciate the statewide leadership you

have brought to us. Thank you.

VICE CHAIR KELLEY: Thank you, Ms. Marquez.

MS. de JONG: Thank you. We do have another commenter, Hector Meza. You should be able to unmute yourself.

MR. MEZA: Hi. Good afternoon, Commissioners. My name is Hector Meza and I am an EBITP and ESMTC certified journeyman electrician. I was raised here in the Imperial Valley. I'm a resident of valley.

I went to a state approved electrical apprenticeship here in Imperial Valley through the Joint Apprenticeship Training Committee of Internat4ional Brotherhood of Electrical Workers, Local 569, and National Electrical Contractors Association.

I help build the IAD's battery storage from Bellwood, and having the opportunity to learn and work while being paid with full benefits for myself and my family means more than anything to the world to me. It has been life-changing.

Working on a project like lithium battery can give many other people in this area like me the same opportunities for many ears. Thank you for your time, and have a nice day.

VICE CHAIR KELLEY: Thank you, Mr. Meza.

MS. de JONG: Thank you. We have another

comment from Tom Sephton. You should be able to unmute yourself.

MR. SEPHTON: Thank you. Appreciate the opportunity. Since my name was brought up by Mr. Lakic, I'd like to explain a bit. One of the common misconceptions that's out there, very common in social media and being talked about by people in the region is the thought that the Salton Sea is being shrunk for the purpose of making the lithium resource available.

And while that may or may not have any reality in the minds of some of the water agencies making those decisions, I would like to point out that it's completely unnecessary for the Salton Sea to be a victim of lithium brine -- lithium recovery from brine.

We know perfectly well that the part of the Salton Sea, the southeast corner, is very shallow, only a few feet deep. It's entirely possible to dike off those areas necessary to access the geothermal resource and still have an active and living Salton Sea.

And the other thing I'd like to add to that is the geothermal industry is actually the key to being able to solve the challenge of the increasing salinity in the Salton Sea that is actively killing off the fish.

There's only a few left in the sea itself.

There are some. I've seen them recently, but there are not many. The geothermal, in addition to having access to minerals, particularly lithium, it provides the heat and the power that would be necessary to remove salt from the Salton Sea, and to make it, again, into a truly sustainable resource for recreation, for the wildlife and for the whole region.

So the geothermal industry is the key, both to lithium and to a restored Salton Sea. They can and should work together. I've personally spent over a decade in Imperial County developing the technology to do that.

It works, and we have new funding to move that forward, and we will be working right next to you to accomplish that end.

VICE CHAIR KELLEY: Thank you, Mr. Sephton.

MS. de JONG: All right. Thank you, Vice Chair Kelley. At this time since we are taking one comment per person per comment period, that is all of the comments at this time, and we do have a couple written comments in the Q&A, but I believe we will read them during the general comment period at the end of this meeting.

VICE CHAIR KELLEY: Okay. And with that we will move onto future meeting discussion. So I -- as

we have progressed we've been having some very good information shared monthly, and next month is the environmental impacts, which Commissioner Olmedo and Commissioner Flores are preparing and working with, I'm sure, a detailed presentation for October.

We also have incentives in December, Mr. Weisgall and Commissioner Aceves, and then we have also on that slate for December, economic impacts, Commissioner Olmedo and Commissioner Flores. January, workforce development, Chairperson Paz and Commissioner Castaneda.

And then February it would be nice to have a suggestion for that. It's still to be determined. We have three topics that are remaining to be scheduled, one being benefits to geothermal plants; another being challenges to lithium extraction and legislative/regulatory recommendations.

I would ask if Commissioner Scott or Commissioner Hanks are comfortable about a February scheduling for the benefits of or to geothermal plants.

MS. de JONG: Commissioner Hanks is having technical issues, but he should be able to unmute himself and speak.

VICE CHAIR KELLEY: I think I heard him say yes, Elisabeth.

COMMISSIONER HANKS: Yes, I'm okay with it.

VICE CHAIR KELLEY: Okay. That was just me divining what you were thinking, Jim. And the others, to move forward at another time, but we can pencil in February for the benefits of or to geothermal plants.

Are there any other topics, speakers or presentations that the Commission would like to bring forward? No? All right. Before we move onto the general public comment, there were a couple of inquiries that were brought up.

One was -- and I was meant to share more information about the November 17th Community Engagement Meeting. So Chairperson Paz and Commissioner Olmedo, Assembly Member Garcia and the Energy Commission staff have been planning on a Community Engagement Meeting, and that, as it was shared earlier, will not be -- staff from the Energy Commission will not be on site.

This will be a hybrid and it is being planned as some physical locations in Coachella Valley and Imperial County, but available by Zoom, electronically, virtually, for anyone. And I wonder if Commissioner Olmedo would like to elaborate on some of those conversations. Okay. Maybe not.

COMMISSIONER OLMEDO: Hi. There was, as I'd

mentioned I guess earlier, I brought up the fact that the team there at the Energy Commission had reached and I paired them up with, you know, our team here who has quite a bit of expertise.

You know, we often refer to them as community health workers or from a part of the Salud (phonetic). As I recall, I think Leon Stein (phonetic) and Leadership Council, Russell, provided some of their teams to be able to help inform on, you know, strategies and ways to reach the hard to reach population and ways to be culturally appropriate, and you know, address the language barriers.

There are other local partners that also participated in, if I recall, I want to make sure I recall them correctly, but I think our Roots Multi-Cultural Center, we know him as John Hernandez, who is head of that organizations, as well as Eric Reyes through Los Amigos de la Comida, and I'm trying to recall if Equity and Justice Coalition also participated, but maybe not.

But yeah, I just, again, want to commend the Energy Commission for, you know, for doing two things. One is to reach out and find out, you know, who are the key organizations, and local voices to help inform a well-informed, productive community engagement.

Also, part of the dialogue I think it was bringing some of the lessons learned, and I think it was also brought up earlier by one of the public commenters that, you know, challenges that are there between what's happening with the Salton Sea, what's happening in the Lithium Commission, where there's also a lot of lessons learned there in terms of the engagement that has happened, and the Salton Sea efforts through the California Natural Resources.

So some of that conversations happened. But again, you know, that's just sort of eye level, you know. Certainly, if the Energy Commission team there wants to elaborate more on that, but you know, we'll see.

We're going to learn from this first one. So we'll see what -- you know -- what opportunities there are. Hopefully, it won't be the first. Hopefully, it'll be the first of many.

VICE CHAIR KELLEY: Okay. And then another thing for future meetings, I heard Rod echo something, and Jonathan had brought this up early. The Commission -- Energy Commission staff, this idea between extraction and recovery definition.

Do we want to resolve that? And it was shared with me that there will be a glossary to this report.

And so do we want to have it agendized to have a further conversation about what we're talking about? I look to you, Rod. You brought it up today.

COMMISSIONER COLWELL: Yeah. I think, you know, lithium recovery, you know, I mean, DLE is quite a common term. So I don't need to build and/or. We're talking about the same process, just terminology. So I'm -- you know -- I'm easy either way. We can have a -- I don't know whether it's an agenda item, but you know, have a talk about it.

VICE CHAIR KELLEY: Jonathan. You're muted, John.

COMMISSIONER WEISGALL: I raised this at one of our earlier meetings. Certainly, we know that we're not talking about mining. I realize that Cameron, you know, I mean, he's kind of used to talking about mining, which really shows how wonderful Imperial Valley's going to be, because it's certainly not mining.

You know, I talk about recovery. I think -- when I think extraction I think of, you know, pulling something out from the ground. But I think it probably is just something semantic. I'll make my own recommendations for our report.

So certainly, when I talk about it, I talk

about recovery, but I don't think -- that may not be a distinction with a huge difference. But I do think it's certainly something we ought to resolve for the report we get to the legislature at some point.

Indeed, maybe the resolution could be that we use both terms. I don't know. So I'm --

VICE CHAIR KELLEY: Is anyone --

COMMISSIONER WEISGALL: -- not too helpful, but those are my thoughts.

VICE CHAIR KELLEY: So as -- and Jonathan, you had brought this up from the get-go, and I heard Rod bring it up today. So is there anyone reluctant to have this as a discussion on the next agenda, because the terminology should be consistent, clear text, let everybody know what we're talking about and we're talking the same thing. So is anybody in opposition of change -- having that conversation?

COMMISSIONER OLMEDO: Chairman, I just -- didn't have my hand raised. I just want to also just remind us that we had had this conversation early on, and I think at that time we opted to just stay consistent with the legislation about this Commission and deliver what was expected.

I think it named it as, if I recall, extraction. But I mean, I -- at that time it was

whatever was consistent with the legislation. And so is your ask, we want to bring it back, that same discussion? Because I think I also heard that there's misinformation.

So I think that -- if I interpret that correctly. I don't want to, you know, misunderstand what was the attempt that was -- but to me it was just more about just being perhaps more consistent in clarifying.

But I don't recall if Tom Sephton was the one that brought it up. I certainly will reach out to him and try to better understand so -- what specific information, but I assume that it's overall. You know, there's no misinformation.

So I'm not sure if it's just specific to the, you know, extraction or the word recovery, I assume, but I -- we had already had this conversation. But you know, I mean, if you want to bring it back, you know --

VICE CHAIR KELLEY: Sure.

COMMISSIONER OLMEDO: -- I'm not against it.

VICE CHAIR KELLEY: Right. No. It's on the meeting notes for me, Luis, that I need to bring this back for discussion with all of you to see if you want to have it on the next agenda. And there will be a glossary of terms, and so the definitions can be shared

with us.

And if there's a conflict with the authorizing legislation, then that can be discussed, as well. But without seeing anybody in protest, let's just put it on for next -- the next meeting. It shouldn't be a long discussion. Well, maybe it will. I don't know.

Okay. Elisabeth, is that good enough for direction?

MS. de JONG: Yes. I think that was great. If there's nothing else to move, to talk about under this item, we can go to public comment.

VICE CHAIR KELLEY: Okay. I almost caught you laughing there, didn't I. No? Okay.

MS. de JONG: No, I don't do that. Thanks, though.

VICE CHAIR KELLEY: All right. Then now, we have come to general public comments.

MS. de JONG: All right. Great. So if you're joining us by Zoom on your computer please use that raise hand feature, and if you've called in, please dial *9 to raise your hand and *6 to unmute your phone line.

First, we'll go to the hands raised in the Zoom application, and then to the phones and then to the written comments.

I have a hand raised from Nikola Lakic. You should be able to speak.

MR. LAKIC: Hello, can you hear me now?

MS. de JONG: Yes.

MR. LAKIC: Hello. Yeah. Thank you for this second opportunity. My name was mentioned by Tom Sephton, so I have to respond it. I was talking about the facts. The facts is that your motion, your call is really production of the lithium by extracting it or -- well, from brine, just from brine.

And it's your own interest to have lake less shrink like smaller lake. So call it perimeter lake. So that's the fact. The fact is also that whenever you talk about the media and Tom Sephton never is mentioned really consequences of it to the public.

So it's just what was -- my point is this, that it is integral part -- extraction of lithium and long-term solution for Salton Sea and that should not be separate issues. And I mount proposal that I am uniting it. And just be patient. Wait for the report.

Will be next year, or at least don't make some serious decision yet, because what -- if you continue what you're doing, we are going to lose lake, period. Yeah, that's the fact.

MS. de JONG: All right. Thank you.

VICE CHAIR KELLEY: Thank you, Mr. Lakic.

MS. de JONG: We have other -- another hand raised. Nicole Colwell, You should be able to speak, unmute yourself. Nicole, if you're trying to speak, it looks like you're still muted on our end. All right. Well, I'll come back and see.

Nikola Lakic, if you -- sorry. We are trying to limit to one comment per topic, sir, but --

MR. LAKIC: I know, but just if I may say regarding Tom Sephton. I don't mean to be this kind of sound, well, dialogue or confrontation, but he's talking about diking that area. I would take this as endorsement of my proposal, because that's what I'm pushing from 2013, and it's well documented, and he is welcome to see it. But thank you very much.

MS. de JONG: Thank you.

All right. So then I'll go over to the written comments. There was a written comment earlier in the meeting today. It's from Michael Marsden that says, "What are we doing to accelerate," I believe regulatory was the word there, "approval to capitalize on the current market?"

And another comment that was written in, it says -- so this comment is from Mariela Loera, from the Leadership Counsel. They want to comment in support of

Commissioner Ruiz's earlier suggestion of a community targeted docket.

I would add that we need to -- sorry, she -- would add that we need to insure that it is accessible to the community and agree that it should be made available in a printout version and would add that this printout version is made available in community centers, parks and churches.

This material should be made available in Spanish and should consist of accessible language instead of technical language, having a consistent space monthly or every two months, like you are doing with these meetings, but that is -- but that instead is targeted at communities is also important.

This space should be left technical, but still address some of the unanswered questions and concerns, as well as actively make residents a part of the decision-making process. Let me just quickly check. I don't see any other written comments or raised hands at this time.

VICE CHAIR KELLEY: Okay.

COMMISSIONER WEISGALL: Just a quick comment, if I could, in response to one of those written questions.

VICE CHAIR KELLEY: Go ahead.

COMMISSIONER WEISGALL: The Michael Marsden, what are we doing to accelerate regulatory approval to capitalize on the current market. Just two points. We've covered one, which is right now jurisdiction for permitting a lithium plant in Imperial County falls with the Planning Division, and that division has been working very hard.

They've processed energy sources, EIR quite quickly. The second point is that even though we have a report due to the legislature next fall, Assembly Member Garcia is the head of a select committee on the lithium economy.

And should there be issues that we think are of critical importance that cannot wait until the fall of 2022, that committee is open for business. Staff is accessible, and I think they would entertain any ideas to accelerate that regulatory approval.

I don't think anyone is talking about making end runs around CEQA. Certainly, when you look at the 1388 page report that Energy Source put out, that is CEQA complaint. Whether you're at the county or in Sacramento, you still have CEQA, But those are, I think, two answers to Mr. Marsden's question.

VICE CHAIR KELLEY: Thank you, Commissioner Weisgall.

MS. de JONG: there are no other public comments at this time. Thank you.

VICE CHAIR KELLEY: Thank you, Elisabeth. And I see that we have the general public comments. Are we to go into that, as well, now, Elisabeth?

MS. de JONG: We can certainly take a pause and see if there are any additional hands raised. I am not seeing any hands or comments coming into the Q&A. So I think we're okay to move on.

VICE CHAIR KELLEY: All right. Well, thank you for all your comments. At this moment I would like to adjourn the meeting. The next meeting is for October 28th, 2021. Without any other comment, this meeting is now adjourned. Thank you for your time.

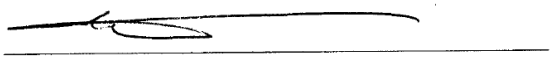
(Adjourned at 5:11 p.m.)

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 21st day of October, 2021.



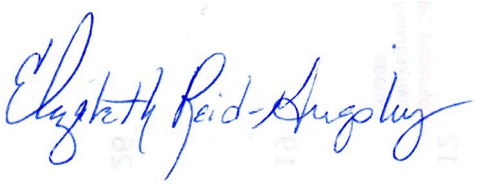
PETER PETTY
CER**D-493
Notary Public

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 21st day of October, 2021.



Elizabeth Reid-Grigsby
Certified Transcriber
AAERT No. CET**D-145