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WEBVTT

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00:00:00.000 --> 00:00:01.330
Anthony Ng: everybody…

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00:00:02.200 --> 00:00:13.379
Anthony Ng: Oh, alright. Good morning, everybody. Thank you so much for joining us this morning. My name is Anthony Ying with the California Energy Commission's Research and Development Division.

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00:00:13.380 --> 00:00:24.120
Anthony Ng: We're really excited, to have you today for today's workshop. So throughout this morning, me and my colleagues are going to be going over a view of

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00:00:24.260 --> 00:00:30.500
Anthony Ng: Our exciting ideas for the next round of investments from our electric program.

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00:00:30.500 --> 00:00:45.360
Anthony Ng: investment charge. So, we're gonna get started here, as folks are continuing to join the, the Zoom here this morning. So, I just wanted to start off with some housekeeping items before we begin.

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00:00:45.360 --> 00:00:56.280
Anthony Ng: So this workshop is being recorded, following, the workshop's conclusion. The recording, as well as the presentation slides, will be posted to the CEC's website.

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00:00:56.740 --> 00:01:21.670
Anthony Ng: Throughout the workshop, we're gonna have plenty of opportunities for you all to ask questions, interact with us. I'll go over a little bit, but that's really the point of today's workshop, is for us to share our ideas, and more importantly, to get the feedback and get the input from all the attendees here today. But for now, and during the presentations, you're going to be muted, and then when we go into the Q&A session.

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00:01:22.070 --> 00:01:25.020
Anthony Ng: We'll have an opportunity to ask questions and engage.

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00:01:25.610 --> 00:01:42.739
Anthony Ng: Following the workshop, we are also going to be taking in public comments, written public comments as well, and so, we ask that, comments be submitted through the CEC's docket system, and that they are submitted by June 18th, so next week.

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00:01:42.740 --> 00:01:51.149
Anthony Ng: So that our staff can continue to, yeah, take that input and, and, you know, continue to develop and evolve our plans here.

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00:01:53.620 --> 00:02:04.849
Anthony Ng: So, just to, yes, kind of preview today's agenda, I'll just give a little bit of a background on the

EPIC program, as well as, you know, what we're hoping to accomplish here with

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00:02:04.850 --> 00:02:20.729
Anthony Ng: today's workshop, and then we're gonna turn to, you know, the bulk and the meat of the presentation. My colleagues are going to be going over the draft initiatives and topics that our team have been developing over the past several months here as it relates to

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00:02:20.730 --> 00:02:38.699
Anthony Ng: these five, categories that I'll talk a little bit more about as well. In total, I think we have about… we have nine initiatives and about 30 topics that… that we'll be walking through, and… and as I mentioned, after each kind of initiative presentation, we'll stop for some.

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00:02:38.700 --> 00:02:46.200
Anthony Ng: feedback, some Q&A, some comments, just so that folks can kind of ask relevant questions for a particular

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00:02:46.200 --> 00:02:57.830
Anthony Ng: Technical area, but then at the end, after all the presentations are done, we'll have kind of an open questions and feedback session, just to make sure that everyone has an opportunity to provide the comments, provide the input to us.

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00:03:00.310 --> 00:03:14.760
Anthony Ng: So, just starting off with a little bit of background, the Electric Program Investment Charge, also known as EPIC, is a publicly funded ratepayer program administered by the California Industries Commission, along with the three largest

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00:03:14.760 --> 00:03:25.909
Anthony Ng: Investor on Utilities, PG&E, San Diego Gas and Electric, and Southern California Edison. The program is, overseen by the California Public Utilities Commission.

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00:03:25.910 --> 00:03:42.680
Anthony Ng: The budget for the, program is approximately $185 million a year, and as mentioned, many of you may know, we're, here discussing the next 5-year investment plan, for… for the program.

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00:03:42.680 --> 00:04:02.060
Anthony Ng: The overall goal of Epic is to support the development of, you know, new and emerging commercial technologies to support California's clean energy and climate goals. The program is chiefly designed to provide ratepayer benefits in the form of

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00:04:02.080 --> 00:04:09.879
Anthony Ng: Equitable access to safe, affordable, reliable, and environmentally sustainable clean energy for ratepayers.

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00:04:10.300 --> 00:04:11.690
Anthony Ng: the…

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00:04:12.140 --> 00:04:24.980
Anthony Ng: Program funds technology and research development in three broad areas. Applied research and development, which is earlier stage, typically kind of lab-scale type technology development and analysis.

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00:04:24.980 --> 00:04:42.970
Anthony Ng: technology demonstration and deployment, which are your kind of full-scale deployment in a real-world setting or scenario. And then market facilitation, which looks at some of the, kind of, non-technical or non-engineering challenges that, may prevent a technology from commercializing or reaching a market.

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00:04:43.380 --> 00:04:53.759
Anthony Ng: As I mentioned, yeah, the EPIC program is administered by the CEC along with the IOUs. The CEC has the lion's share of the funding, you see 80%, and the IOUs

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00:04:53.760 --> 00:05:06.570
Anthony Ng: administer the remaining 20% of the funding. Today's presentation is just going to be, providing an overview of the CEC's portion, or the CEC's proposed ideas for the EPIC program.

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00:05:09.130 --> 00:05:27.770
Anthony Ng: Just a little bit about the Epic 5 process, in a little bit more detail. The development for this latest round of investments actually started a couple of years ago. The California Public Utilities Commission began a process to scope out and develop high-level

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00:05:27.770 --> 00:05:32.440
Anthony Ng: Goals and objectives for the program, and that process actually started

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00:05:32.440 --> 00:05:40.249
Anthony Ng: Back in 2024, where the CPC convened a series of workshops throughout the state to develop

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00:05:40.640 --> 00:05:50.079
Anthony Ng: high-level goals, and then, more recently, the, PUC also led a, a robust stakeholder-driven process to develop.

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00:05:50.170 --> 00:06:07.049
Anthony Ng: additional strategic objectives to provide the guidance, provide that direction for the administrators who are now developing the rest of the plan, which are the administrator initiatives and research topic areas that we'll be going over today.

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00:06:07.790 --> 00:06:19.360
Anthony Ng: So, just a quick recap, the five goals that I mentioned, these were adopted by the CPUC in 2024, and so there's, yeah, five goals, transportation, electrification.

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00:06:19.360 --> 00:06:34.980
Anthony Ng: DER integration, building decarbonization, getting to 100% net zero carbon, and the coordinated role of gas, and climate adaptation. So these five goals set the kind of high-level overall direction for the program for this upcoming investment period.

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00:06:35.490 --> 00:06:49.290
Anthony Ng: And earlier this year, in February, the PUC also adopted 13 strategic objectives, which provide, more detail, more clarity, more guidance on specific,

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00:06:49.290 --> 00:07:08.210
Anthony Ng: areas that, you know, fit within either one or multiple of the goals that, again, provide the administrators additional guidance and additional areas to focus on. And so, all of the initiatives and topics that you'll be hearing are, you know, connected to both the objectives and the goals in varying fashion.

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00:07:10.330 --> 00:07:33.639
Anthony Ng: A little bit about the kind of CEC's administration that is a little bit different than the IOUs, and kind of put into context where we are in the process here, for those who may not be familiar. So, at this stage, we are at the, investment plan development process, and so these are high-level ideas that are going to kind of set the stage for

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00:07:33.640 --> 00:07:36.969
Anthony Ng: Our, investments over these next 5 years.

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00:07:37.420 --> 00:07:53.209
Anthony Ng: once the investment plans are submitted to the CPUC, they will then go through a process where they will assess the plans and ultimately, you know, provide feedback and approve the plans. Once the plans are approved.

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00:07:53.210 --> 00:08:02.610
Anthony Ng: by the CPUC, we can go into execution mode, where we will then develop, individual solicitations that, you know, kind of

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00:08:02.610 --> 00:08:16.920
Anthony Ng: derived from the plan, but will be more focused and more kind of targeted and directed based on, you know, specific technology areas or specific technical or research targets, that we also identify through, you know, kind of more,

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00:08:16.920 --> 00:08:22.799
Anthony Ng: more stakeholder engagement and more, kind of, public input. And those will, you know, those will have,

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00:08:23.180 --> 00:08:29.950
Anthony Ng: Their own kind of efforts, depending on the particular technology area or research area that a solicitation may be targeting.

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00:08:30.150 --> 00:08:48.789
Anthony Ng: Once solicitations are developed and issued, they are put out for application, and so eligible applicants are able to submit proposals. The CC then evaluates and scores those proposals, and we then move into actual project awarding and project execution according to

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00:08:48.790 --> 00:08:50.289
Anthony Ng: You know, the approved.

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00:08:50.700 --> 00:09:00.099
Anthony Ng: scope and budget associated with each project. And so, throughout the process, you know, I guess, you know, the main takeaway is that, you know, while we're talking about

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00:09:00.100 --> 00:09:18.250
Anthony Ng: the investment plan today, as we, you know, kind of finish out this process and we move into the implementation, there's still additional opportunities to provide input to the CC as we move into the later phases, where we're scoping out specific solicitations and projects, down the road.

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00:09:21.030 --> 00:09:30.899
Anthony Ng: Okay, I mentioned this a little bit, but yeah, some overall goals that we're hoping to accomplish with today's workshop. Two, kind of, primary goals, hoping to,

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00:09:30.900 --> 00:09:43.549
Anthony Ng: share publicly, the… our staff's ideas on our draft initiatives and draft topics for Epic 5, but most importantly, yeah, we are really looking for your input and your feedback

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00:09:43.550 --> 00:09:58.580
Anthony Ng: For our staff to consider as we continue to develop and finalize the plan here, in the coming months. And so, as you go through, as you're listening to the presentations, excuse me, really welcome your thoughts.

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00:09:58.950 --> 00:10:17.519
Anthony Ng: Excuse me. You know, are there any gaps in the proposed research that you feel that we're missing, that you think is a high priority that, you know, we should include? Do you have suggested changes to kind of what we're presenting in terms of either priority or focus area, or what have you?

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00:10:17.520 --> 00:10:28.769
Anthony Ng: And lastly, you know, are there other suggestions that, you know, we could adopt to promote, kind of greater equity or greater, kind of inclusion of our investments so that a broader,

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00:10:29.060 --> 00:10:41.209
Anthony Ng: population of California can benefit from our research. So, some things to keep in mind, as I mentioned, we'll have opportunities to go, and have… have the Q&A and have the feedback as we move

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00:10:41.350 --> 00:10:48.100
Anthony Ng: But without further ado, I think we'll move into here the, the bulk of the…

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00:10:48.120 --> 00:11:01.579
Anthony Ng: presentation this morning. So, this is just a high-level snapshot of the… So I mentioned, yeah, the strategic goals, that were adopted by the CPUC, and you can see our,

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00:11:02.070 --> 00:11:16.320

Anthony Ng: nine initiatives here nestled under the goals, and so we'll go through these, in this order. And so, to start us off with the transportation electrification goal, and the associate initiative, I will introduce my colleague, Peter Chen.

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00:11:18.310 --> 00:11:24.840
Peter Chen: Great, thanks, Anthony. Good morning, everyone. My name is Pierre Chen. I supervise the Transportation R&D team here at CEC.

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00:11:25.290 --> 00:11:35.999
Peter Chen: So we have one initiative to present today, focused primarily on addressing transportation electrification, the strategic goal that was defined earlier. Next slide, please.

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00:11:37.810 --> 00:11:43.260
Peter Chen: So, our initiative is titled, Harnessing the Value of Transportation Electrification for Ratepayers.

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00:11:43.640 --> 00:11:57.740
Peter Chen: So the context here is, you know, it's well understood that EVs will be a primary driver of load growth through 2045, as we continue to depend on transportation electrification to achieve our state's climate, clean energy, and clean air goals.

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00:11:58.310 --> 00:12:05.290
Peter Chen: We know that infrastructure investments will be needed to connect this growing and increasingly diverse EV load to the grid.

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00:12:05.760 --> 00:12:18.639
Peter Chen: And we also think that ratepayer savings can be achieved along the way if technologies and policies are developed to reliably shape EV load at scale in ways that synergize with grid needs and alleviate constraints.

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00:12:19.100 --> 00:12:29.120
Peter Chen: We have 3 research topics under this initiative related to managed charging, bidirectional charging, and strategic electrification of emerging end uses.

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00:12:29.460 --> 00:12:41.399
Peter Chen: And this initiative targets, kind of three primary categories of benefits that center around the concept of trying to maintain momentum on the EV transition while putting downward pressure on rates.

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00:12:41.670 --> 00:12:48.610
Peter Chen: So the first of these categories is avoiding grid upgrade costs that would otherwise be needed to support EV load growth.

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00:12:49.180 --> 00:12:55.079
Peter Chen: The second is orchestrating EVs as DERs to provide grid services and net cost savings.

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00:12:55.300 --> 00:13:06.010
Peter Chen: And the third is making it faster and cheaper to energize EV charging infrastructures, including

for new customer and vehicle segments seeking to transition to electrification.

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00:13:06.580 --> 00:13:07.580
Peter Chen: Next slide.

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00:13:11.670 --> 00:13:19.419
Peter Chen: So the first research topic is focused on managed charging, and it's also inclusive of flexible service connections applied to EV charging infrastructure.

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00:13:19.690 --> 00:13:29.679
Peter Chen: Both relate to adjusting EV charging load to align with some operating envelope defined by an entity like a utility or distribution system operator.

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00:13:30.190 --> 00:13:46.490
Peter Chen: In the managed… on the managed charging front, we have active EPIC projects, as well as low-carbon fuel standard LCFS-funded programs underway, through the IOUs to pilot managed charging orchestration, primarily for single-family residential customers.

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00:13:47.280 --> 00:14:03.739
Peter Chen: However, we see gaps remaining around the reliance on proprietary protocols today, participation across more diverse customer types beyond single-family residential, and also appropriate allocation of value streams for managed charging.

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00:14:04.720 --> 00:14:22.559
Peter Chen: Regarding flexible service connections, we see, some future applications of longer-term non-bridging, as well as dynamic or near-real-time flexible service connections, which have potential value for enabling more efficient, more capacity-efficient EV charging infrastructure.

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00:14:22.760 --> 00:14:26.630
Peter Chen: But that value has not yet been quantified or really validated in the real world.

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00:14:27.340 --> 00:14:42.459
Peter Chen: So, in Epic 5, we're proposing to address these gaps by exploring collaborations to address limitations in data quality, transparency, and interoperability with a focus on EV telematics and EV charger communications.

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00:14:43.110 --> 00:14:49.440
Peter Chen: We're interested in validating more advanced, these longer-term, dynamic, flexible service connection approaches.

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00:14:49.620 --> 00:14:55.790
Peter Chen: Which can be enabled by utility systems, as well as, related communication technologies.

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00:14:56.530 --> 00:15:06.740
Peter Chen: And we're interested in researching methods to boost participation in managed charging from commercial customer segments, which include multifamily homes, fleets, and public charging stations.

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00:15:07.710 --> 00:15:16.259
Peter Chen: Ideally, this research can contribute to some midterm outcomes, such as improved data streams that increase managed charging's reliability as a grid resource.

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00:15:16.360 --> 00:15:22.610
Peter Chen: And informs a closer tie between actual performance and incentives that are used to drive participation.

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00:15:24.120 --> 00:15:32.599
Peter Chen: We'd like to see, interoperable systems, come to fruition, which can support scale, while minimizing risk of vendor lock-in.

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00:15:32.840 --> 00:15:43.870
Peter Chen: And we want to see, quantified value of longer-term, dynamic, flexible service connections for UV charging, and hopefully inform future policy direction and program offerings in that space.

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00:15:44.570 --> 00:16:00.179
Peter Chen: Ultimately, we want to contribute to a future where a significant amount of EV load can be reliably shaped by EV… by, grid operators, sorry, unlocking both distribution and bulk grid value across multiple EV customer segments.

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00:16:01.220 --> 00:16:02.220
Peter Chen: Next slide.

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00:16:05.230 --> 00:16:20.150
Peter Chen: So the second research topic under this initiative is focused on bi-directional charging and enabling EVs to function essentially as distributed energy resources, or distributed storage resources, more specifically.

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00:16:20.850 --> 00:16:30.409
Peter Chen: Thanks in part by past and active Epic projects, we're seeing increasing numbers of bi-directional charging products being announced and released in recent years.

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00:16:30.810 --> 00:16:35.969
Peter Chen: However, adoption has been limited, and the market is still in this nascent and early stage.

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00:16:36.340 --> 00:16:50.170
Peter Chen: We see gaps clearly when observing through the customer experience today, which is impacted by limited interoperability between products and manufacturers and, you know, matching compatible bidirectional chargers with compatible EVs.

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00:16:50.300 --> 00:16:56.520
Peter Chen: We see high costs of equipment, and also complex interconnection processes.

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00:16:57.310 --> 00:17:12.710
Peter Chen: One of the biggest gaps, as well as the lack of a common valuation framework for long-term compensation, especially for B2G exports. And this risks underutilizing bidirectional EVs for the value that they can provide to the grid.

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00:17:13.520 --> 00:17:23.009
Peter Chen: In Epic 5, we're proposing to address these gaps by expanding customer access through simplifying installations, interconnection, and overall experience with the technology.

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00:17:23.720 --> 00:17:35.410
Peter Chen: We're interested in developing tools for site-specific planning decisions based on estimated value for customers, as well as the grid, considering factors like vehicle operations and local grid conditions.

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00:17:36.200 --> 00:17:44.849
Peter Chen: And we're interested in exploring potential joint project opportunities with the utilities to test valuation frameworks and compensation mechanisms for B2G.

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00:17:45.580 --> 00:18:03.259
Peter Chen: Ideally, this research can contribute to some midterm outcomes, such as informing how future demand response rates and DR orchestration frameworks end up maturing, so that they can operationalize bi-directional charging use cases that generate net value for ratepayers while also reducing costs for EV adopters.

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00:18:03.940 --> 00:18:18.129
Peter Chen: In the long term, we hope to chip away at the customer experience barriers that we're seeing, enabling a smoother transition from early adoption and limited use cases to broad scale-up, where we have bidirectional charging becoming a ubiquitous DER.

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00:18:19.070 --> 00:18:20.290
Peter Chen: Next slide, please.

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00:18:23.190 --> 00:18:32.819
Peter Chen: And the third research topic, under this initiative is focused on strategic electrification of what we're calling emerging transportation and uses.

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00:18:32.920 --> 00:18:45.129
Peter Chen: And the context here is that a large majority of EV adoption to date has really been concentrated in the light-duty on-road segment, where certain customer types, typically higher income, single-family homeowners.

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00:18:45.260 --> 00:18:47.990
Peter Chen: Have disproportionately higher adoption rates.

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00:18:48.720 --> 00:18:59.579
Peter Chen: So for the purpose of this research area, we're defining emerging transportation end uses as emerging vehicle types, as well as emerging customer types that expand beyond today's primary EV adopters.

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00:18:59.910 --> 00:19:08.330
Peter Chen: So for example, some emerging vehicle types may include, things like autonomous vehicles, advanced air mobility.

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00:19:08.720 --> 00:19:12.830
Peter Chen: Port equipment, rail, and medium-heavy duty vehicles as well.

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00:19:13.360 --> 00:19:19.559
Peter Chen: In terms of emerging customer types, this could be rural customers, low-income customers, as well as renters.

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00:19:19.970 --> 00:19:30.169
Peter Chen: And together, you know, these emerging end uses will introduce unique load profiles, unique customer needs, as well as electricity demand growth in potentially unprepared locations.

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00:19:31.180 --> 00:19:39.989
Peter Chen: So, to address these gaps and help these emerging end uses electrify in a timely and cost-effective manner, we're proposing to do the following in Epic 5.

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00:19:40.240 --> 00:19:48.480
Peter Chen: We're interested in researching load profiles, charging behavior, and expected locations of emerging end uses to inform grid planning.

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00:19:48.860 --> 00:19:57.260
Peter Chen: We're interested in exploring innovations like strategic co-location with other large loads or generation to share infrastructure.

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00:19:58.040 --> 00:20:04.319
Peter Chen: And we're interested in advancing technologies as well to enable efficient grid connections and enhance customer access.

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00:20:04.580 --> 00:20:12.820
Peter Chen: For example, this could include DC distribution technologies for more efficient, large-scale multi-megawatt charging stations.

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00:20:12.890 --> 00:20:24.599
Peter Chen: As well as wireless, mobile, or curbside charging technologies, which offer unique ways of connecting chargers to buildings, to the grid, and to vehicles to meet unique customer needs.

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00:20:25.290 --> 00:20:33.580
Peter Chen: Ideally, in the midterm, this research can improve our understanding of load attributes for these emerging end uses.

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00:20:33.800 --> 00:20:45.010

Peter Chen: The role and readiness of innovative charging technologies, and also understand some opportunities for infrastructure co-location or other efficient grid integration strategies.

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00:20:45.690 --> 00:20:57.110
Peter Chen: Ultimately, we would like to contribute to a future where the grid and its supporting systems can facilitate timely, cost-effective energization of a growing diversity of electrified transportation and uses.

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00:20:57.910 --> 00:20:58.870
Peter Chen: Next slide.

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00:21:02.270 --> 00:21:10.589
Peter Chen: Great, thank you. So yeah, with that, we can transition to some… some quick questions, feedback on, these topics.

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00:21:11.440 --> 00:21:28.089
Anthony Ng: Great, thank you so much, Peter. Yeah, so we'll take a break here for our first feedback session on the initiative and associated topics under the transportation electrification goal that Peter just went over. If you'd like to ask a question or make a comment, a couple of ways, if you're

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00:21:28.090 --> 00:21:44.230
Anthony Ng: logged in on the Zoom platform, you can use the raise hand function. I'll call on you in order, and I'll unmute you so you can ask your question. If you are just calling in on your phone, you can use the star 9 function to raise your hand.

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00:21:44.230 --> 00:22:01.139
Anthony Ng: At which point I'll also call on you, and then you can use the star 6 function to toggle your mute and unmute, options as well. Alternatively, you can also type in a question into the Q&A box in Zoom, and our teams can answer questions that way as well, so…

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00:22:01.480 --> 00:22:06.040
Anthony Ng: See a couple of raised hands, we'll start with those. Let's see, first here is…

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00:22:06.250 --> 00:22:22.509
Anthony Ng: Hari, Vakata, apologies if I mispronounce your name, but Hari, I, open your line, you should be able to unmute on your end, and make your comment. Oh, and I, sorry, if you could also please introduce yourself, your organization, and then, and then, yeah, your comment.

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00:22:23.670 --> 00:22:25.620
Hari Venkata: Yeah, great. Can you hear me?

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00:22:25.620 --> 00:22:26.010
Anthony Ng: Yes.

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00:22:26.200 --> 00:22:41.459
Hari Venkata: Yeah, thanks. So, my name is Hari Venkata, you know, we are based in the Bay Area, and we have been developing AI and digital twin-based solutions for predictive intelligence, you know, for EV

batteries.

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00:22:41.610 --> 00:22:59.350
Hari Venkata: Meaning, you know, imagine an EV, it could be a bus, it could be a car, it could be any vehicle for that matter. We have, you know, digital twins, and along with AI ML models, we can predict with more than 99% accuracy the degradation patterns.

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00:22:59.430 --> 00:23:12.100
Hari Venkata: Right? So, the benefits are reducing the cost of ownership for the vehicle owner, and improving the energy efficiencies, which goes along, I think, aligning with some of your goals here, right? So, I was… my question is.

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00:23:12.340 --> 00:23:24.810
Hari Venkata: you know, this sort of great initiative you've laid out today here. In fact, I was at your offices, you know, yesterday in Sacramento. I met with Jimmy and, you know, at Sacramento. So, my question is.

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00:23:25.030 --> 00:23:32.620
Hari Venkata: you know, do you see any particular initiative as to what we are trying to do? Because we're trying to also improve efficiency at the vehicle level.

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00:23:34.940 --> 00:23:51.260
Peter Chen: Yeah, thanks for that comment, Marie. Yeah, so in terms of improving, kind of, technologies on the vehicle level, I mean, another aspect of Epic is, you know, we're challenged to prioritize our funding as well, and, kind of have

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00:23:51.360 --> 00:23:56.409
Peter Chen: You know, an understanding of, kind of, our program's role versus other funding sources.

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00:23:56.560 --> 00:24:15.050
Peter Chen: Which may be available for, yeah, other types of technologies. So for that reason, we are, you can tell from the presentation here, this initiative, at the very least, is very much focused on kind of the interaction of EVs with the grid, and kind of on charging infrastructure.

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00:24:15.090 --> 00:24:26.030
Peter Chen: Mark, particularly. I will say for, kind of EV battery degradation, you know, this is a… this is an important issue for certain use cases we're interested in, like bidirectional charging, right? You know, this is a…

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00:24:26.680 --> 00:24:39.709
Peter Chen: a new use case where, you know, potentially a battery is being used for multiple purposes, not just mobility, and degradation is this, kind of open question, I think, especially from customers, on what that impact is.

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00:24:39.710 --> 00:24:47.920
Peter Chen: So there could be ways, you know, where that technology, you know, contributes to some of these topic areas of interest that we have.

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00:24:48.010 --> 00:24:52.079
Peter Chen: But I appreciate the comment, and yeah, we'll…

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00:24:52.230 --> 00:24:58.720
Peter Chen: Definitely consider that in our, kind of, further, refinement of our… our, investment plan.

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00:24:59.100 --> 00:25:00.309
Hari Venkata: Great, thank you so much.

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00:25:00.630 --> 00:25:18.659
Anthony Ng: Yeah, and actually, before you, go there, I will mention later on in the presentation, we do have an initiative on, kind of clean energy, life cycle supply chain analysis, and there is a proposed topic that I think better aligns with the kind of battery analytics predictive

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00:25:18.900 --> 00:25:26.869
Anthony Ng: technologies that you're discussing, so if you're able to stick around, that'll be covered under the Getting to 100% Net Zero portion of the presentation today.

137
00:25:26.870 --> 00:25:28.930
Hari Venkata: Great, yeah, I'll be, I'll be around. Thank you so much.

138
00:25:28.930 --> 00:25:29.610
Anthony Ng: Thank you.

139
00:25:29.980 --> 00:25:32.680
Anthony Ng: Okay, next we'll go to Richard Shorsky.

140
00:25:32.890 --> 00:25:36.060
Anthony Ng: Richard, could unmute yourself on your end there.

141
00:25:37.040 --> 00:25:47.409
Richard Schorske: Yeah, thanks very much. As you know, we've really made very little progress on the multifamily challenge over the course of the EV era here in California.

142
00:25:47.410 --> 00:26:04.340
Richard Schorske: As elsewhere, and there are just so many market barriers and, unique barriers to property, economics for multifamily owners, that the provision of, free equipment, even, and free installation and other things that.

143
00:26:04.340 --> 00:26:09.130
Richard Schorske: Superficially seem to be workable, just don't… don't get traction.

144
00:26:09.130 --> 00:26:31.869
Richard Schorske: And, I feel like in every EPIC solicitation and in every other solicitation from the CEC on

these topics, multifamily has ended up actually not getting much in the way of resources, for a variety of reasons. And I just note that, you know, the budget is not large here, vis-a-vis the number of goals that are being, set.

145
00:26:31.870 --> 00:26:47.130
Richard Schorske: And I'm really just putting in a pitch for noting that, despite everybody's best intention, multifamily has basically not gotten the attention that's required to get real traction from a commercial adoption perspective.

146
00:26:47.130 --> 00:27:10.310
Richard Schorske: And that, just to note a couple of the barriers, I think some of these are fairly well known, but, you know, some of the innovative approaches, and I'll mention a shout-out to PowerTree Services, has a model of, back behind the meter solar storage, and EV… shared EV charging for multifamily that I think has shown itself in the marketplace.

147
00:27:10.310 --> 00:27:32.900
Richard Schorske: Peninsula Clean Energy has done some great work with just very simple Level 1, also with shared approaches and other approaches that are innovative, and I just want to, suggest that opening up the frame to include, not to be too narrowly prescriptive vis-a-vis, ports,

148
00:27:32.920 --> 00:27:56.630
Richard Schorske: you know, funding cap per port, which is often seen in the solicitations, and to move towards a units-enabled for sharing approach, which, shows the economics of sharing as a strategy, to be more liberal around the possibilities of Level 1, and also to be flexible around the

149
00:27:56.630 --> 00:28:08.299
Richard Schorske: The really strong economics of deploying 100% behind the meter, meaning no necessary interconnect, to the distribution, net metering approaches.

150
00:28:08.300 --> 00:28:12.019
Richard Schorske: for integrated solar storage and EV charging.

151
00:28:12.020 --> 00:28:25.359
Richard Schorske: So, you know, as you're… as you're looking at translating these, these high-level goals into solicitations, to be just relatively liberal and expansive about.

152
00:28:25.360 --> 00:28:49.180
Richard Schorske: how the goal, the overall goal of enabling charging and or shared charging for tenants is approached, and also to recognize that we just gotta have a massive catching up to do for the nearly half of Californians that live in rental properties, of which a very small proportion compared to single-family residents have… have yet had access to the EV, to EV use.

153
00:28:49.640 --> 00:28:56.570
Richard Schorske: Because of past underinvestment and, you know, market barriers that just haven't been surmounted yet, so…

154
00:28:56.730 --> 00:28:59.050

Richard Schorske: Thank you for, considering that.

155
00:29:00.730 --> 00:29:02.440
Peter Chen: Great, thank you for that comment.

156
00:29:03.650 --> 00:29:10.840
Anthony Ng: Thanks, Richard. Okay, move on to Josh Simmons. Josh, you should be able to unmute yourself on your end now.

157
00:29:11.460 --> 00:29:19.039
Josh Simmons: Thank you. So my name is Josh Simmons, I am co-director of the Tribal Energy and Climate Collaborative, which is

158
00:29:19.230 --> 00:29:25.039
Josh Simmons: serving the 26, member tribes by the Southern California Tribal Chairman Association.

159
00:29:25.220 --> 00:29:39.639
Josh Simmons: And, appreciate the opportunity to provide feedback. So, you know, want to emphasize that tribes have interest in, you know, advancing technologies and deployments of EV infrastructure, including

160
00:29:41.220 --> 00:29:54.529
Josh Simmons: vehicle-to-grid, vehicle to building, want to see advancements in the EV technology itself, and that, you know, the projects also need to include distributed energy resources that are going to be

161
00:29:54.920 --> 00:30:03.230
Josh Simmons: with the increased electrification that, you know, creates vulnerabilities in rural and tribal communities that DRs, such as energy storage.

162
00:30:03.490 --> 00:30:10.730
Josh Simmons: With generation like solar are needed for resiliency to mitigate the cost impacts and lead to cost savings.

163
00:30:10.820 --> 00:30:24.250
Josh Simmons: I think are needed to… to mitigate the grid… the grid impacts itself, and benefit the grid, and flattening the duct curve from the increasing strain of the grid from electrification. And then for tribes, too, to…

164
00:30:24.250 --> 00:30:32.830
Josh Simmons: you know, when they're deploying EV infrastructure, it's… it's getting, needing to do utility upgrades can be…

165
00:30:32.830 --> 00:30:50.320
Josh Simmons: can take time, can be costly, and so, you know, having these things paired with distributed energy resources will decrease that need and make these projects more likely to be successful. Tribal Energy and Climate Collaborative has an innovation ecosystem under its economic and workforce development program that's

166
00:30:50.320 --> 00:30:54.469
Josh Simmons: Seeking to advance emerging clean energy technologies, including

167
00:30:54.470 --> 00:31:06.179
Josh Simmons: Those related to transportation electrification through pilots and demonstration projects, through, you know, tribal… tribal co-ventures, tribal-led ventures, and workforce development and training initiatives.

168
00:31:06.310 --> 00:31:25.380
Josh Simmons: So, you know, we'd like to see that there be carve-outs in EPIC transportation electrification funding for tribes, and all kind of, you know, funding that's out there, that there are carve-outs for tribes, and that ideally, there would be some transportation electrification capacity building and training available for tribal governments and communities.

169
00:31:25.470 --> 00:31:36.489
Josh Simmons: So I guess, you know, that's feedback. My question is, is, you know, how so far have tribes been incorporated into the programming and investments for this area for transportation electrification?

170
00:31:38.090 --> 00:31:43.199
Josh Simmons: to, you know, to date, so I didn't… I didn't… I joined a little bit late. I didn't see any mention of tribes.

171
00:31:44.020 --> 00:31:50.510
Peter Chen: Yeah, thanks for that comment, Josh. And in terms of where tribes fit, I think in the third topic that we have on emerging

172
00:31:50.570 --> 00:31:59.959
Peter Chen: and uses. You know, I gave some kind of illustrative examples of what we mean by that, but I certainly think, you know, rural, tribal communities would,

173
00:31:59.960 --> 00:32:11.479
Peter Chen: you know, certainly face kind of unique barriers to transportation, electrification, much like what you described just now. So, definitely we see it kind of falling within the scope of that third topic that I presented.

174
00:32:11.530 --> 00:32:16.719
Peter Chen: And certainly we're thinking about, tribes as a, you know, important,

175
00:32:17.060 --> 00:32:27.969
Peter Chen: you know, type of community to include with Epic implementation going forward. Anthony, I don't know if you have anything else to add on, kind of, tribal engagement,

176
00:32:28.760 --> 00:32:31.690
Peter Chen: Yeah, that… that we've done. Yeah, thanks, Peter.

177
00:32:31.950 --> 00:32:38.870
Anthony Ng: Yeah, thanks, Peter. I'd say, yeah, just comment for Josh. I think, we are, gonna have more,

178
00:32:39.010 --> 00:32:57.840
Anthony Ng: topics specifically targeted towards tribes a little bit later on, actually in the next set of, initiatives under distributed energy resource integration. So, yeah, just kind of preview there, but yeah, would also kind of, when we get to that point, and we pause for the next set of questions there, would also welcome your feedback on, some of our additional ideas on

179
00:32:58.520 --> 00:33:00.700
Anthony Ng: Tribal, focused.

180
00:33:01.260 --> 00:33:03.379
Anthony Ng: Initiatives and topics.

181
00:33:04.170 --> 00:33:11.440
Josh Simmons: Great, thank you, yeah. I mean, I think it's, you know, the point is that, you know, certainly we want tribal-specific programming, but,

182
00:33:11.910 --> 00:33:22.110
Josh Simmons: Ideally, all the programming has some element of opportunities for, you know, tribal participation, tribal benefits, mutually, you know.

183
00:33:22.170 --> 00:33:38.360
Josh Simmons: mutual benefits to the state, you know, and advancing these technologies at large, that's also simultaneously advancing technologies. Now, we have tribes, I think, have a unique opportunity to be in a position to help the advancement of these technologies and the solutions on behalf of the state.

184
00:33:38.430 --> 00:33:56.429
Josh Simmons: And already doing so through deployment of things like advanced microgrids, a lot of EV infrastructure being deployed, long-duration energy storage, so on and so forth, but I will, you know, be prepared to kind of comment, provide some feedback, and ask questions in the next session. Thanks.

185
00:33:57.480 --> 00:33:58.339
Anthony Ng: Thanks, Josh.

186
00:33:59.530 --> 00:34:09.459
Anthony Ng: Okay, we have 4 more folks with their raised hands, so we'll go through, Doug, Collimer, Mark, Blakely, Josh Cohen, and then Sebastian Sierra, and then we'll move on

187
00:34:09.489 --> 00:34:24.250
Anthony Ng: We will have, just kind of a reminder for the audience, we will have an opportunity for just kind of more broad Q&A, at the end of the presentations, and then, I see there's also some chat, Q&As coming into the chat as well, so we'll respond to those.

188

00:34:24.350 --> 00:34:29.999
Anthony Ng: In the, in the Q&A chat as well. So, but yeah, for now, let's go to Doug Collimer.

189
00:34:32.330 --> 00:34:34.739
Anthony Ng: Doug, you should be able to unmute yourself on your end.

190
00:34:41.639 --> 00:34:48.769
Doug Kollmyer: Okay, so Doug Comar, I'm with University of California in Riverside, and I also work with San Diego Cleantech Scene.

191
00:34:48.899 --> 00:34:56.919
Doug Kollmyer: And my question is, under this program, would, fuel cell be considered for remote EV charging?

192
00:35:00.170 --> 00:35:07.240
Peter Chen: Yeah, so I think this is kind of an extension of you know, DERs to support

193
00:35:07.380 --> 00:35:12.729
Peter Chen: Yeah, kind of remote transportation electrification. And yeah, certainly that is…

194
00:35:12.880 --> 00:35:18.579
Peter Chen: I think a use case that we're interested in, especially for that, Topic 3, right, where we

195
00:35:18.740 --> 00:35:20.149
Peter Chen: Yeah.

196
00:35:20.280 --> 00:35:31.090
Peter Chen: know that there's, unique challenges with certain types of communities. With rural communities, it could be, you know, not enough grid capacity, and if you can supplement that with DRs, we certainly think that's a…

197
00:35:31.560 --> 00:35:36.969
Peter Chen: Yeah, something of interest that we would like to explore further, so,

198
00:35:37.890 --> 00:35:41.590
Peter Chen: Yeah, I hope that answers the question, but yeah, I think that.

199
00:35:42.120 --> 00:35:46.169
Doug Kollmyer: Yeah, so there would be funding for that under these programs, is what you're saying.

200
00:35:46.170 --> 00:36:04.520
Peter Chen: I mean, I think that's a kind of specific, technology that, you know, if it kind of meets the intentions of the problem that we're trying to solve, which is a bit higher level at this point, then potentially, yes. You know, it kind of depends on, you know, when we get to developing solicitations, like, how exactly

201
00:36:04.810 --> 00:36:09.439
Peter Chen: We'd like to scope that out, but the comment's helpful for… for us to consider.

202
00:36:09.440 --> 00:36:10.370
Doug Kollmyer: Okay, thank you.

203
00:36:12.540 --> 00:36:13.310
Anthony Ng: Thanks, Doug.

204
00:36:13.530 --> 00:36:16.020
Anthony Ng: Okay, move to Mark Blakely.

205
00:36:16.130 --> 00:36:18.809
Anthony Ng: Mark, go ahead, you should be able to unmute yourself.

206
00:36:31.000 --> 00:36:34.569
Anthony Ng: Mark, are you there? You should be able to unmute yourself on your end now.

207
00:36:48.560 --> 00:36:56.099
Anthony Ng: Okay, Mark, we'll move on, we'll try to come back to you in a little bit, but for now, let's move to Josh Cohen.

208
00:36:56.480 --> 00:36:59.879
Anthony Ng: Josh, you should be able to unmute yourself on your end now.

209
00:37:00.240 --> 00:37:21.909
Mark Blakeley: Sorry, I was talking with your coworkers at the CEC. Hi, my name is Mark Blakely, I'm with the County of Los Angeles. I just had a quick question of, like, as we're talking about transportation electrification, as we've, come upon, like, different technology and deployments, the one thing that's really been coming up is, the destruction or theft of charging cables.

210
00:37:21.910 --> 00:37:28.479
Mark Blakeley: So, where, like, there's some, like, rural parts of, like, LA County and other counties where

211
00:37:28.480 --> 00:37:30.140
Mark Blakeley: The existing charging app.

212
00:37:30.140 --> 00:37:49.519
Mark Blakeley: infrastructure doesn't actually operate because of theft, and I'm just curious if the CEC would be interested in funding technologies that would be similar to, like, almost, like, bring your own charger to some of these sites. So I just kind of wanted to raise that and see if there's, like, an interest at the CEC in this type of technology, and that's my question. Thank you.

213
00:37:49.520 --> 00:38:05.299

Peter Chen: Yeah, for sure. I think on one of the slides for, again, I think topic 3, I mentioned some examples of advanced charger technologies that could help with meeting some unique customer needs, and I think curbside was one that we mentioned, and we actually have a project with

214
00:38:05.320 --> 00:38:22.599
Peter Chen: it's electric in Epic 4, so it's an active project. They have this kind of bring-your-own-charger, bring-your-own-cable kind of approach. So, yeah, we're aware of the technology, and we definitely think there's promise, and, you know, it's in this kind of early stage with pilots, and maybe there's something we can do there to further advance that.

215
00:38:23.430 --> 00:38:25.019
Peter Chen: Yeah, thanks for that comment, yeah.

216
00:38:25.290 --> 00:38:26.250
Mark Blakeley: No, thank you.

217
00:38:28.290 --> 00:38:32.509
Anthony Ng: Thanks, Mark. Okay, let's go to Josh. I think you should still be able to unmute yourself.

218
00:38:32.790 --> 00:38:36.700
Josh Cohen, SWTCH: Yeah, thank you, and thanks for this presentation. I just have…

219
00:38:36.710 --> 00:38:49.349
Josh Cohen, SWTCH: Some brief feedback, and then a brief question. My feedback is, really to plus one Richard Shorsky's comments about multifamily. As we all know, it's… it remains, despite

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00:38:49.350 --> 00:38:59.349
Josh Cohen, SWTCH: a lot of people's best efforts, it remains significantly underserved, and so my one encouragement there is for the CEC to

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00:39:00.390 --> 00:39:05.839
Josh Cohen, SWTCH: Provide a lot of flexibility in terms of the types of applications, you're inviting.

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00:39:05.980 --> 00:39:22.829
Josh Cohen, SWTCH: Because one of the challenges, in my view, that we've seen that have kind of hindered multifamily is that a lot of the funding out there is too prescriptive, either in terms of the technology or in terms of the deployment model. And so, just wanted to,

223
00:39:22.880 --> 00:39:30.830
Josh Cohen, SWTCH: Again, encourage flexibility, but appreciate that you specifically mentioned multifamily as a continuing focus area.

224
00:39:30.940 --> 00:39:32.730
Josh Cohen, SWTCH: The other,

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00:39:33.200 --> 00:39:41.479
Josh Cohen, SWTCH: kind of question I have is, I'm interested in how… how the team at the CEC is looking at

226
00:39:42.180 --> 00:39:52.320
Josh Cohen, SWTCH: charging… Which, as we know, is a transportation electrification thing, but it's also a built environment thing.

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00:39:52.710 --> 00:39:55.960
Josh Cohen, SWTCH: And just in terms of these 5 categories.

228
00:39:56.090 --> 00:40:08.629
Josh Cohen, SWTCH: That… that you're hoping to address with this round. I don't know, to the extent you can share any perspective from your end, and, like, are you looking at applications just

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00:40:08.850 --> 00:40:20.499
Josh Cohen, SWTCH: only within the, you know, parameters of one specific funding stream? Are you looking at applications that may potentially touch on… on more than one?

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00:40:20.710 --> 00:40:24.790
Josh Cohen, SWTCH: I'm just curious if you have any perspective you can share. Thanks.

231
00:40:24.970 --> 00:40:27.140
Peter Chen: Yeah, that's a good question. So…

232
00:40:27.200 --> 00:40:41.729
Peter Chen: The way that Epic 5 is structured is we have these kind of five overarching strategic goals. There's a separate one for transportation, electrification, and building decarbonization, but I think clearly there's a, from a technology perspective and how

233
00:40:41.740 --> 00:40:52.529
Peter Chen: these things are deployed, there's a connection, clearly. So, you know, definitely in terms of internally at CC, you know, we'll look at opportunities to

234
00:40:52.710 --> 00:41:01.679
Peter Chen: work together, and we're already, I think, exploring some of these intersections, right? I mentioned flexible service connections at some point.

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00:41:01.780 --> 00:41:18.699
Peter Chen: And, you know, that kind of goes into this, field of, like, smart panel technology, of, trying to make the most out of, you know, the capacity that you have, taking advantage of the flexibility of EV charging. So, yeah, I think,

236
00:41:18.800 --> 00:41:24.499
Peter Chen: there will be opportunities to think creatively and, kind of across sectors in this way, I think.

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00:41:26.090 --> 00:41:33.420
Peter Chen: yeah, you know, both building decarbonization and transportation are kind of within the same FIC plan in terms of scope, so…

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00:41:33.550 --> 00:41:36.269
Peter Chen: Even though we have these separate, kind of.

239
00:41:36.380 --> 00:41:41.970
Peter Chen: Categories, you know, ultimately we'll like to achieve, both of those, those goals.

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00:41:42.680 --> 00:41:43.820
Josh Cohen, SWTCH: Great, thanks.

241
00:41:45.790 --> 00:41:49.209
Anthony Ng: Thanks, Josh. Okay, then we'll go to Sebastian.

242
00:41:49.640 --> 00:41:51.900
Anthony Ng: Sebastian, you should be able to unmute yourself now?

243
00:41:53.760 --> 00:41:54.890
Sebastian Sarria, PCE (he/him/el): Perfect.

244
00:41:55.420 --> 00:42:12.670
Sebastian Sarria, PCE (he/him/el): Thank you, everybody. My name's Sebastian Saria. I am in the regulatory team at Peninsula Clean Energy, and my comment is centered around the first topic of scaling managed EV charging.

245
00:42:12.800 --> 00:42:27.439
Sebastian Sarria, PCE (he/him/el): Just wanted to share that, we worked with a few professors from UC Davis and the University of Chicago, where they published a paper on the National Bureau

246
00:42:27.440 --> 00:42:46.149
Sebastian Sarria, PCE (he/him/el): of economic research, looking at testing 12,000 households within our service territory on the effectiveness of managed EV charging, and the results were surprising to us. It showcased that it was less effective than we previously thought, even

247
00:42:46.370 --> 00:43:00.309
Sebastian Sarria, PCE (he/him/el): With high incentives, enrollment was low. And so I just wanted to highlight that for you, Anthony and Peter. I'll put the link in the chat, and if there are any further questions, I'm happy to connect you

248
00:43:00.310 --> 00:43:08.389
Sebastian Sarria, PCE (he/him/el): to our programs team, who worked with those professors on this study, so I just wanted to share that with you all.

249
00:43:10.410 --> 00:43:13.999
Peter Chen: Great, thank you for that comment. We'll definitely look into it.

250
00:43:14.470 --> 00:43:15.850
Anthony Ng: Yeah, thanks, Bastion.

251
00:43:16.500 --> 00:43:31.609
Anthony Ng: Okay, well, thank you for the comments. I do see, we're gonna have to move on, just so we have, the opportunity to cover all of our topics today. Yeah, and there are a handful of questions in the Q&A window, Peter, if you could.

252
00:43:32.010 --> 00:43:42.810
Anthony Ng: kind of go through those. As a reminder, we are going to have an opportunity at the end to have an open Q&A on any of the ideas and topics we go over as well, but for now, we're going to move on.

253
00:43:42.820 --> 00:43:55.669
Anthony Ng: So our next goal that, the next set of initiatives will be is the distributed energy resource integration goal, and our first initiative is, gonna be covered by Hudson.

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00:43:55.730 --> 00:43:56.920
Anthony Ng: Take it away, Hudson.

255
00:43:57.450 --> 00:43:58.780
Hudson Spivey: Good morning, everyone.

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00:43:58.990 --> 00:44:04.560
Hudson Spivey: I'm Hudson Spivey, and I supervise the Demand Flexibility R&D team here at the CEC.

257
00:44:04.870 --> 00:44:15.949
Hudson Spivey: Today, I'm going to be presenting the outline for our proposed research initiative titled, Leveraging DERs and Load Flexibility for Affordability and Grid Reliability.

258
00:44:16.110 --> 00:44:28.460
Hudson Spivey: The challenge this initiative seeks to address is that while installations of behind-the-meter DERs like solar, storage, and flexible loads are growing quickly across California.

259
00:44:28.460 --> 00:44:36.350
Hudson Spivey: These devices are often deployed in a fragmented manner and are underutilized for the full system-scale benefits that they can provide.

260
00:44:36.670 --> 00:44:52.229
Hudson Spivey: Devices are procured independently, they lack interoperability, and are not fully integrated into utility or LSE operations or market structures. This prevents California from capturing the full value of these resources for

261
00:44:52.230 --> 00:45:00.630
Hudson Spivey: Grid reliability, grid resilience, and reducing the need for costly grid upgrades, which has a significant impact on ratepayer affordability.

262
00:45:01.390 --> 00:45:10.680
Hudson Spivey: Disadvantaged and vulnerable communities, tribes, and rural communities also face substantial barriers to accessing DERs.

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00:45:10.680 --> 00:45:21.579
Hudson Spivey: This diminishes the significant benefits that could be achieved from reduced energy burden, improving resilience, cleaning local air, and participating in grid services.

264
00:45:22.720 --> 00:45:28.040
Hudson Spivey: To address this challenge, we've proposed research topics in the following three areas.

265
00:45:28.330 --> 00:45:34.270
Hudson Spivey: The first focuses on advancing customer-sided DER integration and interoperability.

266
00:45:34.550 --> 00:45:40.370
Hudson Spivey: The second looks at improving grid-orchestrated DER coordination and market integration.

267
00:45:40.640 --> 00:45:48.760
Hudson Spivey: And the third focuses on equity-focused DER solutions for disadvantaged and vulnerable communities, or DVCs.

268
00:45:49.510 --> 00:46:07.899
Hudson Spivey: We foresee several benefits could emerge from this research, but some primary benefits include, first, lowering overall costs for customers by better using existing DERs. This would maximize the use of existing grid infrastructure and minimize the need for costly grid upgrades.

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00:46:07.930 --> 00:46:10.720
Hudson Spivey: Which would benefit ratepayer affordability.

270
00:46:10.780 --> 00:46:25.499
Hudson Spivey: Second, this would improve grid reliability by shifting and shaping load during peak periods. And third, this would expand DER access in disadvantaged and vulnerable communities to reduce energy burden

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00:46:25.500 --> 00:46:32.239
Hudson Spivey: and improve resilience. I'm gonna now walk through each individual topic in detail. Next slide, please.

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00:46:34.920 --> 00:46:43.149
Hudson Spivey: The first research topic we've proposed under Epic 5 is titled, Advancing Customer-Sided DER Integration and Interoperability.

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00:46:43.620 --> 00:46:54.820
Hudson Spivey: This topic seeks to address the following gaps around DER interoperability, which can be defined as the ability of devices and software to reliably exchange information.

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00:46:54.830 --> 00:47:08.280
Hudson Spivey: Currently, DER interoperability is limited by a patchwork of proprietary protocols, no unified data models, and a lack of standardized compliance testing programs for assessing device interoperability.

275
00:47:08.730 --> 00:47:28.239
Hudson Spivey: This forces customers and LSEs to build expensive custom software, or pay expensive API fees for every device type to integrate them into native platforms, whether that be a building energy management system or a distributed energy resource management system at the grid scale, or DERMS.

276
00:47:28.680 --> 00:47:39.669
Hudson Spivey: The lack of device interoperability further limits the ability of multiple behind-the-meter DERs to dispatch in a coordinated fashion in response to grid signals, such as dynamic rates.

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00:47:40.050 --> 00:47:50.299
Hudson Spivey: To address this interoperability challenge in Epic 5, we're proposing the following research activities, which may be conducted simultaneously or in succession.

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00:47:50.480 --> 00:48:00.720
Hudson Spivey: First, research and evaluate existing interoperability protocols, standards, and pilot efforts to identify successful models and opportunities to consolidate protocols.

279
00:48:01.240 --> 00:48:12.190
Hudson Spivey: Second, develop and test next-generation communication protocols that match common DER use cases, along with standardized data formats and cybersecurity measures.

280
00:48:12.560 --> 00:48:24.110
Hudson Spivey: Lastly, conduct multi-stakeholder field projects across different building types to validate data architectures and cybersecurity protocols under real-world DER dispatch conditions.

281
00:48:24.650 --> 00:48:33.930
Hudson Spivey: As for the outcomes we envision emerging from this work, in the near term, in the near term, this work would establish unified California-specific

282
00:48:33.930 --> 00:48:47.399
Hudson Spivey: interoperability profiles based on open standards, which would lower DER integration costs and improve the reliability of coordinated dispatch of DERs in response to pricing or other signals.

283
00:48:47.790 --> 00:48:53.019
Hudson Spivey: In the midterm, this work would validate and deploy solutions for, secure.

284

00:48:53.200 --> 00:49:03.250
Hudson Spivey: fast, two-way data sharing between DERs and LSEs, or aggregator systems, while continuing to protect customer privacy.

285
00:49:03.730 --> 00:49:18.859
Hudson Spivey: Lastly, in the long term, the goal of this topic would eventually to enable a market-wide rollout of certified plug-and-play products that operate as reliable grid resources and provide an array of customer and ratepayer benefits.

286
00:49:19.600 --> 00:49:20.980
Hudson Spivey: Next slide, please.

287
00:49:23.100 --> 00:49:31.389
Hudson Spivey: Our second research topic in this initiative is focused on improving grid-orchestrated DER coordination and market integration.

288
00:49:31.870 --> 00:49:43.640
Hudson Spivey: This topic proposes to address the following gaps. Customer-sided DERs are currently underutilized at scale, and the system is not fully capturing the potential system-wide benefits.

289
00:49:43.830 --> 00:49:52.309
Hudson Spivey: LSEs and grid operators currently lack real-time visibility into where flexible capacity from DERs exists on the system.

290
00:49:52.730 --> 00:50:00.990
Hudson Spivey: The locational and operational benefits of DERs are not well quantified and are difficult to appropriately value, which limits the market.

291
00:50:01.080 --> 00:50:13.700
Hudson Spivey: And existing planning and operational methods rely on static assumptions and broad system-level signals that do not accurately reflect localized grid conditions or dynamic operational needs.

292
00:50:14.370 --> 00:50:19.499
Hudson Spivey: To address these gaps, this topic proposes the following research activities.

293
00:50:19.820 --> 00:50:33.810
Hudson Spivey: First, develop forecasting, planning, and valuation tools in collaboration with LSEs, aggregators, and grid operators for integration into existing planning, measurement, and verification, and settlement processes.

294
00:50:34.340 --> 00:50:44.890
Hudson Spivey: Second, demonstrate signal-responsive DER orchestration on targeted feeders or substations to assess system-wide operational and economic impacts.

295
00:50:45.460 --> 00:50:59.280
Hudson Spivey: Lastly, develop standardized data infrastructure, including common data formats, access

protocols, and real-time sharing frameworks to support broader participation of demand flexibility and DERs in grid services.

296
00:50:59.920 --> 00:51:02.629
Hudson Spivey: In terms of potential outcomes from this work.

297
00:51:02.690 --> 00:51:21.200
Hudson Spivey: In the near term, we envision that projects would demonstrate real-time DER orchestration, improve data visibility, streamline measurement and verification for timely participant settlement, and establish the initial framework for DER evaluation and methodologies for evaluation.

298
00:51:21.730 --> 00:51:37.439
Hudson Spivey: In the midterm, this research would expand the use of DERs to provide grid services through improved coordination, integration into planning processes, and real-time dispatch strategies that increase utilization of existing grid infrastructure to benefit California ratepayers.

299
00:51:37.890 --> 00:51:55.039
Hudson Spivey: Lastly, in the long term, we would aim that DERs would provide quantifiable and compensated grid services across both the distribution and bulk power systems, supporting mature, value-based market structures and helping defer transmission and distribution upgrades.

300
00:51:55.670 --> 00:51:56.990
Hudson Spivey: Next slide, please.

301
00:52:00.340 --> 00:52:11.630
Hudson Spivey: Our third and final topic focuses on ensuring that disadvantaged and vulnerable communities are able to fully participate in and benefit from California's clean energy transition.

302
00:52:12.060 --> 00:52:26.519
Hudson Spivey: Today, DER adoption is disproportionately concentrated among higher-income residents and homeowners who have access to capital, suitable properties, and the time and resources needed to navigate incentive and interconnection processes.

303
00:52:27.070 --> 00:52:45.200
Hudson Spivey: In contrast, many low-income households, renters, multifamily residents, tribes, and rural communities face significant barriers to accessing these technologies, even though they often stand to benefit the most from lower energy bills, improved resilience, cleaner local air, and other benefits.

304
00:52:45.560 --> 00:52:53.200
Hudson Spivey: To address these gaps, we are proposing research and demonstrations that test community-centered deployment models for DERs.

305
00:52:53.380 --> 00:53:12.930
Hudson Spivey: Potential activities may include demonstrations of community microgrids, resilience hubs, multifamily DER packages, approaches that enable greater participation in demand flexibility programs, such as virtual power plants, and innovative ownership and financing structures.

306
00:53:13.700 --> 00:53:21.790
Hudson Spivey: A key emphasis will be working closely with communities to design solutions that meet local needs and deliver measurable benefits.

307
00:53:22.770 --> 00:53:34.180
Hudson Spivey: For expected outcomes in the near term, we expect that this work would demonstrate and validate new deployment models that have the potential to reduce energy burdens and improve resilience.

308
00:53:34.380 --> 00:53:42.780
Hudson Spivey: Over the medium term, successful approaches could be replicated through utility and CCA programs and other deployment efforts.

309
00:53:43.060 --> 00:53:50.919
Hudson Spivey: Ultimately, the long-term goal is to reduce the DER adoption gap by expanding equitable access to clean energy technologies.

310
00:53:51.080 --> 00:54:02.779
Hudson Spivey: This would serve to improve community resilience and ensure that all Californians have the opportunity to participate in and benefit from a more distributed, flexible, and decarbonized electric system.

311
00:54:03.590 --> 00:54:04.979
Hudson Spivey: Next slide, please.

312
00:54:07.850 --> 00:54:12.190
Hudson Spivey: And with that, we can transition to the questions and feedback portion.

313
00:54:13.480 --> 00:54:23.810
Anthony Ng: Great, thank you so much, Hudson. Okay, yeah, so we'll move on to our next break here. I know we're still catching up on some of the written questions coming in on the chat, but we'll, yeah, we'll have questions for…

314
00:54:23.870 --> 00:54:38.109
Anthony Ng: Hudson on the, DER and load flex, portions here. So yeah, same, same instructions if you want to participate, you can use the raise hand function on Zoom, if you're listening in on the phone only. You can use the star 9,

315
00:54:38.110 --> 00:54:45.189
Anthony Ng: Function to raise your hand, and then the star 6 function to toggle, mute, and unmute. And as well, yeah, you can continue to add your

316
00:54:45.190 --> 00:54:50.590
Anthony Ng: questions into the Q&A chat here as well, but for now, we'll start with David Myers.

317
00:54:50.880 --> 00:54:54.100
Anthony Ng: David, I should be able to unmute on yourself, on your end.

318
00:54:55.950 --> 00:55:00.330
David Meyers: Good morning. Thanks for the opportunity to participate.

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00:55:00.910 --> 00:55:11.929
David Meyers: I'm the founder and CEO of GridTractor, and work in these areas. I think all of the three priorities are…

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00:55:12.100 --> 00:55:13.570
David Meyers: are worthy.

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00:55:13.980 --> 00:55:21.719
David Meyers: But without addressing them holistically, and especially the economics of how they work after pilots and in deployment.

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00:55:21.730 --> 00:55:29.080
David Meyers: We'll have lots of good demonstration projects that, again, don't scale. So, specifically.

323
00:55:29.080 --> 00:55:49.039
David Meyers: I see in the first two priorities the idea of new standards and protocols. There should be an overarching goal, in my view, to reduce the number of standards and protocols. We don't lack standards and protocols, we lack decisions on what to use, which means that technology vendors

324
00:55:49.110 --> 00:55:53.609
David Meyers: Are not adopting, because there are… there are too many out there.

325
00:55:53.730 --> 00:56:08.060
David Meyers: Second, if the first two priorities are not coordinated in some ways, technology vendors will show up for the pilots, because they get paid for them. But then when it comes to trying to scale them, we run into the same problem

326
00:56:08.060 --> 00:56:17.610
David Meyers: That they will pick the most lucrative ones and wall off their customers from the others. So, for example, if they can get a capacity payment from VPPs.

327
00:56:17.610 --> 00:56:28.200
David Meyers: they will probably not sign up, as an automation service provider for dynamic prices. So if these economic issues and industry issues are not addressed.

328
00:56:28.200 --> 00:56:48.029
David Meyers: we end up with lots of demonstration projects. So that's for priorities 1 and 2, and frankly, the only way to make progress on priority three, which is to get this into the hands of more people, less affluent people, all of the communities described there, is to make it such that vendors of the technologies that people use

329

00:56:48.030 --> 00:56:53.270
David Meyers: Give them access to whatever programs, rates, etc. are out there.

330
00:56:53.300 --> 00:57:09.459
David Meyers: So I really suggest some sort of overarching, research and standards, or standards development, or, you know, decision-making layer that sits above these. Otherwise, lots more good demonstration projects without scaling. Thank you.

331
00:57:11.770 --> 00:57:20.960
Hudson Spivey: Thank you, David. I appreciate that feedback, and look forward to any submission to the docket as well, so we can,

332
00:57:21.380 --> 00:57:24.410
Hudson Spivey: reflect on those and take those into account as well. Thank you.

333
00:57:24.580 --> 00:57:25.769
David Meyers: I shall do. Thank you.

334
00:57:26.630 --> 00:57:27.540
Anthony Ng: Thanks, David.

335
00:57:27.840 --> 00:57:34.319
Anthony Ng: Okay, next we'll go to Hari Makata. Hari should be able to… Unmute on your end now?

336
00:57:34.320 --> 00:57:40.469
Hari Venkata: Yeah, hi. So, as I mentioned earlier, right, we are working on the larger canvas of,

337
00:57:40.760 --> 00:57:49.020
Hari Venkata: you know, digital twins and AI-based solutions for solving the energy efficiency problems within the renewable space.

338
00:57:49.190 --> 00:57:52.700
Hari Venkata: So, along those lines, you know, one of the solutions we were working on

339
00:57:52.770 --> 00:58:10.939
Hari Venkata: It kind of aligns with some of the things you talked about, like, you know, DVCs and DERs. We're building an agentic platform for energy management, for microgrids. You know, this could be small communities, this could be island grids and the like, and we'll have this solution ready within a couple of months.

340
00:58:11.050 --> 00:58:15.969
Hari Venkata: So my question is, while the EPIC-Fi program is being rolled out.

341
00:58:16.130 --> 00:58:22.470
Hari Venkata: If we have a ready-made solution that can be piloted or, you know, even deployed in

production.

342
00:58:22.680 --> 00:58:32.120
Hari Venkata: I mean, I'm just wondering, what would be the timeline look like? When can somebody, if they have a solution, when can they actually take it to the field, and what does that process look like?

343
00:58:34.180 --> 00:58:42.019
Hudson Spivey: Thank you for the question, Hari. I can say that, as Anthony said at the top of this

344
00:58:42.460 --> 00:58:43.580
Hudson Spivey: workshop.

345
00:58:43.630 --> 00:58:45.759
Hudson Spivey: Right now, we are,

346
00:58:45.800 --> 00:58:59.029
Hudson Spivey: We're presenting on the investment plan, and once that investment plan is approved by the PUC, that's when we move to the stage of actually developing solicitations, and that timeline varies.

347
00:58:59.030 --> 00:59:18.089
Hudson Spivey: in the near term, could anticipate releasing requests for information or hosting public workshop to, gain input from the community stakeholders, etc, as to, potential targeted research effort opportunities. And then the solicitations would.

348
00:59:18.090 --> 00:59:25.919
Hudson Spivey: be developed from that. There would be a public workshop, there would be time to apply, so it can take anywhere from, you know.

349
00:59:25.920 --> 00:59:39.800
Hudson Spivey: a year and a half, year, year and a half after the investment plan is approved till the first solicitations are coming out. The timeline varies, of course, but actually getting to pilot a technology would require that solicitation being scoped.

350
00:59:39.800 --> 00:59:49.499
Hudson Spivey: Developed, presented, you know, put in the wild for folks to apply, and then, evaluated, scored, and eventually ranked before,

351
00:59:49.710 --> 01:00:00.530
Hudson Spivey: that the pilot would actually happen, so I would anticipate, at minimum, a year before a solicitation would be out, and more time than that to actually have the project approved.

352
01:00:01.220 --> 01:00:03.249
Hari Venkata: Great, thank you for that, appreciate that, thanks.

353
01:00:05.080 --> 01:00:07.760

Anthony Ng: Thanks, Hari. Alright, next, let's go to Orly.

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01:00:08.020 --> 01:00:11.049
Anthony Ng: Orly, should be able to unmute on your end.

355
01:00:11.580 --> 01:00:19.829
Orly: Hi, I wanna… first of all, I wanna thank you for the event yesterday, the ETCC, and then back-to-back this, so thank you for… for both.

356
01:00:19.850 --> 01:00:32.919
Orly: My question maybe ties in a little bit to Mr. Meyer's comment about, we have a lot of standards, and if we want to look at dura integration, I really think we need to look at it a little holistically, and…

357
01:00:32.920 --> 01:00:50.699
Orly: I want to say that in the past, the CC, for example, with OpenADR, you know, set something and created something that revolutionized, you know, DR and how utilities communicate with their customers, and it started in California, and it's now all over in Europe as well.

358
01:00:50.750 --> 01:01:10.559
Orly: I'm… I'm more curious, Hudson, would you consider, or would be willing to, instead of, we have plenty of standards, an open source platform that really takes into account and integrates the different DERS, the different standards, it's… it's the bigger picture. So…

359
01:01:11.000 --> 01:01:21.069
Orly: I'm gonna try to work on a comment to put it in so I could put more details, but… would you be willing to consider, you know, taking a stance in that way?

360
01:01:21.310 --> 01:01:29.189
Orly: So, different products, different protocols, you know, an open-source platform that's, you know, accessible to all.

361
01:01:29.450 --> 01:01:35.870
Orly: That could take that into, into really implementing DIR integration.

362
01:01:36.920 --> 01:01:46.179
Hudson Spivey: Yeah, I appreciate that comment and question. I think, that is in the realm of what we're envisioning. I'm not…

363
01:01:46.440 --> 01:02:09.419
Hudson Spivey: Really, just to clarify, I think the first research topic we have here is about, you know, device-to-device integrations and behind-the-meter coordination of DERs, and then that second research topic is looking at how those are actually dispatched and coordinated at the distribution grid scale, or even more broadly, and how that distribution system interfaces with the bulk transmission system.

364
01:02:09.420 --> 01:02:22.629
Hudson Spivey: I think there's room within either of those topics, potentially, for what you're envisioning. We

would appreciate knowing more, and to David's comment as well, I don't necessarily think we're interested in,

365
01:02:22.700 --> 01:02:40.829
Hudson Spivey: hyper-proliferating more standards that either, you know, are redundant with existing ones or obviate others that are still present, we are interested in simplifying and streamlining that as well. So, if that's in line with what you're asking as well, we'd love to know more, and I don't think it's beyond the balance of what we're proposing.

366
01:02:41.070 --> 01:02:45.349
Orly: Wonderful, Hudson, thank you. It does apply to both, and I'll,

367
01:02:45.820 --> 01:02:53.789
Orly: Yeah, I'll try to put in a comment, and we can follow on the discussion. Thank you, thank you very much. Very excited about this, just so you know.

368
01:02:54.280 --> 01:02:54.740
Hudson Spivey: Thank you.

369
01:02:55.730 --> 01:02:56.650
Anthony Ng: Thanks, Orly.

370
01:02:56.960 --> 01:03:08.389
Anthony Ng: Okay, we'll go to Adam, George, and then Josh Simmons, and then we'll… we'll move on, and yeah, keep the… keep the questions coming into the Q&A as well, we'll get to those in order. But yeah, let's go to Adam, George.

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01:03:08.650 --> 01:03:11.110
Anthony Ng: Adam should be able to unmute on your end now.

372
01:03:13.240 --> 01:03:14.690
Adam Jorge: Hey y'all, hopefully you can hear me.

373
01:03:14.900 --> 01:03:15.560
Anthony Ng: Yes.

374
01:03:15.960 --> 01:03:27.310
Adam Jorge: Great, yeah, I just wanted to say thank you all for your work here. Adam George of Senior Clean Power. This is a really well-thought-out concept, and I feel I just wanted to make a few quick comments.

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01:03:27.640 --> 01:03:35.619
Adam Jorge: as you move these forward to the CPC, in the form of an investment plan, I would just encourage you all to make sure that,

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01:03:35.780 --> 01:03:50.690
Adam Jorge: you're fostering a series of projects that can work across the activities you're proposing. You have a lot of very strong activities, and I want to make sure they're not so compartmentalized that you can't integrate across the categories. Really.

377
01:03:50.700 --> 01:04:07.120
Adam Jorge: I also just want to echo interest in ensuring that these projects focus on recommendations to enable post-pilot scalability. You know, we're talking about standards in previous comments. I completely agree with the commenter and with CEC's approach at the same time, right? We're trying to balance the idea of moving

378
01:04:07.120 --> 01:04:30.010
Adam Jorge: standards forward in a means that enable scalability, shareability, but we should also focus on how to reduce those barriers moving forward, and a deep economic study or a deep barrier study as part of these pilots is immensely helpful for people following in the footsteps. So, very much appreciate the equity focus as well, including all the innovative ownership models. I think that's a very interesting way to look at

379
01:04:30.010 --> 01:04:39.669
Adam Jorge: diversification of scaling these resources and enabling decarbonization, especially in the specific DVC communities that we hope to see these projects take.

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01:04:39.670 --> 01:04:41.639
Adam Jorge: Root. So, thank you all very much.

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01:04:42.970 --> 01:04:45.089
Hudson Spivey: Those are great comments. Thank you so much, Adam.

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01:04:46.380 --> 01:04:50.290
Anthony Ng: Yep, thanks, Adam. Okay, let's go to Josh Simmons. Josh.

383
01:04:51.850 --> 01:05:04.139
Josh Simmons: Great, yes, Josh Simmons, co-director of Southern California Tribal Chairman Association's Tribal Energy and Climate Collaborative. So just, you know, again, appreciate, appreciate all the efforts here.

384
01:05:04.340 --> 01:05:20.009
Josh Simmons: want to, you know, just share that, you know, tribes are, I believe, can be potential ideal communities for participation in the yard load flexibility initiatives under Epic, because

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01:05:20.350 --> 01:05:22.599
Josh Simmons: You know, on reservations,

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01:05:22.870 --> 01:05:33.919
Josh Simmons: There are a collection of… often a collection of homes, buildings, and facilities that are really a more integrated community than you would typically see outside a reservation, where

387
01:05:33.970 --> 01:05:44.590

Josh Simmons: You know, the members of the government themselves, tribal council, general council, are mostly those that live on the reservation itself and own and operate the businesses.

388
01:05:44.670 --> 01:05:47.769
Josh Simmons: So I think it really…

389
01:05:47.900 --> 01:06:05.800
Josh Simmons: advocating for, you know, ensuring that opportunities for tribes to participate and access funding and be in a position to advance these technologies and solutions should be prioritized. But, you know, there still should be some emphasis on capacity building.

390
01:06:05.930 --> 01:06:20.119
Josh Simmons: and training for tribes. You know, I think this is a more general kind of consideration, other than a specific question right here. It's like, you know, considering how the unique needs of tribes, unique opportunities that tribal communities present is being

391
01:06:20.650 --> 01:06:34.159
Josh Simmons: considered in the investment plan and in the programming. And then, one additional question, has any consideration been given to transactive energy models and systems?

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01:06:34.400 --> 01:06:39.410
Josh Simmons: in this realm, I did not see it mentioned at all, and, you know, certainly there's

393
01:06:39.550 --> 01:06:45.839
Josh Simmons: Do you think they're, you know, that type of opportunity, the success of something like that, particularly with the…

394
01:06:46.870 --> 01:07:04.629
Josh Simmons: emergence in artificial intelligence that, transactive energy could, you know, went from maybe potentially being something that's perhaps a little more challenging to more realistic. So, yeah, if you can share any thoughts on that, thank you.

395
01:07:05.960 --> 01:07:22.849
Hudson Spivey: Thank you for that comment and question, Josh. To the first point, definitely hear you on taking into account the needs and opportunities that tribal communities offer. To the second question, I'm not familiar with that topic, so I'm happy to

396
01:07:22.850 --> 01:07:36.499
Hudson Spivey: follow up on that after the workshop, concludes, and if there's any information you'd like to share via the docket, submitting some comments there too, we'll definitely take a closer look at that. I'm happy to, follow up.

397
01:07:37.000 --> 01:07:37.819
Hudson Spivey: Thank you.

398
01:07:43.330 --> 01:07:58.329

Anthony Ng: Okay, thanks everybody. We're gonna have to move on here, and yeah, I encourage folks to continue, questions. If you did answer… ask a question in the chat, we are going through those, so you can check, the answer tab to see if your question got answered. We're gonna continue

399
01:07:58.330 --> 01:08:07.920
Anthony Ng: to go through those as we… as we move on, but yeah, we're gonna have to move on, for now. Again, just a reminder that, yeah, we'll have additional opportunities for… for overall Q&A here.

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01:08:07.920 --> 01:08:15.520
Anthony Ng: At the end. But for now, let's go to my colleague Ben for the next, initiative.

401
01:08:16.670 --> 01:08:27.310
Ben Wender: Thanks so much, Anthony, and thanks to everybody tuning in today. Have really enjoyed the conversation thus far, and thinking about a lot of those comments in the context of

402
01:08:27.310 --> 01:08:41.229
Ben Wender: this following initiative that we'll present. My name is Ben Wender, I'm a supervisor of the Grid Innovation Unit, and sharing an initiative titled Accelerating Grid Connection of Clean Resources and Beneficial Loads.

403
01:08:41.340 --> 01:08:52.509
Ben Wender: While previous initiatives have focused on applications of DERs and other advanced technologies to promote affordability, promote reliability.

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01:08:52.649 --> 01:08:58.290
Ben Wender: This initiative is really focused on accelerating the timeline for connecting

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01:08:58.310 --> 01:09:10.219
Ben Wender: more renewable generation resources and electrifying end uses and whole sectors more rapidly. As many of you likely know, we'll need to deploy

406
01:09:10.220 --> 01:09:24.629
Ben Wender: You know, tens, hundreds of gigawatts of new generation, and at the same time, you know, many, many gigawatts of new load, whether it's transportation, buildings, industrial electrification.

407
01:09:24.630 --> 01:09:43.359
Ben Wender: New data center load growth, and the electric grid, the wires, operational processes, and planning processes that connect those resources are really central to achieving the state's clean energy and climate goals, and doing so in a way that both

408
01:09:43.359 --> 01:09:52.320
Ben Wender: Progresses rapidly while balancing affordability, reliability, and the many other things we want from our infrastructure.

409
01:09:52.460 --> 01:10:02.390
Ben Wender: So, underlying this core challenge is just the growing number and size of resources and loads

that we have to connect to the electric grid.

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01:10:02.460 --> 01:10:17.709
Ben Wender: And these large loads, particularly if they're concentrated in constrained areas or locations with aged infrastructure, can cause a need for long timeline upgrades to

411
01:10:17.720 --> 01:10:25.429
Ben Wender: The electric system, things that can take, you know, many years to build a new substation or add transformer capacity.

412
01:10:27.940 --> 01:10:36.899
Ben Wender: So what we're interested in doing in this initiative is exploring and scaling and validating technologies that can help reduce that timeline.

413
01:10:36.970 --> 01:10:52.369
Ben Wender: And make us progress more quickly on connecting these resources. I'll talk through a couple of research topics in this area in more detail. The first is looking at innovations in bridging solutions for faster grid connections.

414
01:10:52.480 --> 01:10:58.439
Ben Wender: A topic on technology alternatives to constructing new lines and new rights of way.

415
01:10:58.650 --> 01:11:13.240
Ben Wender: A topic on advancements in data and planning tools for grid infrastructure investments under uncertainty, and to help inform and coordinate infrastructure investments with customer decision making.

416
01:11:13.310 --> 01:11:24.109
Ben Wender: And then finally, a topic on a pre-commercial grid tech incubator, looking at some of these more novel, early-stage technologies that hold tremendous promise.

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01:11:24.530 --> 01:11:34.979
Ben Wender: We can anticipate a number of types of benefits coming from these investments. Overall, the goal is faster connection of these clean resources and

418
01:11:35.060 --> 01:11:46.520
Ben Wender: Flexible, beneficial electric loads. Benefits in the form of optimizing the use of existing grid infrastructure and reducing the extent of

419
01:11:46.820 --> 01:12:05.809
Ben Wender: costly and time-consuming upgrades needed. And then, supporting, disadvantaged and vulnerable communities throughout the state, including tribal communities, by prioritizing technology innovations and infrastructure enhancements that, serve these communities.

420
01:12:06.460 --> 01:12:07.680
Ben Wender: Next slide, please.

421
01:12:10.710 --> 01:12:12.990
Ben Wender: So, the first topic is

422
01:12:13.030 --> 01:12:32.289
Ben Wender: Titled, Innovations in Bridging Solutions for Faster Grid Connections. There's been a lot of interest in bridging solutions, strategies that allow a customer to receive some level of partial service in the time it takes for permanent infrastructure to be constructed.

423
01:12:32.530 --> 01:12:52.510
Ben Wender: However, there's still a lot of opportunity to innovate and broaden the range of these bridging solutions available on the market, improve their efficacy, both for the customer participating as well as the grid operator, and to inform how they're included in policy and program development.

424
01:12:53.000 --> 01:13:08.460
Ben Wender: This initiative would fund a number of potential activities, including technology development, field testing, and larger-scale demonstrations of these innovations across a range of possibilities. One example could be

425
01:13:08.460 --> 01:13:16.020
Ben Wender: You know, mobile solid-state transformers and other power equipment that you could use to connect in places that

426
01:13:16.020 --> 01:13:32.819
Ben Wender: You know, have some capacity on maybe a sub-transmission or medium voltage system, but the lower voltage distribution has no capacity, and then could, you know, provide power in the time it takes to upgrade that capacity and be relocated to

427
01:13:32.820 --> 01:13:50.980
Ben Wender: the next site that's facing that challenge after upgrades have been completed. Another technology space we're interested in is expanding, validating, and improving, conformance and effective implementation of standards. I, the comments

428
01:13:50.990 --> 01:13:57.789
Ben Wender: previously that we have no shortage of standards are well noted, I would say there's still a lot of opportunity to

429
01:13:57.940 --> 01:14:02.720
Ben Wender: Improve how those standards are implemented, and

430
01:14:02.890 --> 01:14:10.620
Ben Wender: Figure out how to, build a broader pool of equipment providers and,

431
01:14:10.620 --> 01:14:35.270
Ben Wender: technologies available that follow the best standards. And so, thinking about how we could support the development of a broad market of that equipment that could support more dynamic, near-real-term, flexible service connections. Of course, we anticipate coordinating closely with our utility colleagues,

with technology developers, and large electric

432
01:14:35.270 --> 01:14:50.449
Ben Wender: customers to validate the performance of these technologies, again, inform standards and the application of those standards, and then to integrate these technologies into planning and operational processes.

433
01:14:50.730 --> 01:15:03.580
Ben Wender: A number of outcomes we hope to see through these investments, in the nearer term include just getting, you know, large customers, large resources connected to the grid more quickly.

434
01:15:03.580 --> 01:15:12.749
Ben Wender: And helping to, maintain and even accelerate progress on our electrification and decarbonization goals.

435
01:15:12.860 --> 01:15:27.799
Ben Wender: The more medium term, could see improving standards, supporting, again, a wider marketplace of standards-compliant products, and supporting, conformance to those standards, and then

436
01:15:27.950 --> 01:15:36.630
Ben Wender: You know, helping differentiate within the marketplace technologies and products that better meet customer needs and the grid needs at the same time.

437
01:15:37.120 --> 01:15:49.370
Ben Wender: In the longer term, these innovations can play a key role in putting downward pressure on electricity rates by enabling greater electricity sales,

438
01:15:49.370 --> 01:16:00.000
Ben Wender: And, spreading out the costs of infrastructure upgrades over a larger number of kilowatt-hour sales. In the most simple example.

439
01:16:00.000 --> 01:16:12.620
Ben Wender: you know, you could imagine a large EV charging, fast-charging plaza that, you know, would take 8 years to upgrade a substation to power it, if you can, you know.

440
01:16:12.790 --> 01:16:32.310
Ben Wender: run it at half power for 5 years, and sell all that additional electricity. That gives you, you know, more volumetric electricity sales to spread out the cost of that upgrade over, and this will be a key strategy to maintaining affordability as the state progresses on its goals.

441
01:16:34.020 --> 01:16:35.889
Ben Wender: Next slide, please.

442
01:16:39.380 --> 01:16:47.400
Ben Wender: The second topic is, titled Technology and Alternatives to New Lines and New Rights of Way.

443
01:16:47.460 --> 01:17:06.080
Ben Wender: in some sense, related to the first topic on bridging solutions, but, asking a slightly different question with some nuanced and important differences. But in the first topic, we're thinking about technologies that can help connect resources while an upgrade is completed.

444
01:17:06.080 --> 01:17:15.099
Ben Wender: In this topic, we're thinking about, technologies that could permanently avoid the need for an upgrade, and as I said.

445
01:17:15.100 --> 01:17:23.429
Ben Wender: There's some, important nuanced differences, and the technology solutions are likely different across those two,

446
01:17:23.440 --> 01:17:38.789
Ben Wender: objectives. So, one of the key challenges here is just acquiring new land and permitting new rights-of-way is a very time-consuming and costly process, and that's, you know, particularly true in

447
01:17:38.790 --> 01:17:46.869
Ben Wender: Densely populated areas of the state, or areas that are environmentally or ecologically sensitive.

448
01:17:47.130 --> 01:17:56.129
Ben Wender: Over the past, you know, 5, 10 years, there have been a number of technologies that are coming into the market that can

449
01:17:56.180 --> 01:18:08.939
Ben Wender: Hold tremendous promise for increasing the amount of energy carried through these existing rights-of-way, often reusing equivalent, or, you know, reusing the same infrastructure.

450
01:18:08.940 --> 01:18:27.529
Ben Wender: However, we have relatively limited experience with the operation of these technologies, with how these technologies should be factored into, planning decisions, regulatory decisions, capital investment decisions, and so this,

451
01:18:27.970 --> 01:18:46.389
Ben Wender: topic would support development of studies and decision support tools focused on California that would strive to identify optimal locations or infrastructure characteristics or combinations of these different advanced technologies, things like,

452
01:18:46.390 --> 01:18:53.169
Ben Wender: You know, carbon conductor, or carbon-containing conductors, power flow controllers.

453
01:18:53.200 --> 01:19:12.459
Ben Wender: dynamic line rating and power control systems, things like that. Doing some studies to help inform the characteristics and locations that have the greatest potential for adoption of these technologies, and alternatively, you know, areas or locations where they don't make the most sense.

454
01:19:14.590 --> 01:19:33.329
Ben Wender: We may also fund targeted demonstrations that validate the benefits and performance of these technology solutions and trade-offs between either advanced technologies or, you know, conventional infrastructure enhancements. I think it will take all of the above to meet our goals.

455
01:19:33.610 --> 01:19:46.260
Ben Wender: And, again, explore some of these, more challenging questions when you're relying on these technologies as a strategy for permanent infrastructure deferral.

456
01:19:46.980 --> 01:20:05.249
Ben Wender: Some outcomes we can anticipate from these investments include, in the near term, increased understanding of the, you know, big opportunities and near-term priorities for grid operators, planners, others to.

457
01:20:05.250 --> 01:20:23.659
Ben Wender: target for deployment of these technologies. In the midterm, these types of solutions can often provide one of the fastest pathways to increasing grid capacity. Again, allowing more resources, more clean, flexible loads to connect.

458
01:20:23.660 --> 01:20:30.170
Ben Wender: More rapidly than, you know, construction of new mines, acquisition of new land.

459
01:20:30.350 --> 01:20:41.760
Ben Wender: And in the long term, again, see tremendous opportunity for these technologies to promote affordability and support, reduced costs for ratepayers,

460
01:20:41.840 --> 01:20:57.710
Ben Wender: You know, again, in the narrow sense, just from reduced costs of land acquisition and permitting, but critically, also from better understanding and utilization of the capacity within grid infrastructure.

461
01:20:58.070 --> 01:21:01.250
Ben Wender: Next slide, please.

462
01:21:04.980 --> 01:21:23.009
Ben Wender: And the last topic that I'll present is on data and planning tools for grid infrastructure investments and coordinating customer decisions. So, the first two topics, looked more at the, technology and operational side of

463
01:21:23.200 --> 01:21:34.789
Ben Wender: these innovative grid technologies. This topic will focus more on the planning tools, models, assumptions, and data sets that,

464
01:21:34.790 --> 01:21:50.579
Ben Wender: underlie adoption of these technologies and are, you know, kind of the processes through

which we anticipate what our grid needs are and make those investments. A key gap is that the existing planning tools and models are,

465
01:21:50.980 --> 01:21:58.149
Ben Wender: challenged in times of rapid load growth, which we're experiencing, particularly

466
01:21:58.380 --> 01:22:17.829
Ben Wender: for, you know, concentrations of large loads in an area, think, you know, freeway corridors with a lot of EV charging, or Silicon Valley with a lot of data center load growth. Planning for these large, concentrated, rapid loads has been challenging.

467
01:22:17.940 --> 01:22:34.380
Ben Wender: And one of the core questions is uncertainty in exactly when, where, and at what, you know, level or load factor these new loads and resources will materialize, and that's a really challenging problem for planners, because they have to

468
01:22:34.380 --> 01:22:42.829
Ben Wender: You know, balance anticipating where these will show up and investing in our infrastructure to make sure it's ready to accommodate them.

469
01:22:42.830 --> 01:22:54.899
Ben Wender: While on the other hand, limiting risk of stranded investments or underutilized infrastructure that, ultimately could harm affordability. And so.

470
01:22:54.900 --> 01:23:01.569
Ben Wender: Cracking this nut of, you know, when and where upgrades need to happen is,

471
01:23:01.890 --> 01:23:07.120
Ben Wender: a critical opportunity that Epic is seeking to inform,

472
01:23:07.120 --> 01:23:25.199
Ben Wender: Some of the research we envision conducting under this initiative includes creating advanced planning tools and frameworks, building off a lot of the great work that's already happening at the CPUC and our utilities and CEC's demand forecasting efforts, but exploring

473
01:23:25.280 --> 01:23:40.140
Ben Wender: More advanced, processes and algorithms, you know, probabilistic scenario-based methods that give you a way to quantify uncertainty and explore, you know, levels of confidence

474
01:23:40.140 --> 01:24:01.899
Ben Wender: in different types of investments under different scenarios. Another topic we may be interested in investing in is improving the granularity, both spatial and temporal granularity, of CEC's own demand forecasting processes, which are, you know, kind of top-down, statewide.

475
01:24:01.980 --> 01:24:05.929
Ben Wender: And often may not, line up

476
01:24:06.850 --> 01:24:16.890
Ben Wender: Precisely with what our load-serving entities are experiencing or getting requests to serve from customers in their area.

477
01:24:17.240 --> 01:24:31.479
Ben Wender: We're also very interested in understanding and exploring development of common data frameworks, data dictionaries, ontologies, things that improve and facilitate sharing of information across

478
01:24:31.480 --> 01:24:41.929
Ben Wender: Utilities and customers, across, planning agencies, and, with our, you know, bulk system operator.

479
01:24:41.930 --> 01:24:48.570
Ben Wender: And looking to, increase commonality and, adoption of.

480
01:24:48.600 --> 01:24:54.219
Ben Wender: You know, shared structures across many of these actors.

481
01:24:55.560 --> 01:25:14.039
Ben Wender: We could anticipate a number of benefits and outcomes from investments under this topic. In the near term, you know, examples could be just reductions in forecasting error that could be validated by looking back in time.

482
01:25:14.070 --> 01:25:25.619
Ben Wender: These, planning tools could help, improve grid readiness and result in reduced delays for new customers and resources connecting to the grid.

483
01:25:25.700 --> 01:25:31.180
Ben Wender: And in the longer term, again, a real opportunity and pathway to

484
01:25:31.220 --> 01:25:50.899
Ben Wender: Affordability and ratepayer benefits from increased grid readiness in areas where development is most likely to happen, and upgrades are most needed, and reduced risk of stranded assets or underutilized infrastructure investments.

485
01:25:52.040 --> 01:26:01.229
Ben Wender: Next, I'm gonna pass to my colleague, Lindsay, to share the pre-commercial, grid tech incubator. Lindsay, take it away.

486
01:26:01.760 --> 01:26:04.580
Lindsey Fransen: Alright, thank you, Ben. Is my audio okay?

487
01:26:05.310 --> 01:26:05.860
Ben Wender: Sounds great.

488
01:26:05.860 --> 01:26:18.340
Lindsey Fransen: All right, thanks. As explained in the initiative introduction, California's grid isn't currently equipped to handle the increased load necessary to meet the state's climate goals, or the new generation that will serve this load.

489
01:26:18.460 --> 01:26:34.119
Lindsey Fransen: There are innovative technologies, some of which have been highlighted previously in the presentation, that could improve the utilization of existing grid capacity, deliver services without the need for costly infrastructure upgrades, and increase system safety by reducing wildfire risk.

490
01:26:34.680 --> 01:26:42.669
Lindsey Fransen: The road from idea to implementation of these technologies, especially by the IOUs, is a long and challenging one, though.

491
01:26:42.870 --> 01:27:01.650
Lindsey Fransen: For a number of reasons. Among these are that the IOUs can't use EPIC funds for pre-commercial research, and also technology developers struggle to gain access to these large companies. Some of this was highlighted in a comment or question here in the Q&A, so hopefully I'll be addressing that here.

492
01:27:02.780 --> 01:27:17.080
Lindsey Fransen: This funding topic would address these gaps by providing support to early-stage researchers and entrepreneurs working on technologies identified by the IOUs as being useful in meeting the EPIC strategic goals and objectives.

493
01:27:17.280 --> 01:27:25.070
Lindsey Fransen: Support would include both technology and business model advancement oriented toward the IOUs as ultimate customers and implementers.

494
01:27:25.840 --> 01:27:39.740
Lindsey Fransen: The CEC will collaborate with IOUs to identify needed technologies, to develop solicitations and review applications as appropriate, and also by supporting networking and pilot opportunities with relevant IOU business units.

495
01:27:40.970 --> 01:27:48.130
Lindsey Fransen: The expected outcomes are initially improved visibility and access between the IOUs and grid technology developers.

496
01:27:48.390 --> 01:27:54.280
Lindsey Fransen: The advancement of innovative grid technology readiness levels, as well as commercialization readiness.

497
01:27:54.900 --> 01:27:59.439
Lindsey Fransen: And the accelerated deployment of emerging technologies on California's grid.

498

01:28:00.130 --> 01:28:13.879
Lindsey Fransen: In the long term, we would anticipate benefits such as reduced wildfire risk, improved reliability due to enhanced capacity or better utilization of existing capacity, and reduced costs due to deferred or avoided infrastructure upgrades.

499
01:28:15.570 --> 01:28:19.820
Lindsey Fransen: So that's it for this topic, and I think the initiative.

500
01:28:22.560 --> 01:28:23.280
Lindsey Fransen: Thank you.

501
01:28:27.980 --> 01:28:47.919
Anthony Ng: Great, thanks so much, Ben and Lindsey, for that overview. Okay, yeah, moving on to our next kind of feedback and comment period. Same as before, please use the raised hand function if you'd like to make a, ask a question. And if you're on the phone, please use the star 9 function to raise your hand, and the star 6 function to toggle

502
01:28:47.920 --> 01:28:49.319
Anthony Ng: You know, mute and unmute.

503
01:28:49.850 --> 01:29:06.360
Anthony Ng: I will, I just, yeah, wanted to also emphasize, in addition to all the great discussions and questions, also encourage everybody in the chat and in attendance to please also submit written comments, to our docket. That'll help our team just have that as a reference, for us, in addition to the recording and the,

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01:29:06.410 --> 01:29:10.659
Anthony Ng: And the discussion today. But yeah, first we'll go to Kurt Rustin.

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01:29:10.730 --> 01:29:13.460
Anthony Ng: Kurt, should be able to unmute yourself on your end.

506
01:29:14.100 --> 01:29:17.629
Kurt Rustin: Yeah, thank you. Kurt Rustin, CEO, Watson Water.

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01:29:17.940 --> 01:29:27.730
Kurt Rustin: I just want to lend some advocacy around, solar technologies on non-traditional terrains.

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01:29:27.940 --> 01:29:34.480
Kurt Rustin: As a potentially very effective way to combat right-of-way issues.

509
01:29:34.840 --> 01:29:46.229
Kurt Rustin: And, grid, reducing grid stress, specifically solar technologies that are built on water.

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01:29:46.400 --> 01:29:53.989

Kurt Rustin: Can usually take advantage of on-site loads, water pumping and movement being one of the

511
01:29:54.100 --> 01:29:56.559
Kurt Rustin: Larger energy uses of the state.

512
01:29:56.770 --> 01:30:06.580
Kurt Rustin: So… While those technologies are commercialized, there's still quite a big gap on the data

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01:30:07.090 --> 01:30:19.710
Kurt Rustin: and, optimization intelligence of where those types of systems can be built, to best benefit the grid and avoid, right-of-way complexities. So…

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01:30:19.870 --> 01:30:29.000
Kurt Rustin: Epic 4, supported that with a split grant, but I hope that there will continue to be support for those types of technologies in Epic 5. Thank you.

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01:30:33.270 --> 01:30:35.559
Ben Wender: Great, thanks. Good, good feedback.

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01:30:37.890 --> 01:30:48.180
Anthony Ng: Yeah, thanks, Kurt, and just kind of a preview for, yeah, again, a little bit later on, we do have another initiative a little bit later on that actually speaks more specifically to that, so, be on the lookout for that one as well.

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01:30:48.530 --> 01:30:53.780
Anthony Ng: But, yeah, thank you. Yep, thanks, Kurt. Yeah, next we'll go to David Myers. David?

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01:30:57.740 --> 01:31:14.489
David Meyers: Thank you, Anthony. My question is for Lindsay. This incubator seems like a fabulous idea. My question is, at this stage, what kind of comments are needed in terms of domains and technologies, or will it be wide enough

519
01:31:14.710 --> 01:31:17.739
David Meyers: Once established that,

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01:31:17.890 --> 01:31:25.639
David Meyers: You know, sort of anything can fit, or do we… do we need to kind of direct, like, hey, there might be proposals from this direction, so make sure that fits under the umbrella?

521
01:31:25.850 --> 01:31:28.740
David Meyers: I hope that question is clear. Let me know if I need to clarify.

522
01:31:29.870 --> 01:31:44.009
Lindsey Fransen: Well, I'll try answering, and then you let me know if I'm responding. At this stage, we are keeping things fairly high level. We are also talking to the IOUs for their input early on and throughout the

process. We certainly welcome

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01:31:44.010 --> 01:32:07.549
Lindsey Fransen: any specifics in terms of technologies or particular support that you think should be offered under this plan. We may not write every detail in, as we do want to remain broad enough to respond to changing, you know, things on the ground, but any and all input is welcome, and we have a number of ideas for technologies, but of course we

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01:32:07.550 --> 01:32:09.000
Lindsey Fransen: We welcome yours as well.

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01:32:10.140 --> 01:32:23.950
David Meyers: Okay, and do you expect to have parameters on, sort of, project size and investment? You know, because obviously there are some that are hardware intensive, some that are less. Is there going to be a box around that, or you're kind of looking to industry, too?

526
01:32:24.250 --> 01:32:26.049
David Meyers: Propose.

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01:32:26.260 --> 01:32:48.890
Lindsey Fransen: Yeah, not at this time. I mean, we are still working out our budget details by initiative, so that will create some constraints on the types of funding that can be provided. You know, I think some of the funding to entrepreneurs would be relatively small at the early stage, where ideas and concepts are being developed, but that's also something that we would be getting into more detail on during the solicitation development stage.

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01:32:50.000 --> 01:32:50.779
David Meyers: Thank you.

529
01:32:54.910 --> 01:32:58.880
Anthony Ng: Thanks, David. Okay, let's move on to Josh.

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01:33:02.840 --> 01:33:08.169
Josh Simmons: Thanks again, Josh Simmons, co-director of the Tribal Energy and Climate Collaborative.

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01:33:08.270 --> 01:33:16.259
Josh Simmons: So reiterating some points, again, in this context, about tribes having unique needs and presenting unique opportunities to

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01:33:16.420 --> 01:33:31.770
Josh Simmons: advance these technologies and solutions. With respect to rights-of-way, you know, tribes have unique challenges, including the need for Bureau of Indian Affairs to approve rights-of-way… rights of way on tribal trust lands.

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01:33:31.910 --> 01:33:40.859
Josh Simmons: And just, you know, want to advocate for ensuring that all funding and programming has a

tribal carve-out that… and that there's capacity building and training

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01:33:40.870 --> 01:33:55.230
Josh Simmons: for tribes related to advancing grid technologies. I want to elaborate on something I mentioned before about the tech innovation ecosystem, which is funded by California Jobs First Regional Innovation, Regional Investment Initiative Tribal Fund Grant.

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01:33:55.230 --> 01:34:05.349
Josh Simmons: Which is designed to incubate, accelerate, and advance pre-commercial technologies through tribally-led pilots, demonstration projects, partnerships, and co-ventures.

536
01:34:05.350 --> 01:34:21.659
Josh Simmons: our ecosystem includes, partners include Cleantech San Diego, Lacey, Larda, UCSD, UCR, SDU, and others that are, you know, I think, promoting these, advancing technologies at earlier stages, where, you know.

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01:34:21.920 --> 01:34:25.410
Josh Simmons: Our ecosystem is particularly positioned to

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01:34:26.200 --> 01:34:40.159
Josh Simmons: help these pre-commercial technologies, you know, navigate the valley of death, and on the other side to, you know, early commercialization to full commercialization, and would advocate providing funding and programming

539
01:34:40.390 --> 01:34:50.690
Josh Simmons: for tribal-specific initiatives that can build upon and extend this existing infrastructure. Coming back to the… an earlier point,

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01:34:51.070 --> 01:34:55.619
Josh Simmons: In terms of the types of solutions being considered and the research being conducted,

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01:34:55.820 --> 01:35:11.850
Josh Simmons: you know, I think this should include non-wire solutions, including off-grid systems owned and operated by IOUs. You know, I can't say that I… you know, tribes are going to have varying perspectives on this, but, you know, there are plenty of tribal communities and rural communities that

542
01:35:11.940 --> 01:35:19.279
Josh Simmons: are so far from the nearest grid that they don't have access to power. It's just not feasible and cost-effective to run

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01:35:19.810 --> 01:35:28.649
Josh Simmons: Distribution or transmission miles to get to them, and, you know, these communities that lack the resources.

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01:35:28.650 --> 01:35:40.460
Josh Simmons: To make these investments themselves, you know, could benefit from having access to, you

know, utility-operated, off-reservation grid systems.

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01:35:40.460 --> 01:35:50.339
Josh Simmons: you know, with the same rate base, has CEC considered… considered this, this potential solution?

546
01:35:50.490 --> 01:35:51.680
Josh Simmons: or approach?

547
01:35:56.770 --> 01:36:03.860
Ben Wender: I'll start answering and welcome other folks' additions or jump in.

548
01:36:06.440 --> 01:36:08.819
Ben Wender: I guess two thoughts,

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01:36:09.200 --> 01:36:23.539
Ben Wender: First, to the, you know, broader discussion of tribes, good to connect with you again, Josh. I think, certainly we'll make sure to continue to think about the unique, challenges and opportunities that tribes,

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01:36:23.540 --> 01:36:33.339
Ben Wender: bring in partnership with the CEC and with the EPIC program, and as you well know, we have a… I personally would like to thank,

551
01:36:33.700 --> 01:36:53.289
Ben Wender: pretty robust and strong history of partnering with tribes, as reflected in, you know, substantial resources from our portfolio, or a substantial fraction of the resources from our portfolio, going to support tribal communities and projects with and supporting tribal communities.

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01:36:53.290 --> 01:37:06.029
Ben Wender: Your question on fully off-grid or not grid-connected innovations and solutions to providing electricity access in remote or

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01:37:06.030 --> 01:37:14.000
Ben Wender: you know, isolated communities. I think we have some examples in our historical portfolio

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01:37:14.070 --> 01:37:26.579
Ben Wender: And we'll, certainly be interested to discuss with you further opportunities. It's a needle to thread in a lot of ways. These dollars,

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01:37:26.950 --> 01:37:32.110
Ben Wender: Are very much designed to support, innovations that, you know.

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01:37:32.300 --> 01:37:41.620
Ben Wender: support the state's progress, support priority communities, while also benefiting ratepayers and

the grid broadly.

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01:37:41.760 --> 01:37:43.789
Ben Wender: And, you know, that…

558
01:37:44.510 --> 01:37:55.319
Ben Wender: can be hard if you're not connecting to the grid at all. And so there's, you know, some thread to, some needle to thread there in understanding

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01:37:55.330 --> 01:38:08.359
Ben Wender: And articulating, broader grid benefits from, fully off-grid, but I'm sure there's opportunity there, and welcome your submissions to the docket and further discussions with you.

560
01:38:08.530 --> 01:38:18.690
Josh Simmons: Sure, just a, you know, quick response to that, too. It's, you know, everyone understand that the Epic funding is, you know, dependent upon being an IOU customer.

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01:38:18.900 --> 01:38:28.599
Josh Simmons: And so, you know, I think the model is, is, okay, well, you know, there could be a costly upgrade of infrastructure to get to a community,

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01:38:28.730 --> 01:38:43.159
Josh Simmons: Which, you know, increases rates, versus there not being that costly infrastructure of, you know, transmission distribution infrastructure to get there, and, you know, and the off-grid system itself being… being…

563
01:38:43.270 --> 01:38:52.780
Josh Simmons: operated as part of the grid without the wires connecting it, that I think would be not only beneficial to the community, that's

564
01:38:52.780 --> 01:39:09.690
Josh Simmons: Otherwise, lacking access, you know, basic access to power, which, you know, should just be a human right, you know, and affordable access to that power while keeping the cost, the infrastructure investment, the vulnerable infrastructure, you know, which is likely not in place because it's going across

565
01:39:09.800 --> 01:39:25.590
Josh Simmons: You know, hard, difficult terrain or forested lands that's vulnerable to, you know, starting wildfires, that ultimately it is… it is of benefit to the ratepayers and the grid at large to not be investing in that type of infrastructure.

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01:39:26.280 --> 01:39:33.700
Ben Wender: Yeah, yeah, noted. I think in that, you know, pretty constrained context and scenario, makes total sense.

567
01:39:34.010 --> 01:39:42.169
Ben Wender: you know, if there's another community nearby, that's when it gets, you know, more

challenging, or requires more nuanced thought, I'd say.

568
01:39:45.290 --> 01:39:58.619
Anthony Ng: I will just note also, later on, under the climate adaptation and kind of resilience-related, initiative and topics, I think some of this is gonna… we'll also touch on some of these, ideas, Josh, so also, yeah, preview for some of the later content today.

569
01:40:01.520 --> 01:40:02.049
Josh Simmons: Thank you.

570
01:40:02.050 --> 01:40:02.620
Anthony Ng: Alright.

571
01:40:03.330 --> 01:40:06.210
Anthony Ng: Thanks, let's move to Scott Anders. Scott?

572
01:40:09.810 --> 01:40:27.400
Scott Anders: Yeah, good morning, everyone. Thank you so much for the workshop and the opportunity to comment. My name is Scott Anders. I'm the Executive Director at the Energy Policy Initiative Center. We're based at the University of San Diego, and I had a question about the pre-commercial incubation hub concept.

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01:40:27.700 --> 01:40:31.780
Scott Anders: As you, as you know, over the past 10 years.

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01:40:31.880 --> 01:40:45.589
Scott Anders: The EPIC program has invested in a network of energy innovation clusters around the state. Our university is a partner organization with Cleantech San Diego as part of their Southern California Energy Innovation Network.

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01:40:46.350 --> 01:40:58.870
Scott Anders: The network supports regional entrepreneurs in San Diego, Imperial, and Riverside counties. And since 2016, we, at our center, have worked with our colleagues at the engineering school.

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01:40:59.060 --> 01:41:06.070
Scott Anders: To provide technical and regulatory and policy services to companies in the network.

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01:41:06.430 --> 01:41:08.889
Scott Anders: So, given the fact that,

578
01:41:09.170 --> 01:41:12.510
Scott Anders: The program has invested in this… these…

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01:41:12.890 --> 01:41:16.360
Scott Anders: this series of networks around the state, and I think

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01:41:16.630 --> 01:41:25.200
Scott Anders: you know, they've been fairly successful. Maybe others, maybe others who are attending the call can comment on that, but…

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01:41:25.450 --> 01:41:30.380
Scott Anders: I just wanted to see if you anticipated using this existing regional

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01:41:30.530 --> 01:41:39.160
Scott Anders: Energy Innovation Network for this purpose, or is this a new effort, or, you know, do you have any further thoughts on, kind of, how this will actually be implemented?

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01:41:41.290 --> 01:41:47.689
Lindsey Fransen: Sure, thanks for your comment and question. Yes, very, very familiar with the regional innovation clusters.

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01:41:47.750 --> 01:42:02.439
Lindsey Fransen: We would anticipate this incubator being a new kind of program set up under Epic 5, but we absolutely recognize that there are incredible resources that have been developed and nurtured through these previous EPIC programs, and so, you know.

585
01:42:02.670 --> 01:42:11.069
Lindsey Fransen: current members of those networks would certainly be welcome to apply, you know, individually or as part of a group.

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01:42:11.090 --> 01:42:22.930
Lindsey Fransen: And so we would hope to leverage and extend that expertise that has been developed over the past decade under a new program, specifically focused on these grid-related technologies.

587
01:42:30.140 --> 01:42:31.340
Anthony Ng: Alright, thank you, Scott.

588
01:42:31.870 --> 01:42:38.930
Anthony Ng: Okay, so we'll go to Jason, Edson, and then Sub, Submarinen, to close out this.

589
01:42:39.480 --> 01:42:42.140
Anthony Ng: portion here. So, Jason, go ahead.

590
01:42:43.200 --> 01:42:47.010
Jason Anderson, Cleantech San Diego: Thanks, Anthony. Jason Anderson, President and CEO of Cleantech San Diego.

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01:42:47.200 --> 01:43:02.660
Jason Anderson, Cleantech San Diego: partner along with Scott Anders on the Southern California Energy Innovation Network, and just want to echo what Scott had said about the Energy Commission establishing

the kind of statewide network of organizations like ours, Los Angeles Cleantech Incubator and others.

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01:43:02.800 --> 01:43:11.840
Jason Anderson, Cleantech San Diego: That are working on the ground, kind of performing these incubation services a little bit more broadly than just grid tech related, and so I would…

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01:43:11.840 --> 01:43:24.280
Jason Anderson, Cleantech San Diego: I would encourage the staff, as you continue down the path of developing your implementation plan, is to really appreciate the work that's been done by the energy innovation clusters over the last 10 years.

594
01:43:24.280 --> 01:43:37.029
Jason Anderson, Cleantech San Diego: and really understand how that can be tapped into to advance not only what I think is trying to be done here on the grid tech side of things, but really more broadly on all of the strategic objectives.

595
01:43:37.030 --> 01:43:49.269
Jason Anderson, Cleantech San Diego: If you look back at what the CPUC acknowledged in its proposed decision, there was definitely an acknowledgement of the work that we're doing on the ground to support innovation throughout the state.

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01:43:49.270 --> 01:43:57.220
Jason Anderson, Cleantech San Diego: And while they don't call that out as a specific funding strategy, definitely note that it could be tied to all the goals and objectives

597
01:43:57.220 --> 01:44:10.429
Jason Anderson, Cleantech San Diego: of what the CEC is doing as part of Epic 5. So, we know, you know, we are an established program, we're nimble, we're proven, we have relationships with IOUs, we have relationships with other LSEs up and down the state.

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01:44:10.430 --> 01:44:19.319
Jason Anderson, Cleantech San Diego: And so I would just say that think about this and the role that the regional energy innovation clusters have played over the last 10 years.

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01:44:19.320 --> 01:44:38.859
Jason Anderson, Cleantech San Diego: how they can continue to advance all the objectives that are being presented by the CEC today, as opposed to just on the grid tech side, because I think there's a need there. There's a lot of conversation this morning about research, but I think we really need to focus on development and deployment, and obviously energy entrepreneurs up and down the state play a key role in that.

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01:44:38.860 --> 01:44:44.129
Jason Anderson, Cleantech San Diego: And really, just to emphasize that kind of where there's so much uncertainty at the federal level.

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01:44:44.370 --> 01:44:59.159
Jason Anderson, Cleantech San Diego: we have to maintain leadership here in California on the innovation

side, and I truly believe that these energy innovation clusters are a key part of that in helping our state meet its energy, its climate goals, its equity goals, really tackling affordability.

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01:44:59.160 --> 01:45:14.860
Jason Anderson, Cleantech San Diego: And so I encourage you, as you move forward with this, to not just think about an incubator that is just focused on grid tech, but one that is more broadly focused on all the objectives and the technology areas that are identified as part of the implementation plan. Thank you.

603
01:45:19.420 --> 01:45:21.350
Anthony Ng: Yeah, thanks, Jason, thanks for the comments.

604
01:45:22.230 --> 01:45:34.770
Anthony Ng: Okay, so yeah, I see a lot of comments, but we're… so we'll go to Edson and then Samaritan, and then we'll… we'll move on from there, just to keep the… the, presentation going, but yeah, I encourage folks to…

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01:45:34.780 --> 01:45:42.479
Anthony Ng: Drop questions into the chat, and then, as again, reminder, we'll have a question and answer and feedback period at the end after the presentations as well.

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01:45:42.510 --> 01:45:43.919
Anthony Ng: But yeah, let's go to Edson.

607
01:45:47.400 --> 01:45:48.080
Edson Perez: Alright.

608
01:45:48.130 --> 01:46:04.219
Edson Perez: Thank you. Hi, my name is Edson Perez. I'm a co-founder of Parawat Energy. It's a startup based out of Berkeley, and we're developing, new soft magnetic materials, or electromagnetic materials. And so, I wanted to make two quick points. One is to

609
01:46:04.240 --> 01:46:12.980
Edson Perez: really uplift the importance of the technology we're developing within the context of this topic and others, and I also had a quick question about the scope, too.

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01:46:13.310 --> 01:46:28.550
Edson Perez: So first, I wanted to support the focus on solid-state transformers as bridging solutions, as was presented, given their ability to really turn passive interconnection points into actively controlled points that can support dynamic

611
01:46:28.630 --> 01:46:33.539
Edson Perez: dynamic control of the load. Now, one…

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01:46:33.720 --> 01:46:43.739
Edson Perez: issue in technologies like… in power electronics technologies, like solid-state transformers, is that they're often bottlenecked in their performance by the magnetic cores inside of them.

613
01:46:43.850 --> 01:46:50.610
Edson Perez: Especially as wideband gap semiconductors are increasingly adopted to make these power electronics more efficient.

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01:46:50.610 --> 01:47:07.180
Edson Perez: the legacy magnetic materials just can't keep up with these new semiconductors and limit how efficient they can be. So that's what we're working on at ParaWatt, a new class of magnetic materials. We're working with India National Labs on this, and we're looking to test with systems like solid-state transformers.

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01:47:07.180 --> 01:47:19.670
Edson Perez: later this year, or early next year. So, wanted to uplift the importance of technology development within systems like Solace Transformers. And so, my related question is… is about the…

616
01:47:19.770 --> 01:47:21.340
Edson Perez: the scope of…

617
01:47:21.570 --> 01:47:38.010
Edson Perez: this proposed activity, it mentioned technology development on bridging solutions, like solid-state transformers, so curious if that would involve, like, what the scope of that would be, I guess, in terms of technology development of these kinds of hardware technologies.

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01:47:38.310 --> 01:47:39.670
Edson Perez: That's it, thank you.

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01:47:40.740 --> 01:48:01.740
Ben Wender: Yeah, thank you, Edson. I'll quickly say, you know, we're broadly interested across a range of technology readiness levels and stages of innovation, and so, you know, earlier stage, you know, core materials advances, validating them in, you know, prototypes, very much of interest all the way through.

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01:48:01.790 --> 01:48:12.580
Ben Wender: you know, operational demonstrations in, you know, targeted customer environments. So, sounds like great work, and I hope you submit some comments. Would love to learn more about what you're up to.

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01:48:13.560 --> 01:48:15.520
Edson Perez: Awesome. Will do. Yeah, thank you.

622
01:48:18.180 --> 01:48:29.280
Anthony Ng: Thanks, Edson. Okay, so we'll go to Submariner. It'll be our last, comment for this portion, and then we'll move on here. So again, encourage folks to drop in questions into the chat as well.

623
01:48:29.380 --> 01:48:30.490
Anthony Ng: So, Samir?

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01:48:33.000 --> 01:48:47.469
Subramanian Shastri: Sorry about my full name, sorry about my full name, you can call me Ben Kite. I'm a professor here in the University of San Diego. I work with Jason and Cleantech and, Scott Anders. We are, USD is a partner organization.

625
01:48:47.540 --> 01:48:59.419
Subramanian Shastri: Over the last 10 years on what cleantech has done regionally here with the energy innovation clusters. I want to echo what they said, but also want to add the following, which is that

626
01:48:59.630 --> 01:49:08.820
Subramanian Shastri: It's not just the services, it's also a set of processes that we have developed where we help small companies understand

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01:49:08.880 --> 01:49:14.250
Subramanian Shastri: How to vector the products they build into being something useful in pilots.

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01:49:14.250 --> 01:49:37.559
Subramanian Shastri: So it's not just the connection, it's not just the… it's not just the services, it's a legacy that we have, that we bring in over the last decade that we have developed, that really help small companies do better in terms of working in the pilots, either with an institution or with a company, or with the IOU. So, and it's cross-cutting across all of these priorities, so I would echo what

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01:49:37.610 --> 01:49:43.169
Subramanian Shastri: Jason and Scott said, and say that it would really be helpful to think of what

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01:49:43.260 --> 01:49:50.900
Subramanian Shastri: the clusters are doing as something that's cross-cutting across all the priorities instead of being, you know, in one or the other. Thank you.

631
01:49:54.040 --> 01:49:55.540
Anthony Ng: Great, thank you for the feedback.

632
01:49:56.040 --> 01:50:09.290
Anthony Ng: Okay, so we're gonna have to move on just to, make sure we're having the opportunity to cover our topics here. Yeah, and again, encourage folks to submit, written feedback, to us as well. So, again, thank you so much for the…

633
01:50:09.460 --> 01:50:13.159
Anthony Ng: participation and encouragement, but yeah, and thanks, Ben and Lindsay.

634
01:50:13.630 --> 01:50:18.829
Anthony Ng: Okay, for now, let's move to our next initiative, and I'll hand it to Lorraine.

635
01:50:23.060 --> 01:50:24.430
Lorraine Gonzalez: Hello, everyone.

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01:50:24.690 --> 01:50:30.949
Lorraine Gonzalez: Okay, so the next initiative we'll be proposing is called Community-led

637
01:50:31.160 --> 01:50:40.210
Lorraine Gonzalez: clean energy capacity building and research incubation for California Native American tribes and community-based organizations.

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01:50:43.000 --> 01:50:55.599
Lorraine Gonzalez: This initiative will create two coordinated incubators, one for tribes and one for CBOs, to help strengthen their role in California's clean energy research and demonstration ecosystem.

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01:50:56.160 --> 01:51:15.460
Lorraine Gonzalez: Both incubators will draw on the deep local expertise these groups already hold, and the program will address the structural access and resource barriers that have limited participation in clean energy projects, utility pilot processes, and state and federal energy proceedings.

640
01:51:16.110 --> 01:51:35.810
Lorraine Gonzalez: The incubators will provide multi-year training, mentorship, technical assistance, and partnership development. Together, these activities will help communities shape early research concepts, update their energy priorities and plans, and prepare for participation in clean energy demonstrations.

641
01:51:36.180 --> 01:51:46.739
Lorraine Gonzalez: Over time, these support systems will help improve affordability, reliability, and environmental outcomes for IOU ratepayers. Next slide, please.

642
01:51:50.560 --> 01:51:58.880
Lorraine Gonzalez: For the Tribal Energy Incubator, the focus will be on sovereignty-centered long-term energy governance capacity.

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01:51:59.050 --> 01:52:09.599
Lorraine Gonzalez: Tribes will participate in multi-module training covering topics such as energy systems, markets, regulation, microgrids, storage, and siting.

644
01:52:09.920 --> 01:52:13.709
Lorraine Gonzalez: Each tribe would be paired with a dual mentor team.

645
01:52:13.830 --> 01:52:26.650
Lorraine Gonzalez: Consisting of an experienced tribal energy manager, as well as a technical or regulatory mentor. Tribes would also receive technical assistance for early concept development.

646
01:52:26.650 --> 01:52:34.430
Lorraine Gonzalez: And feasibility exploration, as well as experiential learning through site visits to successful tribal projects.

647
01:52:34.910 --> 01:52:48.039

Lorraine Gonzalez: Through these activities, tribes will be able to refine their energy priorities, strengthen their planning and permitting capacity, and build readiness for state and federal clean energy funding opportunities.

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01:52:48.490 --> 01:52:58.029
Lorraine Gonzalez: Ultimately, this will support improved siding, reduce project risks, and expand tribal leadership in clean energy demonstrations.

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01:52:58.640 --> 01:52:59.650
Lorraine Gonzalez: Next slide.

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01:53:03.700 --> 01:53:13.249
Lorraine Gonzalez: The CBO Incubator will follow a similar multi-year structure, but will be tailored to environmental and social justice communities.

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01:53:13.260 --> 01:53:26.640
Lorraine Gonzalez: CBOs will receive foundational clean energy training, tool mentorship, technical assistance, and structured partnership development with utilities, researchers, and local institutions.

652
01:53:26.870 --> 01:53:40.300
Lorraine Gonzalez: This support will help CBOs evaluate emerging technologies, develop community-driven research concepts, and participate more effectively in regulatory processes and demonstration planning.

653
01:53:40.890 --> 01:53:49.040
Lorraine Gonzalez: As the program progresses, CBOs will gain greater readiness to engage in federal and state funding opportunities.

654
01:53:49.040 --> 01:54:04.410
Lorraine Gonzalez: and demonstration partnerships. Their involvement will lead to stronger community engagement, better siting and technology fit, and improved affordability, reliability, resilience, and environmental outcomes for IOU peers.

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01:54:06.360 --> 01:54:13.079
Lorraine Gonzalez: Okay, and that's it for this one. Happy to answer any questions here.

656
01:54:17.340 --> 01:54:18.959
Anthony Ng: Great. Thank you, Lorraine.

657
01:54:19.310 --> 01:54:30.500
Anthony Ng: Okay, yeah, move to our feedback period here. Same instructions, please use the raised hand function, or drop a note in the Q&A session here. So, yeah, let's go to Josh.

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01:54:32.710 --> 01:54:41.780
Josh Simmons: Thank you. Yeah, exciting to see this. I appreciate the consideration of this for California tribes.

659
01:54:42.050 --> 01:54:46.240
Josh Simmons: I just, you know, want to make sure that…

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01:54:46.700 --> 01:54:58.150
Josh Simmons: You know, in the tribal category that, you know, tribal consortia are also eligible, as a means by which, you know, several tribes can work together and build out

661
01:54:58.790 --> 01:55:00.610
Josh Simmons: this programming?

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01:55:00.970 --> 01:55:15.190
Josh Simmons: In addition to the proposed training capacity building investments that were shared, which absolutely, you know, are along the lines of what I was… been advocating for in all… on all these areas, I think this kind of

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01:55:15.310 --> 01:55:20.729
Josh Simmons: covers it, you know, going back to, I think, the last topic, too, you know, I think it's…

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01:55:21.850 --> 01:55:35.369
Josh Simmons: that there also be funding for… for tribes themselves to be, you know, to have an accelerator incubator program like Cleantech San Diego, like LAC, focused specifically for tribes that

665
01:55:35.600 --> 01:55:49.830
Josh Simmons: You know, can be in the position, not just kind of building capacity, getting training, but are also helping facilitate, partnerships, pilots, demonstrations, investments in these businesses that… that can capitalize on the unique

666
01:55:49.910 --> 01:55:58.829
Josh Simmons: opportunities and resources and, you know, and challenges, that, that tribes present. And I think, you know, tribes

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01:55:58.880 --> 01:56:01.309
Josh Simmons: Tribes are, you know, tribes are…

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01:56:01.320 --> 01:56:11.410
Josh Simmons: potentially on a per capita basis are, I think, deploying clean energy technologies and solutions, I think, at a greater rate than perhaps the rest of California through

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01:56:11.410 --> 01:56:34.059
Josh Simmons: you know, through projects supported by CEC and EPIC funds, and so, you know, I think there's a mutually beneficial opportunity here, both for tribes and for the state to advance these solutions, advance these priorities in ways that also are going to help advance tribal energy

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01:56:34.750 --> 01:56:42.429
Josh Simmons: you know, self-sufficiency and economic investments and workforce development, so on and

so forth. So, thank you.

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01:56:43.370 --> 01:56:54.240
Lorraine Gonzalez: Thank you, Josh. Just a follow-up question, if I'm understanding correctly, you're advocating for the ability for tribes to be the administrators of this program, is that correct?

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01:56:55.260 --> 01:57:05.909
Josh Simmons: Yeah, I guess it's hard to see what the program looks like, itself, but I mean, there's some, you know, the tech's innovation ecosystem is…

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01:57:06.030 --> 01:57:25.090
Josh Simmons: doing some of this right now already. So, you know, SETCA, Southern California Tribal Chairman Association, is a 501c3 whose board is made up of the 26 member tribes throughout Southern California, and so, you know, there is some infrastructure in place that is, you know, funded

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01:57:25.200 --> 01:57:45.189
Josh Simmons: through the state right now, originally was funded with the National Science Foundation Regional Innovation Engines Grant that got clawed back, focused, I think, particularly on this. And so, you know, to be able to do this, that, you know, provides training, capacity-building activities, but also can facilitate

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01:57:45.620 --> 01:58:00.150
Josh Simmons: you know, pilots, demonstration projects, partnerships, investments, so on and so forth, would, I think, you know, help us to kind of build out and continue to maintain this complete ecosystem that is partnering with

676
01:58:00.150 --> 01:58:09.980
Josh Simmons: With, other, other organizations throughout the state, like the universities, like the, the other accelerator incubators, non-tribal specific ones.

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01:58:11.440 --> 01:58:13.419
Lorraine Gonzalez: Thank you. Thanks for the feedback.

678
01:58:14.500 --> 01:58:15.640
Josh Simmons: Thank you, exciting.

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01:58:16.940 --> 01:58:17.800
Anthony Ng: Thanks, Josh.

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01:58:18.390 --> 01:58:20.349
Anthony Ng: Okay, let's go to Maya.

681
01:58:21.460 --> 01:58:22.930
Anthony Ng: Maya, go ahead.

682

01:58:24.970 --> 01:58:34.039
Maia Cheli: Hi, this is Maya Kelly from the Schatz Energy Research Center. Just thank you all so much. It's really exciting to see this. You know, obviously we've been talking about

683
01:58:34.670 --> 01:58:40.759
Maia Cheli: Having incubators and, tribal capacity support, programs like this for a long time.

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01:58:41.140 --> 01:58:54.420
Maia Cheli: I'm just curious, because it sounds like we're talking in the singular about an incubator, and when we were working on the, what was at that time, the CTERRA application, with the Energy Commission under the GRIP one round.

685
01:58:54.720 --> 01:58:58.070
Maia Cheli: One of the challenges that we were trying to understand

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01:58:58.210 --> 01:59:02.350
Maia Cheli: Was how to support tribes across the vastness of the state.

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01:59:02.500 --> 01:59:21.480
Maia Cheli: And recognizing that there are, really different ecosystems, both, you know, biologically, but also, culturally. For example, here on the North Coast, in the Central Valley, in the Central Coast, and then in the area that, Josh's group has been serving and supporting.

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01:59:21.520 --> 01:59:26.180
Maia Cheli: And so I'm wondering if there has been thought given to how to…

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01:59:26.230 --> 01:59:28.730
Maia Cheli: Support that balance across the state.

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01:59:29.030 --> 01:59:32.089
Maia Cheli: Meaningfully within the context of this incubator.

691
01:59:32.820 --> 01:59:39.669
Lorraine Gonzalez: Thank you. Thanks for that feedback. I think we can definitely take, geographic diversity into consideration.

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01:59:41.360 --> 01:59:45.690
Maia Cheli: Okay, thanks, and if you have follow-up related to that,

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01:59:45.960 --> 01:59:50.400
Maia Cheli: Would love to engage with you in that conversation about how that might be viable,

694
01:59:50.500 --> 02:00:01.399
Maia Cheli: Rather than, asking any technical team, or, tribal consortium to carry the sort of burden of knowledge for the entire state.

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02:00:01.510 --> 02:00:02.909
Maia Cheli: So, thank you.

696
02:00:02.910 --> 02:00:03.820
Lorraine Gonzalez: Thank you so much.

697
02:00:06.080 --> 02:00:08.830
Anthony Ng: Yeah, thank you very much. Okay, go to Jamie.

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02:00:09.480 --> 02:00:10.600
Anthony Ng: Amy, go ahead.

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02:00:12.060 --> 02:00:34.969
Jamie Garrett: Hi, my name is Jamie Garrett. I'm the owner of Trellis Strategy. I serve as a technical advisor to startups participating in the Cleantech San Diego Scene Program, and is a strategic partner helping those companies identify and execute pilots, programs, and partnerships that accelerate market entry. Lauren, I just had a question about what you intend or envision with the CBOs. Is it

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02:00:34.970 --> 02:00:37.949
Jamie Garrett: Is it mostly for project deployment, or…

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02:00:38.300 --> 02:00:40.079
Jamie Garrett: Yeah, what was your intention?

702
02:00:40.930 --> 02:00:44.080
Jamie Garrett: When describing CBOs in relation to the priorities.

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02:00:45.250 --> 02:00:51.290
Lorraine Gonzalez: Sure, so I think the intention would be, providing,

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02:00:52.300 --> 02:01:02.570
Lorraine Gonzalez: A few different, types of opportunities, which would include, additional training modules for energy,

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02:01:02.700 --> 02:01:12.809
Lorraine Gonzalez: Topics, and then, kind of, having a mentorship program as well, but allowing CBOs to…

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02:01:12.950 --> 02:01:23.749
Lorraine Gonzalez: Be able to be trained in certain energy topics so that they could also go out into the communities and be, like, trusted ambassadors,

707
02:01:23.840 --> 02:01:43.110
Lorraine Gonzalez: Have, kind of, community engagement, and get the communities on board, and start

scoping out project locations and, ideas, so that when funding opportunities come up, that the community is already engaged and knowledgeable and trusting.

708
02:01:43.210 --> 02:01:45.499
Lorraine Gonzalez: Some of these opportunities.

709
02:01:46.390 --> 02:01:58.700
Jamie Garrett: Thank you, that makes a lot of sense. And yeah, to that response, I just also wanted to echo some of the previous comments regarding the continued support of the regional energy innovation clusters. Again.

710
02:01:58.940 --> 02:02:16.529
Jamie Garrett: they're very well established and have a great reputation within the regional ecosystems they serve, including with CBOs. Their reach is very significant and continues to grow, expanding access to partners, pilots, and capital across the region. And…

711
02:02:16.530 --> 02:02:22.830
Jamie Garrett: Leveraging the existing regional innovation clusters will allow these,

712
02:02:23.110 --> 02:02:27.560
Jamie Garrett: newer, communicated CEC initiatives to be successful, I think.

713
02:02:27.560 --> 02:02:51.630
Jamie Garrett: more successful and more immediately successful, and by connecting startups… by continuing to connect startups with CBOs, tribes, private contractors, utilities, investors, public agencies, labor, and academia, the regional energy innovation clusters actively move technologies from concept to implementation and help ensure alignment with grid needs and integration strategies.

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02:02:51.870 --> 02:03:02.920
Jamie Garrett: And what I've found is with the open cross-sector engagement that they're very successful in doing, they discourage the siloed and stagnant thinking across all of these industry partners.

715
02:03:03.020 --> 02:03:20.590
Jamie Garrett: The funding from the CEC has allowed these regional energy innovation clusters to meet the startup companies where they are and deliver tailored, timely support without requiring, in some cases, fees or any equity from the founders, who are already resource constrained.

716
02:03:20.590 --> 02:03:44.149
Jamie Garrett: Finally, with regard to some of the newer priorities, or ever-evolving priorities of CEC, the regional energy innovation clusters are not just seen as support programs, they are direct implementers of the state's innovation agenda, advancing priorities like transportation, electrification, building decarbonization, and grid resiliency through real projects and partnerships.

717
02:03:44.230 --> 02:03:57.779
Jamie Garrett: So, just wanted to express that we hope that the CEC will continue considering these existing energy innovation clusters, when they move forward with their investment plan. Thank you.

718
02:03:58.630 --> 02:04:00.589
Lorraine Gonzalez: Thank you very much for your feedback.

719
02:04:02.180 --> 02:04:03.219
Anthony Ng: Yes, thanks, Jamie.

720
02:04:05.460 --> 02:04:14.140
Anthony Ng: Okay, so let's move on. A quick, just kind of time check here. I know we're, running longer than our,

721
02:04:14.140 --> 02:04:27.700
Anthony Ng: scheduled time, but we're gonna keep the workshop going until we, you know, cover all of our topics and get the feedback, the discussion, and the comments has been really valuable thus far. We'll do Building DCARB next, and then we'll take a break.

722
02:04:27.730 --> 02:04:31.880
Anthony Ng: For a little bit, and then… and then we'll finish up here with our…

723
02:04:32.070 --> 02:04:41.930
Anthony Ng: last two, goal areas. So, this could be the plan for, kind of, the rest of the workshop here. But again, really appreciate everybody's feedback, and comments thus far.

724
02:04:42.430 --> 02:04:46.689
Anthony Ng: But for now, yeah, I'll hand it to Jackson to cover building decarbonization.

725
02:04:47.740 --> 02:04:51.109
Jackson Thach: Thanks, Anthony. Hi, everyone. My name is Jackson Thatch.

726
02:04:51.330 --> 02:05:00.459
Jackson Thach: I'm a mechanical engineer in the Building Decarbonization Unit, and I am here to talk about the initiative, Innovative Approaches to Building and Community Scale Decarbonization.

727
02:05:01.190 --> 02:05:15.380
Jackson Thach: So this initiative responds to the challenge that despite being a significant source of greenhouse gas emissions and grid stress, California does not yet have cost-effective or widely scalable pathways to decarbonize buildings and entire communities

728
02:05:15.530 --> 02:05:22.469
Jackson Thach: In a way that maintains affordability, reliability, and equitable access for ratepayers across building types.

729
02:05:23.070 --> 02:05:31.120
Jackson Thach: So I'll be going over our four research topics in the following slides that should realize benefits that include reducing total electrification and retrofit costs.

730
02:05:31.320 --> 02:05:36.359
Jackson Thach: Improving indoor air quality and climate resilience. And enhancing grid stability and low flexibility.

731
02:05:36.900 --> 02:05:37.990
Jackson Thach: Next slide, please.

732
02:05:41.960 --> 02:05:48.849
Jackson Thach: So the first topic I will be going over is called Advancing Affordable Building Electrification Systems for Residential Homes.

733
02:05:49.560 --> 02:06:01.399
Jackson Thach: Building electrification remains difficult, especially for low-income, multifamily, and hard-to-electrify communities due to electrical panel constraints, high upfront costs, and installation complexity.

734
02:06:01.990 --> 02:06:18.639
Jackson Thach: These projects will focus on advancing low-power electrification systems, including 120-volt HVAC, heat pump water heaters, integrated HVAC and control systems, and plug-and-play distributed energy resources solutions that reduce the need for costly panel upgrades.

735
02:06:19.910 --> 02:06:26.760
Jackson Thach: Additionally, 240V each pack and heat pump water heating systems still require innovation to improve performance.

736
02:06:26.890 --> 02:06:30.969
Jackson Thach: Reduce emissions, and expand deployment through advances in refrigerants.

737
02:06:31.120 --> 02:06:35.229
Jackson Thach: System components, air distribution, and climate resilience.

738
02:06:36.320 --> 02:06:47.800
Jackson Thach: These projects may include real-world demonstrations in homes and communities, validating next-generation technologies, improving performance and usability, and testing solutions in under-resourced and renter communities.

739
02:06:48.850 --> 02:06:59.060
Jackson Thach: With the collaboration of partners and administrators such as CalMTA, we will aim to pilot deployments and field demonstrations that generate real-world performance data

740
02:06:59.170 --> 02:07:04.009
Jackson Thach: And identify opportunities to reduce electrification and installation costs.

741
02:07:04.910 --> 02:07:17.120
Jackson Thach: We hope to showcase solutions that lowers upfront costs, expands access to high-efficiency electric technologies, reduces energy bills, and improves grid reliability through low flexibility and peak

demand reduction.

742
02:07:17.810 --> 02:07:27.920
Jackson Thach: If successful, these systems will lead to widespread adoption that delivers sustained repayer benefits through avoided infrastructure upgrade costs.

743
02:07:28.140 --> 02:07:32.220
Jackson Thach: Long-term cost savings, and improved grid reliability.

744
02:07:33.180 --> 02:07:42.689
Jackson Thach: Overall, this work aims to make electrification more affordable and accessible while improving indoor air quality, comfort, and energy reliability.

745
02:07:43.150 --> 02:07:52.579
Jackson Thach: By partnering with community-based organizations and tribal governments, the projects ensure that solutions are shaped by community needs and deliver meaningful local benefits.

746
02:07:53.310 --> 02:07:54.420
Jackson Thach: Next slide, please.

747
02:07:57.800 --> 02:08:01.280
Jackson Thach: So, the second topic is, whole home retrofit solutions.

748
02:08:01.570 --> 02:08:08.789
Jackson Thach: More than half of California homes were built before energy codes, resulting in energy loss through poorly performing building envelopes.

749
02:08:09.420 --> 02:08:15.800
Jackson Thach: Retrofitting building envelopes would greatly improve its performance, but these retrofits are costly and disruptive.

750
02:08:16.110 --> 02:08:25.530
Jackson Thach: For the rental community, additional challenges include the landlord-renter split incentive and limited access to renter-friendly envelope retrofit solutions.

751
02:08:27.040 --> 02:08:30.799
Jackson Thach: This topic aims to develop and demonstrate whole home retrofit solutions.

752
02:08:30.960 --> 02:08:41.740
Jackson Thach: The solutions could include non-destructive diagnostic tools, renter-friendly retrofit solutions, and business models that address split incentives between landlords and tenants.

753
02:08:42.400 --> 02:08:57.560
Jackson Thach: Project demonstration sites could have emphasis on rental, low-income, disadvantaged, multifamily, or tribal communities, measuring impacts through energy use, bill savings, load reduction,

occupant comfort, and satisfaction.

754
02:08:58.750 --> 02:09:05.250
Jackson Thach: Ideally, results will show a clear path from research to deployment, with expanded workforce and contractor adoption.

755
02:09:05.350 --> 02:09:11.519
Jackson Thach: Lower electrification costs, Better access for low-income renters, And fewer deployment barriers.

756
02:09:12.250 --> 02:09:14.800
Jackson Thach: This should lead to cheaper retrofits.

757
02:09:15.080 --> 02:09:18.540
Jackson Thach: better building performance, reduce HVAC loads.

758
02:09:18.750 --> 02:09:21.110
Jackson Thach: And greater electrification and rental housing.

759
02:09:21.910 --> 02:09:26.450
Jackson Thach: Successful projects will lead to scalable full-building or community-scale retrofit markets.

760
02:09:26.650 --> 02:09:30.300
Jackson Thach: And broad participation in rental housing and statewide decarbonization.

761
02:09:31.530 --> 02:09:32.639
Jackson Thach: Next slide, please.

762
02:09:35.820 --> 02:09:38.720
Jackson Thach: So the next topic is neighborhood-level decarbonization.

763
02:09:39.160 --> 02:09:48.200
Jackson Thach: California's current building-by-building electrification approach is not enough to look to efficiency, to efficiently decarbonize entire neighborhoods.

764
02:09:48.620 --> 02:09:55.169
Jackson Thach: Without coordination, We risk increasing peak electric demand, And driving costly grid upgrades.

765
02:09:55.790 --> 02:10:03.619
Jackson Thach: This topic explores integrated neighborhood-scale solutions that combine community thermal energy networks Shared Central Plants.

766
02:10:03.750 --> 02:10:15.949

Jackson Thach: And coordinated distributed energy resources to better manage energy across multi-family buildings, small businesses, campuses, tribal communities, and mixed-use districts.

767
02:10:17.140 --> 02:10:22.759
Jackson Thach: Through real-world demonstrations, this research will evaluate how these systems can reduce peak demand.

768
02:10:22.940 --> 02:10:26.259
Jackson Thach: Improve resilience during public safety power shutoff events.

769
02:10:26.380 --> 02:10:30.750
Jackson Thach: Reuse waste heat, and defer distribution infrastructure investments.

770
02:10:31.360 --> 02:10:42.620
Jackson Thach: The goal is to develop scalable, data-driven neighborhood decarbonization models that improve affordability, strengthen grid reliability, and support California's long-term climate and energy goals.

771
02:10:44.240 --> 02:10:45.380
Jackson Thach: Next slide, please.

772
02:10:48.330 --> 02:10:52.809
Jackson Thach: So, finally, the last topic I will present is difficult to decarbonize commercial buildings.

773
02:10:53.110 --> 02:11:05.469
Jackson Thach: The large commercial buildings, such as hospitals and educational facilities, and light industrial buildings, like food processing, laundries, and distribution centers, face a major gap.

774
02:11:06.090 --> 02:11:16.059
Jackson Thach: They lack integrated, low-GWP thermal systems, and current solutions keep HVAC, hot water, refrigeration, and process heat operating in silos.

775
02:11:16.250 --> 02:11:20.330
Jackson Thach: There's also very little R&D that bridges commercial and industrial adjacent needs.

776
02:11:20.990 --> 02:11:32.929
Jackson Thach: In coordination with the cost-effective industrial decarbonization initiative team that we'll present later, our proposed research develops and validates advanced heat pumps and low GWP refrigeration with heat recovery.

777
02:11:33.050 --> 02:11:37.719
Jackson Thach: And then demonstrates these integrated systems in representative high-load facilities.

778
02:11:38.190 --> 02:11:44.809
Jackson Thach: The research can also generate open performance data and provide scalable retrofit and design guidance.

779
02:11:46.010 --> 02:11:50.240
Jackson Thach: Targeted outcomes include clear reductions and peak load-in emissions.

780
02:11:50.490 --> 02:11:55.279
Jackson Thach: Replicable retrofit packages for complex commercial and industrial sectors.

781
02:11:55.420 --> 02:12:00.499
Jackson Thach: An accelerated commercialization of advanced thermal recovery and heat pump technologies.

782
02:12:00.890 --> 02:12:02.129
Jackson Thach: Next slide, please.

783
02:12:04.140 --> 02:12:09.370
Jackson Thach: So, that's all I got for you guys, and I am… thank you for your time, and I'm available for any questions.

784
02:12:11.840 --> 02:12:28.089
Anthony Ng: Thanks so much, Jackson. Yeah, we'll go to feedback on the building decarbonization topics. So yeah, again, please use the raise hand function, or drop a question in the Q&A. All right, let's go to Alex. Go ahead, Alex.

785
02:12:32.170 --> 02:12:34.000
Alex Ferrarese (ReMo Homes): Alright, can you hear me okay?

786
02:12:34.190 --> 02:12:34.960
Anthony Ng: Yes.

787
02:12:35.410 --> 02:12:51.519
Alex Ferrarese (ReMo Homes): Thank you very much. Okay, so, good morning, everyone. My name is Alex, I'm speaking on behalf of Remo Homes. Thank you for the opportunity to provide this input. Clean energy upgrades are often still delivered one project at a time through fragmented site-by-site construction.

788
02:12:51.560 --> 02:13:02.830
Alex Ferrarese (ReMo Homes): That makes solar, batteries, heat pumps, high-performance windows, insulation, cool roofs, EV charging, wildfire resilience, and other systems more expensive and harder to scale.

789
02:13:02.860 --> 02:13:07.630
Alex Ferrarese (ReMo Homes): We believe that zero-carbon modular housing gives California a better path.

790
02:13:07.630 --> 02:13:23.659
Alex Ferrarese (ReMo Homes): By integrating these systems in a factory setting, the state can standardize clean energy deployment, reduce field labor, improve quality control, and lower soft costs, especially on

smaller projects. That matters across single-family, multifamily, tribal, affordable workforce, and retrofit applications.

791
02:13:23.820 --> 02:13:27.100
Alex Ferrarese (ReMo Homes): This is also about the people building the homes as well.

792
02:13:27.100 --> 02:13:45.360
Alex Ferrarese (ReMo Homes): So, construction is really hard, skilled work. It means long commutes, long hours in the sun, long days away from family. Factory-built housing can offer safer, more predictable work, shade, air conditioning, a reliable commute, and getting home in time for dinner with the kids. That should be a part of California's clean energy strategy, too, we think.

793
02:13:46.500 --> 02:14:06.400
Alex Ferrarese (ReMo Homes): Epic should treat zero-carbon modular housing as a high-value ratepayer investment because it can reduce the cost of deploying clean energy tech while scaling them across California's housing market. Factory integration can help move the state toward lower installed cost benchmarks already seen in other markets, including solar near $1 per watt, and battery storage near $650 per kilowatt hour.

794
02:14:06.440 --> 02:14:16.279
Alex Ferrarese (ReMo Homes): We believe that's epic at its best, not just funding new tech, but also helping it reach real communities with clean energy, resilience, affordability, and worker well-being built in. Thanks.

795
02:14:18.730 --> 02:14:37.860
Jackson Thach: And thanks for your comment, Alex. Yeah, we've done research projects before with module clones, and we see the benefits there. I think that, you know, in regards to your feedback, I think it could fit into the second topic with whole-home retrofit solutions. So, but yeah, definitely we'll keep that in consideration, so thank you for your feedback.

796
02:14:37.860 --> 02:14:38.690
Alex Ferrarese (ReMo Homes): Thank you very much!

797
02:14:40.040 --> 02:14:42.749
Anthony Ng: Thank you, Alex. Okay, let's go to Stephanie.

798
02:14:43.370 --> 02:14:45.509
Anthony Ng: Stephanie, go ahead, you should be able to unmute yourself.

799
02:14:45.850 --> 02:14:51.260
STEPHANIE PINCETL: Thank you. I would like to compliment, CEC on the,

800
02:14:51.640 --> 02:15:01.580
STEPHANIE PINCETL: moved for whole home retrofits. I think that without doing that, we will be really wasting not only a lot of energy, but people will not be able to afford cooling.

801
02:15:01.580 --> 02:15:13.989

STEPHANIE PINCETL: And it will mitigate the amount of cooling that they will need. So I would like to really recommend… really reinforce that avenue for research. I also want to highlight a note I made in the chat

802
02:15:13.990 --> 02:15:18.400
STEPHANIE PINCETL: around the data access group that we facilitated for the PUC.

803
02:15:18.400 --> 02:15:27.800
STEPHANIE PINCETL: You will find a lot of echo in our recommendations about some of the DER information and platform that was discussed here.

804
02:15:27.800 --> 02:15:43.100
STEPHANIE PINCETL: The link is in the chat, and I also think that there's going to have to be a lot of negotiation between CEC and PUC around a lot of these initiatives, so I'm looking forward to that process as well. So thank you very much, and I will send written comments.

805
02:15:44.230 --> 02:15:45.020
STEPHANIE PINCETL: Thanks, Seth. Thanks, Seth.

806
02:15:45.020 --> 02:15:50.689
Anthony Ng: Stephanie, again, we did receive the link to the resources in the chat, so yeah, thank you again.

807
02:15:51.450 --> 02:15:53.700
Anthony Ng: Okay, let's go to Marty.

808
02:15:53.860 --> 02:15:56.560
Anthony Ng: Marty, go ahead, you should be able to mute yourself.

809
02:15:59.870 --> 02:16:01.049
Marty Turock: Hi, can you hear me?

810
02:16:01.610 --> 02:16:02.809
Jackson Thach: Yep, I can hear you, Marty.

811
02:16:02.810 --> 02:16:22.739
Marty Turock: Great, this is Marty Turok. I am currently a private clean energy consultant, and I'm actually working with a Southern California Energy Innovation Network member company that actually has a breakthrough technology in home water heaters. It's a 120 volt.

812
02:16:22.740 --> 02:16:44.360
Marty Turock: electric water heater that is affordable, costs no more than a gas water heater, and also can be aggregated into VPPs to provide load flexibility. So my comment or concern, as I've come up to speed in learning about this company's technology and guiding them.

813
02:16:44.360 --> 02:16:56.210
Marty Turock: to commercialization. I've seen that both in California and across the nation with the DOE,

there's just this, kind of 100% push for heat pump water heaters.

814
02:16:56.209 --> 02:17:15.759
Marty Turock: And again, from my experience in bringing new products to market, it's best to be technology agnostic. I think I even heard Jay Jackson potentially say heat pump water heaters, and so my caution or my advice, is to keep all of these programs technology agnostic.

815
02:17:15.760 --> 02:17:26.939
Marty Turock: So that you don't, write specifications or potentially eliminate technologies that actually are in a position to leapfrog some of the things that are currently out there.

816
02:17:28.410 --> 02:17:42.760
Jackson Thach: Yeah, thanks for that feedback, Marty. Yeah, I did mention heat pump water heaters, but I also mentioned water heating as more of a general high-level term, so that way it gives us some flexibility to not just be locked in with heat pump water heaters only. But, but yeah, thank you for your feedback, though.

817
02:17:43.590 --> 02:17:44.439
Marty Turock: Thank you.

818
02:17:46.000 --> 02:17:47.010
Anthony Ng: Thanks, Marty.

819
02:17:47.610 --> 02:17:50.579
Anthony Ng: Let's go to Chris, Chris Rush.

820
02:17:51.170 --> 02:17:52.609
Anthony Ng: Chris, go ahead.

821
02:17:53.510 --> 02:18:13.620
Chris Ruch: Yeah, good afternoon. Yeah, and I thank you for the opportunity to comment. My name is Christopher Rook, R-U-C-H, and I am speaking on behalf of Smart Local 104. We appreciate that the Epic 4 investment plan recognized the importance of workforce development, job creation, economic opportunity, and equitable participation in California's clean energy transition.

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02:18:13.709 --> 02:18:23.309
Chris Ruch: As the Commission develops Epic 5, we encourage you to build on that foundation by incorporating stronger workforce standards, accountability measures, and high-road workforce principles.

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02:18:23.430 --> 02:18:38.260
Chris Ruch: This recommendation is consistent with the discussions of the meeting that took place yesterday at the 2026 CEC EPRI Electrification Summit, where stakeholders emphasized that achieving California's ambitious electrification and decarbonization goals will not only

824
02:18:38.370 --> 02:18:46.959
Chris Ruch: Innovative… provide innovative technologies, but also a highly skilled workforce capable of

deploying, operating, and maintaining those technologies successful.

825
02:18:47.230 --> 02:19:07.129
Chris Ruch: It should be noted that this is also consistent with the findings of the recent Tech Clean California Workforce Education Training Evaluation of the ESMAC training requirement. That evaluation found introductory awareness training has value, but does not provide the hands-on instruction, competency, verification, technical assessment, other applied learning necessary.

826
02:19:07.129 --> 02:19:09.900
Chris Ruch: To develop installer-level proficiency.

827
02:19:10.680 --> 02:19:24.969
Chris Ruch: As the Commission continues to prioritize disadvantaged communities and its decarbonization efforts, it is equally important to recognize that equity is not achieved solely by deploying clean energy technologies in those communities.

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02:19:24.969 --> 02:19:36.189
Chris Ruch: If decarbonization plans do not address the underlying challenge of low wages, limited career advancement, and jobs that lack family supporting benefits, we risk missing a significant opportunity.

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02:19:36.190 --> 02:19:47.420
Chris Ruch: Clean energy investments should help create pathways into high-quality careers that allow workers and families in disadvantaged communities to fully participate and benefit from California's energy transition.

830
02:19:47.850 --> 02:20:12.149
Chris Ruch: Epic 5 should also expand access to these quality careers for women, veterans, disadvantaged, and underrepresented populations while supporting ongoing education and training aligned with the emergency clean energy technologies. By embedding these high-road workforce principles into project design and research and evaluation, the Commission can strengthen both the economic and environmental outcomes of California's clean energy

831
02:20:12.150 --> 02:20:18.600
Chris Ruch: Energy investments, while ensuring that our workforce quality remains a core component of program success.

832
02:20:18.600 --> 02:20:22.040
Chris Ruch: Thank you for your consideration, and I'll follow it up with written comments.

833
02:20:23.120 --> 02:20:26.770
Jackson Thach: Yeah, I appreciate your comment, Chris. Yeah, we, we, we've…

834
02:20:26.940 --> 02:20:37.479
Jackson Thach: recognize that one of our gaps during our earlier research is, you know, like, having specialized knowledge to be able to install these, you know, specialized technologies, so…

835

02:20:37.480 --> 02:20:47.350
Jackson Thach: Workforce training is definitely something that we've been, evaluating and including in our film of our Epic 4 research, and we continue… plan to continue to do so in Epic 5.

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02:20:50.890 --> 02:20:52.519
Anthony Ng: Great, yeah, thank you so much, Chris.

837
02:20:52.790 --> 02:20:55.270
Anthony Ng: Okay, let's move on to, Maya.

838
02:20:57.540 --> 02:21:06.479
Maia Cheli: Thanks so much, this is Maya Kelly from the Schatz Energy Research Center here again, up at Cal Poly Humboldt, on the North Coast, and I'm just specifying that because,

839
02:21:06.480 --> 02:21:18.279
Maia Cheli: Just a quick request to make sure to consider the regional differences when we're thinking about the building envelope needs and the current solutions that are being employed, and what triggered that thought was

840
02:21:18.280 --> 02:21:25.220
Maia Cheli: They comment about combustion, and that the needs in our remote rural communities that are depending on wood heat are different than

841
02:21:25.410 --> 02:21:37.009
Maia Cheli: For example, down on the, on the south coast. So as you're writing out those, parameters for the proposals, to make sure to include those factors in as well.

842
02:21:37.470 --> 02:21:39.429
Maia Cheli: Please, and thank you.

843
02:21:40.310 --> 02:21:46.989
Jackson Thach: Thanks, Amelia. Yeah, that's great feedback. We'll be sure to consider that as well when we move forward with these initiatives and topics.

844
02:21:50.410 --> 02:21:53.099
Anthony Ng: Thank you, Maya. Okay, let's go to Patrick Carter.

845
02:21:53.290 --> 02:21:54.130
Anthony Ng: Patrick?

846
02:21:55.070 --> 02:22:12.989
Patrick Carter: Hello, I am Patrick Carter, I work for the City of Paluma, and I just would like to advocate in the section about hard-to-decarb commercial buildings, municipal pools. They're a huge, use of gas with the gas boilers that are heating that water.

847

02:22:12.990 --> 02:22:23.169
Patrick Carter: One of the biggest gas uses in a municipality, and, didn't hear anything about that in one of the harder-to-carb. It mentioned office buildings and

848
02:22:23.180 --> 02:22:41.430
Patrick Carter: educational areas, but I imagine through the state, there's a lot of cities like ours that have gas boilers, and it's one of the biggest uses of gas in a municipality, and they're probably, getting near to the end of life, and it'd be great if we could replace those with a,

849
02:22:41.910 --> 02:22:47.039
Patrick Carter: a heating source that doesn't involve combustion of gas. That's all. Thanks.

850
02:22:47.990 --> 02:23:02.470
Jackson Thach: Hey, thanks, Patrick. So, yeah, so… so the difficulty decarbonize commercial buildings that we measured here is only a, I also mentioned that there's also a, the cost-effective industrial decarbonization initiative.

851
02:23:02.470 --> 02:23:11.050
Jackson Thach: that's gonna be presented later. I think that our scale is a little bit, might be a little bit on a different, on a different scale, but,

852
02:23:11.120 --> 02:23:28.459
Jackson Thach: But I would say stay tuned for later to hear the initiative later about the cost-effective industrial commoditization. And then if not, then, you know, we could always, coordinate, teams to be able to consider your suggestion as well. So thank you.

853
02:23:32.430 --> 02:23:33.850
Anthony Ng: Alright, thank you so much, Patrick.

854
02:23:36.120 --> 02:23:38.700
Anthony Ng: Okay, thanks, Jackson, very much.

855
02:23:40.470 --> 02:23:55.059
Anthony Ng: Okay, we're gonna take, just a bit of a break. I know it's been a marathon session this morning. We have a few more initiatives to go through, but really, again, thank you so much for, everybody's attention, the comments, and the discussion.

856
02:23:55.060 --> 02:24:03.189
Anthony Ng: thus far has been extremely valuable for our teams here. So, take a quick 10-minute break. It's, 11.55, so we'll resume at

857
02:24:03.290 --> 02:24:14.520
Anthony Ng: 12.05, with our next, we got 2 more goals and about 4 more initiatives to go through. So, again, thank you so much, and we'll take a… take a quick break here. We'll resume in 10 minutes. Thanks.

858
02:34:46.710 --> 02:35:00.720

Anthony Ng: Okay, welcome back, everybody. Got a bit of a stretch break in. Again, thank you so much for, continued attention and participation here. Again, really valuable feedback and discussions we've been having thus far.

859
02:35:00.980 --> 02:35:06.890
Anthony Ng: Okay, we're gonna continue on, we're gonna move on to our next set of…

860
02:35:07.480 --> 02:35:17.250
Anthony Ng: initiatives and topics in the Getting to 100% Net Zero Carbon and a Coordinator Roll of Gas goal. And so our first initiative, I'll hand it over to Julia.

861
02:35:18.170 --> 02:35:34.020
Julia Harnad: Thank you. Can everyone hear me fine? Yes. Great. Fantastic. My name is Julia Harnad, and I'm here to introduce, to you our initiative on advancing the clean energy transition while protecting communities and ecosystems. And we look forward to your feedback.

862
02:35:34.020 --> 02:35:42.689
Julia Harnad: So as we move forward to reach California's clean energy goals, community and environmental impacts need to be considered for optimal outcomes.

863
02:35:42.810 --> 02:35:58.990
Julia Harnad: The challenges in this space that we see include knowledge gaps with insufficient data and metrics to evaluate the positive and negative impacts of clean energy on human and health, as well as equity, and the environment and natural organisms.

864
02:35:59.270 --> 02:36:12.580
Julia Harnad: Associated with this, California often lacks effective mitigation strategies and tools to bridge the gap between best available science and decisions to support meeting our 100% clean energy goals.

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02:36:13.070 --> 02:36:30.360
Julia Harnad: The innovations proposed by this initiative are twofold. First, to support research to clarify the benefits and trade-offs of decarbonization on communities, public health, and air quality, and to develop mitigation solutions towards faster, more equitable

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02:36:30.360 --> 02:36:43.410
Julia Harnad: electrification. And secondly, to assess the environmental impacts of clean energy technologies and develop siting and mitigation strategies to enable more rapid and lower-cost clean energy development.

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02:36:44.330 --> 02:37:00.889
Julia Harnad: The two topics we propose in this initiative are advancing health and air quality research to inform building and transportation electrification in California, and innovation in clean energy environmental impact assessment and mitigation.

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02:37:01.460 --> 02:37:14.810
Julia Harnad: And these initiatives would benefit ratepayers by leveraging the clean energy transition to improve ratepayers' air quality and health outcomes, increasing equity while also reducing healthcare burdens and costs.

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02:37:15.120 --> 02:37:24.760
Julia Harnad: Accelerating clean energy deployment while reducing ratepayer costs and development-related risks, as well as conserving ecosystem services and species.

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02:37:24.910 --> 02:37:34.600
Julia Harnad: And increasing economic potential through dual-use clean energy operations, which respond to both energy and non-energy-related resource priorities.

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02:37:35.060 --> 02:37:42.470
Julia Harnad: I'll now pass it, over to my colleague Maninder Tin, to speak about our first topic, and thank you for advancing the slide.

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02:37:44.070 --> 02:37:45.300
Maninder Thind: Thank you, Julia.

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02:37:45.440 --> 02:38:00.780
Maninder Thind: Good afternoon, everyone. I'm Ananda Tind. I'm an A Resources Engineer, within the Sustainability and Health Research Unit at the Commission, and I'll talk about our, this topic under this broader,

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02:38:00.790 --> 02:38:15.019
Maninder Thind: initiative of advancing the clean energy transitions while protecting communities and ecosystems. So, this research topic, is titled, Advancing Health and Air Quality Research to Inform Building and Transportation Electrification in California.

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02:38:15.090 --> 02:38:26.620
Maninder Thind: As California accelerates electrification across buildings and transportation, electricity ratepayers are increasingly being asked to make decisions about clean energy technologies.

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02:38:26.980 --> 02:38:37.799
Maninder Thind: However, many still lack trusted, actionable information about the health, air quality, affordability, and broader community impacts of those choices.

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02:38:38.230 --> 02:38:57.039
Maninder Thind: At the same time, most planning and evaluation frameworks continue to focus primarily on energy savings and greenhouse gas reductions, leaving significant gaps in the data, metrics, and tools needed to assess and communicate the full benefits and trade-offs of electrification.

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02:38:57.540 --> 02:39:01.339
Maninder Thind: So this research topic, I think, is a priority because

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02:39:01.340 --> 02:39:24.929
Maninder Thind: Widespread adoption of clean electric technology depends not only on technology availability, but also on trusted assessments of the broader benefits and costs of adoption, and the effective sharing of that information to inform consumers and the public. And those are some of the factors

consistently emphasized by the community-based organizations with whom we routinely engage.

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02:39:25.100 --> 02:39:37.260
Maninder Thind: To ensure that our portfolio is responsive, to… to these gaps and concerns. So, the proposed topic builds on our Epic 4 investments,

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02:39:37.260 --> 02:39:47.610
Maninder Thind: That have previously and are generating indoor air quality data, evaluating the health implications of electrification, and advancing air quality sensors and models.

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02:39:47.950 --> 02:39:52.509
Maninder Thind: So the next step is to increase the value of these datasets.

883
02:39:52.650 --> 02:40:03.180
Maninder Thind: By linking them with health, affordability, and community outcomes, and translating the findings into actionable tools, applications, Dashboards.

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02:40:03.830 --> 02:40:09.139
Maninder Thind: And decision support resources for ratepayers, policymakers, and program administrators.

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02:40:09.600 --> 02:40:11.620
Maninder Thind: It also builds on,

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02:40:11.760 --> 02:40:30.759
Maninder Thind: feedback from community-based organizations and members of the Disadvantaged Communities Advisory Group, or DCAG, who have consistently emphasized that advancing science-based education, trusted information, and community engagement are critical to accelerating equitable adoption of clean energy technologies.

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02:40:31.460 --> 02:40:38.209
Maninder Thind: So this research would help address these gaps through Policy-relevant studies and practical tools.

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02:40:38.450 --> 02:40:52.440
Maninder Thind: Examples include conducting policy-relevant epidemiology studies, such as longitudinal and quasi-experimental analysis, to evaluate health outcomes before and after residential electrification.

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02:40:52.440 --> 02:40:59.780
Maninder Thind: As well as community-level studies assessing air quality and health improvements in areas with increasing electric vehicle adoption.

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02:41:00.050 --> 02:41:02.640
Maninder Thind: Particularly near the freight corridors.

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02:41:03.200 --> 02:41:19.630

Maninder Thind: Another focus is developing data analytics, public-facing tools or dashboards, and application-based filtration management tools that help translate air quality data into actionable information for households, utilities, and policy makers.

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02:41:20.450 --> 02:41:33.730
Maninder Thind: We also proposed research to quantify and monetize healthcare and ratepayer benefits, including exploring the relationship between electrification, healthcare utilization, and long-term cost savings.

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02:41:34.430 --> 02:41:45.719
Maninder Thind: So the expected outcome, is a stronger evidence base that helps ratepayers, policymakers, and program administrators make more informed electrification decisions.

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02:41:46.390 --> 02:41:51.760
Maninder Thind: In the near term, this includes standardized datasets and validated methods.

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02:41:52.180 --> 02:42:00.189
Maninder Thind: In the midterm, it includes integration of health and air quality metrics into programs, codes and incentives.

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02:42:00.680 --> 02:42:10.420
Maninder Thind: And in the long term, more cost-effective electrification pathways, reduced healthcare burdens, and improved targeting of ratepayer-funded investments.

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02:42:10.880 --> 02:42:16.809
Maninder Thind: Ultimately, the goal is to ensure California's clean energy transition delivers measurable health.

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02:42:16.950 --> 02:42:24.990
Maninder Thind: Air quality and affordability benefits to electricity rate payers while supporting equitable deployment across the communities.

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02:42:26.300 --> 02:42:32.110
Maninder Thind: So that concludes the overview of this topic. I hand over to Julia next to discuss the next topic.

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02:42:32.770 --> 02:42:50.559
Julia Harnad: Thanks, Minander. So our second topic within this initiative is innovation in clean energy environmental impact assessment and mitigation. To reach SB100's clean energy goals, California has to dramatically accelerate the build-out of renewable energy resources.

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02:42:50.560 --> 02:43:01.069
Julia Harnad: Especially solar and battery storage. And timely permitting and efficient environmental reviews are prerequisites for accelerating California's clean energy build-out.

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02:43:01.070 --> 02:43:10.819
Julia Harnad: So this topic addresses knowledge gaps on the lifecycle impacts of clean energy technologies

on California's environment and natural organisms.

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02:43:11.080 --> 02:43:20.249
Julia Harnad: Additionally, this topic also seeks to respond to the lack of environmental mitigation innovations necessary to maintain clean energy project timelines.

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02:43:21.200 --> 02:43:34.110
Julia Harnad: This EPIC-V topic includes advancing studies, data collection, and technology development that support environmental permitting, siting, construction, as well as operation activities

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02:43:34.110 --> 02:43:45.189
Julia Harnad: for clean energy build-outs. So, examples could include using machine learning, AI, networked sensors, drones, and or visual and acoustic sensors.

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02:43:45.480 --> 02:43:58.709
Julia Harnad: Another focus will be developing environmental mitigation solutions. For example, preventing interactions of sensitive species with clean energy facilities, or adapting facility operations to minimize risks.

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02:43:59.570 --> 02:44:16.639
Julia Harnad: A third research area will be investigating emerging dual-use clean energy production, solutions like agrivoltaics, photovoltaics, or solar over water, which not only produce clean energy, but simultaneously respond to landscape and resource level constraints and priorities.

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02:44:16.790 --> 02:44:29.080
Julia Harnad: And lastly, this research proposes to synthesize varied clean energy siting datasets, providing publicly available tools, which will streamline environmental reviews and accelerate clean energy siting.

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02:44:29.950 --> 02:44:48.439
Julia Harnad: The outcomes we can expect from supporting this topic include lowering risks and costs of clean energy project development and operations, shortening energization timelines through streamlined permitting processes, deploying clean energy projects more rapidly while also bolstering reliability.

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02:44:48.590 --> 02:45:04.050
Julia Harnad: Increasing economic potential and resource stewardship through dual-use energy production innovations, and overall, facilitating a sustainable, clean energy development, which protects valuable ecosystem services and biological resources.

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02:45:04.260 --> 02:45:09.249
Julia Harnad: That concludes our presentation on this initiative, and we are open to questions.

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02:45:12.370 --> 02:45:24.679
Anthony Ng: Great, thank you so much, Julia and Maninder. Okay, opening the floor back up to the audience for any questions or feedback or comments, for Julia or Maninder on the…

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02:45:25.300 --> 02:45:26.719
Anthony Ng: Topics they just went over.

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02:45:36.170 --> 02:45:42.119
Anthony Ng: Let's see, I don't see any raised hands. There was a question here in the chat, since we have some time, I'll just read it out, and…

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02:45:42.380 --> 02:46:01.999
Anthony Ng: You can see if you could, address it. So, question in the chat here regarding health and air quality research. I'm concerned about the implication that there isn't enough existing data showing the dangers and health impacts of pollution caused by combustion byproducts of fossil fuels. I think the real issue is that there has been a focus effort to discredit this research.

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02:46:04.190 --> 02:46:06.530
Anthony Ng: I guess more of a comment, but yeah, I don't know if the…

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02:46:06.890 --> 02:46:09.209
Anthony Ng: Team has any feedback for that comment?

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02:46:15.260 --> 02:46:23.830
Julia Harnad: Meninder, maybe you might have a response, either in writing or, over the call here, the meeting?

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02:46:24.590 --> 02:46:39.420
Maninder Thind: Yes, yeah, thank you for that comment. We have, I think there is, still, a lot of questions in the air quality domain, still a gap between monetization.

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02:46:39.470 --> 02:46:51.929
Maninder Thind: And, translation, translational, needs to support the decisions and programs, related to air quality impacts, that needs to be addressed, so…

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02:46:51.930 --> 02:47:14.380
Maninder Thind: So that will be, tackled through this, topic, and, and our ongoing grants are, are working on generating more indoor air quality data, on understanding what are the impacts, and, and you're welcome to check out, some of the descriptions of those ongoing grants, on our…

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02:47:14.560 --> 02:47:23.989
Maninder Thind: Energize Innovation and other sources, as well as our heat working group. But yeah, thank you for your comment, and, we'll…

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02:47:24.550 --> 02:47:31.460
Maninder Thind: We'll, take this into consideration as we, as we, develop this topic further.

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02:47:33.420 --> 02:47:37.780
Anthony Ng: Great, thanks, Minator. We did get a couple of raised hands here, so let's go to Kurt Rustin.

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02:47:38.110 --> 02:47:39.279

Anthony Ng: Kurt, go ahead.

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02:47:40.920 --> 02:47:44.530
Kurt Rustin: Hi, Kurt Rushton, Watson Water.

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02:47:44.930 --> 02:47:53.799
Kurt Rustin: I just wanted to give advocacy to non-traditional terrain solar technologies as a promising avenue to

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02:47:54.060 --> 02:48:00.350
Kurt Rustin: Deploy resource in non-environmentally fragile ecosystems.

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02:48:00.510 --> 02:48:03.219
Kurt Rustin: As opposed to more traditional solar.

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02:48:03.370 --> 02:48:04.280
Kurt Rustin: Thank you.

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02:48:07.450 --> 02:48:09.110
Julia Harnad: Thank you for the comment, Kurt.

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02:48:10.720 --> 02:48:11.230
Anthony Ng: Thanks, Kurt.

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02:48:11.230 --> 02:48:11.850
Kurt Rustin: Thanks, girl.

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02:48:12.530 --> 02:48:13.709
Anthony Ng: Okay, let's go to Amya.

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02:48:16.040 --> 02:48:16.700
Kurt Rustin: True.

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02:48:16.700 --> 02:48:19.730
Maia Cheli: Thank you, Julia, this is really exciting.

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02:48:20.020 --> 02:48:30.659
Maia Cheli: in… particularly in the context of the clean energy environmental, piece, I was curious if you had any more specifics about what you're looking at.

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02:48:30.710 --> 02:48:41.259
Maia Cheli: applaud you in doing this work, and moving this forward. It's a huge category. When we think about things like life cycle, obviously, you know, you're looking at everything from

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02:48:41.330 --> 02:48:54.189
Maia Cheli: mining to, you know, final deposition of materials, and I'm thinking about, you know, we're looking at battery systems, there's been a lot of questions raised in the context of offshore wind related to these. So I was wondering if you had any…

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02:48:54.640 --> 02:49:03.159
Maia Cheli: Further specifics, or if you are looking for input on what specific technologies, might really need this attention at this point in time.

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02:49:04.800 --> 02:49:28.630
Julia Harnad: I think, there's not a specific designation of which technologies we're emphasizing. I think all categories that fit under clean energy are of interest. I think in California in particular, we know that solar and battery storage have a bigger momentum for various reasons, but certainly offshore wind, onshore wind, geothermal, and even hydro.

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02:49:28.630 --> 02:49:34.310
Julia Harnad: are all, relevant. And so, we're open to feedback on…

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02:49:34.310 --> 02:49:56.920
Julia Harnad: specific technology impacts that might need further investigation, or specific, species or groups of categories that are… that are affected in certain ways. Those are all of interest, but, generally speaking, we have, we keep a very broad, open, topic as far as the… both the technologies and the potential environmental topics.

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02:49:56.920 --> 02:50:00.759
Julia Harnad: So that we can kind of prioritize where there's most impact.

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02:50:01.670 --> 02:50:03.150
Maia Cheli: Okay, thank you.

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02:50:06.690 --> 02:50:08.000
Anthony Ng: Great, thank you so much, Matt.

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02:50:10.350 --> 02:50:16.350
Anthony Ng: Okay, we'll move on then. Thank you so much, Julia and Maninder, for the presentation.

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02:50:16.620 --> 02:50:21.330
Anthony Ng: We'll move to our next initiative, and I'll hand it to Elise.

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02:50:22.420 --> 02:50:37.030
Elyse Kedzie: Yes, thank you so much, Anthony. My name's Elise Ketzie, and I am an engineer in our R&D division. I'll be sharing our initiative on enhancing clean energy technology safety, supply chains, and lifecycle benefits.

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02:50:37.030 --> 02:50:51.569

Elyse Kedzie: As California accelerates towards a clean energy future, we face critical challenges in enabling technology adoption. Many communities remain concerned about the fire safety, environmental risks, and health impacts of batteries and other emerging clean technologies.

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02:50:51.590 --> 02:51:01.710
Elyse Kedzie: At the same time, gaps in our domestic supply chain for critical materials and the high cost of recycling slow down the affordable deployment of these clean energy solutions.

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02:51:02.460 --> 02:51:12.129
Elyse Kedzie: This research initiative tackles these barriers through three topics. First, the initiative will support advancing the safety of next-generation energy storage solutions.

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02:51:12.280 --> 02:51:27.060
Elyse Kedzie: This means developing better standards, testing methods, and design practices to reduce fire risk and improve thermal stability, ensuring these technologies can be deployed confidently in homes, businesses, and communities.

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02:51:27.580 --> 02:51:34.040
Elyse Kedzie: The second topic is enhancing energy storage performance and longevity through advanced battery analytics.

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02:51:34.120 --> 02:51:47.839
Elyse Kedzie: By using improved diagnostics, modeling, and real-time monitoring, this work can extend battery life, reduce maintenance costs, and improve reliability, making these technologies more accessible and affordable for everyone.

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02:51:48.440 --> 02:51:54.959
Elyse Kedzie: And third, this work will strengthen critical materials supply chains for clean energy technologies.

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02:51:55.370 --> 02:52:04.300
Elyse Kedzie: This includes exploring new domestic sources of key materials, improving recycling and recovery processes, and reducing dependence on foreign supply chains.

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02:52:05.040 --> 02:52:11.050
Elyse Kedzie: This research area will help lower costs, increase resilience, and support local economic development.

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02:52:12.050 --> 02:52:21.469
Elyse Kedzie: By improving fire and safety codes and standards, this initiative helps ensure clean energy technologies can be deployed with greater confidence and fewer risks.

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02:52:21.650 --> 02:52:30.910
Elyse Kedzie: In addition, improving safety practices directly mitigates hazards to nearby communities, reducing the likelihood of fires, toxic emission releases, or other harmful incidents.

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02:52:31.030 --> 02:52:42.699
Elyse Kedzie: At the same time, advancing safer, longer-lasting storage solutions and investing in a domestic supply chain of critical materials that enable these technologies will lower the overall cost of storage on the grid.

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02:52:43.090 --> 02:52:53.129
Elyse Kedzie: Together, these improvements help reduce outages and service interruptions, boosting grid resiliency and supporting better health and safety outcomes for disadvantaged communities and tribes.

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02:52:54.430 --> 02:52:55.880
Elyse Kedzie: Next slide, please.

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02:52:56.820 --> 02:53:08.240
Elyse Kedzie: I'll now go into the specifics of our, initiative topics. So our first topic is advancing the safety of next-generation storage solutions.

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02:53:08.300 --> 02:53:19.990
Elyse Kedzie: Emerging energy storage technologies like thermal storage, solid-state batteries, sodium ions, zinc, and iron-based batteries, these offer enormous potential for California's clean energy future.

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02:53:19.990 --> 02:53:31.960
Elyse Kedzie: But right now, we simply don't yet know enough about their unique safety hazards. Each of these technologies is very unique and has specifics that produce different risk factors.

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02:53:32.140 --> 02:53:44.780
Elyse Kedzie: Without that knowledge, these technologies struggle to pass certification, and emergency responders lack the tools and guidance they need to manage incidents involving new chemistries or other types of technologies.

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02:53:45.080 --> 02:53:49.959
Elyse Kedzie: This uncertainty slows down deployment and increases the risk for communities.

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02:53:50.800 --> 02:54:00.909
Elyse Kedzie: This work will directly address this gap by generating data, protocols, and California-specific guidance needed to safely deploy these emerging storage systems.

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02:54:01.110 --> 02:54:13.550
Elyse Kedzie: This research will evaluate chemistry-specific hazards, develop standardized test methods, and create practical permitting and emergency response tools for regulators, fire officials, and project developers.

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02:54:13.550 --> 02:54:25.869
Elyse Kedzie: This includes everything from design curves and plan check worksheets to acceptance criteria for authorities having jurisdiction or AHJs that they can use with confidence.

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02:54:26.500 --> 02:54:36.490
Elyse Kedzie: In the near term, we'll focus on understanding the unique hazards of a wide range of next-

generation chemistries, also investigating storage incident air emissions.

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02:54:36.850 --> 02:54:53.020
Elyse Kedzie: In the midterm, we'll conduct large-scale validation tests that translate these findings into actionable tools for permitting and field deployment. And in the long term, our results will help shape national and state standards informing UL and FPA, and ultimately the California Fire Code.

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02:54:53.320 --> 02:55:00.580
Elyse Kedzie: By building a strong safety foundation, now we can accelerate the responsible adoption of these next-generation storage technologies.

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02:55:01.510 --> 02:55:03.090
Elyse Kedzie: Next slide, please.

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02:55:05.360 --> 02:55:12.569
Elyse Kedzie: This next topic focuses on advanced battery analytics to improve performance and longevity of energy storage.

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02:55:12.700 --> 02:55:27.030
Elyse Kedzie: Today's battery management systems weren't designed to predict degradation, optimize charging for grid needs, or prevent localized overloads. This work will focus on closing this gap by advancing intelligent, hardware-agnostic battery analytics.

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02:55:27.190 --> 02:55:46.600
Elyse Kedzie: Research will develop adaptive charging processes that respond to each battery's unique degradation state, improving both performance and longevity. Through a combination of lab testing and real-world field demonstrations, this research will validate strategies that can reduce peak demand, extend battery life, and enhance safety.

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02:55:47.380 --> 02:55:57.339
Elyse Kedzie: We're also planning to advance early failure detection methods to identify internal anomalies before they become hazards, protecting both customers and the grid.

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02:55:58.500 --> 02:56:06.249
Elyse Kedzie: In the near term, the validation of intelligent charging strategies across multiple chemistries will improve battery health and safety.

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02:56:06.430 --> 02:56:15.550
Elyse Kedzie: In the midterm, these algorithms and processes will be integrated with fleets and aggregators to help flatten localized peaks and support grid stability.

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02:56:15.710 --> 02:56:24.580
Elyse Kedzie: And in the long term, these innovations will help California systematically defer expensive distribution system upgrades, directly lowering costs for ratepayers.

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02:56:24.970 --> 02:56:38.039

Elyse Kedzie: By improving how batteries charge, age, and interact with the grid, this research will strengthen reliability of the grid, reduce costs, and support a cleaner, more resilient energy future.

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02:56:38.690 --> 02:56:39.800
Elyse Kedzie: Next slide.

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02:56:42.430 --> 02:56:49.670
Elyse Kedzie: The final topic in this initiative is focused on strengthening critical materials supply chains for clean energy technologies.

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02:56:49.930 --> 02:56:59.459
Elyse Kedzie: California's clean energy transition depends on a reliable supply of critical materials like lithium, cobalt, nickel, rare earth elements, and platinum group catalysts.

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02:56:59.600 --> 02:57:10.680
Elyse Kedzie: But today, these supply chains are vulnerable. Recent global disruptions and extreme price volatility have shown just how fragile our access to these materials can be.

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02:57:10.910 --> 02:57:19.510
Elyse Kedzie: Without stronger domestic sourcing, processing, and recycling pathways, the cost and pace for deploying these technologies will remain uncertain.

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02:57:19.980 --> 02:57:33.810
Elyse Kedzie: This topic focuses on strengthening the supply chains from end to end, and advancing research to improve how critical materials are sourced, refined, and manufactured for technologies like energy storage, wind turbines, and fuel cells.

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02:57:33.970 --> 02:57:35.910
Elyse Kedzie: This work will also develop

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02:57:36.190 --> 02:57:47.390
Elyse Kedzie: New recycling and recovery processes that can reclaim high-value materials and reduce dependence on imported resources, thereby creating a circular clean energy economy.

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02:57:47.720 --> 02:58:00.310
Elyse Kedzie: And importantly, we're also planning to explore novel or alternative materials that can be produced domestically, helping to build a more sustainable energy economy.

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02:58:01.280 --> 02:58:13.479
Elyse Kedzie: In the near term, this initiative will focus on pilot projects and applied research and development to de-risk emerging sourcing, processing, and recycling pathways.

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02:58:13.590 --> 02:58:27.530
Elyse Kedzie: In the midterm, we expect to see scaled recycling operations, improved refining processes, and the introduction of new domestic materials, leading to measurable cost reductions that directly lower electricity rates.

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02:58:27.530 --> 02:58:35.069
Elyse Kedzie: And in the long term, ratepayers will benefit from a more stable and affordable energy system as the recycled materials supply

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02:58:35.070 --> 02:58:41.679
Elyse Kedzie: a meaningful share of demand, and California builds new manufacturing and recycling industries, supporting local economies.

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02:58:41.940 --> 02:58:50.859
Elyse Kedzie: By strengthening the critical materials supply chains, this research will build a more cost-effective and equitable economy for California.

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02:58:51.460 --> 02:58:55.350
Elyse Kedzie: And with that, I'm happy to take any questions that folks have.

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02:58:59.140 --> 02:59:00.220
Anthony Ng: Thanks, Elise.

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02:59:00.450 --> 02:59:04.709
Anthony Ng: Yeah, yeah, opening up the floor again for comments, questions, and feedback.

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02:59:04.970 --> 02:59:08.910
Anthony Ng: We'll start with David Myers here. David, go ahead.

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02:59:11.240 --> 02:59:15.990
David Meyers: Thank you, Anthony. Elise, this sounds exciting.

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02:59:16.180 --> 02:59:21.929
David Meyers: my comment, I suppose, is to request to ensure that the pathway is open

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02:59:21.940 --> 02:59:38.970
David Meyers: for technologies that don't have the problems that, these areas aim to solve. In other words, storage technologies that perhaps just aren't dangerous, or don't need some of these rare materials, but still need R&D support and everything else that comes with being involved in

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02:59:39.050 --> 02:59:41.490
David Meyers: In Epic Projects.

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02:59:42.230 --> 02:59:53.829
Elyse Kedzie: Yeah, that's a great point, and one of the focuses, especially on that energy storage safety, topic, is on emerging technologies that don't have the same risk profile, so,

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02:59:54.110 --> 03:00:09.779

Elyse Kedzie: identifying what the hazards are for those new technologies. They don't have to be… they're… in a lot of cases, they aren't thermal runaway, in these non-lithium technologies, but they have other hazards, and just de-risking those and, allowing

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03:00:09.780 --> 03:00:19.469
Elyse Kedzie: AHJs to have more insight into what those risk profiles look like before they commit to installing those in communities is really what we're after here.

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03:00:20.210 --> 03:00:21.470
David Meyers: Excellent, thank you.

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03:00:24.420 --> 03:00:26.929
Anthony Ng: Thanks, David. All right, let's go to Edson.

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03:00:27.220 --> 03:00:28.440
Anthony Ng: Hanson, go ahead.

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03:00:30.200 --> 03:00:43.220
Edson Perez: Hey everyone, Edson Perez again here, co-founder of Parawat Energy, and yeah, I definitely wanted to support this last track here on strengthening critical material supply chains.

1013
03:00:43.240 --> 03:00:52.609
Edson Perez: And within that context, you know, I wanted to emphasize submagnetic materials again, but with this new, initiative here, and how it would impact it, because,

1014
03:00:52.650 --> 03:00:56.630
Edson Perez: Soft magnetics are…

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03:00:56.630 --> 03:01:18.989
Edson Perez: impact supply chains in two key ways, in power electronics and in motors. Within power electronics, many of the soft magnetics currently in the market rely on nickel or cobalt, which, as you emphasized, are of a critical… percent critical supply chain risk. Now, our material relies on iron and nitrogen, which is commodity material, so, you know, I would emphasize looking at

1016
03:01:19.020 --> 03:01:34.090
Edson Perez: soft magnetics and alternatives to nickel or cobalt, or critical mineral soft magnetics. When it comes to motors, there are a lot of motor cores, especially rotor cores, focus on or rely on

1017
03:01:34.160 --> 03:01:35.329
Edson Perez: It's rare earth.

1018
03:01:35.520 --> 03:01:38.269
Edson Perez: materials, and

1019
03:01:38.500 --> 03:01:57.749

Edson Perez: Now, soft magnetics, they make up the stator cores, and… but the more efficient the stator core becomes, the less of the rotor core you need, so the less earths you need. So, I just wanted to emphasize the importance of soft magnetics research and investment, when it comes to this topic area, because it's a pretty critical one.

1020
03:01:57.810 --> 03:01:58.610
Edson Perez: Thank you.

1021
03:01:59.680 --> 03:02:11.330
Elyse Kedzie: Yeah, thank you for that comment. We're hoping to be able to incorporate lots of different, technologies where these critical materials are relevant, and motors are a big

1022
03:02:11.510 --> 03:02:21.980
Elyse Kedzie: component of wind turbines and electric vehicles, so it definitely plays into this initiative, and I think fits under that topic.

1023
03:02:23.030 --> 03:02:24.000
Edson Perez: Great, thank you.

1024
03:02:25.740 --> 03:02:28.249
Anthony Ng: Thanks, Edson. Let's go to Zora Chung.

1025
03:02:28.510 --> 03:02:29.679
Anthony Ng: Zora, go ahead.

1026
03:02:32.150 --> 03:02:33.500
Zora Chung | ReJoule: Hi, can you hear me okay?

1027
03:02:33.770 --> 03:02:34.940
Anthony Ng: Yes.

1028
03:02:35.670 --> 03:02:55.010
Zora Chung | ReJoule: Yeah, thank you so much for this. I wanted… I'm sorry, I'm the co-founder and CFO at Rejewel. We actually have an active CEC grant to deploy Second Life EV batteries into stationary storage, providing resilience for the local community. My comment is on the third topic.

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03:02:55.010 --> 03:03:18.349
Zora Chung | ReJoule: As… I don't know if everybody knows, but used EV batteries are a domestic feedstock, but unfortunately, at end of life, many of them are ending up at salvage yards across the country. And with transportation costs being very high, and also handling of these batteries requires skills and resources that many of these smaller salvage yards do not have, I'd love to see if there would be funding support

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03:03:18.350 --> 03:03:37.409
Zora Chung | ReJoule: on how to consolidate this really fragmented ecosystem. And I'd be happy to share more, because we're really at the center of it, being a diagnostic company, working with not only

automakers, but also best integrators as well. So, I'll pass back the time so that everybody else can comment, but happy to continue this offline.

1031
03:03:38.110 --> 03:03:43.159
Elyse Kedzie: Yeah. Thank you for your feedback, and, yeah, definitely would appreciate,

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03:03:43.370 --> 03:03:58.249
Elyse Kedzie: everyone who's commented to submit to the docket so that we, you know, have as much information as you want to provide us on these topics. But, definitely Second Life batteries are a topic that we've previously funded in Epic, and

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03:03:58.250 --> 03:04:03.890
Elyse Kedzie: I think could, could, fit into, this, this, supply chain…

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03:04:03.890 --> 03:04:09.460
Elyse Kedzie: Topic as well in the future, and it's definitely a critical… Component.

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03:04:09.960 --> 03:04:13.939
Elyse Kedzie: for EV, EV supply chains. So,

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03:04:14.150 --> 03:04:21.199
Elyse Kedzie: yeah, we welcome your feedback there, and I think this does align also with the topic.

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03:04:24.530 --> 03:04:26.969
Anthony Ng: Great, thank you, Zora. Go to Richard.

1038
03:04:30.410 --> 03:04:37.880
Richard Schorske: Yeah, I just want to point out something I'm sure everybody on this call is familiar with, which is that local AHJs, and particularly

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03:04:37.910 --> 03:04:54.569
Richard Schorske: With respect to batteries and fire permitting entities, are using vastly different standards to approve or not approve batteries based on different chemistries and different local interpretations of code and so forth.

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03:04:54.630 --> 03:05:00.809
Richard Schorske: in order for this initiative, I think, to have the maximum impact I'd love to see…

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03:05:00.950 --> 03:05:05.429
Richard Schorske: Some kind of, well-organized effort to…

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03:05:05.860 --> 03:05:18.119
Richard Schorske: if possible, align, in a really robust way all the AHJs around acceptance of these common standards, for, safety.

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03:05:18.250 --> 03:05:27.540
Richard Schorske: And, and ensure that the value tip criteria that are used by the AHJs are… are aligned as well. We're experiencing…

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03:05:27.670 --> 03:05:37.570
Richard Schorske: you know, up to 3 to 6 months variation in AHJs, assessing the same batteries, and just a great variation, and…

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03:05:37.750 --> 03:05:42.640
Richard Schorske: level of training and awareness among AHJs, particularly with battery chemistry.

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03:05:43.710 --> 03:05:54.290
Richard Schorske: So, if that's something that could be done, that'd be great. And likewise, on the federal, input, too, I don't know if anybody specifically

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03:05:54.630 --> 03:05:59.910
Richard Schorske: charged at the federal level, like NIST, with standards associated with

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03:05:59.970 --> 03:06:17.179
Richard Schorske: getting various standards bodies aligned on what the, you know, cradle-to-grave LC life cycle analysis and etc. on environmental criteria may be for things like batteries and solar panels, but we've had a situation where

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03:06:17.240 --> 03:06:26.090
Richard Schorske: Not long ago, the original math on solar panel, carbon intensity and other impacts

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03:06:26.090 --> 03:06:37.410
Richard Schorske: Was traced back to some original studies, or frankly, one original study that was found to be extremely flawed in methodology, and then everybody started quoting… was quoting that study over many years.

1051
03:06:37.530 --> 03:06:50.879
Richard Schorske: to come up with criteria that vastly understated the actual carbon intensity of solar panels. And so, again, there seems to be an absence of clear alignment and common acceptance of

1052
03:06:50.960 --> 03:07:06.860
Richard Schorske: study findings with respect to this whole domain, so on the environmental side as well. So, if California could show leadership in convening stakeholders, both intrastate and nationally, to accept the findings of these studies.

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03:07:06.870 --> 03:07:11.359
Richard Schorske: And, processes, that would be… that would be terrific, and… and urgently needed.

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03:07:12.630 --> 03:07:29.899
Elyse Kedzie: Yeah, thank you for that feedback. That is something that we've heard from a lot of previous

EPIC grant recipients, that AHJs all have their own unique, set of standards and qualifications in order to permit, our, these kind of emerging technologies.

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03:07:29.900 --> 03:07:37.699
Elyse Kedzie: And so, I think that is definitely one of the goals of that safety topic, to try to align everyone so that we can,

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03:07:38.180 --> 03:07:50.430
Elyse Kedzie: Speed up the permitting timelines and get everyone, you know, comfortable with the same set of standards around these non-standard and kind of pre-commercial technologies.

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03:07:52.830 --> 03:07:53.500
Richard Schorske: Thank you.

1058
03:07:54.490 --> 03:07:55.030
Elyse Kedzie: Thanks.

1059
03:07:55.030 --> 03:07:58.349
Anthony Ng: Great, thank you, Richard. And, thank you, Elise.

1060
03:07:58.860 --> 03:08:05.789
Anthony Ng: Alright, we've got two initiatives left, so let's move on, and I'll hand it to Ilya.

1061
03:08:08.030 --> 03:08:09.180
Ilia Krupenich: Thanks, Anthony.

1062
03:08:09.680 --> 03:08:15.880
Ilia Krupenich: My name is Alia Kropanic, and I will present an initiative targeting cost-effective industrial decarbonization.

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03:08:16.860 --> 03:08:24.099
Ilia Krupenich: California's industrial sector accounts for over 20% of GEG emissions in California, second to transportation only.

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03:08:24.300 --> 03:08:34.439
Ilia Krupenich: It remains one of the most challenging areas to decarbonize, due to its diverse processes, need for very high capital investments, and long lifetime of equipment.

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03:08:34.890 --> 03:08:43.309
Ilia Krupenich: Industrial facilities contribute significantly to local air pollution, particularly impacting communities located near these facilities.

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03:08:43.780 --> 03:08:50.909
Ilia Krupenich: Many industrial processes require high temperature heat, generate process-related emissions, and operate continuously.

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03:08:51.150 --> 03:08:57.370
Ilia Krupenich: These factors can make industrial decarbonization more complex and costly than in many other sectors.

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03:08:58.250 --> 03:09:04.869
Ilia Krupenich: At the same time, electrification must be implemented in a way that supports greater reliability and affordability.

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03:09:05.230 --> 03:09:13.389
Ilia Krupenich: Large new industrial loads can double electricity demand and significantly increase costs for building transmission lines and substations.

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03:09:13.500 --> 03:09:22.540
Ilia Krupenich: But if deployed strategically, electrification projects can defer or avoid costly upgrades and promote affordability for all rate payers.

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03:09:23.140 --> 03:09:28.730
Ilia Krupenich: To address these challenges, this initiative is organized about four complementary research areas.

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03:09:29.090 --> 03:09:30.910
Ilia Krupenich: industrial electrification.

1073
03:09:31.060 --> 03:09:37.239
Ilia Krupenich: Construction materials, Clean chemical production, and first-of-a-kind deployment support.

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03:09:37.650 --> 03:09:52.969
Ilia Krupenich: Together, these efforts are expected to reduce emissions, improve air quality and public health, support grid reliability, create job opportunities through deployment of clean energy technologies, and promote affordability of electricity for all ratepayers.

1075
03:09:53.400 --> 03:09:54.679
Ilia Krupenich: Next slide, please.

1076
03:09:56.570 --> 03:10:02.690
Ilia Krupenich: The first topic is grid integrated industrial electrification for affordability and reliability.

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03:10:03.120 --> 03:10:12.679
Ilia Krupenich: This topic focuses on accelerating industrial electrification, while ensuring that new electric lots support, rather than burden, California's electric system.

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03:10:13.030 --> 03:10:21.510
Ilia Krupenich: Electrification is the most impactful pathway to making industrial sector in California clean, but there are challenges that hinder widespread adoption.

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03:10:21.960 --> 03:10:24.689
Ilia Krupenich: The first challenge is economic and operational.

1080
03:10:24.900 --> 03:10:33.929
Ilia Krupenich: Many electrification technologies face higher capital costs and uncertain operating economics compared to incumbent fossil fuel systems.

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03:10:34.170 --> 03:10:40.199
Ilia Krupenich: Industrial operators also have limited real-world performance data for many of the emerging technologies.

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03:10:40.780 --> 03:10:48.209
Ilia Krupenich: The second challenge is technical. Cost-effective solutions remain limited for applications requiring high-temperature process heat.

1083
03:10:48.420 --> 03:10:58.340
Ilia Krupenich: Processes involving contaminated or complex material streams, like cement manufacturing, for instance, and operations with significant process-related emissions.

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03:10:58.910 --> 03:11:01.230
Ilia Krupenich: The third challenge is grid integration.

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03:11:01.620 --> 03:11:10.169
Ilia Krupenich: Large-scale industrial electrification could increase electricity demand and require costly infrastructure investments if not implemented properly.

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03:11:10.630 --> 03:11:12.400
Ilia Krupenich: To address those barriers.

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03:11:12.700 --> 03:11:26.840
Ilia Krupenich: This topic will support demonstration of electrification technologies, flexible industrial loads, thermal energy storage, demand response strategies, and integrated energy management systems under California operating conditions.

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03:11:27.570 --> 03:11:32.480
Ilia Krupenich: Expected outcomes include reduced emissions, improved air quality.

1089
03:11:32.610 --> 03:11:41.979
Ilia Krupenich: Improved ratepayer affordability and great reliability for increased load flexibility and avoided or deferred infrastructure upgrades.

1090
03:11:42.900 --> 03:11:44.259
Ilia Krupenich: Next slide, please.

1091
03:11:46.200 --> 03:11:51.680
Ilia Krupenich: The second topic is decarbonizing construction materials for cost-effective infrastructure.

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03:11:52.500 --> 03:12:02.759
Ilia Krupenich: Constructured materials such as cement, steel, and glass contribute significantly to industrial emissions and often rely on manufacturing processes that are difficult to decarbonize.

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03:12:03.120 --> 03:12:09.530
Ilia Krupenich: For instance, cement manufacturing is using a process that generates carbon dioxide by itself.

1094
03:12:09.700 --> 03:12:12.780
Ilia Krupenich: In addition to emissions associated with combustion.

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03:12:13.160 --> 03:12:19.710
Ilia Krupenich: Even 100% decarbonized heat would cut emissions from cement manufacturing only by half.

1096
03:12:19.970 --> 03:12:26.290
Ilia Krupenich: And electrification of cement is challenging because of high level of contamination with particulate matter.

1097
03:12:27.790 --> 03:12:36.050
Ilia Krupenich: There are emerging alternatives to manufacturing pathways that can address these issues, but many remain at early stages of development.

1098
03:12:36.240 --> 03:12:40.549
Ilia Krupenich: And or require additional validation under real-world conditions.

1099
03:12:41.350 --> 03:12:48.269
Ilia Krupenich: There is also critical need to better understand how these emerging production pathways interact with California's energy system.

1100
03:12:48.940 --> 03:12:54.760
Ilia Krupenich: This topic will support research, development, and demonstration of low-carbon materials.

1101
03:12:54.890 --> 03:13:03.059
Ilia Krupenich: Alternative manufacturing pathways, and circular material approaches that reduce waste And improve resource utilization.

1102
03:13:03.750 --> 03:13:10.200
Ilia Krupenich: Projects may also explore opportunities for beneficial integration with industrial operations and electric grid.

1103
03:13:10.560 --> 03:13:17.340

Ilia Krupenich: Expected outcomes include reduced emissions, Improved air quality and public health benefits?

1104
03:13:17.510 --> 03:13:23.730
Ilia Krupenich: Increased resilience of California's supply chains, and more cost-effective infrastructure deployment.

1105
03:13:24.650 --> 03:13:25.979
Ilia Krupenich: Next slide, please.

1106
03:13:28.290 --> 03:13:33.480
Ilia Krupenich: The third topic that we're proposing is affordable, clean chemical production.

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03:13:34.280 --> 03:13:45.810
Ilia Krupenich: Chemical manufacturing is a critical part of California's economy and supply chains, yet many chemical production processes remain energy intense and dependent on conventional production pathways.

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03:13:46.220 --> 03:14:00.420
Ilia Krupenich: Alternative approaches such as electrochemical processes, advanced separations, carbon utilization, and sustainable feedstocks show promise, but continue to face technical, economic, and commercialization barriers.

1109
03:14:01.690 --> 03:14:09.279
Ilia Krupenich: As these technologies scale, understanding their interaction with California's electric system will also become increasingly important.

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03:14:09.790 --> 03:14:20.799
Ilia Krupenich: This topic will support development and demonstration of alternative chemical production pathways, while also exploring opportunities for integration with industrial operations and energy systems.

1111
03:14:21.390 --> 03:14:35.570
Ilia Krupenich: Expected outcomes include reduced greenhouse gas emissions, improved air quality around chemical production facilities, greater resilience of California supply chains for critical chemical inputs, like plastics and fertilizer.

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03:14:35.580 --> 03:14:41.410
Ilia Krupenich: and cost-effective pathways to industrial decriminalization that benefit California ratepayers.

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03:14:41.990 --> 03:14:43.220
Ilia Krupenich: To summarize.

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03:14:43.460 --> 03:14:57.850
Ilia Krupenich: The first three topics focus on reducing greenhouse gas and local air pollution from some of the California's most emission-intensive industries, which often disproportionately impact disadvantaged and vulnerable communities located near them.

1115
03:14:58.420 --> 03:15:03.440
Ilia Krupenich: The first topic focuses primarily on direct electrification of industrial processes.

1116
03:15:03.660 --> 03:15:10.770
Ilia Krupenich: While the second and third topics explore indirect electrification through alternative manufacturing pathways.

1117
03:15:10.910 --> 03:15:13.680
Ilia Krupenich: For construction materials, and for chemicals production.

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03:15:13.960 --> 03:15:19.909
Ilia Krupenich: Together, these approaches address both energy-related and process-related industrial emissions.

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03:15:20.400 --> 03:15:29.679
Ilia Krupenich: As these pathways increase reliance on electricity, it is important to demonstrate that deployment can occur in a manner that supports grid stability.

1120
03:15:30.160 --> 03:15:37.030
Ilia Krupenich: Load flexibility, and avoids or defers unnecessary transmission and distribution infrastructure upgrades.

1121
03:15:37.380 --> 03:15:48.309
Ilia Krupenich: Doing so will help improve affordability of electricity for all California ratepayers, while advancing industrial decarbonization goals, and also improving local air quality.

1122
03:15:49.090 --> 03:15:58.880
Ilia Krupenich: And my colleague Lindsay will talk about last but not least topic under this initiative that provides first-of-a-kind deployment support for difficult-to-decarbonize sectors.

1123
03:15:59.070 --> 03:16:00.790
Ilia Krupenich: Thank you for your attention.

1124
03:16:02.330 --> 03:16:03.809
Lindsey Fransen: Alright, thank you, Ilya.

1125
03:16:03.930 --> 03:16:09.589
Lindsey Fransen: As laid out in the initiative introduction, the industrial sector faces unique decarbonization challenges.

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03:16:09.690 --> 03:16:18.209
Lindsey Fransen: Nonetheless, researchers and entrepreneurs have made impressive progress in developing novel technologies that can decarbonize a variety of industrial processes.

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03:16:18.610 --> 03:16:27.859
Lindsey Fransen: Many of these technologies have been technically validated or proven at some scale, but they face a barrier in delivering their first-of-a-kind commercial-scale deployment.

1128
03:16:28.050 --> 03:16:35.139
Lindsey Fransen: Here, they face special challenges, which can be broadly grouped into two buckets, right here under the gaps addressed.

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03:16:35.390 --> 03:16:51.060
Lindsey Fransen: The first is that project development requires an entirely different skill set than technology development. Teams need to build permitting, contracting, financing, and operating expertise on top of their technology knowledge that they've developed.

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03:16:51.530 --> 03:16:58.079
Lindsey Fransen: There isn't a readily available source of finance for these types of projects, which is the second bucket of challenges here.

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03:16:58.280 --> 03:17:09.970
Lindsey Fransen: First-of-a-kind projects are referred to as the missing middle in the literature because the costs are considered too big for venture capital, but too risky for big banks and other traditional sources of finance.

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03:17:10.430 --> 03:17:17.369
Lindsey Fransen: To address these challenges, funding under this topic will develop innovative approaches to first-of-a-kind projects.

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03:17:17.370 --> 03:17:30.720
Lindsey Fransen: By assembling a coalition of firms and organizations with relevant project development skills, and connecting them with technology developers so these companies can access the resources they need to execute their initial commercial scale deployments.

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03:17:31.100 --> 03:17:38.459
Lindsey Fransen: Funding could also provide development or other catalytic capital directly to selected projects to further reduce risks to investors.

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03:17:38.880 --> 03:17:53.529
Lindsey Fransen: Funding may also support the collection and sharing of data and lessons learned from these early projects that could be relevant to CPUC proceedings or that might support policy or regulatory reforms to facilitate broader deployment of industrial decarbonization technologies.

1136
03:17:54.110 --> 03:18:02.330
Lindsey Fransen: The expected outcomes include the development of tools and coalitions that can support industrial decarbonization, first-of-a-kind projects in California.

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03:18:02.700 --> 03:18:17.559
Lindsey Fransen: the actual deployments of some of these industrial decarbonization technologies at commercial scale with the support of these tools and coalitions. And ultimately, we would expect that the de-

risking and knowledge and skill development resulting from these investments under this topic

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03:18:17.560 --> 03:18:35.409
Lindsey Fransen: will lead to the acceleration of commercial-scale industrial decarbonization projects in California without the need for continued public support in this manner, and the ratepayer benefits discussed in the initiative overall, such as reduced air quality impacts, GHG emissions reductions, and so on.

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03:18:36.430 --> 03:18:37.260
Lindsey Fransen: Thank you.

1140
03:18:42.480 --> 03:18:44.440
Anthony Ng: Great, thank you, Lindsay. Thank you, Ilya.

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03:18:44.640 --> 03:18:47.380
Anthony Ng: Opening the floor back up to…

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03:18:47.640 --> 03:18:54.339
Anthony Ng: Questions, comments, or feedback on the industrial decarb-related Initiative and topics.

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03:19:01.540 --> 03:19:03.669
Anthony Ng: Yeah, Stephanie, go ahead.

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03:19:05.340 --> 03:19:24.669
STEPHANIE PINCETL: Thank you. I really like this topic. I think it's… again, you guys are really putting your finger on the most important questions facing California going forward. I would suggest, in line with a couple of other comments, that one of the areas that really needs a lot of attention is agricultural

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03:19:24.670 --> 03:19:33.309
STEPHANIE PINCETL: Use of fossil energy for processing in the Valley. I think something like 17.5% of California's fossil gas is used.

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03:19:33.310 --> 03:19:53.099
STEPHANIE PINCETL: In that sector, and it is one that tends to be somewhat neglected. We always think of cities and industry, but California has this really robust agricultural sector, so I just would like to make a plea for looking at agricultural, industrial, and commercial gas use.

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03:19:53.370 --> 03:19:54.280
STEPHANIE PINCETL: Thank you.

1148
03:19:55.940 --> 03:20:07.479
Ilia Krupenich: Thank you for your feedback. Yes, food processors are definitely one of the core industries in California, and we will make sure to address their needs as well as our subsectors.

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03:20:07.980 --> 03:20:08.890
Ilia Krupenich: Thank you.

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03:20:13.530 --> 03:20:14.520
Anthony Ng: Thank you, Stephanie.

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03:20:19.400 --> 03:20:24.730
Anthony Ng: Any other questions, for… Elliot or Lindsay?

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03:20:34.410 --> 03:20:50.360
Anthony Ng: See, I do see a comment in the chat here. I'll read it out. How will electric repairs benefit from addressing industrial customers that are mostly served by natural gas today? Is there any way to work with CEC Gas R&D or other IOUs to collaborate?

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03:20:50.480 --> 03:20:51.939
Anthony Ng: In these areas.

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03:20:53.980 --> 03:21:07.150
Ilia Krupenich: Yeah, thank you for your question. Definitely coordinating investments in both gas R&D and Epic, depending on the processes, industries, and specific technologies.

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03:21:08.170 --> 03:21:15.109
Ilia Krupenich: guess, R&D program has very limited funding, so we need to use it strategically.

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03:21:15.700 --> 03:21:32.909
Ilia Krupenich: And here we are talking about electrification as a key for industrial decarbonization. And because of that, these large industrial lots, then convert it to electricity, they will significantly increase demand for electricity. And this can really disrupt operations of the electric system.

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03:21:33.070 --> 03:21:52.220
Ilia Krupenich: Which is why we are trying to deploy and demonstrate how these technologies can be deployed in a way that is beneficial, that doesn't require, infrastructure upgrades. And these infrastructure upgrades are… the costs of infrastructure. They, spread among all of our ratepayers.

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03:21:52.250 --> 03:22:05.150
Ilia Krupenich: This is why deferring or eliminating need for these infrastructure upgrades is a way to improve affordability for every ratepayer. Not only industrial, but every ratepayer in California.

1159
03:22:09.790 --> 03:22:11.890
Anthony Ng: Great. Thanks, Ilya. Thanks, Lindsay.

1160
03:22:13.540 --> 03:22:14.540
Ilia Krupenich: Thank you.

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03:22:14.540 --> 03:22:26.569
Anthony Ng: Yep. All right, we'll move on here to our last initiative. So, again, thanks everybody for hanging in there, but I'll hand it to Jill here to cover our climate adaptation-related initiative and topics.

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03:22:27.200 --> 03:22:42.410
Jill Horing: Awesome. Thank you, Anthony. Good afternoon, everyone. Thank you so much for sticking around through all the initiatives. I'll now be providing an overview of our initiative that's titled, Leading Innovation in Electricity Sector Resilience and Adaptation, and really look forward to hearing your input and feedback as well.

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03:22:42.920 --> 03:22:50.509
Jill Horing: This initiative addresses the challenge of anticipating and mitigating climate change impacts to the grid and to community energy resilience.

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03:22:50.790 --> 03:22:56.290
Jill Horing: And it recognizes that this adaptation will occur simultaneously with a transition to cleaner energy.

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03:22:56.430 --> 03:23:02.890
Jill Horing: While controlling escalating energy system costs, and while ensuring equitable and reliable energy services.

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03:23:03.290 --> 03:23:17.790
Jill Horing: This also includes, and this came up in the comments earlier today, targeted improvements in energy resilience and energy service provision in rural and tribal areas, addressing better power for communities that face poor quality, unreliable, or no electric service.

1167
03:23:18.120 --> 03:23:35.329
Jill Horing: It emphasizes that the electricity system's interdependence with California's everyday energy needs and infrastructure impacts, and by doing that, it hopes to foster climate resilience approaches that achieve strong benefits for ratepayers and Californians overall by cost-effectively and robustly adapting to a changing climate.

1168
03:23:35.530 --> 03:23:39.679
Jill Horing: By identifying what's not adequately valued in the market or in planning.

1169
03:23:39.980 --> 03:23:44.669
Jill Horing: And by highlighting opportunities for integrated solutions and focusing on equity.

1170
03:23:45.340 --> 03:23:50.490
Jill Horing: To address these challenges, this initiative includes the three topic areas listed here that I'll cover next.

1171
03:23:50.640 --> 03:23:58.820
Jill Horing: And they're designed to realize the benefits of equipping planners with the data, tools, and technologies that are needed to better manage climate risk.

1172
03:23:59.560 --> 03:24:06.850
Jill Horing: By identifying and evaluating cost-effective wildfire mitigations, and finally advancing locally

customized resilience strategies.

1173
03:24:07.080 --> 03:24:08.350
Jill Horing: Next slide, please.

1174
03:24:10.670 --> 03:24:16.509
Jill Horing: So the first topic under this initiative focuses on advancing energy system resilience under climate change and extreme weather.

1175
03:24:16.880 --> 03:24:26.340
Jill Horing: It recognizes that climate change and extreme events pose a significant threat to the resilience of California's electricity grid, and that left to the status quo, this threat will continue to grow.

1176
03:24:26.800 --> 03:24:39.879
Jill Horing: And these impacts are already being felt in a number of ways. Utilities and ratepayers are experiencing escalating costs through adaptation investments. There are disruptions to grid service, supply and demand impacts, and damages to infrastructure.

1177
03:24:40.460 --> 03:24:55.319
Jill Horing: Under earlier rounds of EPIC, the state invested in the foundational climate information, tools, and analyses, such as downscaled global climate projections, the Calid App Data Explorer and Analytics Engine, and research linking these climate signals to energy system impacts.

1178
03:24:56.450 --> 03:25:02.189
Jill Horing: These investments have supported utilities and planners in starting to incorporate climate change into energy planning.

1179
03:25:02.540 --> 03:25:05.860
Jill Horing: And these efforts have also surfaced areas where additional work is needed.

1180
03:25:06.230 --> 03:25:19.579
Jill Horing: High-quality, accessible climate data remains essential for effective energy system planning, but there are gaps in public data and modeling resources that are needed to support a resilient energy system. So this initiative is really focused on filling those gaps.

1181
03:25:19.610 --> 03:25:26.670
Jill Horing: So, for example, we need new datasets that capture long-duration and compounding climate stressors, things like multi-year drought.

1182
03:25:26.740 --> 03:25:32.109
Jill Horing: as required in IOU adaptation planning, and for planning at more localized geographic scales.

1183
03:25:32.470 --> 03:25:42.729
Jill Horing: We also need improved modeling and analytics to translate those climate signals into energy system-relevant insights that directly support planning, operations, and adaptation decisions.

1184
03:25:43.060 --> 03:25:48.669
Jill Horing: And we need demonstration and validation efforts to ensure that these tools work for the real planning needs.

1185
03:25:49.310 --> 03:25:58.570
Jill Horing: And then complementary to this data and modeling, this topic could also fund technology development of novel grid hardening solutions and innovative operational resilience.

1186
03:26:00.120 --> 03:26:15.770
Jill Horing: Successful execution of this research would lead to the expected outcomes of improvements to utility and policy planning processes in the near and the midterm, and ultimately informing decisions that align our investments with emerging climate risks, improving both affordability and safety.

1187
03:26:16.570 --> 03:26:17.840
Jill Horing: Next slide, please.

1188
03:26:21.050 --> 03:26:28.449
Jill Horing: So this next topic focuses on wildfire as a key climate risk that is impacting affordability, safety, and reliability of the grid.

1189
03:26:28.890 --> 03:26:38.610
Jill Horing: Wildfire risk mitigation and liability costs are now the number one driver of rising electricity rates, with utilities and ratepayers carrying an outsized burden of risk mitigation.

1190
03:26:39.070 --> 03:26:47.130
Jill Horing: And the mitigation options that are available to utilities carry significant trade-offs in terms of cost, risk reduction, and impacts to service reliability.

1191
03:26:47.910 --> 03:27:03.150
Jill Horing: Proposed research under this topic will build on and further our scientific understanding of near- and long-term wildfire science and hazard characterization in order to better anticipate the risk of utility ignitions causing devastating fires and the risk to utility infrastructure.

1192
03:27:03.980 --> 03:27:12.930
Jill Horing: Research can evaluate risk mitigation strategies for their cost, effectiveness, and additional impacts to ratepayers, and integrate this knowledge into planning and regulatory processes.

1193
03:27:13.420 --> 03:27:26.159
Jill Horing: There's also a growing opportunity to draw from a broader portfolio of risk management techniques across sectors, including strategies to reduce the spread or consequence of fire through land management, cultural burning, and community hardening.

1194
03:27:26.580 --> 03:27:32.819
Jill Horing: Research here can integrate this diverse knowledge to promote coordination and cost-effective risk management.

1195
03:27:33.700 --> 03:27:43.810
Jill Horing: Expected outcomes from this research area include improved data, modeling, and decision support tools in the near term that can support utility investments and regulatory evaluation.

1196
03:27:44.150 --> 03:28:02.059
Jill Horing: Ultimately, research can lead to the development and validation of more cost-effective wildfire mitigation options, reduced reliance on disruptive measures, and improved safety and affordability. And a key goal here is to provide resources towards reducing both these utility-caused wildfire risk, but also the rate impact of these mitigations.

1197
03:28:03.180 --> 03:28:04.349
Jill Horing: Next slide, please.

1198
03:28:06.300 --> 03:28:16.550
Jill Horing: So this third topic turns to community energy resilience, by which we mean the ability of people to stay safe, and for at least essential services to remain operational during outages or extreme events.

1199
03:28:16.890 --> 03:28:26.090
Jill Horing: In contrast to utility grid resilience, which puts the focus on infrastructure and grid operations, community resilience foregrounds improving the outcomes that people actually experience.

1200
03:28:26.550 --> 03:28:29.190
Jill Horing: This initiative addresses two major gaps.

1201
03:28:29.450 --> 03:28:39.520
Jill Horing: First, uneven reliability and increasing climate pressures have left some communities, especially at the far ends of distribution lines, more vulnerable to frequent or long-duration outages.

1202
03:28:39.870 --> 03:28:45.680
Jill Horing: Second, centralized grid planning has not been able to fully address these localized and persistent outage risks.

1203
03:28:46.020 --> 03:28:51.449
Jill Horing: So this work will include developing and evaluating locally relevant resilience energy strategies.

1204
03:28:52.480 --> 03:29:07.510
Jill Horing: So this requires understanding what services matter most locally, what happens when the grid fails, and what resources and strategies, like storage, microgrids, backup power, and non-grid measures, can keep communities functioning, and how to cost-effectively realize these improvements.

1205
03:29:07.860 --> 03:29:24.209
Jill Horing: The research emphasis will be on communities that remain most vulnerable to these long-duration outages, so in particular, rural and tribal communities, with an emphasis on co-production and alliances with these communities, and in the case of tribes, respecting tribal energy sovereignty.

1206

03:29:24.840 --> 03:29:37.569
Jill Horing: The research will build on experience from past EPIC-funded projects, including those that have demonstrated tribal microgrids that are customized to benefit tribes, but have also been shown to prove… to provide critical resilience benefits to the surrounding communities.

1207
03:29:38.700 --> 03:29:50.999
Jill Horing: Successful research in this area will result, for the near term in resilience approaches that are better optimized to community resilience needs, resulting in higher levels of resilience, as well as of energy service reliability.

1208
03:29:51.680 --> 03:30:00.419
Jill Horing: This will lead to substantial progress in energy system equity, and in the long term, a natural integration of community resilience with grid benefits for all ratepayers.

1209
03:30:00.960 --> 03:30:09.580
Jill Horing: Next slide. And so with that, I welcome your feedback and your input, and I'd love to invite my colleague Meetra, co-author of this initiative, to join the discussion, too.

1210
03:30:12.330 --> 03:30:13.649
Anthony Ng: Thank you so much, Jill.

1211
03:30:14.210 --> 03:30:20.579
Anthony Ng: Okay, yeah, open the floor back to questions and feedback. We'll start with Josh.

1212
03:30:20.680 --> 03:30:21.670
Anthony Ng: Go ahead, Josh.

1213
03:30:23.750 --> 03:30:27.439
Josh Simmons: Thank you. Yeah, so, you know, appreciate…

1214
03:30:27.900 --> 03:30:33.639
Josh Simmons: the CEC's passed funding for tribal microgrid projects and efforts and other…

1215
03:30:34.070 --> 03:30:40.119
Josh Simmons: Funding and programming to increase tribal energy sovereignty and resiliency.

1216
03:30:40.170 --> 03:30:56.750
Josh Simmons: you know, I mean, starting with, kind of, the Blue Lake Rancho Rios microgrid, and I guess, in terms of what I've seen under Epic, I think that's… we've not seen a whole lot of funding under Epic for tribal microgrid deployments, and I, you know, there isn't, particularly with the…

1217
03:30:57.380 --> 03:31:13.939
Josh Simmons: federal government's, changes to the investment tax credits, impacting solar and renewable energy resources, the kind of resources for new solutions are decreasing, and there's the CPUC's Microgrid Incentive Program, but that's only for in front of the meter systems that really are not a good fit.

1218
03:31:14.190 --> 03:31:18.979
Josh Simmons: For the majority of, of, of tribes and their situations. Certainly, the…

1219
03:31:19.440 --> 03:31:28.889
Josh Simmons: In front-of-the-meter systems decrease in tribal energy sovereignty versus the behind-the-meter systems that tribes are in greater control of, and…

1220
03:31:29.610 --> 03:31:49.179
Josh Simmons: and allow them to decrease their costs. You know, I… so, sorry, it's Josh Simmons with the Tribal Energy and Climate Collaborative. You know, I also have a firm called Prosper Sustainably that serves as owner's rep for, probably a half dozen tribes on tribal microgrid projects, and

1221
03:31:49.810 --> 03:31:51.740
Josh Simmons: You know, they're still…

1222
03:31:52.060 --> 03:31:59.120
Josh Simmons: these projects are still challenging. They're still… they're still very costly, you know, and the simpler ones are… are sure easy, like,

1223
03:31:59.340 --> 03:32:06.889
Josh Simmons: you know, small solar plus storage system, but larger ones with controls, systems, the, you know, the…

1224
03:32:07.240 --> 03:32:26.320
Josh Simmons: there are limited tech controls, technologies, and solutions out there. You're kind of stuck with a few different vendors, and you're kind of operating at their whim. We've seen developers, you know, go out of business in this space as well. And so, really want to encourage CEC to

1225
03:32:26.550 --> 03:32:28.310
Josh Simmons: In the, in the epic…

1226
03:32:28.440 --> 03:32:38.049
Josh Simmons: Investment plan to include investment in advances in tribal energy microgrid technologies and solutions and resiliency.

1227
03:32:38.660 --> 03:32:57.029
Josh Simmons: And then ultimately that, you know, any of the funding in this area, just like others, has carve-outs. Funding and investments and programming has carve-outs specifically for tribes, and also supports, you know, capacity building and training activities to help tribes build their capacity to be able to deploy these projects successfully.

1228
03:32:57.230 --> 03:32:58.550
Josh Simmons: Thank you.

1229
03:33:00.370 --> 03:33:13.969

Jill Horing: Yeah, thank you for those comments. A lot of, like, nuanced points in there, and we'll be sure to consider that both for this initiative, but I think also in coordination with a few of the other initiatives that focus on DER deployment and working with tribal communities, so thank you.

1230
03:33:19.870 --> 03:33:23.469
Anthony Ng: Thanks, Josh. Okay, let's move to Greg… Gregory Smith?

1231
03:33:23.960 --> 03:33:24.800
Anthony Ng: Greg?

1232
03:33:27.260 --> 03:33:46.129
Gregory Smith - Flex Power Control: Yeah, thank you, thank you, Greg Smith from Flex Power Control. I just had a question about, you talked about the hardening of the grid for these events. Are you thinking only large-scale stuff, or are you thinking anything at the building level?

1233
03:33:46.360 --> 03:33:48.420
Gregory Smith - Flex Power Control: to provide resiliency.

1234
03:33:48.530 --> 03:33:49.740
Gregory Smith - Flex Power Control: Or hardening.

1235
03:33:52.370 --> 03:34:07.469
Jill Horing: Yeah, that's a great question. I think, it depends on the topic. I think the first one is a little bit more broad scale, where it's looking at, sort of, grid resilience, and then the third is more of that community or home hardening level. But yeah, I invite Amita to add to that as well.

1236
03:34:08.210 --> 03:34:08.830
Gregory Smith - Flex Power Control: Okay.

1237
03:34:09.480 --> 03:34:13.550
Mithra Moezzi: Yeah, so it can include building level as well, especially in that initiative.

1238
03:34:14.610 --> 03:34:16.880
Gregory Smith - Flex Power Control: Okay, great. Thank you so much.

1239
03:34:18.020 --> 03:34:22.590
Jill Horing: Yeah, thank you, and if there are specifics that you'd like us to consider, please feel free to add that to the docket as well.

1240
03:34:22.590 --> 03:34:23.789
Gregory Smith - Flex Power Control: Okay, I will.

1241
03:34:25.650 --> 03:34:26.560
Anthony Ng: Thanks, Greg.

1242
03:34:26.670 --> 03:34:28.420
Anthony Ng: Let's go to Jeremy.

1243
03:34:31.620 --> 03:34:32.340
Anthony Ng: Nope.

1244
03:34:32.530 --> 03:34:35.029
Anthony Ng: Jeremy, you just lowered your hand if you wanna…

1245
03:34:35.730 --> 03:34:40.579
Anthony Ng: Come back into the queue, you'll need to raise your hand again, I lost you in the…

1246
03:34:42.080 --> 03:34:43.580
Anthony Ng: In the list here.

1247
03:34:44.680 --> 03:34:47.360
Anthony Ng: Okay, there you are. All right, Jeremy, go ahead.

1248
03:34:48.440 --> 03:34:50.820
Jeremy Zeedyk: Sorry about that, I jumped the gun.

1249
03:34:50.870 --> 03:35:15.699
Jeremy Zeedyk: Thank you. Thank you for the opportunity to speak. This is a general comment for this and all the other initiatives that were spoken about today. My name is Jeremy Zedijk, and I'm here on behalf of the Western States Council of Sheet Metal Workers. We're the HVAC union. I thank you for the opportunity to comment on the EPIC-V investment plan. I support the Commission's previous recognition of workforce development and the importance of creating high-quality careers through California's clean energy investments, such as EPIC programs.

1250
03:35:15.960 --> 03:35:22.230
Jeremy Zeedyk: However, I encourage the Commission to strengthen workforce standards throughout the initiatives in this and future versions of the program.

1251
03:35:22.240 --> 03:35:46.960
Jeremy Zeedyk: California is investing billions of dollars to develop, demonstrate, and deploy increasingly sophisticated clean energy technologies. The success of these investments depends not only on innovation, but also on the workforce responsible for installing, commissioning, operating, and maintaining these systems. That means looking beyond contractors and company owners, and ensuring that the frontline technicians and installers performing the work have the skills necessary to deliver quality outcomes.

1252
03:35:47.180 --> 03:36:11.679
Jeremy Zeedyk: Real systemic change for disadvantaged communities will not come from simply providing electric appliances or promoting short-term online training programs. It will come from advancing skilled labor standards, creating career building apprenticeship programs, and workforce requirements that create meaningful access to high-quality jobs within these publicly funded programs. A recent CPUC-commissioned evaluation of the tech and ESMAC

1253
03:36:11.680 --> 03:36:33.270
Jeremy Zeedyk: heat pump water heater training found that while the program was a useful introduction to the technology, it was not designed to replace apprenticeship or advanced technical training. The evaluation found no competency testing, no hands-on training component, and no formal assessment of whether participants had mastered the material. The lesson here is simple. Training alone is not a workforce standard.

1254
03:36:33.270 --> 03:36:51.930
Jeremy Zeedyk: Workforce quality is not simply a labor issue, it is a product… a project quality issue, a reliability issue, an energy performance issue, and ultimately a ratepayer and taxpayer protection issue. Even the most advanced technologies cannot deliver their full benefits if they are not properly installed, commissioned, and maintained.

1255
03:36:51.940 --> 03:37:03.309
Jeremy Zeedyk: California has long recognized the need to pair workforce development with workforce standards that create demand for skilled workers and reward employers that invest in apprenticeship, training, and long-term workforce development.

1256
03:37:03.390 --> 03:37:28.370
Jeremy Zeedyk: I encourage the Commission to incorporate stronger and more enforceable workforce standards into future EPIC program design, including high-road workforce principles, apprenticeship utilization, meaningful workforce program metrics, and skilled and trained workforce requirements where appropriate. This includes clearly defining who is responsible for enforcement of these provisions. By doing so, the Commission can help ensure that the public investments deliver not only technological

1257
03:37:28.370 --> 03:37:52.209
Jeremy Zeedyk: innovation, but also reliable project performance, quality careers, and long-term benefits for California workers, ratepayers, and communities. The Western States Council of SMART stands ready to work with Commission staff and stakeholders to help develop and strengthen meaningful workforce standards that support both California's climate goals and long-term workforce needs. Thank you for your time and your consideration. We will be submitting written comments on the docket.

1258
03:37:57.000 --> 03:37:59.079
Anthony Ng: Great, thank you so much for those comments, Jeremy.

1259
03:37:59.980 --> 03:38:08.200
Anthony Ng: Okay, let's move to, nadihi, apologize if I've… Mispronounce that, but go ahead.

1260
03:38:08.200 --> 03:38:13.299
Nidhi Upadhyaya: No worries, thanks, Anthony. Hi everyone, my name is Nidhi, I…

1261
03:38:13.800 --> 03:38:27.390
Nidhi Upadhyaya: look after policy and regulatory for Ryzone. We're a climate resilience software startup that helps transmission distribution utilities integrate climate and wildfire risk into their planning process.

1262
03:38:27.480 --> 03:38:37.989

Nidhi Upadhyaya: We specifically analyze wildfire risk, alongside, some of the more broader map-based climate resilience planning.

1263
03:38:37.990 --> 03:38:47.879
Nidhi Upadhyaya: I was part of the… the… for brevity, I will call it Sea Dog. This was another initiative run by the CEC, essentially.

1264
03:38:47.880 --> 03:38:58.290
Nidhi Upadhyaya: requesting input on climate data and wildfire research direction. So, tying that, EPIC-V and the, research direction on climate adaptation.

1265
03:38:58.320 --> 03:39:02.630
Nidhi Upadhyaya: I was wondering if you could talk to whether…

1266
03:39:02.710 --> 03:39:07.449
Nidhi Upadhyaya: Investing in generating new data products is…

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03:39:07.450 --> 03:39:25.800
Nidhi Upadhyaya: is one of the priorities under the climate adaptation track, specifically just looking at whether there is any sort of integration of latest CMEP outputs, any integration into hyperlocal observational data as well is something that is

1268
03:39:25.800 --> 03:39:29.010
Nidhi Upadhyaya: a big priority under this track. Thank you.

1269
03:39:33.230 --> 03:39:39.289
Jill Horing: Yeah, thank you for the question, and thank you for attending the recent CDOGS presentation.

1270
03:39:39.290 --> 03:39:54.860
Jill Horing: So I'd say yes, under the first, topic shared under this initiative is where we sort of anticipate a continuation of our research portfolio that does some of the, like, high-resolution climate data downscaling. I think there are tons of new research directions, some of which you mentioned, like the more hyper…

1271
03:39:54.910 --> 03:40:01.820
Jill Horing: localized, data downscaling could be a direction. I think, we are sort of…

1272
03:40:02.100 --> 03:40:16.679
Jill Horing: proceeding with the process, and we're gonna see, sort of where those priorities lie as we get solicitations underway, but we're intending to sort of scope this initiative with, new data development in mind, for sure. And Meetra, I welcome you to add anything there.

1273
03:40:19.340 --> 03:40:25.350
Mithra Moezzi: Yeah, I have nothing to add, but we definitely… we are thinking of doing more micro-scale

1274
03:40:25.520 --> 03:40:28.519

Mithra Moezzi: Downskilling for sure, so, yeah, or almost for sure.

1275
03:40:32.490 --> 03:40:37.530
Nidhi Upadhyaya: Thank you, I just… I just had a follow-up clarification question on…

1276
03:40:37.720 --> 03:40:51.969
Nidhi Upadhyaya: If there's other sort of inputs specifically, would that… would that be under the CDOG track, or would you recommend we provide comments, in the public comment section for this… for this initiative?

1277
03:40:54.000 --> 03:41:09.730
Jill Horing: Yeah, I think, providing public comment through the docket for EPIC 5 would probably be the best pathway, but we do… we did take into account some of the proposed research directions we heard in the CDOG that we're not able to scope under Epic 4 are definitely being considered for EPIC 5 as well. So, yes and? Thank you.

1278
03:41:15.590 --> 03:41:18.499
Anthony Ng: Great, thank you so much. Okay, let's go to Maya.

1279
03:41:21.010 --> 03:41:37.179
Maia Cheli: Hi, thank you so much. I just wanted to, voice my gratitude and enthusiasm for this. And also just a question about the extent to which you anticipate doing some crosswalking with other agencies. I'm thinking about, you know, the climate assessments and sea level rise and

1280
03:41:37.180 --> 03:41:45.279
Maia Cheli: The myriad of ways that particularly folks in under-resourced communities are trying to engage with the climate resilience questions, and whether or not

1281
03:41:45.280 --> 03:41:53.500
Maia Cheli: There could be some support within this effort for integrating those things, and then also to the extent that there are multiple grants available.

1282
03:41:53.570 --> 03:41:57.670
Maia Cheli: Reducing having to do, like, multiple reporting schemes.

1283
03:42:08.340 --> 03:42:27.850
Mithra Moezzi: We… we are thinking of… we are going to try to coordinate to the extent we can, or at least learn from other agencies. For example, like, we want to talk to Cal OES about, about some of the resilience… resilience efforts, too, to make sure that the energy resilience… resilience perspective catches the community resilience perspective.

1284
03:42:31.690 --> 03:42:33.920
Jill Horing: Yeah, I'll add that a lot of our,

1285
03:42:34.140 --> 03:42:53.889
Jill Horing: our climate work is in coordination with the Governor's Office of Land Use and Climate Innovation

towards supporting the Fourth and Fifth climate change assessment, and expect to continue coordinating closely with them. I think there are other, you know, many other agencies that are involved in that process, and yeah, there are a lot of, like, touchpoints amongst the state agencies in climate adaptation coordination, but

1286
03:42:54.000 --> 03:43:03.179
Jill Horing: Definitely welcome additional suggestions if you think there are areas that we could be better plugged into and ensure that our research is, you know, providing additional value and leveraging some of those other efforts.

1287
03:43:03.700 --> 03:43:04.789
Maia Cheli: Okay, thank you.

1288
03:43:04.950 --> 03:43:05.759
Jill Horing: Thank you.

1289
03:43:07.540 --> 03:43:10.289
Anthony Ng: Thanks, Mayor. Let's go to David Myers.

1290
03:43:13.300 --> 03:43:19.930
David Meyers: Thank you, Anthony, and thank you for this entire thing. This comment cuts across all areas,

1291
03:43:20.300 --> 03:43:36.369
David Meyers: as kind of a serial epic participant, one of the things that sticks out is that sometimes projects with proposals, or even those approved, kind of rehash things that have been done before, and I think that it would be the best use of

1292
03:43:36.460 --> 03:43:55.520
David Meyers: all rate payer funds, and also for advancing all of these balls forward to incorporate in the EPIC solicitation process, both from the CEC side and especially from the recipient slash proposer side, requirements to review what has been done so far, especially

1293
03:43:55.580 --> 03:44:05.890
David Meyers: funded by Epic, because it's really a travesty when the same things get done again, with Epic money, but also beyond that. I think it can be a small effort on the part of the

1294
03:44:05.910 --> 03:44:19.470
David Meyers: writers of the solicitations to note what progress has been made and what they're looking to advance, but really to place the onus on the proposers to do, just like in any academic research, a lit search and a lit review

1295
03:44:19.470 --> 03:44:26.140
David Meyers: It says, okay, this is how far we've gotten, and this is what… how we're going to advance, this particular area. I think this will…

1296
03:44:26.170 --> 03:44:37.170

David Meyers: save money, it will help us move things forward, and can also really help on that previous discussion about standards. That if the proposals are forced to deal with the standards that exist.

1297
03:44:37.170 --> 03:44:46.299
David Meyers: And how they're going to tie into the previous work, we won't have lots of little projects spread out doing kind of micro-trials of things that never make it to scale.

1298
03:44:46.390 --> 03:44:54.299
David Meyers: And we'll use all of our money much more effectively. With that, thank you very much for this opportunity to speak a couple of times and for the process.

1299
03:44:57.140 --> 03:44:58.560
Anthony Ng: Great, thank you so much, David.

1300
03:45:04.970 --> 03:45:15.379
Anthony Ng: All right, any, further questions? Yeah, we are, that was the last initiative, so thank you so much, Jill and Meetra, for, for the presentation. So yeah, that was the last…

1301
03:45:15.550 --> 03:45:25.670
Anthony Ng: initiative, and so we can kind of move on to just general feedback, if anybody has any just general comments, about any of the

1302
03:45:25.760 --> 03:45:38.340
Anthony Ng: topics, we do have our team members still, online here who can answer questions on any of the initiatives or any of the topics, brought up, so yeah. Let's see, let's go to Benton Moore here first. Benton?

1303
03:45:40.700 --> 03:45:56.040
Benton Moore | The Brink: Good day. Nice to see you, Anthony and team. Thanks for your commitment to clean energy. I'm Benton Moore. I'm the director of the Brink Small Business Development Center at University of San Diego. We are a California designated innovation hub.

1304
03:45:56.360 --> 03:46:04.089
Benton Moore | The Brink: With over a thousand startups and over a billion dollar of capital infusion, spanning early ideas to IPO.

1305
03:46:04.120 --> 03:46:18.470
Benton Moore | The Brink: We are a partner organization with Cleantech San Diego's SCAEIN scene, Southern California Energy Innovation Network. Many of our clients and partners are on this call, and we're proud to support regional energy entrepreneurs.

1306
03:46:18.500 --> 03:46:24.159
Benton Moore | The Brink: At the Brink, we accelerate innovation in deep tech. We work closely with Scene.

1307
03:46:24.200 --> 03:46:29.060
Benton Moore | The Brink: We advise startups from EV charging to solar and battery tech.

1308
03:46:29.250 --> 03:46:38.550
Benton Moore | The Brink: to sustainable data centers and AI, all with limited resources, but unlimited passion, expertise, and capital efficiency.

1309
03:46:38.880 --> 03:46:48.670
Benton Moore | The Brink: Collectively, we connect startups with investors, government agencies and grants, utilities, academia, and industry experts.

1310
03:46:49.130 --> 03:46:54.410
Benton Moore | The Brink: Seen as a vital accelerator for energy innovation, from R&D to commercialization.

1311
03:46:54.530 --> 03:46:59.670
Benton Moore | The Brink: And CEC funding is essential to maintain our local clean energy economy.

1312
03:47:00.330 --> 03:47:10.139
Benton Moore | The Brink: I'll add one more thing. From my various perspectives as a technical advisor, an active investor, and former cleantech CEO,

1313
03:47:10.270 --> 03:47:20.229
Benton Moore | The Brink: I see the 2030 plan as a perfect example of how we position California as a world leader in advanced energy tech. Thank you for your support.

1314
03:47:24.330 --> 03:47:26.770
Anthony Ng: Great, thank you for the comments and perspective there, Ben.

1315
03:47:27.360 --> 03:47:31.009
Anthony Ng: Okay, let's… let's go to Kurt Rustin.

1316
03:47:31.290 --> 03:47:32.380
Anthony Ng: Kurt, go ahead.

1317
03:47:34.620 --> 03:47:36.120
Kurt Rustin | Watts on Water: Hi, Anthony, thanks.

1318
03:47:36.500 --> 03:47:47.609
Kurt Rustin | Watts on Water: This is Kurt Rustin, CEO of Watson Water. We're a clean energy startup in San Diego. Thank you all for your efforts to establish an impactful Epic 5, and for hosting the meeting.

1319
03:47:47.760 --> 03:47:50.570
Kurt Rustin | Watts on Water: I have two comments. First.

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03:47:50.950 --> 03:47:57.439
Kurt Rustin | Watts on Water: Startups are the lifeblood of the innovations needed to address much of the

topics discussed today.

1321
03:47:57.570 --> 03:48:05.050
Kurt Rustin | Watts on Water: They ensure that billions of federal and private dollars funnel into California's ecosystem for the benefit of Californians.

1322
03:48:05.400 --> 03:48:12.380
Kurt Rustin | Watts on Water: Reics have demonstrated themselves as a critical support infrastructure for those innovators, like myself.

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03:48:12.620 --> 03:48:27.349
Kurt Rustin | Watts on Water: And I would like to lend my voice to the many others we heard today in support of REICs, and I hope the CEC addresses their continued operation in Epic 5, so our startup ecosystem remains funded and state-of-the-art.

1324
03:48:28.120 --> 03:48:30.099
Kurt Rustin | Watts on Water: My second comment…

1325
03:48:30.930 --> 03:48:48.330
Kurt Rustin | Watts on Water: is more technical. California is projected to displace a million acres of valuable land with utility-scale solar to achieve its statutory energy goals. These displacements have significant negative effects on the economy, the environment, and our communities.

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03:48:48.380 --> 03:48:59.040
Kurt Rustin | Watts on Water: Solar located on non-traditional terrain, like systems built on water, can avoid these negative effects and provide opportunity to use existing grid

1327
03:48:59.100 --> 03:49:13.860
Kurt Rustin | Watts on Water: connected infrastructure, avoid environmental impacts, and permitting backlogs. These systems have demonstrated commercial viability, but the industry is lacking decision support tools and data for stakeholders and regulators.

1328
03:49:14.100 --> 03:49:18.559
Kurt Rustin | Watts on Water: As well as optimal site visibility for developers.

1329
03:49:18.720 --> 03:49:22.639
Kurt Rustin | Watts on Water: Which was identified in the number of topics today.

1330
03:49:23.060 --> 03:49:34.140
Kurt Rustin | Watts on Water: I would like to advocate that the CDC continue to support the development of critical analysis tools for non-traditional solar in Epic 5, like the SPLINT grant of Epic 4.

1331
03:49:34.250 --> 03:49:44.229
Kurt Rustin | Watts on Water: These kinds of tools would enable beneficial deployment of low-impact solar, and enable policymakers to provide regulatory guidance and promote incentives.

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03:49:44.380 --> 03:49:45.230
Kurt Rustin | Watts on Water: Thank you.

1333
03:49:49.080 --> 03:49:50.969
Anthony Ng: Great, thank you so much for the comments, Kurt.

1334
03:49:52.350 --> 03:49:55.769
Anthony Ng: Okay, let's go to Derek Tang. Derek, go ahead.

1335
03:49:57.600 --> 03:50:12.520
Derrick Tang: Thank you, Anthony. My name is Derek Tang, and I'm the Head of Programs at New Energy Nexus. Thank you for the very thoughtful and in-depth presentation today on these initiatives, and for this opportunity to participate. For the past 10 years, New Energy Nexus has administered

1336
03:50:12.520 --> 03:50:21.109
Derrick Tang: EPIC programs, including CalSEED and Cal Testbed, and I'll be eager to share the successes of those programs in more detail in written comments.

1337
03:50:21.300 --> 03:50:38.909
Derrick Tang: But for today, I want to point out that in these epic five discussions, I think it's clear that the CEC, CPUC, and many others recognize the reality that the challenges we face today are by no means purely technical challenges, and increasingly, success depends on the ability

1338
03:50:39.090 --> 03:50:46.419
Derrick Tang: To navigate a complex ecosystem of grant funding and testing facilities, manufacturing resources, workforce partners.

1339
03:50:46.850 --> 03:50:51.910
Derrick Tang: Customers, investors, utilities, local governments, and community stakeholders.

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03:50:52.020 --> 03:51:01.139
Derrick Tang: So, as Epic 5 is developed, I believe there is opportunity to invest in the connective tissue that helps these stakeholders work together more effectively.

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03:51:01.460 --> 03:51:17.059
Derrick Tang: California has already made substantial investments in research infrastructure, technology development, demonstration projects, but ensuring that these assets are well-connected and accessible can help maximize the impact and the return of those investments.

1342
03:51:17.170 --> 03:51:25.090
Derrick Tang: And maybe more importantly, as the challenges we are working on become more specific and complex and nuanced.

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03:51:25.500 --> 03:51:29.979
Derrick Tang: I believe that leveraging the clean energy ecosystem that California has built

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03:51:30.140 --> 03:51:34.219
Derrick Tang: Will allow us to meet those challenges more effectively and efficiently.

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03:51:34.530 --> 03:51:43.370
Derrick Tang: And we've seen that when innovators can more easily access early grant funding, testing resources, deployment partners and customers.

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03:51:43.500 --> 03:51:56.479
Derrick Tang: And when they participate in these coordinated networks, that those technologies can then move more quickly toward commercialization and deployment. And I believe it's these types of ecosystem-level investments that can complement

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03:51:56.520 --> 03:52:10.400
Derrick Tang: technology development funding, and then help complete this picture of how innovation leads to real benefits of affordability, reliability, and safety for all ratepayers. So, that's my comment. I just want to thank you again for your time and for this discussion.

1348
03:52:12.360 --> 03:52:13.800
Anthony Ng: Thanks, Derek, appreciate it.

1349
03:52:15.110 --> 03:52:17.759
Anthony Ng: Okay, let's go to Zora Chong.

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03:52:18.360 --> 03:52:19.549
Anthony Ng: Zora, go ahead.

1351
03:52:21.210 --> 03:52:33.379
Zora Chung | ReJoule: Hi, Zara again from Regul. We are a startup, that has directly benefited, from the many regional energy innovation clusters, or RECs, like, Scene and Lacey.

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03:52:33.380 --> 03:52:41.619
Zora Chung | ReJoule: So REACS have really helped us navigate the myriad of funding programs available that have helped bring our innovation from R&D stage

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03:52:41.620 --> 03:52:47.519
Zora Chung | ReJoule: Into the commercial market, which allows us to create a more efficient and thriving circular economy.

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03:52:47.520 --> 03:53:09.830
Zora Chung | ReJoule: Furthermore, Ridgewell has been directly impacted by federal support for clean energy, as it's faced uncertainty since last year. So, we do see that it is more important than ever that California continues its nationwide leadership in energy innovation by sustaining investment in the proven regional programs that deliver real economic and environmental results.

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03:53:09.830 --> 03:53:10.999
Zora Chung | ReJoule: Thank you so much.

1356
03:53:13.010 --> 03:53:14.000
Anthony Ng: Thank you, Zora.

1357
03:53:15.070 --> 03:53:17.210
Anthony Ng: Okay, let's move to Edson.

1358
03:53:17.780 --> 03:53:18.969
Anthony Ng: Edson, go ahead.

1359
03:53:20.030 --> 03:53:39.580
Edson Perez: Alright, hey everyone, Edson Perez again, co-founder of Parawat Energy. Thank you for the whole presentation and for the opportunity to comment. I actually missed the opportunity to tune in earlier on the Transportation Electrification Initiative, so I wanted to just take this opportunity to uplift soft magnetic materials within that context.

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03:53:39.610 --> 03:53:49.400
Edson Perez: So in Epic 4 Initiative 17, actually focused on charging technologies as a key way to reach vehicle electrification goals.

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03:53:49.400 --> 03:54:04.559
Edson Perez: And it was highlighted there that Level 1 and 2 chargers still typically sit below 90% efficiency, meaning that over 10% of all the energy spent on charging vehicles is lost when charging them, which quickly adds up to strain of grid and substations.

1362
03:54:04.560 --> 03:54:05.860
Edson Perez: So,

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03:54:05.860 --> 03:54:22.970
Edson Perez: since that initiative focused on this high-finity charging, it also included next-generation power electronics as a key way to do that, leveraging innovations like wideband gap semiconductors, and that topic is still extremely relevant, but at the same time, like I mentioned earlier, wideband gap semiconductors are

1364
03:54:22.970 --> 03:54:28.979
Edson Perez: pushing these power electronic systems to higher frequencies that legacy soft magnetics can't support, so…

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03:54:29.030 --> 03:54:38.009
Edson Perez: We're really seeing that, a bottleneck in efficiency improvements for charging equipment because of these soft magnetics, so…

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03:54:38.010 --> 03:54:57.640
Edson Perez: I want to put, like, just uplift the importance of soft magnetic material R&D under this context, and that's exactly what we're working at in Parawat, novel soft magnetics that are higher efficiency and

don't depend on critical minerals. So, happy to submit all these comments in the docket, and thanks so much for the opportunity.

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03:55:00.620 --> 03:55:03.340
Anthony Ng: Great. Thank you so much, Edson, for the feedback.

1368
03:55:04.600 --> 03:55:06.030
Anthony Ng: Okay, Marty.

1369
03:55:06.570 --> 03:55:07.500
Anthony Ng: Go ahead.

1370
03:55:07.800 --> 03:55:27.989
Marty Turock: Hello again, it's Marty Turok, as I said, currently an independent clean energy consultant, but I actually was the founder and executive director of the Sea Innovation Cluster from its launch in 2016 right through 2023. It's, you know, the comprehensive EPIC-V plan, the 13 programs.

1371
03:55:28.680 --> 03:55:34.690
Marty Turock: Cover all the key, priority initiatives that the state needs to achieve our 2045 goals.

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03:55:34.710 --> 03:55:39.290
Marty Turock: But I have to say, I'm personally shocked and disappointed

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03:55:39.290 --> 03:56:02.470
Marty Turock: that what Derek called the connective tissue, or I call the oxygen that feeds all 13 of these initiatives, has not been included in the EPIC-V budget. So, I can only assume that decision makers were not fully aware of the compelling ratepayer benefits that have been delivered to Californians. So, I'd just like to summarize a couple

1374
03:56:02.470 --> 03:56:25.619
Marty Turock: of the programs and their impact across the state, and I'd like to start with benefits to the DVCs. Ivy Energy, their virtual grid software platform, makes solar PV monetizable for multifamily property owners, and that enables 47% of Californians who rent their residences who can now benefit from clean energy savings.

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03:56:25.620 --> 03:56:50.529
Marty Turock: For just $399, anyone who has a 240-volt circuit for their clothes dryer can use NeoCharger's smart splitter and have level 2 charging at their home without panel upgrades. Nuvi was one of the earliest pioneering companies in bidirectional vehicle-to-grid charging and VPPs, and in particular, they've been a leader in California in electrification of school

1376
03:56:50.530 --> 03:57:15.390
Marty Turock: bus fleets, which reduces GHG and carcinogenic diesel particulate matter emissions. Controlled thermal resources, geothermal plant with lithium extraction has been delayed by legal and permitting challenges, but they are pressing forward and will create 480 construction jobs and another 220 direct operational jobs in one of the most economically and environmentally disadvantaged communities in the

1377
03:57:15.390 --> 03:57:16.200
Marty Turock: stating.

1378
03:57:16.330 --> 03:57:33.269
Marty Turock: Current scene companies, Energy Innovations, is introducing an affordable home water heater that leapfrogs heat pump water heaters and will accelerate the decarbonization of California's 77% of installed base of gas water heaters.

1379
03:57:33.270 --> 03:57:46.199
Marty Turock: also creating a VPP for the second largest residential demand. I'm almost done. Zendi offers one of the premier software platforms for microgrid design, optimization, and operation

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03:57:46.200 --> 03:58:09.909
Marty Turock: being used by universities, military bases, data centers for increasing operational resiliency, reducing costs, while offloading demand from the grid. Childyne's direct-to-chip negative pressure liquid cooling technology is reducing energy use and cost for hyperscale and AI-driven data centers that are using higher power chips and high-density GPU clusters.

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03:58:09.910 --> 03:58:16.630
Marty Turock: Particularly at a time when federal administration and the DOE are prioritizing and only funding

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03:58:16.630 --> 03:58:39.380
Marty Turock: coal, oil, natural gas, geothermal, and nuclear investments. If California eliminates funding for the proven, highly successful entrepreneurial ecosystem, please recognize this will severely shrink the pipeline of new, emerging, and pre-commercialized clean energy innovations that are essential for all 13 of the epic

1383
03:58:39.380 --> 03:58:54.920
Marty Turock: five strategic objectives to be achieved, and it's also going to significantly jeopardize reaching the state's 2045 energy, climate, and equity goals. So, I would really appreciate if you would seriously reconsider this funding allocation. Thank you.

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03:58:59.950 --> 03:59:05.330
Anthony Ng: Thank you, Marty, for the… for the feedback and the, and the stories there. Yeah, again, kind of…

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03:59:05.740 --> 03:59:15.029
Anthony Ng: Reinforcing the, encouraging folks to, to also compliment their comments today with, written, written, submissions, so, we can have that on our record as well.

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03:59:15.440 --> 03:59:17.860
Anthony Ng: Thanks, Marty. Let's go to Tanya.

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03:59:20.300 --> 03:59:39.090

Tanya - (CEL): Hi, Anthony, this is Tanya Barum from CEL. I just wanted to chip in, like all the others, in support of the REICs, working as an entrepreneur, in translating deep tech from the labs into an actual commercializable product, especially when you're using machine learning.

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03:59:39.170 --> 03:59:46.790
Tanya - (CEL): integrated solutions and hardware. It just takes so… it takes a village.

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03:59:46.960 --> 04:00:01.080
Tanya - (CEL): And so, I wanted to just call out a few particular things that we benefited from. You know, I know you're familiar with CL. We did recently win the Bridge Grant through the CEC, which we matched with some of our own commercial dollars.

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04:00:01.080 --> 04:00:08.360
Tanya - (CEL): And we could have never gotten to the point where we could have brought that much commercial match without the effort and attention of several of the REICs.

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04:00:08.470 --> 04:00:15.360
Tanya - (CEL): So, for our early business plan, market research, customer research.

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04:00:15.360 --> 04:00:34.480
Tanya - (CEL): We relied heavily on our first CalSEED grant, through New Energy Nexus and all the support that they and Cleantech Open provided. And then we went on to Phase 2, which was invaluable in prototyping aspects of our design that were very complicated to move from research and development.

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04:00:34.500 --> 04:00:44.740
Tanya - (CEL): For the portions of our design that we inherited from the labs, or I should say we licensed from the labs, or co-developed, we were supported through Cal Testbed.

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04:00:44.740 --> 04:00:57.979
Tanya - (CEL): Caltestbed provided technical support and measurement and verification that we were able to publish in a peer-reviewed journal, giving us enough credibility to move to the next phase, which is working with organizations like SEIN

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04:00:57.980 --> 04:01:06.029
Tanya - (CEL): on paid pilots and commercial maturation, SEIN helped us secure, not only, hiring.

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04:01:06.120 --> 04:01:20.059
Tanya - (CEL): help but a proposal writer, which led to paid pilots. And it's that revenue which led to recurring revenue that we were able to use as match as we crossed that, you know, what's usually called the valley of death, into full commercialization.

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04:01:20.060 --> 04:01:38.139
Tanya - (CEL): You know, I would also say there's that intangible piece. You know, I hear Zora on the phone. All of these people who are speaking have been people who I know I have been an agony on for them, and they have for me. There's, like, what is it, a 97% failure rate in startups? I'd imagine it's even higher for hardware and integrated solutions.

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04:01:38.150 --> 04:01:50.489
Tanya - (CEL): Why do we have such a high success rate within this cohort? There's really something to be said for that network of other entrepreneurs, founders, and people whose main job is to support us through this valley of death.

1399
04:01:50.490 --> 04:02:01.750
Tanya - (CEL): And to really gut it out when times are hard. As a result, my company is growing in California. We're hiring good, I would say, frankly, great-paying jobs. We're generating tax revenue.

1400
04:02:01.750 --> 04:02:14.420
Tanya - (CEL): And a cool team that has fun and helps California maintain its reputation as a great employer, a great place to live, and a great place to work. So thank you for your time. I'd like to encourage the,

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04:02:14.420 --> 04:02:22.739
Tanya - (CEL): CEC to continue funding these types of organizations and making sure that the pipeline to innovation is healthy at every single stage.

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04:02:26.100 --> 04:02:29.100
Anthony Ng: Thanks, Tanya. Appreciate the feedback and the comments there.

1403
04:02:33.290 --> 04:02:36.830
Anthony Ng: Okay, any last call for…

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04:02:37.220 --> 04:02:44.490
Anthony Ng: questions or feedback from, those in the audience? I know, yeah, it's been a long morning and afternoon, but again, thank you, everybody, for

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04:02:44.810 --> 04:02:49.059
Anthony Ng: For the… for the attention and for the… for the feedback here thus far.

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04:02:53.230 --> 04:03:11.870
Anthony Ng: Okay, so I'll just close up. I think some of these were addressed in the Q&A chat, as well as just throughout the various portions, but, kind of just to wrap up here, so the, yeah, so we're requesting that, folks submit their written comments to the CC docket by

1407
04:03:11.950 --> 04:03:19.669
Anthony Ng: June 18th, the, instructions are on the CC website, same as the information on

1408
04:03:19.670 --> 04:03:36.040
Anthony Ng: this event. There's a kind of a submit docket log, or submit e-comment link on the page there. We are going to… we're trying to get the recording for this workshop, as well as the slides posted by the end of today, or tomorrow morning at the…

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04:03:36.040 --> 04:03:50.970
Anthony Ng: latest, so folks will have that for review and reference as they're putting together their

comments. Yeah, any further updates on the Epic 5 will be posted on the CC webpage, and so, stay tuned there, as well as continuing to subscribe to the

1410
04:03:50.970 --> 04:04:08.669
Anthony Ng: Epic-related subscription. Just in terms of kind of next steps, I do, just want to kind of give a sense that, the Epic administrators, so the CC and the IOUs, are working on our investment plans currently. We are set to submit the plan to the PUC.

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04:04:08.770 --> 04:04:21.829
Anthony Ng: at the end of August, at which point the PUC will kind of open up their process and their proceeding to evaluate and ultimately kind of drive towards approval of the plans. And only once the plans are approved from the PUC can.

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04:04:21.830 --> 04:04:30.349
Anthony Ng: we actually start issuing solicitations, from the plan, so it's kind of a high-level overview of the process and the next steps there.

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04:04:30.580 --> 04:04:37.339
Anthony Ng: I do see, yeah, another hand here from Petra, so go ahead. Kind of last set of questions here.

1414
04:04:40.000 --> 04:04:41.720
Anthony Ng: Oh, okay. Was that…

1415
04:04:42.380 --> 04:04:43.670
Anthony Ng: Mistake, okay.

1416
04:04:46.370 --> 04:04:49.320
Anthony Ng: Okay, so that is all…

1417
04:04:49.490 --> 04:04:56.919
Anthony Ng: we have prepared… yeah, I just wanted to say thanks to the CC team here for, preparing and presenting

1418
04:04:56.920 --> 04:05:09.869
Anthony Ng: the content, and for those still remaining on the line, thank you again so much for your attendance, and your feedback, and your comments, and all the, you know, prep that you're going to be, preparing your written comments as well. So, thank you again, everybody. Have a good day.