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CALIFORNIA ENERGY COMMISSION

COMISSIONER WORKSHOP

In the matter of,	)	Docket No. 17-MISC-01
	)	
Workshop on AB 525	)	RE: Offshore Wind
Wind Energy Goals	)	

IN PERSON AND REMOTE VIA ZOOM VIRTUAL MEETING

Warren-Alquist State Energy Building
Rosenfeld Hearing Room (Hearing Room A)
1516 9th Street,
Sacramento, CA 95814

WEDNESDAY, MAY 18, 2022

9:30 A.M.

Reported By:
Martha Nelson

APPEARANCES

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Genevieve Shiroma, Commissioner, California Public Utilities Commission

Alice Reynolds, President, California Public Utilities Commission

Clifford Rechtschaffen, Commissioner, California Public Utilities Commission

David Hochschild, Chair, California Energy Commission

Kourtney Vaccaro, Commissioner, California Energy Commission

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Scott Morgan, Chief Deputy Director, Governor's Office of Planning and Research

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Julia Zuckerman, California Wind Association (CalWEA)

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Nancy Kirshner-Rodriguez, Business Network for Offshore Wind

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APPEARANCES (CONT.)

Public Comment (Cont.)

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Thalia Kruger, Principal Power

Rob Holmlund, Humboldt Bay Harbors, Recreation and Conservation District

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P R O C E E D I N G S

MAY 18, 2022 9:30 A.M.

MS. BRAND: Welcome. We're going to give it a minute for people joining us remotely to enter the webinar, and then we'll get started this morning.

Good morning. I'm Erica Brand, with the Energy Commission Siting, Transmission, and Environmental Protection Division. Welcome to today's Workshop focused on Assembly Bill 525, and the Energy Commission Staff Draft Report, Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045.

Today, Staff will present an overview of Assembly Bill 525, including the requirements directing the Energy Commission to evaluate and quantify the maximum feasible capacity of offshore wind in California, and establish offshore wind planning goals for 2030 and 2045. Before we begin, I am going to go over a few housekeeping items.

First, this meeting is being recorded and is being held both remotely and in-person to improve public access. For those of you joining us remotely, to make the workshop more accessible, Zoom's closed captioning has been enabled. Remote attendees can use the service by clicking on the live transcript icon, and then

choosing either show subtitle, or view full transcript.

The closed captioning service can be stopped by exiting out of the live transcript or selecting the hide subtitle icon. Closed captioning cannot be exited by phone. Workshop materials can be located on the CEC website, which can be accessed by those in the room using the QR code labeled "workshop materials," located in the back of the room near the entrance.

For those of you online, we will drop the link to the workshop materials in the chat. For those of you joining in person today, restrooms are located outside the Rosenfield room to the left, near the P Street exit.

In case of an emergency, please follow building staff to the Roosevelt Park, located diagonally across from the Warren Alquist State Energy Building.

Next, when we get to the public comment portion of our agenda, we will start with those in the room followed by those online. For those in the room that would like to make a public comment, please sign up through the QR code labeled, "In Person Public Comment," located in the back of the room near the entrance. If you are unable to use a QR code, for any reason, you may also fill out a blue card located on the table in the back of the room and walk it over to Dorothy from our Public Advisor's Office.

For those of you on Zoom that would like to make a public comment, we will be using the raised hand feature today, which looks like a high-five. For those of you joining by phone, press star-nine to raise your hand, and then star-six to mute and unmute. Please also note that the chat feature is not available to the audience today.

A few more notes on public comment. Public comment will be at the end of the meeting. Comments may be limited to three minutes or less per speaker. We'll show a timer on the screen, and we'll alert you when your time is up. All comments will become part of the public record.

Next slide, please.

Now, I'm going to give a quick run through of our agenda for this morning. For the workshop today, we will start off with opening remarks from agency leadership. Opening remarks will be followed by a staff presentation on the draft report, Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045. After the staff presentation, we will move into public comments.

Before we get started, let's take care of some administrative matters. Please be advised, that while

CPUC Commissioners are present at the workshop, the CPUC's rules governing ex-party contacts with Commissioners and their staff remain in effect, even though this a CEC initiated and noticed workshop.

With that, I'll ask any remote agency leadership to please turn on their cameras, and I'll turn it over to Commissioner Vaccaro to lead our opening remarks.

COMMISSIONER VACCARO: Great, thank you so much, Erica for getting us started this morning. Good morning, everyone. I feel like I'm still a little giddy with these in person meetings. We haven't had them for so long, and I think this is maybe one of a few that I have attended, but it makes me happy to see folks in the audience as well as continuing to have the robust virtual participation.

As Erica mentioned, I'm Kourtney Vaccaro, I'm a Commissioner here at the California Energy Commission. One of my lead Commissioner areas is offshore wind. I am so looking forward to today's discussion. I think, as many of you know, today's discussion of the report really is just to cover the first of many analyses that are going to be required as the state develops the strategic plan that's required for AB 525.

I'm learning as we go along, and that's why

today, I think it's really going to be important to hear what all of you have to say, to get your reactions, your thoughts about what you've read, and to hear what recommendations you have as we move forward.

I've been privileged, I think, over the past few years as a former advisor to Commissioner Karen Douglas, to be working with so many stakeholders and agency partners on offshore wind and am pleased today to have many of those agency partners represented on the physical and virtual dais.

We're going to hear from them in just a few moments, but I think I want to go ahead and just make a few very brief comments about, at least from my perspective, some of the significance of having this robust agency participation. I think what it shows to everyone is that there is an inter-agency commitment to collaboration, to cooperation —— but really, there's a commitment to a thoughtful, responsible, and informed approach to evaluating the potential for offshore wind energy to help California meet its climate and clean energy goals.

In addition to the participation from our agency partners, I'd really like to thank and recognize at this point so many of the stakeholders who've also provided contributions that have led to what you see in

the draft report. That includes local governments, tribal governments, environmental and environmental justice organizations, fisheries and the communities that depend on them, local government, labor organizations, and other stakeholders.

We appreciate that you continue to come to the table and share data, perspective, and most importantly, the constructive feedback. We need this input, and we benefit from this input, and we're going to continue to invite and welcome it. And not just because AB 525 says we have to. We're doing this because it is what we've done for years, and because it's necessary and important.

So, shortly we're going to hear from Commission Staff on the analyses, the studies, the methodology that ground the recommendations in the report. But, I think it bears repeating, and for some of you it's not repetition it's maybe hearing it for the first time. Something really important about what the legislature said in AB 525. And it made plain that the planning goals that are required are not intended to create a technology set-aside, or mandatory minimum for any type of eligible energy resource. What we understand that to mean, is that these megawatt planning goals and other requirements in AB 525 are intended for

strategic planning purposes.

I emphasize that point and I'm going to be interested in some of the reactive and responsive comments that come in later today. We've seen some, you know in the docket already, and through various conversations that we have. There seems to be, I think, the need to still get clarity around planning goals versus targets or procurement targets.

So, before turning to my colleagues, I'm going to turn first to the colleagues that are here in person, then we'll go to those who are here virtually. I'd really like to recognize the Energy Commission Staff from our sub-division who contributed to this report, as well as my advisor Eli Harland, and my fellow Mark Danielson.

Their work has been invaluable in this space, as well as the staff and the principles from agency partners, including State Lands Commission, Public Utilities Commission, Department of Fish and Wildlife, Ocean Protection Council, Coastal Commission, the CAL-ISO and others, who we were able to share an early draft with. They provided invaluable feedback that allowed us to improve on what we had already produced and be able to provide you with a draft that I'm very pleased and proud of. I hope that all of you see that there's a lot

of analysis work that went into it, and a candor that says there's so much more work to be done. But this is a starting point, and it's a foundation.

Again, really looking forward to your feedback today, and I think I'm going to turn it over to my colleagues on the dais starting first with Commissioner Houck, and then I think I think we'll just make our way over to Justine from the Ocean Protection Council. Thank you all so much for being here today.

COMMISSIONER HOUCK: Thank you, Commissioner Vaccaro. Good morning, I'm Darcy Houck, I'm a Commissioner at the California Public Utilities Commission, and I'm pleased to be here this morning and look forward to the presentation of the CEC's report on the role of offshore wind in advancing California's clean energy goals.

First, I'd like to thank the California Energy Commission, their staff. Also, specifically, Chair Hochschild, Commissioner Vaccaro, former Commissioner Douglas, who is now the Governor's Energy Advisor, for all of her work, particularly in reaching out with tribal communities, the Coastal Commission, for all of their leadership in this effort. I also join in recognizing the interest groups who have contributed to this effort. Specifically, tribal governments and local

governments who will be impacted by the development.

Offshore wind will be a critical resource addition to California's energy profile as we transition to our clean energy future. It's important that as we examine the potential of this new resource in California and its role in shaping California's future load profile, that we also need to examine the associated transmission and infrastructure needs, as well as its impact on California's coastal resources, rate payers, and indigenous communities.

While balancing these interests may be challenging, it also presents a tremendous opportunity for meeting our clean energy goals, contributing to California's economic growth, and furthering collaboration amount the energy agencies: the California Public Utilities Commission, and the California Energy Commission, Coastal Commission, California Air Resources Board, and CAL-ISO.

So, with that, again, I thank everyone for the presentations that we'll hear today, and I look forward to listening and learning from the discussion.

COMMISSIONER VACCARO: Commissioner Shiroma?

COMMISSIONER SHIROMA: Yes, thank you. Good morning, everyone. I'm Commissioner Genevieve Shiroma. Can you folks hear? I have turned this on. Yeah. You

can hear? Okay. Alright.

Thank you. I'm Commissioner Genevieve Shiroma, from the California Public Utilities Commission. My pronouns are she/her. I'm pleased to join our agency partners from the Energy Commission and all of the entities outlined by Commissioner Vaccaro —— I see PUC colleagues —— for this very important workshop on offshore wind and the CEC staff report and response to AB 525.

I'm looking forward to this workshop as an opportunity for us to learn about how we consider the AB 525 planning goals as they relate to the State's integrated resource planning and transmission planning processes as well. Thus, this workshop is a critical part of the effort to shine a light on our specific efforts around offshore wind, and the unique challenges and opportunities around this resource.

Thank you to all of the Energy Commission staff responsible for organizing today's event, in addition to the many different agency staff who contributed to the Energy Commission report. Thank you.

COMMISSIONER VACCARO: President Reynolds?

PRESIDENT REYNOLDS: Thank you, Commissioner Vaccaro. I wanted to echo your sentiment about how nice it is to be here in person today. So, I'm really very,

very pleased to be here, especially to get to share the dais with leadership from CEC, from State Lands Commission, and the Ocean Protection Council, as well as my fellow Commissioners.

As we know from the draft AB 525 Report, as well as the SB 100 Joint Agency Report, and the CPUC's 2021 Preferred System Plan, offshore wind really does have the potential to play a significant role in meeting California's decarbonization goals. I wanted to recognize the collective effort in getting here today, as Commissioner Houck mentioned, we have many, many state, local, federal agencies who have already been working very hard together with a wide variety of stakeholders to get us to this first stage in the process. I look forward to today's presentation on the work that has already been done so far.

With respect to AB 525's directive to evaluate the ability of offshore wind to achieve ratepayer benefits, I'm also looking forward to discussion on how our planning goals and assumptions can be optimal for ratepayers for the coming —— over the coming years. So, we need to ensure that the entire state benefits from the contribution of offshore wind to decarbonization efforts.

My hope is that the work captured in this

workshop today will help us and lead to a better understanding of the path forward needed to advance the responsible development of offshore wind. So, thank you, again, to the CEC Commissioners and Staff for their leadership in planning this workshop. I'm very pleased to be a part of the discussion.

COMMISSIONER VACCARO: Thank you. Commissioner Rechtschaffen?

COMMISSIONER RECHTSCHAFFEN: Thank you very much, Kourtney. My colleagues have said a lot of what I wanted to say, although I thought you were going to say you were giddy, Commissioner Vaccaro, that you could sit next to me. I was waiting for that. There —— that's what she really meant.

I really want to thank the Energy Commission, and especially the staff, for the extremely close and highly productive collaboration with the PUC's Energy Division, and in particular our IRRP staff in this effort. Our colleagues on the resource agencies are —— that collaboration's been extremely valuable as well, but the energy staff have worked really closely together.

I think the journey to offshore wind in California —— I don't know if it's going to take a thousand steps, but it's going to take many, many steps,

and this is one important step along the way, this report and this 525 process.

I agree with my colleagues. I strongly feel that offshore wind is a critical component of getting to our long-term climate goals. I think there's consensus around that. But there are important questions about how we do that. How much we need, when it's —— when the resource is going to come online, transmission is available, what's feasible. And this report takes important steps to start answering that question.

I want to highlight two things. One, Commissioner Vaccaro mentioned, that these are —— the goals talked about here are planning goals. They're not determined mandates, they're not targets, they're planning goals, and should be viewed as such.

The report draws helpful links with the PUC's IRP process, and the ISO's transmission planning process. It particularly says, "It's a good thing for these goals to exceed the current assumptions we have in those processes," because that will allow for flexibility. That will allow us to adjust as we get more information. They're not a floor, they're not a ceiling, they're just broad planning goals.

I'm also very encouraged that the report confirms that we expect to have transmission for five

gigawatts for offshore wind off the Central Coast in 2030. That makes a very big deal in assessing the feasibility of that resource.

Thanks again, I look forward to the discussion today.

COMMISSIONER VACCARO: Thank you. Jennifer Lucchesi.

MS. LUCCHESI: Good morning, everyone. My name is Jennifer Lucchesi, I'm the executive officer of the California State Lands Commission.

I want to associate myself with my colleagues on the dais here and everything that they've said. Two things I want to emphasize and uplift is, also, my gratitude to my colleagues here, and —— but especially, to all of our staff. It's one thing to have all of us principles coordinate and collaborate, but we all know that the majority of the work involved here is born by our staff, and they have been absolutely exceptional.

In my over 20 years of government service, I have never seen the amount and the level and the intensity of collaboration amount multiple state agencies across multiple sectors of government as I've seen with the offshore wind and the strategic planning over the past couple years, and will continue indefinitely. It's really, really, positive and really,

I think, speaks to how California is devoted and dedicated to this energy transformation, especially in our offshore waters.

The second thing I just want to uplift is the —— what I'm looking forward to is really learning from all of our stakeholders and members of the public and my colleagues here on the dais. The State Lands Commission manages state property offshore consistent with the Common Law Doctrine, the Public Trust Doctrine, and it really talks about that these are public lands and resources for the benefit of all the people

We only know what the needs of our communities and our people are through dialogue and learning from each other and really listening to each other. And so, for us as decision makers, and our decision makers above us, we really need to hear from all of you to make the best decisions for the State of California, and this is just the beginning of that. And so, I really look forward to the conversation today, and the conversations that we'll have in the future.

So, thank you Commissioner Vaccaro, it's a pleasure and an honor to be here with all of you. Thank you.

COMMISSIONER VACCARO: Thank you. Justine Kimball.

MS. KIMBALL: Good morning, everyone. I'm Justine Kimball, Senior Program Manager at the Ocean Protection Council, and I lead the Climate Change Program there.

I'll echo all the thanks to everyone that's been involved getting to this point, and channel our Executive Director, Mark Gold, again, and just acknowledge just the tremendous amount of collaboration and coordination. As Jennifer said, just very unprecedented. Many meetings per week, and I think we have just a really great group of people working on this.

And, has also been mentioned, we also have the same goal of supporting offshore wind while also being sufficiently thoughtful about the process for development. I think that comes across really well in the report that we'll be discussing today, and particularly for OPC, the acknowledgment that we just don't have enough information right now to assess the potential impacts on biological and cultural resources, fisheries and communities to include in the planning goals at this stage, and it's —— as more information becomes available these goals may need to be refined.

Given the pace that we are asked, and that we've been moving, and again, the unprecedented nature

of floating wind off of the West Coast, we think this is a very reasonable place to be as we move forward into the strategic planning process and further analysis of suitable sea space.

Thanks to some funding that OPC received in the last budget cycle, we've been able to fund a series of projects that will provide some critical information to feed into these next steps. But, given again, with less than a dozen turbines world-wide, we know that monitoring and adaptive management will also need to be a part of this process.

We look forward to bringing as much science and information to the table as possible and working with our great colleagues both within and outside the state government going forward. Thank you.

COMMISSIONER VACCARO: Thank you, Justine. Erica, I'm going to turn to you to help with who is on the virtual dais. I do see Scott Morgan with the Office of Planning and Research and Chair Hochschild, but if there are others, I can't see them. So, maybe we'll start with Chair Hochschild, we'll go next to Scott Morgan and then if there are others, I'll look to you to help us with that. Thank you.

CHAIR HOCHSCHILD: Well, thank you so much, Commissioner Vaccaro for your leadership, and I wish I

could be there in person. Although, I think I wish I was with you more than you wish you were with me, because I'm getting over a chest cold here. So. But if I were there, Cliff, I'd be giddy to sit on the dais with you.

I wanted to just, first of all, offer my thanks to Commissioner Vaccaro for her incredible focus and hard work and diligence on this critical issue, and that of her advisor, Eli Harland, and the whole staff team, and of course, our tremendous colleagues at the PUC. This is really a very exciting example, I think, of, you know, inter-agency collaboration to bring a new technology to help us confront our energy and climate challenges and bring it to fruition. And thanks, also, to OPC, OPR, Coastal Commission, and all the other partners.

A few thoughts I just wanted to share. I have been fortunate to be able to visit offshore wind installations in four different countries at this point. I was particularly impressed by Denmark and by the UK. Denmark has 500 offshore wind turbines installed today. The UK, with a load of 60-gigs has 10 gigs installed and operating today. We are going to 40-gigs. This is definitely an area you know —— one of the technologies where we are planning catch-up in California. You know,

we may be leading in electric vehicles and efficiency in storage, but offshore wind, we have a ways to go.

I think one of the take home points for me, is we need to have some humility about the change in landscape as technology improves. I started engaging on this issue seven years ago, and at that time the largest turbine on the market was a seven-megawatt turbine. Today, we're at a 15-megawatt turbine, and closing in on 18 to 20-megawatt turbines coming in very short order.

All of which is happening in real time, and all of which impacts, you know, our ability to plan. So, staying highly attuned to technology development, I think, is really critical as we engage in this planning exercise. I just wanted to echo Commissioner Rechtschaffen's point about, you know, just our —— the necessity to stay very focused on the evolution of the technology because, it is —— you know, this is a planning goal, which is different and distinct from a procurement mandate.

I think there's —— I think that's actually a good place for us to be in this exercise. So, really looking forward to the discussion today. I will just share with you, the Governor is really excited about California going big on this, and for good reason. You know, my own view, having spent my career in renewables

and this via, I believe that after rooftop solar, that offshore wind is the lowest impact form of energy generation in the world. Just when you think about impact to —— not to say there are no impacts to it, because there are impacts to every form of energy generation, but it offers up the opportunity to create electricity in ways that really minimize that impact.

I would remind everyone that as we're going forward with this lease sale, which we expect later this fall, 582 square miles off the coast of California, the areas that we're talking about don't even begin until 20 miles offshore. So, you know, many of the issues that caused significant heart burn early on, say off of Massachusetts where they're much, much closer —— you know we're under a very different circumstance here —— and just with —— bear in mind that.

But, um, my thanks to the whole team that brought us today, and for all the hard work in this report.

COMMISSIONER VACCARO: Great, thank you. Scott Morgan.

MR. MORGAN: Yes, thank you for having me, everybody, I wish I was there in person —— to be able to sit next to Commissioner Rechtschaffen as well. Special thanks to Commissioner Vaccaro and her staff. The

amount of working hours that they have put into this is quite mind-boggling and impressive.

I'm with the Governor's Office of Planning and Research, and OPR in statute is designated as the State's planning entity, to look broadly at land use and environmental policy across the state. So, we take a kind of high-level stance on projects like this.

Really excited just to continue to work with the group as well as our stakeholders and federal partners on thinking about the use of our unique and natural resources here in California, and how we get to our planning and renewable energy goals while respecting those unique resources as well. So, really looking at how we balance all of the things that go into these types of great projects and making sure that we're getting input and feedback from all the stakeholders and entities that are impacted and involved.

And so, a great process that's been set up at the Energy Commission, and I'm happy and excited to be part of the group working on this. Look forward to hearing the presentations here later today and continuing to work with everybody on this really unique and cool project. Thank you.

COMMISSIONER VACCARO: Okay, next I'd like to turn the microphone over to Becky Ota at the California

Department of Fish and Wildlife.

MS. OTA: Thank you very much. I hope everyone can hear me and, like Chairman Hochschild, I'm sorry I'm not there, I also am recovering from a chest cold. And, of course, with the wonderful miracles of technology, my camera is not working. So, I apologize on all fronts for not being there, although I do have a great staff there, and Chris Potter who can also speak for the Department as things come up in technology, you know, then you'll speak.

I am the Habitat Conservation Program Manager for the Department of Fish and Wildlife's Marine region. And we, you know —— all of the things said today are spot on for the department as well, you know, as a trustee agency and responsible agency status under CEQA, you know, to oversee the conservation, the protection, the management, fish and wildlife and native plants, and we're also responsible for marine biodiversity protection and the Marine Life Protection Act in coastal marine waters of California, and then ensuring fisheries are sustainably managed in the Marine Life Protection Act.

We have been involved in offshore wind for quite a while, now, for going on six or seven years. We have really valued all of the cooperation, coordination,

collaboration that we have with all of the agencies. With our fishing industry, we've been reaching out to them, as many of you know, on facilitating conversations among all of the agencies involved, and we really value that ability to do that.

Everything that everybody has already said about the amazing collaboration, I'd say one more thing about that, is that we collaborate all the time amongst ourselves on smaller projects, which just shows that collaboration that we have created over many years with each other has really paid off in these big, big, big projects.

Whether it's the offshore wind, or in my case, back in the mid to late 2000's was the Marine Life Protection Act, and creating our Marine Protected Areas off the coast, which was also a very large process and many agencies and stakeholders involved. So, it's very wonderful to see, that that collaboration continues and builds and strengthens even on these big, big projects.

So, we really appreciate that, and definitely will keep that going. I look forward to hearing everything, and presentations on the report, and we will definitely be continuing our involvement with everyone in regard to offshore wind, and the report coming up. So, thank you very much, I'm here in case there's

questions, but I also have Chris Potter in the audience as well. So, thank you very much.

COMMISSIONER VACCARO: Thank you. Are there any other principles on the line? Do one last check. Okay. Thank you everyone for your remarks.

With that, we are going to turn it over to Rhetta deMesa, with the Energy Commission for this fact presentation on the draft report, Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045.

MS. DEMESA: Good morning. I am Rhetta deMesa with the Energy Commission Siting, Transmission, and Environmental Protection division, and I'd like to start by thanking everyone for joining us here today, both in the room, and virtually.

As you may recall, the Energy Commission hosted a workshop in March of this year, to discuss the requirements of Assembly Bill 525, and the Energy Commission's proposed approach to meeting the first requirement, which is that the Energy Commission must, by June 1st of 2022, evaluate and quantify the maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment, and decarbonization benefits, and shall establish megawatt offshore wind planning goals for 2030 and 2045.

This morning, I'm going to discuss the draft report, Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045, that was issued by the Energy Commission on May 6th of this year, to meet the first Assembly Bill 525 requirement.

Before getting into the details of the report, I'm going to provide context for why the state is focused on offshore wind energy development, what Assembly Bill 525 requires, and the methodology and recommendations of the Energy Commission's staff in developing the draft report.

We look forward to hearing your comments during the public comment portion of the day.

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California has an ambitious suite of clean energy and climate goals. Offshore wind energy is poised to play an important role in the portfolio of solutions that will be needed to make those goals.

We are working to meet an economy-wide target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030, and 80 percent below that by 2050. With the passage of the 100 Percent Clean Energy Act of 2018, more commonly referred to as SB 100, California requires that eligible renewable energy resources and

zero-carbon resources supply 100 percent of total retail sales of electricity in California and to end-use customers, and 100 percent of electricity procured to serve all state agencies by 2045.

SB 100 also increased the State's renewable energy portfolio standard, to ensure that at least 60 percent of the State's electricity comes from eligible renewable energy resources by 2030. SB 100 requires the Energy Commission, the Air Resources Board, and the Public Utilities Commission to prepare a joint policy report every four years that meets certain statutory requirements.

This first report was issued in 2021 and found that we need a significant buildout of clean energy generation over the next 25 years to meet our goals. Portfolio modeling completed for the report covered a range of scenarios and technologies, and in the core scenario the modeling used the build-in assumption that up to ten gigawatts of offshore wind is available, and all ten gigawatts were selected by the model included in the 2045 portfolio.

For context, one thousand megawatts equals one gigawatt, and one gigawatt of offshore wind can meet the electricity needs of about 750,000 average California homes. I'll discuss the 2021 Joint Agency SB 100 Report

in more detail later in the presentation, but I mention it now to provide context for the State's focus on the potentials of offshore wind energy to help further diversify the State's renewable energy resource portfolio.

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California has been assessing the development of wind in federal ocean waters long before the 2021 Joint Agency Report. Building on the State's years-long work to assess offshore wind, Governor Newsome signed Assembly Bill 525 into law in September of 2021, and on January 1st, 2022, AB 525 took effect.

AB 525 comprises a suite of statutes, directing the CEC to develop a strategic plan for offshore wind energy development installed off the California coast in federal waters, and to do so in coordination with the California Coastal Commission, the Ocean Protection Council, the State Lands Commission, the Office of Planning and Research, the Department of Fish and Wildlife, the Governor's Office of Business and Economic Development, the Independent System Operator, the Public Utilities Commission, and other relevant federal, state, and local agencies as needed.

AB 525 sets the analytical planning framework for offshore wind energy development off the California

coast in federal waters, and tasks the CEC to move swiftly to develop a strategic plan for offshore wind development on or before June 30th, 2023. In enacting AB 525, the legislature found and declared, among other things, that if developed and deployed at scale, offshore wind energy can provide economic and environmental benefits to the state and the nation.

Additionally, offshore wind energy can advance California's progress towards its renewable energy and climate mandates, can add resource and technology diversity to the State's energy portfolio, presents an opportunity to attract investment capital and realize community, economic, and workforce development benefits, can contribute to a diverse, secure, reliable and affordable renewable energy resource portfolio to serve the electricity needs of California ratepayers, and improve air quality, particularly in disadvantaged communities, and finally, offshore wind can be developed in a manner that protects coastal and marine ecosystems.

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In consideration of these legislative finds and other goals, AB 525 tasks the CEC in coordination with an array of specified local, state, and federal partners, and with input from stakeholders, to develop a strategic plan for offshore wind energy development

installed off the California coast in federal waters and to submit it to the Natural Resources Agency and the legislature by June 30th, 2023.

The strategic plan is required to include, at a minimum, the following five chapters. First, identification of sea space. Second, economic and workforce development and identification of port space and infrastructure. Third, transmission planning. Fourth, permitting. And fifth, potential impacts on local resources, fisheries, native American and indigenous peoples, and national defense, and strategies for addressing those potential impacts.

AB 525 also established priorities for the strategic plan. The priorities include that the strategic plan should emphasize and prioritize near-term actions, particularly related to port retrofits and investment in workforce, to accommodate the probable immediate need for jobs and economic development. In considering port retrofits, the strategic plan shall strive for compatibility with other harbor tenants and ocean users to ensure that the local benefits compliment other local industries.

The strategic plan shall emphasize and prioritize actions that will improve port infrastructure to support land-based work for the local workforce. The

development of the strategic plan regarding workforce development shall include consultation with representatives of key labor organizations and apprenticeship programs responsible for training the construction workforce.

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In developing the strategic plan, AB 525 also requires the CEC to meet the following interim deliverables. By June 1st, 2022, the CEC must evaluate and quantify the maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment and decarbonization benefits, and establish megawatt planning goals for 2030 and 2045. By December of this year, the CEC must complete a preliminary assessment of the economic benefits of offshore wind as they relate to seaport investments and workforce development needs and standards. And again, by the end of this year, December 31st, 2022, the CEC must develop a permitting roadmap that describes timeframes and milestones for a coordinated, comprehensive, and efficient permitting process for offshore wind energy facilities and associated electricity transmission infrastructure off the coast of California.

Next slide, please.

To date, most offshore wind energy projects

have used fixed-bottom foundations, which are more suitable for shallow waters of 60-meters or less. The deep waters off the Pacific outer continental shelf off California's coast have steep drop-offs and will require offshore wind turbines installed on floating platforms to be anchored to the seabed. The diagram here shows some examples of currently known platform designs, mooring, and anchor configurations being pursued in deep waters currently.

Next slide, please.

And here, we have an example of what an offshore wind energy development will look like. In addition to the turbines themselves, there are inner array, or electrical cables, which represent most of the wind development footprint. These cables run between the turbines to a substation, and then into onshore infrastructure.

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As I mentioned, the first requirement in AB 525 directs the CEC on or before June 1st of 2022 to evaluate and quantify the maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment, and decarbonization benefits and to establish offshore wind megawatt planning goals for 2030 and 2045. In March of this year, the Energy Commission

Staff held a public workshop on AB 525.

At the workshop, we walked through the requirements of the legislation, presented our planned approach for evaluating and quantifying the maximum feasible capacity and establishing the megawatt offshore wind planning goals, and described much of the existing analytical work we would be relying on. At the time, we had initiated a literature review of existing publications and research and asked for public input to help identify additional resources we needed to be considering.

Over the last two months since the workshop, we have continued our review and analysis of the various studies, publications, and research as well as the public comment we received following the March workshop and used that information to develop the draft report.

Next slide, please.

AB 525 directs the CDC to evaluate and quantify maximum feasible capacity but does not provide a definition for feasible. One of the first tasks for us was to determine what feasible means in the context of this AB 525 requirement. To do this, we looked to regulations that govern the CEC proceedings, and the legislative findings of AB 525 to give meaning to the term.

The CEC's governing regulations define feasible as, "Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." This definition aligns with a wholistic reading of AB 525 legislative findings, which focus on evaluating how California can realize the development of offshore wind at scale, but with realistic projections of what could be achieved by 2030 and 2045, considering a range of factors based on existing work to assess wind energy developed in federal ocean waters.

CEC staff is approaching the evaluation of maximum feasible capacity based on these sources. The Energy Commission definition of feasible is found in California Code of Regulations, Title 20, Section 1201, Subsection H.

Next slide, please.

Next, I'll describe some of the considerations and research analyzed by CEC staff in thinking through some of the maximum feasible capacity for offshore wind energy. AB 525 specifically calls on the Energy Commission to evaluate and quantify maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment, and decarbonization benefits.

I'll briefly touch on each of those, next.

First, reliability. Moving to zero-carbon resources is a pillar of the State's strategy for reducing greenhouse gas emissions to address climate change. Several, but not all of these sources, including wind energy, are variable, and do not operate on demand like traditional fossil fuel generation, or as a base load resource, such as geothermal.

Integrating these variable resources requires a more agile management of the grid, greater coordination of the electricity market, and resource planning that takes variability into account. Offshore wind is an attractive technology from a system planning perspective, due to the high-capacity factor, and associated generation profile that compliments solar.

Offshore wind can provide more consistent output during the winter months when solar production is lower, however, there is still a significant variability that may make grid integration a challenge. Studies that are part of the CPUC's Integrated Resource Planning, or IRP process, consider how offshore wind generation at specific locations fit within system-wide electrical demand. And the role of other resource types, including energy storage, to support the integration of offshore wind reliably.

Moving to ratepayer benefits. Staff at the CEC continue to work closely with the CPUC and the California Independent System Operator, or ISO, to evaluate offshore wind as part of California's renewable energy portfolio and integrate consideration of ratepayer costs into their respective planning processes. Cal-ISO's Transmission Planning Process, or TPP, which results in an annual transmission plan, is a key route for ensuring development for the transmission needs in California to accommodate future transmission investments to deliver future energy resource planning portfolios including offshore wind resources.

The TPP is based upon the State's stand forecast, GHG emission reduction targets, and a portfolio of future generation and storage resources from the CPUC IRP that are intended to minimize ratepayer costs while achieving specific GHG targets and reliability metrics.

The CPUC's IRP process also ensures implementation requirements of Senate Bill 350, ensuring load serving entities meet targets that allow the electricity sector to contribute to California's economy-wide greenhouse gas emission reduction at the least-cost to ratepayers.

An NREL cost study performed by the CPUC's IRP

estimated that the levelized cost of energy in California between 2019 and 2032 could decline by 44 percent on average if the global floating offshore wind markets expand. NREL estimated the level cost of energy would reach between 53 and 64 dollars per megawatt hour by 2032 based on assumptions of the global floating offshore wind market. This decline in costs, along with other factors, could help achieve ratepayer cost benefits.

Next, moving to employment benefits. In adopting AB 525, the legislature found that offshore wind energy development presents an opportunity to attract investment, capital, and realized community, economic, and workforce development benefits in California. The largest economic benefits for California from an offshore wind industry would be realized with the development of a local supply chain, where offshore wind components such as floating platforms, towers, mooring lines, and anchors could be manufactured in-state.

Based on currently available information summarizing industry opinions, a minimum of eight-gigawatts of offshore wind over the next decade should be considered for signaling the scale of needed supply chain and manufacturing investments.

As required by AB 525, a preliminary economic assessment, including an analysis of the workforce development needs for a California offshore wind industry, will be completed by the CEC on or before December 31st of this year. The economic assessment will provide additional insight into the employment opportunities and benefits of a robust offshore wind industry in California.

Finally, we have decarbonization benefits. Meeting the State's decarbonization goals will require significant modernization of the current electric system, including diversifying the energy mix. The SB 100 Joint Agency Report assessed how California should approach achieving the policies established by SB 100.

Portfolio modeling, completed for the Joint Agency Report, included an assumption of ten-gigawatts of offshore wind resource potential available in the resolved model by 2045. In the resulting analysis, the resolved model selected all ten gigawatts of offshore wind for many of the scenarios analyzed, including the SB 100 core scenario.

In addition to being a renewable generation resource, including offshore wind in the State's energy portfolio may help California reduce the use of gas-fired power plants in the evening hours, helping reduce

greenhouse gas emissions and maintain system reliability during net-peak periods. A study by the USC Schwarzenegger Institute for State and Global Policy estimated that if five-gigawatts of gas-peaking capacity can be replaced with the development of ten-gigawatts of offshore wind, it could result in a potential reduction of 4.7 million metric tons of CO2.

Next slide, please.

We're now going to move to the report findings on maximum feasible capacity. There have been multiple assessments of California's offshore wind potential in federal waters, including those by NREL and BOEM, UC Berkeley, the Schatz Energy Resource Center, and the CPUC. These studies explore differing amounts of offshore wind generation technical potential, with differing focuses such as supply chain economics, technology costs, levelized costs of energy, and transmission and infrastructure needs.

In the 2020 cost study produced by NREL, NREL identified areas that are technically feasible for offshore wind generation with an average wind speed of at least seven meters per second, and water that's between 40 and 1,300 meters. NREL selected five study areas for a detailed cost analysis including the Morro Bay, Diabolo Canyon, and Humboldt Call Areas, as well as

other areas near Cape Mendocino, and off the coast of Del Norte County.

The study areas in the technical studies were identified based on wind speed, ocean depth, bottom slope, distance to grid interconnection, and distance to existing port infrastructure and are technically suitable for current technologies. They are all identified in federal waters, within the leasing jurisdiction of BOEM, and are located outside the network of existing National Marine Sanctuaries, and other protected areas.

However, it's important to emphasize that these areas in the technical studies have not been fully examined for existing coastal and ocean uses, or environmental impacts. These potential study areas add up to a total area that would support more than 21,000 megawatts of offshore wind capacity. Based on the studies described in the report, nearly 21.8 gigawatts of offshore wind technical potential has been identified and examined for technical feasibility.

It's important to note this number does not represent the quantification of the maximum feasible capacity of offshore wind as defined in the draft report and required by AB 525. Instead, it represents the offshore wind technical potential that has been studied

and has been included in the draft report as a reference point for additional evaluation through the AB 525 process.

The Energy Commission did not ignore the legislative directive and intends to fully comply with it. But as noted in the draft report, the statutory deadline for establishing the megawatt planning goals and identifying the maximum feasible capacity for offshore wind comes will before the Energy Commission is to complete its work to identify sea space, which is a required chapter of the Strategic Plan.

Based on the CEC's experience of assessing offshore wind energy, the CEC staff concluded that the Sea Space Evaluation is a condition precedent for being able to evaluate maximum feasible capacity of offshore wind. CEC staff will continue to examine potential areas for offshore wind development, and potential impacts further in the assessment and identification of sea space. This work is necessary to further evaluate and quantify the maximum feasible capacity of offshore wind to achieve reliability, ratepayer, employment, and decarbonization benefits.

Next slide, please.

I'm now going to transition to the offshore wind megawatt planning goals. First, I'm going to

provide an overview of the proposed planning goals. Then, in later slides, I'll walk through the factors and research that were considered and informed reaching these recommendations. Based on the CEC staff's assessment of existing information, as presented and evaluated in the draft report, we recommend the preliminary megawatt offshore wind planning goals summarized in this slide.

As discussed in the draft report, the preliminary megawatt planning goals do not fully account for other important factors, such as environmental considerations or competing ocean uses.

For purposes of developing the Strategic Plan, the CEC recommends establishing a preliminary planning goal of 3,000 megawatts of offshore wind by 2030. This goal could be accomplished by a full buildout of the Morro Bay Wind Energy Area, or a combination of a partial buildout of each of the Morro Bay and Humboldt Wind Energy Areas, which the CEC will further explore when assessing and identifying suitable sea space.

The CEC recommends establishing an additional preliminary planning goal in the range of 7,000 to 12,000 megawatts of offshore wind by 2045. This goal is additive to the 2030 goal and establishes a total offshore wind planning goal for 2045 at 10,000 megawatts

to 15,000 megawatts.

The lower end of the range is consistent with the total amount of offshore wind identified in the SB 100 Joint Agency Report. The upper end of the range is at about the midpoint between the SB 100 Joint Agency Report, and the megawatt capacity examined in the ISO's 2021-2022 Transmission Plan.

The total goal for 2045 will be evaluated as part of the AB 525 strategic plan as more information becomes available from the analysis of suitable sea space and potential impacts on coastal resources, fisheries, native American and indigenous people, and national defense, as well as other topics addressed in the Strategic Plan, such as supporting infrastructure and workforce and supply chain.

The information from the studies we've reviewed indicate that the proposed range of megawatt planning goals are potentially feasible, if significant investments are made in the transmission and other related infrastructure such as ports. These planning goals are also within the range necessary to support and sustain employment and economic benefits to the state.

These preliminary megawatt planning goals are established at a level that can make a significant contribution to achieving the climate goals, reflecting

available data and science, and evaluation of the 12 factors prescribed by AB 525 with acknowledgement that we have yet to complete critical sea space and impact analyses.

We recognize in the report, however, that by 2045, there may be sufficient technological developments and related cost reductions driven by innovation for reaching up to 20 gigawatts between 2045 and 2050. These innovations may include advanced monitoring systems, improved mooring systems and cables, and increased turbine sizes.

As previously stated, while these preliminary megawatt planning goals do not fully account for impacts on coastal resources and ocean users, the planning goals will be further evaluated as part of the analysis of suitable sea space and the development of the strategic plan where those potential impacts and strategies to address them will be considered.

Finally, it's important to note, as was mentioned from our dais this morning, the AB 525 is very clear, that nothing in its suite of statutes is intended to create a technology set aside or mandatory minimum for any type of eligible renewable energy resource.

Next slide, please.

AB 525 requires the CEC to consider 12 factors

when establishing the megawatt offshore wind planning goals. These are presented on this slide in a different order than in the AB 525 statute. CEC staff assessed all 12 factors required by AB 525 and determined that, while all factors are important in establishing megawatt planning goals for the Strategic Plan, the first five factors, which are bolded here, have greater influence on shaping or affecting the megawatt planning goals than others.

These five factors are consistent with what we presented at the March workshop and were reinforced with our continued research over the last couple of months and discussed in the draft report. I'll now run through these five factors in more detail.

Next slide, please.

The first factor includes findings from the SB 100 Joint Agency Report. As I mentioned earlier, SB 100 requires the CEC, California Air Resources Board and CPUC to prepare a Joint Agency Report every four years that meet statutory requirements. The first report was issued in 2021, and AB 525 tasks the CEC to consider the findings of the report in establishing the goals.

This slide is a variation of the one I showed you earlier. It reflects that portfolio modeling completed for the SB 100 Joint Agency Report covered a

range of scenarios and technologies. In the core scenario, the modeling used a build in assumption that ten gigawatts of offshore wind is included in the 2045 portfolio. It also reflects that the core high-flexibility scenario showed a total resource cost-savings of $1 billion in 2045 with a portfolio that includes ten gigawatts of offshore wind.

The SB 100 Joint Agency Report acknowledged that there are additional investments and actions that would have to occur to realize ten gigawatts of offshore wind by 2045 and found that while there is a significant resource potential off the California coast, there are also considerable barriers.

Among the foremost challenges are significant anticipated transmission requirements, and competing coastal uses, including shipping, fishing, recreation, marine conservation, and Department of Defense activities. The SB 100 Report and modeling guide the offshore wind megawatt planning goals, indicating that with additional actions and investments to address these challenges such as transmission and competing coastal uses, a minimum of ten-gigawatts of offshore wind could be achievable by 2045.

Next slide, please.

The second factor is the need for long-term

infrastructure planning. Both the availability of existing transmission and the need to develop more transmission capacity in specific areas affect the offshore wind megawatt planning goals the CEC establishes. The CPUC IRP process and the ISO TPP examine energy resources by location and technology and identify the transmission infrastructure and infrastructure upgrades needed to achieve the State's climate and energy goals. They are designed to ensure that the energy system is developed and operated cost-effectively while ensuring system reliability.

As such, the outputs from these planning processes provide key information to inform both the maximum feasible capacity of offshore wind and megawatt planning goals for both 2030 and 2045.

The development of new transmission capacity has been identified as necessary to deliver offshore wind form the North Coast to California load centers. For 2030, it's prudent for the AB 525 Strategic Plan to evaluate at least the current adopted 2032 IRP amount for offshore wind of 1.7 gigawatts, and potentially up to 5 gigawatts, which is what can be accommodated on existing transmission.

An amount beyond this appears infeasible from a transmission perspective by 2030. For 2045, there's a

greater possibility of achieving some or all of the transmission upgrades examined by the ISO. This suggests that the CEC may consider establishing a megawatt planning goal for 2045 ranging from ten gigawatts to 14.3 gigawatts as informed by both the ISO's 2021-2022 transmission plan, and 20-year transmission outlook.

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The third and fourth factors are California's shifting peak load and offshore wind generation profile. The complimentary nature of offshore wind to solar, both daily and seasonally, suggest the CEC establish offshore wind megawatt planning goals that are reasonably higher than the current amount of offshore wind in the IRP. This is to allow flexibility, as IRP and TPP and other load serving entities in the state continue to direct the optimal procurement of generation and transmission for ratepayers over coming years.

The generation profile of offshore wind goes hand-in-hand with the shifting peak load factor, in terms of informing the megawatt planning goals. Reliability and modeling considers historical weather patterns, projected climate change, and the related impact on generation and demand, and uses this information in a stochastic analysis to project expected

reliability of future electricity generation portfolios.

Further real-time wind data collection and ongoing modeling will continue to improve our understanding of the inherent patterns of variability across specific areas with offshore wind technical potential. The chart on the right here shows how the average generation profile of offshore wind, represented by the light blue line, complements solar, which is represented by the yellow curve.

However, the chart on the left-hand side is an example of the variability we can see in the generation profile of offshore wind. Additional study is also needed to investigate strategies that maximize the use of storage technologies and other great integration solutions with offshore wind resources as part of a portfolio of renewable and zero-carbon resources.

Evaluating megawatt planning goals above the current adopted amount in the IRP helps to prepare California to take advantage of the generation profile of offshore wind to help ensure California meets its SB 100 energy goals.

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Finally, the fifth factor is the potential impacts on coastal resources, including ocean resources and marine ecosystems, as well as impacts on other ocean

users and strategies for addressing those impacts. This new infrastructure may introduce several impacts to coastal and cultural resource and existing users. However, because the floating wind offshore market is in the early stages and the technology is rapidly advancing, additional study and analysis is needed to fully understand the degree, magnitude, and extent of potential impacts of offshore wind development on coastal resources, fisheries, Native American and indigenous peoples, and national defense, and identify effective strategies for addressing those potential impacts.

Based on existing information, including a literature review and through extensive outreach, major themes have emergedto help identify a suite of impact concerns. From an ocean-uses perspective, tribal governments have identified potential impacts to cultural landscape and sacred sites. Fishing industry stakeholders have identified potential impacts related to restricted access to fishing grounds, impacts to fish habitat and species, and impacts to specific types of fishing activities such as mid-water, and bottom trawl.

Coastal communities have identified concerns regarding visual impacts from turbines and lighting, increased vessel traffic, and potential economic impacts

to fishing and tourism in dependent coastal economies.

From the environmental perspective, potential impacts have been identified to pelagic and benthic fish, marine mammals, sea turtles, marine birds, sea bird and benthic habitats, water quality, and ocean currents and upwelling.

As part of developing the Strategic Plan, CEC staff will coordinate with the California Coastal Commission, Department of Fish and Wildlife, Ocean Protection Council, State Lands Commission, stakeholders, and other state, local and federal agencies, the offshore wind industry, and California Native American Tribes to identify suitable sea space for offshore wind energy.

This will also include recommendations regarding potential significant adverse environmental impacts and use conflicts, such as avoidance, minimization, monitoring, mitigation, and adaptive management, consistent with California's long-term renewable energy, greenhouse gas emission reduction and biodiversity goals.

It's important to make clear that the preliminary megawatt planning goals proposed in the draft report do not fully consider potential impacts to ocean use and environmental consideration. The

assessment of potential impacts and the strategies for addressing those impacts that are identified in the Strategic Plan will inform and may potentially limit the amount of maximum feasible capacity of offshore wind and the megawatt planning goals that are ultimately identified in the Strategic Plan. The degree, magnitude and extent of potential impacts of offshore wind generation will be identified and assessed by CEC staff both during and after the identification of sea space required by AB 525.

Next slide, please.

As I previously mentioned, CEC staff evaluated all 12 factors required by AB 525 and found that while the five factors we just reviewed had greater influence on our proposed planning goals, all the factors were considered. I'm going to quickly run through the remaining factors, starting with workforce.

Having a skilled and trained workforce will be necessary to successfully deploying offshore wind in California. The workforce opportunity from a robust offshore wind industry can be significant. Work completed by Guidehouse earlier this month for the CEC assessed California workforce needs for various offshore wind deployment scenarios, including ten gigawatts, 18 gigawatts, and 20 gigawatts by 2042, 2045, and 2050

respectively. Guidehouse found that most jobs needed will be in the component manufacturing and supply chain and support services.

They also concluded that the total workforce needed is significant and is roughly the same for all three scenarios. The CEC recognizes the need to take near-term actions to start developing a trained and skilled workforce to support the development of offshore wind. This factor does not directly influence the establishment of the megawatt planning goals as the magnitude of the workforce required will scale from actual project development. The need for a skilled and trained workforce will be explored further as required by AB 525 in the development of the Strategic Plan.

Next, we have the potential to attract supply chain manufacturing. A possible benefit of developing wind offshore California is the economic development opportunities for California and the Pacific region from scaling up this new industry. A report, California Offshore Wind Workforce Impacts and Grid Integration, conducted by the UC Berkeley Labor Center, was consistent with the findings from Guidehouse, indicating that the largest economic development benefits of an offshore wind industry would come from having a local supply chain.

Moreover, as offshore wind continues to develop around the world, having a local supply chain and workforce capabilities can make California, the West Coast, and the United States less vulnerable to global supply chain bottlenecks, and better positioned to achieve offshore wind deployments at scale. However, offshore wind developers and the supply chain industry need to have confidence in the offshore wind pipeline to support early investments in local supply chain development.

While developing a local supply chain in California and throughout the Pacific region is necessary to maximize the economic benefits for California that can be realized from an offshore wind industry, this factor does not directly influence the magnitude of the megawatt planning goals. Like the development of a workforce, the development of a local supply chain will scale from the planned project development.

Factor eight is economies of scale to reduce costs of floating offshore wind. In 2019, NREL found that the levelized cost of energy for offshore wind ranged from $83 to $180 per megawatt-hour. In 2020, NREL published results of a study updating those cost assumptions for offshore wind in California. The latest

estimates indicate costs could decrease by 44 percent on average by 2032, reaching a levelized cost of energy in the range of $53 to $64 per megawatt-hour, assuming a global deployment of eight gigawatts of offshore wind by 2032.

The study attributed this potential cost decline to the following factors. Turbine upsizing, which can result in lower per unit cost, economies of scale and efficiencies in manufacturing, technology innovations, which can reduce material uses, improve performance, and improve logistic efficiencies.

The report specifically states, "Continued turbine and plant upscaling, as well as an expansion of the supply chain, are needed to obtain the cost modeled in this analysis." It's also important to note that these cost estimates do not include other significant investments that will be needed to construct offshore wind, such as port and waterfront facilities needed to deploy the technology, and the transmission to deliver energy output.

The CEC recognizes the importance of economies of scale to reduce offshore wind development costs. While this factor, again, did not directly influence the establishment of the offshore wind megawatt planning goals as significantly as some of the other factors

previously discussed, it does overall support more ambitions planning goals.

Factor nine is the availability of federal tax incentives. The offshore wind provision of the Business Energy Investment Tax Credit, or ITC, allows a 30 percent investment tax credit that applies to capital expenditures on projects that start construction before the end of 2025. A safe-harbor provision allows projects that start construction or spend at least five percent of the total capital expenditures of a project by the end of 2025, and come online by 2035, to capture the benefit of the ITC.

However, the availability of the federal tax incentives after 2025 are uncertain. The CPUC's 2021 IRP preferred system plan portfolio included 1.7 gigawatts of offshore wind energy by 2032. With the key assumption being that the 2025 safe harbor ITC deadline could be met by developers. The IRP analysis showed that if the ITC is not part of the offshore wind cost assumptions, seeing the optimal resource portfolio does not include any offshore wind by 2032, beyond 300 megawatts included in some low serving entities' individual IRP's.

While some of the early offshore wind development projects may be able to take advantage of

the ITC, there's considerable uncertainty about the availability of the tax credit for projects that do not meet the safe harbor provision by the end of 2025. However, the availability of the ITC for such projects is possible and supports the establishment of megawatt offshore wind planning goals higher than the current adopted amount of offshore wind in the IRP.

Factor ten includes an NREL report that found California has 200 gigawatts of offshore wind technical potential. In early 2020, NREL published a report assessing offshore wind potential based on a state-of-the-art wind resource data set for the outer continental shelf. The report found significantly higher mean wind speeds modeled in the new dataset compared to other models.

The report also applied revised input assumptions from a previous 2016 assessment to generate new estimates of technical potential for offshore wind in California. These new estimates resulted in a finding of increased technical potential for the Pacific outer continental shelf of 201 gigawatts. The findings in this report were found to be most applicable to evaluating and quantifying maximum feasible capacity of offshore wind as previously discussed.

Factor 11 includes the opportunity to

participate in federal offshore wind planning goals. In March 2021, the Departments the Interior, Energy, and Commerce announced the shared goal to deploy 30 gigawatts of offshore wind in the United States by 2030. In May 2021, the Biden administration and Governor Newsom announced an effort to advance areas for offshore wind off the northern and central coast of California. The Biden administration contextualizes this announcement as part of a nation-wide 2030 deployment goal.

A recent study by NREL developed a baseline scenario to achieve the federal deployment goal of 30 gigawatts by 2030, which included two and a half gigawatts of offshore wind from California by 2030. The study noted that while the timeline may be ambitious, and would require work in developing the technology, supply chain, and regulatory and permitting processes, it may be possible, given the state's support of growing an offshore wind industry. These considerations support a 2030 offshore wind planning goal of at least two and a half gigawatts to contribute to the federal goal of 30 gigawatts by 2030.

Finally, the twelfth factor, we are to consider offshore wind executive actions by the governor. To date, there haven't been any executive

orders, proclamations, or other executive actions regarding offshore wind for consideration in the offshore wind megawatt planning goals.

Next slide, please.

In conclusion, here is a table that summarizes the key findings of the draft report. Including the technical potential reference point of 21.8 gigawatts and offshore wind planning goals of 3,000 megawatts by 2030, and 10,000 megawatts to 15,000 megawatts by 2045.

Next slide, please.

As I previously mentioned, on March 3rd, the CEC held a public workshop on AB 525 where we presented our approach for meeting the requirement of the legislation. In total, we received public comments from 25 different entities or individuals. In the comments, offshore wind energy stakeholders provided a range for suggested planning goals, starting at three gigawatts in 2030 and scaling to between ten gigawatts and 18 gigawatts by 2045.

Several of the comments from industry emphasized the importance of the megawatt planning goals in sending market signals necessary to drive investments in ports, infrastructure and supply chain development and pointed to how planning goals and procurement targets have driven offshore wind development in the

East Coast. Others commented that the planning goals should be robust enough to drive economies of scale, which will be essential for reducing costs, delivering competitively priced clean power, and encouraging local industry and job development.

From the environmental organizations that commented, we heard that offshore wind goals should be aligned with environmentally and socially responsible offshore wind development, avoiding, minimizing, or mitigating significant or adverse impacts to the environment and other ocean users. All of the comments received were taken in and considered in the development of the draft report.

Next slide, please.

Additionally, written comments on the draft report were due on Monday. Including a couple that came in yesterday, we received a total of 13 comments. Overall, the comments were supportive of the planning goals included in the draft report. A few of the commentors did suggest we could increase the 2045 planning goal to 20 gigawatts or higher.

Comments were also supportive of revisiting maximum feasible capacity after additional work, including the sea space analysis, is completed, and one comment suggested we consider expanding the definition

of maximum feasible capacity to include comprehensive cost-effective analyses, environmentally and socially responsible offshore wind development, and local economic development.

Next slide, please.

That concludes our overview of the draft report. Thanks to those of you who already provided written comment. For those of you who did not provide written comments, or would like to, or those of you that did submit/provide written comments and have additional comments you'd like to provide, we welcome those during our public comment today. All written comments received through our docket, as well as those provided at the workshop today, will be considered as we revise and finalize the draft report.

We then plan to present the revised report at the Energy Commission's May 24th business meeting. I also want to note that the CECE accepts both written and verbal comments for business meeting items, which is an additional opportunity for public comment on this report.

Next slide, please.

While we've been working on the draft report, we've also been focusing on other AB 525 requirements. After the May 24th business meeting, we'll ramp up our

work to meet the remaining requirements with a primary focus on the next set of interim requirements, the preliminary economic assessment, and permitting roadmaps which are due by the end of the year.

For the preliminary economic assessment, we have a couple of efforts that have already been initiated. The State Lands Commission, in partnership with BOEM, is in the process of conducting a ports inventory —— building from previous work to better understand infrastructure and capability gaps at California's existing ports.

The CEC is also working with the State Lands Commission to conduct a regional ports assessment to explore any additional opportunities outside of the existing port system that may be capable of supporting floating offshore wind activities, with a focus on the central to southern coast area, where limited port capabilities exist.

Finally, the CEC, the Governor's Office of Business and Economic Development, and the Governor's Office of Planning and Research, have recently selected a contractor to support the workforce component of the preliminary economic assessment.

To help advance progress over the next few —— on these next few focus areas, we're in the process of

establishing technical working groups of agencies and the ISO. We will also continue stakeholder engagement through a combination of workshops and informal stakeholder meetings, and later this year we'll be working to finalize the preliminary economic assessment and permitting roadmap.

Next slide, please.

That concludes my presentation. I'd like to open it up to the dais for any questions or comments before we transition to public comment. Thank you.

COMMISSIONER VACCARO: You know, why don't we go ahead and start, I think, in the room first. We'll start with Commissioner Houck, and then we'll make our way to Justine. I'll bring up the rear after we do the virtual dais members as well. And of course, no obligation for anybody to make comments or ask questions now —— not putting anyone on the spot but, seemed like this was a really good opportunity to hear from the dais.

COMMISSIONER HOUCK: Thank you, Commissioner Vaccaro. Thank you for the summary of the report, a lot of impressive work going on in this area. I also just wanted to comment that the PUC right now is doing a number of tribal consultations across the state, and the offshore wind has continued to come up, particularly in

the north coast.

So, it's good to hear that that's being in include in here, and the ongoing efforts that you're going to be making to reach out to tribes. Commissioner Rechtschaffen and I will be in the North Coast next week, and I'm anticipating that this issue may come up in our consultations there as well, and we've been in communication with your tribal advisor on these issues, so we can follow up with you on that as well. And, if there's any support we can provide, given the consultations we're doing, we'd be happy to work with you and collaborate on that area in particular.

COMMISSIONER SHIROMA: Thank you, that —— a tremendous presentation. Thank you —— and a lot of work, clearly, going into the report.

My question is this. Well, first of all, let me give you a preface. Back in the 1980's, while I was working at the Air Resources Board, my team was assigned the offshore drilling, and the mitigation of the air quality impacts of offshore drilling. This was when, under then-president Reagan, there was this big effort to site more drilling platforms. There was a negotiated rulemaking, and it ended when President Reagan stopped that activity and it placed a moratorium under any more drilling.

So, my question is simply this, that we do have offshore oil platforms off of our coast. Off of Santa Barbara, off of Long Beach, and so, as the work ensues, will there be any lessons learned from that activity in terms of looking at the infrastructure and the environmental impacts of sea cables and so forth that can be garnered from that much earlier work when — all sited way before CEQA, before NEPA. There may be technical or scientific information that can be used to help us here with offshore wind.

MS. DEMESA: Yeah, that's a great question, and that point has come up a number of times in the past. I think there certainly are lessons learned that we can pull from previous industries such as that. There are also some interested in looking at some of that existing infrastructure to see if there are opportunities to repurpose some of it for offshore wind. So, it's something that's definitely on our radar and that we're thinking about as we are thinking about offshore wind moving forward.

MS. ANDERSON: Sorry to interrupt, this is Hillary, I work with the CEC. Before you speak your question, would you be able to state your name for the benefit of our 240 attendees online. That would be great. Thank you.

COMMISSIONER SHIROMA: Thank you for that reminder, Genevieve Shiroma, Commissioner at the CPUC. Thank you.

MR. FLINT: Hi, folks. This is Scott Flint with the California Energy Commission. I'm joining Rhetta to help her with answering questions. I'd love to be with her —— with you there today too, but unlike the others who are recovering from their colds, mine's just ramping up. So, I'm sorry that I can't be there.

Commissioner Shiroma, there are just a couple of things I want to add. We are —— there is information coming from —— and lessons learned, from oil drilling work, especially deep-sea drilling work. That is helping with the platform technology and developing appropriate technologies and how to anchor it in the deep waters off the California coast off the continental shelf.

And that's a positive outcome of learning from the oil industry. Those platforms drill really —— drill into the earth and need to be really stable. So, one of the issues and questions that come up often on the floating wind technology is how, you know, how stable is it and how well can we anchor it in storms and in the rough seas off the California coast. And so, we do have some learnings to help us with that.

As far as the environmental perspective, we're also looking at lessons learned on improvements on how to deploy those and better protect resources at the same time, and those have to do with potential entanglements and collisions with marine mammals and those species —— sorts of species.

And then, another thing that we're looking at is how, if we do, well —— as we move forward and support port infrastructure, we're also looking at as many dual uses as possible. So, if there are already commissionings of those large platforms that are happening at the same time, how can we make use of the work and support the workforce and the activities at those ports so they can serve a dual purpose —— to help decommissioning and constructing offshore wind at the same time. So, we have a couple things we are thinking about.

COMMISSIONER SHIROMA: Thank you, Scott. Genevieve Shiroma speaking, thank you.

PRESIDNET REYNOLDS: Thank you. I just wanted to add my thanks to Rhetta for the fantastic presentation. I appreciated it, all the detail. I look forward to the public comment portion of today's workshop, especially with respect to input on the planning goals and how we should be thinking about

those.

My only question at this point is, Rhetta, you talked a little bit about workforce development benefits, and I was wondering if you had any specific comments on benefits to communities and the —— inland of the areas where we are looking at offshore wind development. I know that impacts and benefits are still the subject of further study, but do you have anything that we should be thinking about at this point in terms of benefits to communities beyond labor and workforce, which you did cover in your presentation.

MS. DEMESA: I actually might want to defer to Scott on this one.

(Pause)

COMMISSIONER VACCARO: Scott is looking for his microphone, I'll jump in really quickly, this is Commissioner Vaccaro. Thank you for the question, President Reynolds. Scott might have a more fully flushed out response.

One thing that we are doing, you know, we are looking forward to the BOEM lease sale that's going to be happening this fall, and, you know, there's been a lot of conversation among the state agencies, and with BOEM, and you know, a number of stakeholders looking at that very question among others. Right? Benefits to

potentially impacted communities, what this looks like for the fisheries and the communities that are dependent on them, and others, and how that Proposed Sale Notice, which should be coming out hopefully eminently, you know, how to address this fact.

We've had a lot of dialogue and we're hopeful and there's going to be something in there as well, complimentary to the analysis that we're doing with AB 525 to look more wholistically and broadly, you know, at impacts and then what can be done to mitigate, and how that might translate to benefits, or benefits agreements, or other opportunities for capacity building for engagement or otherwise.

So, it's a really important question. No answers quite yet, but just wanted to make sure that you know that it is certainly on our radar, even though not fully reflected in the draft report.

PRESIDENT REYNOLDS: That's great, thank you. And, I realize, I neglected to say that this is Alice Reynolds, PUC President. Thank you.

COMMISSIONER VACCARO: So, Scott, please feel free to supplement, compliment, or correct what I said. It's just —— I was watching your arm move as you were going to your unmute and wanted to build the space.

MR. FLINT: Thank you, and no corrections

needed for you, Commissioner. That was a pretty good explanation. I'll just add that we —— while that stuff is going on in the BOEM leasing process, we are looking at it. The work that was done by the California Coastal Commission already in their Consistency Determination work on the Humboldt Call Area sets up some ways to start looking at potential impacts on fisheries and some of the other resources and how we —— and strategies on how we might deal with them.

So, we want to be consistent with those, and bring those into our work. That only makes sense to have those play out across other areas we might look at, and then to bring that kind of thinking and strategies to other areas that we identify —— of impact that we might identify that need to be addressed going forward.

(Pause)

COMMISSIONER RECHTSCHAFFEN: This is Commissioner Rechtschaffen. Rhetta, I have a question for you about the sea space analysis. Can you shed any more light about the evaluation, where it is in the process, and what other —— what you're going to be looking at? You —— the report identifies the main factors, but is there anything else you can tell us about it —— that analysis and its current status?

MS. DEMESA: Yeah. So, there's been a lot of

work done in the past year towards the BOEM process that we're going to be able to leverage as a starting point for the sea space analysis. And that is, again, one of the priorities. I didn't mention it on the slide in there because it wasn't one of our near-term deliverables, but it is something that we're going to start ramping up come June 1st, just because there are so many other deliverables within the strategic plan that are dependent on that, such as maximum feasible capacity, so that's something we should be coming out with more information on very shortly.

And Scott may also have more to have on the sea space analysis, he's our lead sea analysis guru.

MR. FLINT: I can add a little bit to that. So, we have been —— we were —— have been working closely with BOEM and we've been looking at different areas off the coast starting in 2016, and now the parlance we're using is sea space analysis from the AB 525 construct. But, it's the same sort of work. And, we —— as we move through that working with BOEM, the Call Areas developed and were refined from original larger areas.

So, the two sorts of areas that have been studied for technical potential that are part of that 21.8 gigawatts of potential that's been heavily studied are the area in the North. On the North Coast off

Crescent City and off Mendocino Coast, those haven't had the same sort of refinement. So, I think we have focused that work on as much scientific information that we can get about the sea floor and the marine ecology, but that's kind of spotty in different places, and so more information needs to come in on that.

But, we —— so we've also looked heavily at the technical requirements for deploying offshore wind. So, that's the things that were discussed earlier and in the report. Distance to support, ports that can support, construction and maintenance, the distances we have to go for transmission and the interconnection, the amount of upgrades that might be needed in the terrestrial environment to support that, wind speeds, depth, and the depth of the water to be able to anchor it with the current technologies we have.

There's no real limits on that. We've put some limits on ourselves. So, one of the things we've got to do is explore —— can we go deeper, and how deep can we go? Also, in our work it's become clear that the slope or the flatness of the sea floor to help support that anchoring might be more important than just the depth by itself. So, we want to look more at that component of the sea floor to see if we can expand these areas into deeper waters, because we expect that some of

the things that are still near-shore in these areas might have conflicts and might —— some of that area might be reduced in our work.

So, we want to work about —— we want to think about how we can also expand that. And so, that's some of the subject of the things that we'll be discussing with the stakeholders as we go forward in the process. Our slide said starting June 1, but we've already started, as Rhetta pointed out, and been working on all these issues since we kicked off our AB 525 work.

COMMISSIONER LUCCHESI: Jennifer Lucchesi, Executive Officer of the State Lands Commission. Thank you, Rhetta, for the comprehensive presentation. I don't have any questions, but I did want to supplement Rhetta and Scott's response to Commissioner Shiroma's questions about learning from offshore oil and gas operations.

The State Lands Commission manages the offshore oil and gas operations and platforms for the state in state waters, and so there's a lot that we can bring to the table to help inform how we look at offshore wind and the cables. In addition to that, we've also been the lead agency for many of the fiber-optic cables that cross state lands and connect onshore.

Many of the —— our colleagues that work on the

offshore wind efforts are also part of the State-Federal Inner-Agency Decommissioning Working Group that we host with BOEM and BSEE, and so there's a lot of work going on and cross-cutting conversations between initiating offshore wind in California while also decommissioning state and federal platforms. The State Lands Commission is right now actively decommissioning one state platform and one offshore island.

So, there's a lot of activity happening in this space, and we are certainly learning from the past to help inform the future. Thank you.

COMMISSIONER KIMBALL: Justine Kimball, Ocean Protection Council. No additional comments or questions from me. I thought it was a perfect presentation and thanks to CEC Staff.

COMMISSIONER VACCARO: Chair Hochschild?

CHAIR HOCHSCHILD: Yeah. Thank you so much, Rhetta and Scott, for all your hard work and Rhetta, terrific presentation.

One thing I neglected to say in my opening comments, but I did want to just highlight it since we have our colleagues from the PUC here, is that offshore wind has also been a focus of our R&D investments through EPIC, and actually will continue to be. And so, California investment in R&D in this industry is

ongoing, and we are committed to continue to strengthen that in partnership with other states, actually. And, I just think it's a really nice full-circle with our joint work on the EPIC program together.

I know that since the draft came out, there have been three different energy resource organizations —— GridLab, Telus Energy, and Energy Innovations that have come out with reports on, you know, how to scale clean energy faster and kind of make a case for higher goals. And then, a separate group of energy system scientists at UC Berkeley went in a much bigger —— they're arguing for 50-gigawatt goal by 2045.

I think some of those folks may have a chance to speak during public comment, and I look —— I really look forward to hearing staff response to those. But I was just wondering, Rhetta or Scott, if you'd had a chance to review those reports that have come out since our draft report was released, and any reflections on points made in those?

MS. DEMESA: I have not had a chance to personally review those reports, but I would be interested in doing so before we put up —— put our next version.

MR. FLINT: I did —— I did, Chair, I did glance at a couple of those reports early this morning —— last

night, early this morning. Some of them were tied to some comments that we received just today and last night, and definitely want to take a look at those. The goals they talk about are much higher, and I'm just interested in diving into those. And there are some, I think, some suggestions, at least that I glanced —— as I glanced through, I saw that might help us consider that information going forward.

CHAIR HOCHSCHILD: Okay, thank you.

COMMISSIONER VACCARO: So, thank you, everyone so far on the dais for your feedback and your comments. I think what people should be taking away from some of this is there's a real intentionality and sincerity, I think, on the part of agency leadership and staff to be thoughtful, to be responsible.

We have different mandates as agencies. I think we are all focused on the potential for offshore wind, but we champion different issues, and I think that's really coming across and that we are listening to one another. I think that does make me want to underscore, I think, a really important point that I don't want lost in any of this discussion. It was on one of Rhetta's slides, it was planning goal factor five, and it was really the one that reminds us that we have to focus on the potential impacts to ocean, and

coastal users and resources, potential impacts to Native American and indigenous peoples, fisheries, national defense, and develop strategies around them.

And I think what we've said in the report, and what we continue to hear, is that the degree, the magnitude and the extent of impacts is yet to be determined. So, we really can't say, you know, what those impacts are going to be, what the level or degree of impact might be. And I just sort of want to make sure that we keep that in mind. That's something that we've held out, it's an area that requires considerable evaluation as we move forward. And as Scott pointed out, we really are well anchored by the recent work of the Coastal Commission staff, which was excellent work with respect to the Humboldt Wind Energy Area Environmental Assessment. It was a conditional concurrence by the Coastal Commission, it was unanimous, and it really does reflect just tremendous expertise and analysis of what some of those impacts might be, and where we still need to continue to focus.

So, I just want to underscore that point. Commissioner Houck, I want to thank you for inviting the Energy Commission to participate with you as appropriate on some of the tribal discussions and the consultation. Did want to make you aware, we sent a letter out to all

of the tribes in the State of California, not just the coastal, making them aware of the release of the draft report, inviting informal discussion as well as formal consultation. And so, if there are ways so that we can avoid, you know, impacting tribal governments and their resources by having so many continual meetings on the same topic, and if we can sort of have economy of scale, I think we would welcome that. You know, and really welcome your leadership in that space as well.

And Commissioner Shiroma, to your point raising prior work of the Air Resources Board, that just adds to my list yet one more agency that we need to make sure that we're connecting with as we're doing this work. They're not specifically called out in any of the statutory mandates and so far, our focus has been kind of elsewhere because it's not project specific environmental impacts yet. But even so, this is a good time for us to bring our partners at the Air Resources Board into the discussion. So, thank you so much for that question.

So, I'm not going to belabor any more points except for, it is important to recognize Rhetta —— how well done that presentation was. And to thank you so much, you know, for summarizing nicely what's in the draft report, which I think is also well written, easy

to understand for folks that are steeped in this area and for lay-people. So, I think with that, I'm going to turn it back over to Rhetta and Erica to invite the public comment.

MS. BRAND: Thank you, Commissioner Vaccaro. And before we do that, I just want to check in with the other members of our virtual dais and see if Scott Morgan from the Office of Planning and Research, if you have any comments or questions for Rhetta or Scott.

MR. MORGAN. No comments at this time, great information, really appreciate it.

MS. BRAND: And Becky, from the Department of Fish and Wildlife.

MS. OTA: Hi, thank you. I don't have any questions, so thank you, Commissioner Houck, for bringing up number five on the report, with regards to all of the impacts that we need to be mindful of. And the Department of Fish and Wildlife looks forward to having further conversations with equity about sea scape, and we want to have further conversations about that as well. So, we look forward to the further conversations. And thank you again, Rhetta, as well. Great conversation and great presentation. Thanks.

MS. BRAND: Thank you, Becky. Well thank you, Rhetta for your presentation, and to our dais members

for your comments and questions. We are now going to move into the public comment period of the workshop. For that, I would like to turn it over to Dorothy with the Public Advisor's office.

MS. MURIMI: Thank you, Erica. Hello, I'm Dorothy Murimi with the California Energy Commission's Office of the Public Advisor: Energy, Equity, and Tribal Affairs. We'll now move to public comment. A few instructions for everybody.

Each person will have up to three minutes to speak. Comment time may be reduced to allow for more individuals to make comments. As we mentioned earlier, we'll start with those that are here in the room, and then move to those participating remotely.

As a reminder for those of you in the room, if you'd like to make a comment, you can use the QR codes located in the back of the room. If you are unable to use the QR codes, use the blue cards on the front table, and bring them over to me. Once your name is called, please go —— for those in the room, please go to the podium, turn on the microphone, make sure that light is green, and state and spell your name, give your affiliation if any, and you may give your comments. Once complete with your comment, turn off the microphone to prevent audio feedback for those on Zoom.

For those participating remotely, to indicate that you'd like to make a comment, use the raise-hand feature —— looks like a high-five or an open palm at the bottom of your screen or device. Press star-nine to raise your hand if you are calling in, and star-six to unmute on your end. When you are called upon, or once I mention the last three digits of your phone number, go ahead and open your line. Or again, star-six to unmute if you are on the phone.

State and spell your name again, give your affiliation, if any, and you may begin your comments. We'll now have the timer on the screen, as you can see, and we'll alert you when your time is up. I'll begin with those in the room.

(Pause)

First up, I have Varner Seaman. Apologies if I have mis-stated your name. Come to the podium, unmute your mic, give your name and affiliation, and you may begin your comment.

MR. SEAMAN: Good morning. Commissioner Vaccaro, folks in the room. My name is Varner Seaman. That's spelled V as in Victor, A-R-N-E-R S-E-A-M-A-N. I'm with American Clean Power of California, and the ACP is also a part of the Offshore Wind Now Coalition.

I just want to start by, like others, thanking

the staff for level of work that's taken place so far and the presentation today. I think that the quality of the collaboration, and the quality of the staff work really gives us the opportunity as we're having this conversation now about how we move forward, that really raises the level of the dialogue and lets us focus on kind of important issues.

I think one of the things that we talked about in —— so far in this workshop is what the role of the goals are. And I think that that's a really important kind of frame for us to be looking at as we have this conversation today, about what the appropriate level of those goals should be.

I think we agree that as ACP and as industry that these are not mandates, these aren't procurement goals, these aren't setting floors or ceilings, this is really talking about how do we plan for and how do we look for what the level of offshore wind should be as we meet those AB —— or excuse me, those SB 100 goals in terms of reaching that zero-carbon level.

What we do see though, and what our concern is, is that, as we approach these goals, while we are not setting a procurement floor, or a procurement ceiling, there is sort of an impact in terms of the planning that comes out of these. And what, as we've

been looking at the reports and looking at the excellent staff work so far, it occurs to us that we're not going to build more than we planned for. And that in a way, what those planning goals are and what's adopted, especially as we look for 2045, that is ultimately going to become the ceiling for what we look to for what the role —— what role offshore wind is going to have in the energy mix for California moving forward.

As we look at these planning goals and what we've already seen in some comments we noted last night that we filed, that state agencies are going to be looking —— particularly CAISO, particularly the CPUC —— are going to be looking to these planning goals in directing what kind of IRP levels are being set, what transmission planning is taking place going forward. And, while we may end up procuring at a lower level than what's in these planning goals, we're not going to be going likely higher than what we look at, in terms of what's put forward.

And so, we would encourage the CEC to be going as high as possible in that 2045 goal level, and kind of taking into consideration that the level of technological change that's going to take place between now and 2045 is kind of beyond that which we can anticipate.

I mean, we'd remind folks that in the year 2000, which is about the same distance from 2045 as we are today, we didn't have electric cars, we didn't have SpaceX, we didn't have social media. The rate of technological change that's going to come in the next 23 years is going to be really rapid. And so, with that, we would encourage you to be as ambitious as possible in looking towards 2045 and 2030 goals. Thank you very much.

MS. MURIMI: Thank you. Next, we have Alan Weinstein. Apologies, Alla Weinstein.

MS. WEINSTEIN: Good morning. I'm Alla Weinstein. I'm the CEO of Castle Wind, which is a joint venture between Triton Wind and Total Energies. Those of you that were here in 2016 may remember that Triton Winds solicited —— submitted unsolicited lease request that kind of started the whole discussion of offshore wind in California.

I've been in marine renewables for 22 years, and sometimes it's hard to admit that it's been such a long time. So, the point I want to make, and why I go back so far —— technology advances, and technology moves fairly rapidly. So, back in 2008 when I co-founded Principal Power, then developed wind flow technology ——you know, we needed something to even think about

offshore wind on the west coast. We didn't have floating offshore wind technology. So, that's why there was no dialogue about offshore wind in 2008. It took up till 2016 to even think about it.

Today, in 2019, wind flow technology had the first commercial installation, and Chair Hochschild was able to see it. And so, that is reality. It takes about ten years for technology maturity. So, while we're looking today at something that gives us water depth limitations, ten years from now we probably will not have that. So, I would encourage those who are looking at how to look at the sea space, because the sea space today is our main limitation on what can and cannot be achieved in California, you should really almost remove the sea —— the water depth limitation, because technology will get there.

Already, today, people are thinking how to remove water depth limitations. And so, if we can think about sea space as area that can be developed for offshore wind and think about everything else that needs to come with it, like the infrastructure onshore that is going to get to the infrastructure in ports, and transmission lines, then everything comes together in the ambitious targets that I think California should adopt. Because we need it. You know, we're in the

climate crisis, and I don't think I need to convince anybody that we have climate crisis. But we need to think big, because without thinking big and without, kind of projecting beyond the horizon, we just can't get there.

So, we know technology will get there, because in ten years we will see reality that will remove the barriers that we have today. But if we don't plan for them, we'll just not have the infrastructure and all the other elements that we need to be ready to be able to materialize all those aspects that we can materialize.

Time moves, and we have to deal with it today, not tomorrow. So, some of the reports and some of the comments that actually provided —— and especially from the Berkeley Public Policy Center, really did the analysis —— and pretty interestingly indicated that technological ability is there. Technology will mature and provide the ability to capture the offshore wind, now we need to look and put the policies in place to be able to make it happen.

So, thank you very much, and we do appreciate very much all the work that California Energy Commission did, and Commissioner Vaccaro, thank you very much for being here to make it happen. Now we just have to put all the policies and infrastructure in place. Thank

you.

MS. MURIMI: Thank you, Alla. Next, we have Amal Phadke, apologies if I've misstated your name. Go ahead and state and spell your name, give your affiliation if any, and you may begin your comment.

MR. PHADKE: Good morning, I am Dr. Amol Phadke, I am with UC Berkeley School of Public Policy, and I'm Affiliate Senior Scientist there. Really, thank you for taking the initiative on offshore wind, California needs it, the world needs it, and excellent work by the staff.

So, we got so excited because California started looking at this, we actually conducted a detailed study of looking at significant deployment of offshore wind in California. We just released the study three days ago, so it didn't get in time for this version of the report, but I hope you get a chance to look at it.

I want to kind of summarize four findings from this analysis. First, California is not alone. Other regions are increasing ambition as fast as possible. For example, UK has a goal of 50 gigawatts by 2030. Now, this is much higher than California's goal. China built 17 gigawatts, which is California's goal in 2045, in 2021. So yes, California is not alone in developing

this technology. So, California can benefit from those advances.

Second, potential is not a constraint. I mean, California was defined as one of the most buildable offshore potentials. It's not only that it has enough potential. We find that its potential of 120 gigawatts above 50 percent capacity factor. That is like a baseload of natural gas plant potential. It also not only provides support in winter months, it is summer peaking and evening peaking. Like, it's pretty amazing how much it matches California's load profile.

Given all that, we actually ran state of the art grid simulation models to assess what would be the ratepayer benefits of deployment from ten gigawatts to 100 gigawatts of offshore wind in California by 2045. We found that up to 50 gigawatts of offshore wind provides one of the lowest wholesale costs. We actually simulated 100 gigawatts offshore wind case, and those costs are not —— those are comparable to today's costs.

So, given all —— you know, what is happening on offshore, and the reason why we need it —— because, like ten gigawatts by 2045 will only be six percent of the total clean supply we need. So yes, it will add to resource diversity, but not by much.

Given our findings we have two

recommendations. First, consider a 50 gigawatt or more planning goal for 2045, and consider the existing goal deployment earlier. Thank you.

MS. MURIMI: Thank you, Amol. Next, we have Mike O'Boyle. Again, once completed with your comment, please turn off the microphone.

MR. O'BOYLE: Hello everyone. My name is Mike O'Boyle, and I am Director of Electricity Policy for Energy Innovation, which is a climate and clean energy policy research organization located in San Francisco.

I just want to say —— overall, as a Californian, I'm just deeply thankful for the quality of work that you all engage in every day, and to be represented by highly competent, analytically rigorous regulators, that's actually quite a rare thing —— as I work in a lot of different states across the country, and California is in rare form. So, thank you all for the work that you do. I really mean it.

I think my comments are similar to some that have been made, but I just want to highlight why this really does matter. Other agencies and analyses really will look to this and depend on this as their record in California in offshore wind potential really hasn't been fully built yet, and this is the first opportunity to make that a really robust exercise.

It will matter for future SB 100 studies. It will matter for the carb-scoping plans. It will matter for CAISO transmission planning for IRP, and it will matter for private industry as they consider how much of their capital to put at risk in investing in ports and the supply chain, and ultimately the jobs that are developed in California in the offshore wind. And it will matter in the rest of the West, as assessments of regional plans for transmission and markets evolve.

I want to pick up on Commissioner Rechtschaffen's comment that the planning targets exceeding current state estimates and assessments grants agency's flexibility in crafting California's path to a net-zero emissions economy by 2045, and my main takeaway is that this process, this AB 525 target, it simply can't be the bottleneck to greater ambition, and it would be a shame if it were a limitation on future analyses of the potential for offshore wind, which, we've seen in the Berkeley studies, can be quite significant and beneficial.

The three-gigawatt target in 2030, I just want to highlight that, you know, the growth rate in offshore wind implied by adopting that target and then a ten to 15 gigawatt target by 2045 —— it represents a virtually flat growth rate. So, in the next eight years getting

to three gigawatts, and then in 15 more years adding roughly seven more at a minimum, that's a flat growth rate for a technology that is accelerating exponentially globally. So, as we think about where it's going to be in 2045, I would encourage that kind of exponential, or the possibility for exponential growth as we've seen in other technologies.

So, the one last thing I will say is, I think there's great space in the framework to be iterative and would encourage you all to do that. I've heard some comments to that effect so far, and if we can get where we get at the end of this process but keep considering new data and keep considering new comments as they become available and update those planning goals, I think will serve us all well —— and continuing to monitor the market. Thank you very much.

MS. MURIMI: Next, we have Molly Croll. Please state and spell your name, give your affiliation if any, and you may begin your comment.

MS. CROLL. Good morning, Molly Croll. M-O-L-L-Y C-R-O-L-L. I'm with Avangrid Renewables. We're a developer of land-based and offshore renewables, including the JB and Vineyard Wind 1, which was the first commercial scale project in the US, and three others in development. Thank you, Commissioner Vaccaro,

for your leadership in this report and to your team as well and thank you to members of the dais for being here today.

We submitted comments before the draft report came out in March, and one of the things that we emphasized is the value of these goals for two primary reasons. One, setting a market signal. Right now, developers and others across the supply chain are looking to what you are doing today in determining how and how much they're going to invest in the state. So, the market signal is really important.

Two, setting the direction for the state as far as scale in addressing the public policy and infrastructure challenges. Thus, while we support the three-gigawatt by 2030 goal, we would recommend a higher 2045 goal, on the order of 18 or 20 gigawatts by 2045.

This is a big state. We have huge demand, we have a huge coastline, the enormity of the renewables that we need to bring online in the next two —— two gigawatts would justify it. The potential for offshore wind is huge, and 2045 is a long way out, as others have commented. The potential for technology to improve over the next few decades is really great. Also really appreciate the reports and comments from Energy Innovation and Gridlab, as well as the Goldman School,

at UC Berkeley, on the potential to set a more ambitious 2045 goal, and the value of offshore wind in providing grid diversity.

And on that point, I think in light of recent supply chain disruptions, that those of us in the industry and the state are facing, as well as the governor's recent acknowledgement of the need to maybe bring on up to five gigawatts of backup capacity for reliability purposes, there is a higher risk in not doing enough now to plan for the long term and to plan to build diversity into the system, than there is risk of, you know being too ambitious.

So, I think we need to think about it in that respect. And this is really a chance for the state to get ahead and start planning for what we really need in the next few decades.

Last point that I'll make is on the environmental considerations. Appreciate the comments from Chair Hochschild about the offshore wind really being relatively low-impact compared to other renewables, and I think we need to start thinking about it in terms of the portfolio of resources, land-based and offshore that we'll need over the next two decades, and thinking about the potential benefits and impacts of cost of that whole portfolio, land-based and offshore,

rather than isolating offshore wind and focusing too heavily on the uncertainties associated with that technology just because its new.

And so, in conclusion, you know as I said, the offshore wind industry is sort of all eyes on California now, especially with the auction coming this fall. The Energy Commission has been a real diligent and thoughtful leader in bringing us to this point. We're grateful for your leadership, look forward to partnering as we move into execution. Thank you.

MS. MURIMI: Thank you, Molly. Next, we have Dr. Nikit Abhyankar, apologies if I've misstated your name. Go ahead and state and spell your name, and give your affiliation, if any.

MR. ABHYANKAR: Thank you. My name is Nikit Abhyankar, I'm a scientist at UC Berkeley's Goldman School of Public Policy. We have already sent out detailed comments, and thank you for the opportunity. And thank you for the great work that staff has put in for putting up this report.

In addition to the comments that have already been made, I would make three additional comments. Number one, is, as we also note in our detailed comments, in the current 21.8 gigawatts of technical potential and the 10 to 15 gigawatts of planning goals

are really based on looking at just five call areas off the California coast.

But, as we found out in our study, as well as NREL's study, there is 200 gigawatts of technical potential. There is 1700 gigawatts of gross potential. So, we really urge the CEC and other agencies to look beyond these five Call Areas, and look for high targets. That's number one.

Number two is really about the goal of setting these planning goals. It's really meeting the SB 100 2045 net zero emission target. So, the current SB 100 analysis, it doesn't really consider full economy-wide net-zero emissions by 2045. If you consider that, then the collective state demand would be about 100-120 terawatt hours higher than what has been assessed in the current SB 100 analysis. And if we need to meet that demand as well with clean energy, that implies an additional solar installation of about 80-100 gigawatts. So, that increases the resource risk that increases reliance on just one technology even further if you also include that additional demand. And that's why the role of offshore wind becomes even more critical in an economy wide net-zero ambition world.

And the third point, I think my colleague already talked about how other countries are taking up

offshore wind in general, but there is also —— there are a few other countries that also have offshore wind as one of their only options. Like Japan, Korea, to some extent, India. They do need a lot of offshore wind, and offshore wind is definitely one technology that may be critical in bending the global mitigation curve.

California can be one of the technology as commercial leaders in making sure other countries can also adopt and develop these technologies and meet the global challenge of mitigation. Thank you very much for the opportunity.

MS. MURIMI: Thank you, Dr. Nikit. Next, we have Kelly Boyd. Go ahead and state and spell your name, give your affiliation, if any, and you may begin your comments.

MS. BOYD: Thank you. Kelly Boyd, K-E-L-L-Y B-O-Y-D, with Equinor Offshore Wind. I am indeed giddy to be here with Commissioner Rechtschaffen, who I first met in Assembly Member Skinner's office discussing energy storage, and look where we are with that now. So, I'm very hopeful about the future, really pleased with the staff report.

Equinor is a pioneer in the offshore wind industry. We operate, currently, an 88-megawatt floating offshore facility Hywind Tampen. We've been

operating offshore wind for 20 years now. We're very bullish on this technology, very supportive of the direction California is taking. We think you have to be bold at the outset to get the momentum to move forward to achieve the economies and the synergies that we're going to need. Three gigawatts is a modest initial goal, especially if we want to get to 220 or higher at some point. So, staging that, and making sure we put enough things in place up front to get to where we need to go on time.

Climate issues will continue to happen, and this is a very low-impact resource that's very well paired with California's demand patterns. I'm not a doctor, but I trust the doctor who said our electricity use will go up exponentially for good reasons. We have to be able to address reliability, encourage you to be bold with these goals, to continue to coordinate, collaborate, address transmission, address other constraints, ports, all the work that's being done at SLC, and —— thank you very much.

MS. MRUIMI: Thank you, Kelly. Now we will move on to individuals that are on Zoom. Once again, for those that are in the room, you can utilize the QR codes located in the back of the room, or the blue cards in the back as well and bring them on to me.

Now, for those on Zoom, we have Manley McNinich. I'm going to unmute your line. Go ahead and state and spell your name, and give your affiliation, if any.

MR. MCNINCH: Hi, I'm Manley McNinich.

MS. MURIMI: Apologies, we are having difficulty hearing you. Could you check your connection and try again?

MR. MCNINCH: Any better?

MS. MURIMI: Try once again?

MR. MCNINCH: I'm afraid I might have —— I've got a——

MS. MURIMI: Much better.

MR. MCNINCH: Okay, great. I'm with Southwest Regional Council of Carpenters, and we were informed of everything that's going on, especially with the skilled and trained language being put into the documents. Things we would really like to ask is if you could put a (INDESCERNIBLE) going onward to assure that ——

MS. MURIMI: Apologies,

MR. MCNINCH: —— good paying jobs that are being lost will be getting replaced by the offshore wind industry. And it's critical now more than ever that we start developing these special skills that are needed. And we have some of the best apprenticeship available to

where we can start working with the developers to assure that we have the workforce ready to go when its time.

And just to finish up on mine, I'd like to echo what the rest of the folks have been saying about maybe getting a little more —— a lot more aggressive on the amount of electricity we're looking for. By 2045 we're going to be way behind the ball if we don't increase the amount. Thank you for your time.

MS. MURIMI: Thank you, sir. Moving on to Eddie Ahn. Go ahead and state and spell your name, give your affiliation, if any.

MR. AHN: Hi, Eddie Ahn, that's E-D-D-I-E A-H-N, of Brightline, an environmental justice nonprofit. Also part of Offshore Wind Now, which is a larger environmental justice labor coalition that has been working on offshore wind for some time, and was strongly supportive of AB 525, the authorizing legislative framework for this.

We applaud the strong gigawatt target set in the report itself. We really do believe that an aggressive statewide target is important, and particularly 20 gigawatts by the 2045 to 2050 timeline. For Brightline, we've really focused on two reasons. Clean air, the idea of lessening our reliance on the fossil fuel industry by building this large scale

utility generation source, and also local jobs through local hiring and targeted hiring.

Really appreciated, particularly today, CPUC President Reynold's question on what more can be done around equity on offshore wind besides workforce. There are just a couple of examples to throw out that, you know, all the agencies here can consider. Ranging from, say, community ownership of the generation itself. A larger question of can it affect rates, and perhaps reduce rates for, particularly, low-income households. And then, thinking through local supporting infrastructure.

There's been mention today, of course, of transmission, but also thinking of things like how about community benefits in the form of EV charging infrastructure for the community, or what does cleaner port development mean as well for where the offshore wind turbines are being proposed to be sited and manufactured. And also, you know, a larger question too, is the idea of a community benefits fund.

If you look at the town of Nantucket and Vineyard Wind, they've already seeded their own offshore wind fund for $4 million, with a potential total of $34 million. Now, just keep in mind, the average household income in Nantucket is probably in excess of $140

thousand alone, not to mention it's well known as being a wealthy vacation zone.

I'd like to think California can do a lot better than that. That, you know, particularly for the North Coast and Central Coast areas where this is being proposed, is that there is a robust relationship that can be developed between industry and local impacted communities, and that this is where your leadership as state leaders on the environment are really needed, and that today, you know, I'm glad to hear there is references, for instance on making sure the concerns of indigenous peoples, national defense and fisheries should be incorporated. But, also making sure that their explicit references to environmental justice and equity are just as important. We really believe that this is one of the big generational opportunities we have to really make a difference in our fight against climate change, and also create, essentially, equitable winds for our own communities that we really care about.

Thank you for your time.

MS. MURIMI: Thank you, Eddie. Next, we have Alan, from Pacific Sky Productions. Please state and spell your name, give your affiliation, if any.

MR. SHELLY: Hi. Alan Shelly, Pacific Sky Productions, California, Los Angeles. Just one general

question, comment. All this research to date has been presented based upon using horizontal axis wind turbines. I know we're looking about five, ten years out in terms of technology, people mentioned technology is evolving and one of the technologies that's really evolving now is vertical axis wind turbines.

In terms of sea space, you're going to need one quarter of the same sea area for vertical axis wind turbines as you would for horizontal wind turbines, because the physics for vertical turbines is much better in terms of spacing. So, you can reduce your sea space requirements or increase your capacity in a given region.

I bring that up, because California, we have a —— some world leading researchers in vertical turbines at Stanford, a couple of other places, some firms along the west coast, but it's being overlooked right now and that's something that I would recommend folks in California, we should really consider and take a look at, because there are some advantages.

I mean, other advantages of vertical turbines, they can be fabricated on site. You don't need a dedicated facility like in Europe or they're building on the East Coast, you just go to the fabrication yard you can protrude those. The physics again, for floating

foundations, because the lower pressure, lower center of gravity, the floating hull can be smaller. So, that has benefits to the infrastructure. You may not need as big of a, you know, yards for buildout, you know, things like that.

So, that's all, just vertical axis wind turbines should be something that should be in sight. Thanks.

MS. MURIMI: Thank you, Allan. Next we have Joanne Freemire. Please state and spell your name, and give your affiliation, if any. You may begin your comment. That's Joanne Freemire. Please unmute on your end and begin your comment.

MS. FREEMIRE: Hello. Can you hear me okay?

MS. MURIMI: Yes, we can.

MS. FREEMIRE: Wait is that you, ma'am? Hold on, I'm trying to talk on the Zoom thing. Hello?

MS. MURIMI: Hello, we can hear you.

MS. FREEMIRE: Okay. Here's my question. I live in Cam —— my name is Joanne Freemire, J-O-A-N-N-E F-R-E-E-M-I-R-E. My affiliation is that I would be a neighbor to the wind farm. I live in Cambria, which is right on the coast. One of the closest communities to the wind farm. I think I would probably be able to see the lights at night, although they, you know, from what

I've seen in the reports, you probably couldn't see it during the day. And that's fine, I'm a great supporter of wind and solar, and I —— here's my question though. Is, what I've observed on the wind patterns here, at least on the coast, is that the wind blows hard in the afternoon, but dies at night and the morning. So, I was puzzled by your chart that showed it steady 24 hours a day, you know, supplementing the fact that solar, you know, is only active during the day. So, can you explain to me, is the wind heavier offshore than it is on shore here? Or more steady 24 hours a day?

MS. MURIMI: Thank you, Joanne. We can follow up with your question.

MS. FREEMIRE: That's it? Okay.

MS. MURIMI: Moving on, we have Dan Jacobson. Go ahead and state and spell your name, and give your affiliation, if any.

MR. JACOBSON: Thank you very much. My name is Dan Jacobson, D-A-N- J-A-C-O-B-S-O-N, in this case with Environment America. First, we want to give a wholehearted thanks, as many already have, not only to the agencies, but I'd like to say in particular to the staff who have put in a lot time to do a lot of good work on this report.

Second, is I want to say that setting goals is

really important. We've set a number of goals here in the state for a million solar roofs, for getting to 100 percent clean energy, and when the state sets goals, the market responds and we're able to hit the key numbers that we need. So, thank you very much for setting a goal of three gigawatts by 2030 and of looking at between 10 to 15 and up to 20 gigawatts by 2045 and 2050. We think we're going to need more but this is a very good place to start and we're encouraged by all the work that you've done.

I want to echo the comments of Eddie Ahn from Brightline and the environment justice issues that are going to be critical to this issue moving forward. We have an opportunity here to really not only create clean energy and to move the state forward there, but to also create equity in the energy plan that we have, and that's going to be very important.

A couple of just key things I would have going forward. I think that the agencies are going to need more money. So, in this time when the state has a little bit of a surplus, I think it's important for the agencies to go into the state and ask for more money that you're going to need for research, for permitting, and for stakeholder engagement that's going to be critical moving forward. So, any opportunity that you

have, I would encourage that.

The next thing I would do —— I think it's important to look intra-state. Look at the opportunities that we have with Oregon and Washington. That's going to be critical moving forward. The opportunity to expand to the whole coast amongst the three states gives us greater opportunity.

Thank you very much, appreciate the opportunity to speak, and yield back the rest of my time.

MS. MURIMI: Thank you, Dan. Next, we have Adam Stern. Go ahead and state and spell your name, give your affiliation, if any.

MR. STERN: Thank you. I'm Adam Stern, A-D-A-M S-T-E-R-N, executive director of Offshore Wind California, a trade group that represents the offshore wind industry. We were the hosts of the Pacific Offshore Wind Summit held in San Francisco at the end of March. We want to thank the CEC staff and the Commissioners for their work in creating this report, as well as the authors and supporters of AB 525, which set offshore wind planning goals as one of the key deliverables.

We believe the multi-gigawatt goals proposed by the CEC in this draft report are very encouraging

news, and an important milestone for the Golden State's offshore wind industry. They show that California is serious about going big on floating offshore wind to drive economies of scale and realize the very substantial jobs, climate, and clean power benefits that offshore wind can deliver for our state.

The CEC's draft goals send an important signal to industry and other state and federal agencies that California is committed to moving forward expeditiously to make offshore wind power a reality. The next key steps include the federal lease auction this fall, and further planning for ports, transmission, procurement, additional Call Areas, workforce development, and sustainable supply chain.

Indeed, we'd like to encourage the Commission, as others have said today, to consider going even bigger and advance the 20-gigawatt goal forward to 2045. Such a move, which is well supported by industry and academic research, would take advantage of the many benefits from economies of scale that are inherent in offshore wind power.

Your own report states that the technological innovation and cost reductions which we expect ahead could support a faster rate of offshore wind deployment. And, earlier in this comment period we've heard from the

authors of the Berkeley report, the GridLab report, and references to the NREL analysis, all of which could provide additional substantiation for why going still bigger is better.

California can make offshore wind a key part of the state's diverse clean power portfolio while also protecting marine and coastal resources. Looking ahead, we're committed to working with the CEC and other state agencies to continue implementing AB 525's roadmap. Thank you very much.

MS. MURIMI: Thank you, Adam. Next, we have Anthony Ventura. Go ahead and state and spell your name, give your affiliation, if any, and you may begin your comment.

MR. VENTURA: Good morning, can you hear me?

MS. MURIMI: Yes, we can.

MR. VENTURA: Good morning, my name is Anthony Ventura, I'm a member of the Southwest Regional Council of Carpenters for the last 30 years. And my family live in the local area of the project. I was born and raised along the Central Coast. I believe we will be impacted by the environmental impacts of the project.

The California Energy Commission should require or encourage offshore wind energy projects to be build utilizing the local and skilled and trained

workforce. This workforce requirement would reduce construction related environment impacts, while bringing good paying jobs that will benefit the local economy.

By bringing in revenue to local merchants and bringing good paying career jobs to residents that will bring clean and renewable energy, while providing jobs for our community. The use of a local state and certified apprenticeship program for skilled and trained workforce will not only help the local community, but also will train members of the community for years to come. Thank you.

MS. MURIMI: Thank you. Next, we have Jim Lanard. Apologies if I have misstated your name. Go ahead and state and spell your name, give your affiliation, if any, you may begin your comment.

MR. LANARD: Thank you. This is Jim Lanard. J-I-M L-A-N-A-R-D. I'm with Magellan Wind, and offshore wind developer, and we have a joint venture development with Copenhagen Infrastructure Partners for offshore development off the coast of California. They're co-developing the Vineyard Wind project on the East Coast, and two other leases there.

I want to start by complimenting the staff and Commissioner Vaccaro for getting this report out in such a short period of time. It's really comprehensive, it's

very thoughtful, and as Commissioner Rechtschaffen said, and Jennifer Lucchesi said, we really are seeing an all-of-government approach to offshore wind. It's refreshing and exciting to see what the future is going to bring us.

Magellan supports planning goals that are a little bit more aggressive than what we've heard from some of our colleagues on the early stage. That is, for 2030 we're asking the Commission to consider four gigawatts of capacity, and we'll explain why in a minute. We also support the 20 gigawatts for 2045, provided all the wildlife and environmental protection studies are thoroughly considered.

We base our four-gigawatt conclusion on six different factors. Some have been hinted at, but not specifically mentioned today, and these are some of the new data points that have come out since the report was published by the Commission.

The first is the GridLab study. They stress tested accelerating clean portfolio to meet 85 percent clean electricity by 2030. In two of their models, four gigawatts of offshore wind was included to get to that 2030 goal, so we see that that helps get our greenhouse gas emission reductions done quicker.

Energy Innovation did a companion report, and

they found that four gigawatts of offshore wind and two gigawatts of geothermal would also help advance the goals and reduce the risk of over-reliance on other clean energy sources.

We heard from the scientists from the University of California at Berkeley. They talk about the 50 gigawatts at 2045. They also talk about the idea of five gigawatts by 2030 with the right policy driver, something that obviously the state is looking at.

In addition, the NREL study that looks at the lease areas in the wind energy areas concluded that there could be as much as 7.5 gigawatts of capacity density in that area. So, we don't need to expand the footprint from the WEA's that exist now for the leases that we're going to see in the fall to get to the four or five gigawatts of capacity.

Lastly, European wind farms do have larger capacity densities than the three megawatts per kilometer that we're using in the United States. We will caveat that with floating mooring systems we may lose some of that extra advantage, but we'll see. And lastly, as Commissioner Hochschild said, we're looking at 18-20 megawatt turbines, they spin higher where the wind is faster, with larger rotor swept areas that capture more wind and produce more energy.

We can make five gigawatts by 2030. Thanks very much.

MS. MURIMI: Thank you, Jim. Next, we have Pedro Toscano. Go ahead and state and spell your name, give your affiliation, if any, you may begin.

MR. TOSCANO: Hi. Good morning, can you hear me?

MS. MURIMI: Pedro, we are having a little —— a hard time hearing you. Do try that again.

(Pause)

Pedro, we cannot hear you at this time.

Please check your connection.

MR. TOSCANO: Okay, very well.

MS. MURIMI: We'll try you a little later, thank you, Pedro. Next, we have Ian Emerson. Please state and spell your name and give your affiliation. You may begin, Ian.

MR. EMMERSON: Hello. This is Ian Emerson Beck. That's I-A-N E-M-E-R-S-O-N B-E-C-K. Thanks to the Commission for taking comments today. I'm the clean energy advocate with Environment California, the state-wide environment organization. We are also part of the Offshore Wind Now Coalition.

Together we are calling for state-wide offshore wind enforceable planning targets of five

gigawatts by 2030, and 20 gigawatts by 2045. Just to describe the current landscape a bit, California's total retail electricity sales in 2019 were about 250 terawatt-hours, and in 2050 California's electricity usage with full electrification is projected to triple to about 761 terawatt-hours as we electrify transit, building, heating, and appliances that currently use natural gas.

So, while demand increases, we also need to get to 100 percent clean energy as fast as possible, and SB 100 requires that we do so by 2045 at the latest, as you know.

California's offshore wind will be a huge part of this expansion of renewable energy capacity. According to our recent Environment California Research and Policy Report, Offshore Wind for America, California has offshore wind potential of 52 percent of our projected 2050 electricity use, including that full electrification change.

So, the goals that we are calling for are five gigawatts by 2030, and 20 by 2045 would be a great help as we move toward 100 percent renewable energy by 2045. Given that California will simultaneously be converting a lot of the generation capacity that already exists over the same time period as demand grows, using just

some of the potential of offshore wind will make a huge difference in our energy budget. So, to conclude, we urge the Commission to set ambitious goals of five and 20 gigawatts of offshore wind capacity, with projects subject to strong environmental and governmental review so that California will have much needed breathing room as we go through both the transition of our existing generation capacity, and simultaneously, increases in demand over the coming years. All of which is just part of getting to 100 percent clean energy by 2045. Which, itself is a goal that we think would be great to accelerate. So again, thanks to the Commission and the staff, we appreciate your time and effort on this matter, and I'll yield the rest of my time. Thank you.

MS. MURIMI: Thank you. We'll try Pedro Toscano again. Pedro you may unmute on your end, and you may begin your comment.

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

MS. MURIMI: A little better.

MR. TOSCANO: Okay. Sorry. My name is Pedro Toscano, I am a union representative with the Southwest Regional Council of Carpenters, Local 805. We represent men and women, carpenter members, that currently work at Diabolo Power Plant, and about five to six hundred other members building our schools and public work

municipalities in the same region as this project.

There is much need for offshore wind energy, local carpenter members would like to work in the area they live in and would like to continue to be of service and play a part in the solution from nuclear energy into offshore wind energy.

Please help us prevent environmental impact in our community, and require state accredited apprentice programs today, for the good paying jobs of tomorrow. Thank you very much.

MS. MURIMI: Thank you, Pedro. Next, we have Julia Zuckerman. You may state and spell your name, and give your affiliation, if any.

MS. ZUCKERMAN: Thank you. I'm Julia Zuckerman, J-U-L-I-A Z-U-C-K-E-R-M-A-N, and I'm with Clearway Energy Group. Clearway is a California based renewable energy company with close to 1,800 megawatts or renewables under our ownership and operation today.

Our portfolio includes both solar and land-based wind, and we hope to be adding offshore wind to that in the coming years. I first just want to echo the thanks to all of the Commissioners and the staff for your work on this. It is so great to see agencies working together and looking ahead to new technologies and how we build our clean energy future together.

As the CEC finalized this report, we encourage you to pick a single goal for 2045, and to make that an ambitious 20-gigawatt goal reflecting the best of California's history of forward-thinking commitment to new clean energy technologies. Others have talked about this technology innovation story. Some of the projects that Clearway is proud to own and operate today are solar PV plants that were developed in the early years of the RPS, like the California Valley Solar Ranch project in San Luis Obispo County.

It is hard to remember today, but back when those projects were first envisioned, their technical feasibility and their costs were just as uncertain as floating offshore wind is today. But California leaders saw the potential for clean energy, technology, innovation, and they made a big commitment that has paid off incredibly for California and for the world in the decade plus since then.

We've seen clean energy technology consistently advance and decline in cost much faster than forecasts would indicate. We've seen it with solar PV, onshore wind, and we've seen it with offshore wind in Europe. We should expect the same with floating offshore wind. So, a 20-gigawatt goal for 2045 would reflect that ambition, and that optimism for our clean

energy future, and we encourage you to set that goal. Thank you.

MS. MURIMI: Thank you, Julia. Next, we have Nancy Rader. Go ahead and unmute on your end, state and spell your name, and give your affiliation, if any.

MS. RADER: Well, good afternoon. Nancy Rader, R-A-D-E-R, California Wind Energy Association. CalWEA generally supports this impressive report and its megawatt planning goals. We believe that the planning goal ranges are appropriate, given various uncertainties that will not be resolved, even by the time the strategic plan is finalized in June 2023.

CalWEA has three suggestions for strengthening the report. First, the 2030 planning goal of three gigawatts should be converted to a range, and the report should identify the policy decisions that would be necessary to achieve each end of the range.

Unless the 2030 goals are grounded in a defined path towards their achievement, they won't have much meaning. The report should note that achieving the 2030 goals would require accelerating the BOEM permitting process, designating a central procurement entity to procure on behalf of loads from the entities, and ensuring that deliverable transmission capacity will be available at the Central Coast.

While the AB 525 report is aimed at projects in federal waters, the report should acknowledge the potential for 100 megawatts of capacity to be operational in state waters before 2030. Given BOEM's long permitting timeline and other challenges associated with bringing federal waters projects online by then, the two proposed projects in state waters offer the most likely prospect for projects being operational by 2030. And those projects can also help build the state's industrial capacity and workforce to support the federal waters projects and can help us understand and mitigate the environmental impacts of those projects.

Second, we encourage the Commission to use the SB 100 model to evaluate levels of offshore wind exceeding 10 gigawatts to determine how much more offshore wind can be justified as part of an overall portfolio that ensures reliability and minimizes cost in achieving the SB 100 goals.

Finally, the brief section on the reliability benefits of offshore wind really underplays those benefits. Adding wind to a portfolio otherwise dominated by solar energy substantially reduces not only the storage capacity that's required to ensure reliability, but also reduces the total overall amount of capacity necessary to achieve our SB 100 goals.

Adding resource diversity is itself a reliability benefit, because of the operational, supply chain, land use, and other risks that would be associated with a portfolio that would otherwise be dominated heavily by solar and batteries.

Lastly, if the transmission network designed for offshore wind is located off the coast below sea level, that network would reduce the substantial reliability that wildfire poses to the grid.

Thank you very much.

MS. MURIMI: Thank you, Nancy. Next, we have Larry Miles. Go ahead and state and spell your name, give your affiliation, if any. And please be sure to unmute on your end. Larry Miles?

MR. MILES: Yes. My name is Larry Miles. L-A-R-R-Y M-I-L-E-S. I'm with a startup company called Pacific Coast Renewable Energy. Formerly, I was with a company called the Wind Turbine Company, a recipient of early funding from the California Energy Commission, for which I thank you very much.

I'm calling about a couple of —— my question relates to your use of the NREL study of, I believe dated 2019, projecting a cost-reduction of 44 percent, if I'm not mistaken, in the future. And I simply wanted to bring to your attention the not too often talked

about financial difficulties of existing wind turbine manufacturers, who in the last two to three years have lost several hundred million dollars each —— that is the big three turbine manufacturers that presumably are going to be supplying wind turbines to offshore California. That —— their poor performance should be better understood, I think.

In that context, if you look at the DOE's ARPA-E webpage, they basically suggest that existing wind technology is just too massive and expensive to be economically viable. Seems like there should be some thought given to, or discussion with the ARPA-E folks to understand what they're talking about.

And lastly, as it relates to the CEC, they supported a small company 20-something years ago called The Wind Turbine Company in collaboration with the DOE, who had a program looking for the next generation wind turbine technology that was intended to reduce, or eliminate actually, the requirement for ongoing subsidization to basically bankroll wind technology. It turned out to be a difficult situation for a difficult time for a small company to start up in the face of existing wind technology being subsidized by the likes of the Production Tax Credit.

So, it's an issue that's probably more

complicated than the 30 seconds I have left would allow going in, but it seems like it should deserve a little more study from the likes of the CEC, and prospectively, the DOE, and maybe the folks at Berkeley's Goldman School that came up with the suggestion to increase the use of wind energy. So, thank you very much.

MS. MURIMI: Thank you, Larry. Next, we have Nancy Kirshner-Rodriguez. Go ahead and state and spell your name, give your affiliation, if any, you may begin your comment.

MS. KIRSHNER-RODRIGUEZ: Thank you very much. Nancy Kirshner-Rodriguez. N-A-N-C-Y K-I-R-S-H-N-E-R-R-O-D-I-G-R-U-E-Z, and I am with the Business Network for Offshore Wind.

I would have been in person, but I am also recovering from a chest cough or cold. Thank you for this opportunity. Commission Vaccaro and Chair Hochschild, to the entire CEC staff team that lead the creation of this draft report, I want to commend you. Thank you to the CPUC Commissioners and other state agency partners participating today. I want to salute my friend and former Assembly Member David Chiu for authoring AB 525, and working with industry and advocates, unions and environmental allies to craft the legislation that brought us to today.

We have provided written comments already on the draft report, but I was very pleased to hear Chair Hochschild talk about how bullish our Governor continues to be on offshore wind, and that he wants to see it succeed as a significant resource. The Business Network and our more than 500 member companies and organizations have been championing offshore wind in the United States since 2012. We are growing exponentially every day.

When we went to talk to the new California administration and legislature in 2019, we saw interest but skepticism. But today I think we all know that offshore wind has arrived in the U.S., and that the next frontier, the floating frontier, is California's to lead on if we act aggressively.

Our members range across the supply chain, and our focus is the development of a domestic supply chain that will create good jobs in our communities. We've been proud to partner with many of you in the room already, and we'll continue to push for at least the three in 2030 and 18 in 20-4 and as large a gigawatt planning goal as we can, so that we can see the full benefit of a robust regional supply chain and workforce that can also look to supply and service global projects as well. We are working with NREL on a NOWRDC supply chain study that is now expanded to the West Coast. We

will begin —— be beginning our foundation of laid trainings in California last year, and we look forward to continuing to support these efforts and see everyone's vision be a reality. Thank you.

MS. MURIMI: Thank you, Nancy. Next, we have Mike Conroy. You may —— apologies. Go ahead and unmute on your end, and state and spell your name, give your affiliation, if any, thank you.

MR. CONROY: Yeah, thanks. Confirming you can hear me?

MS. MURIMI: Yes, we can.

MR. CONROY: Yeah, my name is Mike Conroy. M-I-K-E C-O-N-R-O-Y. I am the Executive Director of the Pacific Coast Federation of Fisherman's Associations and Principal of West Coast Fisheries Consultants.

I represent folks, both harvesters and community members that are dependent on the seafood that we harvest, who will be both directly and indirectly impacted by offshore wind. Directly to the extent that certain fisheries will lose access to important fishing grounds, and indirectly as impacts from electromagnetic fields generated by power cables and the like remain unknown.

It is somewhat astonishing to me that here we are at 12:15 and I'm the first and probably the only

commenter who will mention anything regarding fisheries during today's workshop.

I do want to point out that we are not opposed to offshore wind. We are disappointed about the process that has been utilized by BOEM to date, which did not engage with the fishing fleets before identification of Call Areas off California to deconflict those. I do want to appreciate Alla's acknowledgement that 1,300-meter depth restriction isn't really a thing anymore. We have seen that with two recent Call Areas which were identified off the East Coast, which are located in a depth up to 2,600 meters.

We encourage the state to push BOEM to engage with the fishing industry as future Call Areas are considered and identified off the state. We have to learn from the past, and expect better and more meaningful engagement by both the federal and state agencies.

While reaching out to fishing community members in those ports and harbors near the Call Areas is important, it fails to capture the concerns of fishery participants and/or community members that are reliant upon those areas, but aren't based in those areas. We need to acknowledge that fisheries and their participants are mobile, you know, a perfect example of

that is the North Pacific Albacore fishery. Fishery participants range as far south as San Diego, and as far north as the northern parts of Washington. And, you know, those folks' fishing areas where the fish are is not uncommon to see boats from Washington down off the California, and not uncommon from San Diego fishing off of Washington.

So, those stakeholders have been, you know, kind of ignored and left out of those conversations and we encourage the state and federal agencies to, you know, expand their engagement to all potentially impacted folks.

Just want to close by acknowledging that offshore wind is going to impact our ability to provide valuable services to Californians, both in terms of our food security, and access to the marine resources off the state to disadvantaged communities. I want to acknowledge that the carbon footprint of producing a pound of protein from our commercial fishing operations off the state are very low and very favorable, even in terms of land-based protein sources.

And just close by saying we remain concerned about the large amount of unknown aspects with regards to offshore wind. You know, concerned about environment impacts, ecological impacts ——

MS. MURIMI: Mike, please conclude your comment.

(Pause)

Thank you. Next, we have Natalie Nax. Natalie, you may state and spell your name, give your affiliation, if any, and you may begin your comment.

MS. NAX: Yeah. Can you all hear me?

MS. MURIMI: Yes, we can.

MS. NAX: Great. My name is Natalie Nax. That is spelled N-A-T-A-L-I-E N-A-X, and I'm speaking on behalf of Ceres, which is a sustainable nonprofit that runs a coalition of more than 80 major businesses, many of whom have substantial operations in California. We really appreciate Commissioner Vaccaro's leadership, staff's hard work on this draft, and all of the great conversations today.

The major businesses we work with recognize that climate change poses a significant risk to their long term economic success and threatens the livelihood of communities in which they operate. For these reasons, many publicly supported AB 525 to jumpstart California's offshore wind industry, including Salesforce, Dignity Health, Sierra Nevada Brewing, Gap, and Workday. These companies see offshore wind as a cost-effective clean energy resource, and a significant

economic opportunity for the state.

In line with many of the other public and written comments, while we support the Commission's proposed targets as minimum requirements, we urge the Energy Commission to strive for bolder deployment targets of five gigawatts by 2030, and 20 gigawatts by 2045.

We believe ambitious targets will initiate the state's opportunity to capture the economic and clean air benefits of the industry. Thank you for all of your work to advance clean energy solutions in California.

MS. MURIMI: Thank you, Natalie. Next, we have Thalia Kruger. Apologies if I have misstated your name. Go ahead and state and spell your name, give your affiliation, if any, and you may begin your comment.

MS. KRUGER: Good morning. My name is Thalia Kruger, and I represent Principal Power. Thank you, California Energy Commission, and Commissioner Vaccaro, and Chair Hochschild for your leadership. Ms. deMesa, your presentation was succinct and to the point.

Principal Power is a California company —— base company providing technology and engineering services. Our wind-float is producing already 75 kilowatts of energy off the coat of Portugal and Scotland. We were able to visit the sites. We are excited to bring our

technology back home.

I echo the words of our founder pioneer, Alla Weinstein. The technology is already working, and the technical challenges related to installing floaters in deep waters have been already resolved by the oil and gas industry.

I also echo the request of all the participants to consider higher goals for offshore wind in California. As a company, we are committed to working with stakeholders to create market conditions that position the sector for significant contributions to global power sector decarbonization. Bringing about thousands of high paying, quality jobs.

California can be a global leader in that industry. This is what I believe. We, as a company, advocate ocean-based climate action. We believe in a sustainable blue economy that brings benefits to local communities, where multiple ocean users can co-exist. And, I repeat co-exist, with minimum impact on the environment.

We work to support these efforts, and I'm proud to share our learnings. Our learnings are based on data. Data gathered in other regions of the world. And talking close to back home, they —— a seven year-long study, the first of its kind in the U.S. titled, *The*

Merciful Fish and Invertebrate Catches Relative to Construction and Operations for North America's First Offshore Wind Farm, was published in the ICES Journal of Marine Science on March 29th, proving that offshore wind not only not impacts adversely the fisheries, but contributes to their growth.

Understanding balancing and responding to the varied and sometimes conflicting stakeholder priorities is an important point. And we engage with multiple stakeholders and continue the dialogue. To help approach these issues from a position of understanding, and to find suitable solutions and gain acceptance, because this is the way we should go.

Let's dream big and consider this effort of the California Energy Commission just a small step, because while the difficult takes time, the impossible just takes a little bit longer, and the future for offshore wind in California is now. Thank you.

MS. MURIMI: Thank you, Thalia. We'll move on to our last commenter. Again, if anyone in the room would like to make a comment, go ahead and see me or use the QR codes in the back of the room, and anyone on zoom can use the raise hand feature. We have Rob Holmlund, apologies if I've misstated your name. Go ahead and state and spell your name, give your affiliation, if

any, and you may begin your comment.

MR. HOLMLUND: Hello, can you hear me?

MS. MURIMI: Yes, we can.

MR. HOLMLUND: All right. My name is Rob Holmlund, I'm the development director for the Humboldt Bay Harbor Recreation Conservation District. The Harbor District is actively working with a range of partners and stakeholders to prepare Humboldt Bay to serve the offshore wind industry. We have a detailed master plan for a 180-acre wind terminal here on the bay, and we've initiated the preliminary design and permitting of the site.

We are also collaborating with a range of stakeholders to ensure the broadest possible support for the project, and we are actively communicating with a range of wind companies to evaluate the industry's needs for a vertical assembly component manufacturing and long-term operations and maintenance.

And based on all this feedback, we're adjusting our designs as we go. I'm going to take the time to thank the CEC for a ten and a half million-dollar grand issued to the district earlier this year to prepare the port for the offshore wind industry. We're working to leverage those funds to attract federal grants. And in fact, earlier this week we submitted a

grant application to MARAD's Port Infrastructure Development Program for construction of the initial phase of the master plan, and we're actively working with the California Association of Port Authorities, and the state to request an additional $45 million funding for construction. The goal of all of the state and federal money is to attract private investment in the state.

So, Humboldt Bay is optimally located to serve all three areas in the North Coast, as well as the Morro Bay call area. The bay has no vertical obstructions, no air space restrictions, there's a deep, federally maintained channel, and has the available coastal industrial land to serve the industry.

Our site is also within a 15-minute drive of Cal Poly Humboldt, and College of the Redwoods, both of which are actively working with the County Workforce Development Board to prepare a workforce.

So, thank you, again, for your leadership and support, and we look forward to being one of the primary offshore wind ports in California.

MS. MURIMI: Thank you, Rob. And with that, there are no more public comments. I'll give the microphone back to Commissioner Vaccaro for closing comments.

COMMISSIONER VACCARO: Yes, thank you, Dorothy. Erica, before we, sort of make the rounds on the dais, I just want to make sure if there was anything else from your end, because you've been helping with the run of show, and I don't want to jump in front of you.

MS. BRAND: I have nothing else, please go ahead.

COMMISSIONER VACCARO: Okay, great. So, we've been starting with the in-person dais, but I think for closing remarks maybe we'll go ahead and start with the virtual dais. Chair Hochschild, if you want to go ahead and get us started, that would be great.

CHAIR HOCHSCHILD: Well, thank you so much. Really wanted to extend my gratitude to all the stakeholders for weighing in. That was a very, very insightful and rich set of comments with some terrific feedback, I think, for us to chew on and work through together.

I do want to say —— it's been really beautiful, actually, watching this industry ripen and the stakeholders involved with it ripen over the last few years. It makes me feel hopeful for the future, and I really, again, just wanted to thank Commissioner Vaccaro for working so hard on this. There's been so much outreach that's kind of got us to this point.

I heard the gentleman mention from Humboldt, the funding we did for the port there, and some of the other work. And, we haven't talked about the tribal outreach, but there's been that element as well. Just really kudos to you, Commissioner, for helping get us to this point.

Special thanks to the PUC. It's nice to see such great turnout. We hope, eventually, to be able to host you in our new building, they tell us next month the A/V will finally be ready. Thank you all for joining, I'm happy to be a part of it today.

COMMISSIONER VACCARO: Alright, and Becky, I don't know if you're still on the virtual dais?

MS. BRAND: Becky had to leave at noon.

COMMISSIONER VACCARO: Okay, and is Scott still there? Great.

MR. MORGAN: Yeah, Scott Morgan.

COMMISSIONER VACCARO: Thanks, Scott, for hanging out.

MR. MORGAN: Oh, certainly. I just want to echo the Chair's comments, I really appreciate the stakeholder feedback —— super insightful, and provides us a good path forward. So, looking forward to continuing the work on this great project, and making offshore wind happen here in California.

COMMISSIONER VACCARO: Alright, thank you. I'm going to go left to right this time starting with you Justine, if you'd like to make a closing comment.

MS. KIMBALL: No additional comment from me.

MS. LUCCHESI: I just want to extend my gratitude to everybody and their comments. A lot to chew on, and I appreciate it. Thank you.

PRESIDENT REYNOLDS: I'll just add that I really appreciated the comments today, especially the substantive content of the comments. Really, really helpful, and we appreciated all the stakeholders taking the time to speak to us today. Also grateful to the CEC for inviting us here today and to all the staff who helped pull this together. I am really looking forward to next steps and share the Chair's hope for the future after this event today. Thank you.

COMMISSIONER SHIROMA: Thank you everyone, Genevieve Shiroma from the CPUC. Great workshop, really engaged community. I learned a lot and look forward to next steps. And the neighbor who called in, who asked about wind patterns, I —— someone will be getting back to her about that. That was an excellent question, looking at the wind patterns. The —— what was written up in the draft report, as far as looking at the reliability of our —— of mother nature to help us out to lower our

greenhouse gas footprint. Thank you and look forward to working with everyone.

COMMISSIONER HOUCK: I just wanted to add my thanks to the Energy Commission's staff, to Commissioner Vaccaro for all your work, and am also looking forward to next steps and will reach out to you before next week, and we can talk about tribal engagement issues. Again, appreciate all the work that you and former Commissioner Douglas and Chair Hochschild are doing on those efforts.

COMMISSIONER VACCARO: Great, well thank you. So, I just want to extend my appreciation, I think to everyone, for the work that was done to get us to today, and for all of the contributions today. With every convening with every conversation, I feel like I learn something. I think there's new information that's come in, even between as we learned the release of the draft, and as we sit here today, quite a bit to ponder between now and the May 24th business meeting, which is really, just around the corner.

We take this all seriously, and it's not information that's just coming in today and we'll deal with it in another month or another several months. We're going to take the information that comes in today and think about what that means between now and the 24th,

and what it means for the continuing work on the strategic plan.

So, I think what we heard today —— we heard industry, we heard labor, we heard some environment and environmental justice representatives. We heard the important voice of fishing as well, and we heard from some businesses that aren't directly involved but see some indirect and important benefits.

I am going to point out that there were some voices that we didn't hear today, but we've been hearing them, and we've been meeting with them. There are other environmental organizations and groups that have a lot to say about this. We didn't hear them today, but that doesn't mean that their comments and their feedback isn't being registered, or that it's not in the docket, and I really want to point that out.

There was mention that just earlier this week there was outreach and engagement with fishing organizations and communities that are dependent on them. A lot of that feedback didn't come into today's meeting, but it's information that the Energy Commission, Department of Fish and Wildlife, State Lands Commission and others are really considering as well, because it's important as well to this conversation. And we have had, as Commissioner —— as Chair Hochschild

mentioned, extensive outreach with tribes on the North Coast as well as the Central Coast. And, in fact, there was some grant funding provided to the North Coast tribes and we'll be doing the same with Central Coast to really get a sense of the cultural and other impacts, you know, that are of particular importance to tribal governments and indigenous peoples.

So, this was tremendous today. I just want to make sure that we're all understanding this is only part of the conversation, and it's only some of the input, and there's a lot more and there are so many competing interests and important priorities that we're trying to weigh, consider, and navigate as we look at the potential for offshore wind development in federal waters off the California coast.

So, thank you all so much for your time. This was a great workshop, really appreciate it. So, I think we're done.

(Thereupon, the Workshop was adjourned at 12:33 p.m.)