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CALIFORNIA ENERGY COMMISSION

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	)	RE: Land-Use Screens

IEPR COMMISSIONER WORKSHOP ON LAND-USE SCREENS

IN-PERSON AND REMOTE VIA ZOOM

MONDAY, OCTOBER 10, 2022

1:00 P.M.

Reported by:

Martha Nelson

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Jared Ferguson, CEC

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Patrick Hennessy, California Department of Conservation

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Nathaniel Roth, Chief Scientific and Data Advisor, Department of Conservation

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P R O C E E D I N G S

1:00 A.M.

MONDAY, OCTOBER 10, 2022

MS. RAITT: Alright, we'll go ahead and get started. Good afternoon, everybody. Welcome to today's Workshop on Land-Use Screens. I'm Heather Raitt, the Director for the Integrated Energy Policy Report. So I'll make a few logistical announcements before we get into the substance of today's workshop.

Next slide, please.

To follow along the meeting schedule and presentations have all been docketed and they're posted on the CEC's IEPR webpage. And for those in the room, there are QR code signs available and you can use those to access the presentations. We also have hard copies available at the entrances of the hearing room and they're there for your review. And let us know if you need your own hard copies.

This workshop and all IEPR workshops are recorded and the recording will be linked to the CEC's website shortly after the workshop, with a written transcript available in about a month.

So we have a few different ways for

attendees to participate today. First we'll be reserving a few minutes after the panel discussion to take some questions. Unfortunately, we may not have time to address all the questions submitted. But those who are on the Zoom platform, you can use that Q&A feature to submit questions. And you can also click the up-vote to let us know if you saw a question there that you also had.

And, alternatively, we will have a public comment period at the end of the workshop. And we'll be reserving about three minutes for each person, one person per organization to make comments.

And finally, we always welcome written comments and instructions for written comments are in the notice. And we request those by November 1st, at the end of the day on November 1st.

And with that, I will turn it over to Vice Chair Siva Gunda, who is the Lead for the -- the Lead Commissioner for the 2022 Integrated Energy Policy Report update, for opening remarks.

Thank you, Commissioner.

VICE CHAIR GUNDA: Thank you, Heather.

Good afternoon, everybody. I think I just want to begin by just expressing my gratitude to you and your team for all the work you do in pulling together the IEPR workshops and the broader report.

Before we make our opening comments, I would like to go to Commissioner Vaccaro here to just acknowledge the special day we have today and provide some comments.

COMMISSIONER VACCARO: Thank you so much.

So in honor of Indigenous Peoples Day, we begin this meeting by recognizing all indigenous people who call California home. In this year's IEPR, we're centering equity and environmental justice as the state transforms this energy system away from fossil fuels to achieve a clean energy future that benefits all Californians.

We have met with tribes throughout the state to continue to build relationships as key partners, including tribes as key partners in our clean energy transition, and to increase our cultural awareness and understanding of tribal concerns to better inform our work. One of the aims of the IEPR is to empower communities and tribes to easily access energy information,

including the land use information we will discuss today.

VICE CHAIR GUNDA: Thank you, Commissioner Vaccaro.

I want to invite all the participants on the dais today. We have Commissioner Vaccaro, also joined by Nate Roth here, Chief Scientific and Data Advisor for Department of Conservation. And we have a couple other Commissioners joining online, Commissioner Rechtschaffen and President Reynolds.

I was inaccurately informed that Commissioner Rechtschaffen was going to be in person here and I didn't want CPUC to be equal here on the dais, so I had to come in, so -- but anyways, Commissioner Rechtschaffen, we miss you here.

With that, I would actually like to go to the comments, opening comments, from our Commissioners here.

Commissioner Vaccaro, would you want to start?

COMMISSIONER VACCARO: Thank you. Yes. Just a few brief comments.

First of all, again, thank you for your

leadership in this space, Vice Chair Gunda. It's very important work.

I'd like to recognize Erica, Jared, Travis, Saffia, and Gabriel for an incredibly impressive report that is something that is foundational, I believe, to the work that we're doing as we're trying to achieve this clean energy transmission and the resource build out at a scale and pace never seen before.

And so I also wanted to just recognize that this is work, of course, that staff has been leading. But you've also been embracing the importance of looking to our state agency partners and our federal agency partners. I think that just improves the credibility and the integrity of the work, allows for accuracy, and also allows a common understanding for what this data and this information is and what it isn't as we move forward. I know we're going to hear more about that in the presentation. But again, just want to recognize this very impressive work.

Thank you.

VICE CHAIR GUNDA: Thank you.

Can I call on President Reynolds for any opening comments you might have?

PRESIDENT REYNOLDS: Sure. Thank you very much, Vice Chair Gunda.

Good morning, everyone. I wanted to welcome, add my welcome, to all the panelists and to members of the public who are joining us today. I'm really pleased to be here with the CEC leadership and my fellow Commissioner, Mr. Rechtschaffen, as well as Dr. Roth.

I wanted to start by thanking the CEC staff and the PUC staff for putting together this workshop, but also for what I know was many hours of collaboration and thoughtful planning to get us where we are today. I do think that this is an example of really visionary planning, where we're trying to get ahead of issues related to Land-Use Screens to maximize the usefulness of the information that a form informs our work.

And so with this approach, we're not waiting for, you know, this land use decisions to be made completely organically. But instead, we're thinking through how we can maximize benefits and thinking through how we can have the best information possible to inform our planning.

This is an example of one of the ways that we can work to meet and even accelerate our

progress toward clean energy in the energy sector, something I know that we all are very, very focused on right now. And I do see this workshop as a piece of that progress.

So thank you very much for inviting me to share the virtual dais at today's workshop. And I'm very much looking forward to the into the discussion.

Back to you, Chair Gunda -- Vice Chair Gunda.

VICE CHAIR GUNDA: Thank you, President Reynolds.

Going to Commissioner Rechtschaffen.

COMMISSIONER RECHTSCHAFFEN: Thank you very much. And apologies for not being there in person or for your thinking I was going to be there in person and disappointing you. I am not able to join you. And I'm actually going to have to leave relatively early in in the program and then come back.

I don't have much to add to what Commissioner Vaccaro and President Reynolds mentioned. The work, the Staff Report is extremely impressive. We, of course, use the land new screens in our planning processes. We

use them to the SB 100 processes. They're very useful throughout the administration.

And because the scale of the challenge continues to intensify and accelerate, we know we need to do more than ever. The Governor has directed us to do more faster. We're in the midst of a climate emergency. Getting a proactive sense of how we do this in a way that minimizes land use conflicts and promotes development in the best areas is incredibly important, more important than ever.

So thank you so much for the work here. And I look forward to the discussion.

VICE CHAIR GUNDA: Thank you, Commissioner Rechtschaffen.

To Dr. Roth.

DR. ROTH: It is a pleasure to be here. And thank you, Commissioners, Staff for inviting DOC to be a contributor to the Land-Use Screening report and all of the thinking that went into it.

Like others have said, this is an example of how we should be doing this type of work, working together across multiple agencies and multiple subject areas, and multiple sets of conflicting issues that can all get identified

early and, to the extent possible, be reconciled with a minimum of long-term conflict.

There are many really interesting intersecting issues associated with this. The connections, and these are just ones that I've been connected to, with natural working lands, mitigation and adaptation, and increased resilience to climate change, 30 by 30 efforts, preserving and supporting the state's sustainable economic development, including agricultural use, these all intersect here. And it's been absolutely amazing to see how the pieces have come together, supporting both DOC's, as well as my connections to other portions of natural resources agencies initiatives.

Thank you all. I'm looking forward to seeing the rest of it and looking forward to continuing to work with all of you in the future.

VICE CHAIR GUNDA: Thank you, Dr. Roth.

Before I hand it off to Erica and all for the first presentation here, I just wanted to acknowledge the leadership that the STEP Division is providing in the Land-Use Screen work. So obviously, it starts at the top.

Elizabeth Huber, who is the director now,

thank you, Elizabeth, for your work on, you know, centering around this work.

Erica, you have been a wonderful change agent in the organization. As Dr. Roth mentioned, you know, you really work hard towards improving the collaboration and you do it very thoughtfully, so thank you for your work.

And Travis and Saffia, you guys are with us at the data sites, so thank you for all the work you're doing.

And, Jared, look forward to your presentations.

I also just wanted to note, you know, Commissioner Vaccaro's leadership and, you know, former Commissioner Douglas's leadership around land use work for years here at the commission. So really look forward to Commissioner Vaccaro's leadership on having this conversation today.

I also wanted to just comment that in, you know, as Commissioner Vaccaro mentioned, the Indigenous Day, land has huge implications for equity. It means, you know, tremendous to people who live on the land, but also from an environmental perspective and conservation perspective. So we have a lot of people that we

need to respect in this process and collaborate with. So I look forward to continuing that spirit here and pass it on to Erica for the first presentation.

Thank you.

MS. BRAND: Thank you. Where's my video? I'm sharing the slides

Well, while we're getting the slides up, my name is Erica Brand. I'm a Project Manager in the Land Use and Infrastructure Planning Unit of the CEC's Siting, Transmission, and Environmental Protection Division. Today, I'm joined by my colleagues Travis David and Saffia Hossainzadeh of the CEC's GIS Unit.

Today, our staff team will share a proposal for the first phase of updates to the Land-Use Screens used in electric system planning. The proposal described today provides an overview of the contents of a Draft Staff Report that was noticed on Wednesday, October 5th. The title of that Draft Staff Report is Land-Use Screens for Electric System Planning Using Geographic Information Systems to Model Opportunities and Constraints for Renewable Resource Technical Potential in California.

In February of this year, the CEC, in collaboration with the California Public Utilities Commission and the California Independent System Operator, hosted a workshop on land use information and energy planning. At that workshop, we shared that staff would start a process to review and update the map-based or spatial environmental land use data used in electric system planning.

Following that workshop, the CEC staff, in coordination with staff from the CPUC, led an interagency process to review and vet the data and methods used to develop the statewide Land-Use Screens. Between now and the end of the year, we're socializing this proposal and seeking your feedback before issuing a final Staff Report in January of 2023.

Next slide, please.

For over ten years the CEC, CPUC, and California ISO have used spatial, environmental, and land use data to guide their relevant energy resource planning. This high-level statewide land use evaluation became known as Land-Use Screening. This slide reflects some of the proceedings being led by the agencies and where

Land-Use Screens fit into the process.

At a high level, Land-Use Screens are used in two primary ways in electric system planning.

First, they're used to estimate the renewable resource technical potential. The National Renewable Energy Laboratory, or NREL, defines the renewable resource technical potential of a technology as its achievable energy generation given system performance, topographic, environmental, and land use constraints. The technical potential estimated after applying the map-based Land-Use Screens then becomes an input into capacity expansion modeling, such as the RESOLVE model for the CPUC's integrated resource planning, or SB 100 analysis.

The second use is to identify, at a high level, environmental and land use constraints within a particular region of study and energy planning, such as a geographically large transmission zone or grouping of substations. Jared from the CPUC will explain these uses further in his presentation after the CEC staff presentations.

Moving forward, we propose to use the updated Land-Use Screens to inform the land use analysis and the next SB 100 report.

The last point I want to make on this slide is why the energy agencies used Land-Use Screens and electric system planning.

Land-Use Screens are one example of a coordinated approach across state government to strategically plan to achieve the state's multiple goals, including biodiversity, conservation, clean energy, and sustaining agricultural lands. The use of the screens support increased transparency and decision making and early identification of issues or barriers to development, which supports long-term reliability in planning for long lead time investments, such as transmission.

Next slide, please.

Over time, the approaches used by the agencies to Land-Use Screening have evolved to meet the needs of new energy resource planning processes. And I won't be going through each of these boxes, but at a high level they reflect how Land-Use Screens have been used over the years and how they've evolved as new processes have

emerged. There's a full accounting of this in our Draft Staff Report.

So over the years, new datasets have been added to Land-Use Screening, such as information about biodiversity, habitat connectivity, and landscape intactness. And new methods for using this information have been tested, such as using modelling in ArcGIS, which is a mapping software to combine and consider information.

As the methods evolved, the agencies have sought public feedback through workshops and various staff documents to improve the approaches. And within the last 14 months, the CEC has hosted three workshops to discuss Land-Use Screening methods.

And that brings us today. Over the past eight months, staff from the CEC and CPUC have worked with staff from the California Department of Fish and Wildlife, the Department of Conservation, California Department of Food and Agriculture, Department of Water Resources, the United States Department of Agriculture, Natural Resources Conservation Service, the Bureau of Land Management, and the United States Fish and Wildlife Service to review and revise the data

and methods used in Land-Use Screening.

Our updates to the Land-Use Screens aim to improve on past efforts by updating data to capture new information, updating data to reflect new state conservation priorities and climate initiatives, and updating the methods to incorporate the latest agency and stakeholder input. This includes addressing stakeholder feedback to increase the transparency around how the screens are developed.

These updates to Land-Use Screens are part of this year's Integrated Energy Policy Report Update and will be featured in the CEC's forthcoming California energy planning library.

Next slide.

Today, our staff team will share the details behind three proposed Land-Use Screens for onshore wind and utility scale solar for electric system planning. These Land-Use Screens are heavily informed by and build on past screening approaches. They incorporate many of the same datasets, updated where newer information was available from state or federal agencies.

Of the dozens of datasets used in this

analysis, there are four datasets under consideration which haven't been used before and Land-Use Screening. Those are terrestrial, which means on land, climate change resilience data from the California Department of Fish and Wildlife, a terrestrial conserved areas dataset from 30 by 30, greater sage grouse habitat management areas from the Bureau of Land Management, and a dataset that represents distance from a protected area.

You might be wondering why there are three proposed options for Land-Use Screens, and it's because our team proposes to use each screen in a different way to support the state's multiple long-term energy planning processes. Having multiple screens available is consistent with past screening approaches.

For example, the RESOLVE model, which I've mentioned was used in integrated resource planning and the modeling for the 2021 SB 100 report, has included multiple options for Land-Use Screens over the years. Further, the Land-Use Screens used for Buspar mapping have included different datasets than the screens used as an input to capacity expansion modeling.

Having multiple screens available creates optionality. For example, Staff can model pathways to achieving SB 100 under one set of land use assumptions, and then model achieving SB 100 under a more land use constrained set of assumptions, allowing us to compare differences in the resource build out pattern, such as changes in selected technologies or the geographic distribution of selected resources.

The second thing that you'll see in the presentation is a proposed approach to land use evaluation and resource potential estimation for geothermal energy resources.

As I mentioned earlier, this is the first phase of our updates to Land-Use Screens. And for this first phase, we focused on updates to exclusion, biodiversity, cropland, and habitat datasets.

The next phase of the project will evaluate how to incorporate additional important land use considerations, such as local land use policies and ordinances, energy equity and environmental justice, and future water availability. I'll touch on these points more at the end of our presentation.

And finally, CEC staff did not address land use evaluation for other energy technologies that plan to explore in future updates. An example of that would be energy storage.

Okay. Next slide.

Okay, before we dive into the analysis, I think it's important to spend a few minutes describing what this analysis is and what the analysis isn't.

So the models and the Land-Use Screens that you'll see today, they're for use in electric system planning, including SB 100 and integrated resource planning. They're intended to inform a high level estimate of technical renewable resource potential for electric system planning and aren't meant to be used on their own to guide the siting of individual generation projects, nor assess project-level impacts. So, for example, these maps are not intended as a project sighting tool. They help us with statewide analysis.

Now, I'll hand the presentation off to my colleague Travis.

MR. DAVID: Next slide, please. Next slide, please.

Data modeling and screening, especially with spatial data, may be unfamiliar to some. I like to think about it being a lot like cooking.

Let's say I want to make a lasagna. The first thing I need to do is gather the ingredients, for this project, our GIS developers, folks who work with data that has a location component that can be compared with other spatial datasets by layering them on top of each other, like layers of lasagna, the GIS developers, gathered spatial datasets that represent the project study area, the state of California, exclusion areas, lands that were removed from the energy resource planning consideration, and inclusion areas, lands we want to ensure are considered for energy planning.

Combining study area exclusions and inclusions is the screening process. I will describe these categories in more detail later in the presentation.

UNIDENTIFIED MALE: Is your mic on?

MR. DAVID: Yes. I can speak louder.

Next slide, please.

Keeping with the lasagna analogy, after gathering the ingredients, the next step is to

prepare those ingredients, chopping the onions, measuring the amount of salt, mixing the sauce, and putting the whole thing in the oven. Too much salt or overcooking can ruin your hard work. And the same is true for modeling.

The GIS team filtered data, removed everything that's unnecessary, adjusted ranks to be on the same scale of each other, and worked with subject matter experts to ensure our methods were appropriate for each dataset. Then we removed exclusions and added inclusions to the study area to create our results.

The figure in the lower right is our Land-Use Screen 1 process for solar. The blue ovals represent input datasets, study area exclusions and inclusions. The yellow rectangles are changes made. And the green ovals are change data outputs. This modeling approach is great for going back and tweaking methodology, referencing what was done and where everything came from.

Next slide, please.

After the processing phase, we have our results, a delicious lasagna on the left. You could tell I was hungry when I made this

presentation. And areas with renewable resource technical potential on the right. We created three different results for solar, three for onshore wind, and one geothermal. Saffia will discuss our results more later in the presentation.

Next slide.

There were several considerations on what data was chosen and how we worked with it. This is a statewide-scale planning effort requiring our input datasets to be at a statewide scale. Data changes over time; generally it gets better and more detailed. So we plan to assess our methods and data and rerun every two years. Data that goes into this project must have a location component. Much of our methods and source datasets came from previous CEC Land-Use Screens. And time is a factor as we need to have a product in place for upcoming SB 100 modeling and CPUC planning efforts.

Next slide.

We combine datasets that represent categories of exclusions called technoeconomic, things like high population areas, airports, military installations, and modeled resource

potential, California Native American tribal lands, and legally-protected areas, into a dataset called base exclusions. The map on the right shows these base exclusions colored orange. Leaving the white areas called resource potential base map, we further considered for energy resource planning.

Next slide.

Legally-protected areas, a category of base exclusions, is made up of datasets from U.S. Geological Survey's Protected Areas Database, things like National and State Parks, wildlife reserves, and conservation areas, State of California datasets, things like conservation easements, and terrestrial conservation areas, and other protected areas.

Next slide.

We want to ensure some areas are included in energy resource planning. For this report, we included development focus areas and variance process lands from the Desert Renewable Energy Conservation Plan. The DRECP is a plan that streamlines renewable energy development, while conserving desert ecosystems and providing outdoor recreation opportunities. The DRECP is a

collaborative effort between U.S. Bureau of Land Management, California Energy Commission, California Department of Fish and Wildlife, and U.S. Fish and Wildlife Service.

We may learn of other plans, studies or areas designated for Energy Development to include as inclusion areas in future versions of Land-Use Screening.

Next slide.

Resource potential base maps, the study area leftover after base exclusions were removed, determines technical resource potential. Saffia will discuss this later in the presentation.

Next slide.

On top of base exclusions, our team excluded areas of high land suitability for biodiversity, cropland, and landscape intactness and proximity to protected areas. These exclusions underwent modeling processes themselves to make them comparable to each other.

Next slide. Next slide, please.

This is the methodology for developing highly suitable lands for biodiversity. We combined biodiversity and connectivity on a scale of one to five, divided into grid cells at a one

kilometer resolution. The resulting grid was separated into two categories with a threshold of 2.75 for screen one and 2.5 for screens 2 and 3. Areas above that threshold are considered highly suitable for biodiversity areas and excluded from the energy resource planning and the screening process.

Next slide.

A similar approach was used to determine highly suitable lands for crops. First, data from the Soil Survey Geographic Dataset Database, California important farmland, and crop mapping were combined at economy scale at proportions, listed above, and resulted in a gridded area. The areas were divided into two classes using natural breaks (Jenks) classification method. The highest category was considered highly suitable for crops and excluded from the screening process.

Next slide.

The suitability modeling approach was used to determine areas of high landscape intactness and proximity to protected areas. Intactness means how much the land has been disturbed by human development. It was compared

to how far these areas are to legally protected areas. The result was gridded similar to the cropland and biodiversity models. The areas were divided into two category classes using natural breaks (Jenks) classification method. The highest category was considered highly intact and in close proximity to legally protected areas and excluded from the screening process.

Next slide.

More details on our modeling approach and references to the source datasets used is available in our Staff Report.

Now I'll hand it over to Saffia to discuss screening.

MS. HOSSAINZADEH: alright. Thank you, Travis.

To explore other land use planning priorities, CEC staff developed three Land-Use Screens.

Next slide.

In addition to the base exclusions for solar and wind, we further reduced the land footprint available for technical resource potential by applying the high categories of model results as exclusions. This is seen in the

diagram on the right of the slide. Previously, the base exclusions were applied to the raw resource potential to get a reduced land footprint of available areas with technical resource potential.

The base exclusions included characteristics like water features, steep slopes, protected areas, and now we add the Land-Use Screens to these exclusions to come up with a further refinement of the technical resource potential distribution available within the state.

The three CEC models that were explained previously explore unique factors of land use considerations, namely biodiversity of species and their habitats, the cropland value, and landscape and toughness. Each of these models represents the combined results of multiple important factors that informed the land use priority.

The fourth topic of focus for a screen is the ACE climate resilience, the climate -- the ACE climate resilience dataset. This dataset exhibits the likelihood that the region will remain suitable for its current array of plant

and animal life under changing climatic conditions. The future climate conditions used in this analysis to create the climate change resilience dataset represents the two ends of the spectrum of projections for California from an ensemble of climate models.

The areas that are screened out have the highest climate resilience values, meaning they could serve as climate refuges, and climate adaptation strategies would seek to conserve these areas.

Next slide, please.

The first screen comprises the base exclusions and the high category of results of both the CEC biodiversity index model and the CEC cropland index model. For this screen, we partitioned the CEC biodiversity model using a threshold of 2.75 within a model range of 1 to 5. Al land areas less than 2.75 are allowed to be considered for technical resource potential estimates. And all and greater than or equal to 2.75 will be excluded. Staff referred to the partitioned results as areas of higher implication and lower implication.

In this analysis implication is defined

as a possible significance or likely consequence of an action. For example, planning for energy infrastructure development in an area of high higher biodiversity has implications for other land use priorities.

For the cropland index model, we partitioned the results into two categories using a natural breaks (Jenks) classification. The areas where the cropland index value fell into the high implication category have relatively more factors that support high value croplands than those in the lower category.

After removing both the high CEC biodiversity regions, and the high CEC cropland areas, the remaining resource potential for solar is shown in the figure here. It's about 5.32 million acres, or about 650,000 megawatts by using a constant power density conversion factor of 30 megawatts per square kilometer.

For wind, the resource potential is about 25,000 megawatts using a power density factor of 2.7 megawatts per square kilometer.

Next slide, please.

Well, Land-Use Screen 2 is comprised of the base exclusions, the high category results --

the high category of results of both the CEC biodiversity index model and the CEC cropland index model, and the high category results from the CEC antagonists model. In this screen, a slightly lower threshold of 2.5 is used in the CEC biodiversity model to partition the results. The lower threshold increases the amount of land excluded from renewable resource potential consideration as compared to the first.

This more stringent threshold on the biodiversity model, which is used for Land-Use Screens two, as well as three, was chosen to capture more lands with factors that support biodiversity and habitat connectivity. This screen is intended to represent a more land constrained scenario for analysis. So by adding the intactness model results as an additional screen and altering the biodiversity model threshold it produces the resource potential footprint seen in this figure for solar.

The total land area is reduced to 2.61 million acres, or about 320,000 megawatts. For wind, the technical resource potential is about 12,000 megawatts.

Next slide, please.

Land-Use Screen 3 is comprised of the base exclusions, the high category of results from the CEC cropland model, the high category of results with the more stringent threshold for the CC biodiversity model, and the high category results from the from the ACE climate change resilience dataset. The result of merging all of these exclusions results in the resource potential footprint that is seen here in the figure in purple for solar. This identifies about 3.08 million acres of technical potential or about 370,000 megawatts. For wind, there is an estimated 14,000 megawatts.

Next slide, please.

Here you can view the three solar resource potential areas side by side to better compare the results. On the left is the resource potential area in red after applying Land-Use Screen 1. This is the screen with the largest footprint of land with technical resource potential. Solar resource potential is identified throughout much of the state, including concentrations in the West Mojave, the San Joaquin Valley, in the northern Sacramento Valley, and in the northeast corner of the state.

In the middle panel, the red areas show the lands with technical resource potential after applying Land-Use Screen 2. In this more land-constrained screen, the amount of resource potential is reduced. For example, east of the Sierras in Inyo and Mono counties, the resource has been all but removed.

On the right, the red depicts the resource potential area under the Land-Use Screen 3. Most notably, the resource potential in the central coastal counties have been removed, as well as some areas in the northeast corner of the state.

As anticipated the screen results vary in total quantity and geographic distribution of the solar resource potential. Later in the presentation, Erica will describe the staff recommendations for use of each of the screens in the SB 100 analysis.

Next slide, please.

The results for onshore wind are now displayed. The geographic distribution of the onshore wind resource potential shifts considerably across the screens. The resource potential under Land-Use Screen 1 is shown on the

left. All areas of onshore wind resource potential are geographically distributed across much of California. The footprint covers areas across the state.

The resource potential underlying Land-Use Screen 2 in the middle panel is the most land-constrained screen, like in the case for solar. Smaller scattered areas with onshore wind resource potential are identified throughout many counties.

Under Land-Use Screen 3, lands with onshore wind resource potential are reduced along the central coast, while additional areas are identified in the Eastern Sierras.

Next slide, please.

The land use evaluation methods described previously were applied for solar photovoltaic and onshore wind technologies. For geothermal, we use a different method. Instead of starting with the entire state as having resource potential and removing the basic exclusions and Land-Use Screens from it, we began with areas of the state that are known through state and federally-funded research and assessments as having geothermal potential capable of utility-

grade power generation.

The sources for these areas of potential development include the KGRAs, as identified by the Department of Conservation Division of Geologic Energy Management in their 2002 Geothermal Map of California. The geothermal resources identified and assessed in the 2004 report for the Energy Commission by Lovekin, et al, and Geothermics, and geothermal fields that have a proposed BLM geothermal lease associated with them.

And the reason for applying this different methodology is that we require the resource potential estimates to be spatially explicit. And although we can derive heat from the Earth's interior anywhere, there is generally not enough information known about the resource to estimate a generating capacity that would warrant the exploration, confirmation, and development of a power plant. But in most of the KGRAs and other geothermal fields that we considered, there is enough information with sufficient certainty about the geologic conditions to consider it as an area with resource potential for electric system planning.

So after identifying these known geothermal fields, we then filtered these areas by whether they were entirely within a protected area. Partial overlaps are allowed because of the small land use footprint of this technology and the flexibility in the surface placement of the plant and wellheads.

The areas seen here in the figure are the geothermal fields that remain after applying this land use evaluation method on the known geothermal fields. To estimate the generating capacity, we took the most likely value on each of these fields from the 2000 report -- 2004 report for the Energy Commission by Geothermics and Lovekin, et al. And the capacity estimate from Truckhaven was taken from the Environmental Impact Statement reported by the BLM. And then we subtract the capacity already in production in each of these areas to get the undeveloped generating capacity of about 3,000 megawatts for the state.

Now I'll hand it off to Erica Brand to talk about the next steps and using this information provided here.

MS. BRAND: Thank you, Travis and Saffia.

Okay, so in the following section, I will cover how our staff team recommends using the updated Land-Use Screens in future SB 100 analysis, how our proposed Land-Use Screen 1 compares to the most recent screen that was used as an input in SB 100 analysis that informed the 2021 report, our timeline for finalizing the methods, the proposed Land-Use Screens and the Staff Report, and then our next steps in developing methods for the SB 100 land use analysis.

So next slide, please.

In the Draft Staff Report, our team proposes to use Land-Use Screen 1 as the primary screen for estimating resource potential for onshore wind and solar. Of the three proposed screens, this screen identifies more lands with renewable resource technical potential for consideration by the modeling for SB 100.

Land-Use Screens 2 and 3 include additional environmental and land use considerations or constraints and identify less land with renewable resource technical potential. Our team proposes to use one or both screens as a more land use constraint scenario to explore how

the resource build out pattern to achieve SB 100 would differ from the core cases. If we carry over Travis's food analogy, in these scenarios, a capacity expansion model would have a more limited menu from which to select new onshore wind and solar resources.

Next slide, please.

Next, I want to explore some of the differences between the Land-Use Screen used to estimate onshore wind and solar in the last SB 100 analysis. And the screen that we are proposing to use as the primary screen in the next SB 100 analysis. So let me set the stage on both the previous screen and the maps that you see here.

So in the last SP 100 analysis, a screen called DRECP/SJV was used. The acronym stands for Desert Renewable Energy Conservation Plan. And the SJV acronym stands for San Joaquin Valley. This is the same screen that has been used by our colleagues at the CPUC for integrated resource planning since around 2018.

What this screen does is it applies categories one and two, which are exclusions, from the Renewable Energy Transmission

Initiative, or RETI, and focuses on preferred development areas only within the boundaries of the Desert Renewable Energy Conservation Plan and the San Joaquin Valley.

Preferred development areas are defined as the development focus areas from the DRECP and lands that were identified as the least conflict for solar PV in a report titled A Path Forward: Identifying Least Conflict Solar PV Development in California's San Joaquin Valley. Those are the exclusions and then those are the preferred development inclusion areas.

So the map that you see here on the left, both these maps are for solar, the map that you see on the left in purple has solar resource potential that was identified under the DRECP/SJV screen. The map on the right shows, in purple, lands that have the same solar resource potential identified across both screens. So the DRECP/SJV screen and the new proposed Land-Use Screen 1. And in red, we show newly identified solar resource potential under our Land-Use Screen.

So a couple of observations that our staff had from comparing the two screens is that, first, the new Land-Use Screen 1 identifies more

solar resource potential within the San Joaquin Valley, as well as the West Mojave. The screen identifies less solar resource potential in the northern Sacramento Valley, the Modoc plateau, and the Salinas Valley. These results align with public feedback that our agencies have received about areas of commercial interests and projects that are currently in the queue.

And also for context, I want to compare to some of the results from the 2021 SB 100 scenarios.

So in the last SB 100 analysis, the amount of new build utility-scale solar, the modeled land area, ranged from between 487,000 to 612,000 acres across the scenarios. So that can be the amount of land needed for new utility scale solar generation. Under Land-Use Screen 1, we identify approximately eight times that modeled land area requirements. We want to offer the model enough flexibility to be able to select resources from different areas of the state.

Next slide, please.

This slide compares the two screens and the renewable resource technical potential that's identified for onshore wind. This is terrestrial

wind. Similar colors scheme. On the left, wind resource potential from the DRECP/SJV screen. On the right, purple is renewable resource technical potential identified across both screens, and red our lands with newly identified resource potential under our screen.

Our team had several observations when comparing these screens. The first is that the proposed Land-Use Screen 1 identifies fewer large areas with wind resource potential and identifies more distributed potential across the state.

For context, in the 2021 SB 100 scenarios the new build utility-scale onshore wind modeled land area requirements ranged from 173,000 to around 209,000 acres. The resource potential under Land-Use Screen 1 identifies approximately 11 times this much modeled land area with wind resource potential.

Next slide, please.

I wanted to revisit the timeline for finalizing the Land-Use Screen and the Staff Report, this first update.

We are, today, at the workshop. Last Wednesday, our Draft Staff Report was noticed on October 5th. And November 1st is the public

comment deadline. We aim to release the final Staff Report in January 2023. And it will be considered at a February 2023 business meeting, along with this year's IEPR update.

Next slide.

As I mentioned earlier, this is our first phase of updates to the Land-Use Screens, so focusing on exclusion, biodiversity, croplands.

An important next step for our team is to conduct broader public outreach to engage other stakeholders and interested persons and organization in updates to the Land-Use Screens and the land use evaluation for the next SB 100 report. We anticipate this engagement will be conducted through a combination of workshops and webinars, and through targeted meetings with local governments and tribes.

After completing the first phase of updates of Land-Use Screens, our team will begin further developing the methods for land use evaluation for the next SB 100 analysis.

The 2021 SB 100 report included several recommendations for further analysis, including two that were specific to land use. The first recommendation was to analyze the projected land

use impacts of scenarios and opportunities to reduce environmental impacts. And the second recommendation was to define and include social costs and non-energy benefits and future analyses of which land use impacts were identified as one.

So finally, through feedback we've received on the last SB 100 report, and from outreach to update the Land-Use Screens, we've heard two other important topics that our staff team would like to explore as we develop methods for the land use analysis to support the next SB 100 reports.

So the first is how should future groundwater availability be considered in the SB 100 land use analysis?

And the second is how should the land use evaluation explore the energy equity and environmental justice implications of renewable and zero carbon build out patterns?

Next slide, please.

Alright. Thank you all so much for your time and attention. So this concludes our staff presentation.

Next, I'm going to hand it off to my colleague Travis, who will provide a

demonstration of the draft Land-Use Screens web mapping application. This web application provides an interface where the public can interact with, examine, and explore the preliminary data from the draft report.

VICE CHAIR GUNDA: Erica, just a quick question.

MS. BRAND: Yes.

VICE CHAIR GUNDA: First of all, that was an amazing presentation.

Just looking that we are a few minutes ahead of time, could we -- are you okay with taking a few questions from the dais?

MS. BRAND: Sure.

VICE CHAIR GUNDA: Okay.

COMMISSIONER VACCARO: Great. Thank you.

Well, again, I echo the compliments on the presentation. It's not always easy to talk about data, datasets, modeling, and do it in such a clear way. So just thanks to the team for the effort that you took there to make it understandable to anyone, especially people who don't do this type of work.

So I just had a couple of questions, and another observation, which is, first of all,

thank you so much for the introductory screen. That really level-set on intended use. I think that's really important and something that we need to continue to underscore in the outreach and engagement as we talk about what this means and what it doesn't mean at a very specific project level. So really, thank you for that, that foresight there.

I had a question. This is really more about the geothermal. It was kind of interested, you know, as I was looking at the maps. And if you could talk a little bit about which KGRAs are identified in the map, as you get to Southern California? I'm presuming part of that is the Salton Sea KGRA, but I really couldn't tell. And it seems like it identified about 1,400 or so megawatts, roughly speaking.

And so I just was curious, is that multiple KGRA's? Is that really just the Salton Sea KGRA? And if you could just sort of talk that through just a little bit, if you're comfortable doing that now? And if you want to save it to later, that's fine as well.

MS. HOSSAINZADEH: Yeah. Sure. I could talk a little bit about that now. Yeah.

If we go back to that slide in that figure, there's a cluster of geothermal fields in the Imperial County. And, yeah, the main one, which has like I think 1,476 undeveloped megawatts there, that is from the Salton Sea KGRA, what's labeled as the Salton Sea. Yeah. Yeah. Yeah, let me --

COMMISSIONER VACCARO: Do you want to save that or come back with answers to that? Not trying to put you on the spot, I was just curious.

MS. HOSSAINZADEH: Yeah. The other -- so as you go kind of like clockwise around those polygons there, there's a little tiny sliver that's called the North Brawley Geothermal Field, and then there's the East Brawley Geothermal Field, and then East Mesa, and then Heber, and then South Brawley, And then Truckhaven. Truckhaven is the 50 megawatts to the southwest of Salton Sea, or maybe to the west. Yeah, there are a few other geothermal fields, actually, east of East Brawley and East Mesa that got excluded due to the protected areas screen.

MR. DAVID: I should add that a public-facing web mapping application that we've

developed will allow you to zoom into those areas and click on them and determine their name.

COMMISSIONER VACCARO: Yeah. Thank you. That's really helpful. Just, again, this is an example of how work we do on one area interfaces with other. So there's a lot of effort, as many of you know, in terms of Lithium Valley development, there's a vision for that and a lot of work being done by the Blue Ribbon Commission on Lithium Extraction in California.

And so I think people there will be interested to use the tool -- I know you're going to take us through it, Travis in a minute -- but to kind of see what that means too. I feel like there's good information here that's also useful for that work that we're doing and another area.

And then I just had one final question for you, Erica, which is related to the phase two work that you're talking about. I'm not sure if I caught kind of the projected timeline for when phase two begins or if that's going to be parallel work.

MS. BRAND: So my goal is to really start kicking off that work before the end of this year, so that we can work through and develop the

methods to be aligned with the next SB 100 analysis which, based on my current timeline, has us wanting to have proposed methods by around this time next year, so around fall, so --

COMMISSIONER VACCARO: Thank you all for letting me ask the question, so --

MS. BRAND: Yeah.

VICE CHAIR GUNDA: I just wanted to make sure, Commissioner Rechtschaffen raised his hand, And I see his audio is connecting. But while we wait for him, can I just ask one quick question? I'm going to look at Heather. When she says cut off, I'll turn it off.

So you mentioned, Erica, on the Screen 1, we have approximately 11 times the wind potential, is what you mentioned. My recollection on the SB 100, we had about 10 gigs of onshore wind. And one of the screens said it's 25 gigs of wind is the potential. I just wanted to kind of -- is it because you're accounting for better energy densities or --

MS. BRAND: I think the numbers that I presented were for California onshore wind, and so I wasn't thinking about contribution of Western. That might be one difference there.

VICE CHAIR GUNDA: Commissioner Rechtschaffen, did you did you have a question?

Alright, we'll pass it back to you.

MR. DAVID: Making sure that I have control. Okay. Alright.

So now that we've discussed our screens, we want to make them available to everyone so that we can get some feedback and talk about revising them.

This web mapping application is available through a web browser, and you can find the link to it through the workshop docket log. It's in a docket called Land-Use Screens for Electric System Planning Web Mapping application. And on that docket, you can scroll down and get a link that brings you right here to the application that you can see.

And it's very simple, where we have the results of our modeling efforts loaded onto this web map. On the left hand side of the screen, it shows what layer is currently active. By default, only the Screen 1 solar resource potential is active. But if you look over on the right hand side of the screen, there's a layer list of three categories of data. You can expand

these categories. And the data that's on here is an existing electric transmission infrastructure, substations and transmission lines, proposed resource potential areas, which are the three solar screen -- the three solar resource potential screens, and the three onshore wind resource potential screens.

And then there's the resource potential base maps where you get the resource potential base map for solar, wind and geothermal. And you can toggle on and off these by clicking on the "i" symbol next to it that says, "Show layer" and I can show the resource potential base map information in relation to the screens. And then it shows what is active on the left hand side in the legend.

You can scroll around in the map. You can zoom in and out. There's buttons, like the plus sign and the minus sign, it shows you how to do that. If you zoom in too much the layers will disappear as this is a statewide scale and the data is not meant for the local level. We made it so that it disappears after you zoom in too far.

If you're interested on what a dataset --

what went into a dataset in the layer list, you can click on the "i" symbol to the right, the details, and that brings you to a page that talks about all of the datasets that went into it, what methodology there was, and then depending on who has access, so because we're developers, we have direct access, so we have more tool options here than other people would see, just by viewing.

Go back, please.

Well, in the application, it's designed -- it knows what screen size you're viewing it on, and it's actually configured. So if you're viewing it on a tablet or a phone, it will be streamlined for that interface, too.

And that's all I really wanted to talk about with the screening app.

VICE CHAIR GUNDA: Just a question.

So just connecting, you know, next steps in terms of local engagement and stuff, if a certain local authority wanted to kind of, you know, understand how much technical potential we have laid in, in their county, you know, you could quickly pulled it out from here?

MR. DAVID: You could view the resource potential in that county. We made it so that

that data isn't downloadable at this point. But we could make it so that they could download the data and look at it in relation to their infrastructure, things like that.

Right now it's just a polygon, so we could go farther and divide that polygon by different units of measure, like counties, and then calculate acreage, calculate areas, we could do things like that. But you could estimate areas using the application.

And one of the tools that's on the mapping feature is a measuring tool, do you can measure distances. So you can toggle on energy electric infrastructure, like substations and transmission lines, measure the distance between like a substation of interest and one of the potential areas, figure out how far away it was, and then you could draw polygons around an area and figure out what size polygon you draw, as well.

VICE CHAIR GUNDA: Well, just one of piece.

We currently have, also, information on existing areas that were already developed,

MR. DAVID: Existing area of what?

VICE CHAIR GUNDA: Areas that have already been developed.

MR. DAVID: Oh, developed. Yes, there's datasets. That would be in technical.

MS. BRAND: Oh, in terms of energy projects that have already been developed?

So I know that the CEC has some datasets for solar footprints but I don't know the year that they go through, so that might be something that our team could potentially update in the future. That might be an interesting overlay.

MR. DAVID: We do have power plant data, so we know where existing power plants larger than one megawatt are in California that could be added to the application.

VICE CHAIR GUNDA: Yeah, it may be helpful. And kind of two questions pop out for me is like, as you think about the resource potential, what has already been developed would be a good thing to know. And also, second thing, when you talked about the DRECP versus this, we've isolated regions that are new, right, in red, and then areas that are, you know, together, which is blue, but then which areas did we drop, right, would be also helpful, and to just talk

about why we dropped them or like how things are evolving, so --

MS. BRAND: And for those that are interested in the Staff Report, we have several figures that compare counties in terms of technical resource potential. So we do have a breakdown of some of that information in the Staff Report.

DR. ROTH: So another -- a couple -- there's probably a small family of questions for you.

First, congratulations on explaining some very dense material. And I say that being a person that does it on a regular basis, that it's really hard to do and I think you've done a very nice -- a very good job with that.

One of the realities of modeling is that modeling is never perfect. You're always missing something that you're interested in. And your data is rarely as good as you would like it to be.

Were there any really significant gaps in the data or the subject areas that you were able to approach that you think would be targets for next sets of improvements to the efforts?

MR. DAVID: I feel that the categories of information that we chose, I mean, could always be enriched with alternative datasets, but we/I stand by our decisions by the datasets that are currently in there but there could always be additions to it, and there could be additional categories.

I know it's a big day for equity right now. And I think that there could like potentially be like an equity screen that's added or something like that. That was my feeling on it.

MS. BRAND: I would add the information about future groundwater availability. I think that that is going to be an important consideration in thinking through a number of agricultural-related datasets. Moving forward, I'd say that's the gap right now.

And then one that we've discussed before is our model is focused on cropland, so lands used to produce crops, and it does not include grazing lands, for example. There's some other things that fit under the broader umbrella of agriculture that are not included in the model at this time.

DR. ROTH: Thank you very much.

VICE CHAIR GUNDA: Thank you.

I think, Saffia, did you have something you want to add?

MS. HOSSAINZADEH: Erica basically said it.

VICE CHAIR GUNDA: Oh, yeah.

MS. HOSSAINZADEH: So, yeah.

VICE CHAIR GUNDA: Awesome. Thank you.

Alright, with that, we could move to the next agenda item.

MS. BRAND: Okay. Great. So I'm really excited to introduce our colleague from the California Public Utilities Commission, Jared Ferguson, a Regulatory Analyst on their Integrated Resource Planning Ream. And we worked in close partnership with Jared and his colleagues on developing this proposal. And Jared is going to share more with us today about how Land-Use Screens are used in the CPUC's integrated resource planning.

Thanks for being here, Jared.

MR. FERGUSON: Thanks, Erica. And thanks for inviting me to present this workshop today.

As Erica said, I'm an analyst with the

Integrated Resource Planning Team in the Energy Division at the CPUC. And I'm going to talk about the role of land use and environmental screens within integrated resource planning activities.

Next slide, please.

So I'll give a brief refresher for everyone on what is integrated resource planning and how it interacts with the various processes within the larger electric planning ecosystem.

I'll talk about the most recent products developed by the IRP, the preferred system plan, and the portfolio transmitted to the ISO for the current transmission planning process. Both are products that utilize Land-Use Screen data and which are done in collaboration with the CEC. I'll go into more detail about how we use land use currently in those two processes. And then finally, I'll talk about our staff plans to incorporate these proposed new Land-Use Screens into our future work.

Next slide, please.

Established by SB 350 in 2015, IRP is meant to guide the electric sector resource planning and help the state achieve its

greenhouse gas production goals at least cost and while maintaining system reliability. We do that by looking across the boundaries of the individual load serving entities, or LSEs, towards looking towards the whole electricity system. The goal is to identify resource after optimization opportunities and identify issues that may not be apparent when looking at things on an LSE-by-LSE level.

The goal of the just-started 2022-2023 IRP cycle is ensure that the electric sector is on track between now and 2035 towards achieving the deep midcentury decarbonization goals of SB 100.

And a typical IRP planning cycle is broken down into roughly two halves. The first half, which is led by the Commission and its staff is where the CPUC identifies an optimal portfolio for meeting the state policy objectives objective and then set requirements for the LSEs to plan towards. We give the 40-plus LSEs clear filing requirements and a due date to describe how they will meet their individual GHG targets through an optimal mix of new and existing resources while achieving the reliability and

other metrics that we set.

In the second half of the cycle, that starts after LSEs have submitted their plans to us. The CPUC collects and aggregates those portfolios and compares them to the electric system that would result from there. We then compare their -- we aggregate them and compare that electric system that would result from their planning to the previously identified more optimal system that we had developed in the first half.

We use that work to eventually adopt a final preferred resource portfolio through a commission decision that goes into effect for use in planning and procurement.

Next slide, please.

This is an often used slide by IRP staff that just shows how IRP fits into that broader electric sector planning ecosystem. There's a lot on this slide, so I'm not going to go into too much detail, but I just added it here to really show the scale of the interagency coordination and the dependencies that the various processes have on each other, both at the CPUC, but also at the CEC and the Cal ISO.

IRP itself relies on the higher level policy guidance provided by the Air Resources Board Scoping Plan and the Joint Agency's SB 100 work. It also relies on the CEC's Integrated Energy Policy Report for demand forecasts and scenarios, as well as for key cost inputs.

IRP then feeds into the Cal ISO's transmission planning processes and into the LSE's planning themselves and their procurement orders, when necessary.

It's, as I said, it's a complicated web with lots of arrows pointing every which way, but it works to ensure that the state agencies and market actors are moving together in the same direction so that our generation and transmission system is on track to meet our climate goals while maintaining reliability and affordability.

Next slide.

So the CPUC adopted the 2021 Preferred System Plan, that's sort of the final part of the two-part IRP planning cycle. CPUC adopted the first Preferred System Plan in 2021 -- or sorry, the 2021 Preferred System Plan in February of this year. That decision lowered the greenhouse gas target to 38 million metric tons by 2030.

The plan also required LSEs to submit their own plan for the upcoming -- or the current IRP cycle, the 2020-2023 cycle, detailing how they will meet their own share of that 38 million metric ton target.

The decision also required LSEs to make plans for a more stringent 30 MMT target by 2020 30. And just for reference, because the CPUC asked ISO to plan out to 2035, those two targets are roughly 30 MMT by 2035 and 25 MMT by 2035.

The PSP decision also included the PSP portfolio, that optimal amalgamation of all the IRP plans and additional CPUC modeling. And this portfolio had over 25 gigawatts of new supply-side renewable resources and 15 gigawatts of new storage and demand response resources by 2032. And I have here just a figure that shows that that projected new resource need out to 2032 by year, and then a table summarizing the various resources by resource type.

Next slide, please.

So that PSP portfolio was transmitted to the ISO for use in the 2020-2023 transmission planning process as the base case portfolio. So the TPP is the ISO's annual transmission study

which traditionally analyzes transmission needs on a ten-year time horizon to assess future reliability, economic, and policy-driven transmission needs.

The base case portfolio that the CPUC transmits each year is utilized by the ISO to identify transmission solutions that then go before the ISO Board of Governors for approval.

The CPUC also will transmit sensitivity portfolios and for this TPP the CPUC transmitted one sensitivity portfolio. And sensitivity portfolios are intended to provide additional transmission information on certain key issues that are important for identifying transmission needs for various policy goals. And historically, the transmission solutions that have been identified by these sensitivity portfolios have not gone before the Board of Governors for approval.

And the sensitivity portfolio that we passed to the ISO this cycle focused on the more stringent 30 million metric tons greenhouse gas target by 2030, and utilize a higher load scenario, the additional transportation electrification grid planning scenario developed

by the CEC as part of its 2021 IEPR.

Finally, the portfolio --

(Mr. Ferguson's Zoom audio fails)

MR. FERGUSON: So the table and chart here show the resource build comparisons between the two TPP portfolios. On the left is the table by resource type and for the 2032 study of the base case, and then the 2035 study year of the activity. And then to the right is the chart showing the same thing.

The sensitivity, as you can clearly see, has more than doubled the resources being studied in the base case, and has additionally significant amounts of geothermal out-of-state wing an offshore wind, all long lead time resources with significant transmission development questions.

Next slide, please.

So the development of the IRP resource portfolios that I just discussed and their preparation for transmittal to the ISO are the two key areas in which the CPUC utilizes land use analysis. In first case, the development of the portfolios themselves, IRP staff utilizes the RESOLVE capacity expansion model that Erica had

referenced earlier to support the development of the portfolios. We use it to create an optimal least cost portfolio that informs what types of resources and how many are needed within specific time horizons.

Land-Use Screens serve as an input into the result model to help determine the magnitude and location of resource potentials that the model can then optimize amongst.

The second and probably more intensive implementation of Land-Use Screens is in the preparation of the portfolios to be transmitted to the ISO. The IRP resource portfolios consist of geographically coarse amounts of resources. But to be studied in the TPP, the ISO needs those resources at a busbar or substation level of granularity. Thus, the resource for mapping is the process by which a Working Group comprised of CPUC, CEC, and ISO staff map the higher-level resources that have been selected in the portfolios to those specific busbars or substations.

The mapping process follows a methodology, which has been publicly vetted by stakeholders, and relies on a variety of criteria

to identify optimal locations for those resources. And this criteria naturally includes land use analysis. I'll go into more details about both of these points of use next.

Next slide, please. I think you skipped two slides. Thank you.

IRP and RESOLVE models themselves have a broad array of inputs and assumptions. These assumptions include resource potentials for various renewable resources across both California, but also the wider west. And we rely on the Land-Use Screens to help establish those resource potentials.

The inputs and assumptions for IRP and the result model were last developed at the start of the previous IRP cycle, sorry, not current, we've just started a new one, the previous IRP cycle back in 2019. Since they were developed, we have had some updates for resource costs and updated information on transmission limits, but we have not updated the resource potentials.

With the start of the new IRP cycle, staff are working on an update on the inputs and assumptions (I&A). This effort was kicked off this past September, a month ago, with a modeling

Advisory Group workshop. And part of these updates that we're doing for the I&A will include an overhaul of the resource potentials in the RESOLVE Model resource areas. And for that work, the CPUC staff are planning to utilize the new CEC Land-Use Screens that are being developed.

Next slide.

So this map and table here on the right illustrates how Land-Use Screens are incorporated into RESOLVE resource potentials currently. The current Land-Use Screens that we use were developed and implemented with CEC staff collaboration back, starting in 2016, as Erica noted, or even 2015.

The technical potentials of the resources which account, as Erica was explaining, how the resources -- which resources can physically be built in an area are filtered through a set of environmental screens. And RESOLVE has the options to have multiple resource potentials to choose between.

And for the PSP portfolio and the recent TPP portfolios that I've shared, the environmental screens utilized are the exclusion of the renewable energy transmission initiative,

category one and two land. And then also for the two specific study areas that have been discussed, the Desert Renewable Energy Conservation Plan and the San Joaquin Valley Solar Assessment, we included only those specifically identified development areas and the two regions.

And so the map on the top left is an example of the resource potentials that we have for solar resources.

Now for RESOLVE, which is a zonal model, so it has some coarse geographic granularity, and so to potentially bend the resource potential statewide into RESOLVE areas, we are guided by the ISO's 2019 transmission zones, which are mapped on the right. So, basically, we overlay the resource potential and the transmission zones to identify key resolved resource areas. And those -- a few examples of those are shown in the table on the bottom with their corresponding megawatt solar potentials that are currently in the RESOLVE model.

For the updates to the resource potentials that we are planning, as I said, we're planning use the new Land-Use Screens to obtain

the resource potentials, but then we are also going to be overhauling the resource areas themselves to account for the new ISO transmission constraints that the ISO has updated. So the combination of the new Land-Use Screens and the new transmission constraints will be utilized to create the new resource potentials.

Next slide.

The second use of Land-Use Screens occurs during the busbar mapping effort. As noted, it's a joint effort by CPUC, CEC, and ISO staff utilizing an established methodology. In busbar mapping, the Working Group seeks to optimize maps' resources alignment with the following five criteria. An economical distance to a substation of appropriate voltage. The availability of existing transmission capability or cost effective transmission upgrades. The goal for three is to limit potential land use and environmental impacts. Four is to optimize alignment with existing commercial development interests. And the fifth one is to have consistency with the prior years TPPs base case portfolio mapping.

The role of Land-Use Screens is primarily criteria three, but also highlighted is criteria one, that distance to substations because land use analysis also affects that screen, as well.

I will note that those screens are predominantly, particularly the environmental screens, are for solar, wind and geothermal. We have some additional separate screens for battery storage including prioritizing mapping to air quality nonattainment areas and aligning the location of standalone storage with retiring gas plants.

In this mapping effort that we conduct each year, that ISO staff provide the transmission constraints capability limits and upgrade information and provide guidance on the transmission implications of the mapping, while the CEC staff compile and conduct the land use analysis that goes into criteria one and criteria three. And we currently use an array of datasets. The current datasets we're using are listed in that table to the right, which are a combination of CEC-developed datasets, and then Department of Fish and Wildlife Areas of Conservation Emphasis datasets.

And then the top map just shows a depiction of the completed mapping results of the recent 2020-23 TPP base-case portfolio. The map has the resources by substation location, while the chart shows chose the map resources broken down into broad resource areas.

Next slide, please.

So now I'm going to focus on a little more detail on how the current Land-Use Screens are applied specifically to that criteria three analysis.

In the criteria three analysis, the Land-Use datasets are applied at a substation level, overlaying them on the resource potential used in RESOLVE. We then focus on resources that are within an economical distance from existing and proposed substations.

And we split that criteria three analysis into two parts. In the first part, we utilize an environmental implications layer developed by the CEC which combines the intactness biodiversity and connectivity datasets that were listed in the table on the previous slide. It is normalized into a single layer and splits resource potentials into higher or lower potential

environmental impact implications.

The figure at the top right of this slide shows that criteria three, part A analysis for solar resource potential at the Kramer Substation in Northwest San Bernardino County. In this figure, the red and yellow colored areas are the available solar resource potential areas. The noncolored areas are -- and the hashed out areas are locations that have been screened out through that original technote economic limitations, and through the Land-Use Screens applied in the development of the resource potentials for results. So that's how you see like Edwards Air Force Base is not included. And also there's Areas of Critical Environmental Concern that been excluded through BLM data.

The red colored areas that are the resource potential available areas indicate areas of high possible environmental implications, while the yellow indicates the lower potential environmental implications. The two circles centered around the substation indicate the area that's within 10 and 20 miles of the substation, those circles factored into that economical distance from the substation. We prioritized

looking at land within ten miles. And if there's not enough for high environmental concerns, we expand out to 20 miles. And for solar, in particular, we don't look beyond 20 miles for other resources. When there are geothermal that are in more fixed locations, we have different distance requirements.

And so with this analysis, we -- the Working Group seeks to avoid mapping the amount -- an amount of solar that would utilize more than a fixed percentage of the lower potential application area. So for this Kramer location, there is actually very little low environmental implication in that ten mile radius, so we would try to either map only a small amount of megawatts or, if we're going to decide to map a larger amount of megawatts, we would say that we would likely have to map it further away from -- it would likely have to be built further away from the substation if it were to develop.

The second part of the criteria analysis for three, part B, assesses the impacts from each dataset individually. So for part A was this amalgamation layer of three datasets. In part B,

we're looking at the datasets individually. Each dataset is overlaid on the resource potential around the substation to assess what percentage of that resource potential is in an area of high impact for that specific dataset.

And the bottom table here shows that analysis again, for the Kramer Substation for solar resources. You can see for Kramer, a large percentage of that resource potential area within that ten mile sphere is and -- does have high potential impacts for within the biodiversity dataset, as well as the rare terrestrial species habitat dataset. So this information also factors into how much the Working Group would decide to then map to the substation.

Next slide, please.

So that was an overview of how Land-Use Screens are currently utilized in an IRP. And so on this slide, I'm just going to summarize sort of how the CPUC staff plan to utilize the new proposed screen in, basically, a very similar manner.

As I noted earlier, CPUC staff are currently updating the inputs and assumptions for IRP. And staff plan to use the Land-Use Screens

to develop the new resource potentials for solar, wind, and geothermal within California.

We kicked off the I&A update last month and are expecting to wrap up the document, I&A document, developed either by the end of 2022 or early 2023.

On the busbar mapping side, busbar mapping for the upcoming '23-24 TPP is already underway currently. And so we are using existing Land-Use information that I just presented. CPUC staff plan to work with CEC staff through the busbar mapping workgroup to incorporate the new Land-Use Screens and do busbar mapping for the following 2024-2025 TPP cycle.

For that, we are still considering how to overhaul the Land-Use analysis and busbar mapping to best utilize the new screens. That but our mapping methodology update will likely begin in Q2 or Q3 of next year, after we've completed that and transmitted the 2324 TPP portfolios. And for through that busbar mapping methodology development process, we would be seeking stakeholder review and feedback of any methodology update.

I'll wrap up my presentation there. And

thanks to the Committee and this workshop, very much, for having me.

MS. BRAND: Thank you so much, Jared.

I think we have time now on the agenda for questions from the dais if there are any remaining to our, CEC staff, presentation or Jared's presentation.

VICE CHAIR GUNDA: Yeah, we'll jump into it. Thank you, Jared.

I just want to say, Erica, thank you for setting the stage at the top of those excellent presentations.

I liked the lasagna analogy, Travis. That was really helpful.

And Saffia and Jared, thank you for all the presentations.

So maybe I just want to ask a couple of questions to Jared, and then we can kind of circle back.

Jared, on kind of the timing for the current IRP process, the '22-23 was completed; right? So the '23-24, when will it be completed?

MR. FERGUSON: So the ruling for the '23-24 TPP portfolios went out on Friday. And we need to -- the CPUC needs to transmit those

portfolios to the ISO in early February. That's to keep in line with the ISO's planning. So the February 2023 is when the portfolios will be transmitted to the ISO for the '23-24 TPP.

VICE CHAIR GUNDA: Got it. Thank you.

My other question, on the sensitivity study that we -- the CPUC has conducted, you know, is the 30 million metric tons by 2035, in alignment with the new newly mandated 90 percent by 2035?

MR. FERGUSON: So it's, yes, it's -- so 30 MMT by 2030 which -- because that's the traditional standard and it's -- so 20 to 25, I believe, by 2035. And it's in RESOLVE.

The RESOLVE, when RESOLVE calculate it, by 2035, it meets the 100 percent SB 100 renewable or clean or GHG target. So according to the results model, we are at 100 percent in that sensitivity portfolio by 2035.

VICE CHAIR GUNDA: So what was the million metric tons for 2035?

MR. FERGUSON: 25 MMT.

VICE CHAIR GUNDA: Did you have any questions?

COMMISSIONER VACCARO: No, I don't have a

question, but I had a just a comment.

I just wanted to recognize, Jared, the importance of your presentation. Because what it did, I think, is connect some really important dots. It's not always clear how the relationship among the CEC, the PUC and the CAISO works in this space. I think you laid it out very nicely and very clearly.

And I think it's really important because it dovetails. I mean, there's really a relationship between what you're talking about and the Land-Use Screens. It could have started with yours and then then the other one behind it. But I think the two together today are really important because they work together so closely. And it really is a pretty significant change that we're looking at with the recommendations that are made in the Land-Use Screens. So the refresh, I think, is the way that I that I look at it. So thank you for connecting those dots so clearly.

VICE CHAIR GUNDA: So I have a couple of questions that I'm going to just jump in.

Jared, for you, just on the Land-Use Screens usage, you know, you kind of divided them

into two key piece, right, the capacity expansion and the busbar mapping. Is the busbar mapping done like post analysis? Is that a way to like circle back or no?

MR. FERGUSON: So it is done. So we get a RESOLVE portfolio, which is within the sensitive, it's 49 -- or 40 gigawatts of solar. And then we take that RESOLVE portfolio and then map it to individual substations after the fact.

RESOLVE, it's a zonal model, so doesn't have that geographic granularity. It has some. So in RESOLVE, the solar is basically in nine areas, so you have -- and they're fairly large. So you have Northern California solar, which is everything north of, basically, looks Los Banos and that central -- like, basically, you have the San Joaquin Valley, and then Northern California solar is everything north of it. So it's fairly large geographic areas for RESOLVE resources.

And the main reason you can't get more geographically smaller is runtime for the model. So the more locational resources you add into RESOLVE, the longer it takes to run RESOLVE. And so that's the main balancing act that we have with the RESOLVE model. And how location-

specific we can get in it is how long it takes to produce those model results.

VICE CHAIR GUNDA: Last question. So once we do the busbar mapping and stuff, like at what part -- at what step is the local reliability study done?

MR. FERGUSON: So that is done -- the ISO conducts LCR studies each year. And it's not quite in sync with the TPP but it's sort of at the same timing as the TPP. So the ISO is conducting those like, basically, right now for the current '20-23 TPP. And the results are released on a similar timing, as well.

VICE CHAIR GUNDA: And are they utilized in the IRP at some point?

MR. FERGUSON: So we do incorporate them into the mapping efforts, particularly of battery storage in those load constrained areas and those local reliability areas. Basically, the ISO has estimates on how much battery storage can be put into those areas without needing additional transmission or additional generation within those specific area. So that information on those areas is incorporated into the platform mapping process.

VICE CHAIR GUNDA: Thanks, Jared. Just one question on the mapping side, specifically that 2.75 number that you mentioned in terms of the impact and using that as a cutoff, could you just speak to how that is decided?

MS. HOSSAINZADEH: Sure. So for that threshold for the CEC biodiversity model, we basically wanted to try to minimize the impact. We wanted to minimize the inclusion of the high connectivity and high terrestrial biodiversity ranks, so in the input data layers to those models. So we -- it was a very manual identification process. We just played around with the thresholds and saw what would give us the most area with minimal impact to the minimal inclusion of those high ranking biodiversity and connectivity areas.

And the 2.5 was actually -- that included zero land area that had a connectivity rank of four or five. So for the top 40 percent of the land area in California with -- well, actually, sorry, like the four and five connectivity ranks actually have specific meanings in that dataset. So those were considered, though, the highest in terms of like for linkage corridors for habitats

and species. So we excluded all of those areas of consideration by using the model threshold of 2.5.

VICE CHAIR GUNDA: Thank you, Saffia.

And just one last question to Erica. Maybe you could take a shot at this one. Just in terms of the changing climate goals and conservation goals of the state, you know, like, you know, as we develop these, these are snapshots in time, how do you recommend that we, you know, develop analysis that, you know, in the next SB 100 report that doesn't get stale too fast? You know, when you mentioned like potential sensitivities are kind of duplicate, if you could comment on that, that would be really helpful.

MS. BRAND: Yeah, happy to. It's definitely a challenge that we face in working with data. In the Staff Report, we propose to update the information that forms the Land-Use Screens every two years.

I think there would be the opportunity for ad hoc updates if important datasets came out, but our electric system is undergoing rapid transformation. Climate change is driving a lot

of change on the ground in terms of land use. And so we're just going to have to do our best to stay on top of all the new information that's coming about how natural resources, agricultural resources, that information is changing over the next decades.

VICE CHAIR GUNDA: Thank you. Again, thank you so much, the four of you, wonderful presentations. A lot to think and digest, so look forward to continuing our conversations.

And, Jared, particularly, thank you for helping develop the collaboration from the PUC side and working together really well. Thank you.

Back to Heather.

MS. RAITT: Thanks. Thanks, Commissioner.

So we are a little bit ahead of schedule, so we have some questions from the zoom Q&A and I thought maybe we could go over them now, and then -- rather than waiting till after the panel.

MR. COLVIN: (Off mic.)

MS. RAITT: So, sure. Yeah. Did you want to go ahead and ask a question that you have put in.

MR. COLVIN: Good afternoon, everyone. Michael Colvin of Environmental Defense Fund. And thanks for letting me take the mic for a second, Heather. I really appreciate it.

First of all, again, just incredible presentation system of this. It's just -- it's complex and you distilled it down to something that I can understand, so very well.

I guess I have two -- I have a question and an observation.

The observation is the presentations seemed to be focused on the California Land sets that we have, but the Energy Commission also has a pretty big investment happening on offshore wind. And I think it's completely fine. They are totally different sets of questions or requirements.

But I just sort of note that we are trying to develop a whole other set, sort of at the same time, and I would love to hear, as part of the next update, of sort of how do we integrate and do the same types of analysis of, well, what is available near transmission, what is available that makes sense for developing that resource with the recently adopted goals that are

out there? It's going to be trick just to try and get some parallel treatments. I was reading through this and saying, well, I get to this land use and not offshore wind use, but sort of like liquid land, like how do we do this in such a way that works?

The second thing, and I'm really excited to dig into the actual mapping itself, and I'm really excited with how easy user friendly, you've made it, the observation that I think that I would make is that not all land that can be developed on will be developed on and will be suitable. And so just sort of thinking through, for when we get into the IRP process, there's going to be a shrink down from developable land and suitable land, and how do we sort of recognize that not everything is going to be there?

We just have to have an assumption to start with of not every single square area is going to be able to be developed on that makes sense. So what's our basic assumption of, you know, a failure rate, for lack of a better word? We do that in contracting all the time for procurement planning. And I think having that

type of an assumption figured out and knowing where the sensitivities are, so we want one universal assumption or do we want something that is, in the sensitivity areas, it's a higher failure rate or lower? I think that would be a really important place to just have a little bit more conversation.

But, again, thank you all so much for just really great work. I'm very excited.

MS. BRAND: I'll be happy to -- should I go ahead and respond to the first question about offshore wind?

Yes, ocean use analysis is critical, in addition to land use analysis. And under AB 525, we have colleagues that are working on a sea space identification process pursuant to that. And I could see a future where we are able to have the offshore information and the onshore information that informs our long-term energy planning.

I don't know if anyone else in the panel would like to offer any thoughts, or Commissioner?

COMMISSIONER VACCARO: Yeah. Thank you for that great question about offshore wind

energy development. Erica, you're spot on. The sea space identification work is really going to be an important facet.

But another really important aspect of the Assembly Bill 525 work is really looking at the transmission needs, right, and the transmission sort of opportunities and challenges. And I think those two things together, as we do that work, we just had a workshop on the 6th sort of laying out like here are what we see for the upcoming touchpoints for stakeholder engagement to roll out a lot of the work that we've been doing.

So I would invite you to stay tuned, join the listserv. We can also kind of keep you in mind as things happen. But I think you'll be seeing how we're trying to approach that, maybe not identically to the way that the Land-Use Screens are being handled, but there is a lot of effort right now as we speak to really wed the space identification and transmission needs, as well as, you know, waterfront facilities and so many other things that are going to be important to moving forward with offshore wind.

MR. COLVIN: Great. Thank you.

MS. BRAND: Yeah. And to your second question, you know, in a statewide evaluation, we are not going to be able to identify every factor on the ground, and we can't try to. I mean, there's so much that plays into, you know, what happens on the ground in terms of information that's available at different scale.

And so that's where we're very much looking forward to public feedback on the factors that we selected for land use constraints and if there are additional ones that we should consider or other considerations that we should play into decision making.

MR. COLVIN: Okay. Thank you. Thank you for letting me jump the queue, Heather.

MS. RAITT: Great. So this Heather. So I will go ahead and read some of these questions that we received. And whoever wants to jump in, I welcome you to jump in.

So the first one is from Richard Rollins, and he wrote,

> "By excluding high population areas, it would seem as though the model excludes potential associated with rooftop solar, community solar, parking lot solar, and solar on

brownfield sites. Why? Do you have an estimate of how much potential has thus excluded from the models?"

"And then, also, other potential on the irrigation canals, highway rights of way, et cetera, also appears to be excluded. Why? Do you have an estimate of the potential excluded in these areas?"

MS. BRAND: I think I can start with that one.

So the Land-Use Screens were originally designed to inform estimates around utility-scale generation, given the larger land use footprint of utility-scale renewable energy generation than smaller installations, like community-scale solar or distributed energy resources.

One of the things that we want to do for the land use evaluation in the next report is take a look at things like brownfield or infield solar development opportunities across the state, agrivoltaics. Another comment that we've received is alternative deployment techniques like photovoltaics or solar over canals. So we want to think in our methods development about how we look at some of those different deployment

opportunities and how that factors into the land use evaluation and land use conversation.

So this work here is meant to apply to utility-scale generation to inform long-term energy planning. We definitely plan to tackle different deployment techniques and technologies in our land use evaluation for SB 100. And we appreciate your comments on what should be within that scope.

MS. RAITT: Thank you.

Next is from Nancy Rader. And she says, "From the draft report, it looks like you are still using extremely outdated wind resource maps at 80 meters height, using very coarse granularity, even though more granular data at 100 meters is readily available."

"Also, the power curves in the NREL wind toolkit are now at least seven years old. Are you still using these? And, if so, you're missing a lot of potentially developable areas using current wind technologies. Why has this data not been updated?"

MS. BRAND: So I can start by saying that we sought to use publicly available information

wherever feasible, including from the National Renewable Energy Laboratory. I think what our team can do is go back and take a look at some of the assumptions in the NREL data and double check that we're using the most up to date information that is available.

Does the team want to add anything else to that?

MS. RAITT: And you may have already discussed this, but let's see, again, from Nancy Rader,

"Do you consider the very small footprint of wind energy projects in your analysis, for example, compatibility with agriculture and limited and impacts on terrestrial species? And, if so, how?"

MS. BRAND: So we do recognize that there's different impacts depending upon the type of utility-scale generation technology. We are at the starting point in this Draft Staff Report of applying all of the modeling outputs to wind and solar technologies. And we appreciate your feedback on that proposed decision.

MS. RAITT: Thank you, Erica.

So next, "How would private lands" --

this is a question from Ventura (phonetic) Camacho.

"How would private landowners be able to submit their parcel for collaboration or consideration for solar farming that meets solar farming criteria? We'd like only to have those opportunities."

I'm not sure what that -- anyway.

MS. BRAND: I think the LLC is Limited Liability Corporation . Good question, and I think one that I would need to think about more in terms of how private landowners could proactively identify their lands for consideration. I'd be happy to follow up on that question or provide my contact information.

MS. RAITT: Great. Thanks.

MS. BRAND: Does anyone else have any thoughts that they want to add?

MS. RAITT: Next is from Claire Broome.

"Given the enormous projected solar resource need in 30 MMT and high electrification, will IEPR IRP optimized for distribution grid solar as an alternative to utility sizing transmission with citing using Land-Use Screen?"

VICE CHAIR GUNDA: I could take that one.

Thank you for that question, Claire. So one of the things we're trying to do for the SB 100 process is to rely on the newly open docket and the DER side at CEC. It's an informational proceeding. The idea under that proceeding is to construct a number of DER scenarios that could be used as a demand modifying side for whatever demand scenarios we might come up with for SB 100.

So we are looking at it both through the lens of just different DER scenarios, but also from the lens of using or including nonenergy benefits, such as resiliency, land use, other elements that could, you know, kind of help develop those demand side scenarios, especially the DERs, so we are working on that. I look forward to connecting with you specifically through the DER process.

Thank you.

MS. RAITT: Thank you.

This is from Shannon Eddy.

"The new Land-Use Screens will be used and current IRP modeling update going on now but not for busbar mapping until 2024-2025 TPP?

"And can you repeat which layers will be used for busbar mapping levels two, three, or just level one?"

MR. FERGUSON: Thanks, Shannon. And your statement is correct, the new Land-Use Screens would not be implemented until the 2024-2025 TPP, which we'll be doing next year because the '23-24 TPP work is already underway.

The Land-Use Screens that are specifically in the busbar mapping side of that, I think the easiest way is that is the table that was included in my slides of busbar mapping had about nine different datasets that we incorporate into the busbar mapping Land-Use Screens.

For the portfolio development itself in RESOLVE, we are using the DRECP/SJV screen that's been in the IRP inputs and assumptions for a while now. And that, as Erica explained, is -- has -- excludes the RETI category one in two land. And then for those two, the DCREP and SJV areas includes only the development areas that were identified in those two processes.

VICE CHAIR GUNDA: Just on, Jared, specifically for '24-25, though, I mean, my understanding is recommending level one to be

used, the study idea?

MS. BRAND: I think for busbar mapping, what I heard in Jared's presentation is that once the land-use screens are finalized, we will work together as staff to put forward a proposal in the next round of documentation --

VICE CHAIR GUNDA: Right.

MS. BRAND: -- about specifically how that will be used.

MR. FERGUSON: And just to provide a little bit more detail to that is I think what will likely be as we'll use a combination of the screens to help prioritize what locations and how much to map there. So I wouldn't say we probably won't even use a single screen, we might use all three, or use parts of all three for various purposes.

MS. BRAND: And I believe I heard you say there would be a public comment opportunity associated with those documents?

MR. FERGUSON: Yes. We have traditionally and plan to have -- we have a ruling each cycle in which we release the proposed methodology for that cycle and seek stakeholder feedback on that methodology.

MS. RAITT: Thanks, Jared.

So just a couple of more questions, one from Shannon Eddy.

"The solar layers appear to show not insignificant solar resource potential in Northern California forest areas, and also on beaches throughout the state, and on the Channel Islands. We assume that's because staff has yet to scrub the data. Can you talk about the process that will be used to scrub these kinds of areas from being considered as viable for solar?"

MR. DAVID: I can speak to that.

I think the areas you are seeing are what's called slivers. After we ran the screens, there are certain datasets that don't exactly line up together, one of them being our state of California outline. And after we ran the screens, there are certain areas that show up on the shores, and like in the water of Lake Tahoe and places like that.

So yes, we should go through that data and remove this slivers. Trying to get the data product out in time was a constraint, and this is the product, as of now. But it's good feedback

and we'll look into removing those artifacts.

MS. BRAND: I just wanted to add quickly that one of our goals with this particular Staff Report was to increase the documentation around the information that we're using for transparency.

So for all interested participants, if you look at Appendix D in the Staff Report, it lists all of the datasets that we are using. And we would appreciate your feedback on that - there's dozens of datasets, and perhaps we missed something. And so that's exactly the kind of feedback that we're looking for and why we wanted to document everything with such detail so that we could get your feedback.

MS. RAITT: Thank you. So this will be our last question before we go into the panel. This is from John Taylor.

> "How about analyzing drought/climate change constraints on imported water on cropland suitability in addition to analyzing groundwater availability?"

MS. BRAND: That is not something I've considered before but I look forward to talking with our colleagues at some of the agricultural

agencies about that to learn more and hear their thoughts and perspective.

MS. RAITT: Great. Well, thank you for the Q&A.

And so, Erica, if you want to go ahead and start the next panel, that'd be great.

MS. BRAND: Yeah, so for the panelists, if you could please turn on your videos?

We have a remote panel today. I'm really excited to welcome a number of agency partners that we collaborated with over the last eight months to review the datasets and assumptions in developing the Land-Use Screens.

So, great, I see folks videos turning on. I'm going to go ahead and make some introductions.

So I'm excited to welcome today's expert panel. The Land-Use Screens that we are presenting here today really rely on data from many state and federal agencies. And we were very fortunate to work with a number of colleagues over the past eight months to consider how to use this information in our Land-Use Screens.

So in today's expert data panel we are

joined by: Ryan Hill, a Research Data Specialist at the California Department of Fish and Wildlife; Patrick Hennessey, a Research data specialist II at the Department of Conservation; Stanley Mubako, Senior Environmental Scientist Supervisor, Department of Water Resources, Land and Water Use Efficiency Program; and Maegan Salinas, Environmental Scientist at the California Department of Food and Agriculture.

Today's panel format is a moderated discussion, followed by conversation and questions from the dais.

I'm going to start by giving each panelist around three minutes to introduce themselves, describe the mission of their agency, their role, and any opening comments they would like to make to kick off the discussion. So let's dive in.

First up, I'm going to call on Ryan.

MR. HILL: Thank you, Erica. And thank you to the Commissioners and everybody involved with this project for affording me the opportunity to speak on this very important topic.

My name is Ryan Hill. And as Erica

mentioned, I work for the California Department of Fish and Wildlife, the CDFW. My official title is Research Data Specialist. It means I spend my days working and analyzing spatial data concerning natural resources. I was going to speak a little more on what that means but I think that Travis did an excellent job of introducing us all to what spatial analysis is all about.

So I'm just going to piggyback on his metaphor, and say that I, too, am a maker of lasagna is, in my case, very heavy on notes in biodiversity. My educational background is in landscape ecology and conservation science from the University of California Davis.

And I'd like to share with you something that many of you have probably heard in some form or another, which is that California is considered a global biodiversity hotspot. It is home to more species of plants and animals than any other state in the union, including many hundreds of species that are found nowhere else in the world, they're found here in California, and nowhere else.

You may also be aware that CDFW has a

mission statement. And that statement is, quote,

> "To manage California's diverse fish, wildlife and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public," end quotes.

So to me, the word management in that statement, it really speaks to the nuts and bolts of what we do day to day. But I'd like to make something else a little more explicit, something that is really integral to our mission, and that is conservation. Conservation is more of an omnipresent ethos, if you will, which informs and shapes our many management strategies.

And this is the reason that I personally came to work for the CDFW. It is important to me that that great mosaic of California's biodiversity remains an enduring legacy for generations of Californians to come. California's biodiversity is a national treasure, and it is also one of the world's natural wonders.

So those descriptions of biodiversity may appeal to moral or ethical sensibilities, and that's fantastic. But I'd also like to make a

very strong point that these kinds of sentiments over many years have led to protections for biodiversity that have been codified through a number of legal instruments, most notably the Federal and State Endangered Species Acts. We have the Natural Community Conservation Planning Act, which actually bakes biodiversity protections into long-term planning processes in California.

We also have a host of statewide executive orders, such as the 2018 Biodiversity Initiative, or the more recent Natural and Working Lands Initiative, which seeks to protect 30% of California's lands and coastal waters by the year 2030.

So as an employee of CDFW, I work for a conservation organization. And one of my primary roles is to develop information and tools which help to further conservation goals while also recognizing that our own collective social, cultural, and economic needs will continue to be expressed into the future, and that these needs will require space on the landscape. So I come to work every day with the firm belief that good information can help to reduce the potential

conflicts from these multiple concurrent objectives.

Thank you.

MS. BRAND: Thank you, Ryan.

Next, I'm going to call on Pat.

MR. HENNESSY: Hello, everyone. My name is Patrick Hennessy and I'm Research Data Specialist with Department of Conservation in the Division of Land Resource Protection. And I work in the Farmland Mapping and Monitoring Program, also known as FMMP.

At Conservation, the mission is to balance today's needs with tomorrow's challenges and foster intelligence, sustainable, and efficient use of California's energy, land, and renewable resources. Our vision is a safe, sustainable environment for all Californians.

At Conservation, we have five divisions, division, Division of Land Resource Protection, that I work in, the Division of mine -- excuse me, Mine Reclamation, the California Geological Survey, the Geologic Energy Management, and the State Mining and Geology Board.

At Division of Land Resources Protection, we support a number of programs designed to

promote orderly growth in coordination with agricultural endeavors.

At the Division of Mine Reclamation, pretty much it administers the Surface Mining and Reclamation Act, also known as SMRA. It's a link between producing the mineral products important to California and protecting the environment.

At the California Geologic Survey, they pretty much produce the geologic maps, mineral resources mapping, the distribution, and analyzing the state's mineral resources.

At Geologic Energy Management Division, they prioritize protecting public health, safety and environment and its oversight, the oil, natural gas, and geothermal industries, while working to help California achieve its climate change and clean energy goals.

And the Mining and Geology Board operates within DOC. It's granted certain autonomous responsibilities and obligations under several statutes. This general authority requires all nine Board members to represent the general public's interest.

And that's pretty much a summary for conservation. And thank you for having me today.

MS. BRAND: Thank you, Pat.

Next, I'll call on Stanley.

MR. MUBAKO: Okay. Good afternoon, Commissioners and all stakeholders who are attending or tuning in today. My name is Stanley Mubako. I am Senior Environmental Scientist Supervisor with the Land Use Unit of the Department of Water Resources in the Water Use and Efficiency Branch.

So I'm coming from the Division of Regional Assistance. And some of you may be wondering here, you know, well, what does land use have to do with water? So I hope to share some of that information briefly today, in addition to the contribution that land use has made is an input to the CEC process that we are gathered for here today.

So within my Unit, you know, we have a mission, but first I will give the mission of the Department of Water Resources. It is a big organization that you are all familiar with.

DWR's mission is to sustainably manage the water resources of California, in cooperation with other agencies, obviously, and to benefit the state's people, and to protect, restore and

enhance natural and human environments. And within DWR, in my Division Regional Assistance, we do have a mission that is for the Land Use Program that I'm heading. Our mission is to survey land more frequently and efficiently using satellite imagery, high elevation digital imagery, local sources of data, as well as the use of GIS and remote sensing, in combination with our field service.

That's a brief about my role and where I'm coming from. And I'm glad to be here to contribute to today's discussion.

Thank you.

MS. BRAND: Thank you, Stanley. And then next we'll hear from Maegan.

MS. SALINAS: Hi, everyone. This is Maegan Salinas with the Department of Food and Agriculture. So thank you for inviting me. It's nice to chat with you all.

So, briefly, the CDFA's mission is to protect and promote agriculture through environmental stewardship. And through spatially driven science, innovative science, we ensure food quality and safety, and promote equitable opportunities for agricultural marketplaces, and

also protect against invasive and exotic pests and diseases.

I work closely in that last category. I am an environmental scientist within the Plant Health and Pest Prevention Services Division. In the PDAS Unit, there's so many acronyms, I understand that, but it's Plant Data Analysis Services. And we primarily use GIS on a day-to-day basis to map detections of exotic pests and diseases, which facilitate emergency response actions, such as treatment and establishing quarantine boundaries.

And we also provide several spatial and tabular data for the Division and Department, and work interdepartmentally, as well and maintain integrity of that spatial and tabular data.

So, again, thank you.

MS. BRAND: Thank you, Maegan. And thank you, panelists, for being here with us today.

So I'm going to kick things off with a series of questions about the datasets used by CEC staff to construct the draft Land-Use Screens. Our goal here, really, is to help the audience learn more about these data, what are they, how are they collected?

So I'm first going to start with a question for Ryan from CDFW.

So the CEC staff used some of the datasets from the Department's ACE 3.0 Project. Could you describe what ACE is and what some of the datasets are that we used?

MR. HILL: Sure. Before I describe what ACE is, I think it would be instructive to start with why ACE is, what was the purpose of engaging in ACE Project?

And, essentially, what we're doing is we recognize that planning decisions and processes are being engaged in every day, whether that's for conservation acquisitions, for development, planning, urban development, and resource development. And we want to interject biodiversity into that conversation to make sure that biodiversity is being represented is being protected.

And when we're talking about biodiversity, it's a very complicated topic, and there are a lot of layers to it, a lot of nuance. So what the ACE Project was designed to do was take a lot of that messy data and put it into some more tidy thematic categories. And then

within those categories, roll up some of that mess into some more generalized patterns and summaries so that we could make some very clear determinations about what's happening on the landscape that regular people can understand.

So for instance, we have the areas of conservation emphasis, terrestrial biodiversity layer. And that layer is based on something called species richness. And that's simply a count of the number of species on the landscape. So taking all of these different data sources, we can say, over here in Area A, there are 100 different species that we would expect to find, whereas over here in Area B, we only expect to find 17.

So it's very general, it's a very high level summary, but it gives you something very specific and data-driven to tell us something important about what's happening on the landscape.

And so we do that species richness in a very -- in a way that accounts for all common terrestrial vertebrate species, but also we do in a way that focuses on special status species, those other species that we, at CDFW, have a

special mandate to pay attention to because these are species that are on the Federal or California Endangered Species List, whether they are candidate species or species of special concern for our Department.

And then we also take a subset of those species and look at those which occur only in California, and look at how geographically restricted they are, and come up with weights and metrics so that normal people can see on a scale of one through five, this area is a one, it's very low in terms of those criteria that have been evaluated by CDFW, versus the area over here which is a five, the highest category in terms of those criteria.

So I've mentioned terrestrial biodiversity. There are two other thematic categories, specifically, one is connectivity, which is very important, and that is basically how these species move across the landscape. And then one on climate refugia, which I don't know how much in detail you want me to go in at this point.

But we're basically identifying areas that we expect to remain relatively constant in

the face of climate change in terms of changing amounts, temperature and precipitation, and identifying areas that we expect to remain fairly constant and maintain stable habitat or the current portfolio of species that are present there.

MS. BRAND: Thank you. I have one more question for you.

One of the other datasets that we're proposing to use is the 30x30 Terrestrial Conserved Areas dataset. Can you speak to that one a little bit?

MR. HILL: Certainly. So the 30x30 Conserved Areas consider various dataset was initiated by the Governor's executive order. And if you're going to shoot for a target of conserving 30 percent of California's land and coastal waters, then you need to understand where you are to begin with. You need a baseline so that you can see how the needle is moving over time.

So we spent some time using two primary datasets, which is the California Protected Areas Database, which is managed by Greeninfo Network, they're a nonprofit organization, and they have a

really good handle on keeping up to date what has been set aside as open space. Now open space is not necessarily protected for biodiversity. You may have open space that is reserved for agriculture, for offroad vehicle use, or for ball fields, things like that.

And then another dataset that we relied on comes from the U.S. Geological Survey, called the Protected Areas Database of U.S., or PADUS. And it is attributed more specifically with a sense of whether an area is set aside or not with biodiversity as one of the focal driving elements for its conservation.

So we had to kind of bring those two datasets together. They're focusing on different things, but by overlaying them and doing a little transfer of the attribution, you can kind of get a sense of what areas in California have been set aside specifically for the conservation of biodiversity. And we're still working on updating that dataset a continual basis.

MS. BRAND: Great. Thank you.

Now we'll switch gears and talk about some of the datasets that informed the cropland model.

So I'll start with Patrick. Could you please describe the California important farmland dataset or datasets?

MR. HENNESSY: Absolutely. It’s going to feel a little bit like a speech because that's just high level glance off the top on the program, but here we go.

The goal of the Farmland Mapping Monitoring Program is to provide consistent and impartial data to decisionmakers for use in assessing nearly-present status, reviewing trends, and planning for the future of California's agricultural land resources.

California Government Code section 65570 mandates FMMP to produce the important farmland maps and the GIS data, which are a hybrid of resource quality and land use. These are produced every two years on even numbered years. The resource quality is defined by the U.S. Department of Agriculture's Natural Resources Conservation Service, their Prime Soils List, and the Soils of Statewide Importance List for each NRCS Agricultural Soil Survey.

The land use component is interpreted from aerial imagery, and site visits via public

roads, and external comments by FMMP. This means that irrigated farmland in the land use data on a USDA NRCS prime soil qualifies for prime farmland.

The important farmland data is also released in statistical formats as the land use conversion tables. These are compiled and summarized within the biannual California Farmland Conversion Report. And first maps and data were produced in 1984 and we covered 30.1 million acres. Currently, we're in the middle of the 2020 update, covering 50.6 million acres now, with 51 counties fully or partially surveyed. And the soil surveys specific to national forests or other government land units are not surveyed by FMMP.

California important farmland map category definitions, they were originally developed by the USDA NRCS as part of their nationwide Land Inventory and Monitoring system, also known as LIM, and then modified for use in California. Categories on our maps include prime farmland, farmland of statewide importance, unique farmland, farmland of local importance, grazing land, urban and built-up lands, other

land, and water.

California important farmland data is used to determine agricultural impacts in the CEQA process, and elements of some county and city general plans. It's used in environmental documents as a way of assessing the impacts to prime farmland and in regional studies on agricultural land conservation. That data also has been applied and urbanization and environmental models.

MS. BRAND: Alright. Thank you, Pat.

Okay, now I'm going to turn to Stanley to give us an overview of the Department of Water Resources statewide crop mapping.

MR. MUBAKO: Thank you, Erica, to present an overview of DWR statewide crop mapping dataset. I will break down my answer to some little subsections, starting with the objective of our Crop Mapping Program.

The main objective is to produce a special induced database, with accuracies exceeding 95 percent, using several tools, a suite of tools, including remote sensing, GIS, geographic information systems, statistics, and also temporal analysis methods. We map irrigated

agriculture and urban areas annually, plus other nonagricultural areas every five years. We like to call that wall-to-wall mapping, or fill-in mapping. So that's the objective of our overall Crop Mapping Program.

And before I talk about, you know, who cares about such datasets, I'm going to go through how we do that just in brief. How do we do that mapping?

We work with contractors or vendors as much as we can, and our current vendor is a company called Land IQ, who we delegate to do certain specific, you know, tasks through task orders.

And going back, you know, a little bit of history historically, the Department of Water Resources, they've been surveying counties once every five years, and filling in temporal data gaps using county agricultural commissioners' datasets. And, you know, those datasets are considered, you know, less reliable because, you know, that procedure is depended on surveying growers, rather than actual measurements on the ground.

There were also times, for example, when

a given county was surveyed, it's longer time intervals than the planned five years due to resource limitations and other difficulties of, you know, associated with conducting on the ground land use surveys. So we decided to switch to remote sensing methodologies.

So DWR, we are now conducting land use classifications annually using remotely sensed satellite data, with maybe a possible lag of one year to process some of the collected data. That's the reason why, for example, you know, currently you can't find statewide 2022, because we are still working on some of those datasets.

So for drought applications, also, given the drought that is much California, we also have drought applications of land use data. And it is our intention to also provide to for the -- to provide farmers land information more frequently, given that for a lot of farmers, you know, are leaving agriculture due to lack of water. And we do this classification at fields now using a supervised classification algorithm to classify the fields that are delineated as part of our workflow.

And we also are determining frequency

here, as well as seasonality of multiple crop fields, using pick cross dates for annual crops. And from model year 2018 and on, we started including multiple cropping.

And all these datasets, once they are produced either internally or by the vendor, by the contractor, they undergo some rigorous peer review in collaboration with our regional offices in DWR, who are the people on the ground who understand their situation on the ground.

And then finally, before the datasets are published for the consumption of various stakeholders, we -- the datasets undergo a process of accuracy assessment using our Department of Water Resources compilation.

I will end by briefly providing an overview of some of the importance of the dataset, you know, the why and who the users are of the datasets.

So land use data is critically, you know, important to the work of the Department of Water Resources and other California agencies. As you can see today, we are gathered because of the CEC initiative. Private consulting firms, academia, research communities, those are some of our

customers, you know, for the datasets. But internally, the land use information that we produced is mainly used for updating the California Water Plan, which is published every five years.

And then, also, the land use survey data is also pivotal for drought-related work plans, you know, including for other state agencies, for example, this initiative by the California Energy Commission. And also understanding the impacts of land use crop protection and encourage management practices in environmental attributes and resource management.

It is also a key step in their ability of groundwater sustainable agencies, GSA, to produce groundwater sustainability plans and implement projects to attain sustainability.

There are some specific benefits of the more frequent analysis that we are now conducting annually in relation to drought response efforts. This includes, for example, the ability to assess past and monitor current agricultural droughts, and also water rate monitoring and analysis of curtailment due to drought and drought response efforts. And you will find that irrigated

agriculture information is also essential for drought water right allocation processes.

And land use survey data, it can also be used to estimate the amount of water available for agriculture. And this information is critical in boosting innovation, as well as adaptation on the part of farmers and other decisionmakers in the space of water resources.

And then finally, my last two points, we can also use this data for drought monitoring purposes, for example, calculating indices such as the Normalized Difference Vegetation Index, to track crops.

And finally, we can also use land use data for direct and indirect estimates of economic impacts across, you know, various regions of California, the state of California, as part of drought planning processes.

Thank you very much, Erica. I will return the time to you.

MS. BRAND: Thank you very much. Appreciate the helpful overview of some of the datasets that were used in creating these draft Land-Use Screens.

And for those that are interested in

learning more, in our Staff Report, in the appendix that lists all the datasets, we do link to collaborating agency websites where they have full descriptions of the datasets that are under consideration and provide a lot more information.

So next, I'm going to ask a couple of general questions. And so if you'd like to respond, we're a small enough group, just take yourself off mute and please chime in.

So the first question I have is: How could the CEC improve our proposed approach to statewide Land-Use Screening for electric system planning? We are in a draft comment period right now, have entered into one. Your input and help shaped where we are today. What additional thoughts might you have for the audience?

Yeah, Ryan?

MR. HILL: So CDFW does have a few other datasets that could be germane to this process. I think in terms of the time that we have, we got the bulk of the really important stuff in there. But we have additional datasets, called significant habitats, which include rural vegetation communities, and things which are particularly rare on the landscape in terms of

their combination of species in terms of the community that exists there.

We list quite a bit that as considered, quote unquote, "significant," you know, that includes all oak woodlands and shrublands, but we may want to take a closer look in collaboration with our VegCAMP Unit within CDFW and maybe pick out the rarest of the rare, some exceptionally unique communities, that I would think would also have been screened out in terms of high biodiversity areas or high rarity areas.

But again, those datasets that we were using were those very generalized summary datasets, so they incorporate a lot of information and sometimes things -- as you know, when you take a summary, some particular details can get washed out. So it may be useful to identify some of these exceptional areas.

MS. BRAND: Thanks, Ryan.

Anyone else want to offer thoughts on that question?

Okay, hearing none, the next question is: Do you have any new information in development that the CEC could consider in this current update to the Land-Use Screens or future updates

down the line?

MR. HILL: Stanley, go ahead.

MR. MUBAKO: I can --

MR. HILL: Go ahead.

MR. MUBAKO: Yeah. I can jump in on that, Erica.

We, you know, we recently published the statewide 2019 dataset, you know, in terms of latest classification. Depending on your cycle and timeline, we also have the 2020 dataset that is currently undergoing final edits. So our original timeline is to publish that by the first quarter of 2023. But things happen and, you know, the dataset could come in faster given that, you know, DWR is also working on the next Water Plan for 2023 for the State of California. So that dataset for 2020 could be available sooner rather than later. I don't know whether it would be too late for the current effort but it will be new in that sense.

And at the same time, we are also working in parallel to process the 2021 dataset. And we are also working on the contract for the water year 2022 classification for the water year 2022.

So as I mentioned earlier on, we are not

doing these classifications annually due to the adoption of remote sensing technologies. And this will enable us to make these datasets more frequently to key stakeholders, you know, like the CEC, who would like to consume some of the services.

Thank you.

MS. BRAND: Thank you, Stanley.

I think, Ryan, you had gone off mute as well.

MR. HILL: Sure. I was just going to say that the datasets that we're using are always a snapshot in time, our best understanding of the landscape. And sometimes the time that it takes to develop that snapshot, sort of the time in the darkroom, so to speak, is such that by the time we have a look at that snapshot, things have already changed on the ground. But, of course, that depends on how quickly the data comes in.

So we've been in the developing room, so to speak, with a dataset on connectivity in particular. We have a very large dataset on ungulate migrations that has been in the works for at least over a year. We have regions across the state that have been working on this, so it's

a collaboration between a number of folks, and these take time to process.

But we are at the point where we have a pretty good provisional look at kind of an almost-final dataset. And we would like to hopefully bring that into an updated picture on connectivity before the finalization of this report.

MS. BRAND: Thanks, Ryan. Real basic question: What's an ungulate?

MR. HILL: Oh, excuse me. Ungulates, we're looking at deer, elk, pronghorn, large game mammals.

MS. BRAND: Okay. Great. Thank you.

MR. HILL: Thank you.

MS. BRAND: Does anyone else have any thoughts on this question, any new information that's on the horizon that you're aware of you

MR. HENNESSY: I do. My comment is really similar to Stanley's, just that the Farmland Mapping Launching Program is constantly releasing data. We're going to have 2020 data out any day, a couple of counties, but we release them as we complete them, so it's a process of constantly releasing data.

The most current form of the map and data is what's required in the CEQA analysis. So we have a data service that also is sort of the most current dataset, so it can be a blend of the 18 and 20 datasets, so that's always out there, too. It's the most current.

MS. BRAND: Thank you.

Any other thoughts?

Okay, I'll move on to my third question. So we, today, have discussed the current update to the Land-Use Screens for electric system planning, the current proposal around exclusions and biodiversity and cropland data. But in our conversation, other land use factors and other information have come up.

So my question is: What other spatial information or factors or data do you think the CEC should consider in the land use evaluation or analysis for future SB 100 planning?

MS. SALINAS: Yeah, I can go.

So I'm not sure if there is an official dataset that exists somewhere. But if it does, then a state-recognized and unrecognized tribal land layer is something that I think should be considered. I know that there are letters of

intent to petition that exist. And that would be a pointsource, potentially. And I know that precontact maps exist, but I don't know if spatial layers of this data exists somewhere publicly.

And I understand it's outside of the scope of the current project to generate a layer but, should it exist, it would represent several people's land not included in the existing federal tribal land layer.

MS. BRAND: Thank you, Maegan.

MR. MUBAKO: Yeah, I can jump in, too, Erica.

I want to just circle back to the previous question and mention that, you know, we also have statewide data for 2017 that is under development. And I'm just mentioning that, I don't know, if that's interesting because, you know, it's now in the past.

But what was happening with the statewide crop mapping process at DWR, prior to 2018, we were developing these datasets biannually. And then starting 2018, we are now doing these datasets, you know, every year, as I mentioned.

But anyway, for, you know, some time

series analysis, it was, for historical reasons, you know, to fit into a Water Plan, there was interest to also classify the Year 2017 that we sort of, you know, skipped previously. So that dataset is being developed using a slightly different methodology from the remote sensing approach that we're using.

We contracted the U.S. Geological Survey to develop that dataset using the California Pesticides Use Reports. So that dataset is now nearing the peer review process and it will be out there, hopefully sometime in the coming year. So they just wanted to mention that, you know, for stakeholders who might be interested, including CEC.

But otherwise, going back to part C, another dataset that may be interesting to consider is the farmland. You know, as we classify agricultural land across the state, we are seeing more and more farmland being left, you know, maybe farmers getting out of -- or leaving out that land because there isn't enough water.

So someone, I think earlier today, mentioned, you know, the possibility of some farmers being interested in PV solar on their

properties or on their farms. So I think an analysis of that fallow land, you know, from the crop mapping datasets that we produce, may be interesting. I think is quite significant, you know, acreage that we're looking at. And there could be farmers out there who may be interested in switching from agriculture to solar farming.

Thanks.

MS. BRAND: Thank you.

Any other thoughts on spatial information are factors to consider in future SB 100 analyses? Thank you for your input so far.

Okay, the next question, I mentioned earlier in my presentation that the Energy Commission is creating an online California Energy Planning Library, where we plan to store and display the results of the final statewide Land-Use Screens.

From your perspective, what would be the most helpful ways for the CEC to share and display this information? Any advice from your work in geospatial information?

MS. SALINAS: Yeah, so I think similarly to what Travis had demonstrated in their presentation on web mapping, a public interactive

web map on ArcGIS Online, where the layers can be turned on and off, would be extremely helpful.

Also, the option to download the data as both a shapefile and TML, so that GIS users from the most advanced to the very lay could bring in those layers into various software, including Google Earth.

Let's see. I think that's all I can think of right now.

MS. BRAND: Thank you.

MR. MUBAKO: Yeah. Yeah, that maybe you guys can also consider, you know, other forms of web apps, for example, you know, dashboards based on ArcGIS, or probably even other platforms, such as Power BI, depending on the software that you guys have out there. This could be various options, you know, in addition to the web apps that you guys already have in mind.

Thanks.

MS. BRAND: Thank you.

Any last thoughts? Okay. I have one final question before we go to the dais.

One of the themes that's been brought up earlier today is just how quickly information changes, both on the energy side and as well as

across California's landscapes.

What are your thoughts on how to keep data current and share information effectively across agencies?

MR. MUBAKO: I will dive in, Erica, if that's not a problem.

I just want to highlight two items. You know, the first one, I think I already saw that in action, so we have that going somehow when Saffia was sharing some of the datasets through ArcGIS portal. So I could access, you know, those preliminary layers through the California Department of Water Resources, you know, enterprise account.

So that's encouraging, you know, that sort of collaboration, because most of the stakeholder agencies that I know across the state, they use ESRI, you know, ArcGIS software, and they study the price side of things. That is very handy for collaboration and sharing data among different agencies.

And also, through the California Geospatial Data Portal, I've seen various agencies there who are sharing the datasets. It's still limited for certain agencies, but I

think more can be done. And your initiative, you know, can be integral, you know, to promote more collaboration and data sharing amongst state agencies.

Thanks.

MS. BRAND: Thank you.

MS. SALINAS: Yeah, to add to Stanley's comment about the Geospatial Portal, every month there is a -- at the end of the month there is a community of practice GIS meeting led by our state's GIO Isaac Cabrera. I attend this regularly. We have several presenters each month, just updating the attendees on what -- the updates they've made or what they're anticipating to be finished soon.

And then, you know, I think that would be a great place to just start the conversation of these data and the updates made to the data. And if collaboration is needed, then also something that can be shared in those meetings.

MS. BRAND: Thank you.

Any final comments from anyone else? Okay. Great.

Well, we've reached the end of my prepared questions, so I think that we can open

it up to the dais to see if you all have any questions for our data experts.

VICE CHAIR GUNDA: Yeah. Thank you, Ryan, Patrick, Stanley, and Maegan, thank you for your comments. It was really helpful to kind of set the stage on some of the common themes that we all kind of pursue.

So I'm going to start with Dr. Roth here. And then I have a couple of questions, as well, for our discussion.

DR. ROTH: So thank you all. Many of you I know and work with on a regular basis, but it's always remarkable to see how these pieces have come together as parts of projects that people have worked on, and the reality of how they're getting used because that's really what matters in the end.

There's a number of neat pieces in what you've discussed, that will, I think, be really interesting to follow up over the longer term. And so what I'm going to note is maybe not so much a question as a comment that we've got a lot of opportunities here.

I mean, as was brought up previously, at some point, you kind of have to freeze your data

to do a particular analysis and come to a conclusion that can be included in a report. But the newer technologies, ArcGIS Online and similar, are starting to make it far more possible to do that freeze, but then to consider having an easier route to ingesting the new data to repeat that cycle on a on a regular basis that maybe eases the burden for the folks that are assembling it new each time.

I think the idea that somebody came up with with dashboards is something that is be really useful. I mean, we had a couple of folks asked earlier if there was way to get those numbers for counties. And a dashboard could be a way that that if you choose to go that route to do that and let people self-serve that information for themselves.

Some other items, the what should be included in the future, some of these are really legitimate challenges to understand. But I'd be interested in hearing your thoughts on the use of either the data that we currently have or the next generations, that I suspect some of you are working on, for looking at how climate change may impact, fallowing cycles of water because of

water use, how we can make sure that we avoid confusing more extended fallowing with a full retirement of that land from agriculture to make sure that we're not just -- we're not mistaking a symptom for a cause.

So, for example, California has enormous quantities of some of the best soils for growing crops in the world. And how can we use our data to let us tease out some of those details about whether that land is likely to be permanently retired from agricultural service or whether it's fallowed and waiting for an opportunity to get water onto it to grow that next round of crops?

Similarly, how can we better -- do we have opportunities here to better understand how a lot of those landscapes can be used for climate change mitigation through the storage of carbon on those? How does that interplay with potential uses for energy versus other purposes? And what do those mean for things like our resiliency to climate change, so not just can we store the carbon on it but can -- are these landscapes being either helped or hindered in their ability to deal with floods that may come through or heat island and other forms of climatic change that we

may want to be paying attention to?

It's these types of integrated questions that I want to pose to you. like do we have routes forward for them? And how can we use the type of teamwork that's been developing a process like this to integrate it more effectively without stepping on the toes of all of our various mandates that require that we deliver a product on a certain set of schedules?

So, yeah, sorry. Those weren't so much questions as maybe pointers towards opportunities, though there's definitely some embodied questions within them that, if you're able to truly answer those right now, you're doing better than 99 percent of everybody along the way.

Thank you.

MS. BRAND: Thank you. I don't have any answers.

But I would say that I think this is an important step forward in interagency collaboration and thinking about how we use land use and environmental data in energy planning. So I think it creates an opportunity for us to at least start to outline what some of those

integrated questions are so we can think about which ones are ripe to address now, which ones need more research before we have the information to address them.

So I hope that this Working Group will be the start of those kinds of important conversations that we need to outline moving forward.

MR. MUBAKO: Yeah. I would like to jump in.

VICE CHAIR GUNDA: Please go ahead, Stanley.

MR. MUBAKO: okay. Thank you. I wanted to jump in, as well, following up on that, a remark there, especially touching on the issue of, for example, the fallow land, how can we make sure that, you know, this land that has been retired compared to land that has been fallowed, you know, maybe on a temporary basis?

Yeah, I want to revisit, you know, the workflow that I've described for the California Department of Water Resources. I think one of the keys in checking, for example, the fallow land, is doing ground reference data collection, or you know, some like to call it ground

truthing.

You know, one of my professors in remote sensing used to say, "Well, there's nothing like, you know, ground truthing because, you know, people on the ground can disagree." So he used to say, ground reference data collection. And it's a key process in the workflow that we go through at the Department of Water Resources.

By the time we finish any one particular water year to produce the statewide datasets that are consumed by various agencies, we cover well over 18,000 miles across multiple provinces and across the state. And it is an expansive, you know, exercise. And given the overall, you know, latest classification effort for us, just operating with the vendor, the contract is what may be around $11 million or so over five years. So it is an expensive undertaking, yet there are plenty of organizations who are consuming the land use datasets.

So this, to me, represents an opportunity. If we were to take our fallowed land and all that, you know, no matter how advanced our remote sensing techniques can be, they cannot replace the ground truthing, the

action on the ground. We need to go in there and verify and validate things. And one of the ways we can be checking on that fallowed land, whether it's permanent or temporary, is to go on the ground and do more ground reference data check.

And this can be improved, you know, if organizations, you know, pull resources. There are areas where we are continually doing the ground truth data collection. And in some cases, there are gaps, you know, in our regional offices because of resource, you know, questions. And this can be plugged.

You know, if all these organizations that are represented here can come to the table and find ways of, you know, maybe collaborating to put resources on the table, it may be one vendor who is doing the land use classification, but if there are organizations there with an interest are putting money on the table, I think, you know, we can make a lot of progress, you know, in that regard to make sure that, you know, our datasets, you know, the accuracy, et cetera, is more improved for us to be monitoring issues like, you know, the fallow and that Nate is mentioning here. So this is throwing it towards

-- you know, on the table for these diverse group of stakeholder organizations.

Thank you.

VICE CHAIR GUNDA: Thank you.

Actually, I'm really glad, Dr. Roth, went before me because he actually laid out a lot of questions.

I'm coming into this kind of as I'm a real beginner in the land use side of work. So I'll just start maybe at a 30,000 foot level to just complement some of the questions that Dr. Roth raised.

Maybe we start with like just, Ryan, if you can just going to help more from a education standpoint? And as we go to kind of like your planning, especially on the 30x30 work, you know, so I'm looking at, obviously, it's a huge conservation goal. I have kind of a few different questions. You know, please, speak to it however you see fit.

But you know like, as far as like beginning with like how do you even define conservation, the 30x30, right, and kind of like looking at that work, and how much is your team currently plugged into the carbon neutrality work

of the Scoping Plan? And to the extent that the carbon neutrality requires, you know, protection of our dependence on natural and some of the working lands, you know, just at an economy level, how are you -- how is your team plugged in within the 30x30 context in this broader energy transition?

MR. HILL: So when it comes to carbon storage, Nate may be actually in better position to answer that question. He was working together with me and our other collaborators on much of the 30x30 work. And I was pretty much exclusively focused on biodiversity, so carbon is not really my bailiwick.

And the other part of your question, if you can refresh my memory?

VICE CHAIR GUNDA: I was asking, basically, like how is conservation kind of defined --

MR. HILL: How it is defined?

VICE CHAIR GUNDA: -- in this context?

MR. HILL: How is it defined? Yeah, so lucky for me, I tried to answer that question as best I could, and then was able to dodge it for the most part because other smarter groups of

people have been working on that question for quite a while.

So in terms of what is conserved, we have fallen back to a definition, which is supplied by the USGS and their gap status system. They have a code system that is one through four. And codes one and two basically indicate areas that are conserved with the protection of biodiversity as one of the focal driving factors for their management strategy.

And when that data is submitted, and it comes from various sources, the National Park Service, Fish and Wildlife Service, state organizations, TNC, data comes from many different areas and they all have to be conversant with that gap coding system. And they attribute their own data. So when it comes in, we basically are told how this polygon is being managed. And it is up to us to compile all that together and put it together with better line work from the Protected Areas Database in order to understand how that applies in California.

VICE CHAIR GUNDA: Thank you.

Did you want to add, Dr. Roth?

DR. ROTH: Yeah.

So to maybe add a little additional nuance to what Ryan said, the definition for -- of what is conserved is always context specific, meaning conserved can, in the case of 30x30, rely on either the gap code definitions or the slightly more narrative version of that definition, which I'll try to paraphrase but not but don't hold my feet too much the fire, which is basically an area that is durably protected for the preservation of the ecosystems and biodiversity that are on them. We interpreted that from a data perspective to be that those gap codes number one and two.

There are also a lot of interconnections between both 30x30 and the Natural and Working Lands Climate-Smart Strategy efforts, that one, the Climate-Smart Strategy, I should clarify, being much more focused on the climate change mitigation and resilience as the foremost goals of those.

But there's those complex interconnections that we both want to recognize and use to our benefit in that the conservation of lands for 30x30. It likely has significant benefits to the climate change mitigation and

resilience of those areas, while the natural and working lands may not formally meet the definition of conserved under 30x30, but they do very likely have some significant additional benefit associated with them through providing that that connectivity space a little more effectively than if it were paved over, through providing intermittent foraging habitats for some sets of species, and food generally mitigating climate change overall.

So it's a complex landscape and there's a lot of us working in it. And I can't think of a single one of us that isn't looking for these opportunities, like we're showcasing here, to work together to bring more of those pieces home because all of these are truly all-hands-on-deck kind of efforts.

VICE CHAIR GUNDA: Awesome. Thank you.

So I have two more questions. Just one, you know, kind of thematic here, just going back to the data experts on the call, you know, both Maegan and kind of Stanley mentioned parts of this, right, which is, you know, the context of the data we are using. And, you know, each one of these are disparate sets of data that, you

know, we are using, for example, in this case, energy, right, how do we plan for energy planning?

So in terms of adequacy of datasets, I mean, as we are looking at this, the context in which those datasets are being created and the purposes. And, you know, Stanley kind of mentioned the opportunity to have a little bit more resources to kind of look at the accuracy of the data and sufficiency.

And also, one of the points that came up is how do we, you know, make sure that much of this data is being aggregated, for example, by the federal government, right, so much of these datasets?

You know, the application of those datasets for the California context and our climate policies, how are we currently -- I mean, maybe I shouldn't say how are we, maybe independently to each one of you, as we take these datasets, for example, specific energy and end use case, right, how do we ensure that the context of that and the accuracy of that is retained for energy planning purposes?

I hope they came together there clearly.

There's a lot of words that I just threw in there. English is my second language.

MR. MUBAKO: I will jump in there. If I got to there, Vice Chair, well, at least for the work that we produced, as long as the primary inputs, for example, were into the primary process, we tried to make to sure, ensuring our QA/QC process, quality check/quality assurance processes, that, you know, our data undergoes, you know, a rigorous peer review, and also check the accuracy, you know, through accuracy assessment. We actually demand that, you know, our vendor produces data or business data that is 95 percent accurate at the minimum.

And then we put it out there for various stakeholders, including CEC. If you check, you know, our metadata, we are clearly stating, you know, quite the accuracy of the dataset is.

And then what happens beyond that, once other agencies take the data and then they are doing the dicing and slicing and differential processing, yeah, we are not quite sure, you know, how agencies were consuming the dataset to ensure that, you know, as they combine the datasets with others from other sources, you

know, how do they ensure that, you know, the final product, you know, is accurate?

But at least on our part, we try to make sure that, you know, there is that QA/QC process. And we actually stated the metadata in full, what the accuracy of the data is, what are the assumptions used, and what the limitations are for the benefit of other stakeholders and consumers.

I don't know if that is making sense. Thanks.

MR. HENNESSY: I'd like to add a little more, too, with regard to the important farmland data. I always describe it as it's like a living document. We make accuracy improvements all the time. Imagery is getting better all the time. Computing capabilities get better all the time. So we're always improving the accuracy while balancing the mandate of getting the workout. So that doesn't mean you make the perfect dataset every time because there's always room for more improvements and it's always going to get better over time.

When it comes to disparate datasets, you know, working with disparate datasets means that

you're going to have slivers and mismatched, unless they're all based on the same base dataset. So, you know, anyone who's worked with disparate datasets and combined them knows that they're going to have these little tiny areas in between to deal with.

MR. MUBAKO: Yeah.

VICE CHAIR GUNDA: I was going to ask what --

MR. MUBAKO: Yeah. I wanted to state that, you know, it takes me back to that opportunity that is presenting itself for better collaboration among the different agencies with an interest because I feel we can also improve the quality of our datasets that are shared among organizations. If, you know, there are more resources on the table to improve the products that we are producing in the first place, for example, the use of imagery, you know, the statewide datasets that you consume from the Department of Water Resources, we produce them using the free imagery resources in Landsat. We all know the spatial resolution 30 meters, essentially, now a little bit better, ten meters. And then other imagery that is high resolution,

like the Hexagon or Planet Max, companies like that, those value-added vendors who are selling high resolution imagery data, and that is an expensive undertaking.

But we still need that dataset, even to do our QA/QC for qualitative assessment, et cetera. And if organizations are coming together, that can make it easier for us to acquire high resolution imagery, which will ultimately benefit all of us through improved products.

Thanks.

VICE CHAIR GUNDA: Yeah, I really appreciate your guys' conversation there, Stanley, about getting the opportunity for us to collaborate ahead and see if resources could be shared collectively to help inform. I think that'll be great. And I defer to Erica to have the conversation.

So last question, maybe this is, Erica, to you, related to, and you can close it up. On the climate change issue that Dr. Roth just brought up, one of the things we recently heard is the changing wind patterns, for example and you know, what that would do in terms of overall

wind generation and existing sites or, you know, future changes.

So just wanted to kind of think it through on how are we -- and maybe this is not a question, but just a comment. And I'm just kind of thinking through how to accommodate those changes in climate, especially on the generation side? And how do we then incorporate that into the need for more or less, you know, of land? You know, so I just wanted to flag that. Any response would be great. If not, we can continue to discuss.

MS. BRAND: I can start. And maybe the GIS team might want to add.

I mean, I think that continually looking at what kind of energy resource potential information we use at the start. So whether it's wind speed data or capacity factor information, along the lines of one of the questions we got earlier, just always checking and making sure that we're using the most up to date information to reflect new analysis, but also changing conditions.

What do you think? Anything to add? No? Okay.

VICE CHAIR GUNDA: Commissioner?

COMMISSIONER VACCARO: So I just want to pull the thread a little bit, Erica, of something you just said. I think it really is good that you hearkened back to the comment that we received earlier, I believe it was from Nancy Rader, just sort of flagging like, hey, what is the currency of the data that you're using? Because those of us that are out here in the world of doing this think there's some more current data that you ought to be looking at.

And I think that, really, that goes to the value of what you all have done in this report, which is you showed your work. And it's why we do these workshops and have this engagement, it's to let everybody know, here's what we've done, here's what we've used, here is how this was peer reviewed, and we know there's still more that we could possibly do. And we always invite and welcome the input.

And I think the way that you framed it is just a perfect way, a reflection, I think, of what we try to do here, right, at the Energy Commission. But I know as you develop the report, and we talked about like how are you

showing your work, why are you going through the steps, how are people understanding what these steps mean, I think this conversation that we're closing with is really important.

And it also underscores, I just want to mention, Dr. Roth, you said something that was really important. I think your words were, you know, this is a all hands on deck; right? And it really is. This is truly a whole-of-government approach to this work. And I think we're all embracing it and seeing the value of it.

So I really appreciated this conversation about data sharing, quality, the peer review process that you went through here, as well, in developing the report. So it's really nice to close out with this panel discussion and all the important points and things that were raised.

MS. BRAND: Thank you, Heather.

So, Heather, do we have any other public questions? I know we have time in the agenda right now to answer.

MS. RAITT: Sure. There's one question. in the Zoom Q&A from Kathleen Ave from SMUD. She wrote,

"Have any of the agencies considered efforts

to integrate habitat restoration on permit" -- excuse me, "beyond the current permit compliance with large-scale renewables? For example, every collaboration with" -- I don't know how to pronounced that -- "third-party review."

"SMUD has a multiyear research project at Rancho Seco underway. Did staff consider possible pathways, new guidance, for this kind of integration that can improve the ecological value of future renewable projects."

MS. BRAND: We haven't yet. But I know, just from reading literature and hearing from other project examples, that there's a number of, I would call them, multi-benefit investments happening in energy projects, everything from pollinator habitat to wildlife-friendly fencing.

I mean, I think we would be interested in hearing of some of these real-world examples to inform how we think about how we evaluate land use for energy planning moving forward in future SB 100 analyses. So if you have more examples to share, or other interested participants do, we would really appreciate hearing about those.

MS. RAITT: Great.

Does anybody in the room have a question? Okay, why don't we just wait one moment for public comment period.

Commissioners, if you don't have any more questions? Great. Okay. Well --

VICE CHAIR GUNDA: Yeah. I have three. No, I'm just kidding. I do, but I will but I will. We will continue.

But I think the last comment just kind of talked to that co-benefits issue and going back, so it's great.

MS. RAITT: Alright. Well, thank you, Erica. And thank you to all of you for being here and presenting today.

And for the folks on the Zoom who asked such good questions, appreciate that, and folks here asking good questions.

So with that, I think we're ready to move on to public comments. And we will go ahead and start with folks in the room. And since there's so few of us, we don't have to worry too much about blue cards. But if you'd like to come up to the to the podium here and -- the lectern, excuse me, and please identify yourself and spell

your name for the record, and let us know if you're having affiliation. And we'll get the timer going to get started.

Go ahead. Thanks.

MS. SOLECKI: Hi. Good afternoon. Mary Solecki. The last name is spelled S, as in Sam, -O-L-E-C-K-I. I'm with AJW. And we represent Clean Air Task Force. I'm here on their behalf.

And this is a really fun workshop for those of us that care about land use planning, so thank you, well done. Loved all the different pieces that you pulled together for this, so thank you.

Clean Air Task Force is definitely in alignment with you on the need for why this sort of thought is needed on land use planning. What they have been seeing and trying to focus some attention on and having conversations with many of you in the room here about, is the fact that the great modelling work that happens in SB 100 and a Scoping Plan process, that does not equal deployment. And even this, this is an excellent next step, but it's still just an important underpinning.

You know this is helpful information to

understand where the land is but it still doesn't necessarily get us over some of those other challenges that the state is going to need to address which is sufficient transmission lines to some of these different locations, providing sufficient local incentives to get those local communities to actually welcome projects into their neighborhoods.

And so that that's sort of where we still want to see this going from here. And so not to take away from anything that's been done because this is a fantastic next step. So we're sort of in a yes-and place. Let's keep going with this. So thank you for the fantastic work on this.

Tomorrow, Clean Air Task Force and Environmental Defense Fund, with Mr. Michael Colvin, are going to be releasing a report called Growing the Grid. And it's going to be talking about the need to do exactly this kind of work to get sufficient clean energy deployment around the state. I will submit it into the public comment so that it's part of the public record. But we will be happy to share that report and speak in more detail about that report and some of the next steps that we have identified with anybody

that would be interested.

So thank you very much for your time. Appreciate today's conversation.

MS. RAITT: Thanks Mary. Thank you for that.

So we'll move on to folks on Zoom. We have a number of people making comments, so we'll limit it to three minutes per person and one person per organization, starting with Claire Broome. And for others, I'll open your line, but just one moment to say that if you did want to make a comment, you just use that raise-hand function to let us know.

So Claire Broome, if you'd like to go ahead?

MS. BROOME: Okay. Can you hear me?

MS. RAITT: Yes. Thanks.

MS. BROOME: Okay. So I'm Claire Broome, B-R-O-O-O-ME, and I am speaking as representative of 350 Bay Area, an environmental and ratepayer advocacy organization. And I'm a Professor of Public Health.

So I'd like to start by commending the CEC and the CPUC staff for an outstanding job of refining modeling and trying to (indiscernible)

land use. This is a critical exercise as part of meeting California's aggressive solar objectives.

Over the past five years, over half of California's solar megawatts were on the distribution grid. So I appreciate Vice Chair Gunda mentioning the DER proceedings. But I also think this is far more than demand modification.

Distribution grid resources are a critical part of meeting artists older goals. Also, they will save ratepayers money because there's less need for transmission. They also are likely to help us with conserving valuable biodiversity of land areas and minimizing conflict over land use.

Currently, the RESOLVE model does not differentiate between solar on the transmission versus distribution grid. I strongly urge the Energy Commission and the PUC to use -- to be able to optimize both distribution grid and transmission grid solar in their modeling for the IEPR and the IRP.

Thank you very much.

MS. RAITT: Thank you.

Next is Shannon Eddy. If you could go ahead and state your name and affiliation, if

any, and spell your name, please?

MS. EDDY: Great. Thanks Heather.

My name is Shannon Eddy, S-H-A-N-N-O-N E-D-D-Y. Okay. Did we get it?

MS. RAITT: Yeah. Sorry about that.

MS. EDDY: That's okay. No problem.

Hi everybody. My name is Shannon Eddy, S-H-A-N-N-O-N E-D-D-Y. I am the Executive Director of the Large Scale Solar Association. And thank you, everyone, for the presentation today.

You're going to have a little bit of a rant from the solar industry as we're digesting this. And there's a lot to take in. And some of what we're seeing is raising some fairly significant red flags. So I want to give you some examples of what has caught our attention, and then talk a little bit about recommendations for going forward.

So a few examples of where there are some real gaps in this, the DRECP DFAs are being represented as wholly developable -- excuse me, wholly developable when, in fact, we now know that they are not due to multiple DRECP citing restrictions. Half of the Eastern Riverside DFA

is not open to development due to the presence 1000s of microphyll woodlands. More than 75 percent of the Imperial DFA is off limits to solar due to a CEC's utility corridors and geothermal carve outs.

In addition, the footprint looks like the footprint of operating in-construction solar projects in the DRECP are shown as being available for development.

Beyond the DRECP, and I noted some of this in the written Q&A, there are large areas of solar identified in northern California forestlands, which is obviously not viable. The draft screens propose major reductions in usable farmland areas, in spite of the fact that half a million acres of farmland are expected to be fallowed due to groundwater restrictions. The ten degree slope exclusion for solar is something industry has advocated for years to eliminate as an unnecessary restriction and yet it was used as an input for the baseline screen. The screens don't provide analysis regarding pacelization how it influences which areas are developable and which are not.

So these are important details that need

to be factored pretty early on in these kinds of mapping processes, especially given the regulatory reach and operational use that's expected for these screens. We have to remember that this effort is specifically designed for electricity system planning, and also fairly granular mapping in the case of busbar mapping, and yet the process seems to be pretty divorced from the kind of electricity planning considerations that do affect real world development.

So I'm sorry to be the skunk at the party here. And I do wish I had more positive feedback for you. And I understand this is not an easy exercise given the multiple land use and conservation pressures that that we're all facing in this state. However, I also understand that the state is formally proposing to add 86 gigawatts in 12 years to a 50 gigawatt grid, and that solar is going to be expected to contribute almost half of those gigawatts.

So we urge you to do better in coordinating and consulting with the industry to provide for more fulsome sets of screens that can really help the state meet its targets. To that

end, we do urge you to make the shapefiles available to us immediately so we can review the layers ourselves, assess viability, and provide informed comments in the next three weeks.

Thanks again for your time. Appreciate it.

MS. RAITT: Thank you.

So next is Joan Taylor. Please go ahead and state your name and affiliation, if any.

MS. TAYLOR: Yes. Thanks. Joan Taylor. No affiliation today, although I was an appointed conservation stakeholder for the entire DRECP.

Can you hear me?

We applaud the CEC effort here. And glad the PUC is also representative because it's critical that all state agencies coordinate to meet both the 30x30 and the state's decarbonization goals.

Recognize that, whereas the best wind and geothermal resources are geographically constrained, solar could be used everywhere. This is a disruptive technology. Like cell phones, solar PV does not have to be tethered to wires.

While not totally on point on your

datasets, I think it's critical today to emphasize looking at the least costs holistically, not narrowly. The Joint Agency SB 100 Report for 2045 forecasts roughly 70 gigawatts of industrial solar, on top of distributed. That's nearly half a million acres. It's astounding. It's more than the roughly 300 million to 400 million acres needed to meet the state's 30x30 goals. It is potentially enormous type conversion and resource destruction, unnecessarily, and lack of natural and working lands which are only proven method to sequester carbon.

So I want to draw a couple of -- attention to a couple of issues.

The Senate Bill 350 called for doubling additional energy efficiency from 2015 to 2030. But we don't see CEC implementing or reporting its progress. Controlling demand directly and profoundly effects the new renewable energy that will be needed to serve building and transportation electrification, and to avoid constantly moving goalposts.

Another -- the key state agency partner, namely California PUC, needs to start also moving

in the same direction as CNRA and CEC in planning. The PUC's NEM proceeding is now moving in the opposite direction. PUC models undervalued distributed generation and they need to recognize its health, energy reliability, avoided transmission costs and charges, and preservation of natural and working lands.

The PUC's proposed NEM would kill customer-side solar. So both energy agencies should be incentivizing distributed energy resources, including storage, to harness this huge potential of DER to provide energy security and protect other societal values.

So let's ensure we can look back ten years from now and be proud that we control demand, utilize the full potential for DER, and decarbonized while preserving the state's critical natural heritage and carbon sinks.

Thanks very much.

MS. RAITT: Thank you.

Before I move to the next person, just a reminder, if you want to make comments and you're on Zoom, you can press the raise-hand function. And if you're on the phone and you want to make comments, press star nine.

So next is Kate Kelly. Please go ahead and state and spell your name for the record and name and your -- provide your affiliation. Kate, I might have -- did we lose you, Kate? Okay, well, we can go back.

So Neil Nadler, go ahead and unmute your line.

MR. NADLER: Yes. Yes. Yes. This is Neil. Can you hear me?

MS. RAITT: Yes. Go ahead.

MR. NADLER: Hi. Good afternoon. You know, really a good job that you people have done today. I actually had to leave in the middle, I had a engagement, but I came back. And I do want to say a couple of things.

Number one, I was a stakeholder in the San Bernardino County Renewable Energy Element and General Plan, and also the 2040 Update to the General Plan. And I was very actively involved in the DRECP, as well as I'm a member of a number of NGOs. A couple of things that I want to address.

First, the ACE 3, which is the CDFW, is a -- it's not accurate. It's not absolutely accurate. And there are a number of habitat -- I

mean, wildlife corridors that were and are and have been studied for the last 20-plus years that, because of politics, they never got into the ACE 3 program, and it had to do with the DRECP as well, and that needs to be addressed and to be dealt with.

I believe that the data sharing is very, very important. And this information should be available in Data Basin, not just in the GIS format.

Equity conflicts, I think that you're going to experience, in San Bernardino County especially, that -- where they, the CAISO and CPUC and California Energy Commission, have been trying to develop in Lucerne Valley for a long, long, long time, that you're going to have problems with environmental justice there.

There are, you know, obviously, some important documents I haven't seen. Erica mentioned the West Mojave solar increasing. I would really like to see what she's talking about there.

And lastly, and most importantly, I agree with Joan Taylor and the people from Bay Area 350 that distributed generation needs to be counted.

You know, I produce 90 percent of my own energy that I consume, and it will be 100 percent in a matter of months. So I fully agree that the DER does need to be included in this discussion.

Thank you.

MS. RAITT: Thank you.

Let's try Kelly. Kate Kelly, again, please go ahead. You can unmute your line on your end, Kate.

MS. KELLY: There we go. Thank you so much. Good afternoon. This is Kate Kelly and I'm here on behalf of Defenders of Wildlife. We appreciate today's workshop and the intensive efforts of staff to update the Land-Use Screens.

Energy Planning is land use planning. And comprehensive, proactive land use screening is an essential performed energy planning that meets our energy needs while protecting natural cultural resources. Clearly, I'm not saying anything new here and probably preaching to the choir, given the great workshop today.

And we appreciate seeing the collaboration and shared data between the energy and resource agencies and look forward to seeing these screens and their ongoing updates

incorporated into the IEPR.

The panel discussion was particularly valuable on the value of public-facing mapping tools. Web-based mapping tools are fundamental for stakeholder participation, as has been played out by others today, in supporting fully informed collaboration and decision making.

A quick glance at some of them, we see a couple of requirements that are needed for protected lands and biodiversity datasets. For example, the Mono Basin seems to be triggering a high value for geothermal, solar and wind, although that area is both in -- by state sage grouse habitat and has various layers of state and federal protections. So there's an area to continue to look at more.

We'll be diving into the tool and ask that the underlying datasets be released as part of the mapping tool prior to finalizing the report to allow parties to provide informed comments, really be able to dig in and understand how it's put together.

Thank you again for the workshop today. And I appreciate all the work that the staff and commissioners have put into this.

MS. RAITT: Thank you.

So next is Nancy Rader.

MR. RADER: Hi. Good afternoon. Nancy Rader, N-A-N-C-Y R-A-D-E-R. I'm Executive Director of the California Wind Energy Association.

I appreciate Commissioner Vaccaro flagging my chat comment above the need to use the best available wind resource data. We actually raised this issue in our comments.

MS. RAITT: Oh, I'm sorry, Nancy. Go ahead.

MR. RADER: Okay. I'm not sure where we left off.

But we raised this issue of the wind resource data over a year ago in our written comments. And we met with staff to discuss it in detail back in June. So I was really surprised and disappointed to see that the draft Analysis continues to use wind resource maps based on really dated wind resource data at 80 meters above ground when, today, when turbines are routinely installed at 100 meters or higher. A 100-meter map, and other updated inputs that are also needed, would show more land area with wind

speeds that are sufficient to support commercial projects.

So continuing with staff's lasagna analogy, the analysis we saw today really left some key ingredients at the store. Better data is publicly available at just a modest cost. And so we strongly recommended that the Commission obtain it for this important public purpose. Otherwise, this analysis we'll be using a base map for wind that completely misses many good resource areas.

Thank you. Okay, thank you.

MS. RAITT: Okay. Thank you.

Next is Ellen Wolfe.

MS. WOLFE: I think you can hear me okay.

MS. RAITT: Oh, excuse me. Go ahead. Yes.

MS. WOLFE: Yeah. My name is Ellen Wolfe. It's W-O-L-F-E. I work for Resero Consulting.

I have a number of clients that participate in IRP and in the SB 100 forums and are very interested in in these processes and the work that the CEC is doing.

Primarily, the clients are bringing

solutions for California's reliability and carbon needs in the form of renewable generation development and/or transmission to interconnect those resources. And interestingly, a lot of the development activity is taking place right at the border of California, or in some cases on the other side of the border of California.

The work that the CEC has done is fantastic, it's really amazing, and it was a pleasure to participate today. You may recall one of Jared's slides where he showed the transmission capabilities of different areas in the RESOLVE model. And in that slide, you can see that there are some bits in the RESOLVE model of the CAISO that sit outside California. And these are areas where the generation interconnection queues are quite large because it's both easy and inexpensive to develop. And these resources are directly connected to the CAISO load.

The problem is, however, a bit of the conundrum where the CEC focuses on the California footprint. The Land-Use Screens that are used for those bits outside of California rely on WECC very general Land-Use Screens.

And carrying on with the lasagna analogy, those screens, the quality of them, is more like a plate of spaghetti with marinara sauce or a can of SpaghettiOs. It doesn't come close to the quality of the information that's in the screening that the CEC is developing. And what my clients are finding is that it's overly conservative, or it finds these resources to be much riskier than they actually are because of the very broad resolution or gross resolution.

So we urge you to find some solution to this, whether it's having stakeholders bring to the CEC these other data sources that can help refine the Land-Use Screens for these areas, or what -- somehow between the agencies, we need to find some solution. The CPUC staff, including Jared and his team, have done a decent job, I think, of looking at these areas.

But in the very important planning scenarios, like the SB 100 scenarios and the CAISO's 20 years scenario, the CEC hasn't been able to apply improved Land-Use Screens for these areas. So I encourage you to work with stakeholders and find a way to improve the quality of the data for those areas.

Thank you.

MS. RAITT: Thank you.

So if anyone else would like to make comments, please use that raise-hand function if you're on the Zoom platform. And if you're on the phone, you can press star nine. And we'll give it another moment to see if anyone else wants to make comments. Alright, I see none.

Can we go to the next slide? I think we're done with public comments.

So before we close that, if you don't mind, I could just plug a couple upcoming workshops. We have one coming December 2nd, our forecasts. And then December 7th -- excuse me, December 2nd on western electricity system integration, and the 7th on our forecast. And we plan to put out the Draft IEPR later this month, and eventually adopt it, after we have a couple opportunities for public comment, in February at the business meeting on February 15th.

And with that, we are done with public comment.

And, Commissioners, if you have any final comments you'd like to make?

COMMISSIONER VACCARO: Thanks Heather.

So, first of all, again, I think I'll close where I started, which is thanking you, Vice Chair Gunda, for your leadership in this space. This has been a really valuable workshop.

Again, just want to commend the CEC staff for a very impressive report. And I think, more importantly, that you invite and welcome the feedback. And I think we heard quite a bit just now in the public comment period.

I'm not going to call out by name, but someone said they don't mean to be the skunk at the at the picnic. And, in fact, you know, we need the skunk at the picnic. And we don't consider anybody to be a skunk. This is what allows us to do better work. And it ensures that we don't have blind spots. So I think we've heard a lot of good feedback today.

And I really appreciated the panelists participation. And that panel discussion, I think it was really illuminating.

And, Jared, again, thank you so much for really connecting those dots between -- I guess among the PUC, CEC and ISO processes, and giving us some really good timelines to be looking at.

So just think thank you all for the

participation today.

VICE CHAIR GUNDA: Yes. And thank you, Commissioner Vaccaro.

Just in closing, I wanted to thank Heather and her team, as usual, and thanks for like another excellent workshop.

I also want to call out Erica. Thank you for your work in pulling this work together. I remember talking to you, kind of like maybe a year ago, on kind of the need for this work. And I'm just both surprised and thrilled how quickly this came together in terms of framing and the collaborations necessary, and totally recognize, you know, the comments that were made to further improve and ensure that viewpoints are brought in.

And, again, I want to second Commissioner Vaccaro's point. You know, the public process is the heart of CEC's work. And, you know, without the valuable input, you know, we cannot have the embedded wisdom to do the work we do. So, thank you for all the wonderful comments, the panelists, and as well as our team and CPUC team here, thank you for your excellent work. And, Dr. Roth, taking the time to be a part of the

workshop today.

Looking forward to getting comments and continuing this work. You know, it's extremely important, the land use work, for, you know, many years to come. You know, the climate -- for the climate change, the conservation, you know, the equity implications, but all the nonenergy benefits, I think there's a lot of work on the shoulders of Erica and her team. Travis and Saffia, thank you for your work as well. I look forward to continuing to collaborate and working together.

Thanks. And we are adjourned. Thank you.

(Off the record at 4:41 p.m.)

CERTIFICATE OF REPORTER

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 5th day of December, 2022.

MARTHA L. NELSON, CERT**367

CERTIFICATE OF TRANSCRIBER

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

I certify that the foregoing is a correct transcript, to the best of my ability, from the electronic sound recording of the proceedings in the above-entitled matter.

MARTHA L. NELSON, CERT**367

December 5, 2022