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DRAFT STAFF REPORT - Land-Use Screens for Electric System Planning

Additional submitted attachment is included below.

November 1, 2022

California Energy Commission
Docket Unit, MS-4
Docket No. 22-IEPR-02
715 P Street
Sacramento, California
95814

Re: DRAFT STAFF REPORT - Land-Use Screens for Electric System Planning

Dear CEC Vice Chair Gunda and Members of the Commission:

On behalf of Sierra Club California, thank you for the opportunity to comment on the Draft Staff Report on Land-Use Screens for Electric System Planning (Draft Report). We strongly support the state's efforts to transition away from combustion towards a 100% zero-carbon grid. We also recognize the importance of land conservation to meet the state's 30x30 goals and keep carbon stocks intact and the land-intensive nature of large-scale renewable energy development.

Without careful planning, significant areas of affected ecosystems may be fragmented, degraded and lost, along with the species that inhabit them. We applaud the California Energy Commission (CEC) for developing geospatial land use screens, especially Screens 2 and 3. These screens can be a powerful tool to help California advance renewable energy generation capacity while protecting and preserving critical habitat, biodiversity, climate resilience, and other vital land uses.

In addition to advocating for the responsible and appropriate siting of renewable energy facilities, Sierra Club California continues to advocate for policies that will enable much greater energy efficiency and use of both customer-side and in front of the meter (IFOM) distributed generation of renewable energy in cities as well as throughout the state. Together these lessen the need for large-scale generation.

We believe these tools are necessary to meet the state's very ambitious, but critical, climate goals, and that the CEC must ensure that at the outset all potential distributed energy resources (including wholesale distribution resources) are modeled and transparently accounted for in determining the capacity need for large scale land-consumptive renewable development. This is especially important in order to properly inform the choice of primary land use screen for estimating resource potential in electric system planning.

Therefore, we ask that when planning for capacity needs for utility-scale renewable energy development, that the CEC:

1. Recognizes the full potential of energy efficiency and demand response to reduce energy demand
2. Fully utilizes and transparently models rooftop solar, distributed energy resources, and renewable energy development in urban areas on brownfields, parking lots, rooftops, etc.

As the CEC looks to further develop its land-use screens, it must:

1. Choose a land-use screen, such as Screen 2, that prioritizes conservation, leaving carbon stocks intact and preserving biodiversity
2. Revise base exclusions so that populated areas can be considered for the development of renewable energy resources
3. Ensure that Screens take local ecological and conservation concerns seriously

I. Capacity Needs Must be Modeled to Minimize Land-Use by Reducing Demand and Encouraging Smaller-Scale and Distributed Renewable Generation

Recommendations:

- Fully implement and track progress on meeting SB 350 additional achievable energy efficiency goals so this date can be inputted into the capacity modeling
- Fully utilize demand response measures to minimize need for increased generation and improve resiliency
- Broaden the scope of land use screening to consider all scales of renewable energy development; focusing only on large utility-scale renewables in non-urban areas creates an unnecessary barrier preventing California from fully benefiting from the potential of IFOM small-to-medium scale rooftop and distributed renewable energy resources
- Permit RESOLVE to select all IFOM distribution grid resources for use in IEPR, and CPUC's Integrated Resource Planning as these are central planning tools for CEC and CPUC

Modeling to estimate renewable capacity needs is the foundation for good planning. The model used for the SB 100 Core Scenario and the Draft Report must be inclusive of all renewable resources and transparently distinguish between them. The focus on utility-scale renewables (page 9 of the DRAFT Report), especially large utility-scale solar, ignores significant potential that exists on previously developed lands in the state. For example, a 2016 National Renewable Energy Laboratory (NREL) Report[1] found sufficient rooftop solar potential in California to satisfy 74% of the state's 2013 energy use. A more recent UCLA study of the Investor Owned Utility areas of Los Angeles County [2] concluded that nearly 30% of the in-building demand could be satisfied by rooftop solar.

[1] Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment: https://www.nrel.gov/docs/fy16osti/65298.pdf

[2] Net solar generation potential from urban rooftops in Los Angeles: https://www.ioes.ucla.edu/wp-content/uploads/2020-net-solar-generation-potential-from-urban-rooftops-in-los-angeles.pdf

Further, during the years 2020-2021, 52% of 5361 MW of new California solar PV capacity was connected to the distribution grid; 28% of that distribution grid PV was non-residential.[3,4] A land-use screen without consideration of the distribution grid potential in front of the meter (IFOM) ignores over half the sites where recent solar PV capacity has been installed. By ignoring the IFOM solar potential on brownfield sites, parking lots, and other developed lands in urban and suburban areas, the land-use screens omit significant potential that could be associated with sites that would not require new or existing transmission lines. Such sites could be connected to the distribution grid thus reducing peak demand on the transmission grid. Distributed renewable energy resources also provide other benefits including energy resilience, reduced air pollution, local job creation, and direct benefits to renters and low-income households via community solar projects. Capital costs for new transmission lines and ongoing monthly charges on ratepayers for Operation and Maintenance of transmission lines could be avoided.

Because the RESOLVE optimization model uses land-use screens that only consider utility-scale solar and it incorporates estimated trends in behind-the-meter solar growth as a fixed input, the RESOLVE model is not able to optimize for or select wholesale distribution generation resources (in front of the meter). Since these can be connected directly to the distribution grid, they are approximately 3 cents cheaper per kWh and therefore would be "least cost" compared to PV requiring the transmission grid. Omitting wholesale distribution potential locks in added costs for transmission and unnecessarily increases pressure to develop remote utility-scale projects that can harm the health of California's natural and working landscape.

Regarding in front of the meter distribution grid resources, it is unclear how these are factored into the CEC models. What capacity is estimated for these resources which represent significant potential? In 2009 the Renewable Energy Transmission Initiative (RETI) recognized potential for a substantial number of 20 MW PV projects connected to 69-115kv substations throughout the state[5]. Then in 2011 the CEC's 2050 RPS and Acreage Calculator for DRECP[6] projected 18 GW of "utility-side" distributed generation. Today this would be a conservative estimate, since an area such as the Inland Empire alone could support as much as 4 GW on its estimated billion-plus square feet of warehouses.[7]

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[3] The two-year 2020-2021 new in-state PV capacity of 5361 MW for California is the sum of 779 MW non-residential distribution grid PV plus 1995 MW residential (distribution grid PV) plus 2587 MW utility-scale PV.

[4] California Distributed Generation Statistics, Statistics and Charts: https://www.californiadgstats.ca.gov/charts/; California Solar Energy Statistics and Data: https://ww2.energy.ca.gov/almanac/renewables_data/solar/index_cms.php

[5] 2009 RETI Phase 1B final pp 5-27 to 5-31 (link unavailable)

[6] Calculator was made available during the Desert Renewable Energy Conservation Plan proceeding. The website now says to contact the CEC for historical documents. If you have trouble finding the calculator, please reach out to daniel.barad@sierraclub.org. https://www.energy.ca.gov/programs-and-topics/programs/desert-renewable-energy-conservation-plan

[7] What a billion square feet of warehouses looks like (2022-05-02): https://www.theverge.com/23053387/billion-square-feet-warehouses-california-inland-empire-online-shopping, 1,000,000,000 sq ft = approx 24,000 acres = 4 GW PV at 6 ac/MW

Regarding wind resource capacity needs, it is unclear if or how CEC's modeling inputted re-powering of older turbines at the end of their useful life. Even without increasing the nameplate capacity of a wind farm, the capacity factor will increase by virtue of much taller new turbines.[8] Re-power potential needs to be modeled and reported.

It is important to note that the capacity projections for utility scale solar and wind in the SB 100 Core Scenario are inconsistent in certain important respects with recommendations in the Utility-Scale Renewable Generation Technology Roadmap (Roadmap). The Roadmap calls out CEC's commitment to California's loading order, which is to meet energy needs first with energy efficiency and demand response, and only then with new renewable energy.[9]

Yet energy efficiency, and specifically meeting SB 350 goals, appears to have been largely neglected in recent years. SB 350 established a requirement to double cumulative Additional Achievable Energy Efficiency in every year between 2015 and 2029, saving another 20,000 gigawatt-hours per year by 2029. If fully implemented, SB 350 would translate to over 50,000 acres of avoided large scale solar (see Energy Efficiency - Acreage Calculator[10]). Yet CEC is evidently not tracking this important policy mandate, even though energy efficiency is the prime tool in the state's loading order.

II. Land Use Screen Must Prioritize Conservation, Keeping Carbon Stocks Intact, Protecting Biodiversity, and Minimizing Wildland Development

Recommendations:

- Land use screens should include datasets that allow assessment of compatible sites near population centers, including but not limited to reservoirs, brownfield sites, parking lots, and other ground mount distributed generation in high population areas of the state and should quantify area for the same, including rooftop potential. Datasets that allow site assessment and area quantification for renewables generation on irrigation canals, highway and railroad rights of way, airports, military lands, etc. should also be included.
- The primary land-use screen for electric system planning should include a dataset of current known organic and inorganic carbon sinks such as desert soil crusts and root systems, grasslands, natural sage habitat, etc. In addition, the screen chosen for the primary land-use screen should include a dataset of presumptive climate refugia to enable flora and fauna to move and adapt to projected increased temperatures and decreased precipitation.
- Screen 2 (potentially augmented with datasets for potential wholesale distribution generation in urban and non-urban areas, carbon sinks, and select climate refugia) is the optimal choice as the primary screen for estimating renewable resource potential.

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[8] Wind Energy Grows Up: https://www.energy.gov/eere/wind/articles/wind-energy-grows

[9] 2021 SB 100 Starting Point for the CAISO 20-year Transmission Outlook, pg ii: https://efiling.energy.ca.gov/GetDocument.aspx?tn=239685&DocumentContentId=73101

[10] Calculator was made available during the Desert Renewable Energy Conservation Plan proceeding. The website now says to contact the CEC for historical documents. If you have trouble finding the calculator, please reach out to daniel.barad@sierraclub.org.
https://www.energy.ca.gov/programs-and-topics/programs/desert-renewable-energy-conservation-plan

- Datasets for biodiversity, landscape intactness, terrestrial climate resilience, tribal lands, and croplands in adjacent states should be utilized to inform the creation of land use screens in California, especially where regional (cross-border) protection of these resources is warranted
- Consult with local governments, regional conservation districts, tribes, communities, and others to ensure that the Screens do not show protected or sensitive areas as well suited for development.

The use of geospatial land-use screens can be a powerful tool to help California advance renewable energy generation capacity while protecting and preserving critical habitat, biodiversity, climate resilience, and other vital land uses. The Draft Report's proposal to update earlier land-use screening methodology to reflect new state conservation priorities is appreciated (page 16). Similarly, the opportunity to refine the updated screens via public review and comment is important and will improve the accuracy and utility of the land-use screens.

Excluding Gap 1 and Gap 2 lands (Table D-2 of the Draft Report) in electric system planning is also critically important to supporting the state's 30x30 goals for natural and working lands. The 30x30 goals recognize the importance of functioning natural ecosystems for climate resilience, carbon sequestration, as habitat for existing biodiversity, and for protection of at-risk or endangered species. Further, the inclusion of CA Nature's 30x30 Conserved Areas, Terrestrial dataset, is a positive and valuable refinement of the land-use screening process (pg C-7 of the DRAFT Report). Including protected city 7 and county lands that were previously omitted from land-use screens is appropriate and greatly appreciated.

However, there is room for improvement in the land-use screens.

First, the land-use screen "base exclusions" effectively close the door to the possibility of realizing the multiple benefits of new renewable energy projects in or near population centers. For example, the LandScan and the Population Buffer (Table D-1) exclude from planning the potential of solar development in urban and suburban areas of the state.

Planning that does not recognize the potential in or near urban centers also creates a barrier for urban communities, many of which are communities deemed vulnerable to environmental and socioeconomic hazards, to benefit from community solar. The previously cited UCLA study noted the following: "The largest unutilized capacity [in Los Angeles County] occurs in areas assessed as higher-risk of economic insecurity and environmental hazard by CalEnviroScreen." To ignore this capacity in electric system planning is a structural omission by the CEC that perpetuates environmental injustice in California.

The recommended primary land-use screen for electric system planning should also include all credible datasets for biodiversity, cropland, landscape intactness, proximity to protected areas, and terrestrial climate resilience. Natural and working landscapes are recognized by the 2021 SB 100 Joint Agency Report as a "key component of meeting the state's carbon neutrality goals." The report states that "Policy in the electricity sector must be made with a clear understanding of the need to balance increased renewable energy demand with loss of ecosystem carbon storage and loss of future sequestration

associated with large footprint energy resources such as utility-scale solar."[11] In order to achieve this goal, electric system planning must be informed by land use screens that identify existing carbon sinks.

As indicated in Chapter 1, pg 12 of the Draft Report, "land-use planning that identifies important locations for land conservation and those more suitable for renewable resource development will ensure the state conserves the health of its natural and working landscape…" However, even Land-Use Screen 2, the most conservative of the three proposed screens, identifies nearly 3.7 million acres of land suitable for new wind and utility-scale solar resource development, which is many multiples of the acreage for solar in the CEC's Starting Point[12] and even in the Joint Agency SB 100 Core Scenario. The far less rigorous Screen 1 is blind to important sensitivities, so its 7.6 million acres of renewable resource potential is illusory. Should CEC use Screen 1 for the primary screen, it would defeat the very purpose of land use screening: to avoid conflict and delay for renewable projects and to preclude stranded transmission assets.

Further, the Draft Report's recommendation to use Land-Use Screen 1 as the primary screen for estimating resource potential in electric system planning (pg 47 of the DRAFT Report) is problematic in two ways:

First, without justification, it exaggerates the potential need for undeveloped land use (5.32 million acres for solar and 2.32 million acres for wind) because, as outlined above, it ignores potential in high population areas of the state.

Secondly, it undervalues or obscures the need for and benefit of intact habitat and terrestrial climate resilience. Historic land use practices in California have resulted in the need for a 30x30 campaign to protect and preserve the biodiversity hotspots that are unique to California and part of our natural heritage.[13] It is now essential that land use planning not only acknowledge our existing (historic) biodiversity but also value the remaining intact landscapes and protect those areas as essential to climate resilience and preservation of our natural biologic resources.

At this time, the land-use analysis excludes consideration of out-of-state renewable resources (pg 22). While this is understandable in terms of state boundaries, it does not address the regional nature of energy and natural resources, especially biodiversity and intact ecosystems. To better reflect the extent to which California energy demand may impact out-of-state resources, the CEC recommendation of using publicly available datasets for areas outside California is appropriate.

As a final, region specific note, Screens 1 and 3 appear to overlap between the Resource Potential Areas and Coachella Valley MSHCP (CVMSHCP) Conservation Areas, and any such overlap would be extraordinarily problematic, regardless of whether the land is publicly or privately owned. The CEC

[11] 2021 SB 100 Joint Agency Report, page 113:
https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity
[12] 2021 SB 100 Starting Point for the CAISO 20-year Transmission Outlook, pg 5:
https://efiling.energy.ca.gov/GetDocument.aspx?tn=239685&DocumentContentId=73101
[13] Sierra Club California's 30x30 Campaign.
https://www.sierraclub.org/california/sierra-clubs-california-30x30-campaign

should consult with local ConCoachella Valley Conservation Commission staff, who can provide a GIS layer showing all CVMSHCP Conservation Areas.

Generally, the CEC should consult with and solicit input from local governments, regional conservation districts, tribes, communities, and others to ensure that the Screens do not show protected or sensitive areas as well suited for development.

III. Conclusion

In sum, Sierra Club California very much supports this initiative to improve land-use screens for avoiding conflicts in electric system planning. We appreciate the opportunity to comment, and believe that more inclusive and policy-driven modeling as well as improvements to the screens will ensure CEC and other energy agencies have the tools to do so effectively.

Sincerely,

Daniel Barad
Associate Director