DOCKETED	
Docket Number:	23-SB-100
Project Title:	SB 100 Joint Agency Report
TN #:	252192
Document Title:	The Climate Center Comments - Joint Non-Profit Parties Comments on SB 100 2025 Joint Agency Report Kickoff Workshop
Description:	N/A
Filer:	System
Organization:	The Climate Center
Submitter Role:	Public
Submission Date:	9/8/2023 3:05:58 PM
Docketed Date:	9/8/2023

Comment Received From: The Climate Center
Submitted On: 9/8/2023
Docket Number: 23-SB-100

Joint Non-Profit Parties Comments on SB 100 2025 Joint Agency Report Kickoff Workshop

Additional submitted attachment is included below.

Docket 23-SB-100
SB 100 2025 Joint Agency Report

Comments of The Climate Center, Center for Biological Diversity, Local Government Sustainable Energy Coalition, 350 Bay Area, Local Clean Energy Alliance Following the August 22, 2023 SB 100 2025 Joint Agency Report Kickoff Workshop

September 8, 2023

The Climate Center, Center for Biological Diversity, Local Government Sustainable Energy Coalition, 350 Bay Area, and Local Clean Energy Alliance ("Joint Non-Profit Parties" or "Parties") hereby submit these comments to the California Energy Commission, California Public Utilities Commission and California Air Resources Board ("Agencies") regarding the August 22, 2023 SB 100 2025 Joint Agency Report Kickoff Workshop ("Workshop").

The Joint Non-Profit Parties appreciate the detailed presentations offered at the Workshop and all the work the Agencies are doing to determine the most effective pathway to achieve the mandates of SB 100. The purpose of these comments is to urge the Agencies to include a "maximum distributed generation" ("Max DG") pathway in the 2025 Report pathway analysis. The analysis of this pathway should include estimates for the technical potential of maximizing solar photovoltaic installations on developed sites such as warehouse roofs, parking lots, shopping centers, highway rights-of-way and irrigation canals, and assess the extent to which realizing the technical potential would reduce the need to build additional utility-scale renewable generation and high-voltage transmission while providing local energy and non-energy benefits and avoiding problematic land-use issues. This pathway should also be adaptable for inclusion in each pathway the Agencies develop and assess, and not be isolated to only the proposed DER Focus pathway.

In the following comments the Parties express our concern that the analysis approaches the Agencies have taken to date, as well as the approach outlined at the Workshop, exclude a Max DG pathway from consideration. As we explain below, the structure of the Pathway Analysis presented at the Workshop will preclude the possibility of a Max DG pathway being identified as a candidate Capacity Expansion Resource Portfolio, due in large part to the positioning of Non-Energy Benefits/Impacts and Land Use Analysis in the analysis process flow. The approach presented at the Workshop inappropriately relegates Non-Energy Benefits/Impacts and Land Use Analysis to an inferior subsidiary position, applying them as an afterthought to the portfolio formation. Based on several prior analyses cited below, the Parties believe that a Max DG pathway would be extremely beneficial for achieving the SB 100 mandates cost-effectively and with due consideration of non-energy benefits/impacts and land use concerns and should be explicitly included in the SB 100 2025 Report analysis.

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Missing from the SB 100 Analysis: A Maximum Distributed Generation Pathway

The SB 100 activities to date and the study plan described at the Workshop focus primarily on the need to build bulk system assets, i.e., utility-scale generation and transmission, to meet SB 100's 2045 mandates. Estimates of the need for bulk system assets assume that most if not all distributed energy resources ("DERs") will be deployed on end-use customer premises, behind the meter ("BTM"), and will provide services and benefits to the state's power system only in the form of conventional demand response and its newer variations such as load shifting and load flexibility services. In other words, there seems to be no consideration of locally-deployed DERs, particularly front-of-meter ("FOM") distributed renewable generation and storage, as a significant contributor to the supply of renewable energy to meet the SB 100 mandates.

The 2021 SB 100 Joint Agency Report issued in March 2021, for example, includes only two types of solar PV generation, "customer solar" and "utility-scale solar," in its core and study scenarios.[1] The companion Inputs and Assumptions document states, in its discussion of candidate resources: "Candidate solar photovoltaic resources are represented as either utility-scale or distributed."[2] The Inputs & Assumptions document offers no definition of distributed solar, but the discussion of solar profiles later in that document considers only utility-scale and behind-the-meter solar.[3]

The 2021 Report frequently mentions concerns about land-use impacts, but only in terms of "balance[ing] clean electric grid infrastructure needs with efforts to restore, conserve, and strengthen natural and working lands."[4] The 2021 Report's extensive discussion of land use and environmental impacts[5] lays out a number of important considerations that must be taken into account in siting utility-scale generation and transmission, but there is no suggestion to explore the potential of maximizing solar installations on the built environment, which would avoid land-use issues.

Perhaps most tellingly, the Governor's May 2023 Clean Energy Transition Plan includes only utility-scale solar in its projections for clean electricity resources by 2030 and 2045.[6] The Plan also notes the lack of "significant procurement of certain diverse resources – such as offshore wind, geothermal generation, and long-duration energy storage – needed to meet the state's clean and reliable portfolio" and attributes the lack of results to the development complexities of those resource types and the "fragmentation among [CPUC-jurisdictional retail] sellers."[7] Here again, by excluding solar installations on the built environment in the potential resource mix, the Plan eliminates resources that are inherently local, use conventional resource types, avoid land-use concerns, and can be scaled to serve the renewable portfolio needs of California's diverse load-serving entities.

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[1] 2021 Report, pp 9-15.
[2] Inputs & Assumptions: CEC SB 100 Joint Agency Report, issued June 2020, p 34.
[3] Id., pp 68-69.
[4] 2021 Report; see recommendation 3, p 20.
[5] Id., pp 111-114, and recommendation 3, p 134.
[6] Building the Electricity Grid of the Future: California's Clean Energy Transition Plan; May 2023; p 7.
[7] Id., p 15.

Turning to the Workshop presentations, the 2025 Report Vision proposes five pathways or scenarios that will be evaluated for purposes of the 2025 Report. It describes the "DER Focus" scenario as "Higher levels of local resources, including distributed energy and community solar"[8] but offers no explanation of what types of distributed resources will be considered. Later the presentation indicates that the DER Focus pathway, compared to the "Reference Pathway," will feature a Climate Resilience Land Use Scenario; Demand Assumptions: DER Sensitivity; Increased DER; and More DR and Load Flexibility.[9] The Parties understand, based on an email response from Erica Brand at the CEC, that further details about the DER Focus Pathway and the other pathways are not yet determined and will be defined by the Agencies through an Inputs & Assumptions workshop this fall.

The Parties look forward to participating in the upcoming SB 100 workshop process. At the same time, we are seriously concerned based on the record thus far that the Agencies are looking exclusively at approaches to SB 100 compliance that rely entirely on procuring utility-scale generation and transmission while limiting the contribution of DERs to various options for load modification using BTM customer deployments. We believe that this represents a serious blind spot in the SB 100 analytical approach by excluding from the start, with no opportunity for consideration, an entire field of resources that could accomplish SB 100's mandates faster, more cost-effectively and without the problematic land-use issues inherent in an approach that relies almost entirely on bulk system resources and load management.

Prior Estimates of the Technical Potential of Solar PV on the Built Environment

Maximizing solar PV installations on the built environment is not a new or particularly innovative idea, nor does its assessment require new analytical techniques. The following are examples of rigorous assessments of distributed PV technical potential which demonstrate the importance and feasibility of examining this potential carefully in the SB 100 2025 Report process.

The first rigorous analysis we point to is the January 2016 report from the National Renewable Energy Laboratory (NREL), which provides a "detailed data-driven analysis of the U.S. (national, state, ZIP-code level) rooftop PV availability and technical electricity-generation potential." One important finding of their state-by-state analysis is that "California has the greatest potential to offset electricity use — its rooftop PV could generate 74% of the electricity sold by its utilities in 2013." This was based on estimated potential installed capacity of 129 GW and annual generation of 194 TWh. For the whole United States, NREL found the technical potential of rooftop PV to be 1,118 GW of installed capacity and 1,432 TWh of annual energy generation, which equates to 39% of total national electricity sector sales.[10] More recently, in June 2019 Google's Project Sunroof estimated a rooftop PV technical potential for California of 168 GW installed capacity and 249 TWh annual generation.[11]

[8] 2025 SB 100 Report Vision, slide 9.
[9] Id., slide 11.
[10] NREL, Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment; January 2016; for state-level totals see Table 6, pp 35-36; for breakdown by building size see Table 3, pp 26-27, and Table 5, pp 32-33. https://www.nrel.gov/docs/fy16osti/65298.pdf
[11] Google Project Sunroof: https://sunroof.withgoogle.com/data-explorer/place/ChIJPV4oX_65j4ARVW8IJ6IJUYs/

Looking at a different component of the built environment, a March 2021 paper in Nature, "Energy and water co-benefits from covering canals with solar panels," reported techno-economic simulations of solar photovoltaic panels covering California's 6,350 km canal network. While it focused on avoided evaporation (a potentially large non-energy benefit in a more water-scarce future) it found that "The net present value of over-canal solar exceeds conventional over-ground solar by 20–50%, challenging the convention of leaving canals uncovered and calling into question our understanding of the most economic locations for solar power."[12]

Focusing only on US warehouse roof capacity as of 2019, not considering all sites of the built environment that might host solar PV, an article published in April 2023 by Environment America Research & Policy Center estimated 185.6 TWh annual generation potential from rooftop PV, of which California warehouses could account for 32.2 TWh annually.[13]
The June 2022 Los Angeles County Community Solar Map report by UCLA's California Center for Sustainable Communities estimated 2,762 MW of rooftop solar PV capacity potential, plus between 704 and 1408 MW of parking lot potential, all combined will produce 5.44 TWh annual generation. The UCLA analysis showed that 2.1 million of LA County's 3.3 million households' energy consumption could be offset by this generation capacity. The analysis was based on shared distribution circuit associations, to link residential electricity consumption values to nearby eligible PV sites in order to estimate how much nearby residential electricity use could be offset by solar PV generation at each site. This approach was used to minimize the potential for reverse power flows along any particular circuit in the event of a temporary excess of PV supply over demand.[14]

The Parties offer these prior studies as indicators that the technical potential of a Max DG pathway utilizing the built environment could be game changing for California, and therefore deserves explicit definition as a candidate SB 100 Pathway and careful assessment in the 2025 SB 100 Report process.

Including a Max DG Pathway in the 2025 SB 100 Report Analysis

The Joint Non-Profit Parties urge the Agencies to begin an evaluation of a Max DG Pathway with an estimation of the technical potential of installing PV arrays on the built environment, including warehouses, shopping malls, parking lots, highway rights-of-way, irrigation canals, and other structures whose on-site electricity demand is likely to consume little or none of the energy produced at those sites. In other words, these structures would serve as sites for deploying renewable energy supply resources that could provide a sizeable portion of the renewable energy production required to comply with SB 100. The energy produced by these resources would be procured in much the same way as energy from utility-scale generators is procured, that is, by load-serving entities in their supply portfolios to serve their customers. In addition, energy from some of these facilities could be procured directly by customers if and when California adopts

[12] McKuin, B., Zumkehr, A., Ta, J. *et al.* Energy and water co-benefits from covering canals with solar panels. *Nat Sustain* **4**, 609–617 (2021). https://doi.org/10.1038/s41893-021-00693-8
[13] https://environmentamerica.org/center/resources/solar-on-warehouses/
[14] https://solar.energyatlas.ucla.edu/methods.html

workable rules for community energy, a topic which is currently being considered in a CPUC proceeding.[15]

The Parties recognize that estimating technical potential has not been part of the SB 100 study methodology to date and appears not to be under consideration for the Pathway analysis for the 2025 Report, which proposes to rely on capacity expansion and production cost modeling.[16] The Parties are concerned that the "Pathway Analysis" flowchart presented at the Workshop[17] will never produce a Max DG pathway for consideration, because the "Pathway Definition" portion of the flowchart will formulate candidate capacity expansion portfolios prior to considering the non-energy benefits/impacts and land-use analysis. In other words, under the analysis proposed at the Workshop, the non-energy benefits/impacts and land-use analysis will be used to evaluate the alternative pathways *only after the candidate pathways have been formulated without considering those benefits and impacts*.

Moreover, the flowchart makes no provision for feedback from the non-energy benefits/impacts and land-use analysis to the portfolio formulation step, though it does provide for feedback and potential portfolio modification from the reliability modeling, which places non-energy and land-use benefits in an inferior subsidiary position. As a result, following the flowchart presented at the Workshop will treat non-energy benefits/impacts and land-use analysis as afterthoughts rather than building them into the portfolio formulation. The appropriate remedy for this omission would be to formulate a Max DG pathway as described in these comments at the beginning of the analysis and assess it fully alongside the other pathways.

Conclusion

For the reasons discussed in these comments, the Joint Non-Profit Parties urge the Agencies to include a Max DG pathway as described above as a candidate SB 100 Pathway at the beginning of the 2025 Report process, starting with a quantitative assessment of the technical potential of such a pathway and its impact in reducing the need for utility-scale generation and transmission additions.

Respectfully submitted,

/s/ Lorenzo Kristov, PhD, on behalf of The Climate Center
/s/ Roger Lin, Center for Biological Diversity
/s/ Marc Costa, Board Chair, Local Government Sustainable Energy Coalition
/s/ Claire Broome, 350 Bay Area
/s/ Elsa Wefes-Potter, Local Clean Energy Alliance

[15] See California Assembly Bill 2316 (2022) and CPUC Docket A.22-05-022.
[16] 2025 SB 100 Report Vision, slides 17-18.
[17] Id., slide 16.