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CEC and CPUC portfolio planning needs smarter use of Distributed Energy Resources to limit rate increases

see attached

Additional submitted attachment is included below.

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July 7, 2023

Joint Agency Resource Portfolio Assumptions for the Next CAISO 20-Year Transmission Outlook to meet SB100 goals

Comments of 350 Bay Area: CEC and CPUC portfolio planning needs optimized use of Distributed Energy Resources to limit rate increases

We appreciate the thoughtful extensive work by the Joint Agencies to develop scenarios to reach California's ambitious clean energy goals, and to identify transmission needed to access the resources. It is therefore striking that the portfolio fails in substantive ways to optimize the contributions that Distributed Energy Resources (DER) could make toward meeting our climate goals. DER have demonstrated their feasibility at scale, can provide ratepayer savings as California increases electricity loads, can accelerate retirement of gas generating plants in Environmental Justice communities, can increase local reliability, and can minimize the environmental disturbances of transmission and utility scale remote installations.

Optimizing DER starts with prioritizing use of conservation and Energy Efficiency to decrease overall load. We recommend that the California Energy Commission emphasize Energy Efficiency as a resource, at a minimum, by tracking and reporting on the CEC website the state's annual progress toward meeting California's SB350 goal of doubling Additional Achievable Energy Efficiency.

DER generation and storage must be considered on a level playing field with remote resources. The portfolio of renewable generating and storage resources for Integrated Resource Planning in RESOLVE is selected largely based on the least cost of the generating capacity, with the assertion that utility scale remote solar and wind are cheaper per MW compared to distributed resources. However this lower cost does not include the capital, maintenance, and shareholder profit costs of long distance transmission (or associated line losses[1]) required to access those

[1] Transmission system energy loss averages 4%, however losses are higher and typically double during peak load periods. Losses per mile are reduced with higher voltage, but increase in proportion to distance.

resources. Currently, once the portfolio is identified, the transmission capacity required is calculated in a separate Transmission Planning Process. The ability to select resources which will result in the lowest cost to ratepayers requires incorporating the transmission cost required for utility scale resources at the point of resource selection, to enable a valid comparison with wholesale Distribution Grid resources.

Why should the Joint Agencies consider this major change in their approach to portfolio planning? As projected in the Affordability of Electricity White Paper, transmission is a substantial and rapidly accelerating portion of ratepayer bills[2]. California's high electricity rates are a cause for concern–therefore, addressing a major factor in future rates should be considered early in portfolio planning by fully integrating the 'total delivered cost' (TDC) of renewable power. Selecting the lowest priced energy product without consideration of the additional costs associated with delivering that product ("shipping and handling fees") is contrary to good budgetary and economic practices. Ratepayers are impacted by the total aggregate cost of energy service, and selecting components without holistic consideration of their broader effects is a classic example of being "penny wise and pound foolish".

The costs of two recent transmission projects in California demonstrate the urgency of defining the real costs of new remote generation. The renewable energy transport cost for SDG&E's Sunrise Powerlink Is approximately $0.09/kWh, or $90/megawatt-hour (MWh). The renewable energy transport cost of SCE's Tehachapi Renewable Transmission Project is about $45/MWh.[3] For comparison, the National RenewableEnergy Laboratory (NREL) projected the 2021 production cost for a commercial rooftop solar array to be $45/MWh[4]--that is, the same or less than the cost of new transmission for transport of energy. Because new transmission facilities add cost equal to the cost of commercial scale energy production at the distribution level, it only makes economic sense to select resources that require transmission if the price of that energy is $0, or if the supply of commercial scale distributed resources and cost-effective load mitigation measures have been fully utilized and is insufficient to meet demand.

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[2] CPUC,Utility Costs and Affordability of the Grid of the Future , February 2021

[3] Ibid Table 10: Large CAISO-approvedTransmission Projects, p. 38; Powers B Transmission-independent Renewable Energy:Parking Lot Shade Structures, Commercial and Industrial Rooftops https://desertreport.org/transmission-independent-renewable-energy/

[4] NREL, U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020 January 2021, pp. 102-103,Attachment B [Commercial Rooftop (200 kW), High resource (CF 20.4%), ITC] https://www.nrel.gov/docs/fy21osti/77324.pdf

The cost-saving potential for ratepayers of wholesale generation on the Distribution Grid must be considered.   In addition there are location specific health and environmental justice benefits of replacing gas generating stations with local clean renewable resources, and significant resilience and reliability value provided by resources on the Distribution Grid where they are inherently closer to the loads they serve. Consumers have costs due to Public Safety Power Shutoffs and associated undergrounding mitigation measures ascribable to remote installations which can be partially or wholly avoided to the extent that local resources are developed as an alternative. There are also Greenhouse Gas sequestration benefits to minimizing the acreage of forests lost to transmission lines and disruption of intact desert crusts lost to large scale solar. All three benefits – health & safety, resilience, and GHG sequestration – have substantial value which should be quantified and included in planning. All three benefits emphasize the importance of identifying and prioritizing sites on the Distribution Grid. Installations on the Distribution Grid can also be implemented more rapidly, facilitating acquisition of the renewable resources needed to meet the SB100 goals.

While we argue for a major change in portfolio planning, we also note that the 2022-2023 IRP cycle now includes distributed solar as a selectable resource, in addition to "utility scale solar" or behind the meter solar. Curiously the portfolio proposed at the June 23 workshop includes a mere 125 MW of distributed solar for the Final 2045 Portfolio (slide 35)[5].   However over the years 2017 to 2021, over half of the 16.5 GW of solar capacity installed in California was on the distribution grid. 18% of that total installed solar capacity, approximately 3 GW, was commercial or community solar[6]. Looking toward the future, models by NREL[7] and a UCLA study of Los Angeles[8] demonstrate the substantial potential to locate renewable resources on the Distribution Grid. The UCLA report shows that the City of Los Angeles alone has approximately 5,536 megawatts of physical rooftop solar capacity spread over the rooftops of single family homes,

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[5] Joint Agency Resource Portfolio Assumptions for the Next CAISO 20-Year Transmission Outlook to meet SB100 goals Workshop June 23, 2023

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

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

[8] 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; 'Bringing Solar Energy to Los Angeles' Available at - https://innovation.luskin.ucla.edu/wp-content/uploads/2019/03/Bringing_Solar_Energy_to_Los_Angeles.pdf

multi-family residences, commercial and industrial facilities, and government agencies. Each of these market segments contains different amounts of physical capacity and associated prices. There are 2,218 megawatts in the commercial and industrial segment, 1,752 megawatts in single family homes, 1,411 megawatts in the multi-family segment, and 156 megawatts on government and non-profit buildings. Because these estimates are based only on rooftop space, they represent the lower-bound of the City's aggregate solar generation potential, and omit the capacity that exists in parking lots and open spaces.

We note that the land use screens employ "techno-economic exclusions" which eliminate sites in urban and peri-urban areas. If the land use screens eliminate such sites from consideration in portfolio planning, how are the Joint Agencies incorporating potential sites for wholesale distribution resources, such as brownfields, highway right of ways, parking lots and commercial and industrial rooftops?

Behind the meter (BTM) solar is judged to not be economically competitive, based presumably on the cost of residential rooftop solar, and is incorporated as a baseline assumption into RESOLVE based on IEPR estimates. We note that behind the meter installations are inherently cost-effective in reducing customer loads, are paid for by the consumer, and can be cost-effective in exporting energy to the grid especially during peak or constrained conditions. A recently reported study by the New England ISO has identified rooftop solar capacity, including winter reliability benefits, as an important contribution to plans to close the Mystic Generating Station this summer. [9]

The IRP modeling also underestimates the potential role of batteries on the distribution grid, which are treated in IRP as a BTM demand-modifying resource. CAISO in their presentation mentioned their interest in "gas power plant retirements that may require transmission development to reduce local area constraints". We suggest staff first analyze whether local battery installations would be a faster, more cost-effective, and more environmentally responsible option to accelerate gas plant retirements in these areas, again compared to the costs of an alternative scenario which includes any required investment in transmission. Batteries, and other demand flexibility tools, demonstrate flexible modular economies at any scale and do not require large footprints or rights of way, allowing relatively easy deployment

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[9] https://www.eenews.net/articles/rooftop-solar-was-overlooked-now-its-closing-a-new-england-power-plant/ 6/29/2023

near or within load centers and areas of constrained peak supply. Over 750 MW of battery storage is being developed and operated just at the Moss Landing generating facility site for the purpose of reducing costs and use of gas peaker facilities. Such installations could be disaggregated and located adjacent to hundreds of substations or elsewhere within the distribution system at no additional cost. Behind the meter battery resources may also be greatly underestimated and underutilized if electric vehicle batteries are not appropriately considered and integrated into planning and operations. Total EV battery capacity in California is estimated to exceed 80 GW by 2030, and it will be extremely significant if even only 10% of that capacity is available in support of grid management during peak demand.

We also urge that the CEC incorporate the latest information on the status of installed DER, to help improve projections in the IEPR. For example, the 2022 IEPR update shows 622 MW BTM storage in 2021, whereas DG stats shows 717 MW BTM storage in 2021, going up to 986 MW in 2022.[10]

We appreciate the Joint Agencies' work with Lawrence Laboratories to refine quantitation of the potential from demand flexibility. Currently the portfolio only includes 'demand shed', anticipated to yield only 1111 MW. The 2022-23 IRP may have a sensitivity analysis of 'shift' DR from LBNL[11]; this also needs to incorporate the potential contribution from managed EV charging, and include potential for bi-directional (V2X) EV to loads or exported to the grid. As noted above, this represents an extremely large flexible resource. Given the importance of demand flexibility during grid stress conditions we urge an accelerated consideration of planning (and policy) to optimize this resource.

While beyond the scope of portfolio planning, it is important to note policy design which undermines the ability of DER to contribute optimally to meeting the SB100 goals. The current approach of billing the Transmission Access Charge on every kWh of electricity consumed by customers of Investor Owned Utilities incorrectly values energy generated on the Distribution Grid. If correctly charged, IOU residential customers would save .03 to .06 per kWh when load is served by wholesale Distribution Grid generation which does not utilize transmission capacity.

[10] https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update p 56 DG stats op cit

[11] https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2023-irp-cycle-events-and-materials/draft_2023_i_and_a_workshop_slides.pdf slides

(In contrast, most Municipal Utilities pay CAISO transmission charges at their interface with the Transmission Grid, not at the customer meter.) Such savings would factor into resource selection and development, increasing the supply of local capacity and reducing the need for future additional transmission capacity.

We also note that policy will be needed that fully compensates DER for the full value provided.

It is laudable that the agencies will be starting to utilize the CEC Land Use Screen tool to help inform siting large scale renewable resources and the transmission to serve them. Incorporating the constraints on land use is particularly important given the magnitude of resources needed, and the expense and long-term planning necessary for new transmission. California's initiative to conserve 30% of land by 2030 for biodiversity, climate mitigation, and habitat is also an important consideration in land use planning. As outlined above, it is also important to minimize the loss of intact carbon sinks when siting transmission and large-scale renewables.

In summary, 350 Bay Area urges the Joint Agencies to substantially revisit their approach to resource and transmission planning so that DER are correctly incorporated. The current approach to portfolio design substantially underestimates the role of solar, battery, and demand flexibility resources that do not require transmission, hence contributing to accelerating costs for transmission, some of which is likely to be unnecessary. This is a serious disservice to ratepayers, needlessly contributing to increasing the already high cost of electricity in California. The bias toward utility scale solar and batteries in the current approach could delay deployment of gigawatts of PV capacity until after new transmission capacity is in service, building in delays of more than a decade, time we do not have.