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November 30, 2022

The Honorable Siva Gunda, Vice Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: The Coalition for Community Solar Access' Response to Request for Information (Docket # 21-ESR-01)

Dear Vice Chair Gunda,

The Coalition for Community Solar Access ("CCSA") is a national, business-led trade organization, comprised of over 100 member companies and organizations, that works to expand access to clean, local, affordable energy nationwide through the development of robust community solar programs. CCSA's mission is to empower energy consumers, including renters, homeowners, businesses, and households of all socio-economic levels, by increasing their access to reliable clean energy. Community solar programs operate nationally in 22 states and the District of Columbia and support over 4.4 gigawatts of installed capacity. CCSA appreciates the opportunity to file this response to the Request for Information ("RFI") issued on November 7, 2022 to "inform staff on the resources and attributes that should be considered in the analysis required by the multiple legislative requirements of SB 846 and AB 205."

CCSA has worked consistently in California to bring the benefits of community solar to energy consumers and recently sponsored the passage of AB 2316 which hopefully will yield a successful community solar market in California. The bill requires the California Public Utilities Commission (CPUC) to review existing community solar programs to ensure they promote robust participation of low-income energy consumers. The CPUC is undertaking the required review in Application no. 22-05-022 et al. As part of that review, the CPUC will also consider implementation of new community solar programs. CCSA intends to propose an expansion of community solar programs in California using CCSA's proposed Net Value Billing Tariff ("NVBT") which will create a distributed solar program that more effectively reaches customers that do not have access to the clean energy and bill savings benefits of behind the meter solar programs without imposing new costs on non-participating customers. As proposed in AB 2316, the NVBT has broad support including ratepayer advocates, labor organizations, and environmental justice groups. Presently, over 13 gigawatts of rooftop solar have been installed in California with support from the state's net energy metering program and Title 24 mandates. In contrast, all other programs supporting access to distributed energy resources for the remaining millions of Californians who cannot install a system on their roof or property amount to less than 600 MW of program deployment. This situation encapsulates the significant equity gap for Californians who, while they support the deployment of distributed energy resources in

their rates, are unable to install a rooftop solar energy system because they are renters, lack suitable roof space or land, lack access to sufficient capital, or a host of other reasons.

In the Net Energy Metering Revisit docket, R.20-08-022, CCSA proposed the NVBT to fill this gap in programs for energy consumers. CPUC consultants found the NVBT to be among the most cost-effective means of serving this vast body of energy consumers with the NVBT showing Total Resource Cost Test scores of 1.14 to 1.69 and Ratepayer Impact Measure scores of 0.85-0.90 for solar plus storage systems.[1] This result is not surprising because the Net Value Billing Tariff utilized the CPUC's Avoided Cost Calculator ("ACC") to develop compensation for exported energy and CCSA designed the compensation structure to ensure community solar resources are primarily compensated for providing energy when the grid needs the energy most during the 5-9 pm evening ramp.[2] This overall compensation structure drives developers to install solar plus storage resources that meet grid needs as a basic function of project viability. The Net Value Billing Tariff then requires compensation to be shared with participating energy consumers via bill credits.

CCSA's efforts to expand access to community solar in California are directly related to development of the Clean Energy Reliability Investment Plan ("Plan") because community solar plus storage resources can be quickly deployed to provide the type of resources – namely solar plus storage – needed for reliability under the Plan while also sharing the financial benefits of doing so with energy consumers through bill credits. In this regard, CCSA encourages the CEC to look at not only deployment of resources but also support for business models that can share the benefits of resources deployed under the Plan with the millions of Californians who are currently stymied from participating, particularly low-income customers and disadvantaged communities. Accordingly, CCSA encourages the CEC to coordinate with the CPUC to ensure the CEC's Plan can effectively support community solar plus storage resources beyond the statutory requirement for the two agencies coordinating on the tariff implementation to meet the requirements of Title 24. Based on the above, CCSA offers the following response to the RFI.

I. Comments on Identified Resource Type and Evaluation Attributes

Question 1: Are the categories (indicated in Tables 1,2, and 3) appropriately representing how the CEC should be evaluating resources?

CCSA generally supports the list of resources specified in Tables 1, 2, and 3 and supports the qualitative attributes identified in Table 4. As noted above, CCSA's Net Value Billing Tariff directly incentivizes solar plus storage resources that inject in the 5-9 pm evening ramp. Thus, deployment of community solar plus storage resources will directly support reliability by injecting energy when the grid needs it the most and decarbonization by displacing fossil fueled

[1] See Cost-effectiveness of NEM Successor Rate Proposals under Rulemaking 20-08-020 – A Comparative Analysis, Energy+Environmental Economics and Verdant, submitted May 28, 2022, pg. 35, Appendix D, Table 5.

[2] See Proposal of the Coalition for Community Solar Access to Establish a Net Value Billing Tariff, R.20-08-020, filed March 15, 2020 (providing overview of CCSA's Net Value Billing Tariff).

generation currently used to serve net peak load during the evening ramp. To better characterize various resources and their relationship to evaluation attributes, CCSA offers the following observations.

First, "utility-scale" solar resources in Table 1 should be defined based on where the resources are interconnected instead of facility capacity: either on the transmission system (utility scale) or on the distribution system (distributed). This observation also applies to Table 3 where distributed solar is identified as less than 1 MW. From a resource perspective, distributed energy resources/technologies are typically characterized as those deployed at the distribution system level rather than at the wholesale transmission system level with the size of the customer's load or circuit carrying capacity determining the size of the facility. Making this change will also allow for a more clear-eyed consideration of how resources can meet the qualitative attributes identified in Table 4 as customer acceptance, policy alignment, and equity are not driven by the size of the resource.

The attribute of "dispatchability" should be clarified to focus on resources that will consistently be available at Net Peak and not just projects that can be dispatched by the CAISO. A critical objective of the Clean Energy Reliability Investment Plan will be to bring all types of resources online that can provide zero carbon electricity and reduce demand during the Net Peak hours even during extended times of high demand. A resource does not need to be fully dispatchable to meet this goal if there are other incentives to ensure it is available at the times it is needed and some resources that are dispatchable by the CAISO are not always available at Net Peak.

Question 3: Are there other attributes that should be considered, in addition to the ones listed in Table 4? If so, should those be considered for the qualitative or quantitative evaluation?

An additional attribute should be considered as part of the CEC's development of the Plan – Bill Relief. CPUC research has demonstrated that since 2013, bundled rates have increased by 37% for Pacific Gas & Electric Company, 6% for Southern California Edison, and 48% for San Diego Gas & Electric Company and bundled residential rates are forecasted to be approximately 12 percent, 10 percent, and 20 percent higher by 2030, respectively.[3] The upshot of these continued rate increases is that essential electric service is projected to decline in affordability with electric bills from essential usage likely to outpace increases in household income.[4] Given the declining affordability of electric rates, consideration of the ability of resources to provide bill relief to energy consumers should be added to the list of qualitative attributes the CEC uses to assess resources.

Question 4) How should the attributes be weighted relative to each other? should some attributes be weighted more than others?

[3] See Utility Costs and Affordability of the Grid of the Future: An Evaluation of Electric Costs, Rates, and Equity Issues Pursuant to P.U. Code Section 913.1, CPUC, February 2021, at pg. 7-8.

[4] See 2020 Affordability Report, CPUC, October 2022, at pg. 4.

It is imperative that the CEC prioritize the equity and policy alignment qualitative attributes when assessing resources. These two attributes focus on outcomes from the Plan and both are critical to a successful Plan.

Equity Should be Centered in the Plan

Centering the Plan on equitable outcomes will drive the benefits of deploying state funds to the disadvantaged and tribal communities so often locked out of consumer programs. Because community solar can address so many barriers that stymie low-income communities from participation in clean energy resources, one of the Principal Recommendations of the SB 350 Barriers Report is that "[t]he State should act to enable the economic advantages of community solar to be readily accessible to low-income and disadvantaged populations across California."[5] This call to action is more salient today than it was in 2016 given the sharp rise in electricity rates and the fundamental lack of access disadvantaged communities face from current programs. Meeting this moment, equity is at the heart of any new community solar program as AB 2316 requires that at least 51% of program capacity serves low-income customers.[6] Any Plan developed by the CEC should also center equitable outcomes as a priority.

Policy Alignment is Essential

It goes without question that policies developed by state agencies should be aligned to "row in the same direction." The CEC authorized community solar as a Title 24 compliance pathway as part of its development of the 2019 Title 24 Building Energy Efficiency Standards ("Standards") recognizing that community solar can provide significant benefits to energy consumers and help the state meet its climate goals. During adoption of the 2019 Title 24 Standards, the CEC found that the Standards would "increase the efficiency of and conserve the use of energy and water" and were cost-effective.[7] In doing so, the CEC found that the standards were *required* to meet the public interest because the Standards directly address numerous state policy directives including the 2003 Energy Action Plan, the Climate Action Initiative (Executive Order S-3-05)[8], the Global Warming Solutions Act of 2006 (AB 32), key recommendations of the Climate Change Proposed Scoping Plan[9], the Integrated Energy Policy Report, the California Long Term Energy

[5] See *Low-Income Barriers Study, Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities, adopted December 14, 2016, pg. 6.*

[6] See Public Utilities Code Sec. 769.3(c)(2).

[7] See Resolution Adopting Negative Declaration and Proposed Regulations, California Energy Commission Docket 17-BSTD-02, filed May 18, 2018, at pg. 5.

[8] Available at: https://www.californiaenvironmentallawblog.com/wp-content/uploads/sites/449/2013/01/Exec.-Order-S-3-05-Jun.-2005.pdf.

[9] Available at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/psp.pdf.

Efficiency Strategic Plan[10], the Clean Energy Jobs Plan, Executive Order B-18-12[11] and its associated Green Building Action Plan[12], and the Clean Energy and Pollution Reduction Act of 2016 (SB 350).[13] It is notable that many of the highlighted policies were joint actions between the CEC, the Air Resources Board and the CPUC as part of their coordinated efforts to address climate change. In adopting the 2022 Energy Efficiency Standards, which would expand the solar mandate to include not only new low-rise residential construction (as required under the 2019 Building Code), but also new high-rise multifamily buildings, nonresidential (grocery, retail, office, etc.) buildings and hotels and motels, the CEC found that the proposed regulations would "reduce wasteful, uneconomic, inefficient, and unnecessary consumption of energy" which serves the public interest and will make a major contribution in meeting the state's goals for reductions in greenhouse gas emissions from buildings.[14] The ability of resources supported by the Plan to address identified policy needs is of critical importance.

In addition to aligning numerous state policies identified by this Commission, a robust community solar plus storage program can also harness federal incentives. The Inflation Reduction Act (H.R. 5376, 117th Cong.) provides significant financial support for community solar plus storage by authorizing $7 billion to support low-income and disadvantaged communities to deploy or benefit from zero-emissions technologies through competitive grants.[15] The Inflation Reduction Act also makes available enhanced support through an Investment Tax Credit bonus for community solar facilities that ensure at least 50% of the financial benefits from the system flow to low-income participants.[16] Coupling these federal incentives with AB 2316's capacity requirement will result in enhanced financial benefits to participants and stretch state support from the Plan to achieve broad deployment to the millions of Californian's currently locked out of the benefits of distributed energy resource programs.

Question 5: What data/information sources can help inform characterization and evaluation (both qualitative and quantitative) of the difference resources

Overview of Community Solar to Inform Qualitative Evaluation

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[10] The California Long Term Energy Efficiency Strategic Plan was adopted by the Commission in D.08-09-040. The 2008 Plan is available at https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/e/5305-eestrategicplan.pdf.

[11] Available at: https://www.green.ca.gov/Buildings/resources/executiveOrder/.

[12] Available at: https://www.ca.gov/archive/gov39/wp-content/uploads/2017/09/Green_Building_Action_Plan_B.18.12.pdf.

[13] See Id. at pgs. 10-13.

[14] See Resolution Adopting Negative Declaration and Proposed Regulations, California Energy Commission Docket 21-BSTD-01, filed August 18, 2021, at pgs. 4, 6-7.

[15] See 42 U.S.C.A. § 7434.

[16] See Sec. 13103, Inflation Reduction Act (H.R. 5376, 117th Cong.), pg. 284.

The National Renewable Energy Laboratory produces research[17] related to community solar, including market trend analysis, addressable market analysis, customer impact analysis, and other research on community solar which addresses the questions related to attributes identified by the CEC.

Community Solar Plus Storage Costs for Quantitative Evaluation

A number of states have looked at the specific costs of community solar and community solar plus storage projects as well as the cost of providing different attributes such as subscribing low-income customers, placing projects on rooftops, etc. These programs and related analysis of community solar and storage are provided in Table 1 below.

CCSA envisions the Plan created by the CEC leveraging the tariff's ACC-based compensation and using incentives via the Plan's funding to drive faster project development and incentivize incremental values such as enhanced low-income customer savings. The states in Table 1 are good examples of states leveraging an underlying compensation structure (e.g., Net Metering, Value of Distributed Energy Resources tariff, etc.) and providing incremental incentives to support different policy objectives.

Table 1: State Evaluations of Community Solar Incentives Beyond Tariff Compensation

State	Incentive	Research underpinning incentive
New York	New York SUN program[18]	NYSERDA has an internal team that routinely evaluates project costs to adjust upcoming incentive blocks and make recommendations to the Department of Public Service for additional funding
New Jersey	Successor Solar Incentive Program (SuSi) Administratively Determined Incentive Program[19]	New Jersey Solar Transition Draft Capstone Report: Successor Program Review (Cadmus 2020)[20]

[17] See Clean Energy Strategies: Community Solar at https://www.nrel.gov/state-local-tribal/community-solar.html.

[18] NY Sun for Contractors - NYSERDA

[19] https://njcleanenergy.com/renewable-energy/programs/susi-program/adi-program

[20] https://njcleanenergy.com/files/file/NJ%20Solar%20-%20Draft%20Capstone%20Report%202020-08-11.pdf

Massachusetts	Solar Massachusetts Renewable Target (SMART) Program[21]	Solar Massachusetts Renewable Target (SMART) Program Summary (Massachusetts Dept. of Energy Resources, 2018)[22]
Illinois	Community Renewable Generation and Illinois Solar For All (ILSFA) Program	2022 Long-Term Renewable Resources Procurement Plan (Illinois Power Agency 2022)[23] See in particular Section 7.5."REC Pricing Model"

The incremental incentive varies in its form: in Massachusetts it is paid out as a $/kWh payment to the facility owner, in New Jersey and Illinois the incentive is a contracted REC payment. New York has an incentive regime most familiar to California: the New York SUN program is a declining block incentive modeled on the California Solar Initiative which pays out a $/kW-dc incentive to the project developer in stages over the project's development.

The states discussed in Table 1 use the NREL Cost of Renewable Energy Spreadsheet Tool (" CREST") which is a standardized project model which determines a project's financial viability. By determining what incentives are needed to make projects financially viable, the CREST tool can help policymakers determine what incentives are necessary to meet certain policy objectives. In response to questions on resource costs CCSA has used CREST with publicly available project cost data from NREL and state evaluations of community solar costs to determine the resource cost for community solar plus storage.

II. Resource Characterization

Question 1: Please provide a general overview of the resource, including the following: resource category (e.g., supply, demand) and type (e.g., solar) and scale (e.g., utility, distributed)

Community solar plus storage projects are distributed generation facilities that are typically between 1 and 5 megawatts-ac, though projects could be built up to the capacity of the distribution substation's transformers, which in some parts of California could approach 20 megawatts. Smaller projects are expected, particularly with federal incentives being limited to projects of 5MW-ac.

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22 https://www.mass.gov/doc/smart-launch-and-program-overview/download?_ga=2.264790863.1181886720.1541775161-483334923.1493903549

23 https://ipa.aem-int.illinois.gov/content/dam/soi/en/web/ipa/documents/2022-long-term-plan-23-august.pdf

Projects can be ground mounted or placed on rooftops and serve onsite loads or be export-only. As distributed generators, these facilities will interconnect through the utilities' distributed generator interconnection processes. Assuming an avoided cost based credit created by the CPUC will concentrate compensation, via customer bill credits, in the evening peak period (5 to 9PM), these projects will be paired with four-hour batteries sized to the same ac-rated capacity as the solar facility.

As shown in Table 2, community solar plus storage resources excel in meeting the attributes identified in the RFI.

Table 2: Community Solar plus Storage Attributes

Attribute	**Community Solar + Storage ability**
Readiness	Community solar plus storage has been deployed commercially at scale across the country in 22 states and D.C. with over 4.4 GW of installed capacity to date. Based on the ramp rate of other states and a conservative analysis of grid hosting capacity, California could deploy over 1 gigawatt of community-solar-plus-storage by 2025 if the CPUC has established regulations by the end of Q3 2023. The response to Question 4 below provides more details around this estimate.
Permitting	Community solar plus storage projects are smaller (less than 20 MW typically) and, therefore, simpler to deploy than utility scale projects due to faster permitting. In some cases, projects can be permitted using the local government's building permitting process. Since most projects would be built on existing buildings or already developed land, the CEQA process will be straightforward. Notably, since many smaller community solar projects would be developed under the NVBT all around the state, as opposed to a few larger utility scale projects, the success of community solar plus storage in meeting the needs identified in the Clean Energy Reliability Investment Plan is not dependent on the speed of any one project or jurisdiction.
Interconnection	Community solar plus storage projects can proceed through the CPUC's Rule 21 distribution interconnection study process, completing studies in as soon as 2 months in the Fast Track process and 6 months in an independent study process. This process is much faster than the typical 20+ month CAISO Queue Clusters interconnection process timeline.
Supply Chain	Community solar plus storage projects have not faced the delays in sourcing necessary equipment that larger scale projects. Unlike utility scale projects,

	community solar providers tend to maintain inventory rather than procure panels on a "just-in-time" basis. Also, smaller shipments of panels are less likely to be delayed in protracted reviews by US Customs. Projects may see delays on a case-by-case basis (e.g., substation transformer upgrades waiting on delayed transformers) but not on a systematic basis.
Customer Acceptance	Community solar plus storage is a proven customer product that can be adopted by industrial, commercial, and residential energy consumers regardless of their home or financial situation. CCSA's NVBT would not require credit scores or upfront payments by subscribers to participate. The projects themselves can be built on rooftops and already developed land where they are unlikely to face community opposition.
Cleanliness	Community solar plus storage creates no emissions and can help reduce the dispatch of high emitting peaker resources in all times of the year including beyond reliability events.
Dispatchability	The tariff developed in CPUC docket A.22-05-022 will focus compensation on the hours of highest need to provide system load reductions that meet the time of typical resource shortfall events during the 5-9 pm evening ramp. Thus, the resource is heavily incentivized to dispatch at the time the grid needs it most even without ISO instruction.
Policy Alignment	Pursuant to AB 2316, the CPUC is considering development of a new community solar plus storage program in A.22-05-022. Pursuant to the Inflation Reduction Act of 2022, enhanced federal funding for community solar plus storage projects that serve disadvantaged communities is available. Community solar plus storage would also create a viable compliance option for Title 24 solar requirements via community solar. Community solar has been identified in the SB 350 report as a critical aspect of meeting the 2045 carbon free goals. Community solar plus storage will help reduce the energy burden of lower income customers which will directly support California's building and transportation decarbonization goals.
Equity	All community solar plus storage projects must serve at least 51% low-income customers pursuant to AB 2316. The IRA requires over 50% of the financial benefits to accrue to participants for enhanced federal incentives to support the project. The Commission should embrace the opportunity to leverage funding from its Clean Energy Reliability Investment Plan to enhance benefits to low-income communities in coordination with the CPUC's development of robust community solar programs.

[Proposed attribute] Bill Relief	Community solar plus storage provides bill credits to customers at a net savings to them. Federal and state incentives can be leveraged to deploy these projects and provide enhanced savings to customers.

Question 3: How does the resource support reliability (e.g., supply, permanent load reduction, net peak reduction, or emergency asset?)

Community solar plus storage projects are functionally load modifiers that result in a net peak reduction and will reliably perform in emergency conditions. With compensation based on avoided costs, which are concentrated in the summer evening hours, a program created by the CPUC pursuant to AB 2316 will result in discharge from the batteries during the evening net peak since this is when the Community Solar Participants will receive the greatest compensation. .

Question 4: How many new MWs and MWhs can the resource provide per year, taking into account resource characteristics and known barriers between now and 2035?

California can deploy over a gigawatt of community solar by Summer 2025

CCSA has estimated that over a gigawatt of community solar plus storage could be deployed by Summer 2025. This estimate is informed by the ramp rate of community solar installations in other markets as well as the readily available capacity to interconnect these facilities on the distribution system in California.

New York and other States Show Community Solar can Scale Quickly

New York established itself as the largest community solar market in the country having deployed over 1,000 megawatts as of March 2022.[24] New York has a goal of deploying 10GW of distributed solar by 2030, most of which will be community solar;[25] when installed this will be nearly one third of the New York Independent System Independent Operator's peak demand.[26]

In New York, Community Distributed Generation was established via rule in 2015 but it was only in September of 2017 that the Value of Distributed Energy Resources tariff was established,

[24] Governor Hochul Announces New York as Top Community Solar Market in the United States - NYSERDA

[25] see page https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4C42AAFF-0EB9-4890-AA0D-21C70B088F4B}

[26] https://www.nyiso.com/-/press-%7C-new-york-s-electric-grid-prepared-to-meet-summer-demand#:~:text=The%20NYISO%2C%20through%20its%20reliability,capacity%20requirement%20of%2034%2C385%20MW.

creating the compensation mechanism for the state's community solar market, and interconnection reforms allowed projects to proceed efficiently. As a result of the establishment of the compensation regime and efficient interconnection rules, New York saw community solar take off in 2018.

Other states similarly show that community solar plus storage resources could be deployed quickly to meet the reliability need. Maine has gone from 16 MW of community solar installed in 2020 to 159 MW by 2022 after legislation was passed in 2019 and community solar and new interconnection rules were put in effect in early 2020.[27] Minnesota likewise experienced over 193% annual growth from 2017 to 2020 after interconnection rules were reformed, from an estimated total of 286.6 MW installed at the end of 2017[28] to over 841 MW by August 2022.[29]

As Table 3 suggests, California should be able to deploy in excess of a gigawatt within the next several years when reliability challenges are most acute for the state.

Table 3: State Community Solar Ramp Up and an Extrapolation to California

	Program MW-ac in Comparable States			CA Program MW-ac, based on Comparable State Glidepaths		
Program Year	NY	MN	ME	NY	MN	ME
1	11	251	91	34	1,425	1,835
2	168	509	170	513	2,890	3,428
3	379	659	329	1,155	3,742	6,634
4	668	771		2,038	4,378	
5	992	838		3,027	4,759	
6						
% Peak Load	7%	11%	8%			

California is better situated than these other markets in that it has utilities with an established interconnection process. In other states, such as New York and Minnesota there has been a lag in projects scaling up due to initial delays in interconnection at the utilities. Indeed, Maine

[27] https://www.maine.gov/energy/initiatives/renewable-energy/solar-distributed-generation

[28] https://mn.gov/commerce-stat/pdfs/MN714MW.pdf

[29] https://ilsr.org/minnesotas-community-solar-program/

corroborates the importance of interconnection processes. Unlike New York and Minnesota, Maine reformed its interconnection processes concurrently with implementing its community solar rules allowing significant capacity to come online in the year following adoption of the community solar regulations.

California also has ample infrastructure that has been underutilized given that most solar capacity in the state has been customer-sited net metering or utility scale projects with modest exceptions for megawatt-plus distributed generation projects deployed through the aggregated net metering, Renewable Market Adjusting Tariff, and the Solar PV[30] programs. Community solar plus storage is a rapidly deployable resource at scale in part because it is interconnecting to infrastructure that has remained largely untapped to date.

Southern California Edison's Hosting Capacity is Indicative of the Ample Capacity to Interconnection Projects Quickly

There is ample capacity to interconnect community solar plus storage projects without major grid upgrades. Looking at SCE alone shows the scale of the potential, even when making conservative assumptions.

Southern California Edison has a robust hosting capacity map and database which allows for a quantitative evaluation of the technical potential and commercially actionable potential in that one service territory alone. Analysis of SCE's hosting capacity shows that there is technical potential for 10,500+ megawatts of community solar, including over 9,200MW of capacity at substations that can interconnect 10 megawatts or more of new generation.

Table 4: Southern California Edison Community Solar+Storage Technical Potential

No.	County	All Substations		Substations 10MW+	
		# of Substations	Substation Capacity (MW)	# of Substations	Substation Capacity (MW)
1	Los Angeles	274	3,391	110	2,784
2	San Bernardino	159	1,807	57	1,542
3	Riverside	108	1,530	45	1,350
4	Orange	67	1,427	45	1,317

[30] IOU PV Programs (ca.gov)

5	Tulare	36	841	26	829
6	Kern	40	576	16	517
7	Ventura	29	454	15	417
8	Santa Barbara	23	240	7	215
9	Mono	12	148	5	137
10	Inyo	14	58	2	37
11	Kings	2	57	2	57
12	Fresno	8	36	2	31
13	Imperial	1	4	0	0
	Total	773	10,569	332	9,233

The technical potential in Table 4 does not account for challenges such as land costs or otherwise prohibitive conditions for project development. A more conservative estimate can be developed by narrowing the substations to: 1) those in rural substations that can host over 10 megawatts of capacity each and 2) those substations in urban areas that have over 5 megawatts of hosting capacity and are within 2 miles of industrial roof space capable of hosting larger community solar projects. As shown in Table 5, this more conservative estimate still yields over 1 gigawatt of interconnection potential without major upgrades.

Table 5: Conservative Evaluation of Interconnection Potential in Southern California Edison Service Territory

System Type	MW Estimate	Rationale
Ground-mounted projects	530 MW	SCE has 52 substations in rural counties (Tulare, Kern, Mono, Inyo, Kings, and Fresno) with 10MW+ of interconnection capacity. It's conservative to estimate that each substation can accommodate a minimum of two 5MW projects.

Rooftop projects	490 MW	SCE has 98 substations with 5MW+ of interconnection capacity, plus over 4 million square feet of nearby commercial roof space (conservatively 25 MW of rooftop potential) within 2 miles of the substation. It's conservative to estimate that each substation can accommodate a minimum of one 5MW project.
Total	**1,020 MW**	

Substantial additional capacity potential exists 2025 to 2035

Minnesota is now the second largest community solar market with 841 megawatts deployed as of this past August[31]. Minnesota's potential is particularly remarkable given that this capacity is all within Xcel's service territory, which has a peak summer load of 7,200MW; community solar is 11.6% of peak load. Maine similarly has seen over 300 megawatts of community solar installed against a peak load of 2,126 MW for the two investor owned utilities (15% of peak load).[32]

Question 5: What is the levelized cost for the resource in $/MW-yr and $/MWh-yr from 2023 to 2035

CCSA has utilized the NREL Cost of Renewable Energy Spreadsheet Tool (CREST) with public cost data from NREL and state analyses to derive resource costs for community solar plus storage in California. At 2022 equipment costs, over the 25 year life of the community solar projects, groundmount projects can be deployed at a levelized cost between $130/MWh and $147/MWh, inclusive of wholesale-energy price components of the compensation and customer bill savings. This cost range primarily reflects differences in solar insolation across the three investor owned utility service territories. As proposed by CCSA in CPUC docket R.20-08-020, avoided-cost-based compensation would vary widely over the year with most of this compensation being concentrated in the summer evenings. This compensation assumes that subscribers to the community solar project would realize a net savings of 10% of the bill credit meaning that the average residential subscriber using between 350kWh and 550kWh per month would realize annual savings between $105 and $131.

On an installed cost basis, a prototypical ground-mounted 5MW-ac solar project with a four hour battery and single access trackers would cost $2,660,000/MW ($2.66/w) inclusive of

[31] https://ilsr.org/minnesotas-community-solar-program/

[32] https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2020-00199

$1.42/w for the solar facility, $1.04/w for the four hour battery, and $0.2/w for customer acquisition.

ACC-based compensation is sufficient to support prototypical 5-MWac community solar+storage deployment in all three large investor owned utility service territories in the state, meaning that the Energy Commission can leverage Reliability Plan dollars to support substantial amounts of capacity and achieve related reliability goals, equity goals, and help bring projects online faster by supporting projects more challenging than a "prototypical" project.

For example, rooftop projects, on industrial rooftops, such as those in denser areas with local reliability constraints, would cost between $193/MWh and $207/MWh for larger (1-5MW) rooftop projects and, for medium-sized rooftop projects (250kW to 1MW) from $215/MWh to $232/MWh . These higher rooftop costs are due to reduced production and higher engineering, procurement and construction ("EPC") costs.

An important caveat is that the resource cost will be a function of the program created by the CPUC pursuant to AB2316 but the numbers here, based on CCSA's proposal in the net metering docket, are indicative of how cost effective this resource would be for meeting reliability needs.

Question 6: what is the average length of time from ordering or purchasing the resource to operation? How long does that typically take in today's market? What conditions must be met to deploy the technology rapidly?

The over 1 gigawatt target for community solar deployment by Summer 2025 is based on a project development timeline. Project timelines will depend on the specific site characteristics and location and the nearby utility distribution infrastructure which will dictate how fast a project's development can proceed. Table 6 below outlines the project development timeline.

Table 6: Project Development Timeline

Development Step	**Time for Step**	**Cumulative Time**
Secure site control of building/landowner	Project specific	
Apply for interconnection	<1 month	< 1 month
Interconnection study complete	2 months (Fast Track)-6 months (independent study)	2-6 months
Project permitting	6-24 months, less if only	3-31 months

	a building permit is required	
Distribution system upgrades (if applicable)	12-24 months	project construction would be timed to roughly coincide with completion of these upgrades
Procurement	<12 months in advance of construction	-
Project constructed and operating	completed 12 months from permits and interconnection agreements finalized	15-43 months

As this table implies, individual projects will have widely varying timeframes for completion but that efficiently developed projects can realistically be completed in less than a year and a half. One benefit of community solar plus storage is that its ubiquity can mean that meeting reliability targets is dependent on no particular locality, developer, or piece of utility infrastructure so that reliability goals can be met with resources seeking the most efficient projects to develop. Should the Public Utilities Commission have program rules in place by Fall 2023, community solar developers will be able to advance projects to completion by Summer 2024.

Question 7: For an emerging technology, when will it be ready for deployment, and at what scale?

Solar plus storage is not an emerging technology so this question is not applicable to solar plus storage resources deployed under a community solar business model.

Question 8: Is the target customer primarily residential, commercial, agricultural or industrial?

Community solar plus storage is open to, and can serve, all customers from all utility classes. Under AB 2316, community solar plus storage projects will be required to serve at least 51% low income customers.

III. Conclusion

CCSA appreciates the opportunity to submit this response to the RFI. Community solar plus storage is poised to meet California's reliability needs with clean, distributed resources in a way that shares the benefits of these distributed energy resources with the millions of Californians who currently lack access to distributed energy resources. The CEC can support this outcome by coordinating the development of its Plan with the CPUC so that the Plan is poised to support community solar plus storage.

Sincerely,

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