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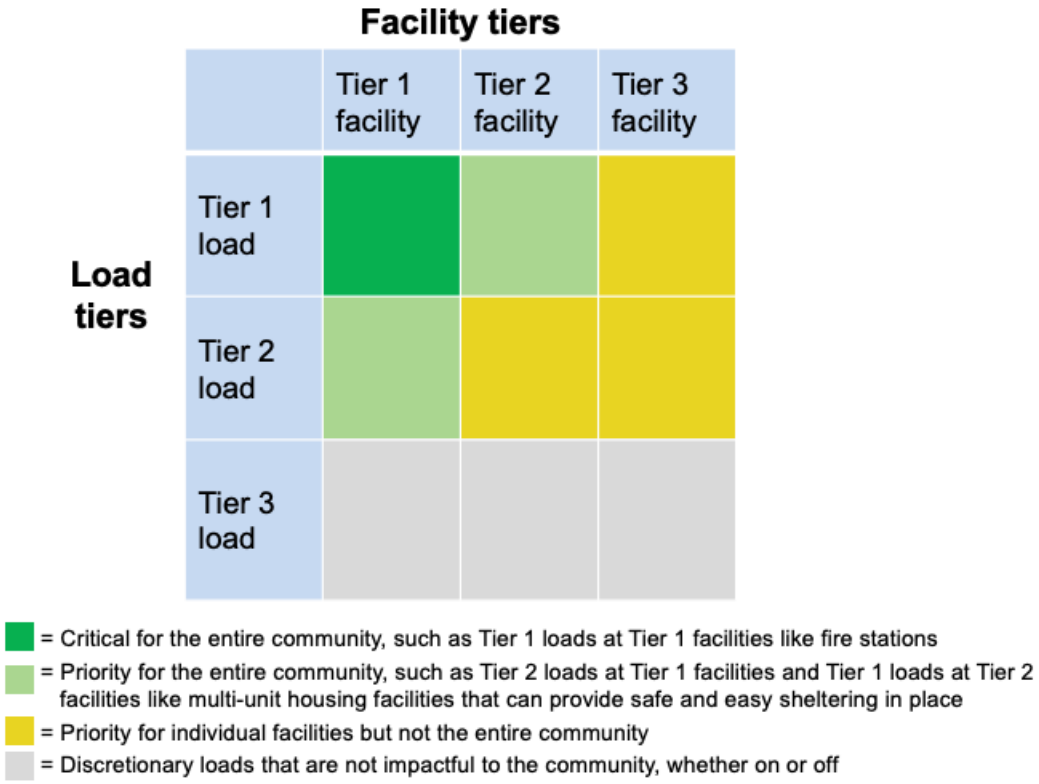
Clean Coalition comments to CEC on Docket #19-ERDD-01, Research on Valuation of Investments in Electricity Sector Resilience

Additional submitted attachment is included below.

19 November 2021
Commissioners
California Energy Commission
1516 Ninth Street Sacramento, CA 95814

RE: Docket #19-ERDD-01, Research on Valuation of Investments in Electricity Sector Resilience

On behalf of the Clean Coalition, I am writing to urge the Energy Commission to consider the Clean Coalition's value-of-resilience (VOR) methodology, VOR123, and Resilient Energy Subscription (RES) market mechanism in its research on the valuation of investments in electricity sector resilience. A standardized way to value resilience is critical for providing a pathway to the widespread deployment of Solar Microgrids and Community Microgrids, which bring communities unparalleled economic, environmental, and resilience benefits. And to finance Community Microgrids beyond ratepayer-funded coverage for the most critical loads at critical community facilities (CCFs), a market mechanism like the RES is essential. This graphic tells the story and succinctly encompasses much of the details contained in the rest of this document



Introduction

Currently, without active utility cooperation, deploying Community Microgrids is close to impossible; even with a utility partner, there is no guarantee that a Community Microgrid will be deployed, either on time or at all. Sadly, while the Redwood Coast Airport Microgrid (RCAM)[1] is staging to become the

[1] See https://microgridknowledge.com/redwood-coast-airport-microgrid/.

first true Community Microgrid in California, after many years of development, RCAM remains the only example of a true Community Microgrid that is in development within California.

A potential step forward would be the proposal made by the County of Los Angeles,[2] which will diversify the Community Microgrid procurement process, reducing the burden on the IOUs and allowing municipalities to work in tandem to protect critical community facilities (CCFs) and disadvantaged vulnerable communities (DVCs).

The Clean Coalition will demonstrate how Community Microgrids can be unleashed, using the example of a potential Community Microgrid serving multiple adjacent CCFs in East Los Angeles that could be funded via the proposal made by the County of Los Angeles — and serve additional facilities via the Resilient Energy Subscription (RES), a cost-effective market-based approach to financing the expansion of Community Microgrids beyond the most critical loads at CCFs. The RES allows non-CCFs to pay fees that allow Community Microgrids to expand coverage to the non-CCFs, which pay for the full cost-of-service (COS) of their self-selected level of coverage. The Community Microgrid opportunity in East Los Angeles, the VOR123 methodology, and the RES market mechanism are described below.

The East Los Angeles Community Microgrid

In partnership with the County of Los Angeles, the Clean Coalition is conducting a Solar Microgrids feasibility study for the East Los Angeles Hub, pictured below, to determine the technical and economic possibilities for Solar Microgrids at three adjacent County of Los Angeles CCFs: the Edward R. Roybal Health Center, the East LA Civic Center, and the East LA Library. Despite being adjacent facilities with available space on rooftops, parking lots, and parking structures for the deployment of immense levels of solar, current restrictions make it nearly impossible to achieve a Community Microgrid that would be far more efficient and sufficient in providing resilience to these CCFs.

[2] See https://microgridknowledge.com/regional-microgrid-agency-los-angeles/.

Three CCFs and adjacent parking lot in the East LA Hub that will be studied.

As a result, a configuration of three separate Solar Microgrids is the most likely outcome, leaving significant solar siting opportunities on nearby built environments unutilized and missing a big opportunity for increased reliability and resilience to this DVM area, which has a CalEnviroScreen over 85. It should be clear that a Community Microgrid can be implemented at this East Los Angeles hub to maximize local solar, reliability, and resilience to vital CCFs and potentially additional nearby facilities. In addition, because the County of Los Angeles is proposing this Regional Public Agency Microgrid Pilot Program as an opportunity to, "deliver net peak demand hours for the summers of 2022 and 2023,"[3] Community Microgrids like this will provide numerous reliability and economic benefits to all ratepayers, including, but not limited to, an increased penetration of DER in a DVC, reduced strain on the transmission grid, peak shaving, and an array of grid optimizations that can be achieved by dispatchable local solar.

Value-of-resilience methodology, VOR123

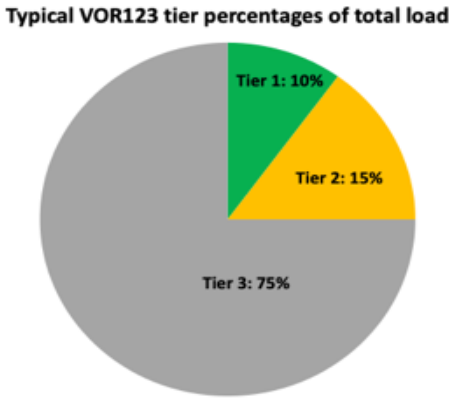
To help unleash Solar Microgrid and Community Microgrids, the Clean Coalition has developed a streamlined, straightforward approach for estimating VOR and factoring VOR into Community Microgrid subscription payments. The methodology allows all stakeholders to effectively consider a standardized VOR when analyzing the economics associated with solar-driven microgrids. This will result in Solar Microgrids and Community Microgrids being widely deployed to deliver far greater resilience to communities throughout California — and well beyond.

[3] Opening Comments of the County of Los Angeles on Administrative Law Judge's Ruling on Potential Microgrid and Resiliency Solutions for Commission Reliability Action to Address Governor Newsom's July 30, 2021, Proclamation of a State of Emergency, page 4: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M406/K593/406593633.PDF

The Clean Coalition's VOR methodology is known as VOR123[4] because it tiers electric loads into three tiers, regardless of facility type or location:

- **Tier 1**: Critical loads that are life-sustaining and/or mission-critical and should be configured for 100% resilience.
- **Tier 2**: Priority loads that should be maintained as long as doing so does not threaten the ability to maintain Tier 1 loads.
- **Tier 3**: Discretionary loads that should be maintained only when doing so does not threaten the ability to maintain Tier 1 and Tier 2 loads.

While load percentages will vary by facility, the Clean Coalition has found that these are typical load percentages for the majority of facilities:



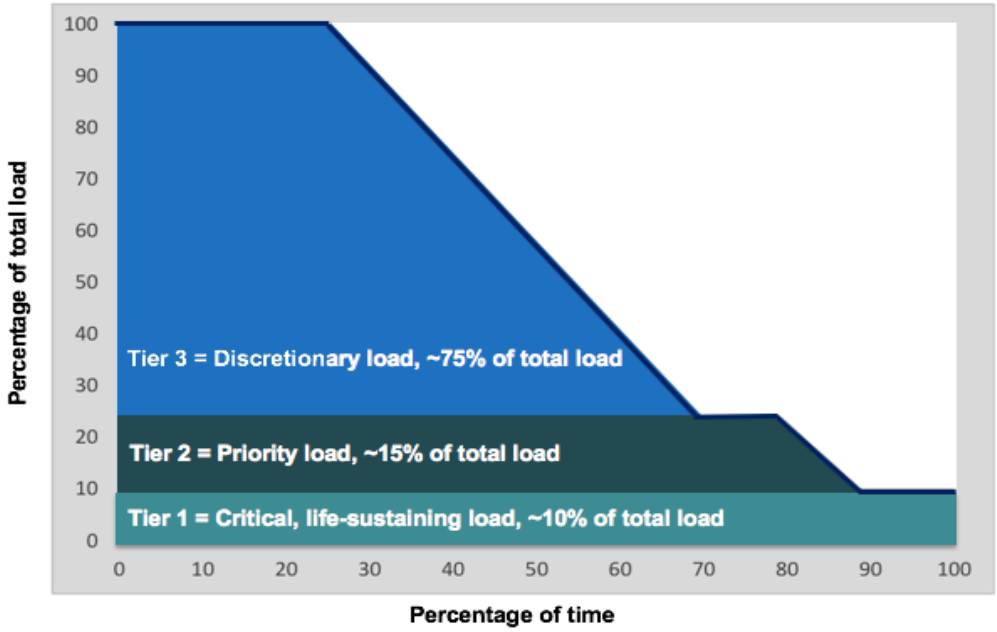
Using these common tier levels, in the Clean Coalition's Solar Microgrid designs the following levels of resilience are provisioned to each load tier, as measured by uptime percentages:

- Tier 1 loads: Online 100% of the time.
- Tier 2 loads: Online at least 80% of the time.
- Tier 3 loads: Online at least 25% of the time.

The Clean Coalition's VOR123 methodology establishes straightforward load budgets that can be determined and valued with relative ease. These three simple steps can be followed by any facility to determine its specific VOR:

1. First, the facility reviews its historical energy usage, accounting for variations across seasons and times of day.
2. Then, the facility tiers the loads, as in this example from the University of California Santa Barbara (UCSB):

[4] See https://clean-coalition.org/disaster-resilience/.



Percentage of time online for Tier 1, 2, and 3 loads for a Solar Microgrid designed for the University of California Santa Barbara with enough solar to achieve net zero and enough energy storage capacity to hold 2 hours of the nameplate solar (200 kWh energy storage per 100 kW solar).

3. Next, the facility uses the VOR123 methodology to determine its overall value-of-resilience. The Clean Coalition's VOR123 approach standardizes resilience values for the three tiers of loads, regardless of facility type or location, as described above. Alternatively, a facility can use empirical experience from past grid outages or some other method to determine its load tiering and VOR.

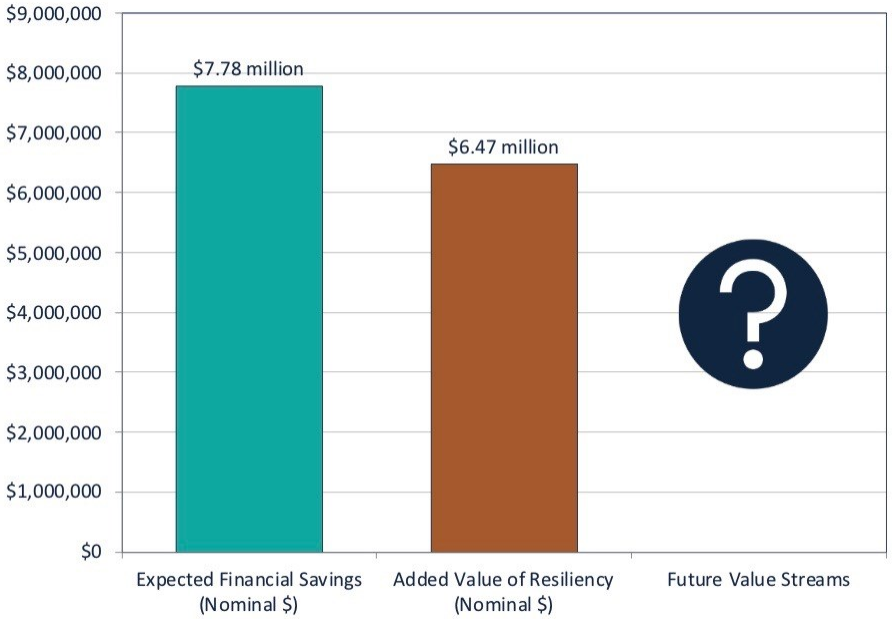
The Clean Coalition has found that there are different VOR multipliers for each of the three load tiers. The following valuation ranges are typical for most sites:

- **Tier 1**: 100% resilience — indefinite energy resilience for critical loads — is worth 3 times the average price paid for electricity. Given that the typical facility's Tier 1 load is about 10% of the total load, applying the 3x VOR Tier 1 multiplier warrants a 20% adder to the electricity bill.
- **Tier 2**: 80% resilience — energy resilience that is provisioned at least 80% of the time for priority loads — is worth 1.5 times the average price paid for electricity. Given that the typical facility's Tier 2 load is about 15% of the total load, applying the 1.5x VOR Tier 2 multiplier warrants a 7.5% adder to the electricity bill.
- **Tier 3**: Although a standard-size Solar Microgrid can provide backup power to Tier 3 loads a substantial percentage of the time, Tier 3 loads are by definition discretionary; therefore, a Tier 3 VOR multiplier is negligible and assumed to be zero.

Taken together, the Tier 1 and Tier 2 premiums for a standard load tiering situation yields an effective VOR of between 25% and 30%. Hence, the Clean Coalition uses 25% as the typical VOR123 adder that a site should be willing to pay, including for indefinite renewables-driven backup power to critical loads — along with renewables-driven backup for the rest of the loads for significant percentages of

time. The Clean Coalition has confirmed the 25% adder via multiple alternative approaches, including the cost that would be required for diesel generators to provide the same level of resilience.[5]

While a facility might reasonably be expected to pay this premium for renewables-driven resilience, the Clean Coalition has facilitated projects that allowed facilities, school districts, and communities to obtain this significant resilience benefit for free. An example is the Solar Microgrids for the Santa Barbara Unified School District (SBUSD); the SBUSD will receive millions in resilience benefits for free via an innovative 28-year power purchase agreement (PPA), in addition to millions in bill savings and potential revenue from future value streams — all at no upfront cost.[6]



Economic outcomes achieved for the Solar Microgrids that the Clean Coalition facilitated for the SBUSD. Future value streams are represented with a question mark, because while they are anticipated, they are currently unpredictable.

The VOR123 principles for an individual facility can also be applied to a larger grid area. In most cases, load tier percentages for a Community Microgrid will mirror typical load tier percentages for individual facilities: 10% for Tier 1 load, 15% for Tier 2 load, and 75% for Tier 3 load.

The Resilient Energy Subscription (RES) to finance and expand Community Microgrids

To finance and expand Community Microgrids, the Clean Coalition has developed the Resilient Energy Subscription (RES) market mechanism under which customers would pay an additional charge to participate in a Community Microgrid, and we recommend using the VOR123 estimate to help calibrate the rates that subscribers should be willing to pay.[7]

The RES is a straightforward market mechanism that allows any facility within the footprint of a Community Microgrid to pay a simple fee on top of its normal electricity tariff for guaranteed daily delivery of locally generated renewable energy during grid outages, ensuring unparalleled energy resilience. The cost of such indefinite renewables-driven backup power will generally be reserved for

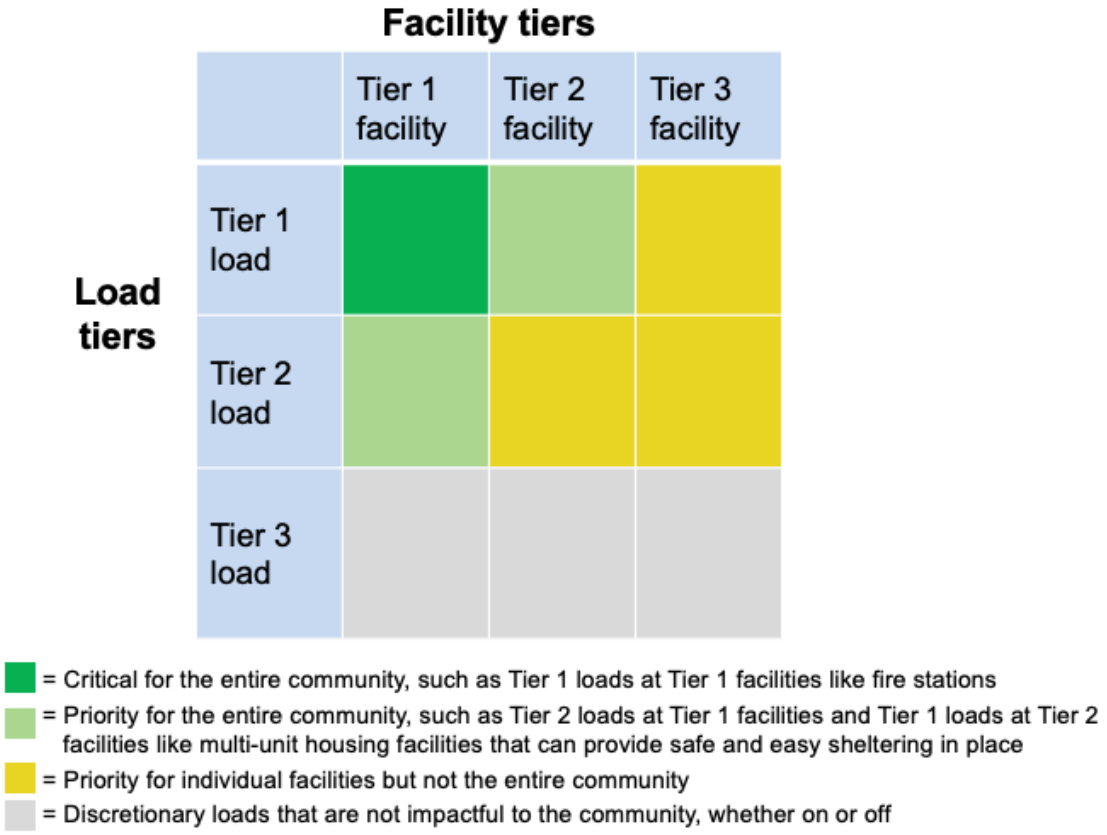
[5] See https://clean-coalition.org/disaster-resilience/#adder.
[6] See https://clean-coalition.org/community-microgrids/goleta-load-pocket/santa-barbara-unified-school-district/.
[7] See https://clean-coalition.org/news/resilient-energy-subscription-for-financing-community-microgrids/.

the most critical loads, but ultimately, each individual facility will decide which loads are critical, as described above, and will procure resilience for those loads via a transparent fee that covers the cost of service (COS) of provisioning such energy resilience from a Community Microgrid. Hence, there are only two fundamental features of the RES:

1. Facilities located within the footprint of a Community Microgrid have the opportunity to procure resilience through a monthly $/kWh RES fee that is separate from any existing rate tariffs, which will remain unchanged. A facility will pay the RES fee to reserve a guaranteed allotment of daily delivered energy when the traditional transmission and distribution grids are unavailable for any reason, including natural disasters, terrorism, and repairs.
2. Through RES fees, the Community Microgrid owner-operators will recover the COS that is required to meet the contracted RES obligations. As is standard in the utility industry, COS is determined by the capital expenditures (capex) associated with Community Microgrid assets, operational expenditures (opex) associated with operations and maintenance (O&M), and an appropriate rate of return.

When there is a shortage of available energy during grid outages, a Community Microgrid is obligated to deliver only to RES limits, and any customer reaching its RES limit can be turned off at its meter. RES subscriptions will be offered on a first-come, first-served basis, limited only by Community Microgrid capacity — which of course will expand as demand for subscription allocations grows.

The figure below illustrates how the different loads in a Community Microgrid should be valued, with the green boxes indicating the most essential loads to keep on. Due to the critical role that Tier 1 facilities play in keeping communities safe and functioning, the COS for serving all Tier 1 loads at Tier 1 facilities (seen below in dark green) should be ratebased, similar to how costs associated with the transmission grid are ratebased. Given the societal value of these Tier 1 Critical Community Facilities (CCFs), it is more than reasonable to ratebase the associated COS for Community Microgrids to a level that they can deliver RES allocations covering Tier 1 loads at Tier 1 facilities — and arguably Tier 2 loads at Tier 1 facilities, too.

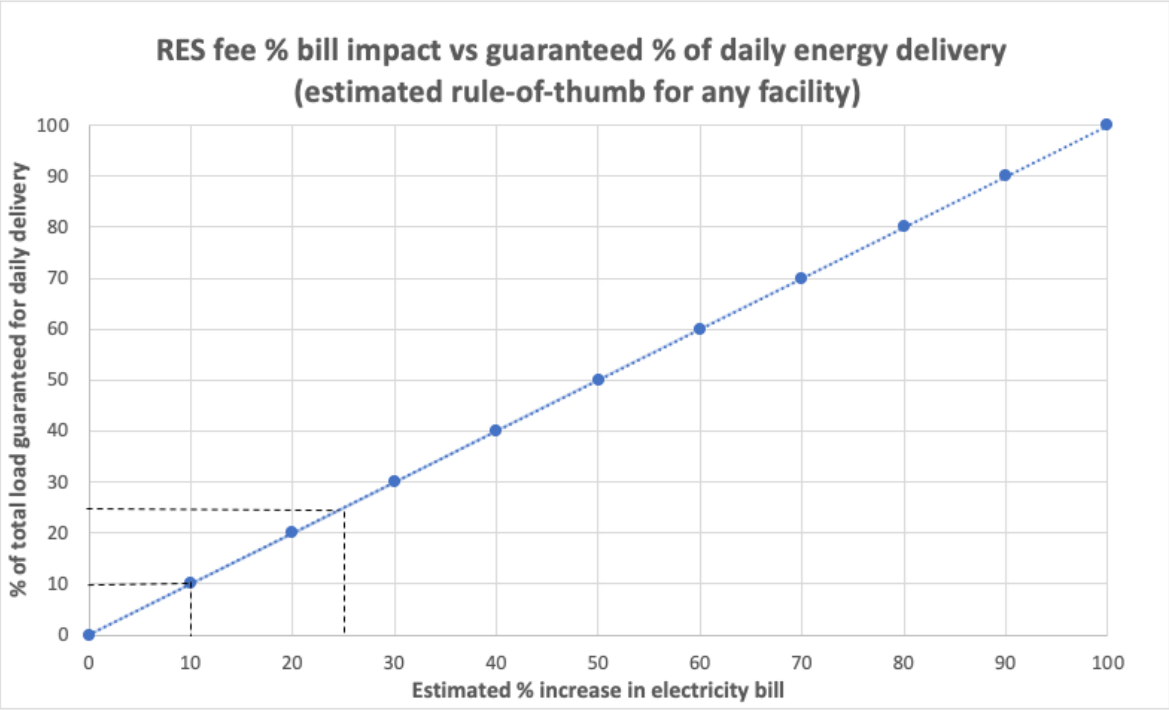


The loads from other facilities will be financed via the RES fee, using simple market forces to determine the additional facilities covered — thereby overcoming the three basic challenges involved with deploying a Community Microgrid:

1. Sizing initial Community Microgrids to meet initial guaranteed resilience requirements.
2. Expanding Community Microgrids to meet potential expansions in guaranteed resilience requirements within the initial Community Microgrid footprint.
3. Expanding Community Microgrids to larger distribution grid footprints that include guaranteed resilience commitments to an expanding list of RES-contracted facilities

RES allows a utility to plan strategically for resilience by aggregating RES allocations as they are contracted by facilities across the Community Microgrid footprint. Once the initial investment of a Community Microgrid for CCFs is made, future investments are based on market demand for resilience. As Community Microgrids expand and cost efficiencies are achieved through learning and economies of scale, RES costs and fees will trend lower, and the RES fees can be recalculated periodically to account for such reductions.

Once an initial Community Microgrid is established for serving the CCFs, the incremental COS for expanding the Community Microgrid via the market-based RES will be relatively low. For the average facility, the Clean Coalition has calculated that each 1% of load that a facility secures via a RES will result in a 1% electricity bill increase, as shown in this chart:



Thus, through a RES, it is feasible for Community Microgrids to be deployed and financed without shifting any costs to non-participants. Importantly, while the RES market mechanism encapsulates the price of resilience for each facility at the COS of the Community Microgrid, the value delivered to each facility is far higher, as evidenced by the VOR123 methodology.

Conclusion

The Clean Coalition appreciates the opportunity to submit these comments on the valuation of investments in electricity sector resilience; further details can be found in our recent comments to the California Public Utilities Commission on its Order Instituting Rulemaking Regarding Microgrids Pursuant to Senate Bill 1339 and Resiliency Strategies.[8] We encourage the California Energy Commission to consider the VOR123 methodology and the RES market mechanism as key elements in its research on the valuation of investments in electricity sector resilience.

Thank you,

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[8] See our comments at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M421/K851/421851991.PDF.