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Contact

www.climateprotection.org
P.O. Box 3785, Santa Rosa, CA 95402
707-525-1665

Recommendation for CEC Action to Enhance Community Resilience: Create an Energy Resilience Planning Handbook for Local Governments

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Lorenzo Kristov, Ph.D.
Contact: Kurt Johnson
Center for Climate Protection
PO Box 3785
Santa Rosa, CA 95402
Telephone: 970-729-5051
E-mail: kurt@climateprotection.org

Summary

The Center for Climate Protection (Center) lauds the substantial work the CEC has been doing to enhance the resilience of California’s energy sector, including support for microgrid projects for critical facilities and other applications of distribution-level energy resources (DER)¹ to meet decarbonization, resilience and equity goals. Following the discussions at the August 8, 2019 IEPR Commissioner Workshop on Climate Adaptation in California’s Energy Sector, it is clear that California’s pathway to sustainable and resilient energy must involve local government energy initiatives that address local priorities while supporting the safe and reliable operation of the state’s electric power system. To promote more rapid progress on that pathway, the Center urges the CEC to create an “*Energy Resilience Planning Handbook for Local Governments*.” Such a handbook would compile guidelines, best practices, templates and technical information covering both the process of participatory local resilience planning and the technical aspects of designing critical-facility microgrids and other DER-based resilience projects.² The Center believes this handbook would be a valuable, needed resource for local governments, and that the CEC is the agency best suited to create it.

The Pathway to California’s Decarbonized, Resilient and Equitable Energy Future: Local Government Planning and Distributed Energy Resources

California has been a global leader in adopting policies and specific targets, most notably the 2005 Assembly Bill 32 and 2018 Senate Bill 100, to shift to renewable energy resources and decarbonize all sectors of society and the economy. With the growing severity and frequency of wildfires, there is a new immediacy to the need for resilience, particularly for communities in high-risk areas who may lose electricity service for days due to preventive measures like public safety power shutoffs. Given this context, the Center believes there is a need for more explicit recognition of and state support for the role of local government initiatives for both near-term resilience and longer-term decarbonization. Moreover, California’s concerns for environmental justice and equity require the state to provide tangible support, expertise and other resources to all cities and counties. To this end the Center urges the CEC to create an “*Energy Resilience Planning Handbook for Local Governments*” (“Handbook”) as a foundational resource for local government strategies and initiatives aimed at decarbonization, resilience and equity.

¹ These comments use the term distribution-level or distributed energy resources (“DER”) broadly to mean the full range of electricity resources connected to the power system at distribution level, on either the customer side or the utility side of the end-use meter, as well as smart inverters and advanced control technologies to optimize their use for both meeting the needs of energy customers and providing grid services to support safe, reliable, efficient power system operation.

² In offering this recommendation the Center recognizes that other organizations, such as the Capitol Region Climate Readiness Collaborative, are already addressing aspects of local resilience planning. We believe the CEC should use its convening capability to engage with these other entities and include their efforts in the proposed Handbook.

Whereas the goals and targets of SB 100 are clear, the Center sees an immediate need to better articulate the pathways and strategies to get there and to provide tools and resources on a statewide basis for implementing effective strategies at the local level. Much of the power industry today is polarized by a debate between a centralized vision of the future dominated by bulk system renewable resources versus a totally decentralized vision dominated by rapid growth of DERs and community power systems. The Center believes this is a false dichotomy, that the state's electric power system in 2030 will be an integrated system of bulk resources and community-level resources. However, today's power industry institutions and the dominant industry culture are biased toward building "utility-scale" infrastructure and tend to minimize the role of DER and community power systems.³ As a result there is inadequate recognition of, much less practical support for the essential role of local government planning and local energy projects in achieving the SB 100 goals.⁴ The Handbook we propose here would be a valuable and relatively straightforward first step the CEC could take to focus on and strengthen local government capabilities to develop energy projects that align local priorities with over-arching state policy goals and support safe and reliable grid operation.

Community power systems and DER offer the following capabilities and benefits that can shape a safe, reliable, efficient, low-carbon California power system by 2030⁵:

- **Electrification.** Effective projects and strategies to electrify transportation and buildings and more broadly reduce carbon emissions from all sources will come about through city and county planning. For example, a huge factor driving carbon emissions is the need for people to commute long distances to work on a daily basis. General Plans directly affect this factor by dealing with such matters as housing densification, affordable housing, traffic and mobility services, building codes, zoning, land use, etc. As buildings, transportation, and agriculture come to rely more on electricity, coordinating electric power system planning with city and county planning will optimize tradeoffs between local DER and bulk-system supply, to electrify current fossil-fuel uses in the most cost-effective and beneficial manner, taking into account local resilience, equity and economic benefits in addition to the usual energy cost considerations. As yet, however, there is no broad statewide program to integrate city and county planning with power system planning.

³ These comments use the term "community power system" to mean a system of carbon-free DER and provisions for coordinating their operation, designed and implemented through state-local collaboration to: (a) support the reliable operation of a carbon-free, secure and efficient electric power system; (b) meet local energy, resilience and electrification needs; (c) achieve California's environment, energy and equity goals; and (d) provide local economic, employment and other benefits to communities.

⁴ For expanded discussion of these ideas, see Lorenzo Kristov (November 27, 2017) "Comments in response to the October 31, 2017 informal public workshop on California Customer Choice." [http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy - Electricity_and_Natural_Gas/Lorenzo%20Kristov%20Comments.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/Lorenzo%20Kristov%20Comments.pdf)

⁵ The year 2030 holds a number of key milestones in California policy. Senate Bill 100, signed into law by Governor Brown in 2018, requires electricity consumed in the state to be 60 percent from renewable supply resources by 2030. SB-32 passed in 2016 requires a 40 percent reduction in greenhouse gas emissions below 1990 levels by 2030, and a Governor's executive order sets a 2030 target for 5 million zero-emissions vehicles. For additional milestones and targets see the California Air Resources Board's Scoping Plan: <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

- **Shaping net load and managing volatility locally.** Customer adoption of DERs will continue to grow with declining costs and increasing capabilities of new local-scale technologies. Combined with electrification-driven demand growth, the resulting variability in PV output and extreme production and net load profiles at the grid edge and the circuit level (i.e., the “ducklings”) can be managed locally using flexible DER and storage at various scales, rather than exporting grid-edge impacts upstream to create operational challenges and drive infrastructure needs at the bulk-system level.
- **Alternatives to expanding costly and vulnerable grid infrastructure.** There is no reason anymore to build T&D infrastructure to meet peak loads that occur infrequently and leave vast amounts of capacity underutilized most of the time. Flexible DERs, including load management and control systems, can create relatively flat net load profiles at both the individual distribution circuit level and the bulk system level, enabling rapid growth of carbon-free local energy supply without driving costly T&D capacity expansion and system-wide “duck curve” impacts. Relatively flat, predictable net load profiles at transmission-distribution interfaces can reduce congestion and increase capacity factors on the bulk system, enabling it to move renewable energy supplies around the western region with less need to invest in massive new grid infrastructure.
- **Resilience.** While resilience has become a national hot topic with many notions about what it means and how to achieve it, California’s wildfires have made it abundantly clear that disruptive events always have local impacts that can drastically affect people’s lives, too often fatally. At the local level, resilience objectives include the capability of essential services and infrastructure to withstand more extreme events and continue functioning, the ability to quickly restore or substitute for essential services that fail, and the ability to activate public safety power shutoffs (PSPS) of at-risk T&D lines without totally cutting power in downstream communities. A local resilience strategy is to create power systems of different configurations that can operate as electrical islands, i.e., microgrids. A microgrid can be entirely on the customer side of the meter, e.g., an individual building or an entire campus that does not rely on utility services upstream of the point of interconnection, to enable a critical facility such as a hospital or emergency shelter to operate off-grid. A microgrid can also serve a larger community by coordinating the operation of multiple single facilities and utility-side DERs to sustain electric service over one or more distribution circuits on the grid.
- **Local and statewide economic benefits.** Once we start to advance community power systems designed and implemented collaboratively between local governments and electricity providers, it opens up numerous job opportunities and economic benefits for disadvantaged communities, cities and counties and all their residents.

To summarize, DER and community power systems can dramatically advance electrification of transportation and buildings with little increase in demand on the bulk energy system, even though total electricity consumption could be much greater than today. New technologies enable electrification demand to be met largely with local supply and storage resources, while new energy efficiency programs decarbonize the state’s existing building stock, and customer-side technologies transform electricity end-users into flexible resources capable of providing grid

services. These local programs can provide hundreds of thousands of well-paying jobs and bring economic benefits to low-income communities, while also reducing congestion on the western grid and moving power from wind and solar rich areas to population centers without having to build massive new infrastructure. However, realizing this vision will require new state programs to provide resources and guidance to all cities and counties, so that local government planning and power system planning can be effectively integrated.

Current Initiatives by Local Governments

In order to achieve climate goals and enhance local resilience, some California local governments are already engaged in planning and implementing local microgrid projects (including [Oakland](#), [Eureka](#), [Marin](#), [Calistoga](#), [Humboldt County](#), and [Santa Barbara](#)). Some are adopting full electrification reach codes aimed at decarbonizing energy end-uses (e.g., [City of Berkeley](#); cities working with [Building Decarbonization Coalition](#) etc.).

It makes sense to utilize the largest and optimal spaces within communities to generate and store energy, rewarding property owners as appropriate. However, because this is a new energy planning approach there are very few resources to guide local governments, and there are regulatory barriers to optimally sizing renewable DER.

Currently there is a disconnect between local government planning and electricity system planning. Cities and counties develop general plans and climate action/adaptation plans, typically with little consideration of the electricity grid and no involvement with the electric utility (unless they are municipal electric utilities). Investor-owned utility distribution planning and integrated resource planning do not currently engage with local governments. If they proceed in isolation from an understanding of local grid capabilities and constraints, customer solar and electric vehicle adoption can drive grid operating challenges and potentially costly infrastructure upgrades. But technologies such as dynamic load management, dispatchable microgrids and “vehicle-to-everything” (V2X) capabilities can be designed and implemented to operate within local grid constraints and even provide real-time services to support grid operation.

There are also data access challenges. An improved data access framework is needed to enable cities and counties to plan electrification and resilience projects, working in collaboration with third-party DER providers, Community Choice Agencies (CCAs) and distribution utilities to develop projects. It is necessary and possible to protect customers’ rights to privacy and control of their own data, and address infrastructure security concerns, without severely limiting access to data held by the incumbent utilities.

Recommendation: Create an Energy Resilience Planning Handbook for Local Governments

For California to achieve its decarbonization, resilience and equity goals for addressing climate disruption, state policy needs to actively support and work with communities to enable them to plan and implement local energy resources that meet local priorities, align with state policy goals, and help reduce costs for the electric power system.

A valuable and needed foundation would be for the CEC to create an “Energy Resilience Planning Handbook for Local Governments,” building upon existing state initiatives and publications (e.g., related to climate change adaption, electric vehicle charging infrastructure, microgrids, etc.).

The Center refers to local government-based project development as “Advanced Community Energy” (“ACE”) planning. The diagram below provides a process schematic for how a state-created program could enable local governments to develop local energy resilience plans based on microgrids and DER.

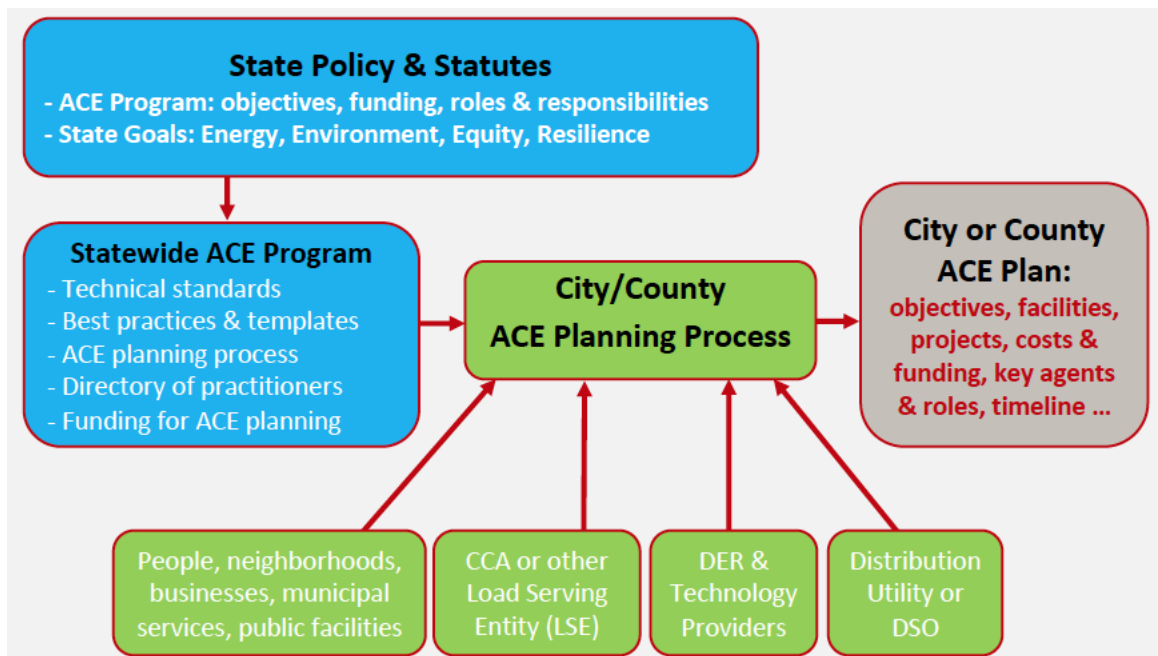


Figure 1: Process Schematic for Advanced Community Energy (ACE) Planning

The proposed handbook would include practical design templates and technical guidance for critical-facility microgrids as well as participatory planning approaches to identify local needs and priorities, thus providing a clearinghouse for best practices in local government energy planning.

The handbook would include case studies (e.g., including CEC-supported microgrid and community energy projects) that address technical aspects as well as financing models and financial incentives for property owners who can provide large rooftops, parking lots and brownfield areas to generate, store and/or shift energy supplies and uses. A companion web page could continually update the case studies and best practices as more cities and counties gain experience with planning and implementing local resilience projects.

Conclusion

The CEC has a pivotal role to play in stimulating, guiding and enabling collaborative local government energy planning for accelerating the development of community-level energy systems to achieve California’s resilience, decarbonization and equity goals. A foundational step forward in this effort would be for the CEC to create an “Energy Resilience Planning Handbook for Local Governments” to accelerate deployment of energy resilience projects for all California communities.