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Comments of The Climate Center for CEC Docket 20-IEPR-01

See attached PDF, thank you!

Additional submitted attachment is included below.

Comments of The Climate Center

Submitted to the CEC
In response to Volume II of the
Draft 2020 Integrated Energy Policy Report Update
CEC Docket No. 20-IEPR-01
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Introduction

The Climate Center lauds the work the CEC has done supporting the development of microgrids in California and respectfully submits the following comments in response to various excerpts listed below from Volume II of the Draft 2020 Integrated Energy Policy Report Update.

Executive Summary

Page 1. *"The 2020 Integrated Energy Policy Report (IEPR) Update identifies actions the state and others can take to ensure a clean, affordable, and reliable energy system. California's innovative energy policies strengthen energy resiliency, reduce greenhouse gas (GHG) emissions that cause climate change, improve air quality, and contribute to a more equitable future. ... Transportation is the focus of the 2020 IEPR Update." …*

"Volume II examines microgrids, lessons learned from a decade of research investments by the California Energy Commission (CEC), and stakeholder input about the potential of microgrids to contribute to a clean and resilient energy system."

Comment:

The ongoing IEPR update process is an extremely valuable resource, bringing together multiple agencies and organizations to construct a broad, multi-disciplinary policy framework. Of all the formal venues for articulating energy policy in California, the CEC's IEPR is the most appropriate one to offer a comprehensive, statewide vision of the State's energy future and a roadmap for implementing it. And yet, although the State has adopted aggressive policy goals for decarbonization, renewable energy and electric vehicles, as well as environmental and social justice and equity, California still lacks a vision of an electric power system architecture that can support those goals. The Climate Center would like to see the CEC go further in articulating such a vision.

The Climate Center believes that an architectural vision of a future electric power system that can best support California's goals is essential to provide direction and cohesiveness to the multiple specific policies and programs being developed to achieve near-term and medium-term objectives. Such an architectural vision must support and augment the present and future needs of all end users of electricity, including communities and local governments as well as individual customers. It must consider the need to electrify the vast majority of fossil fuel-based activities in California, as well as the technological and economic trends occurring in the power industry that are rapidly increasing the cost-effectiveness of clean, local distributed resources. And it must take into account the growing severity and unpredictability of disruptive climate events and the urgent need to address the economic and health disparities that our existing energy systems have exacerbated for decades.

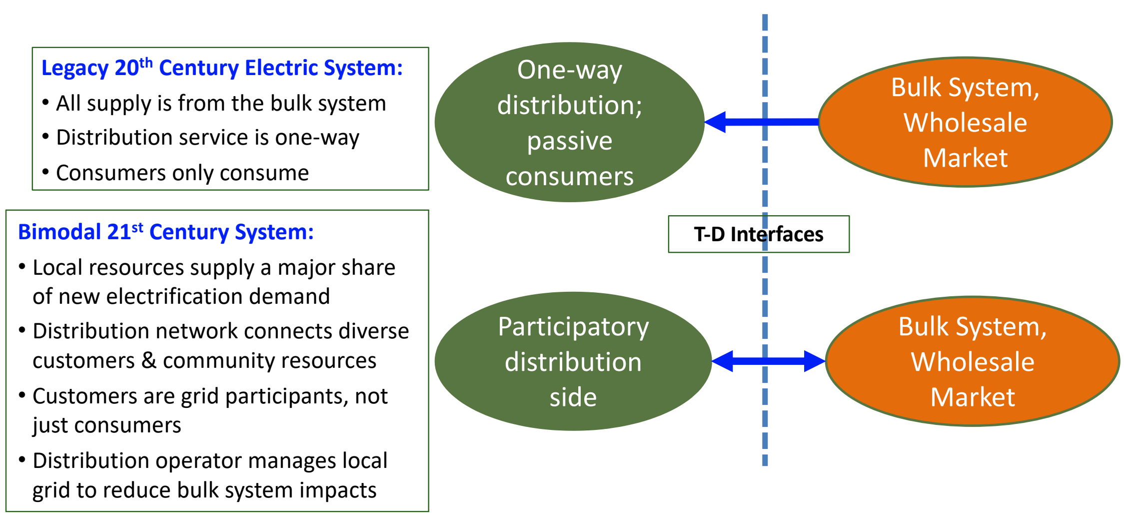
To this end, The Climate Center offers its view of the future electric power system architecture towards which we believe the industry needs to head and is already heading. The fundamental structure needed to achieve sustainability, resilience and equity and that reflects the trajectory of evolving electricity technologies and business models is that of a 'bimodal' electric power system comprised of a vibrant, participatory distribution network that complements and coordinates with the bulk power system of large-scale generators, high-voltage transmission lines, wholesale markets and greater integration across the western region. In particular, The Climate Center believes that the future of electricity is not an 'either-or' proposition of a massive build-up of the bulk system versus a proliferation of distributed resources that meets all needs. Rather, we see the need for a 'both-and' future, and to that end it is important that industry leaders and policy makers set aside the false 'either-or' dichotomy and work towards the bimodal future architecture.

Up to now, the growth of the distribution side has been limited to demand-side programs that provide only a small fraction of their potential, and are implemented in waves of rapid but unstructured customer adoption of on-site solar PV systems and electric vehicles that are experienced as more of a problem for the power system than active, participatory assets. The Climate Center believes that the CEC's IEPR can offer a policy framework that facilitates even more rapid growth of energy efficiency, responsive demand, EVs and distributed generation and storage on both sides of the customer meters, in a structured manner that maximizes the societal and grid value of these resources. Such a framework would start with the bimodal power system as the future architectural vision.

Today, the centralized generation and transmission-based assumptions behind the legacy industry and regulatory structures are no longer valid and the structures themselves are barriers to 21st-century goals. In particular, the legacy structures ignore the fact that distributed energy technologies that exist today offer serious direct competition with grid energy to an extent that was never true before. Today, any customer with financial resources can install on-site energy devices and depart from the grid, and the declining costs of these devices and ever-increasing costs of the grid are only reinforcing that trend. Legacy regulatory approaches try to stem the trend by imposing financial disincentives and procedural barriers, but those approaches undermine California's ambitious policy goals and disregard the desires of the customers for whom the power system exists to serve.

A bimodal power system with an active distribution side can support rapid integration of renewable generation into the whole system while relieving congestion and stress on an overburdened transmission system. A well-designed policy framework for the distribution side can smooth load and production profiles and manage local short-term volatility with minimal stress to deliver relatively smooth, stable net load profiles to the CAISO at each transmission-distribution interface, rather than exporting these local impacts to the CAISO and driving operational challenges, more costly transmission infrastructure and continued reliance on gas generators. The policy implication of this new architecture for Volume II of the IEPR is that microgrids, and distributed resources more generally, must be viewed as essential elements of the future power system, elements without which California's sustainability, resilience and equity goals will be more challenging, more costly, and less likely to be achieved.

The electricity system is evolving to a "bimodal" structure with a vibrant, participatory distribution side



Enabling and augmenting this structural transformation are technologies such as vehicle-grid integration (VGI) that can bridge and integrate both the power and transportation sectors without incurring resource adequacy redundancies. Indeed, Volume II of the Draft 2020 IEPR Update acknowledges this paradigm shift by declaring that among the three areas discussed, *transportation is its primary focus*. That said, transportation applications within a microgrid framework are treated as an afterthought. There are few references to electric vehicles in general, and not one mention of the vast potential of VGI, which occupies only five pages (pp. 96-101) in the Volume I transportation IEPR update.

Page 2. *"In California, utilities are working to maintain and improve reliability and resiliency of the grid for all customers. In certain cases, microgrids may provide a cost-effective solution to meet the individual needs of some end users in the event that they cannot be served by the grid. However, microgrids are not appropriate or cost-effective to address every problem, rather they must be deployed strategically."*

Comment:

The efforts of utilities to maintain and improve grid reliability and resilience are important. The Climate Center strongly believes, however, that depending entirely on the grid for resilient electric service in the coming years is not prudent policy and could very well prove fatal for customers and communities that do not have dependable alternatives when grid outages occur. Each year California and other states experience record-breaking climate events, plus pre-emptive public-safety power shutoffs, that cut off electric service to hundreds of thousands of customers for days at a time.

The resilient electric service the people of California will need to be prepared for the extreme and unexpected climate disruptions to come cannot be achieved without deploying microgrids on critical facilities, including community shelters and resilience hubs, in all communities throughout the state. Therefore, to say that "microgrids are not appropriate or cost-effective to address every problem" implies that there are other solutions that are more appropriate and more cost-effective to substitute for grid power when disaster strikes. But when grid power is out of service there is no alternative, unless the affected customers and communities have installed resilient electricity facilities not dependent upon the grid: i.e., microgrids. The Climate Center believes that suggesting that microgrids are not needed everywhere drastically underestimates the severity of the climate disruption California and the rest of the world are now confronting.

Classification of microgrid applications in terms of "appropriateness" is itself inappropriate, as *some degree of energy resilience will always be appropriate for every site to maintain critical functions during disruptive events.* For example, as indicated in the Clean Coalition's load tier resilience chart below,[1] it can be argued from a policy standpoint that every site should generate and manage enough on-site capacity to service a minimum of ten percent (10%) of projected load to continuously maintain the most critical functions when grid service is not available.

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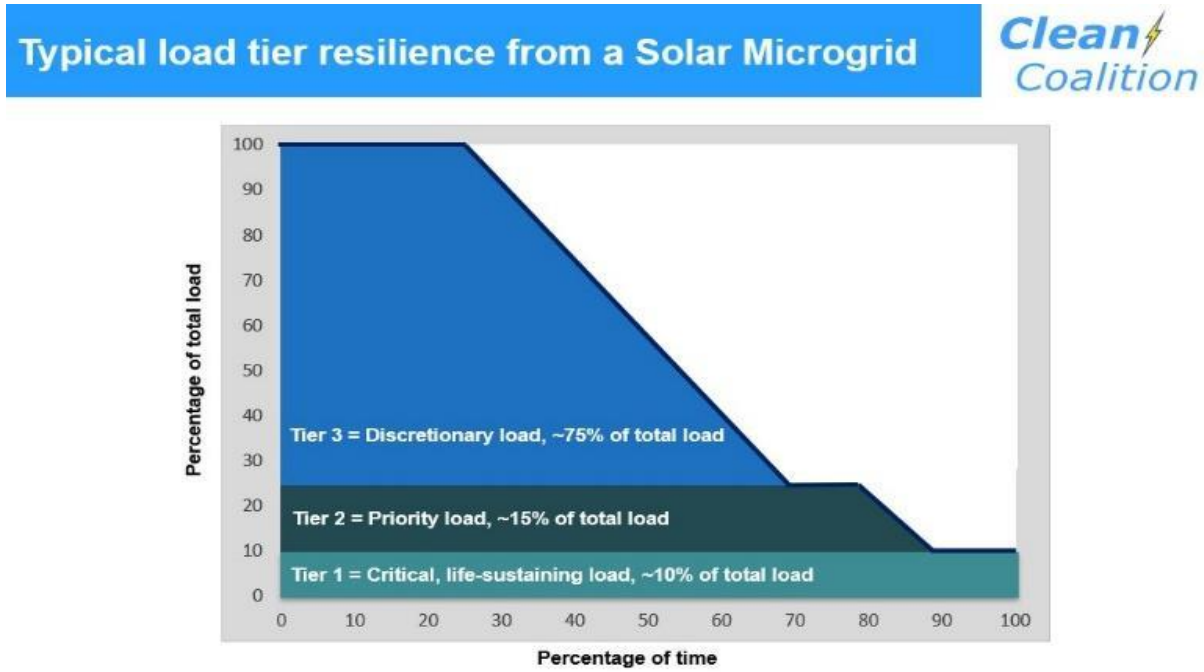
[1] Clean Coalition, "VOR123: Value-of-resilience - Unleashing Community Microgrids to deliver cost-effective resilience benefits to businesses, municipalities, and communities."



Percentage of time online for Tier 1, 2, and 3 loads for a Solar Microgrid designed for the University of California Santa Barbara (UCSB) 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).

<u>Pages 2-3</u>. *"Even though the state has recently used Public Safety Power Shutoffs (PSPS) as a calculated wildfire mitigation strategy, these events are anticipated to steadily decrease due to the significant investment in wildfire mitigation, including vegetation management and grid hardening, by utilities. Microgrids can potentially provide a strategic opportunity to make the grid more resilient. However, they are relatively expensive and are not appropriate for all situations. (See the 2020 IEPR Update, Volume I for opportunities to enhance energy reliability with electric vehicles.)"*

<u>Comment</u>:

While an expectation of declining PSPS events from wildfire mitigation measures is reasonable, it would be a mistake to assume that power outages in general will not persist and likely increase in severity as the impacts of climate change worsen. Wildfires are presently California's climate disaster du jour, but no agency or expert is capable of accurately predicting the source, pattern or severity of future climate change disruptions.[2] In fact, the only identifiable pattern in the progression of climate change disruptions is one of increasing frequency and severity and decreasing predictability.[3] From this perspective, *the resilience opportunity offered by microgrids is entirely appropriate for every critical load site in every community in California*. All communities and many vulnerable customers have critical loads that must be served on an uninterrupted basis. *The degree of appropriateness should only be measured by the number and size of loads deemed critical* by the community residents and local agencies, to avoid fatalities and significant collateral damage as was recently experienced in Texas.[4]

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[2] Umair Irfan, "Why every state is vulnerable to a Texas-style power crisis," Vox, March 11, 2021.

[3] EPA, "Climate Change Indicators: Weather and Climate."

[4] Mark Puleo, Accuweather, "Damages from Feb. winter storms could be as high as $155 billion," March 5, 2021.

Page 4. *"While this research has continued to show the potential of microgrids, microgrid costs continue to be one of the challenges to rapid commercialization. This challenge remains despite declines in the cost of solar and storage, which are typically part of a clean energy microgrid."*

Comment:

This analysis puts the cart before the horse: commercialization is the means to reduce the cost of microgrids. If solar PV and storage are principal components of a clean energy microgrid and their costs are declining, why are the costs of microgrids not declining as well? One factor is the lack of regulatory provisions to recognize and compensate the value microgrids can provide to the grid, including resource adequacy capacity, voltage support, relief of congestion on distribution circuits, and the ability to remove their load entirely from the grid in the event of a system capacity shortage as occurred on August 14-15, 2020. Regulatory provisions to compensate microgrids for the value they provide are a foundational element of microgrid commercialization, and their absence adversely affects the economics of microgrids.

The Climate Center urges the CEC to discuss in the IEPR how reduced costs of microgrids should be an outcome of effective commercialization policy rather than a prerequisite for commercialization as the excerpt above implies. Effective commercialization policy facilitates growth of the microgrid market and leads to innovation and economies of scale, outcomes that should be a primary policy focus for moving towards a truly resilient distributed energy infrastructure. Forward-looking policies and programs can provide a clear path towards scalability through business innovations such as energy-as-a-service (EaaS) microgrid models that are beginning to come to market.

As grid costs continue to rise, the least expensive measure that a site owner can implement is to maximize on-site generation[5] and install an optimized microgrid system with a maximum amount of generation for site load, BEV charging, electrolysis and long-duration storage. Such a system offers significant flexibility and capacity benefits to the site and the surrounding community, while providing services to the grid including energy, local congestion relief, voltage support and deferral of grid infrastructure investment. This adaptive model that integrates both energy and transportation resources will ultimately deliver the highest "bang for the buck" to customers and provide resource adequacy capacity that can be deployed during emergencies and over a wide range of 'blue-sky' circumstances.

Lessons Learned from a Decade of Microgrid Research

Page 17: *"CEC staff offers the following thoughts regarding where clean energy microgrids may best serve California over the next decade, including facilities that:*

- *Respond to PSPS events as addressed the CPUC's deenergization decision D.19-05-042. This list is being regularly updated via the CPUC's ongoing deenergization proceeding R.18-12-005.*
- *Support lifesaving services that require uninterrupted electricity supply.*
- *Deliver community services such as fire, police, emergency response, and overall community management.*

[5] Cory Budischak, DeAnna Sewell, Heather Thomson, Leon Mach, Dana E. Veron, Willett Kempton, "Cost-minimized combinations of wind power, solar power and electrochemical storage, powering the grid up to 99.9% of the time," Journal of Power Sources, Volume 225, 2013, Pages 60-74, ISSN 0378-7753, https://doi.org/10.1016/j.jpowsour.2012.09.054.

- *Support low-income, tribal, rural, and disadvantaged communities that are disproportionately impacted by grid outages.*
- *Enable critical military installations and state infrastructure operations such as ports, water delivery, and water treatment.*
- *Serve other unique energy demands where energy reliability is key.*

Until the price of key components of the clean energy microgrid such as energy storage, renewables, microgrid controllers, and other elements come down, this application is expected to be limited to a small subset of customers. However, the cost of microgrid components has decreased substantially over the last decade and is expected to continue to decrease."

<u>Pages 17-18</u>: *"During the July 7 and July 9, 2020, IEPR workshops, several microgrid owners and third-party microgrid managers indicated that the business case is getting easier to define. With the lower component cost and the ability to finance microgrids over time, it is becoming easier to make the financial case for a new clean energy microgrid. It is highly likely that in the future clean energy microgrids can provide much clearer business cases based solely on energy savings. With more creative financial options such as a power purchase agreement, future microgrids will be a good financial outlook without needing government grants to be successful."*

<u>Comment</u>:

Although the use case scenarios listed by CEC staff are undeniably important, strategic deployment of microgrid technologies should be seen as part of a continuum and not limited to a fixed set of use cases that, while extremely valuable, do not reflect the full spectrum of need for energy security and resilience. For example, operation of a medical device, regardless of location, should qualify as a "lifesaving service," particularly in light of COVID-19 and the likelihood of future pandemics.[6] Clearly, the list provided by CEC staff should be given priority in the short term, but only with the view of quickly creating replicable models that can be widely adopted by a broad spectrum of customers and communities.

To produce policy facilitating a continuous evolution towards resilient, carbon-free local energy systems, the IEPR should frame the locations listed above as critical opportunities to initially demonstrate microgrid benefits that will incentivize future development throughout a community as part of the local planning process. To realize this policy objective, The Climate Center, Vote Solar and other organizations are supporting enactment of SB 99, the Community Energy Resilience Act of 2021[7], and AB 1325, the Clean Community Microgrid Incentive Program.[8] SB 99 requires the commission to "develop and implement a grant program for local governments to develop community energy resilience plans," while AB 1325 would create an incentive program to "fund community microgrids supporting the critical needs of vulnerable communities that utilize distributed energy resources for the generation of electricity. If enacted, these legislative initiatives would empower communities to determine their energy security needs to "ensure that a reliable electricity supply is maintained at critical facilities."

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[6] Mike Hixenbaugh, NBC News, and Perla Trevizo, ProPublica/The Texas Tribune, "Texans Recovering From COVID-19 Needed Oxygen. Then the Power Went Out," March 9, 2021.

[7] SB-99 Community Energy Resilience Act of 2021: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB99.

[8] AB-1325 Microgrids: Clean Community Microgrid Incentive Program: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB1325.

Market Growth Brings Down Costs

Page 25: *"Parties with interests in smaller systems or who have limited access to capital likely depend upon a market that can present a large variety of potential vendors and project partners to create economies of scale. … Also, business models are evolving to create building block approaches for scaling up and developing system configurations based on the customer needs."*

Pages 27: *With more stability in clean energy markets, the financial market has begun to offer new longer-term arrangements like PPAs for clean energy microgrid systems and associated key components. For these PPAs to work, the financial market needs to have confidence in the long-term need for these services and the ability of the equipment to last the expected 10 to 20 years (or longer) that the PPA will be in service. Fortunately, many years of microgrid funding by national and state organizations has provided field data to assist financial institutions with predicting future performance and gaining greater confidence in PPA agreements.*

Comment: The PPA, or more broadly an "energy-as-a-service" (EaaS) business model, presents an opportunity to package microgrids on a turn-key basis, including VGI-enabled EVs that can further defray cost, allow for maximum on-site generation without adverse grid impacts and help California reach its ambitious emissions reduction targets. As a policy matter, California agencies across all sectors (energy, transportation, finance, consumer protection) should work collaboratively to promote widespread adoption of such a model, ranging from single-family residences to large commercial-industrial complexes.

Microgrids Can Provide Support During PSPS Events

Pages 27-28: *"The CPUC reviewed PSPS events in 2019 and found that PG&E customers experienced power outages ranging from 14 to 55 hours, affecting nearly 1.95 million customers.17 Southern California Edison customers experienced power outages averaging 28 hours, affecting 182,000 customers. SDG&E customers experienced outages averaging 30 hours, affecting 48,000 customers. Preliminary results from a survey of residential customers affected by PSPS events shows a 15 percent increase in the purchase of backup generators. Throughout the state, impacted IOU customers experienced outages ranging from 15 to 55 hours."*

Comment: As the above statistics indicate, most PSPS outages last more than one day and will incur increasing collateral damage as extreme weather, of which wildfires are but one element, results in more frequent disruption to our transmission and distribution infrastructure. In the absence of structural policy reforms that will expedite commercialization of DERs and microgrids, the likely immediate solution in advance of this year's fire season will be the continued purchase of fossil-fuel back-up generators, further exacerbating emissions in high density areas Indeed, Gov. Newsom recently announced the distribution of $50 million in grants to local communities to mitigate public safety power shutoffs.[9] These expenditures, while conferring an extremely limited short-term benefit, run contrary to California's urgent environmental, equity and resilience policy objectives.

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[9] Office of Gov. Gavin Newsom, "Governor Newsom Distributes $50 Million in Grants to Local Communities to Mitigate Public Safety Power Shutoffs," March 17, 2021.

Longer-Duration Storage, Clean-Powered Fuel Cells, and Hydrogen

***Page 32**: "During the July 9, 2020, Integrated Energy Policy Report (IEPR) workshop, Mac McQuown from Stone Edge Farms discussed their plans to use hydrogen for seasonal energy storage. … They are developing this seasonal storage by hydrolyzing water (collected on site from rain) to make hydrogen. They will produce hydrogen in the summer months to meet their winter energy demand plus extra to allow for a margin of error. He noted that "it all comes at zero marginal cost and zero carbon footprint" since they generate their own solar energy to produce the hydrogen."*

Comment: The Stone Edge Farm microgrid presents an advanced and dynamic microgrid configuration and close attention should be paid to how hydrogen production by electrolysis and transportation resources can be integrated to provide extremely high levels of resilience over extended periods.[10] The vehicle integration benefits within such a microgrid configuration are many:

- Increased On-site Generation Capacity. Addition of vehicles allows a property to add dedicated generation resources to cover additional load, and inclusion of fuel-cell vehicles, whether alone or in tandem with battery vehicles, introduces an electrolysis component that continuously converts excess generation into a valuable long-duration storage reserve. In fact, the lower round-trip efficiency of electrolysis, often used as an argument against fuel-cell systems, enables maximum siting of behind-the-meter (BTM) generation, which can be fully utilized to cover site load during low production (cloudy/rainy/smokey) conditions and for vehicle charging and electrolysis during high production conditions.

- Ancillary Grid Services. The significant flexibility of this configuration allows the microgrid operator a full range of options, including exporting any combination of excess generation, vehicle capacity and/or hydrogen reserves to adjacent properties and the wider distribution grid.

- Long-Term and Seasonal Capacity Shifting. As illustrated in the above excerpt, addition of electrolysis capacity allows for accumulation of stored energy reserves that can address both peak load conditions and vehicle operations. Utilizing VGI technology, such a microgrid configuration can effectively manage virtually any disruptive situation.

- Emergency Back-up Services. During an extended outage, such a microgrid could also deploy its fleet vehicles to other VGI-enabled locations, effectively bypassing disabled portions of the distribution grid to provide emergency back-up services until the affected portion is reactivated or repaired.

[10] Guidehouse Insights, "Distributed Hydrogen Systems Drive Clean Energy Microgrids," Published 1Q 2021. "Hydrogen was the key enabling technology to reach 100% renewable energy for most of the case studies presented in this report."

<u>Recommendations</u>:

1. **<u>California must embrace a participatory, bimodal electricity system architecture</u>.** Decarbonization through electrification will create a massive increase in electricity demand that can be optimally served by the coordinated operation of the transmission and distribution sides of the energy system. A bimodal architecture comprised of a vibrant, participatory distribution side that complements and coordinates with the bulk power system, as described herein, must be a guiding precept for enacting future policy.

2. **<u>Microgrids serving critical loads are needed in all California communities and comprise a central component of a resilient, energy infrastructure</u>.** The varieties of severe climate-related disruptions in recent years, most recently the extreme freeze that was fatal for many in Texas, clearly signal that we should not be 100 percent dependent on the grid for electricity service. Resilience in the natural world is achieved through diversity and redundancy. In the face of growing climate volatility, prudent planning and risk assessment demand that policy makers recognize that the grid will always have vulnerabilities to unexpected disruptions, no matter how many hundreds of billions of dollars ratepayers are made to pay to harden it. Energy resilience can only be achieved by locating generation and storage resources on or close to end-use sites and applying the microgrid model in a broad spectrum of use cases. As most every property has critical energy needs which would suffer damage if disrupted, some form of microgrid configuration to serve these loads is always appropriate.

3. **<u>VGI-enabled microgrids can be deployed to aggregate and integrate transportation resources while also simplifying EVSE grid interconnection</u>.** In joint comments to the IEPR Update, Nuvve and Enel X discuss the limitations of the current EVSE framework that isolates EV loads and creates inefficiencies by requiring a separate service drop/metered account with each charging station. This structural impediment leads them to conclude that "Without major changes in TE program design, new tariffs for supporting distribution infrastructure, allowances to build new resources and loads at TE host sites, redesign of CAISO's market models, and reforms that properly compensate BTM resources for capacity, we have difficulty seeing how it will be possible to optimally integrate EV loads to the grid, in a manner that maximizes utilization of renewable energy and the existing grid and extends the reach of the state's infrastructure investments."[11]

   One clear solution to this problem would be to integrate multiple VGI charging stations as part of a microgrid, either on a standalone basis or in conjunction with an existing microgrid facility. In such a configuration, a parking lot could utilize a combination of grid energy, on-site generation/storage and available EV capacity, creating a distributed marketplace where EVs can either charge or discharge at predetermined rates while consolidating EVSE load to one interconnection point within the distribution grid. During an outage, the facility would island, and continue operating using an emergency rate structure that incentivizes EVs discharging non-essential capacity when needed.

[11] Jacqueline Piero and Marc Monbouquette, "Comments of Nuvve and Enel X on the Draft 2020 IEPR Update," pp. 3-4, January 27, 2021.

4. **Distributed energy development requires state support and local engagement and participation.** Distributed energy development requires a new proactive, participatory approach that overcomes the limitations of the traditional top-down centralized planning approach and conventional utility procurement mechanisms such as competitively bid RFPs. Coordinating development of DERs at thousands of individual sites requires state funding, program guidance and technical assistance to enable decentralized energy planning through collaboration of local governmental agencies and community organizations with DER and microgrid developers and distribution utilities. While this critical issue is not discussed directly in the Draft IEPR, we urge the Commission to support the policy goals underlying SB 99 and AB 1325 and we request the Commission to consider our comments submitted on July 30, 2020 following the July 7/9 IEPR Workshops on the Future of Microgrids in California.[12]

5. **Incorporation of VGI technologies into microgrid modelling should be given high priority**. Decarbonization of both power and transportation sectors in a manner that advances environmental justice are California's top policy objectives. The flexible benefits offered by VGI to enhance energy resilience can be applied to microgrids of any size in any community, from a single-family residence to large campuses and commercial-industrial facilities. With proactive grid modernization, VGI-enabled vehicles can also bypass disabled grid segments to directly provide back-up generation during outages. Given the need for efficient, effective economic recovery, every dollar spent must confer the absolute maximum possible benefits, and a high premium should be placed on developing technologies such as VGI that create synergies by integrating multiple economic sectors.

6. **IEPR objectives directly correlate to economic recovery and engagement should expand to include stakeholders in all sectors**. A broader convening is needed to determine how the IEPR process and objectives can be implemented to maximize job creation and economic recovery. Gov. Newsom's Task Force on Business and Jobs Recovery generated hope that a comprehensive plan incorporating IEPR objectives could be developed, but the end product of that Task Force left much further work to be done. Going forward, the IEPR should actively engage all stakeholders, both internally in CEC proceedings and through its recommendations for a renewed economic recovery program.

Conclusion

The Draft IEPR's conclusion that microgrid commercialization is challenged by high costs and that microgrids are appropriate and cost-effective only in a narrow set of situations misses the fact that California currently lacks a policy and regulatory framework that recognizes and compensates the value that microgrids can provide to the grid and to society more broadly. If these values were recognized and compensated through an effective commercialization policy framework, the economics of microgrids would dramatically improve. Cost reduction should not be a prerequisite for commercialization; rather, the purpose of effective commercialization policy is to create the conditions that stimulate innovation and additional investment and lead to cost reductions.

The Draft IEPR's conclusion also dangerously underestimates the risks that worsening climate volatility presents to the people of California and mistakenly assumes that hardening the grid will

[12] Comments of The Climate Center Submitted to the CEC Following the July 7/9 IEPR Workshops on the Future of Microgrids in California CEC Docket 20-IEPR-04 July 30, 2020.

provide sufficient resilience to make microgrids largely unnecessary. Given the degree to which global climate cycles and ecosystems have been disrupted, we cannot predict the type, the timing, the location or the severity of future climate events. The spectrum of disastrous possibilities is simply too wide to expect that we can achieve the level of preparedness Californians deserve only by hardening the grid. Disruptive and often fatal climate-related events always have local impacts, which means that every community should have provisions for resilient electric service that are not grid dependent.

The excerpts quoted above expose an unnecessarily limiting adherence to legacy power system structures and mindsets that downplay the potential benefits of microgrids and local energy systems in favor of continued reliance on and massive investment in the increasingly vulnerable centrally planned and managed grid. As a result, the Draft IEPR envisions very limited application and viability of microgrid technology, while more progressive, forward-looking perspectives proffered by microgrid owners, developers and managers identify business models that will *enable microgrid adoption in a manner dictated by the needs and priorities of each community and the capabilities of each project site*.

To reduce the cost of microgrid components and systems, commercialization will be key towards creating the economies of scale that will bring costs down to a level that enables widespread adoption. To this end, adoption of regulatory provisions that recognize and compensate the values microgrids can provide to the power system, and that simplify and streamline the procedural hurdles, will be crucial for engaging private investment and risk-taking and thereby reducing the risks and costs imposed on ratepayers. Under the backdrop of climate change and state decarbonization and equity goals, energy resilience through distributed energy resources (DERs) and microgrid development should not be seen as aspirational or of limited applicability, but as an essential policy mandate requiring coordination among all of California's energy policy agenies.

Enabling and augmenting this structural transformation are technologies such as vehicle-grid integration (VGI) that can bridge and integrate capacity from both the power and transportation sectors without incurring infrastructure redundancies. Indeed, Volume II of the Draft 2020 IEPR Update states as much by declaring that while three areas are discussed in discrete volumes, *transportation is its primary focus*.

Going forward, the IEPR process should seek to identify and exploit areas of synergy where resources can serve multiple functions and advance a wide range of policy goals. Advancing energy security, resilience and equity should start from a broad recognition that the legacy transmission and distribution grid architecture, while absolutely critical to achieving complete decarbonization on a statewide and broader regional basis, will continue to be inherently vulnerable to unforeseen disruptions no matter how many tens of billions of dollars are invested in strengthening it, and therefore cannot provide true energy resilience that will protect communities and customers from the worst impacts of power outages. The growth of a vibrant participatory distribution side must be guided and supported by state policy, supporting local community energy resilience planning to address local priorities and vulnerabilities and incorporate new models for local energy system ownership and governance.