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American Clean Power - California Comments on 2021 IEPR Scope

Attached please find comments of American Clean Power - California on the Proposed 2021 IEPR Scope.

Additional submitted attachment is included below.



February 19, 2020

California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

Submitted electronically

Subject: 21-IEPR-01

Dear Commissioners,

The American Clean Power Association (ACP) is the voice of companies from across the clean power sector that are providing cost-effective solutions to the climate crisis while creating jobs, spurring massive investment in the American economy, and driving high tech innovation across the United States. ACP's mission is to transform the U.S. power grid to a low-cost, reliable, and renewable power system. ACP-California shares this mission with an eye toward California's market and policy objectives.

The clean energy industry commits to ensuring that all Californians have electric power during every hour of every day, particularly in the face of more intense climate events. Reliability is a basic need in modern society, and a diverse portfolio of clean technologies including solar, storage, land-based and offshore wind, and transmission, working together, will deliver affordable reliability without compromising air quality or decarbonization. As such, ACP-California was pleased to see the proposed scope of the 2021 IEPR:

- Energy reliability over the next five years
- Evolving role of the pipeline gas system
- Building decarbonization and energy efficiency
- Energy demand

ACP-California offers the Commission solutions that can ensure reliability, affordability, and decarbonization of the economy in one cohesive statewide plan. We are attaching our clean reliability white paper to this letter, which includes detail on a number of mid-term and long-term recommendations that were included in the Root Cause Analysis. In addition, we recommend the following actions:

1. Initiate development and planning of California's transmission infrastructure to meet the basic needs of affordable, reliable electric power and simultaneously facilitate a transition to 100% clean energy.



California agencies must work with the CAISO and participating transmission owners to advance interconnection upgrades and transmission approvals to enable new generation projects to provide Resource Adequacy.

In addition to the near-term interconnection processing and transmission solutions, ACP-California recommends a statewide transmission planning effort to appropriately consider and evaluate the transmission build out that will be necessary for California to achieve its climate goals.

Unfortunately, the current processes do not enable full consideration of California's future transmission needs and have hindered the approval of new transmission lines. The State should initiate a process to study and approve transmission upgrades that can enable California's near and longer-term climate goals and support long-lead time resource development, including offshore wind.

2. Build a clean energy portfolio that addresses both reliability and decarbonization.

ACP-California appreciates that the IEPR is an important venue for implementing previous policies and guiding future procurement decisions. As such, the Commission should consider the importance of both regional and technological diversity in its reliability analysis, and should work with the CPUC to shape procurement guidance for LSEs. This guidance should reflect the scale of procurement necessary to provide replacement power as California's conventional power plants retire, ensure system and local reliability, and consider both regional and geographic diversity strategies to enhance reliability and resilience.

As California LSEs invest in new generation resources, delivering these resources through a safe, modern transmission system will guarantee both resilience and affordability through economies of scale. The State must recognize and participate in national and regional discussions around hardening and modernizing a strong, resilient transmission system.

We also encourage the Commission to look beyond the next five years in its reliability assessment to ensure that planning and investments made today will put us on track to achieving SB 100 reliably and at least cost. The Joint Agency SB 100 Study results demonstrated the value of a diverse portfolio of clean resources, the huge quantity of renewables and storage needed by 2045, and the rapid pace of deployment required. The Commission should begin planning to implement the requirements of SB 100 immediately as part of its reliability analysis.

The Commission should also study offshore wind as a potential replacement resource for Diablo Canyon and Once-through-Cooling facilities. The transmission capacity available today in the central coast and by 2025 with the closure of Diablo Canyon could deliver offshore wind from the Morro Bay call area to serve load. Given its generation profile, peaking late in the afternoon and evening, offshore wind will be an essential component of a clean resource portfolio to replace this nuclear facility. With new transmission, offshore wind could also provide local capacity value to alleviate reliability constraints in the replacement of conventional facilities. Therefore, while offshore wind may be considered a long lead-time resources, it should be considered in the proposed five-year reliability analysis for this 2021 IEPR.



3. Consider the compounding importance of renewable energy and storage as California moves to electrify buildings and transportation.

ACP-California is strongly supportive of the State's efforts to decarbonize the building and transportation sectors through electrification strategies. Renewable energy has been a cornerstone of the State's decarbonization strategy thus far, and electrification policies do present enormous opportunities for clean energy through increased demand. However, the State must also begin to prioritize investments in transmission, renewable energy, and storage in order to keep up with current demand *and* to anticipate significant increased demand in the coming years. We appreciate the CEC's attention to this trend, and look forward to working with the Commission to ensure timely deployment of renewable energy and associated infrastructure.

The 2021 IEPR should consider the fundamental market and procedural reforms that will be necessary to recognize the changes to the resources powering the grid. Thank you for your focus on reliability in these challenging times. We look forward to working with you and your partner agencies to seek solutions, in hopes of mitigating future reliability challenges in the face of unrelenting climate change.

Sincerely,

A handwritten signature in black ink, appearing to read "Danielle".

Danielle Osborn Mills
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Clean Reliability for California

The clean energy industry commits to ensuring that all Californians have electric power during every hour of every day, particularly in the face of more intense climate events. There can be no backsliding on reliability. A diverse portfolio of clean technologies including solar, storage, land-based and offshore wind, and transmission, working together, will deliver affordable reliability without compromising air quality or decarbonization. We are committed to working with California's leaders to quickly restore the confidence of Californians in addressing this core necessity.

The California Independent System Operator (CAISO), California Public Utilities Commission (CPUC), and California Energy Commission (CEC) are rightly focused on immediate steps to ensure continuous, reliable electrical supply in California over the next 9-18 months. While immediate action is critical to ensuring near-term reliability, such action must be coupled with longer-term reforms that re-envision the way electric planning, procurement, and energy processes work to make sure they are properly designed for the transition to 100% clean energy. This document outlines both immediate regulatory actions to enhance reliability in the next several years, as well as and longer-term market reforms to facilitate the clean energy transition. With improved planning and coordination, California's joint energy agencies and the CAISO can provide for the safe, affordable, reliable, and clean electric service to Californians into the future.

Immediate Regulatory Actions and Market Reforms

- Advance transmission and interconnection upgrades and enable new generation projects to provide Resource Adequacy.
 - Advancing already-approved interconnection upgrades could enable at least 1,400-2,000 MW of new capacity between 2021-2024 and considering modest transmission upgrades in the Integrated Resource Planning process (IRP) for analysis in the Transmission Planning Process (TPP) could enable at least an additional 3,100 by the mid-2020s.
- Enable inverter-based renewable resources to provide and be compensated for essential grid services in 2021 CAISO stakeholder initiatives.
 - Action in 2021 will optimize the efficiency of new capacity and reliability between 2023-2045.
- Cure the current capacity shortfall with a procurement directive sufficient to ensure system reliability by 2024-2025.
 - Additional regulatory action in 2020-2021 should direct LSEs to bring new capacity online to replace planned retirements and ensure system reliability between 2024-2045.

Longer-Term Changes to California's Energy Procurement and Energy Markets to Facilitate the Clean Energy Transition

- Explore a new compensation structure to value flexibility from wind and solar
- Improve the IRP process to facilitate a clean grid transition and send longer-term signals
- Conduct long-term transmission planning
- Reform Resource Adequacy

- Consider Day-Ahead, Real-Time and Ancillary Service market changes to align with the operational characteristics of wind, solar, and storage
- Facilitate improved energy and capacity exchanges across the Western grid

Immediate Regulatory Actions and Market Reforms to Ensure Reliability

The joint energy agencies and CAISO are actively securing additional resources to reduce the likelihood of similar events in 2021. With focus and leadership, these actions can ensure deployment of the renewable energy and storage resources needed for reliability and ensure that California keeps pace with its renewable energy and decarbonization requirements.

The CAISO, CPUC, and CEC should continue to work together to implement the following actions and to ensure reliability and decarbonization through all phases of planning, procurement, deployment, and operations:

Advance Transmission and Interconnection Upgrades

Many transmission upgrades have already been approved by CAISO through the transmission planning and interconnection processes, but remain in various phases of siting, engineering, and construction by the relevant transmission provider and the CPUC. Securing and finalizing the construction of these projects would accelerate the completion of renewable energy and storage projects that they enable and allow those projects to contribute to system reliability. However, some of these transmission upgrades are delayed or have been deprioritized by either the CPUC or the transmission developer responsible for their completion (generally PG&E, SCE or SDG&E).

After initial review, ACP-California has identified several relatively small “interconnection” upgrades that can enable at least 1,400 – 2,000 MW of renewable generation and battery storage. Renewable developers are ready to construct these projects when the transmission upgrades are secure. From an environmental perspective, most of these projects are classified as “reconductoring” of existing transmission lines and substations, meaning they require no new right-of-way and will have minimal environmental impacts. The projects are currently in various stages of the siting and permitting process, but all have been approved by either the CAISO’s generation interconnection or transmission planning processes. The funding mechanisms for the upgrades are already established and well understood. Action is necessary to prioritize these projects and ensure they are completed in a timely manner so that they can unlock renewable energy development in the near-term. Timely completion of these upgrades will help unlock delivery of additional clean energy capacity in the next several years.

To prevent this bottleneck from impacting Resource Adequacy and clean energy requirements over the next 2-3 years, the CAISO should work with the CPUC and transmission providers to prioritize the upgrades that, if left incomplete, would jeopardize the timing of clean capacity coming online in the near-term.

Transmission providers in California have many competing demands for their finite engineering, permitting, and capital programs, including critical requirements like public safety and reliability maintenance. The CAISO and CPUC should consider all options for providing transmission providers the

resources and tools they need to interconnect clean energy projects in a timely manner, including expedited permitting approvals, and proactive identification of transmission corridors.

In addition to the CAISO-approved transmission upgrades discussed above, at least an additional 3,100 MW of renewable generation and battery resources could come online through modest transmission upgrades that have not yet been approved in a CAISO transmission plan. In order for the CAISO to consider these upgrades, many of which are not expected to require extensive permitting processes, the renewable resources enabled by the upgrades must be included in the resource portfolios that the CPUC, with input from the CEC, provides to the CAISO through the IRP. Ensuring that near-term IRP portfolios include the resources that rely on these upgrades would accelerate the approval of these transmission upgrades and facilitate development of additional clean energy resources in the next several years.

The joint energy agencies and the CAISO must expedite interconnection and deliverability upgrades to prevent unnecessarily delaying the ability of new generation projects to provide Resource Adequacy. To do so, the agencies should:

- Work together with transmission owners to prioritize those upgrades with the most timely and impactful Resource Adequacy benefit.
- Factor interconnection upgrade risk into staff's Status of New Resources Expected analysis.
- Expedite, where possible, the Commission's decisions on permitting tracks for upgrades.
- Ensure that near-term IRP portfolios include a more comprehensive set of renewable resources, including those with modest transmission upgrades, to accelerate the analysis and possible approval of these upgrades in the TPP.

Enable Inverter-based Renewable Resources to Provide Essential Grid Services

As recent studies have demonstrated, wind¹ and solar² resources can provide essential grid services. Allowing and encouraging wind and solar to provide these essential reliability services can help California secure reliability and a clean energy future. Significant changes will be required to contracting and procurement practices to fully optimize these services. While some reforms will need more time to take effect (discussed below with other structural reforms), CAISO is poised to consider some operational changes in 2021 initiatives, such as the Dispatch Enhancement Initiative and Frequency Response Initiative. These upcoming stakeholder initiatives should look broadly at the capabilities of variable energy resources and ensure market changes are made with an eye towards the provision of headroom by wind and solar. More granular control of ramp rates via dispatchable renewable products and the ability to procure headroom (upward reserves) from wind and solar resources will be critical to grid reliability as fossil plants retire and are replaced by inverter-based resources.

¹ Loutan, Clyde and Vahan Gevorgian. [Avangrid Renewables Tule Wind Farm: Demonstration of Capability to Provide Essential Grid Services](#). 11 March 2020.

² Loutan, Clyde et. al. [Demonstration of Essential Reliability Services by a 300-MW Solar Photovoltaic Power Plant](#). March 2017.



Cure the current capacity shortfall with a procurement directive sufficient to ensure system reliability by 2024-2025.

The joint energy agencies and CAISO must come together with a consistent understanding of the capacity needs of the system and the State in the coming years, with full consideration of planned resource retirements and a clear understanding of renewable energy and storage development timeframes. The CPUC should use this information to direct procurement of a diverse suite of additional renewable and storage resources, beyond what has already been ordered through the Commission's most recent procurement track.

Longer-Term Changes to California's Energy Procurement and Energy Markets to Facilitate the Clean Energy Transition

California's existing electric planning and procurement processes, transmission planning, and energy markets were designed around a resource mix which, in large part, will be retiring from the grid or used increasingly sparingly as the state transitions to a 100% clean resource mix. Therefore, virtually every aspect of California's electricity rules and regulations needs to be re-evaluated to ensure they support the clean energy transition. This will help the state develop a roadmap to 100% clean, including: re-envisioning the process used to plan for future resources, how clean energy resources are contracted for, the process used to authorize transmission, and how the wholesale electricity market optimizes for these resources. By re-imagining these processes, California can design an electricity market that will be cleaner, more affordable, and more reliable. Alternatively, if these processes are not revised and the fast-acting, flexible, clean resources of today and tomorrow are required to fit into the procurement and market processes of yesterday and without a clear roadmap to achieving the state's policy goals, the result will be less efficient, less clean, and more costly.

The State, its agencies, utilities, and stakeholders must come together to transform the electricity procurement, transmission planning, and wholesale markets in the state. This includes making changes that will enable the use of renewable resources in a flexible and dispatchable manner, rather than the "must-take" with curtailments approach that is used today. In the future, the curtailment of renewable resources can be a proactive tool used to intentionally back-down these resources and enable the more efficient operation of the grid, increase the grid's ability to integrate high quantities of renewables, and reduce overall system costs for consumers.³ This can only happen if there are changes to a number of current processes and market operations.

As California's energy agencies work to ensure reliable electric service in the near-term, California must also take a long-term view of the changes required to successfully transition to a 100% clean energy future and should begin developing the roadmap to 100% now. Below is a summary of potential market and policy reforms to facilitate a transition to a clean grid. These are high-level recommendations meant

³ Nelson, J. et al. October 2018. *Investigating the Economic Value of Flexible Solar Power Plant Operation*. Energy & Environmental Economics. <https://www.ethree.com/wp-content/uploads/2018/10/Investigating-the-Economic-Value-of-Flexible-Solar-Power-Plant-Operation.pdf>



to spark additional conversation, workshops, and initiatives on the transformational changes necessary for California to effectuate the clean, reliable, affordable energy transition.

Explore a New Compensation Structure to Value Flexibility from Wind and Solar

Current contracting, modeling, and energy market functionality treat the output of wind and solar resources as “must take” (though its output can be curtailed or unused when grid conditions cannot accommodate the full capability of the resource). As the penetration of these resources on the grid grows – and as their cost decreases – it is becoming increasingly important to use them in a flexible manner. Doing so involves only utilizing the output of these resources when it is operationally efficient when considering the full needs of the system. Under this approach, these resources may intentionally hold back capacity and not produce to their full capabilities when used flexibly. The resulting “headroom” on the resources can provide system balancing services, including the ability to dispatch in the upward direction in the event of system contingencies. Operating solar, wind, and hybrid resources in this manner will allow for the remainder of the grid to be operated more efficiently and effectively to facilitate the transition to 100% clean energy. Transitioning to a paradigm where wind and solar resources are used in this flexible manner requires changes to the way the resources are planned for, contracted for, and how the system is optimized, as discussed more below.

Utilizing wind and solar more flexibly in the grid of tomorrow requires changing contracting and other practices today, which is why this conversation cannot be overlooked even while the current priority is, appropriately, focused on maintaining California’s grid reliability for the next year or two. Many of the potential changes contemplated in this paper, particularly around the use of flexible wind and solar, cannot be implemented retroactively without undermining existing renewable energy contracts. Therefore, flexible wind and solar use can only be applied to resources that are procured after these policies are implemented. This underscores the urgency of implementing these practices on an expedited basis: if California wants to have this type of flexibility in place in the 2025-2027 timeframe, when it is expected to be critically important, the changes must take shape today.

To encourage wind and solar to provide flexible services and not always seek to maximize their output, they must be compensated differently. Typical contracting structures today pay these resources based on the amount of energy delivered to the grid and often have provisions that will result in non-payment if energy is curtailed. This must be changed as the next generation of renewable resources reach high levels of penetration and requires the right regulatory structures to provide “headroom” type services.

Interested stakeholders and state agencies should begin discussions about effective methods that could be used to incentivize a different type of compensation structure for wind and solar resources, tailored to serve California’s needs.⁴ This might include a requirement that some percentage of ancillary services come from variable energy resources or that renewable resource contracts signed after a certain date include the provision of some fixed percentage of “headroom.” Under this construct, future renewable resources would operate at a maximum of, for instance, 95% of their potential output unless directed to provide more by the grid operator. This type of requirement would provide for built-in ancillary services,

⁴ See, “Evolving the Solar Procurement Paradigm” (2019). <http://go.firstsolar.com/l/474372/2019-10-28/g58hj>



such as contingency and load-following reserves, from the renewable resource fleet and would help ensure the transition to clean energy is more reliable.

Improve the Integrated Resource Planning Process to Facilitate a Clean Grid Transition

Drive Procurement and Provide Long-Term Market Signals

The IRP process should be the primary mechanism used to drive electricity procurement activities in the state. It should include a process by which procurement authorization (or directives) occur, including approval of “action plans” by participating entities that address the procurement plans for the next three, five, and ten years. Recognition of realistic commercial timelines in the procurement planning process is critical. The IRP should create long-term signals that provide a stable market for renewable resources.

Model Flexible Wind and Solar and Renewable + Storage Projects

The IRP modeling must be updated to account for the next generation of resources and their evolving capabilities. Currently, the IRP does not model the flexible attributes wind or solar resources. This must be changed to enable dispatch of low-cost wind and solar generation around the remaining fleet. This includes recognizing the value of, and ability for, renewable generation to be flexibly integrated into the grid.

In addition, the IRP does not currently model co-located wind/solar and storage. It is important to appropriately model the generation fleet and its configuration within the IRP process; otherwise, energy procurement and transmission planning will be misaligned. Stand-alone storage resources are often sited close to load. That storage function operates differently and provides different benefits than a storage facility co-located at a solar or wind project and being a single point of interconnection.

The IRP must properly evaluate these two different applications of energy storage and must reflect the increasing prevalence of co-located solar-plus-storage and wind-plus-storage.

Improve the Approach to Identifying Future Portfolios to Ensure Reliability, Decarbonization, and Affordability

Currently, the IRP process utilizes the RESOLVE capacity expansion model to select future resource portfolios. Portfolios are then transmitted to the CAISO for transmission planning purposes. Unfortunately, continued overreliance on RESOLVE’s capacity expansion tool has created portfolios that do not meet system needs and, as a result, the state is failing to adequately plan transmission for future resource portfolios. CAISO has recently pointed out some of the concerns with the continued reliance on RESOLVE’s portfolio development.⁵ Notably, based on CAISO’s own assessments, RESOLVE has failed to correctly identify system capacity needs and therefore has not selected sufficient resources to meet capacity needs. RESOLVE also has underestimated GHG emissions. CAISO noted that the simplified RESOLVE

⁵ See *Comments of the California Independent System Operator Corporation*, CPUC R.20-15-003, October 23, 2020.



capacity expansion model cannot capture the full costs and benefits of a particular portfolio and recommended the model be used only as a starting tool.

Given these concerns, the CPUC must improve the process used for identifying portfolios in the IRP process, and the portfolios communicated to the CAISO for the TPP to ensure reasonable system reliability, meet GHG reduction targets, and reflect a “least regrets” path forward.

Conduct Long-term Transmission Planning to Facilitate a Clean Grid Transition

If the IRP modeling fails to select the full suite of resources necessary to meet system needs and achieve decarbonization requirements, the transmission planning, approval, and development process also falters. Thus, fixing the IRP process is critical to addressing transmission planning challenges. Additional transmission capacity is going to be critical to ensuring a reliable transition to a clean energy future.

Therefore, the CAISO’s TPP should look out 10 and 20 years into the future and should aim to identify “least regrets” transmission expansion opportunities and to quickly move forward with their approval and construction. The TPP should include evaluation of a range of potential resource portfolios in the 10- and 20-year time horizon. These portfolios should represent an aggressive transition to clean energy resources, consistent with the state’s clean energy goals. The TPP should report the necessary transmission projects and costs for each portfolio that is analyzed.

Transmission projects that show up in most of the resource portfolios and time horizons should move toward approval and construction rapidly. Projects that show up in only some instances should be further studied in the IRP and subsequent TPPs and should begin to be permitted and engineered so that construction can start in a timelier manner in the future, should the projects end up being required. This will provide optionality to move forward with needed projects faster if they are determined to be necessary or beneficial.

Reform Resource Adequacy to Facilitate a Clean Grid Transition

California must overhaul its Resource Adequacy program to address the changing needs of the grid. While the hour of system “net peak” must be addressed in a future Resource Adequacy program, such a program should also address the energy needs of the grid, which will be increasingly important to consider as penetrations of wind, solar, and storage grow.

The new Resource Adequacy process should appropriately incentivize the needed deliverability status of different resources. For instance, there should be consideration of the ability for Energy Only – Off-Peak Deliverability Status resources to provide energy as part of a holistic resource adequacy program.

Additionally, the CPUC and CAISO should condense the hodgepodge of Resource Adequacy rules and regulations into a cohesive program where the roles and responsibilities of each entity are clearly defined and well understood. This will simplify compliance, reduce costs, and serve to benefit the reliability of the grid.

Consider Day-Ahead, Real-Time and Ancillary Service Market Changes

The CAISO currently has several different markets and market timelines, all of which were designed around a very different resource mix than will be in existence ten years from now. At a high-level, the



CAISO's current market processes include the day-ahead, real-time, and ancillary -services markets. There is a need to re-envision these markets and their timelines in light of the changing resource mix and evolving needs of the grid. For instance, the following questions should be considered as part of the clean energy market evolution process:

- Should the day-ahead market have 15-minute scheduling granularity in some or all intervals to help better account for morning and evening ramping needs?
- Should the day-ahead market look out multiple days with updated schedules, forecasts, and bids being submitted closer to when variable energy resource output is well known (e.g. on the morning of the operating day)?
- Should the day-ahead market run multiple times in a day to better optimize the energy storage fleet?
- Should the real-time market look out beyond its current 65-minute horizon?
- Could the real-time market be simplified to only include a 5-minute market?
- What changes are needed to ancillary service markets? Should all resources providing ancillary services be capable of fast response (e.g. implementing a 1-second Automatic Generation Control requirement)?

Facilitate Improved Energy and Capacity Exchanges Across the Western Grid

California needs to evaluate how to better optimize energy and capacity sharing across a larger geographic footprint. While this may involve establishing a larger, regional market footprint, there are other options that may help enable better trading of energy, ancillary services, and capacity across the West. The new market should be designed with an eye towards facilitating greater regional exchanges considered holistically within the market's design.

California's Policies, Processes, and Market Structures Must Evolve with the Changing Resource Mix

Clean energy resources have a large range of capabilities that can be harnessed to ensure a reliable transition to the grid of the future. If California wants to be able to rely on the full suite of services and flexibility that can be offered by these resources, it needs to holistically re-envision its electricity procurement, transmission planning, and wholesale energy markets with an eye towards the evolution of the resource mix. This reinvention needs to start today; coordination now between all relevant agencies will be critical to the long-term viability of California's markets. A broader and more in-depth dialog needs to begin among the state's leaders, key agencies, the CAISO, and stakeholders to determine the appropriate transitions and bring them to fruition.