INDEPENDENT
ENERGY
PRODUCERS
ASSOCIATION

May 26, 2015

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 15-IEPR-06
1516 Ninth Street
Sacramento, CA 95814-5512

Re: 2015 Integrated Energy Policy Report (2015 IEPR): Workshop on Renewable Progress, Challenges, and Opportunities.

The Independent Energy Producers Association (IEP) submits these comments on the California Energy Commission's (Commission) Workshop on Renewable Progress, Challenges, and Opportunities convened on May 11, 2015. IEP participated in the Panel Discussions, and our written comments supplement for the record our oral comments made during the workshop.

1. Issues and Challenges Associated with a 50% Renewable Target.

The Commission distributed a series of questions for the workshop related to the issues and challenges facing the renewable program between now and 2030. IEP appreciates the opportunity to respond to these questions.

1.1. What should a 50% renewable policy framework look like?

In spite of critics and concerns regarding grid reliability, the evidence is overwhelming that the current renewable framework, i.e., the California Renewable Portfolio Standard (RPS), has proven quite successful to fostering significantly higher penetrations of renewables. While improvements can and should continue to be made, the RPS serves as a good foundation for achieving even higher penetrations, including a 50% renewable level. Certainly, it would be an imprudent to eliminate and/or replace the existing framework in the absence of a proven, alternative framework with clear goals, compliance obligations, and penalties for non-performance. Some parties argue for either terminating the current RPS framework or, alternatively, replacing the RPS with a new, unspecified GHG Reduction Framework as the primary means of driving needed investment in clean technologies. IEP disagrees.

Now is not the time to throw a successful RPS policy out-the-door. After 10 years of development and fine-tuning, the RPS policy has proven to be a valuable tool for developing and sustaining renewable resources necessary to achieve a 33% penetration of retail sales. Billions of dollars have been invested, thousands of jobs created, millions of tax revenues realized, and hundreds of projects successfully developed. This proven success provides a sound foundation for moving forward to achieve a 50% renewable goal. Importantly, in the context of infrastructure investment and financing, the current RPS framework provides a measure of regulatory and financial certainty that is too valuable to discard or undermine. Thus, IEP recommends that the Commission not heed the requests of some to abandon the RPS now in order to provide some entities with greater “flexibility” to realize unspecified and unclear goals.

1.2. Should the Renewable Framework Replace the RPS?

No, as noted above. To the extent that the existing RPS program can be improved, then this improvement should occur as rapidly as possible. Notably, the California Public Utilities Commission (CPUC) is in the midst of reforming critical aspects of the existing RPS, including consideration of energy-only facilities; development of sustainable methodologies for determining the appropriate integration cost adder to be imposed on new resources; finalization of capacity calculations for resources (e.g. Effective Load Carrying Capacity or ELCC); and, revisions to the RPS Calculator. This important proceeding should not be superseded nor impeded by a "reform" process, particularly given the overwhelming evidence of RPS success to date. Moreover, the Commission should take note that it took nearly 6 years (2000-2006) before RPS implementation started on a path of sustained renewable development that increased renewable penetration from approximately 12% of retail sales to the 33% level soon to be achieved by the load-serving entities. The Commission should anticipate that the time to design and implement a new, replacement framework risks delay in program design, implementation, and most critically the renewable procurement necessary to incent the infrastructure investment to meet 2030 policy goals with regards to GHG emissions reduction and renewable energy generation.

1.3. What are the Operational Challenges of a 50% Renewable Policy Framework?

The operational challenges primarily arise due to two factors: (a) the inherent intermittency of wind and solar and (b) the imbalance between supply and demand (i.e. "over generation") that can occur when large amounts of renewable energy is available, demand is low, and a certain amount of non-renewable electric generators are required to be available (often at minimum operating levels or "P-mins") for reliability purposes. On the one hand, grid operators have tools under their respective tariffs to address these challenges in real-time. On the other hand, the tools available to grid operators to address these operational challenges, particularly over-generation, are limited essentially to curtailment of generating resources and/or exports of unused energy.

With regards to the operational challenges that do occur (or are forecast to occur), a number of factors currently available to planners, policymakers, and grid operators mitigate the scope and scale of the forecasted operational challenges:

- Regarding the inherent intermittency of wind and solar, this operational challenge may be lessened by utilizing fast-ramping (upward/downward) electric generators to support the integration of wind and solar as the sum of energy generated by these resources moves up/down. Natural gas generators can provide this service well, and fortunately California's natural gas generation fleet is clean and highly efficient. Storage resources, too, can help mitigate the operational challenges. In the short term, however, the "fleet" of storage devices is small and the technology often unproven at the scope and scale needed to fully mitigate the operational concerns. The CPUC-lead storage initiative currently is designed to result in only 1,400 MWs of operational storage by 2024, and this amount of storage may prove inadequate in the interim and insufficient in the long-term given 2030 renewable goals.
- Regarding the mismatch between supply and demand, this operational challenge may be rectified by lowering supply and/or increasing demand. A number of tools currently available can help manage this operational challenge. Here again, the potential for storage resources to help balance supply and demand is large, yet this resource is not expected to be available at the scope/scale required in the near term. Moreover, as discussed more fully below, while currently most if not all the focus related to demand response is on reducing demand, clearly, in certain periods including that of over-generation, a demand response that increases load is appropriate and may well provide ancillary public benefits.

1.4. What Factors Contribute to the Operational Challenges Associated with a 50% Renewable Policy Framework?

As a practical matter, the operational challenges experienced today are a function of procurement choices made over the past 10-15 years. For the past 10-15 years, few truly "merchant" generators have been developed in California; rather, the generation infrastructure is a function of procurement processes and decisions. Fortunately, operational challenges forecast to occur over the next 10-15 years can be addressed through changed behaviors, practical policies, and sound procurement practices that minimize the scope and scale of the operational challenges forecast in the future.

By statute, CPUC jurisdictional entities, which serve approximately 75 percent of the state's load, are directed to procure renewables based on the principle of Least-Cost/Best-Fit (LCBF). In theory, the LCBF methodology should anticipate and thus thwart the probability of operational challenges arising in the future. To the extent that this is not the case, IEP recommends a more focused re-evaluation of procurement practices in general and specifically the implementation of the LCBF methodology. If the LCBF methodology is failing, then the Commission should address the reasons for that failure.

The Commission should also consider market design improvements that could help lessen the operational challenges forecast to occur absent a change in current behavior, and make recommendations in the 2015 IEPR as appropriate. For example, while the current one-year resource adequacy (RA) framework is designed to ensure that the requisite flexible, fast-ramping resources are available to meet reliability needs, this program creates few if any incentives for existing electric generators to retrofit their units to (a) increase their operational capabilities to provide quick-start, upward/downward ramp, or (b) to lower their minimum operating points ("P-min") to reduce energy deliveries to the grid while ensuring availability to the grid operator in real-time. The 2015 IEPR should assess the extent to which a multi-year RA framework would help in this regard.

1.5. Should a 50% Renewable Policy Be Technology Neutral?

Yes. As noted above, IEP has presumed that the LCBF methodology would result in a portfolio of renewables, given the unique operational characteristics of each technology type. Here again, to the extent that this is not the case today, IEP recommends a more focused assessment of the LCBF methodology: If the LCBF methodology is failing, then the Commission should address the reasons for that failure immediately.

1.6. Should Renewable Procurement Practices Under a 50% Renewable Policy Framework Differ From Current Practices?

See section 1.3 and 1.4 above.

1.7. What are the Roles of DG, Energy Efficiency (EE), Demand Response (DR), Storage, Micro-grids, Electric Vehicles (EVs), and Electrification of the Heating Sector in Achieving a 50% Renewable Target?

All these technologies have a role to play in meeting a 50% renewable target. Some of these resources lower retail sales (e.g., behind-the-meter DG, EE, and DR). By lowering retail sales, these resources make attainment of the 50% renewable target that much easier. Some of these resources may support higher levels of renewable penetration, particularly intermittents, by enabling the delivery of the renewable energy at a more useful time (e.g., storage, EVs). Some of these resources could provide a useful “sink” for clean, zero-emitting renewables, particularly during periods of over-generation (e.g., storage, EVs, electrification of the heating sector). These “sinks” should be encouraged as an effective means to reduce the operational concerns associated with robust renewable generation in specific times of the day or year. [See below for additional discussion regarding beneficial “sinks” for renewable energy and policy actions to assist the creation of such sinks].

2. Renewables and Reliability.

2.1. What is the Relationship between Renewables and Reliability?

As noted above (see section 1.3), renewables are a supply resource that present no additional *reliability* problems per se. Moreover, to the extent that the presence of renewables causes concerns regarding reliability, grid operators have sufficient tariff-based tools to mitigate and resolve any reliability issues as they emerge when caused by renewables or any other resources. These tools include the authority to order emergency curtailments and the opportunity to export resources outside their balancing authority.

2.2. What Role Does Curtailment Have In Ensuring Grid Reliability?

The need for curtailment arises when electric supply exceeds demand, and the grid operator has no means to export the excess energy. Two types of curtailment exist, both of which help in managing grid operations. The first type of curtailment is tariff-based authority granted to the system operator to impose curtailments on resources under conditions of declared system emergency.

A second type of curtailment, commonly negotiated in power purchase agreements (PPAs) between Buyers and Sellers, affords the Buyer specified curtailment rights in conditions and circumstances negotiated between the parties. These rights vary by utility and by contract.[1] Generally, the curtailment rights range from (a) unlimited Buyer curtailment with Seller being compensated to (b) limited hours of curtailment with no compensation.[2] In all cases, one should expect that the energy price in the PPA negotiated between the Buyer and the Seller will reflect the risk of curtailment. The CPUC has appropriately recognized the necessity of bounding curtailment risk (or at least the financial risk) when developing its RPS program.

2.3. Additional Tools to Address Over-Generation

The tools to address over-generation focus primarily on the supply-side of the supply/demand equation in real-time via exports and/or curtailments. This framework fails to take advantage of opportunities associated with the demand-side of the equation and, in doing so, misses opportunities. Demand-side tools that should be considered as a means to address the operational challenges associated with too much clean energy being produced in real time are potentially substantial, and need to be considered in the 2015 IEPR.

In this context, IEP recommends that the 2015 IEPR address what additional tools may be needed to reduce the need for curtailment, including opportunities on the demand-side to increase energy consumption during periods of over-generation.

2.3.1. Real-Time Pricing Option As Tool to Increase Demand and Serve as a "Sink" During Periods of Over-Generation

[1] As a practical matter, conditions nearing over-generation and conditions of over-generation are the periods in which the Buyer are most likely to exercise its curtailment rights pursuant to its contract.

[2] Curtailment provisions in PPAs change over time. Most recently, PG&E and SDG&E seemingly prefer full economic curtailment rights, where the Seller receives payment for energy that is curtailed. In the case of PG&E, the curtailed energy price can be different than the Product Price; SDG&E's form contract appears to make payment for curtailed energy equal to the Product Price. SCE has a similar unlimited option to PG&E and SDG&E but SCE also has an option where the Seller submits a price that allows for the energy equivalent of 50 hours of full curtailment.

Conditions of over-generation imply situations in which the real-time price of energy is zero or negative. During these periods, rather than curtail renewables or pay to export surplus energy, the state should consider providing industrial and/or commercial customers an option to take energy at a zero price. Real-time pricing would create the incentive for load to increase its demand for energy (i.e., increase economic output) during periods of over generation, thereby becoming a "positive sink" for surplus energy at zero cost. IEP recommends that the 2015 IEPR consider value and feasibility of real-time pricing as a tool to absorb excess renewable production during periods of over-generation and enhance economic productivity.

2.3.2. Public Benefit Demand

As noted above, relying on curtailment and exports as the primary planning tool to address forecasts of over-generation makes little financial or environmental sense, if alternative solutions exist. The renewable energy that is being produced during these periods is exactly the clean resource on which California is relying to achieve its GHG emission reduction goals and foster a vibrant economy. Rather than curtailing or exporting this energy, the state should focus on creating incentives for in-state load to increase demand during periods of over-generation, i.e. a demand-response program that results in an increase economic activity (jobs, sales, etc.) in contrast to the typical demand-response programs that lessen economic activity.

While utility rates by necessity have to avoid discriminatory treatment, establishing different rates for different classes of consumers is acceptable. Clearly certain types of load may be perfectly suited to quickly ramp-up operations to absorb excess generation, while also providing an important public benefit. For example, given the increasing focus on the risk of prolonged drought, activities that could help increase water supply *and* absorb excess generation would provide a double-benefit to policymakers and the economy. A potential list of business activities that could potentially provide this dual energy/economic benefit includes the following:

- ***Desalination Plants***. Desalination plants serve a public benefit by adding water to the water supply. Given new designs, desalination plants can adjust operations (i.e., increase/decrease water output) in response to real-time price signals. Given that electricity costs are a significant cost of operations for desalination facilities, providing access to zero priced energy for significant periods of time (i.e., periods of over-generation) will serve to lower their annual revenues requirements and, thereby, make them more attractive to communities faced with restricted water supplies.

- ***Ground-water Injection (Pumping Load).*** Currently, an estimated 1-2 million pumps are used to pull water from the underground aquifers located in California. Recent reports focus on the depletion rate of groundwater supply, particularly in conditions of prolonged drought. Moreover, climatologists suggest that one characteristic of global climate change may be an increase in the scope/scale of extreme weather events, including rain. This suggests that California may need to increase its water storage capabilities. The lowered water table in existing aquifers represents a tremendous opportunity for storage of water, particularly in conditions of extreme weather events characterized by high levels of precipitation falling as rain (vs. snow). This water could be stored in aquifers, but likely will require pumping "downward" to deposit the water in the aquifer (rather than awaiting natural seepage). To lower the cost of pumping into storage, real-time zero-priced energy could be made available to pumping load when water is pumped into storage.

- **Pumping/Exchange of Water between the Salton Sea and the Gulf of California.** The Salton Sea is under extreme environmental pressure caused by, among other things, lowering of the water level. Adding water to the Salton Sea would provide significant environmental, wildlife, and public benefit. Pumping of water from the Sea of Cortez to the Salton Sea should be considered under the IEPR as a potential "public benefit" activity that warrants access to real-time pricing to lower project costs and provide a valuable "sink" for renewable over-generation.

IEP recommends that the 2015 IEPR assess the potential benefits of real-time energy pricing for the dual purpose of addressing operational concerns associated with over-generation and enabling access to clean, low emitting resources for the public's benefit.

3. Other Renewable Challenges

3.1. The Relationship between Behind-the-Meter (BTM) DG and Grid-Connected Renewables?

As the state moves aggressively toward a higher penetration of renewables, BTM renewables will become increasingly common. Notably, as this resource grows in scope/scale, the amount of energy from this resource that flows onto the electric grid may increase as well. However, curtailment is typically imposed on utility-scale, grid-connected renewable resources and not on BTM renewables. This raises the concern that one set of renewables, i.e., grid-connected, are bearing an inappropriate curtailment risk/burden due to the actions of another set of renewables (behind-the-meter); and, moreover, the grid-connected resources are being treated in a unduly discriminatory manner.

3.2. Lack of Transparency in Bid Evaluation Criteria.

As noted above, to the extent that renewable generation is forecast to occur in places and/or at times of relatively low value, the first place to investigate is the procurement practices and the LCBF bid-evaluation methodology. One concern is that, while the broad criteria used by the investor-owned utilities in bid-evaluation are described in the various utility RPS Plans and, therefore, publicly available to developers, what will change development patterns will be more transparency on the *relative value* of broad criteria used in bid-evaluation. For example, in the context of over-generation occurring in Northern California, the outcomes of the RPS RFOs (and thus future development) might be different if location and Time-of-Delivery Factors were given higher weights compared to other quantitative and/or qualitative factors such as price, RA value, etc. From a public policy perspective, making more transparent the *relative weight* of key factors used in bid evaluation would help improve the siting of new renewable resources and, thereby, help minimize the operational concerns and challenges of concern today. The IEPR should address the extent to which the current procurement practices are likely to reduce or increase the operational concerns being raised by parties.

3.3. Treatment of Existing RPS Resources

Existing renewable facilities have contributed significantly to cleaning California's energy portfolio and meeting the RPS. Many of these resources are nearing the expiration of their existing contracts. They often are confronted with the need to invest significant capital to maintain and/or retrofit their facilities. The inability to obtain long-term contracts can create barriers to this important energy infrastructure, particularly existing renewable resources located in rural counties where they generate clean energy, provide living wage jobs to thousands of people and help sustain many rural economies. In the 2015 IEPR, the Commission should assess and make specific recommendations related to mechanisms to sustain important energy infrastructure associated with the existing renewable facilities that face closure when power purchase agreements expire and market prices do not sustain otherwise viable and beneficial generation that can make positive impact on meeting a 50% renewable mandate.

3.4. Role of Natural Gas Generators

It is precisely because the California natural gas fleet is available to integrate intermittent renewable resources that renewable resources have proliferated. Without natural gas to "shape and firm" renewable resources, the California grid would not be as reliable as it is today. Natural gas generation provides dispatchability, capacity, frequency response, voltage support, reactive power, inertia, "governor response," ancillary services, reserve margins, and high capacity factors, among other benefits. Simply put, without natural gas to provide clean energy and grid stability, California's current renewable success – which includes having kept the lights on -- would not be happening.

As California moves toward higher penetration levels of renewables, resources that can provide fast acting, upward/downward ramp are necessary to ensure grid reliability. Certainly in the 2015-2030 timeframe, when emerging technologies such as storage, fuel cells, etc., are in their infancy from a development perspective, the resources needed to help integrate renewables will have to include significant amounts of flexible, natural gas generation. Moreover, while existing units could (and should) prove invaluable in providing integration services, some existing natural gas units may require retrofits which can trigger large financial investments. The corollary issue is how to incent these investments? Existing market incentives may not be present to facilitate timely retrofits of these units. Certainly, annual RA requirements are not likely to incent the investment necessary to accomplish the desired retrofits. IEP believes that multi-year financial commitments are necessary to incent the financial investments to create the flexible capability sought by grid operators, and a multi-year forward RA obligation would be helpful in that regard.

4. Summary of IEP Recommendations for the 2015 IEPR

In summary, in the context of achieving a higher penetration of renewables (e.g., 50%), IEP requests that the 2015 IEPR addressing the following critical issues with regards to renewables and renewable policy:

- Are the forecast operational challenges pre-ordained or, alternatively, can they be effectively mitigated through improved procurement practices? What changes in procurement practices would reduce the risk of the forecast operational challenges?

- Will market design changes help reduce the risk of operational challenges emerging as forecast? To what extent would a multi-year forward RA Obligation aid in reducing the forecast operational challenges?

- Would real-time pricing mitigating the risk of operational challenges? To what extent might an option of real-time pricing serve as a catalyst to other public benefits such as increasing the water supply, aiding in other environmental goals, etc?

IEP is pleased to provide these written comments. We look forward to working with the Commission in the 2015 IEPR on the challenges to achieve the 2030 renewable and GHG-reduction goals while maintaining grid reliability.

Respectfully Submitted,

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