DOCKETED	
Docket Number:	22-IEPR-01
Project Title:	2022 Integrated Energy Policy Report Update
TN #:	247987
Document Title:	Synergistic Solutions Comments - Docket No 22-IEPR-01 - Comments concerning Draft 2022 Integrated Energy Policy Report Update
Description:	N/A
Filer:	System
Organization:	Synergistic Solutions
Submitter Role:	Public
Submission Date:	12/7/2022 4:57:41 PM
Docketed Date:	12/7/2022

Comment Received From: Synergistic Solutions
Submitted On: 12/7/2022
Docket Number: 22-IEPR-01

Docket No 22-IEPR-01 - Comments concerning Draft 2022 Integrated Energy Policy Report Update

Additional submitted attachment is included below.

Synergistic Solutions

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California Energy Commission
Docket Unit, MS-4

Re: Docket No. 22-IEPR-01/Draft 2022 Integrated Energy Policy Report Update (the "2022 IEPR Update")

Thank you for the opportunity to comment. This update is very important and timely as California's ambitious objectives concerning energy, equity, environment, housing and transportation are all set on a collision course leading toward implementation, and the IEPR will be a critical point of reference in delivering the most bang for every state and federal dollar spent among all these economic sectors.

Below are comments in outline form with respect to select portions of the 2022 IEPR Update. Please note that excerpted portions are *italicized* for clarity.

A. Executive Summary: Role of Hydrogen (pp. 6-8).

1. Page 6. "*[T]he state would need to address limits to the hydrogen concentration that can be blended in existing gas pipelines or the need for dedicated hydrogen pipelines and other distribution and storage infrastructure."* Unfortunately, numerous studies have shown that the emissions reductions benefit from hydrogen blending are a fraction of what can be achieved using pure hydrogen in either a fuel cell or through direct combustion. From a policy standpoint, the primary (if not sole) beneficiaries from blending hydrogen are the oil and gas companies, who will use blending as justification for maintaining existing pipeline infrastructure. Instead, alternative pipeline technologies employing materials other than steel should be investigated, with the ultimate goal of using existing pipelines as conduit for deliveries of pure hydrogen. Utilizing a "pipe within a pipe" model, both hydrogen and natural gas could be delivered, with an incremental transition towards hydrogen as demand scales upwards.

2. Page 8. *"[P]olicy makers and the public need a better way to assess the potential benefits and costs of using hydrogen as a decarbonization solution. A standard, well-defined taxonomy (or classification) that enables this type of assessment will allow for better informed decisions about investments in hydrogen."* Proactively assessing hydrogen's role within a clean energy economy is essential and should encompass all segments of the energy supply chain. While there has been much focus on scaling hydrogen production upwards to create economies of scale, a parallel effort should examine the benefits of employing electrolysis as a strategic element in developing local distributed energy systems. By incorporating electrolysis as a valuable and productive off-ramp for excess energy, local energy systems (i.e., microgrids) can be designed for maximum capacity, conferring additional reliability and resilience benefits under all conditions.

B. Moving Forward: Addressing Barriers through Technical Assistance and Engagement (pp. 24-25). Synergistic Solutions wholeheartedly supports the themes articulated on pp. 24-25 of the 2022 IEPR update, particularly the themes *"Communities Know Best"* and *"Words Matter."* As stated, *"communities are best situated to determine their needs and wants."* To effectively determine community needs and wants, policy issues and prescriptions must be stated clearly, using uniform

and transparent definitions from the perspective of the community. There is also an overarching theme concerning the lack of resources among local governments and community-based organizations (CBOs) to participate in valuable statewide funding opportunities. Because the emergence of DERs creates a complementary "bottom up" infrastructure requiring active local participation, direct investment in human resources will be needed to bring communities "up to speed." Near-term investment in local energy planning will yield multiple benefits, both to the community and grid infrastructure.

C. Chapter 2: California Energy Planning Library ("Library"). Since proactive energy planning is essential for coordinated development of local energy systems comprised of distributed energy resources (DERs), the maintenance and operation of a central data repository will be an essential unifying element. The emphasis on four main objectives (access, organization, exploration, and analysis) is a good starting point, but while access and organization are important structurally, particular emphasis and consideration of the latter two, exploration and analysis, should be prioritized as they involve the process of optimizing stakeholder interaction and benefit from use of the Library. Merely organizing and providing access to all of California's myriad proceedings and programs in not enough, and there should be equal emphasis on creating a constructive and user-friendly pathway that directs communities to relevant resources.

1. Concept for California Energy Planning Library (p. 44). *Staff plans to include a terminology guide, data dictionaries, links to state partners and external sources, and contact information. The CEC recommends enhancing and modernizing the California Energy Planning Library on an ongoing basis.* As stated above, a self-directed, community-centric approach is critical in order to effectively engage and empower communities as an equal partner. To optimize this experience, the following elements should be developed as core elements:

    a. Community/Stakeholder Profiles. As part of the registration process, communities and stakeholders should be encouraged to develop an ongoing profile through completion of an interative questionnaire that identifies core needs and values and forms the basis for connection with relevant resources and programs. Once created, this profile would undergo iterative updates and provide feedback for improving questionnaire effectiveness.

    b. Interactive, Community-Centered Protocols. Protocols developed for utilization of the library should always emanate from the stakeholder perspective and seek to connect the user to resources and potential allies relevant to the user's end objective.

    c. Integration of User Data and Use Cases. As stated above, utilization of the Library should be an iterative process benefitting from prior user data and use cases. Such a relationship will create a virtuous cycle where all users can benefit from both a variety of perspective and commonalities that prevent redundant cost and effort.

D. Chapter 3: Demand Energy Forecast.

1. Transportation (p. 44). *Because transportation electrification represents a large source of new load and the geographic distribution of such load is not well understood, the AATE framework may expand in future forecasts to align with other infrastructure needs.* More than ever, electrification of California's economy requires extensive coordination with other sectors, particularly housing and transportation. For example, charging and refueling (EVSE) facilities must be considered

critical infrastructure requiring a certain level of resilience that can only be created with proximate DER capacity. This requirement necessarily impacts new housing construction, which has been targeted to increase by 3 million housing units in 2030 and 7.5 million in 2035. Failure to quickly update building codes to require DER-friendly wiring and maximum energy production will create a cumulative retrofit cost that will significantly increase for each year such measures are not taken. This should be of central concern in future IEPR iterations.

E. Chapter 4: Emerging Topics.

1. Role of Hydrogen in California's Clean Energy Future: Grid Reliability (p. 79). *Hydrogen from renewable resources can play an important role in helping achieve 100 percent renewable electricity by supporting grid reliability. As intermittent renewable resources such as wind and solar become a larger proportion of grid-connected resources, ramping needs will increase, and hydrogen has the potential to help support grid reliability.* As stated above, hydrogen can deliver a huge amount of flexibility at all junctures within the transportation/distribution infrastructure to maximize energy capacity. By targeting maximum energy production with planned uses for excess energy, California's grid infrastructure will be able to "bend" under a wide range of energy scenarios.

2. Distributed Energy Resources (p. 96-100). *Technology trends are rapidly lowering DER costs and improving functional capabilities, scalability, and flexibility, while grid costs, on the other hand, are increasing, making DERs more attractive. These factors mean adoption by customers will likely accelerate and exceed analysts' best predictions, like forecasts of rooftop solar adoption.* We are now at a point where market demand is outpacing policy development, and developers are seeking alternatives that circumvent current policy barriers. Future policy must be reality-based and examine actual costs and benefits of energy flows from the point of generation to the consumer. Currently, developers and consumers seeking energy resilience encounter more regulatory barriers than solutions, and failure to accurately assess actual distributed energy costs will lead to mass defection by more affluent communities and leave resource-constrained communities vulnerable to disruption with higher energy costs.

F. Conclusion. The broad scope of the IEPR makes it a perfect tool for coordinating various programs and policy objectives. The inclusion of hydrogen as a critical element is appreciated and should produce dividends as a comprehensive energy strategy is developed.

Thank you again for the opportunity to comment on this important update.

Sincerely,

Robert Perry

Robert Perry, Synergistic Solutions