

DOCKETED

Docket Number:	19-SB-100
Project Title:	SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future
TN #:	236046
Document Title:	Califoirmia Energy Storage Alliance (CESA) Comments on the SB 100 Draft Final Report Workshop
Description:	N/A
Filer:	System
Organization:	Califoirmia Energy Storage Alliance (CESA)
Submitter Role:	Public
Submission Date:	12/18/2020 3:41:31 PM
Docketed Date:	12/18/2020

Comment Received From: California Energy Storage Alliance (CESA)
Submitted On: 12/18/2020
Docket Number: 19-SB-100

CESA's Comments on the SB 100 Draft Final Report Workshop

Additional submitted attachment is included below.

December 18, 2020

Email to: docket@energy.ca.gov

Docket Number: 19-SB-100

Subject: CESA's SB 100 Draft Final Report Workshop Comments

Re: Comments of the California Energy Storage Alliance (CESA) following the December 4, 2020 Senate Bill 100 Draft Final Report Workshop

The California Energy Storage Alliance (CESA) appreciates the opportunity to comment on the Draft Final Report Workshop held in support of the Senate Bill (SB) 100 Joint Agency Report development. CESA recognizes the leadership of the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the California Air Resources Board (CARB) in assembling a vast group of stakeholders and listening to their concerns and proposals regarding the challenges the State will face in its transition to a zero-carbon electric grid by 2045.

CESA is a 501(c)(6) organization representing over 100 member companies across the energy storage industry. CESA is involved in a number of proceedings and initiatives in which energy storage is positioned to support a more reliable, cleaner, and more efficient electric grid. Moreover, CESA has actively engaged in first-in-class modeling studies to better understand the need and opportunity for energy storage, particularly long duration energy storage (LDES), given SB 100 targets.¹ As such, our background and experience providing technical and policy insights are of particular relevance to this subject.

CESA is generally pleased with the results shared on the December 4, 2020 workshop, as with the status of the Draft Final Report. We agree with the Joint Agencies and several stakeholders on the need to conduct robust, iterative modeling that takes into account reliability studies and ensures that the portfolio is both clean and reliable on an 8,760-basis. Our comments focus on the following areas:

- **RESOLVE must be modified to solve for long duration storage needs:** As CESA has previously noted, RESOLVE's optimization scheme may overlook the need for multi-day dispatch of storage assets, hindering its ability to robustly select an optimal portfolio for the purposes of SB 100. Moreover, RESOLVE must be revised to include long duration storage candidate resources beyond pumped hydro storage. Given these needs, CESA recommends that, if the Joint Agencies are to continue using RESOLVE for the development of the Reports associated to SB 100 compliance, they use the RESOLVE

¹ See Strategen, "Long Duration Energy Storage for California's Clean, Reliable Grid", 2020. Available at https://static1.squarespace.com/static/5b96538250a54f9cd7751faa/t/5fcf9815caa95a391e73d053/1607440419530/LDES_CA_12.08.2020.pdf

version developed in the frame of the CEC's Long Duration Storage project.² Once these modifications are done, the CPUC should similarly apply the same changes to the RESOLVE model used in the Integrated Resource Planning (IRP) proceeding.

- **The next iteration of the SB 100 Joint Agency Report should focus on reliability assessments:** As noted in the Draft Final Report, the reported capacity expansion results have not been verified for reliability using a form of production cost modeling. Given the different results on greenhouse gas (GHG) emissions and expected reliability RESOLVE and SERVM have shown within the IRP proceeding, CESA recommends the Joint Agencies collaborate in the near-term with stakeholders to develop a robust methodology for reliability analysis.
- **The Joint Agencies should consider the economic and societal trade-offs between the development of in- and out-of-state generation:** The Joint Agencies should evaluate the labor and economic implications of SB 100 compliance, particularly when evaluating the cost-benefit ratio of developing in- or out-of-state assets. Thus, CESA recommends the next iteration of the Joint Agency Report include an analysis of labor opportunities over a series of cases with differing levels of in-state asset development.
- **The Joint Agencies should consider the potential effects of Western regionalization to further evaluate the resource mix and reliability of proposed scenarios:** CESA acknowledges that the Draft Final Report recognizes the potential role regionalization and transmission investment across the West would have in the compliance of SB 100. Moreover, the Draft Final Report also mentions the growing prevalence of electric decarbonization policies across Western states, via the adoption of policies alike the Renewable Portfolio Standard, for example. Considering these complex interactions, CESA urges the Joint Agencies to assess how these out-of-state efforts could maintain or hinder grid reliability and GHG emission reductions in California.

RESOLVE must be modified to solve for long duration storage needs

CESA generally supports some of the modifications E3 has made to the RESOLVE model over the development of the Draft Final Report. We are pleased to see E3 has expanded the pool of candidate resources, including, for example, technologies such as hydrogen fuel cells. Generally, CESA agrees with the modeling of technologies with a focus on attributes rather than every single technology type,³ especially in cases where publicly-available information and data are not available.

² See <https://www.energy.ca.gov/event/workshop/2020-12/staff-workshop-initial-public-workshop-comments-long-duration-energy-storage>

³ *Modeling Framework and Scenarios Overview* published by the California Energy Commission for the SB 100 Joint Agency Report in Docket 19-SB-100 on August 31, 2020 at 8.

Nevertheless, CESA is still concerned with the inherent deficiencies of the RESOLVE model to identify and solve for long duration energy storage (LDES) needs. As CESA’s Executive Director, Alex Morris highlighted during the September 2, 2020 Workshop, RESOLVE’s architecture does not optimize build decisions based on an 8,760-hour optimization horizon. The Draft Final Report properly recognizes this limitation inhibits the model from identifying the potential need for inter-day energy arbitrage, effectively overlooking the value proposition of several energy storage technologies.⁴ Moreover, despite the comments of CESA and other stakeholders, the RESOLVE model has not included several LDES technologies that are commercially available and could substantially contribute to California’s decarbonization efforts. Instead, RESOLVE approximates LDES build by using pumped hydro storage as a proxy. This is a suboptimal arrangement. The Joint Agencies and E3 should incorporate additional candidate resources, which have unique and different cost structures and capabilities, thus enabling the model to better select a realistic and diversified capacity portfolio. This could be done by integrating technologies such as compressed air energy storage (CAES) as its own candidate resource given their publicly-available data.⁵

In cases where sufficient publicly-available data is not available, we continue to recommend E3 and the Joint Agencies instead characterize LDES options as “generic LDES resources” that focus on the attributes that may be needed to achieve SB 100 objectives. In CESA’s experience, LDES can generally be characterized as generic candidate resource options with higher capacity cost, lower energy cost, and lower roundtrip efficiency relative to battery storage. CESA’s work with Strategen Consulting and Blue Marble Analytics took this approach, constructing two categories of generic LDES by differentiating their performance characteristics and costs per MW and per MWh, informed by leading LDES manufacturers and providers and benchmarked against some preliminary industry estimates. A similar approach could be adopted by the Joint Agencies. In fact, the Joint Agencies have already used a comparable approach in order to evaluate generic zero-carbon firm dispatchable and baseload resources to capture “emerging” resources.⁶ CESA recommends that the Joint Agencies refer to the comments previously filed by CESA under this Docket to consider our proposed cost structure for the a “generic representative” LDES technology resource.⁷

Given the need for these changes, CESA is pleased to note several of these modifications to the RESOLVE model in the context of the CEC’s Long Duration Storage Scenarios initiative.⁸ During the December 3, 2020 Workshop held on this initiative, E3 noted that, in collaboration with the University of California (UC) Merced, they would expand the number of LDES candidate

⁴ Draft Final Report, at 77.

⁵ *Informal Comments of the California Energy Storage Alliance on the Draft Sources for 2019-2020 IRP Supply-Side Resources Document* submitted on April 23, 2018 to the CPUC IRP Modeling Advisory Group at 14. See link [here](#).

⁶ *Modeling Framework and Scenarios Overview* published by the California Energy Commission for the SB 100 Joint Agency Report in Docket 19-SB-100 on August 31, 2020 at 3.

⁷ See CESA, “Comments of the California Energy Storage Alliance (CESA) following the September 2, 2020 Senate Bill 100 Draft Results Workshop”, 2020. Available at <https://efiling.energy.ca.gov/GetDocument.aspx?tn=234768&DocumentContentId=67622>

⁸ See <https://www.energy.ca.gov/event/workshop/2020-12/staff-workshop-initial-public-workshop-comments-long-duration-energy-storage>

resources and study different options to modify the model’s optimization horizon.⁹ As a result, CESA recommends the modifications applied to RESOLVE within said initiative are also adopted in both the SB 100 Joint Agency Report and the IRP processes, in order to foster a cohesive planning environment across all relevant initiatives and proceedings within the Californian policy landscape.

The next iteration of the SB 100 Joint Agency Report should focus on reliability assessments

The Draft Final Report shows a grid heavily reliant on solar PV generation and energy storage assets that facilitate its usage. These results were derived from the capacity expansion modeling undertaken by the Joint Agencies. While these directional results are essential, capacity expansion modeling is the first step in a series of modeling phases to attain reliable portfolios that can be used as a means to meet all the applicable policy objectives while keeping the lights on across California. The Joint Agencies recognize this need, establishing the necessity of performing a comprehensive reliability assessment as their first recommendation within the Draft Final Report.¹⁰ CESA strongly agrees with this recommendation. As the experience of the IRP proceeding demonstrates, the verification of RESOLVE-derived grid mixes using a separate production cost model requires fine tuning between both tools. This process can be time-consuming and, if done inadequately, it can result in significantly different results in terms of both GHG emissions and expected reliability. This experience has prompted the CPUC’s Energy Division to institute a Modeling Advisory Group (MAG) to engage modelers and stakeholders in an effort to unify and standardize the inputs and assumptions used by both RESOLVE and SERVM, the latter being the production cost model used for reliability verification purposes.

If RESOLVE is to be used in following iterations of the SB 100 Joint Agency Report, the Joint Agencies should build upon the work done by the CPUC and the MAG. Currently, the MAG’s efforts have resulted in significant cohesiveness across both RESOLVE and SERVM. This result could be replicated for the Joint Agency Report process. It is worth noting that this would not be immediate, as the RESOLVE model used in the IRP proceeding is limited to the CAISO footprint rather than the entirety of the state of California. As such, while updating RESOLVE and SERVM to be cohesive at the State level might be somewhat burdensome, it would be facilitated by the lessons learned within the IRP proceeding and the MAG’s efforts.

Within the Draft Final Report, the Joint Agencies also recommend convening in an annual fashion in the years between reports.¹¹ CESA supports this recommendation as stakeholder engagement is fundamental to advance the decarbonization goals of the State. In light of this recommendation and due to the urgency of initiating reliability modeling, CESA recommends the first of the annual Joint Agency SB 100 workshops, expected to be held 2021, focus on the

⁹ *Ibid.*

¹⁰ Draft Final Report, at 109.

¹¹ Draft Final Report, at 141.

approach and methodology to develop a robust reliability modeling plan for the results presented in the first SB 100 Joint Agency Report.

The Joint Agencies should consider the economic and societal trade-offs between the development of in- and out-of-state generation

Within the Draft Final Report, the Joint Agencies enlist a series of topics that merit additional analysis. Among them, the Joint Agencies highlight the need to study non-energy benefits (NEBs), such as economic impacts.¹² CESA strongly agrees with the need to study these impacts, particularly from an employment and equity perspective. As the target for decarbonization approaches, California is in the unique position to benefit from a substantial increase in “clean energy” jobs. CESA, as well as the Department of Energy (“DOE”), has previously noted the significant economic benefits derived from the deployment of energy storage resources.¹³ In a 2020 report, CESA notes that the recent and current energy storage project procurement, deployment, and operational activity has supported 20,510 jobs in California.¹⁴ Hence, considering these yields is essential when evaluating the tradeoffs between in- and out-of-state deployment.

Up until this point, the trade-offs between scenarios that vary in their levels of in- versus out-of-state resources have only been framed in terms of land use and environmental impacts. CESA thoroughly agrees these considerations must be included in any evaluation of different resource mix scenarios. Nonetheless, CESA considers the historic opportunity to leverage the monumental deployment necessary to fulfill SB 100 must also be analyzed in terms of its potential economic benefits. In order to achieve SB 100 goals, California would require deploying 2.7 GW of solar, 0.9 GW of wind, and 2.2 GW of energy storage every year over the next 25 years.¹⁵ This scale of development represents an unmatched job creation and workforce training opportunity. In order to quantify this opportunity and better evaluate the cost-benefit ratios of scenarios with differing levels of in- and out-of-state resource development, CESA recommends the following iteration of the Joint Agency Report include an analysis of labor opportunities over a series of cases with differing levels of in-state asset development.

¹² Draft Final Report, at 126.

¹³ See DOE, “U.S. Energy and Employment Report 2020: 2016-2020 Five-Year Trends”, January 2020. Available at <https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd928c61/t/5e780f28e8ff44374c2db945/1584926525529/USEER+2020+5year.pdf>

¹⁴ See CESA, “Energy Storage: The Next Major Job Creation Opportunity”, May 2020. Available at <https://static1.squarespace.com/static/5b96538250a54f9cd7751faa/t/5ec857f92dd571390c0d1563/1590188026152/2020-05-01+Energy+Storage+Jobs+White+Paper.pdf>

¹⁵ Draft Final Report, at 21.

The Joint Agencies should consider the potential effects of Western regionalization to further evaluate the resource mix and reliability of proposed scenarios

As mentioned previously, the Draft Final Report enlists a series of topics that merit additional analysis in future iterations. CESA considers that broader Western coordination, as well as the impacts of the proliferation of decarbonization initiatives across the region are considered within scope. The Draft Final Report documents the relevance of these factors;¹⁶ however, it fails to recognize the trade-off they create.

As noted before in the Draft Final Report, the availability of out-of-state resources greatly influences the resource mix selected. As coordination across the West advances, it is reasonable to expect more resources will become available for import into California. Nevertheless, the adoption of more RPS-like policies in Western states could have the opposite effect: as States become more zealous in their use of renewable energy, current “clean” exports could find themselves replaced by exports with higher associated GHG emissions. As such, there is a tension present at the heart of Western coordination initiatives. CESA considers this tension must be explored and analyzed in the upcoming Report cycle.

Conclusion

CESA appreciates the opportunity to provide these comments and feedback on the Joint Agency Report’s Draft Final Report Workshop. We look forward to collaborating with the CEC, CPUC, CARB, and other stakeholders in this proceeding.

Sincerely,

Jin Noh
Policy Director
CALIFORNIA ENERGY STORAGE ALLIANCE (CESA)
jnoh@storagealliance.org
510-665-7811 x 109

Sergio Dueñas
Senior Regulatory Consultant
CALIFORNIA ENERGY STORAGE ALLIANCE (CESA)

¹⁶ Draft Final Report, at 138.