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Comments on Staff Assessment Section 4-3 Transmission System Engineering

See Attached Comment Letter

Additional submitted attachment is included below.

California Energy Commission
Corby Battery Energy Storage System Project
Docket No. 24-OPT-05

Comments on Staff Assessment Section 4.3

Transmission System Engineering

Commissioners:

I submit these comments regarding Section 4.3 of the Staff Assessment, Transmission System Engineering.

I do not question that CAISO and PG&E use sophisticated engineering methods to evaluate interconnection requests. Nor do I attempt to substitute my judgment for the electrical engineers who perform power-flow, short-circuit, stability, and deliverability studies.

My concern is more basic.

The Commission is being asked in 2026 to conclude that Corby's transmission interconnection is acceptable while the analysis relies substantially upon studies and system assumptions developed years earlier, identifies downstream transmission modifications associated with the interconnection process, recognizes that Corby's charging may be curtailed, and leaves some transmission details and approvals to future proceedings.

Those circumstances warrant a clearer explanation before final findings are adopted.

1. Staff Should Explain Why the Earlier Interconnection Studies Remain Representative of the Transmission System Corby Would Actually Enter

Corby's interconnection request originated in CAISO Queue Cluster 9. The applicant states that the project was evaluated through the 2017 Phase I and Phase II Interconnection Studies, as subsequently modified by an August 31, 2021 Generator Interconnection Reassessment Report. The applicant's project materials identify those studies as the basis for evaluating potential system impacts.

There is nothing inherently improper about relying upon an earlier interconnection study. Projects can remain in the CAISO interconnection process for years, and subsequent agreements and reassessments can preserve or modify the results.

But the age of the underlying analysis matters when the Commission is making findings in 2026.

The transmission system has not stood still since the original Cluster 9 studies or the 2021 reassessment. Staff explains that the Phase II power-flow cases represented 2021 heavy-summer and light-load conditions, including a forecast 2021 summer peak load of 28,018 MW and a 2021 spring off-peak load of 17,321 MW. Those were appropriate study assumptions for their time, but the Commission is making its certification findings in 2026.

The regional context has also continued to develop. The CEC is now reviewing the Vaca Dixon Power Center Project (Docket 26-OPT-01), a separate 157-MW/457-MWh BESS proposal at the Vaca-Dixon area. I do not assume that this project uses the same interconnection configuration, voltage level, or queue assumptions as Corby. Its existence nevertheless illustrates why Staff should state whether the older Corby study cases have been checked against the transmission system and interconnection landscape that is reasonably expected when Corby begins operation.

The Staff Assessment should therefore identify whether CAISO or PG&E has performed a more recent system reassessment applicable to Corby.

If no newer comprehensive reassessment exists, Staff should explain why the earlier study cases remain representative of the transmission conditions expected when Corby begins operation.

The issue is not whether a 2021 study automatically becomes invalid because five years have passed.

The issue is whether the Commission has verified that the assumptions underlying that study remain sufficiently representative to support findings made today.

2. “No Overloads Due to This Project Alone” Does Not Fully Describe Corby’s Transmission Consequences

Staff’s conclusion that there were no overloads observed due to Corby alone sounds straightforward.

But the larger interconnection record is more complicated.

The interconnection record identifies concrete transmission-system consequences even though Staff reports no steady-state overloads caused by Corby alone. Staff states that the short-circuit studies identified Cottonwood 230-kV circuit breakers #222 and #232 as overstressed and recommends replacement. Staff also states that the Deliverability Assessment recommends upgrading Contra Costa 230-kV circuit breaker #650. In addition, Staff reports that the plant-side voltage can reach 1.08 per unit during summer peak conditions and that the plant would need to load-tap-change transformers to maintain proper voltage because of Vaca-Dixon’s scheduled voltage.

The Staff Assessment also identifies a recommended upgrade involving the Contra Costa 230-kV system.

Those findings may be technically consistent with Staff’s statement that Corby alone causes no reliability overload. A breaker replacement, deliverability upgrade, voltage-control requirement, and a steady-state overload finding answer different engineering questions. The problem is not that Staff necessarily reached contradictory engineering results. The problem is that Section 4.3 does not make the relationship among those results sufficiently clear for the Commission and the public to understand what infrastructure or operating constraints are actually attributable to Corby.

But the distinction is not adequately apparent to a member of the public reading the Staff Assessment.

If Corby causes no transmission overload requiring mitigation when evaluated individually, what is Corby’s relationship to the downstream transmission upgrades and deliverability constraints identified in the interconnection studies?

If those upgrades would be required regardless of Corby, Staff should say so. If Corby contributes to the need for them, Staff should say that. If the upgrades arise only from the combined effect of multiple Cluster 9 projects, Staff should identify that distinction and explain how Corby’s contribution was evaluated.

The public should not have to possess transmission-engineering expertise to reconcile an apparently reassuring statement that Corby causes “no overloads” with an interconnection record that nevertheless identifies transmission modifications.

3. Transmission-Related Curtailment Should Be Reconciled With the Project Benefits Claimed Elsewhere in the Staff Assessment

Section 4.3 states that, in charging mode, battery storage would be required to follow California ISO dispatch instructions that could curtail operations. Staff then states that no overloads were observed due to this project alone in steady-state power-flow analysis and that Corby would be required to follow ISO dispatch instructions in discharging mode as well.

Curtailment is not necessarily an environmental impact or evidence that the project cannot operate successfully. It is a normal tool available to grid operators.

But it raises an important project-performance question.

Corby's claimed benefits depend upon its ability to charge when electricity is available and later discharge stored electricity when the grid needs it.

If transmission conditions can prevent or limit charging, the relevant question is not merely whether CAISO possesses the authority to curtail Corby.

How frequently is transmission-driven curtailment reasonably expected?

Could foreseeable curtailment materially affect Corby's ability to recharge sufficiently to provide the four-hour storage capability upon which the project's benefits are based?

Do the Efficiency, Facility Reliability, and project-benefit analyses assume unrestricted charging availability, or do they account for transmission constraints?

We have already seen in Facility Reliability that Staff expects Corby to demonstrate high availability even though the applicant has not provided a project-specific availability factor.

Transmission System Engineering now adds another performance variable: the facility can be physically available yet unable to charge as intended because CAISO has curtailed its operation.

Those concepts should be reconciled.

The Commission should not evaluate transmission constraints in one section and project performance and benefits in other sections as though the subjects were unrelated.

4. The Commission Should Identify the Complete Set of Transmission Facilities and Upgrades Associated With Corby's Interconnection

One of the difficulties with Section 4.3 is determining exactly where the Corby project ends and the surrounding transmission-system work begins.

Corby's interconnection involves more than the batteries themselves.

The project includes a 230-kV gen-tie extending to the Vaca-Dixon Substation, portions of which would be underground and portions overhead. It also requires new interconnection facilities at Vaca-Dixon.

The applicant's own transmission description confirms that the project was developed around interconnection at Vaca-Dixon and that CAISO studies identified additional transmission-system considerations.

Staff appropriately recognizes that where transmission modifications or additions are required as a consequence of the project, environmental review may be required as part of the whole of the action.

The difficulty is that the public should not have to reconstruct the complete transmission scope from separate CAISO studies, PG&E responsibilities, interconnection agreements, Staff Assessment sections, and future approvals.

Before certification, Staff should provide a simple inventory identifying the transmission facility or upgrade; its location; who will construct and own it; whether it is required because of Corby, partially attributable to Corby, or independent of Corby; its present approval/design status; and where its environmental effects have been or will be reviewed.

That would make clear whether the Staff Assessment actually encompasses the full physical consequences of connecting Corby to the transmission system.

5. Future Utility or Interconnection Review Should Not Become a Means of Deferring Environmental Review of Material Project Changes

Condition of Certification TSE-5 is broader than a simple final-drawing requirement. It requires, among other things, Special Protection System sequencing and timing if applicable; a letter addressing mitigation measures or projects selected by the transmission owners for reliability criteria violations for which Corby is responsible; updates to the executed LGIA; and PG&E interconnection approval for project modifications requiring PG&E approval. Those are appropriate compliance controls.

But their breadth reinforces the need to distinguish between final engineering details and a later change in the transmission facilities, mitigation, or operating requirements that materially alters the project analyzed in the Staff Assessment.

That is understandable. Final transmission engineering necessarily continues after certification.

But there is an important distinction between finalizing engineering details for facilities already environmentally analyzed and later identifying different or additional transmission facilities, upgrades, or mitigation measures that could themselves produce environmental effects.

The first can appropriately occur through normal engineering review. The second may require additional environmental consideration.

Accordingly, if subsequent CAISO, PG&E, CPUC, LGIA, or TSE-5 processes identify transmission facilities or mitigation materially different from those evaluated in the Staff Assessment, the Commission should require a determination—before construction—of whether those changes create new or substantially more severe environmental effects requiring additional review.

A future engineering approval should not automatically substitute for environmental review simply because it occurs after project certification.

6. The 2021 Study Cases Should Be Reconciled With the Evolving Vaca-Dixon Energy-Storage Context

Staff states that the Phase II study evaluated seven generation projects, including Corby, totaling 1,057 MW seeking interconnection to the PG&E-owned transmission system, using 2021 study cases. That was a defined engineering study group, not a prediction that the transmission system would remain unchanged thereafter.

By 2026, the CEC is separately reviewing the Vaca Dixon Power Center Project at the same general transmission node. Current CEC materials describe that proposal as two BESS facilities totaling 157 MW/457 MWh. This does not prove that the Corby studies are obsolete, nor does it establish that Vaca Dixon Power Center must be modeled in the same Corby interconnection study. It does, however, make it reasonable for the Commission to ask CAISO and PG&E whether any later study, reassessment, cluster reform, network change, or queued-resource development materially changes the assumptions on which Staff relies.

If CAISO and PG&E have determined that the existing Corby studies and LGIA remain valid without further system reassessment, Staff should simply state that conclusion and identify its basis. That would be stronger than asking the Commission to infer continued representativeness from studies whose power-flow cases were built around 2021 system conditions.

7. The Transmission Analysis Should Not Be Used to Predetermine the Alternatives Analysis

Corby proposes to interconnect at the Vaca-Dixon Substation. That interconnection has therefore been studied extensively.

It does not necessarily follow that proximity to Vaca-Dixon makes the selected Corby site the only reasonable location for a battery storage project.

Transmission System Engineering should answer the engineering question presented by the proposed Corby interconnection.

It should not silently become an alternatives-screening criterion under which locations are disadvantaged simply because Corby has already spent years obtaining interconnection rights for its selected site.

An existing interconnection arrangement is relevant to feasibility.

It is not the same thing as demonstrating that another otherwise feasible site cannot obtain an appropriate interconnection.

This distinction becomes particularly important when comparing alternative locations with the selected Corby site. The comparison should account for the actual transmission infrastructure and upgrades associated with Corby, not compare an alternative site's transmission requirements against an assumed impact-free Vaca-Dixon interconnection.

8. Requested Action

I respectfully request that the Commission require Staff to supplement or clarify Section 4.3 before adopting final findings.

Specifically, Staff should:

1. Identify the most recent CAISO and PG&E transmission studies applicable to Corby and explain why the underlying system assumptions remain representative of expected operating conditions;
2. Explain clearly the relationship between Staff's statement that Corby alone causes no transmission overloads and the downstream network or deliverability upgrades identified through the interconnection studies;
3. Identify which transmission upgrades are attributable to Corby, partially attributable to Corby, attributable to the Cluster 9 group, or independent of Corby;
4. Evaluate whether reasonably foreseeable transmission-related charging curtailment affects the availability, efficiency, four-hour storage capability, or grid benefits attributed to Corby elsewhere in the Staff Assessment;
5. Provide a complete inventory of Corby-related gen-tie, substation, network, breaker, protection, and other transmission modifications, identifying ownership, location, status, and environmental-review responsibility;
6. Require review before construction if subsequent TSE-5, LGIA, CAISO, PG&E, or CPUC actions materially change the transmission facilities or mitigation measures evaluated in the Staff Assessment; and
7. Ensure that the existence of Corby's current Vaca-Dixon interconnection arrangements is not treated as proof that otherwise feasible alternative locations lack viable transmission options.

The Commission does not need to redo CAISO's power-flow calculations.

But it does need to understand what those calculations mean for the project it is approving.

A statement that Corby causes "no overloads" should not obscure transmission upgrades identified elsewhere in the same interconnection process.

A statement that CAISO can curtail charging should not be isolated from Staff's assumptions about Corby's availability and grid benefits.

And future engineering review should not leave the public uncertain about which transmission facilities are actually part of the project being environmentally reviewed today.

The basic question is straightforward:

What transmission infrastructure and system consequences are actually necessary to connect Corby to the grid, and has the Commission evaluated all of them before approving the project?

Section 4.3 should answer that question clearly. On the present record, I do not believe the Commission should treat the transmission-system questions identified above as resolved merely because later CAISO, PG&E, LGIA, or TSE-5 processes remain available.

In addition to these comments, I formally incorporate by reference and fully support the technical comment letter submitted by Keep Vacaville Safe.

Respectfully submitted,

Michael Geller