

*APS Oak Creek to McGuireville 69kV Transmission Line Project #56977*

*Objection Period Submission*

*3-2-2025*

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*Project: APS Oak Creek to McGuireville 69kV Transmission Line Project #56977*

*Forest: Coconino Nation Forest, Red Rock Ranger District*

*Responsible Official: Aaron Mayville, Coconino National Forest Supervisor*

*Submission based on new elements in the Jan 2025 Draft Decision Note (DN)*

The new element here concerns the battery alternative. This element arises since the Draft DN for #56977 does not update (and in places simply repeats the exact wording) of the original documents from the 2021/22 scoping and first comment periods, despite and in the face of significant changes in commercial scale battery installation costs and technologies.

The lack any updates, in the face of these changes, triggers a new element justifying comment in the objection phase.

The critical changes include:

- The proposed hybrid approach in the Draft DN, more specifically the inclusion of underground facilities, increases the cost of the proposed transmission line.
- Commercial scale battery costs have declined considerably, and their significant deployment has greatly increased the technological expertise within the power sector.

- Load management challenges in electrical networks have evolved and will continue to evolve as power utilities and their users add renewable energy generation.
- Climate change, and increasing wildfires, have made intentional power cutoffs an integral part of reducing ignition risk during periods of high wind and temperature, or other weather transients raising ignition potential.

### *Comments on new elements mentioned above*

Given these critical changes, the lack of updates in the Draft DN leaves the analysis of batteries insufficient. Two levels of added analysis must be undertaken to solve this insufficiency, first at the detail level of the particular VOC to McGuireville Line, and another at a larger strategic level.

Let me address each in turn.

- *Detail Level - Update Elements*

Costs - The decreasing costs of commercial scale batteries, plus the added costs for underground segments in the VOC-McGuireville transmission link, push the costs for these options closer. A proper evaluation of batteries at VOC and McGuireville vs. a linking transmission line thus requires an updated, and more detail and authoritative, recosting.

A battery option may still cost more, but the size of gap (if any) must be known with more precision to weigh that gap against other advantages (and disadvantages) of batteries verses the transmission link.

Network Management - Batteries provide for energy storage, giving flexibility to manage peak demands and other conditions. The impact of installations in VOC and McGuireville would be important if moderate. But as discussed below, a strategic decision by APS to transition to future battery installation would provide increasing capability and efficiency.

Redundancy - Batteries run down. Thus, using a battery installation as a redundant supply for loss of a radial arm suffers that disadvantage.

However, to the degree the outage lengths last predominantly below the battery capacity, that disadvantage would be reduced. I could not find a detailed table or discussion of the outage length distribution, for the two locations, or system wide, thus we are missing a key set of data, and one that APS should provide.

Diversity - The transmission link suffers from its own limitation, specifically the high wildfire risk conditions that would trigger a shutdown of power on either primary radial arm could prevent use of the redundant loop link.

Further, the actual proposed link goes so far as to cohabitate the same poles as the radial link for the segment south of VOC, in a location in especially close proximity to the residential structures in south VOC. While just a short length, we can project situations where that lack of diverse routing undermines the ability to use the new transmission link as backup

Cutover Processes - No analysis was presented on the time required and processes used to cutover to either the battery or transmission line in a loss of the radial arm. One might at first approximation assume the transmission link would resupply power immediately. However, is that correct, and would it be feasible in various scenarios? The power recovery may need to be throttled when using the new transmission link, while a battery solution may not be. While the answers may (or may not) reveal any issue, for now this remains an open question.

Scenic, historic, wildfire and other impacts - Use of batteries for backup eliminates the transmission line, removing all the impacts of such a line across its considerable length. Batteries require space, and other resources, but on balance much less.

- APS Strategic Plan - Future Requests

The same trends omitted in the Draft DN, trends creating the above need for a relook specifically at the battery option for VOC and McGuireville, also justify analysis of planned and possible future APS requests for transmission line permits, beyond VOC and McGuireville.

Experience and Cost Curve - Using batteries at VOC to McGuireville does not need to stand alone. That installation could represent a strategic turning point that starts APS down a curve of declining costs and increasing expertise. Such a curve could provide more economic and efficient over time.

Beyond direct costs, the ancillary load management benefits of an increasing APS base of battery installation will further reduce costs and add to APS capability. And as the battery base grows, synergies will occur and the benefits will multiply more than linear

Quick Response Capability - The short duration of batteries cannot be ignored. They would deplete in emergency use; transmission lines do not.

But, given APS appears to have many single feed radial arms, and likely under the status quo cannot build loops in any reasonable time to remedy that situation. They need then to have an alternate plan, a quick response emergency capability to repair downed lines in hours. They do not appear to have one now.

Such a quick response capability would include elements like prepositioned materials, specialty crews, deployment plans including live practice drills, even helicopter capabilities. My experience at a large telecommunication company shows that when a major corporation focuses on speeding up processes, processes that took previously took weeks and months become reworked down 24 to 72 hours. We could thus expect APS which might need days for repair, could learn to execute a repair in less than a day.

**Underground Expertise** - APS quoted extremely high costs for underground installation. That may stem from their not getting practice or experience. Thus, just like VOC - McGuireville could serve to put APS on beneficial curves for batteries, **VOC - McGuireville could serve to put APS on beneficial cost and experience curves for underground placement.**