



February 26, 2025

U.S. Forest Service, Southwestern Region  
Attn. Reviewing Officer, Regional Forester Michiko Martin  
333 Broadway S.E.  
Albuquerque, NM 87102

**Project Name:** APS Oak Creek to McGuireville 69kV Transmission Line Project  
**Name & Title of the Responsible Official:** Aaron Mayville, Coconino National Forest Supervisor  
**Name of the National Forest & Ranger District:** Coconino National Forest, Red Rock District

***Re: Objection Letter Regarding January 16, 2025, Draft Decision Notice and Finding of No Significant Impact in Connection with Proposed Arizona Public Service 69-kV Powerline between McGuireville and Oak Creek Substations in the Coconino National Forest (CNF).***

Submitted by electronic mail to: [objections-southwestern-regional-office@usda.gov](mailto:objections-southwestern-regional-office@usda.gov)

Dear Reviewing Officer, Regional Forester Ms. Martin:

I write on behalf of Big Park Regional Coordinating Council (“BPC” or “Council”), a nonprofit, 501(c)3 charitable organization,<sup>1</sup> to formally object to the January 16, 2025 draft Decision Notice and Finding of No Significant Impact by CNF Forest Supervisor Aaron Mayville, with regard to a proposed 69-kV powerline that is partially above-ground (the “Project”) by Arizona Public Service (“APS”) between substations located in the Arizona communities of McGuireville and the Village of Oak Creek (the “Village” or “VOC”). BPC represents 23 homeowner associations located in VOC that represents 6100 citizens in the area.

Purpose of BPC Letter of Objection:

We would first like to clarify our objectives that shaped this letter.

BPC supports the following aspects discussed in the CNF draft decision:

- APS’ efforts to maintain a high level of power reliability in the Verde Valley, as well as to develop a power system that is more resilient to future storms and other risks

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<sup>1</sup> Big Park Council is a 501(c)3 Arizona corporation representing 23 local property and homeowner associations in the Village of Oak Creek in addition to a nonprofit educational institution. BPC serves as the voice of the community and provides feedback on public policy issues to federal, state and local government agencies.

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- Maintaining the unique scenic beauty in the Sedona region, and a strict adherence to the Scenic Integrity Objectives (SIOs) that Coconino National Forest (the “Forest” or “CNF”) recently established here
  - Ensuring that any future actions by APS and the Forest reduce fire risk in the region, and do not create additional costs to residents (such as increased fire insurance costs or property value reductions)
  - Ensuring that the final decision by CNF on the proposed 69 kV power line is based on a high quality decision basis – including the best available information, a comparison to a full range of alternatives and one based on the value measures expressed by the local community as well as those outlined by the U.S. Forest Service (“USFS”) and CNF for effective management of national forest lands. If there is not a high-quality decision basis, CNF has several options, including:
    - Addressing these major information gaps
    - Start the Environmental Assessment (“EA”) process over again and include alternatives it excluded in the draft EA
    - Given the Project’s complexity, on which we elaborate in greater detail below, discard the EA process and submit a draft Environmental Impact Statement for public comment
    - Consider extending undergrounding in response to APS’ inflated cost estimates, etc.
    - Pause the final decision on the EA until the regional office has a chance to comply with federal law and respond to BPC’s numerous FOIA requests.

#### Description of BPC’s past statement of intent and current position

On January 4, 2022, the Council submitted a substantive, 29-page comment letter to CNF opposing Alternative 1 of the December 2021 draft EA; and generally supporting undergrounding of extensive sections of the Project as proposed in Alternative 2. The letter stated that BPC "supports an underground power line from the intersection of Cornville Road and Beaverhead Flat Road into the Village of Oak Creek to the Oak Creek substation, while permitting above-ground construction on the south side of Cornville Road. Further, as an alternative to partial burial of the new power line, the Council supports studying the feasibility of a microgrid community containing a solar-generated source of energy and relying, as needed, on conventional power from APS."

We are pleased that CNF has stated in its proposed decision that the line should be buried for the 1,000 ' section under Highway 179 in the Village as well as for the 6 miles along Beaverhead Flat Rd.

However, we strongly believe that the decision to have the proposed line above ground for the 0.6 miles from Highway 179 through VOC and over the Kel Fox Trail ridge to Beaverhead Flat Road is not in the best interest of VOC residents and many of the 3 million visitors to the Sedona area and is not the best use of national forest land.

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The letter outlines the serious deficiencies in the information, value measures and risk assessment used by CNF in publishing the Final EA and Draft Decision.<sup>2</sup> In addition, CNF has an obligation to fairly consider a full range of alternatives to achieve the proposed line's objective of enhanced reliability in the Project area. BPC believes there are superior options available that better meet APS' obligations to provide reliable service and CNF's planning objectives for the Forest. USFS is also required under federal law to share information that is requested under a FOIA request. BPC filed its initial FOIA request on Sept. 25, 2023, and up until now has received no response, even when this request was followed up on by our outside counsel and repeated by Senator Mark Kelly's office. As a result, we believe that the Regional Forester must delay any final decision on the Project until these deficiencies are fully addressed.

- Value Measures
  - Scenic Integrity Objectives (SIOs):
    - CNF justified the need to bury the line along Beaverhead Flat Road, primarily based on the need to follow its stated Scenic Integrity Objectives (SIOs) that were updated in 2018, (including any subsequent amendments). However, the Forest ignored these critical objectives in other scenic areas commonly viewed by both VOC residents and 3 million tourists each year. This complete disregard for the SIOs specifically developed by CNF for this particular area of the Forest must be addressed. SIOs should represent the local communities' and visitors' scenic objectives and not overweigh the business objectives of a utility company when a reasonable alternative of undergrounding would resolve this issue. Indeed, if the Forest is making a good-faith effort to balance the needs of APS with the legitimate concerns of local residents, we don't understand the Forest's rationale for undergrounding the line along the much-less travelled Beaverhead Flat Road rather than along Kel Fox Trail and the segment within the VOC.
    - The draft decision also does not specify detailed guidelines that APS must follow to minimize scenic impacts for either above-ground or buried lines. This is a serious deficiency, and one that would allow APS to ignore many of the proposals that APS and CNF previously mentioned during public sessions and meetings with APS. For above ground lines our concerns include:
      - Use of non-specular lines that greatly reduce the reflectivity of the lines
      - Use of non-specular cables for guidewires on poles (if any are required)
      - Use of darker or non-reflective insulators, transformers, etc.
      - Ensuring the line route avoids straight view lines highly visible from VOC or Highway 179.
    - Similarly, the draft decision also does not specify detailed guidelines that APS must follow to reduce fire risks for either above-ground or buried lines. This is a serious deficiency, and one that would allow APS to ignore many of the proposals

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<sup>2</sup> See "Coconino National Forest taking next steps in Oak Creek to McGuireville Transmission Line project," CNF, Jan. 16, 2025. Available at [Coconino National Forest - News & Events](#).

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that APS and CNF have mentioned during public sessions and in our meetings with APS. For above ground lines this includes:

- Avoiding use of equipment in high fire risk areas that is known to cause sparking on lines (e.g., reclosers, switched, etc.)
  - Frequent vegetation management along the right of ways in high fire risk areas.
- Information Used in the draft and final EAs
    - CNF relied almost exclusively on the project’s advocate, Arizona Public Service (APS), for the information used in its evaluation of the Project. There are several areas where this information is not current or of high quality, nor is it sufficiently forward-looking to consider cost trends and likely future changes as is needed for a project with a 50-year life. These weaknesses in the information basis include:
      - *Lack of expertise in undergrounding lines:* APS has stated during public meetings with BPC and CNF that it has little experience or expertise in undergrounding lines, yet CNF relied almost entirely on cost and project design data from APS for the underground option.
      - *Motivational bias:* APS also has an extraordinarily strong motivational bias to provide CNF with data that will justify its preferred (and lower-cost) project design – i.e., an overhead transmission line.
        - This bias was clearly demonstrated in several ways:
          - Outage Data: The outage data for VOC that was presented by APS in the draft EA to demonstrate poor reliability in the region was clearly wrong and very significantly overstated local outages. APS stated that average outages in the region were 4 hours per year with 150-160 hours of rotating outages per year. Based on a BPC survey of over 100 residents in VOC accessing their household outage data directly from APS over a three-year period, outages in VOC averaged only 78 minutes per year, and there were no rotating outages. Based on APS data provided by APS to the Energy Information Agency (EIA), APS’s average system outage duration averaged 120 minutes per year.<sup>3</sup>
          - PSPS Impacts: It does not appear that APS provided CNF data on the reliability impacts of Public Service Power Shutoffs (“PSPSs”) for above ground lines. PSPSs have evolved into a common utility best practice during periods of high fire risk and have led utilities to shut off power to communities during dry periods with high wind velocity. The above ground route for this proposed APS line

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<sup>3</sup> Annual submission by all public utilities to the Energy Information Agency in Form 861. See: (<https://www.eia.gov/electricity/data/eia861/>)

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correlates closely with those lines most likely to be shutoff – i.e., lines that traverse high fire risk areas with high wind in the urban wild-land interface. The duration of PSPS outages tend to be quite long, oftentimes 1-2 days, and sometimes as long as four days. The duration of a single day-long PSPS is 600% longer than the historical outages in APS' service territory. One could argue that the combination of this new operating procedure and additional overhead lines has a fair probability to actually reduce the reliability of power in VOC and the Verde Valley. Neither the draft nor the final EA acknowledge this potential, and very real, reliability risk created by above ground lines.

- Cost Data: The data used for estimating the cost of burying a small transmission line appears to be both outdated and radically overstates the likely cost compared to current costs for undergrounding power lines for either trenching or use of directional drilling.
  - Section B-C Cost Estimate: The costs to drill 1,000 ft. under Hwy. 179 to bury the 69 kV lines is about \$5.5 million, or \$5,500 per foot.
  - Section C-D Cost Estimate: the cost to bury 0.6 miles up the Kel Fox trail following the existing gas pipeline (a mix of trenching and drilling under the gas pipeline at one point) is \$8.9 million, or \$1,400 per foot.
  - Although these areas include rocky terrain that includes some localized fractured basalt deposits, the estimates appear to be much too high. Directional drilling now widely used in the U.S. for fracking has provided a new low- cost option for utilities to bury lines. These costs have fallen substantially to about \$40-80 per linear foot or more for municipal or commercial projects (i.e., the scale of this project).<sup>4</sup> That estimate is roughly 100 times less than the \$5,500 per linear foot APS estimated for section B-C and roughly 40 times less than the \$1,400 per linear foot estimated for section C-D. Similarly, cost estimates for hard rock drilling through rock such as granite are about \$15-100 per foot.

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<sup>4</sup> See “Digging into the Numbers: Understanding the Cost of a Directional Bore,” ClearPath Utility Solutions, LLC. Available at , <https://www.directionaldrilling.com/Blog/Digging-Into-The-Numbers-Understanding-The-Cost-Of-A-Directional-Bore/> (as of Feb. \_\_, 2025).

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- In addition, several fundamental changes are occurring that are significantly reducing the cost of burying power lines.
    - The recent massive wildfires caused by power lines in CA, OR, HI, TX and elsewhere in the U.S. are causing utilities to bury large portions of their power lines for the first time. The experience, expertise and new technology being used are significantly reducing this cost. As an example, CPUC data for PG&E shows that the cost to bury power lines has fallen from \$3.3 million per mile in 2022 to \$3 million per mile in 2023 with estimates for 2024 at \$2.8 million per mile.
  - Rate Impacts of Undergrounding Lines:
    - According to research from Power Delivery Intelligence Initiative (PDI2) underground assets can be 3-7x cheaper to maintain while also having lives 2-3x longer than overhead assets.<sup>5</sup>
    - PDI2 also outlined that several myths that have been used by utilities to argue against undergrounding lines, all of which are minimizing the benefits in the economic evaluation of undergrounding the proposed McGuireville/ Village of Oak Creek 69 kV line.

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<sup>5</sup> See, e.g., “What does undergrounding cost?”, Underground Arizona, available at <https://undergroundarizona.org/what-does-undergrounding-cost>

**Selected Myth-Busting – Myth 2, 3, 4, and 7**

Myth	Myth-Busted
2. Underground maintenance cost far exceeds overhead maintenance cost.	The cost of underground distribution maintenance per mile is 3 to 7 times <u>lower</u> than overhead distribution maintenance. <sup>559, 603</sup> This reduction in maintenance is also a direct reduction in “truck rolls” yielding both a safer environment and a focus on critical/emergency needs addressed by first or second responders.
3. Underground cable fails at a faster rate than overhead cable. <sup>531</sup>	Innovation and problem-solving where 100-year+ cable life, submerged and directly buried, is now possible. <sup>255, 602</sup> Specifically, materials, manufacturing, and factory comparable quality control (QC) field testing are greatly improved allowing cable systems to live 2 to 3 times longer than wood pole-supported assets. <sup>615</sup> In one study, underground assets exhibit 12x fewer System Average Interruption Frequency Index (SAIFI) customer interruptions than overhead assets. <sup>610</sup>
4. Overhead to underground conversion programs are cost-prohibitive. <sup>51</sup>	Undergrounding transformations are driving costs down and performance up via materials science; construction techniques; maintenance practices; regulatory policy; and financial engineering. What is truly cost-prohibitive is the lost GDP incurred by a weather-impacted region or state while overhead line segments are down a day or days longer than necessary – Hurricane Irma estimates of \$1 billion per day lost <sup>612</sup> in regions impacted are consistent with FL's daily GDP of \$3.8 billion and by comparison, VA's daily GDP of \$1.7 billion. <sup>611</sup>
7. Underground faults are hard to find, expensive to repair, and take longer to resolve.	The quality, performance, and field testing of modern materials are allowing cable systems to live 2 to 3 times longer than overhead assets and reducing the number of faults below that of overhead lines. <sup>610, 615</sup> This high-quality performance married with technology to accurately and rapidly locate faults, <sup>608</sup> when they do occur, and specialized keyhole or vacuum excavation technology dramatically speeds up and lowers the cost of finding and repairing any fault.

- Spacing of the trench along the front of the butte
  - The final EA concludes that trenching the line along the beginning of section C-D would require blasting of the hillside given the tight spacing between the existing gas pipeline, an archaeological site, and the hillside. The spacing needed for installation of the trench can be as narrow as 10-20 feet, so it seems unlikely that there is not a means to avoid having to blast the front of the mesa to create the bench needed for the trench in that location. As an example, on a recent Orenco Hydro project in Alaska, a 24” water line (about 4x larger than a 69kV power conduit) was engineered to be laid in the middle of a 10-12’ wide road as the trench was being excavated in hard rock. Directional drilling could also be used in that short stretch of the line.
- Long-term visual impact of the buried line ROW
  - The buried gas pipeline which parallels the planned line and the ground vegetation under which it is buried has healed over the years. As a result, it is virtually invisible from any distance or location, and over time the buried

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transmission line could and should have the same ability to be virtually invisible for recreational users of Kel Fox trail and from the VOC. Of course, both utility lines need access for maintenance, and the buried line would have buried manholes for conduit access, but otherwise no long-term above-ground impact would be observed. In comparison, the final EA posits that the buried line will have a significantly larger permanent visual impact than the above ground line, which seems fundamentally incorrect.

○ Impacts on Property Values

- The final EA states that there would likely be no impact on property values from the above-ground line, but the study cited<sup>6</sup> was rejected as “selective and incomplete,” and that one of the study’s author’s review of the local market and case studies was “flawed and unreliable” by a New Hampshire public siting agency, and later upheld by the state Supreme Court. In addition, there are several studies not mentioned in the final EA that measured significant impacts on property values:

- A 2018 study from the Journal of Real Estate Research found that vacant lots near high-voltage power lines sell for 44.9% less than equivalent lots that aren’t located near power lines. If you take a step back, a lot that is located within 1,000 feet of transmission lines tends to sell for 17.9% less.
- “In most situations, the proximity to high-voltage power lines can lower your home's value by 10 to 30 percent. This varies depending on factors, including the voltage of the lines and whether there's a power station is nearby. However, more extreme situations can lower a property's value by as much as 40 percent.” Source: Gustan Cho Associates dba NEXA Mortgage, LLC.

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<sup>6</sup> See James A. Chalmers and Frank A. Voorvaart, “High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrance Effects,” *The Appraisal Journal*, summer 2009. [Tatosetal-Transmission-Lines-Property-Value-Impacts.pdf](#).



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○ Assessment of Wildfire Risk

- The addition of the proposed above ground transmission line creates an entirely new source of fire risk. Although APS has agreed to take steps to reduce that risk, it cannot be eliminated for an above ground line, whereas underground lines virtually eliminate that risk. According to Jamie Martin, PG&E's vice president, undergrounding reduces fire ignition risk by 98% compared to an overhead line.<sup>7</sup> Similarly, a major study by the Edison Electric Institute estimated that underground lines were 20x less likely to start a fire than an overhead line.<sup>8</sup>
- Although lightning is the most common cause of fires, power lines continue to be the source of many of the most catastrophic fires in the U.S., even in areas where utilities have taken substantial steps to reduce that risk, such as PG&E, SCE, SDG&E, PacifiCorp Oregon, and Xcel Energy in Texas. The recent Palisades and Easton fires appear to have been ignited by sparking power lines, even though in at least one instance, SCE had aggressive measures in place to mitigate that risk.
- The fire risk in VOC is already substantial and well-documented; it should not be increased. Among the many reasons:
  - The Village of Oak Creek already has a 96% probability of higher fire than elsewhere in the U.S., according to First Street (formerly Risk Factor).<sup>9</sup>
  - Insurance companies are already cancelling policies for several homeowners at the boundary of national forest lands and residential areas, e.g., much like where the line would be located in the final EA.
  - The proposed line is routed along an area that was estimated by the Arizona Department of Forestry and Fire Management to vary from very high to extreme fire risk (see fire map below in appendix E). These very high risk ratings are due to the proposed line route is a natural wind tunnel that creates high wind speeds with prevailing winds that blow directly towards VOC.
  - From a risk management perspective, the draft decision is hard to defend, since it proposes to construct an overhead line in areas of exceedingly high to extreme fire danger, in contrast to undergrounding the line along Beaverhead Flat Road, where the fire risk danger is low/moderate to moderate.

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<sup>7</sup> See, e.g., Katie Brigham, "Why burying power lines is an effective, but very expensive way to prevent wildfire," CNBC, Oct. 21, 2023. Available at <https://www.cnbc.com/2023/10/21/burying-power-lines-for-wildfire-prevention-is-effective-but-expensive.html>

<sup>8</sup> See, Kenneth L. Hall, "Out of Sight, Out of Mind; An Updated Study of Undergrounding Overhead Power Lines", January 2013, prepared for Edison Electric Institute.

<sup>9</sup> First Street, "Does Village of Oak Creek have Wildfire Risk," Available at <https://www.cnbc.com/2023/10/21/burying-power-lines-for-wildfire-prevention-is-effective-but-expensive.html>

- The limited road access into and out of VOC also creates the potential for a significant loss of life during a wildfire. The existence of only two roads into and out of VOC creates the potential of a catastrophe during a fire, as happened during the Paradise fire where 85 people were killed by the fire ignited by a spark from an utility line.
- The CNF analysis appears to misrepresent the primary fuel type along the proposed route and underestimates the risk. The draft EA (p. 44) describes the vegetation communities in the project area as Apacherian-Chihuahuan Mesquite Upland Scrub (52% of study area) and Madrean Pinyon-Juniper Woodland, the "second most common landcover type," covering 16% of the study area. When combined it is two-thirds of the study area (68%). Yet the Fire Report indicates two types of grass categories (GR1 and GR2), at 46% dominate the "analysis area" (located adjacent to the VOC and McGuireville). Fire Report at 3. Only 3% of the Analysis Area is listed as a form of "Timber Litter" (TL3, 5 and 6) that, according to the Fire Report, is described as moderate to high loads of conifers, mostly generating low flames. But as seen in the photo below, the project area immediately south of the VOC is not a grassland but rather dominated by a mix of juniper and pinyon woodland, with significant combustible fuel sources. CNF's Fire Report, which states "The vegetation in both line segments is not continuous, broken by areas free of any vegetation" (Fire Report at 2) is clearly inconsistent with the photo below.

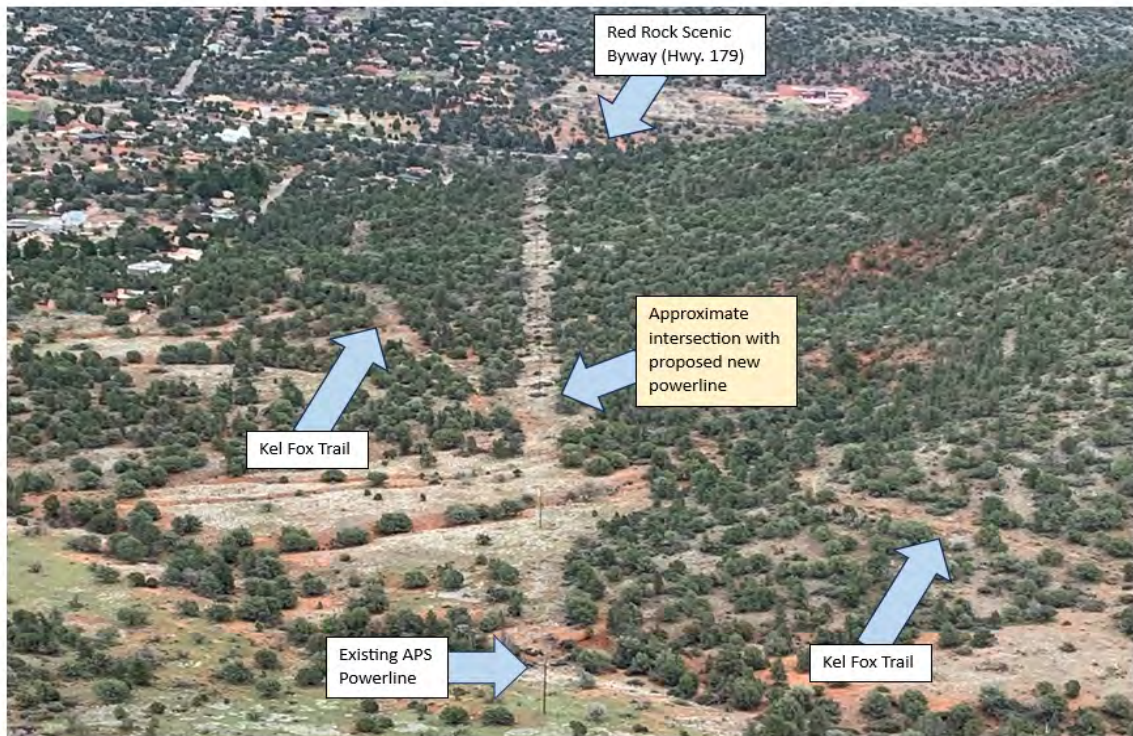


Photo taken Mar. 23, 2024, 1:54 pm.

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- The EA states that the fuel makeup for most of the large fires in places like California or Oregon is vastly different than along the route of the line, but the fuel makeup for the 1.2 million acre Smokehouse Creek fire near Amarillo, TX, caused by a downed power line, is more similar to the fuel make-up in the Project area.
- Evaluation of Alternatives to Provide Enhanced Power Reliability
    - The NEPA process requires that CNF fairly evaluate alternatives to the proposed transmission line. BPC proposed in 2021 that an obvious option was to explore local generation and/or battery storage that could provide power to VOC, with a similar system installed near McGuireville. Appendix F in the EA provides a brief analysis of these options.
    - The cost analysis provided for these options appear to be much higher than current costs, nor do they reflect the rapidly decreasing costs – particularly with respect to battery costs – over the next several years. As a result, CNF has not provided a fair comparison of the other options proposed in 2021 by BPC.
    - Battery Costs: The CNF analysis assumed that a battery able to meet the 25MW load in VOC or McGuireville would cost about \$25 million. Current installed costs in the U.S. for batteries have fallen to about \$220/kWh for a 4-hour system (*“NREL’s 2022 Annual Technology Baseline Report – Utility Scale Battery Storage”*). This translates to about \$5.5 million for the system needed in VOC. CNF is assuming battery costs that are 400-500% too high. In addition, in the most recent grid-level battery system solicitation in China, 60 bids came in under \$68/kWh for dully designed and installed systems. This would translate to only \$1.7 million for battery back-up for VOC.<sup>10</sup> These costs reflect the impact of the current substantial oversupply of battery systems worldwide, a substantial opportunity for buyers such as APS.
    - Critically, a 4-hour battery system would be able to provide power in VOC and McGuireville during almost all outages since there have been very few outages in APS’ territory, or in Arizona in general that are over 4 hours in length. Based on the survey of 100 customers by BPC examining their APS outage data in VOC, customers experienced two outages every three years averaging 38 minutes. The average outage duration per customer (i.e., SAIDI) for APS in 2023 was only 88 minutes, which is much better than the US average.
    - Batteries on the grid also provide other important sources of value to utilities like APS. They provide arbitrage value where power produced during peak solar periods can be stored to be used during peak afternoon and early evening hours. Batteries also have proven to be an important source of grid stability and

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<sup>10</sup> See, e.g., “Mind blowing:’ Battery cell prices plunge in China’s biggest energy storage auction,” Renew Economy, Feb. 15, 2025. Available at [https://reneweconomy.com.au/mind-blowing-battery-cell-prices-plunge-in-chinas-biggest-energy-storage-auction/#google\\_vignette](https://reneweconomy.com.au/mind-blowing-battery-cell-prices-plunge-in-chinas-biggest-energy-storage-auction/#google_vignette).

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frequency control, which on radial lines like those serving VOC and McGuireville, can be a significant problem (see figure in Appendix D).

- CNF cost estimates for a 25MW solar facility of about \$25 million appear to be appropriate, but costs for community solar systems have also fallen by over 80% over the last 10 years from \$5.66/W in 2010 to \$1.01/W in 2020 for all in system costs<sup>11</sup> and are expected to continue to fall. In comparison, transmission line development costs have increased over that time.
- The CNF analysis estimated that a solar farm would require 250 acres, whereas the actual siting requirements for a solar facility and battery system to meet VOC load would only be about 80 acres given the solar intensity in this area and current solar efficiency. This option could be sized to meet local demand and 24-48 hour storage, sufficient for providing power except during long-term outages of the existing 69 kV line, which have never occurred on that line. There also appears to be an ideal site for the solar farm on the mesa WNW of the Kel Fox trail. That mesa is about 100 acres in size, and high enough that it could not be seen from VOC, Highway 179, and almost all of the trails in Sedona. It is also adjacent to the existing 69 kV line from Sedona to VOC, providing a low-cost interconnection.
- An on-site gas generator used only for backup power could be co-located with the existing APS substation and requires only 1 acre and could be operated for the duration of any outage. Recent capital costs for installed gas generation units of the size needed in VOC are about \$1,200/kW, or about \$30 million. Since McGuireville's load appears to be about 67% of VOC, the capital cost for that unit would be about \$20 million. The combined cost of \$50 million would be similar to the cost of the recommended transmission line option and would have significantly fewer impacts on scenic objectives or fire risks and could eliminate all long-term and short-term outages.

In conclusion, the CNF draft decision should be rejected given the major deficiencies in the quality of the information used, the value measures used, poor quality risk assessment, the cursory evaluation of alternatives to the transmission line, and the very attractive cost of the battery option that could protect against almost all outages at a much lower cost. As a result, BPC requests that the decision be delayed until these major deficiencies are fully addressed, preferably in an EIS.

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<sup>11</sup> <https://www.nrel.gov/news/program/2021/documenting-a-decade-of-cost-declines-for-pv-systems.html>

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Big Park Council greatly appreciates a prompt response to this request. The undersigned can be reached at [susan.barber@icloud.com](mailto:susan.barber@icloud.com). Inquiries can also be submitted to the Big Park Council email at [bigparkcouncil.inquiry@gmail.com](mailto:bigparkcouncil.inquiry@gmail.com) .

Sincerely,

*Susan Barber*

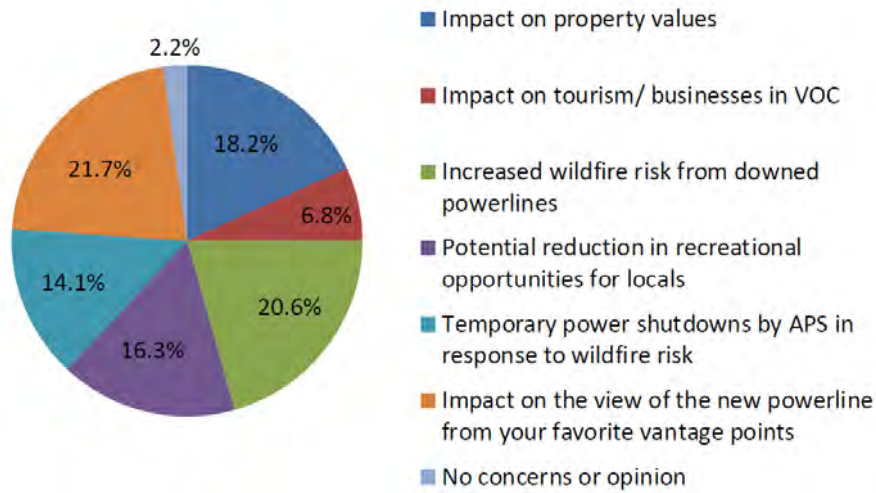
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# Appendix A

Excerpts from BPC Survey of Residents, February 2, 2021 [Referenced on p. 7 of the BPC comment letter, January 4, 2022, to CNF Supervisor Laura Jo West, and in footnote 35.]

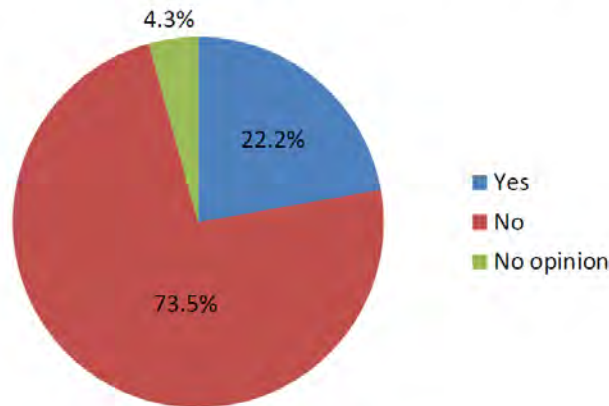
Q2. Please indicate those issues that concern you related to the proposed APS transmission line. Check all that apply.



Big Park Regional Coordinating Council

Survey of Village of Oak Residents Concerning APS's Proposed Power Line 2021

Q4. Weighing both the advantages and disadvantages of the APS project as described, do you believe the advantages of the proposed APS transmission line outweigh the disadvantages?

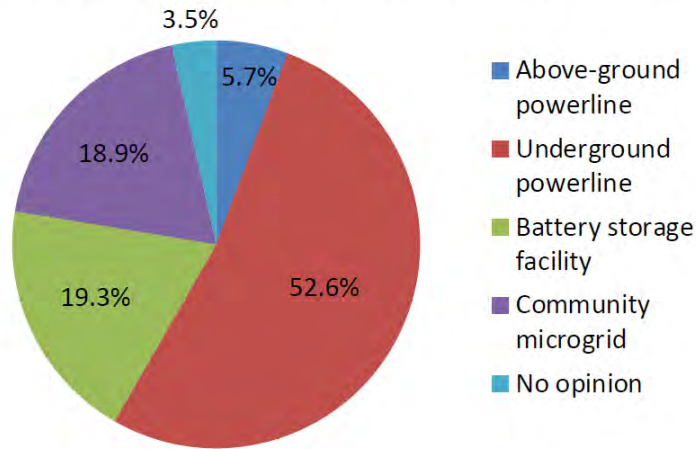


Big Park Regional Coordinating Council

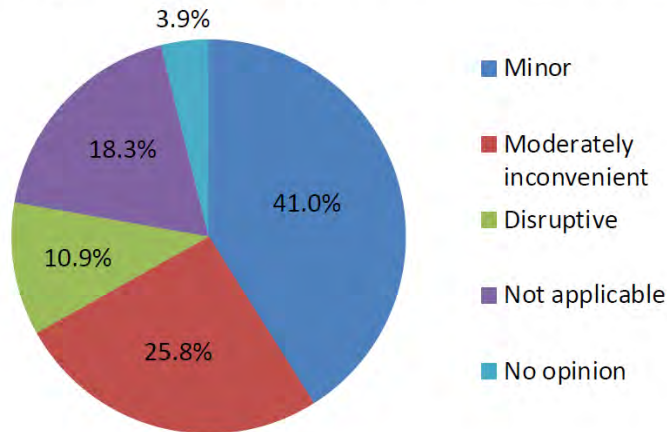
Survey of Village of Oak Residents Concerning APS's Proposed Power Line 2021

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Q5. Of the alternatives below that may increase electrical power capacity and prevent future power outages in VOC, which one would you support? (Select ONE answer ONLY.)

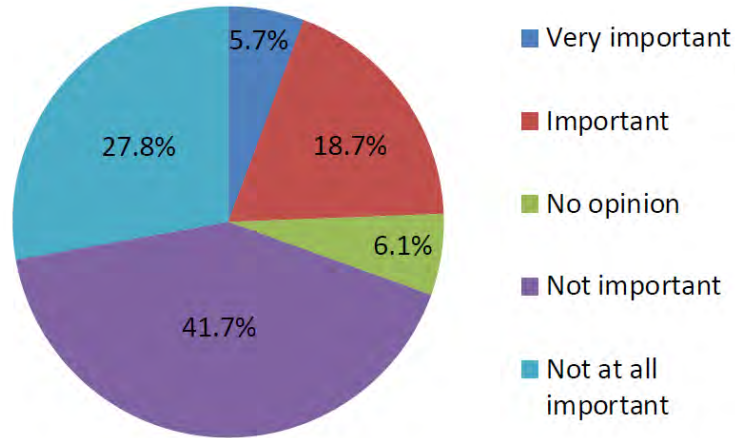


Q7. With respect to power outages that you experienced in the VOC over the last five years, how did it impact you and/or your household? (Select ONE answer ONLY.)



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Q8. Given that much of the VOC is fully developed, how important is the need for a new powerline into the community?





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# Appendix B

Excerpts from BPC Survey of APS Customer Outages in VOC, Conducted January 23-February 6, 2023.

## APS Power Outages in the Village of Oak Creek Survey Design

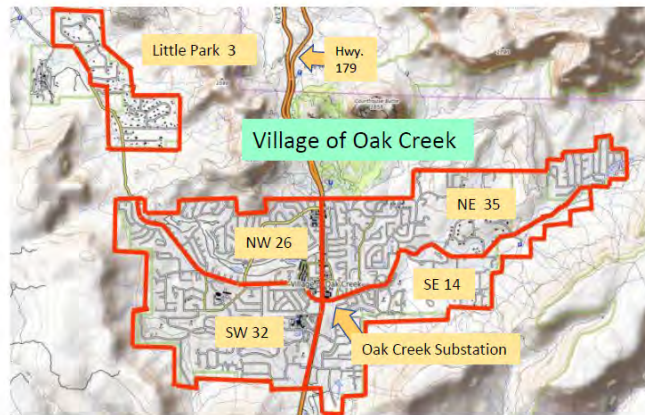
- Big Park Council wanted to better understand the discrepancy between APS outage data and VOC residents' perceptions that there is not a serious problem.
- APS declined to provide specific outage data to BPC, citing proprietary concerns.
- However, APS website allows customers to review their outage history over past 36 months.
- BPC survey conducted 1/23-2/6/23 by email to approximately 500 VOC residents, social media.
  - Valid responses required VOC residents to log into the APS website and enter information on number of outages and duration. BPC received 110 valid responses. Respondents' identities kept confidential.

## Survey Results

	Sustained Outages	Rotating Outages
Draft EA (p. 3)	One event of 4 hours each year	150-160 hrs. per yr.
BPC Survey	2 events every three years, averaging 38 minutes each	0

## APS Power Outages in the Village Results: Survey Question 2

2. In what area of the Village of Oak Creek (VOC) do you live?
- A. 110 valid responses – spread evenly across the VOC (45% east of Hwy. 179, 55% west)
  - B. Responses represent approximately 2.4% of APS customers at Oak Creek substation
  - C. Quadrants (NE, SE, etc.) used in survey responses to identify systemwide outages at VOC substation

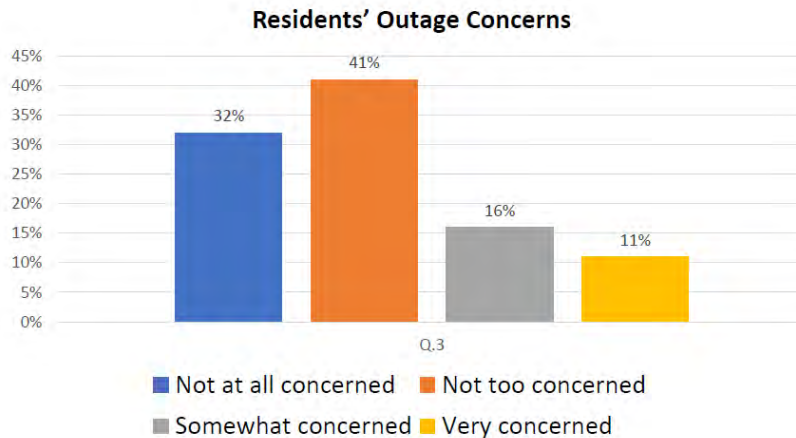


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# APS Power Outages in the Village

## Results: Survey Question 3

3. After reviewing the APS outage report for your home, please check the box that best describes your concern with future outages.



- The review of BPC’s survey of outage data for over 100 APS customers and the last three years of outage data (provided by APS) indicated the following:
  - The average reliability in VOC (in outage duration/year i.e., SAIDI) is already significantly better than APS system average
    - 79 minutes per year (2020-2022) in VOC vs. 120 minutes for APS system as a whole (from APS outage data submitted annually to EIA)
  - The proposed line would not have eliminated a single outage in VOC, since all of the outages in 2020-2022 were distribution outages
- In addition: APS’s reported outage data for VOC appears to substantially overstate the local reliability issues compared to the average of the customer specific on-line data available from APS
  - APS Statement: 1 event of 4 hours every year, and 150-160 hours of rotating outages **vs 1 hour 19 average for VOC customers surveyed, with 0 hours of rotating averages**
- Above ground power lines also have a ~20x higher risk of causing outages, or being damaged by a fire so reliability would likely be further enhanced by a buried line (from a large US power industry study by EEI).

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## Appendix C

- A 2018 study from the *Journal of Real Estate Research* found that vacant lots near high-voltage power lines sell for 44.9% less than equivalent lots that aren't located near power lines. If you take a step back, a lot that is located within 1,000 feet of transmission lines tends to sell for 17.9% less. Source: Charles J. Delaney and Douglas Timmons, "High Voltage Power Lines: Do They Affect Residential Property Value?" *Journal of Real Estate Research*, Vol. 7, No. 3 (Summer 1992), at 315-329. Available at [High Voltage Power Lines: Do They Affect Residential Property Value? on JSTOR](#).
- In most situations, the proximity to high-voltage power lines can lower your home's value by 10 to 30 percent. This varies depending on factors, including the voltage of the lines and whether there's a power station nearby. However, more extreme situations can lower a property's value by as much as 40 percent." Source: Alex Carlucci, "Buying House Next to Power Lines and How It Affects Resale," Oct. 6, 2021, Gustan Cho Associates dba NEXA Mortgage, LLC. Available at [Buying House Next To Power Lines And How It Affects Resale \(gustancho.com\)](#).

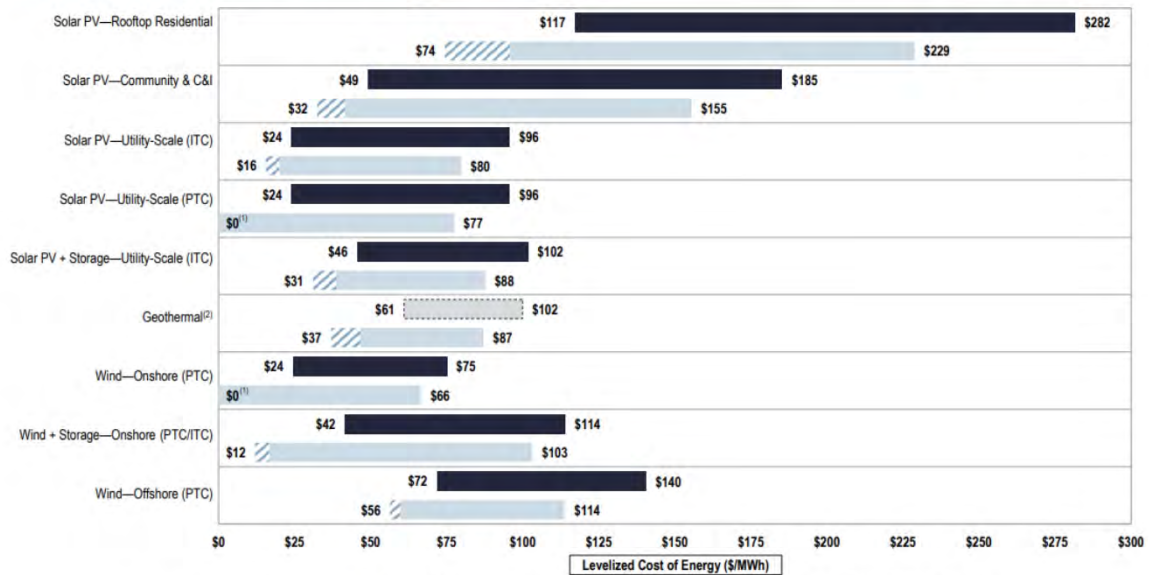
# Appendix D

[Costs: Battery trends; undergrounding costs; microgrid systems]

Sample commentary: “Solar generation has become much cheaper over time, but large-scale solar (the type that would be used in place of a 69kV transmission line) is roughly 25% of the cost of solar panels on residential customers' roofs. The comparison that is widely used by most utility professionals and renewable advocates is Lazard's annual review of generation costs (shown below). If the societal goal is to produce solar energy at the lowest cost. A solar array to serve all of VOC would be about 25MW and would require about 80 acres – about the size of the mesa west of Kel Fox Trail, and would fall in the Solar PV Utility Scale category in rows 3 or 4.

## Levelized Cost of Energy Comparison—Sensitivity to U.S. Federal Tax Subsidies

The Investment Tax Credit (“ITC”), Production Tax Credit (“PTC”) and domestic content adder, among other provisions in the IRA, are important components of the levelized cost of renewable energy generation technologies



Source: Lazard and Roland Berger estimates and publicly available information.  
 Note: Unless otherwise indicated, this analysis does not include other state or federal subsidies (e.g., energy community adder, etc.). The IRA is comprehensive legislation that is still being implemented and remains subject to interpretation—important elements of the IRA are not included in our analysis and could impact outcomes.  
 (1) Results at this level are driven by Lazard's approach to calculating the LCOE and selected inputs (see Appendix for further details). Lazard's Unsubsidized LCOE analysis assumes, for year-over-year reference purposes, 60% debt at an 8% interest rate and 40% equity at a 12% cost (together implying an after-tax IRRWACC of 7.7%). Implied IRRs at this level for Solar PV—Utility-Scale (PTC) equals 17% (excl. Domestic Content) and 22% (incl. Domestic Content) and implied IRRs at this level for Wind—Onshore (PTC) equals 17% (excl. Domestic Content) and 25% (incl. Domestic Content).

In addition, on-site generation or storage can provide a variety of benefits that the transmission line cannot, as illustrated below.

Benefit	Solar + Battery Systems	On-site Gas Generation	69kV Transmission Line
Enhanced reliability	Yes	Yes	Yes
Frequency support	Yes	Yes	Yes
Voltage regulation	Yes	Yes	Yes
Additional generation	Yes	Yes	No
Increased clean energy	Yes	No	No
Lower cost on-peak energy	Yes	Yes	No
Price arbitrage	Yes	Yes	No
Reduces APS' <u>levelized</u> cost of energy	Yes	Maybe	No

Battery backup alone is also an option that could be used to enhance reliability in VOC and McGuireville if the existing line were out. This option would be highly effective for addressing outages that are several hours or less, which constitute dominant share of transmission line outages, As shown below, battery energy storage system (BESS) costs have dropped substantially and are forecasted to continue to drop rapidly for the next 2-3 decades.

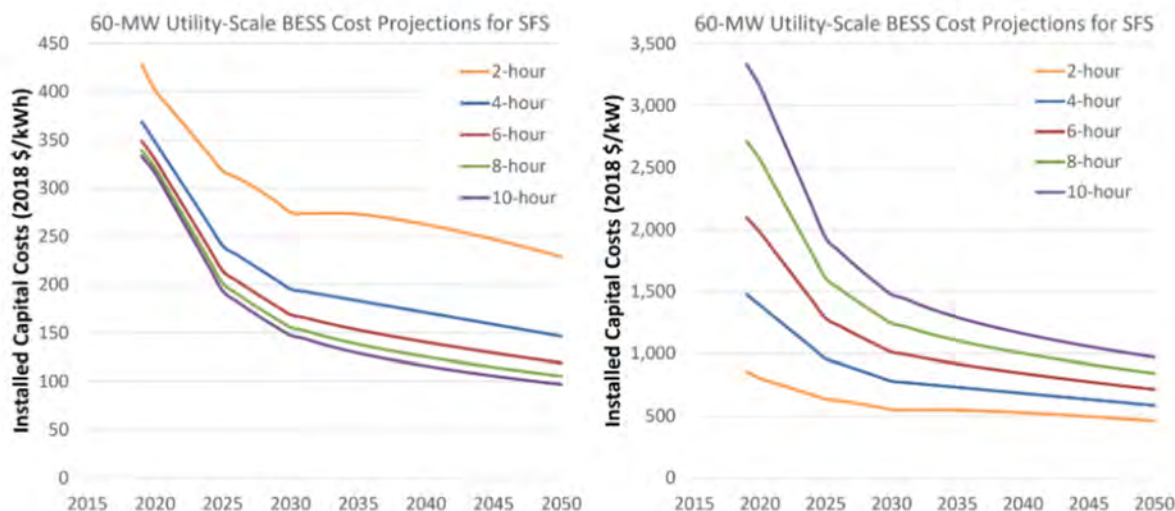
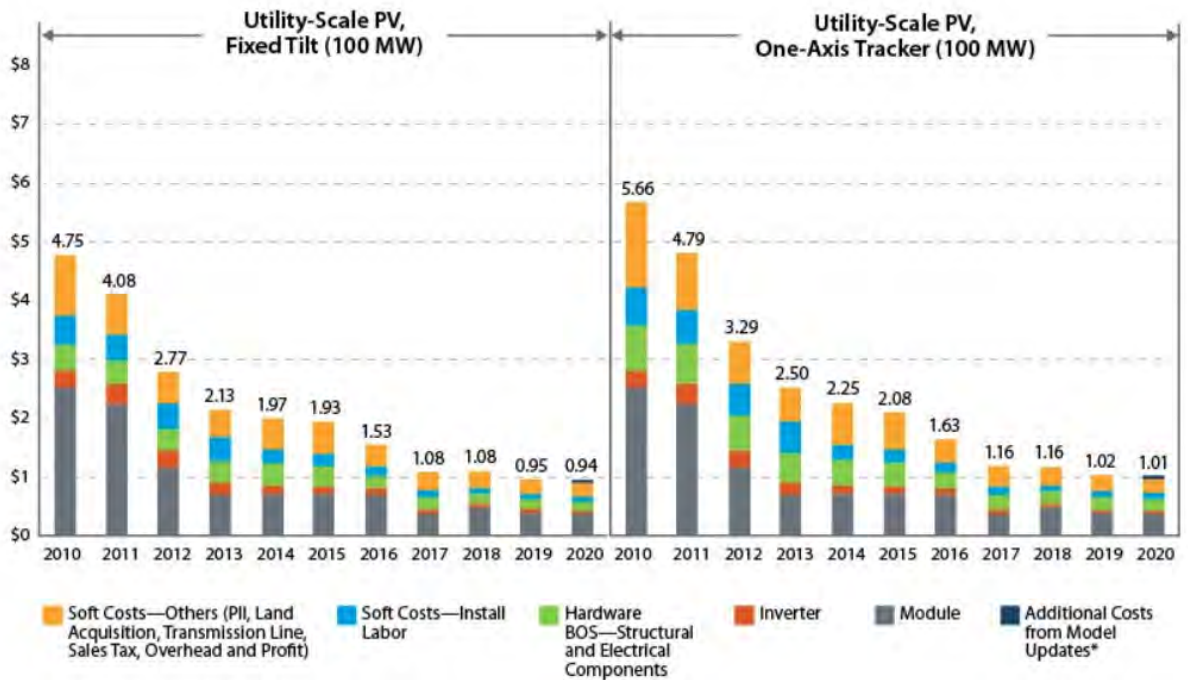


Figure 3. Utility-scale BESS Moderate Scenario cost projections, on a \$/kWh basis (left) and a \$/kW basis (right)

Projections assume a 60-MW<sub>DC</sub> project. Note that 2020 costs correspond to Figure -1 and Figure 2.

See: <https://www.nrel.gov/news/program/2021/documenting-a-decade-of-cost-declines-for-pv-systems.html>



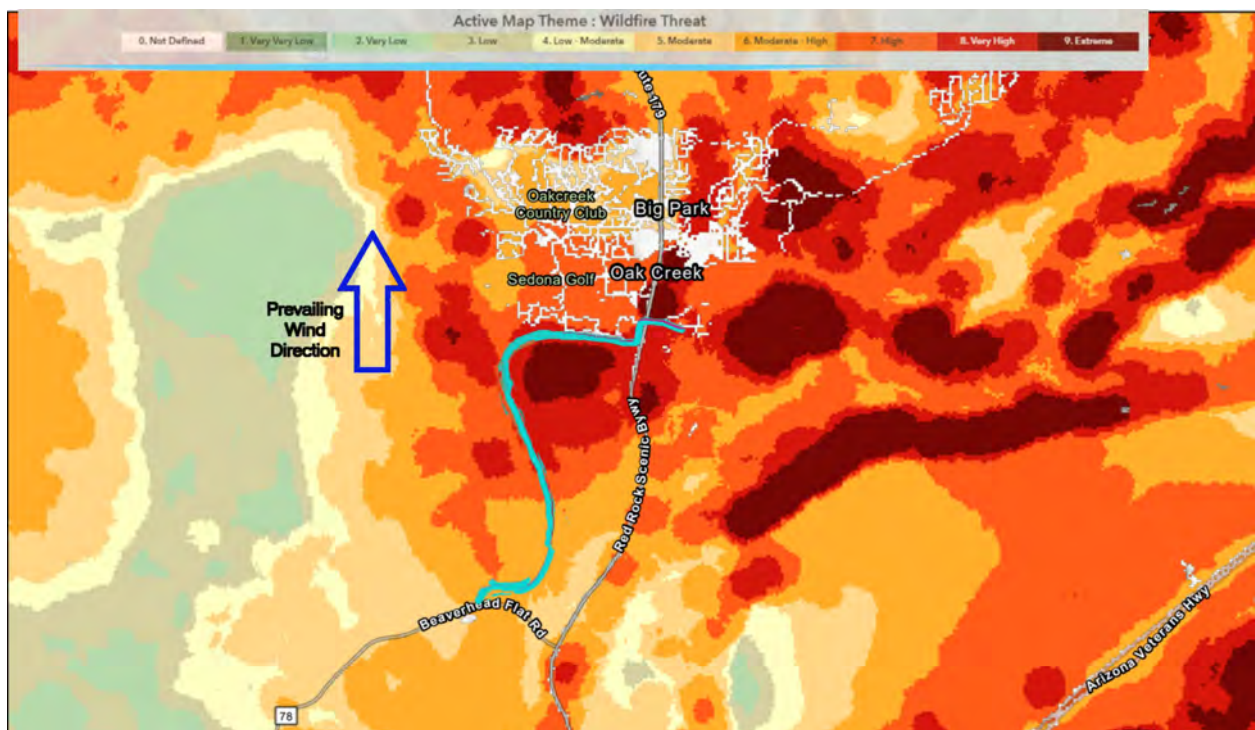
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## Appendix E

Sample commentary (taken from BPC draft EA comments:

The Arizona Department of Forestry and Fire Management fire risk map reinforces this point that CNF has not fairly considered the impact of the above ground portion of the Project near Kel Fox Trail. It clearly shows the wildfire threat to be “high” to “extreme” around the proposed above ground route of the powerline into the Village, including the mesas overlooking the Village to the south. It is notable that CNF requires burying the line in low fire risk areas near the Beaverhead Flat Road but recommends an above ground line in the high to extreme fire risk areas. Source: BPC comment letter, January 4, 2022, to CNF Supervisor Laura Jo West, at 11 and subsequent analysis.

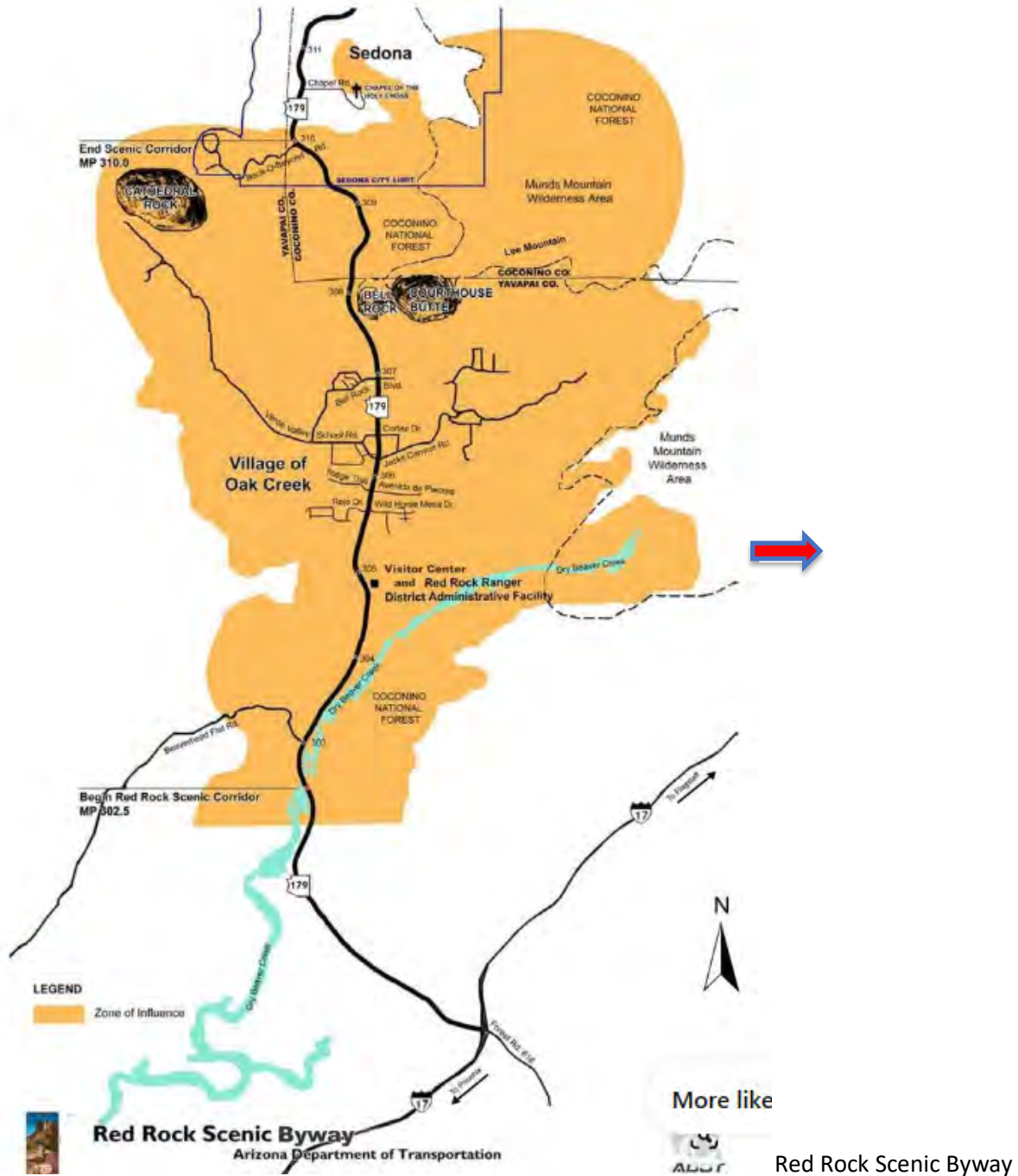
“See, e.g., that while the average hourly wind direction in the Village varies throughout the year, the “wind is most often from the south” for five months, from Feb. 4-July 5 (during the height of fire season), and for three other months, from Aug. 5 to Nov. 14. Weather Spark website. Available at [https://weatherspark.com/y/2635/Average-Weather-in-Village-of-Oak-Creek-\(Big-Park\)-Arizona-United-States-Year-Round](https://weatherspark.com/y/2635/Average-Weather-in-Village-of-Oak-Creek-(Big-Park)-Arizona-United-States-Year-Round). Source: BPC comment letter, January 4, 2022, to CNF Supervisor Laura Jo West, at 12.



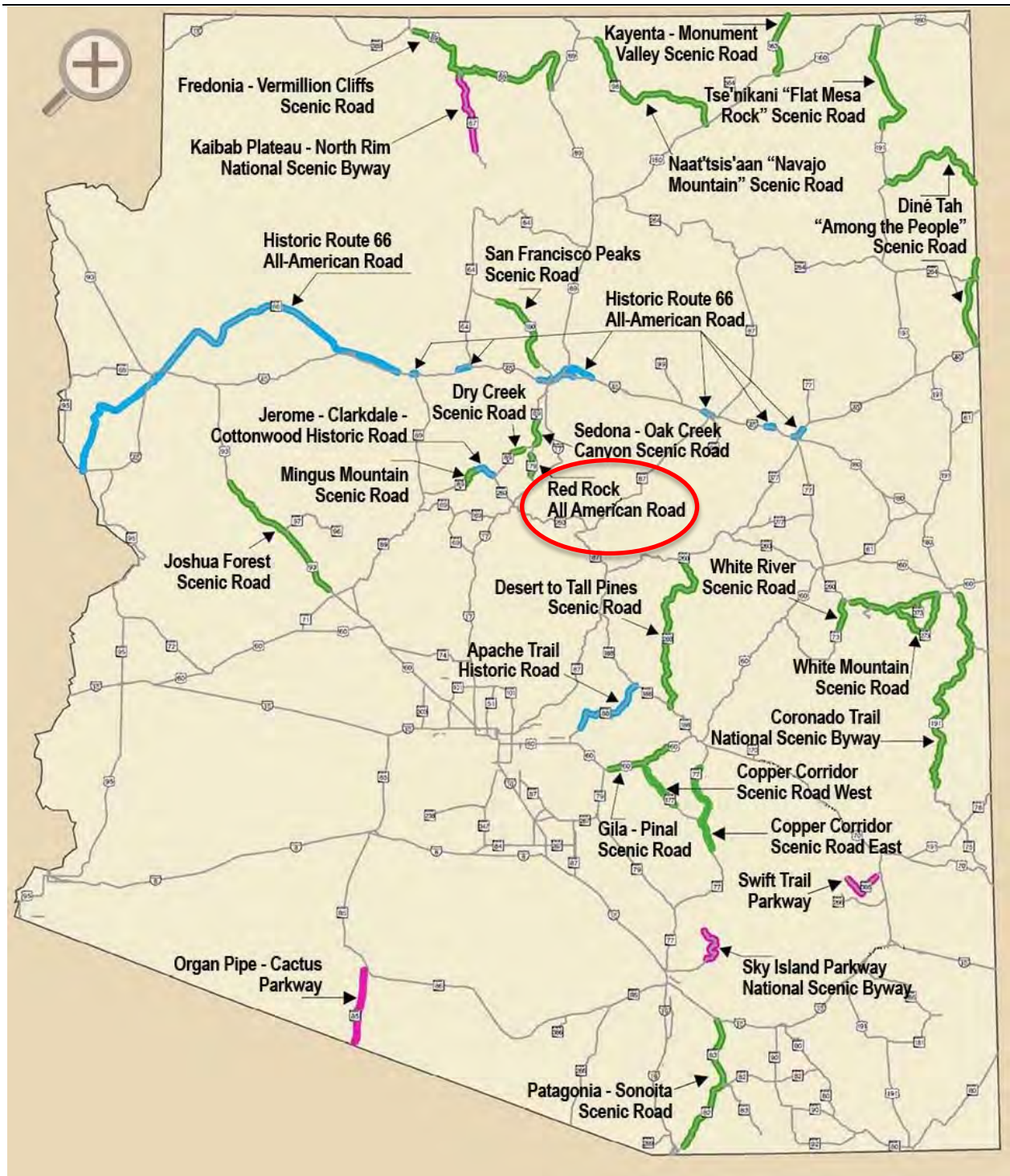
1. The darkest red represents areas of extreme wildfire risk
2. The aqua colored line represents December 2021 draft Environmental Assessment proposed route of transmission line from Beaverhead Flat Road down Kel Fox Trail
3. The blue arrow is the average hourly wind direction for five months during the year, Feb. 4-July 5 (during the height of fire season). This prevailing wind direction toward the population center of the Village of Oak Creek.

# Appendix F

Arizona Department of Transportation maps featuring Red Rock Scenic Byway. Source: [red rock scenic byway, Arizona's first All-American road | Scenic byway, Arizona, Arizona travel \(pinterest.com\)](#)







Source: [Arizona Scenic Drives Map - Search Images \(bing.com\)](#)