

**Santa Fe County Board of County Commissioners  
Rancho Viejo Solar Case #24-5200**

Submission from John Buchser, Chair, Northern Group, Rio Grande Chapter, Sierra Club  
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**Witness list:**

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**Climate Change and the Proposed AES Solar + Storage Project**

Ken Hughes, Northern Group Executive Committee,  
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Submitted to the Santa Fe County Planning Commission, February 3, 2025

Sierra Club's Policy for Siting of Renewable Energy, Transmission, Storage, and Related Infrastructure:

<https://www.sierraclub.org/sites/default/files/2024-06/Policy%20for%20Siting%20of%20Renewable%20Energy%2C%20Transmission%2C%20Storage%2C%20and%20Related%20Infrastructure.pdf>

The Sierra Club's policy for siting of renewable energy, transmission, storage, and related infrastructure "recognizes that a transformative expansion of renewable

energy is necessary to meet Sierra Club's strategic priorities for climate action and ending our reliance on fossil fuel, including achieving 80% carbon pollution-free electricity by 2030 and achieving net zero emissions economy-wide by 2050... The Sierra Club's strategic priorities are based on the understanding that the climate, extinction, and equity crises are existential threats to the survival and well-being of all life on Earth, and are deeply interconnected."

"Key Principles for decision making regarding siting of renewable energy, energy storage, transmission and infrastructure projects and related land use policy proposals:

- a) Supporting rapid build out of renewable energy, transmission, and associated infrastructure to displace fossil fuels and address the climate crisis
- b) Avoiding, minimizing and/or mitigating impacts to natural ecosystems
- c) Ensuring equity for all people and communities
- d) Environmental review and community engagement, consultation, and collaboration"

From the Sierra Club's web page on Climate Change:

<https://www.sierraclub.org/issues/climate>

"The impacts of climate change are here, and they will only grow more frequent and more severe – from extreme weather and unnatural disasters like fires, floods, heatwaves, and hurricanes, to rising sea levels and global food or water shortages, to ecosystem collapse and biodiversity loss – if we don't act. We only have a few short years to implement the transformational changes needed to reduce greenhouse emissions and maintain a livable climate.

Despite the urgency to transition to clean energy, fossil fuel corporations continue to drill new oil and gas wells and build new pipelines that tear through communities, polluting our ecosystems and disregarding Indigenous treaty rights. Every time one of these projects gets built, we lock in years more of greenhouse gas emissions that we simply cannot afford. While our future is put more and more at risk, oil and gas CEOs rake in the profits.

Unless we retire all coal plants by 2030, abandon all plans to build gas plants, and aggressively build out renewable energy resources, we risk destabilizing our livable climate. From shutting down polluting pipelines to building out clean energy, electrifying our buildings and cars to expanding public transportation, we're pushing for aggressive action to protect our communities from climate change.

**We are in a 'code red for humanity.' But it's not too late."**

From the Sierra Club's web page on renewable energy  
<https://www.sierraclub.org/issues/climate/renewable-energy>:

"Building a clean, carbon free electricity grid is the key to decarbonizing the US economy—including transportation, buildings, and industry—in time to avert a climate crisis. We are committed to decarbonizing the grid 80 percent by 2030. That includes retiring all coal and replacing it with... 700 gigawatts of new clean energy by 2030."

Specifically on solar and storage, "Sierra Club supports solar energy that is sited in ways that balance conservation priorities with the need to build out a clean grid...Battery storage is a key existing technology that can store wind and solar and release it back into the grid, lowering electricity costs and delivering a reliable grid."

I believe, as corroborated by my colleagues, that AES' proposed solar + storage project meets the challenges and opportunities laid out in Sierra Club's climate and renewable energy policies and statements.

*Hughes was a Clean Energy Specialist at the Energy, Minerals Department from 2006 to 2019, He was a Sierra Club Delegate at the 2009 Copenhagen Climate Change Conference. Hughes served on City of Santa Fe's Planning Commission from 2006 to 2012. He is a member of the Sierra Club's Rio Grande Chapter Northern Group's Executive Committee.*

## **Supporting material:**

### **1. Fire and contaminant Impacts**

#### **Analysis of impacts, seven recent Battery Energy Storage System (BESS) fires**

(American Clean Power, April 2025, prepared by Fire & Risk Alliance, LLC.)

Refer to attached document "BESS Fire Analysis Impact Assessment.pdf"

The executive summary from this report:

"Battery Energy Storage Systems (BESS) have become an **essential component of modern energy infrastructure, supporting grid stability, renewable energy integration, and peak demand management**. While concerns about fire hazards have been raised, historical data and scientific studies indicate that BESS remains a relatively safe technology with minimal environmental contamination risks. Furthermore, many reported fire incidents involved legacy systems that were designed, installed, and operational before the development and implementation of comprehensive national safety standards, such as NFPA 855 and UL 9540A.

This report provides an analysis of historical BESS fire incidents and, their causes, a review of the types of contaminants released, the extent of environmental impacts, and how advancements in safety regulations and technology have mitigated risks.

In **none of the reviewed cases** of environmental sampling related to the BESS fire events **were contaminant concentrations found that would pose a public health concern** or necessitate further remediation. This finding includes airborne contamination sampling conducted on-site, off-site, and within nearby communities, as well as relevant sampling of water from firefighting activities, automatic suppression system run-off, and groundwater testing in specific instances.”

Electric Power Research Institute’s **BESS failure incident database**. The EPRI chart (roughly at the bottom of first page) shows the **decline in incidents** with time as well as the dramatic increase in deployment of storage systems.

[https://storagewiki.epri.com/index.php/BESS\\_Failure\\_Incident\\_Database](https://storagewiki.epri.com/index.php/BESS_Failure_Incident_Database)

PNM Request for Proposals document, December 2024. In section 1.4.1 (20) is the **requirement** for energy storage and the statement of “**no stand alone solar**” in the proposals. Section 1.4.1 talks about transmission line requirements, and addresses, from a cost perspective, why the facility can’t be located a very long distance from the Zia power station. Refer to attached document “PNM 2029-2032 Generation Resources RFP Instructions and Terms.pdf”

Summary of **all solar facilities in NM** of 5 MW or greater, current thru January this year, Compiled by Craig Hammond of the Sierra Club. Refer to attached document “NM Solar Site Tracker -NNMG-V7-2025-2.xlsx”

Underwriters Laboratory - UL 2025 updates to the testing standard 9540A that AES must pass. Goal is **prevention of thermal runaway events**. Refer to attached document “UL9540A-2025 updates.pdf”

## **2. Impacts of solar farms on wildlife and biodiversity**

Solar farms can protect habitats and biodiversity

<https://environmentamerica.org/center/articles/solar-farms-can-protect-habitats-and-biodiversity/>

Wildlife Friendly Solar Energy

<https://www.fws.gov/project/wildlife-friendly-solar-energy>

## **3. Agrivoltaics, Ecovoltaics, Installation and Management of Solar Arrays**

In the last couple of years, the fields of "agrivoltaics" (the combination of agriculture and solar PV) and "ecovoltaics" (co-prioritizing ecological function/ecosystem services with solar PV) have grown dramatically, with a plethora of new research characterizing potential benefits from these "dual-use" systems.

Particularly in arid climates, there's research showing that the PV modules can maintain higher soil moisture and offer physiological benefits to plants through relieving heat stress. There's evidence of the potential to increase crop yield (in agricultural systems) and increase grassland productivity while extending the growing season and forage quality.

The installation and management of the array can have a significant impact on the ecological outcome. Low-impact installation practices, including maintaining vegetative cover throughout construction, minimizing grading, and limiting the amount of driving of heavy machinery as much as possible can significantly reduce ecosystem degradation and set the site up for greater success with the integration of solar PV.

Sturchio, Matthew A., and Alan K. Knapp. "Ecovoltaic Principles for a More Sustainable, Ecologically Informed Solar Energy Future." *Nature Ecology & Evolution*, August 10, 2023, 1–4. <https://doi.org/10.1038/s41559-023-02174-x>. - this is a nice overview of the idea of ecovoltaics and some of the potential benefits/considerations.

Barron-Gafford, Greg A., Mitchell A. Pavao-Zuckerman, Rebecca L. Minor, Leland F. Sutter, Isaiah Barnett-Moreno, Daniel T. Blackett, Moses Thompson, et al. "Agrivoltaics Provide Mutual Benefits across the Food–Energy–Water Nexus in Drylands." *Nature Sustainability* 2, no. 9 (September 2019): 848–55. <https://doi.org/10.1038/s41893-019-0364-5>. - This is a great paper on the potential food-energy-water benefits of these systems. While it's in a cropping system, the temperature and water benefits could be translated to more of an ecovoltaics system.

Knapp, Alan K., and Matthew A. Sturchio. "Ecovoltaics in an Increasingly Water-Limited World: An Ecological Perspective." *One Earth* 7, no. 10 (October 18, 2024): 1705–12. <https://doi.org/10.1016/j.oneear.2024.09.003>. - This is a really helpful overview of the potential benefits/synergies of solar PV from an ecophysiology point of view, with an emphasis on water-limited systems which is very appropriate here!

Ecovoltaics in an increasingly water-limited world: An ecological perspective

[https://www.cell.com/one-earth/fulltext/S2590-3322\(24\)00433-0?returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2590332224004330%3Fshowall%3Dtrue](https://www.cell.com/one-earth/fulltext/S2590-3322(24)00433-0?returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2590332224004330%3Fshowall%3Dtrue)

A new paper just came out in the last few weeks that looks specifically at benefits during droughts. <https://newsmediarelations.colostate.edu/2025/06/02/research-shows-how-solar-arrays-can-aid-grasslands-during-drought/>

#### **4. Power lines**

A warming planet means more energy in our atmosphere. That means greater intensity of storms, more localized intense rainfall events, and higher temperatures. Sagging power

lines or arcing of the conductors can cause fires. Fires are a part of our natural environment, and a century of fire prevention combined with greater demand on our power lines means greater risk of power lines starting fires. PNM has a policy of notifying communities when these events are anticipated that will potentially result in power outages. **When the power goes out, most business cannot conduct business.** The AES project will be the County's closest power source when either of the two 115KV lines serving the City cannot supply power.

PNM policy on **power outages**, **Public Safety Power Shutoff (PSPS)**:  
<https://www.pnm.com/wildfire-safety>

### **Power line infrastructure** serving Santa Fe County

(these links work better with google chrome)

Two 115KV lines, one north, one south. Both feed Richards (aka Zia) substation:

<https://openinframap.org/#11.95/35.64793/-105.99002>

Local lines and 115KV feeders:

<https://resilience.climate.gov/datasets/d4090758322c4d32a4cd002ffaa0aa12/explore?location=35.626952%2C-105.993677%2C13.00>

### **How do power lines work?**

High voltage isn't the only design challenge associated with electric transmission lines. Just selection of the conductors alone is a careful balancing act of strength, resistance, and other factors. Transmission lines are so long that even a tiny change in the conductor size or material can have a major impact on the overall cost. Conductors are rated by how much current they can pass for a given rise in temperature. These **lines can get very hot and sag during peak electricity demands**, which can cause problems if tree branches are too close. **Wind can also affect the conductors, causing oscillations** that lead to damage or failure of the material.

<https://practical.engineering/blog/2019/9/24/how-do-electric-transmission-lines-work>

## **5. Renewable Portfolio Standard**

PRC July 2024 Report to Legislature on RPS.

PNM has communicated a need for about 2,000 MW in the 2024-30 period and between 5,400 MW and 8,700 MW through the end of its 20-year planning horizon in 2042 (page 8 of attached report). The AES project can provide 96 MW Solar + 48 MW battery energy storage of this need, but Santa Fe County and the PNM service area will need many more projects of similar or larger size to meet the State of New Mexico's Energy Transition Act deadlines. Document attached "PRC Report to Leg on Ren Portfolio Standard 2024."

**6. Santa Fe County Sustainable Land Development Code, Chapter 8: Zoning**

The definition of the **Rural Fringe Zoning** in Santa Fe County states that this zoning district **accommodates** primarily large lot residential, eco-tourism, equestrian uses and **renewable resource-based activities**, seeking a balance between conservation, environmental protection and reasonable opportunity for development (page 6). Document attached “Santa Fe County SLDC Chapter 8 Zoning.pdf”