



PRE-APPLICATION NEIGHBORHOOD MEETING SUMMARY

RANCHO VIEJO SOLAR PROJECT
SANTA FE COUNTY, NEW MEXICO

AUGUST 2024

PREPARED FOR

**Board of County Commissioners,
Santa Fe County**

PREPARED BY

SWCA Environmental Consultants

PRE-APPLICATION NEIGHBORHOOD MEETING SUMMARY
RANCHO VIEJO SOLAR PROJECT
SANTA FE COUNTY, NEW MEXICO

Prepared for

Board of County Commissioners, Santa Fe County
100 Catron Street
Santa Fe, New Mexico 87501

Prepared by

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SWCA Project No. 71537.012

August 2024

INTRODUCTION

The following pre-application neighborhood meeting summary provides a synopsis of the August 22, 2024 public meeting, including input received, for the Rancho Viejo Solar Project in Santa Fe County, New Mexico.

PUBLIC INVOLVEMENT PROCESS

To provide notice of the meeting, letter notices were sent via first class mail on August 5, 2024, to all landowners within a 500-foot buffer around the land parcel to be leased for the proposed project and the Registered Organizations and Community Organizations identified by Santa Fe County. AES also created a web page with a comment form and email address dedicated to Rancho Viejo Solar Project questions. The notice letter included the web page address. Public meeting notices are shown in Appendix A. Additionally, AES staff appeared on both the Richard Eeds show on Talk 1260 & 103.7 KTRC on Wednesday, August 21, 2024 and KSWV 810 & 99.9 on August 22, 2024 to discuss the project and invite the greater public to the community meeting. AES also directly informed the leadership of the Clean Energy Coalition of Santa Fe County and invited them and their membership via email on August 6, 2024. The project website provided a brief project description, a project map, a comment submission field, and contact information for the project team. AES posted the meeting notification on the project webpage with a link to register for the live stream.

The public pre-application neighborhood meeting was held on August 22, 2024, from 5:00 p.m. to 7:00 p.m. at the Santa Fe Community College's Jemez Meeting Room. One hundred and forty members of the public attended the meeting, in addition to AES and SWCA representatives. Documentation of public meeting attendance is provided in Appendix B. The meeting began with a 45-minute presentation to discuss the project's location, equipment specifications, resource studies, county conditional use permit application process, project schedule, economic and environmental benefits. After the presentation, comments and questions were solicited from the attendees. The question-and-answer period lasted for two hours. The meeting was live streamed via Microsoft Teams. A video recording of the meeting will be made available on the website, along with a pdf of the presentation slides.

COMMENTS

All questions and comments that were submitted to the project team are included in Appendix C. Review and analysis of the comments received indicate that the public input falls under six general themes: 1) fire risk, 2) power purchase agreement, 3) infrastructure/technology, 4) conditional use permit application process, 5) environmental impacts and 6) insurance, property values and funding. The following paraphrased comment summaries reflect the questions and comments received prior to and during the neighborhood meeting and subsequent comment period.

Questions/comments concerning fire risk:

- *Use of outdated fire risk map*
- *Fires caused by other AES facilities*
- *Emergency evacuation routes; emergency response protocols*
- *There are high winds year-round here*
- *Santa Fe County- lack of EMP or HazMat Plan*
- *Release of toxic materials from materials burning or fire suppression*
- *Hazards haven't been well explained*

- *Lithium-ion batteries are unsafe*
- *Proximity to residences*
- *Risk of explosions, flying sparks, smoke*
- *Insufficient water storage for fire suppression*
- *Risk from overhead transmission lines*
- *AES's safety record*

Questions/comments concerning power purchase agreement:

- *Agreement process with PNM*
- *Where will electricity go?*
- *How many homes will be powered by this project?*
- *Why not put panels on homes instead?*

Questions/comments concerning infrastructure/technology:

- *Schedule of infrastructure replacement/upgrades*
- *Required testing and certifications*
- *Proximity to homes, community objections and effects thereof*

Questions/comments concerning the county's conditional use permit application process:

- *Should be a collaborative process*
- *County should be more rigorous during review*
- *AES should provide third-party information on the project website*

Questions concerning the project's environmental impact:

- *Project will contaminate and squander limited water resources*
- *Fossil fuels are used to construct project infrastructure*
- *Wildlife disruption and mortality*
- *Hazards from proximity to fire, dust, chemicals*
- *Background noise generated by the project*
- *Use of herbicides*
- *Decommissioning procedures*
- *BESS as a part of the energy transition*

Questions concerning insurance and property values, funding:

- *Cost of insurance will go up*
- *Project will lower nearby property values*
- *Has AES considered other sites*
- *Use of industrial revenue bonds, AES insurance*
- *Effects on the salability of homes*
- *Intended use of land purchased but not utilized by AES*

APPENDIX A

Meeting Notice

Screenshot of meeting announcement from AES project website, available at <https://www.aes.com/new-mexico/project/rancho-viejo-solar>.

Project updates



Rancho Viejo Solar Pre-Application Neighborhood Meeting

AES is hosting a pre-application neighborhood meeting to share the latest information about the project, answer questions and receive feedback.

Details

Thursday, August 22, 2024
5:00 PM-7:00 PM
Santa Fe Community College
Jemez Rooms
6401 Richards Ave.
Santa Fe, NM 87508

To view the live meeting online, [click here to register](#)



Letter notices sent via first class mail on Monday, August 5th, 2024 to 11 community organizations' addresses provided by the Santa Fe County Technical Advisory County and residences within 500 feet of the proposed site's land parcels, for a total of 339 recipients.

August 5, 2024

Re: Rancho Viejo Solar Project – Pre-Application Neighborhood Meeting

This letter is to invite you to a pre-application neighborhood meeting for the Rancho Viejo Solar Project. The meeting is being held by AES representatives to share the latest information about the project, answer questions, and receive feedback. All interested parties are invited to attend. The meeting details are as follows:

Date: August 22, 2024

Time: 5:00 pm to 7:00 pm

Location:

Santa Fe Community College
Jemez Rooms
6401 Richards Ave
Santa Fe, NM 87508

Rancho Viejo Solar, LLC (AES) is proposing to build the Rancho Viejo Solar Project on private land in Santa Fe County, New Mexico. The project would be located approximately three miles south of Santa Fe city limits and approximately 4.2 miles east of La Cienega, located in Sections 2-9, Township 15 North, Range 9 East (see map on page 2). AES is applying to Santa Fe County for a conditional use permit (CUP) under the county's Sustainable Land Development Code. The land is currently undeveloped and is zoned as Rural Fringe, Mixed Use and Planned Development District. The County Planning Commission is responsible for reviewing and approving the CUP application.

The project has been developed to support New Mexico's clean energy transition and would help fulfill the State's Renewable Portfolio Standard (RPS) goals of achieving 50% renewable energy by 2030 and 100% carbon-free energy by 2045 for investor-owned utilities, as codified by the 2019 Energy Transition Act. By pairing solar with battery storage, the project will be able to store clean energy captured from the sun during the day and discharge that energy when it is needed most, often in the evenings after the sun has set, as well as offer ancillary services such as frequency regulation, voltage support, and power smoothing to enhance grid resiliency. The project is estimated to generate enough clean energy to power more than 30,000 homes in Santa Fe and New Mexico annually, and would benefit PNM ratepayers with a market-competitive and low fixed-cost source of renewable energy for decades.

The project would consist of (a) an up to 96-megawatt (MW) alternating current (AC) utility-scale solar energy system on 680 acres; (b) an approximately 1-acre onsite collector substation; (c) an up to 48-MW, 4-hour (192 MWh) nameplate battery energy storage system (BESS) on 2.3 acres; (d) a 115 kV gen-tie line that will transmit the electrical power generated to a new PNM "line-tap" switchyard at their existing 115 kV transmission line; (e) communications infrastructure including fiber optic cable; (f) civil infrastructure including driveways, an operations building, water storage, drainage management, and fencing. The perimeter of the solar PV facility (including the onsite collector substation and the BESS) will be enclosed by a fence with controlled access.

At their highest point, the top edges of the PV panels will be up to 8 feet above ground level depending on spot topography based on current design. The transmission structures will be single-circuit and will either be H-Frame up to 50 feet in height with spans ranging between 250 to 350 feet or monopole up to

70 feet in height with spans ranging between 250 and 450 feet. A 20-foot-wide gravel surfaced or compacted native soil access road would be constructed from State Road 14 to the project site.

To contact the county regarding this application, call the Planning Office at (505) 995-2717.

Sincerely,

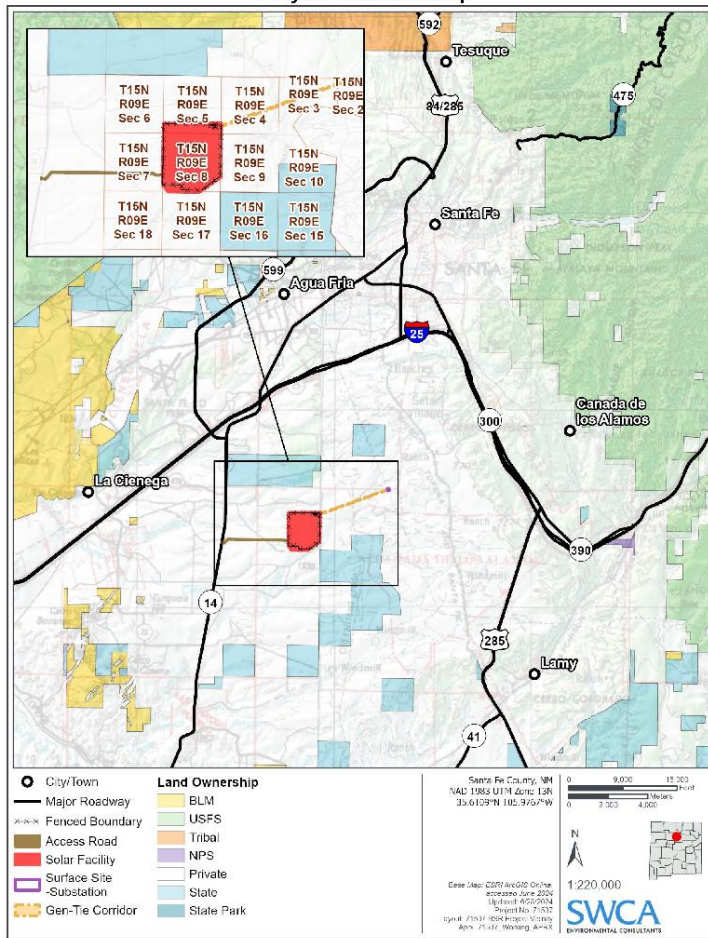
AES Rancho Viejo Solar Project Team

Email: ranchoviejosolar@aes.com

Phone: 505-490-4935

Website: www.aes.com/rancho-viejo-solar

Project Location Map



APPENDIX B

Public Meeting Sign-In Sheets

Pre-Application Neighborhood Meeting – Sign-In Sheet

Rancho Viejo Solar Project
 August 22, 2024
 5:00 PM - 7:00 PM

Santa Fe Community College
 Jemez Rooms
 6401 Richards Ave
 Santa Fe, NM 87508

Name	Phone	Email	Mailing Address
Judy L. Walker	908.627.1495	judywalker87508@gmail	2 Altura Rd. SF, NM 87508
Lee Zlotoff		lee@macgyver.com	53 CAMERADA RD 87508
Dayna Matlin		daynamatlin@gmail.com	53 Camerada Rd 87508
LICIANO EIKLEBOOM	-	-	22750 N Marquez Loop.
William H Jackson	505 660 9370	ayee crew@me.com	
Mary Lou Jackson	505-660-2242	mljackson42@mac.com	36 Alcalde Rd, Santa Fe, NM 87508
Allayne Scott	505 - 920 8261	allaynescott@gmail.com	41 Encantado Loop 87508
MICHAEL KNARR	303-929-4831	MICHAELKNARR@COMCAST.NET	47 ENCANTADO LOOP 87508
Randy Coleman	703-232-5050	rcoleman0@gmail.com	22 Fonda Rd 87508
Robert Foody	917.743.7894	robertfoody@yahoo.com	2 Pino Place 87508
Lloyd Jackson		Lloydjackson5@bellsouth.net	2 pino pl. 87508



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Name	Phone	Email	Mailing Address
Judy Cormier	505 469 1725	chueydala@hotmail.com	2 Oriente Ct, Santa Fe, 87508
Kara Young	505 660 0853	kara22@earthlink.net	71 Encantado Loop Santa Fe, NM 87508
Wolfgang Gersch	505 660 1269	Wolf23@earthlink.net	71 Encantado Loop Santa Fe, NM 87508
PAUL V. ROMERO	505-490-2877	—	19 Calle MALICA N Santa Fe, NM 87508
LISA TACKLEY	518-727-5774	ltackley@gmail.com	3 ABANICO Rd Santa Fe, NM 87508
PUNKIN CLAY STEPHENS	518-727-5774	PunkinClay@gmail.com	3 3 ABANICO RD SANTA FE NM 87508
DAN BAKER	505 603 8458	DAN@ENVIROKARMA.ORG	32 Cam. MARIQUITA 87508
MATTHEW MCQUEEN		mcqueenfornm@gmail.com	CALISTEO
Joel Yelich	505 474 6680	Joel.yelich@gmail.com	71 San Marcos Ln Santa Fe NM 87508
Valerie M	U	U	U



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Name	Phone	Email	Mailing Address
DOUG SPEER	505-819-3833	abspeer2@gmail.com	100 N. W. Puro Santa Fe, NM 87508



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Name	Phone	Email	Mailing Address
DEBRA LINK	505-466-4240	debolink@gmail.com	52 Encantado loop 87508
Dana Johnson		mountainandsunflower@gmail.com	
Chase Coalwell		chasec@duck.com	



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Name	Phone	Email	Mailing Address
Terry Reeden	213-999-6502	Terry R Reed@aol.com	XXXXXXXXXX
Abel Rubio	213-999-9158	Rubio12@aol.com	
ANN WHITE	707 614 4974	steppn999@proton.me	
Paul Laur			E Idonada



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Name	Phone	Email	Mailing Address
Maya Melody	505 466-4705	melomoy@comcast.net	89 Encantado Loop SF NM 87508



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Name	Phone	Email	Mailing Address
Yarvott Benz	917-270-5401	ymbenz@gmail.com	13 Ladera Rd., S.E 87508
Nancy Johnson	505-466-1982	njohnson@cybermesa.com	9 Avenida Casadel Oro 87508
Kaye Cooper-Mead		Kaye@Coopmead.com	
Warren Thompson	505-577-2744	warrenthompson@mac.com	5 W Saddleback Oaks
Thomas TREZONA	505-204-8336	gerintrey@aol.com	138 SAN MARCOS Loop
GERI TREZONA	505-470-5904	" "	" "
Howard DITTMER	847-612-5198	hdittmer@mac.com	111 COLINAS DEL SOL LAMY, NM 87540
Paul Pedersen	505 920 0841	pedersen@Paul@gmail.com	8 Floresta Dr SANTA FE 87508
Robert Barney	410-245-9295	rbjpl08@verizon.net	134 Mejor Lado, S.F. 87508
Mary Watts	469-879-3061	marywattsrn@aol.com	31 Estambre Rd 87508
Nancy Jay	505.471.7061	joenancy209@gmail.com	209 Rancho Alegre Rd 87508



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Name	Phone	Email	Mailing Address
Richard Hall	720.471.9727	rhall-1275@msn.com	5 Covestoga Tr 87508
Robert & Rita Cisneros	805-750-9116	qz-rhino@verizon.net	161 SAN Marcos Loop. SF.
Debra & Butch Martin	(505) 930-6002	butch@butchmartin.com	85 Alteza / 20 Avenida Azul
Mary Stauffer	(303) 941-3756	mestauffer@yahoo.com	3 Buen Pastor, SF 87508
CAROLINE V. STEEN	(720) 252-2100	CAROLINE.UANSTEEN@EXP REALTY.COM	
Carol Colver	505 466-2251	Carol.Colver@gmail.com	12 Mariano Rd SF 87508
Joshua Thomas / Santa Fe County SO	505 948 9688	Joshluke1331@gmail.com	31 Estambre Road SF NM 87508
Bradley Watts	469 358 6851	bradley.watts8@icloud.com	
Margaret Marti	505.795-9960	mmarti505@gmail.com	Dos Lobos Loop
Dennis KURTZ		dennis.kurtz@gmail.com	42 SAN MARCOS Rd W. SANTA FE, NM 87508
Bill Brancard		bill.brancard@gmail.com	91 E. Chili Line Rd SF 87508



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Name	Phone	Email	Mailing Address
Claudia Nelson	979-422-6777	claudia_nelson@tamu.edu	22 Encantado Loop 87508
Julie Parcells Barney	410-245-1342	jparcells@verizon.net	134 Mejer Lado 87508
Michael Clark	505 920 3131	mclark@santafe@gmail.com	3 Guadalupe Rd. SF NM 87508
Cleet Snyder	707-545-2020	cleet@northbay-cpa.com	16 Ladera Rd S.F 87508
Miles Standish	505 920 0875	smiles24k@gmail	65 Camerada Loop SF 87508
Susan Gordon		sosangordom@earthlink.net	6 Eagle Peak SF 87508
Jill Cliburn	505 496 3070	jkcliburn@cliburnenergy.com	45 Crazy Rabbit Dr 08
PABLO VENGOECHEA	917 526 0196	p-emilio.v@gmail.com	15 Evedo Rd
MARTA VENGOECHEA	" "	marta.lorres.v@gmail.com	" "
Ruby Diane Fischer	512-619 0527		15 Antigua Rd
Luc Garfitt	505.577.2007	we.sell.santafe@comcast.net	4 abasco Rd SF NM 87508



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Name	Phone	Email	Mailing Address
RICK BARRON		3RICKB@GMAIL.COM	
Phyllis Turner	—	Zoeyclue@aol.com	— (EL DORADO)
Tom SANSON	—	SANSON01@GMAIL.COM	48 CAMERON RD.
Greg Marshall	—	phototwist@yahoo.com	85 Herrada Rd
Adair Seldon	—	adair@adseldon.com	
SKYE RIVERS	—	—	—
Ashley Schannauer	—	Schannauer@comcast.net	El Dorado 12 Maricao Rd
Rosemary Greenlee	—	RUGREENLEE@gmail.com	Padrecode
Mallory Boylan	—	malloryboylan@gmail.com	11 Fortuna
Julian Spallholz	—	SPALLHOLZ@AOL.COM	"
Janet McVicker	—	jmcvicker@gmail.com	17 Vista Alondra



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Name	Phone	Email	Mailing Address
DEANNA RUNER	505-690-1263	GLRUNER@GMAIL.COM	P.O. BOX 4091, 87502
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ROBERT MAATK	816-520-0020		X
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Diane Silberstein	310/502-7472	DINLU@GMAIL	20 AZUL Loop 87508 SF
Steve Tomich	512/913-0665	STOMICH@ICLOUD.COM	3 Rando Rd SF 87508
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Sandra Nitschke	505 577 0260	thenits5@gmail.com	SF.
Dana Killen	817-919-5325	danakillen@yahoo.com	24 Lucero Rd Santa Fe NM 87508
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Name	Phone	Email	Mailing Address
James A. Olsen	505-501-2238	ICESCREAM@cybermesa.com	84 Verso Loop SF 87508
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douglaskoner-		dkonene.comcast.net	26 Parter Peak SF 87508



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Name	Phone	Email	Mailing Address
Hilary Young	512-699-7905	hyoung1019@gmail.com	96 Verano Loop, SF, NM 87508
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Denise Montgomery			
Allison Peacock		peacock.allison@gmail.com	
Mark Wame			35 Conlase RD Santa Fe, 87506
Shelley Warrick			
LYNETTE JENNINGS	970-250-8288	ljjenrshop@gmail.com	79 CAMERADA LOOP SF, 87508
Marlene Barnes	443-631-5382	mlnbnrs@gmail.co	45 Cam. Costudino 87508
Bill Barnes	443-631-5383	"	"
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Ron Greenbelt			108 Turquoise DRail CT. SF 87508



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Deborah Willford	505-670-7192	deborah@willsolnm.com	
m/m J.K. Lee	404 516-0287	jkeithlee@bellsouth.net	9 MIMOSA RD.
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Name	Phone	Email	Mailing Address
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Patricia Kettas	985 966 7319		71 CAMERADA ROAD 87508
Jacinta "	"		
Victoria Clark	505-920-9555	vsalemclark@comcast.net	3- Gualdo Rd SF NM 87508
Philip Musser	906-370-6817	pmusser306@gmail.com	10 Recado Rd, SF 87508
Heather Stroup	520-508-2341	blubx14@gmail.com	P.O. Box 539 Carrillos N.M 87010
Karen Rodney	505/577-0116	KAREN RODNEY@MAE.COM	4 GAVILAN PLACE, SF 87508
Andrew Rodney	505/577-0116	Andrew.Rodney@MAE.COM	4 GAVILAN PLACE, SF 87508
Dave Arnoth	310 740 2796	dave.arnoth@gmail.com	13 Bosque Loop SF 87508
Naomi Harrison	505-904-3565	ngarrison4@gmail.com	15 Ladera Rd SF 87508



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Name	Phone	Email	Mailing Address
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Anne Morey		amorey@tamu.edu	22 Encantado Loop SF NM 87508



APPENDIX C

Comments Received

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
Comments Received via Comment Form at Meeting				
1	N. Harrison	The placement in the midst of and adjacent to so many residential buildings is totally inappropriate. I am very in favor of solar and have my own ground array connected to the grid.	<i>*Not applicable for this set of comments.</i>	<p>Project siting is being completed in accordance with all applicable land use regulations and requirements.</p> <p>The BESS has been sited 1.5 miles from the nearest residence allowing for substantial buffer. AES supports all forms of solar energy, including residential units, however those grid-connected systems without battery storage backup still depend on the grid for energy (and the prevailing source of generation at the time, whether it be natural gas, coal, or wind) at nighttime. This project contributes to maximizing renewable energy generation to rate payers at all hours.</p>
2		Why use a 2014 map for low fire risk? Climate change has changed the risk.	-	The map shown is the Santa Fe County Wilderness Urban Interface Areas map dated June 6, 2023, with source data from U.S. Forest Service 2014 Landfire Mapping
3		If PNM is not interested in buying from AES can any state buy the electricity?	-	No. The Project will bid into the next PNM RFP and require a contract with them to build the project.
4	J. Cormier	How many fires (large scale) in the 10 years since operating?	-	<p>AES does not have this data, but presented a slide based on information tracked by the Electric Power Research Institute: https://storagewiki.epri.com/index.php/BESS_Failure_Incident_Database</p>
5		What will AES do to determine an emergency exit plan for the nearby communities?	-	<p>AES does not anticipate a need for community evacuation given installed technology, requirements for satisfying NFPA 855 code and UL certification for its equipment, as well as overall safety designed into the site plan and the 1.5-mile distance to the nearest residence from the BESS. AES has drafted a Pre-Incident Plan and First Responder Mitigation Guidelines and will continue to work with Santa Fe County and Fire Department to ensure appropriate plans are in place.</p>
6	K. Rodney	Does PNM have (currently) the infrastructure to utilize this project? If not, how long would it take PNM to upgrade their infrastructure?	-	Per the Interconnection Agreement for the project, estimated timeline for construction of PNM system upgrades is 24 months. All required PNM upgrades will be made in advance of project commercial operations.

August 2024 Public Meeting Summary
 Rancho Viejo Solar Project, Santa Fe County, New Mexico

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
7		Neighbors and general public should consider being collaborative and not 100% self-intent	-	No comment
8	M. Schneiden	AES should go the extra mile to ensure facility is constructed and operated using BEP)	-	AES team is uncertain as to what is being referenced by BEP.
9		County should be demanding and rigorous in their review and approval with conditions	-	No specific comment. AES supports the County in determining its appropriate review process and consideration of conditions upon approval.
10	R. Greenberg	Where exactly will the electricity go? How many homes will be potentially powered? Why not spend the money and resources to solarize all of the homes in the area instead?	-	Electricity generated by the facility will feed into the 115kV Zia – Valencia transmission line through which power flows into the Zia – Rodeo substation on Richards Ave. in Santa Fe, where high voltage energy will be stepped down to distribution level medium voltage for use on the local network within Santa Fe. Surplus energy beyond real-time demand at that substation will continue to support the rest of the PNM network.
11		Fire danger with no HAZMAT available in Santa Fe County, wind excessive almost year-round	-	Safety design features and required compliance with NFPA 855 and other fire codes, in addition to UL9540 certification listings, minimize risk of thermal runaway and fire escaping containment. Project is located in the area of lowest fire risk per County Fire Risk map. Moreover, the BESS is being installed within a graveled area with perimeter access roads serve as a fire break. Potential vegetation and rubbish and other external fire hazards are considered in the Hazard Mitigation Analysis.
12	D. Willford	Surrounding water contamination	-	A Stormwater Pollution Prevention Plan (SWPPP) would be prepared in compliance with the state's Construction General Permit, and Clean Water Act Section 402, National Pollutant Discharge Elimination System (NPDES). The SWPPP would identify best management practices (BMPs) to minimize potential impacts to surface and groundwater. Project does not otherwise contain operating equipment or operational fluids at risk of ground water contamination. Vast majority of all equipment is solid-state material, Lubricating oils for transformers will have self-containment basins.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
13		Fossil fuels used in construction of all materials used in production of panels, batteries, etc	-	Petroleum products are obviously used in many of the products comprising both the BESS and solar plants. If the concern is about global warming effects, it should be understood that the problem with fossil "fuels" is the part where you light them on fire. Using petroleum to manufacture plastics and other products becomes no different than mining and manufacturing using other extracted commodities from the earth. The problem arises from the combustion of the petroleum which is precisely why we instead construct renewable solar and battery plants which do not require combustion in their operation.
14	J. Kehos	If your energy systems are held to national safety standard, then why the fires and releases of mercury (as in Puerto Rico)?	-	There are different standards governing different assets, operations and jurisdictions. AES and the Rancho Viejo project will comply with all the latest, applicable fire codes and industry standards for battery energy storage installations, including NFPA 855 and UL 9540, to ensure the project is designed, built and operated with safety as the first priority. These standards help ensure that battery energy storage facilities are tested, certified and safe for operation on the electric grid. The Rancho Viejo project will also incorporate multilayered and redundant safety features, including advanced safety monitoring and fire suppression technology at the battery module level.
15		We moved to Eldorado for the quiet and proximity to wildlife. These units are not quiet and they disrupt wildlife.	-	The noise study indicates that once in operation the project will have a negligible effect on ambient noise levels beyond the immediate vicinity of the Project area. Environmental protection measures have been identified to minimize impacts to wildlife.
16		Each summer we have to ration the water in our wells. What are you going to do to not use our water?	-	The project will not use local well water. Water may be acquired from the following off-site sources, or a combination thereof: Santa Fe County bulk water station commercial pipe water; Ranchland Utility Company Class A reclaimed water; Santa Fe County reclaimed water; or any other legally permitted commercial water sales.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
17		PNM has not granted access to AES' storage facility, yet you say that they do	-	AES does not understand the question. AES has an Interconnection Agreement executed with PNM in February 2024 for cost and timeline of requisite system upgrades to enable the injection of power into the grid from the facility, but still needs to contract the energy and capacity to proceed to build the project. AES would work with PNM to grant access to facilities as needed, and per agreements.
18	S. Edmunson	What happens if our insurance goes up or if we are refused homeowner fire insurance due to the risk these batteries present?	-	AES is unaware of instances of insurance premiums being raised for residences within proximity to a solar and battery storage facility.
19	W. Gersch	The environmental danger and hazards have not been well explained. I do not feel safe or protected.	-	An Environmental Impact Report (EIR) was prepared as part of the CUP application, which evaluates potential environmental impacts and identifies environmental protection measures to avoid or minimize potential impacts.
20		The map AES sent doesn't show the communities impacted such as Eldorado and Rio Rancho.	-	Eldorado is approximately 1.5 miles from the proposed project, hence on some project maps, it may not appear in depictions showing project level detail.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
21		Lithium batteries are unsafe and can explode. Why can't the facility be built further away from populated communities?	-	<p>Safety design features and required compliance with NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, and other fire codes, in addition to UL9540 certification listings, minimize risk of thermal runaway and a potential fire escaping containment. Passive and active explosion control measures are implemented as required by NFPA 855.</p> <p>Lithium-ion batteries are currently deployed in 90% of global energy storage applications and are the most proven and reliable of current battery energy storage technologies. In 2023, an estimated 16 GW of BESS was operating in the USA, or 333x that of the capacity proposed for this project, and there will be nearly 30GW by the end of 2024, or 666x of that proposed for this project. Instances of thermal runaway are rare. Please see the EPRI failure incident database for relation of failures to deployed operating capacity.</p> <p>As far as AES team is aware of from available research, there have been no known incidents in which a BESS fire escaped containment and spread beyond a project property line. There has also not been a single death from a utility-scale battery energy storage facility in the USA.</p>
22	G. Karr	The impact to wildlife and residents from fire, dust, and chemicals	-	<p>An Environmental Impact Report (EIR) was prepared as part of the CUP application, which evaluates potential environmental impacts and identifies environmental protection measures to avoid or minimize potential impacts.</p>

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
23		Slow response times from the fire department	-	<p>AES will have on-site O&M staff during regular business hours for routine monitoring and maintenance of the facility and will have training and knowledge for appropriate response for any incidents at site. Each BESS container will have sensors to detect any change in acceptable operational parameters of equipment, and in most all scenarios would have advance indication of any pending malfunction of a battery cell or module. The Battery Management System and Program Logic Controller will first shut off current to any cell or module experiencing abnormal operational parameters.</p> <p>The Santa Fe County Fire Department is located 2.5 miles from the project entrance off Hwy 14.</p>
24		Lowering property values	-	Per the Appraisal reports provided as part of this CUP application, there is no anticipated impact to lowering of property values from this project.
25	D. Baker	Fire suppression and fire foam. Fire department training.	-	AES commits to initial and ongoing training for the FD. AES provides Emergency Response Plans (ERP), and First Responder Plans (FRP) along with training to the local fire department personnel. The fire alarm system design and equipment are compliant with NFPA 72 requirements.
26		WL testing required and IEEE certification	-	Correct. IEEE, NFPA, and UL.
27		Need for 4 hours of BESS to capture daytime solar surplus	-	No comment.
28	D. Johnson	Fire is the most significant concern	-	BESS fire incidents are rare occurrences and AES deploys a multi-layered safety system and project level approach to significantly minimize chance for thermal runaway and a fire escape from containment.
29	P. Laur	Has questions on the design and impact to insurance and property values	-	<p>Per the Appraisal reports provided as part of this CUP application, there is no anticipated impact to lowering of property values from this project.</p> <p>AES is unaware of instances of insurance premiums being raised for residences within proximity to a solar and battery storage facility.</p>

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
30	J. Cliburn	Are there unbiased sources of information on the project besides industry ACP?	-	AES suggests review of research from the Electric Power Research Institute. https://www.epri.com/ Santa Fe County will be contracting with an independent third-party reviewer for review of the project Hazard Mitigation Analysis.
31		Has concerns over fire planning for lithium fires	-	BESS fire incidents are rare occurrences and AES deploys a multi-layered safety system and project level approach to significantly minimize chance for thermal runaway and a fire escape from containment.
32	D. Gries	Impacts to limited water supply	-	Construction water use will be minimal, and will be primarily used to mitigate fugitive dust, There will be minimal long-term water use associated with operations and maintenance.
33		Impact to taxes	-	The proposed project will benefit State, County, and local institutions through collections in Gross Receipts and property tax.
34	D. Link	In the event of a battery spark and fire within the metal container, is there a risk of explosion if the container is not opened?	-	Design safety measures minimize the chance of explosion from a BESS container, but units are designed for low-probability scenarios of multi-layer failures. NFPA 855 requires compliance to either NFPA 68 or 69 by inclusion of passive (deflagration panels) and/or active (ventilation) explosion control systems which prevent a structural failure which could harm people in the immediate area.
35	M. Melody	Will gen-line poles require a road and keeping the area under the lines clear?	-	An unpaved two-track access road will be employed during pole installation and maintenance
36		How does 50' to 70' tall compare to height of structures already in the area?	-	Proposed structures are of comparable height to structures already in the area.
37	N. Peterson	This will make insurance unavailable or unaffordable for homeowners because of pollution and increased fire danger	-	The proposed project is an emissions-free facility resulting in no air pollution, nor significant operational waste.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
38		Lithium-ion batteries are not safe for people or the environment	-	<p>Lithium-ion batteries are an integral part of everyday modern life, ranging from such regular uses in cell phones, laptops, electronics, EV automobiles, residential home battery storage units, and now utility scale battery storage. While specific compositions and safety features fluctuate between the applied use, the utility scale battery storage space prioritizes safety and reliability and has fostered continuous review and improvement in applicable fire safety codes such as NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, and UL 9540 and 1973 certifications, among others, to ensure fire risk is minimized.</p> <p>Utilities, states, and countries the world over are deploying lithium-ion battery storage at record-breaking pace, and depend on the technology to support increasing renewable energy to the grid as it can both shift energy production to when demand is highest and ensure a more reliable grid through ancillary services.</p>
39		The company has a negative safety record.	-	<p>At AES, safety is at the core of everything we do. This core value underpins every aspect of the company's operations, with priority placed on the well-being of employees, contractors and the communities we serve. Our Safety Management System (SMS) is consistent with the OHSAS 18001/ISO 45001 Occupational Health and Safety Management System model and provides a consistent framework for safety management expectations that apply to all AES employees, as well as contractors working in AES facilities and construction projects.</p>
40	J. Romberg	The maximum noise from equipment has been compared to a vacuum cleaner. Has this been validated by qualified persons?	-	<p>The noise study indicates that once in operation the project will have a negligible effect on ambient noise levels beyond the immediate vicinity of the Project area.</p>

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
41		Have alternative sites been investigated?	-	<p>Alternative locations for the solar array were explored within the larger parcel. Specifically, partially siting the Project in Sections 5 and 6 was examined but dismissed due to biological resources constraints along the southern branch of Bonanza Creek and the north-facing slopes. Siting the Project in Sections 5 and 6 was also dismissed based on public feedback related to concerns of potential visual resources effects to residential areas located to the south. Locating the Project closer to State Road 14 was also considered but this potential location was eliminated because it is part of the Turquoise Trail National Scenic Byway. Access road locations were modified to avoid documented cultural resources</p> <p>In the initial evaluation of appropriate siting of such a facility in proximity to Santa Fe, no other 700+ acre contiguous tracts of land were deemed suitable and capable of contracting with the landowner(s).</p>
42	H. Dittmer	Concern over the battery system fires impact to water contamination	-	<p>BESS battery enclosures have an ingress protection (IP) rating of IP55, which will prevent fluids from leaking at low pressure. FK-5-1-12 fire suppression injection system will be applied inside the battery modules. FK-5-1-12 evaporates at ambient temperatures so does not have potential for ground water contamination. According to the first responders plan, water should not be applied directly to a burning BESS container. Water instead is applied to adjacent containers to provide evaporative cooling.</p>

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
43	C. Nelson	After the Arizona AES fire, I understand AES now proposes to weld the containers shut to prevent further injuries to first responders. That being the case, and with 3M having stopped producing the chemical formula used to put out these fires. How long do the containers burn? How much hydrogen cyanide and other harmful gases are emitted while the fire burns (per container)?	-	<p>This is not true. Containers will not be welded shut. Proper guidelines will be provided to First Responders as detailed in the First Responder Guidelines so as to protect their safety and provide instructions on how to respond to an event and ensure containment.</p> <p>The direct injection Thermal Runaway Protection System (TRPS) utilizes FK-5-1-12 clean agent which is commercially available. The clean agent system and levels are inspected annually in accordance with NFPA standards.</p> <p>Large-Scale fire testing indicates peak fire intensity occurs within two hours of forced ignition. Majority of external visible flames ceased after approximately 6 hours and all smoldering ceased after approx 24 hours.</p>
44	V. Clark	Santa Fe County currently has no Emergency Management Plan, no Hazardous Management Plan and no local Emergency Planning Committee (LEPC). Considering AES has a history of willingness to pay fines for environmental violations rather than compliance with safety and environmental regulations, are you expecting the County and citizens of the county to just take your word for it that the site is safe? For example, just a few days ago AES settled with the EPA for mercury poisoning and reporting violations in Puerto Rico. How is it possible for the county to consider the impacts and implications of this site to the health and welfare of the community without these resources?	-	<p>Project stakeholders and community residents can better understand the impacts of the Rancho Viejo project on the health and welfare of the community by reviewing the Environmental Impact Report prepared for the updated CUP application with the County, along with a host of other studies and reports, as well as emergency planning, conducted as part of the project development and design process. These studies and materials will be available for review as part of our updated CUP permit application on the County's website.</p>
45	A. Rodney	Can you provide any examples of a BESS fire escaping the facility and causing damage outside the facility?	-	<p>No. AES is not aware of any such instances.</p>
46	S. Garfitt	I have heard that PNM needs battery storage-how (secretly) involved are they with AES to move them forward?	-	<p>AES is not involved with PNM in any manner outside of proscribed regulatory processes related to interconnection studies agreements and participation in Requests for Proposals (RFPs) for commercial offers for energy and capacity. Selection for award and contract via an RFP is then subject to approval by the New Mexico Public Regulatory Commission.</p>

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
47	Not Provided	How will the weeds be managed? Will there be herbicides used?	-	Rancho Viejo developed and will implement a vegetation and noxious weed management plan for the control of noxious weeds and invasive species that could occur as a result of new surface disturbance activities at the site.

48 L. Graeser

- What is the current estimate of AES's investment in the project?
- Will the total investment be recorded as the basis for property tax purposes and as costs for gross receipt tax purposes?
 - Is AES planning to solicit an industrial revenue bond (IRB) from the county? If so, would AES purchase those bonds to create gross receipt tax and property tax abatements, or would the bonds be offered in the market?
 - If the IRB is granted, what amount of payment in lieu of taxes will AES offer the county?
 - Because the change of use from vacant rural-fringe with 20 acres per dwelling to conditionally permitted use where an income approach to commercial assessment is appropriate, will there be an increase in property taxes for the land, even if the equipment were owned by the County?
 - Overall, has AES increased its estimate of total taxes to be paid to the state, school district, community college and county changed from the previous \$7 million estimate?
 - Does AES plan to apply for an IRB? What percentage is this total IRB payment-in-lieu-of-taxes (PILT) to the sum of gross receipts taxes and property taxes that would be paid in the absence of IRB?
 - Can AES confirm the expected investment amount and what proportion would be recorded as the depreciable basis, to calculate taxes over the 35-year project duration?
 - Has AES included changes in the assessed value of the land in its tax calculations? Can AES clarify the current property tax assessment and whether they will increase or decrease?
 - NREL estimates that ongoing M&R costs average 10%. Would AES confirm that this is an appropriate percentage to use to calculate the annual GRT or comp tax to be paid?

- AES expects a total capital investment in excess of \$200M to build the Rancho Viejo Solar and Storage project.
- AES is consulting with appropriate legal counsel to evaluate and anticipate what appropriate tax considerations would be for pursuit of an Industrial Revenue Bond and applicable Gross Receipts Tax. The Industrial Revenue Bond application cannot be submitted to Santa Fe County until after an approval of the CUP, and hence final determinations of property tax payments to the County and other collecting tax entities will be subject to that process.
 - Yes, AES anticipates the former.
- The Industrial Revenue Bond application cannot be submitted to Santa Fe County until after an approval of the CUP, and hence final determinations of property tax payments to the County and other collecting tax entities will be subject to that process.
- AES is consulting with appropriate legal counsel to evaluate and anticipate what appropriate tax considerations would be for the project.
- Yes, AES' most recent estimate of total taxes now exceeds \$10 million. The Industrial Revenue Bond application cannot be submitted to Santa Fe County until after an approval of the CUP, and hence final determinations of property tax payments to the County and other collecting tax entities will be subject to that process.
 - Yes, it does. The Industrial Revenue Bond application cannot be submitted to Santa Fe County until after an approval of the CUP, and hence final determinations of property tax payments to the County and other collecting tax entities will be subject to that process.
- AES is consulting with appropriate legal counsel to evaluate and anticipate what appropriate tax considerations would be for pursuit of an Industrial Revenue Bond and applicable Gross Receipts Tax.
- AES is consulting with appropriate legal counsel to evaluate and anticipate what appropriate tax considerations would be for the project.
- AES is uncertain as to what is being referred to by M&R costs.

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#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
49	F. Holmes	They believe real estate values will decrease. I do not want it in the middle of three neighborhoods. I do not want statistics about flying [sparks?] and fires.	-	AES does not expect impacts to real estate values as a result of this project per the Appraisal study and memo performed for the project.
50	D. Johnson	How will you prevent sparks escaping during the fires at the facility?	-	Through multi-layered safety mechanisms of sensors, auto-shutoffs, direct-injection fire suppressant, fire-rated and partitioned containers, concrete pad and graveled surrounding to the BESS and a complete 20' graveled access road also to serve as a fire break.
51	M. Jackson	If there is an explosion or a fire, is there smoke? Is it toxic? Are the residents evacuated for the duration of the fire? How long until residents can return? Is there residue from the smoke that will settle on land and homes, leaching into the water supply?	-	Yes, there can be smoke. . AES does not anticipate the need for evacuation from any potential event, but would defer to the discretion of the Santa Fe County Department on any action they deem appropriate.
52	P. Romero	Why would AES put a large-scale solar power plant near several residential subdivisions? Why not find a more remote location not near (20 miles) to so many residents? There are plenty of remote areas in New Mexico, Arizona, Utah, Wyoming, etc.	-	As an emissions-free renewable energy power plant, such facilities can be safely and appropriately sited near load centers such as cities. With a 1.5 mile distance between the BESS and the nearest residence, appropriate setback is in place. Additionally, many homes already install solar panels on their roofs and there is growing adoption of residential energy storage batteries, as well, however not every home owner can afford such a system, nor may their roof be suitable due to age or shade. One of the primary challenges to renewable energy deployment is the congestion in the transmission network. As such, siting projects closer to where the demand for electricity exists helps alleviate that hurdle.
53	Not Provided	I have concerns [about] my homeowners insurance will increase or be cancelled.	-	AES is unaware of instances of insurance premiums being raised or canceled for residences within proximity to a solar and battery storage facility.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
54		High fire risk with batteries that can catch fire causing a release of chemicals and loss of wildlife.	-	Safety design features and required compliance with NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, and other fire codes, in addition to UL9540 certification listings, minimize risk of thermal runaway and fire escaping containment.
Comments Received Verbally during Meeting				
55	-	Will the fire marshal go back [to the site] and maintain compliance of fire systems?	Yes, there will be a process	Recurring testing and inspection of the NFPA 72 listed fire systems are required.
56	-	Will there be a community right to know process?	The emergency manager would manage this.	The project will be constructed and operated in accordance with all applicable regulations.
57	-	Who would go in [to the site to] fight fire inside?	Local fire [station personnel] will be inside the fence line, but they would stay a certain distance away.	Per our preliminary First Responder Guidelines, such personnel would maintain a distance of 150' from the subject BESS container experiencing an incident.
58	-	How many days will there be for the community to read the [county conditional use application] documents?	The first hearing officer meeting will be in November/December. The county has at least 30 days from submission to review the application. The county will post the documents after receipt as soon as possible.	-
59	-	Would the comments that were previously submitted be included?	They will be part of the application record.	-
60	-	If PNM doesn't buy the power, does the project get built?	<i>None offered.</i>	As there is no wholesale power market in New Mexico, PNM is the only available purchaser of output from this facility at this time.
61	-	The issue is safety because of proximity to the area. The wind can move sparks and fire can cross canyons.	For comparison and reference, according to the US Fire Administration, there were nearly 1,000 residential structure fires every day in the US, or more than 353,500 in total based on 2021 data, with 2,840 deaths, and 11,400 injuries.	BESS instances of fire are rare and multiple layers of safety mechanisms are incorporated into design to ensure containment in such an event. To the knowledge of the AES project team, there has not been a single death known to have occurred from a utility-scale battery storage facility incident in the country to-date, nor an incident known to have escaped containment from the project property.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
61	-	AES had two fires in Arizona in the past several years. There has been no investigation into what went wrong there. AES did not inform local firefighters that there was a BESS. We want an investigation.	Different technology was used in those scenarios. The warehouse design is different from what is being proposed for Rancho Viejo.	The battery incident in Surprise Arizona in April 2019, occurred at a battery storage facility developed and built by AES and operated by APS, the investor-owned utility serving the Phoenix area and other parts of Arizona. APS issued a report about the incident in July 2020 https://www.aps.com/-/media/APS/APSCOM-PDFs/About/Our-Company/Newsroom/McMickenFinalTechnicalReport.pdf?la=en&sc_lang=en&hash=5447FA391CD988DD24226FA485F81F23 . The investigation and root cause analysis into the BESS incident in Chandler, Arizona, is not complete yet.
62	-	I lived in Arizona at the time [of the fires], and some fire fighters got injured at the time.	No technology is perfect, and this design is different than the ones used at the time.	-
63	-	I am a power engineer. Two items: the compliance sounds like fire compliance; the lithium-ion cells have high failure rates. My concern is that the chemical PFAS would be in the fire prevention system.	There will be no chemicals that are a concern. No chemicals will leach out onto the ground.	-
64	-	Aboveground lines can cause fires.	Only the gen-tie line will be above ground.	High voltage gen-tie in desert environment does not pose elevated fire risk.
65	-	I know a bit about fires. Your equipment has been tested. Have any BESS containers that meet the current code burned?	We don't have that information. The modern containers do not have likelihood to burn.	-
66	-	Look into the wind at this site.	We do wind analysis and full-scale burn testing. We also do explosion testing.	-
67	-	How many of your models take tumbleweed into consideration?	We do take this into consideration.	Local vegetation and rubbish and other possible external sources of fuel are considered in the Hazard Mitigation Analysis.
68	-	I appreciate this presentation. If we lived in a wet place then we wouldn't be concerned. Do these things produce sparks?	They create heat upward. Sparks are produced internally. The sparks are within the container. There can be no flying debris.	-
69	-	What about the California fire that lasted three weeks?	If this is in reference to the incident at a BESS facility in San Diego County, that is a warehouse design, which is different from what is being proposed for Rancho Viejo.	-

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
70	-	I have lived near an existing gen-tie in the neighborhood. In California, companies are going to bury the lines. There are strong winds. Why not just bury the lines from the start? You should bury the gen-tie at the beginning. Please bury it. Lots of homes have insurance costs. I worry that it will cost more if the project causes a fire.	That is not generally a problem for transmission lines.	-
71	-			-
72	-	I live in Eldorado – there are strong winds in the area. How fast can the fire department get to our area if a fire starts? What about a battery that burns for days?	In coordination we will have four personnel on staff to provide onsite fire mitigating response. They will be onsite during regular working business hours. The fire marshal said they will be within 30 minutes. Technologies and sensors can report a fire within seconds. The BESS have multiple fail-safe features.	-
73	-	I own a house in Santa Fe and California. Will you pay our increased fire insurance?	<i>None offered.</i>	-
74	-	My main concern is wildlife. This is a bird and wildlife corridor. Wildlife, badgers and birds migrate through the area. Some of the fires have incinerated millions of billions of animals. I worry about fire growing through the area. What about mitigation, wildlife will be lost.	<i>None offered.</i>	An Environmental Impact Report (EIR) was prepared as part of the CUP application, which evaluates potential environmental impacts and identifies environmental protection measures to avoid or minimize potential impacts.
75	-	What would you do if you had to move? I like solar energy and we all want to be green. Maybe find a different place, a brown site, not a green space with thousands of people, putting us all in grave danger.	<i>None offered.</i>	-
76	-	What about wildlife? Mitigation is needed.	Biological resources surveys were completed. No threatened or endangered species or habitats. We will implement environmental protection measures. We will avoid prairie dogs and use wildlife friendly fencing on the perimeter of sites.	-
77	-	Would AES put some third-party sources on their website?	We can do that.	-

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
78	-	Have alternative sites been seriously investigated? Why this site?	<p>This is the best site in Santa Fe.</p> <p>Transmission lines are the problem. One solution is to site near a significant load center.</p> <p>It is difficult to find 680 acres under single ownership, flat land near a load center, and transmission lines.</p>	<p>Alternative locations for the solar array were explored within the larger parcel. Specifically, partially siting the Project in Sections 5 and 6 was examined but dismissed due to biological resources constraints along the southern branch of Bonanza Creek and the north-facing slopes. Siting the Project in Sections 5 and 6 was also dismissed based on public feedback related to concerns of potential visual resources effects to residential areas located to the south. Locating the Project closer to State Road 14 was also considered but this potential location was eliminated because it is part of the Turquoise Trail National Scenic Byway. Access road locations were modified to avoid documented cultural resources</p> <p>In the initial evaluation of appropriate siting of such a facility in proximity to Santa Fe, no other 700+ acre contiguous tracts of land were deemed suitable and capable of contracting with the landowner(s).</p>
79	-	Were there any other candidate sites? What about government lands?	We do evaluate state or BLM lands, though lots of times it is remote. We have looked at other areas, though this is the one in mind.	-
80	-	AES has a history of environmental problems. AES has been fined for mercury violations in Puerto Rico. Health and welfare in community should be considered.	AES is divesting itself of coal plants. The company is leading the transition to clean energy.	Additional information about AES' sustainability efforts can be found in the latest AES sustainability report at www.aes.com .
81	-	Will groundwater be used?	No.	-
82	-	Will access be from Highway 14 or Highway 285?	Highway 14.	-
83	-	Can the birds interpret the panels as the lake effect?	We have no previous experience with that effect on birds.	<p>Karl Kosciuch, a senior biologist with Western EcoSystems Technology Inc. (WEST), a company that provides environmental and statistical consulting services and contract research, and his colleagues evaluated the potential for a lake effect. Based on their study, limited evidence of attraction of aquatic habitat birds to the PV solar facility sites was found. In addition, they found no evidence of landing, circling or approaching. Reference: https://wildlife.org/tws2021-limited-evidence-birds-confuse-solar-panels-with-lakes/</p>

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#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
84	-	Will you consider using wildlife fencing?	Yes.	Wildlife friendly fencing is included in the project design.
85	-	Defenders of Wildlife would like to share wildlife fence guidelines.	Yes, please share.	-
86	-	There are lots of industrial revenue bonds. Is the IRB is essential to a competitive to the price?	We inquired with the county at industrial revenue bonds. The purpose is to plan for the property tax bond.	-
87	-	Do you need an IRB?	Yes, we need it.	-
88	-	Why has the RFP you submitted to PNM been turned down?	Not sure. Sometimes our bid does or doesn't work. Just because a bid is not selected doesn't mean it isn't competitive.	-
89	-	Regarding decommissioning, I'm interested to know what you do with the materials. Hopefully not put them in the local landfill.	We have arrangements with companies to decommission and recycle the components. Many battery recycler companies are ramping up; we will forecast the process at the time of project decision. The CUP requires a decommissioning plan.	-
90	-	Do you have other solar projects near homes? Are communities concerned?	Yes. Some are concerned, some are not.	-
91	-	How many of the projects did or didn't go through?	The majority get approved. We have adjusted the site due to community concerns.	-
92	-	The design has changed already. Will there be different technical refreshes up until 2063? Will the community be involved in that review?	All equipment will meet design standards.	-
93	-	How long will the contract with PNM be? How long will the equipment be in place?	20 years is the design life of the batteries. The solar components' design life is 35-40 years. We would contract with PNM for 30 years.	-
94	-	Will constituents have input?	The CUP can receive public input.	-
95	-	There is a cost of 200 million dollars to build this investment. How will you protect our property values? No one will want to move into the area or buy a home. The property value study on your website isn't comparable in this area.	We have done this review. The conclusion is that there is no measurable connection.	-
96	-	Realtors are not able to sell houses near these facilities. We worry about property values.	There is no impact that we can see.	-

August 2024 Public Meeting Summary
 Rancho Viejo Solar Project, Santa Fe County, New Mexico

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
97	-	I am the director of the New Mexico renewable energy group. This is the hottest summer in our time. The feds are doing their part. The state is doing their part. The energy transition act regulations so we have clean energy. We need a variety of projects and storage. We can use batteries for storage. I want to say that we are not here to endorse this project. The time is now.	None offered.	-
98	-	I'm a retired nurse with a career in health and safety. Is the fire and smoke toxic? What is the evacuation time? Will prevailing winds push smoke from site to the neighbors? Please look for and find a location that doesn't pose the same risks for the community.	The reality is that these things don't burn for days. The smoke is the same or less than a house fires.	-
99	-	I would like to see fire and explosion tests outside.	None offered.	-
100	-	My home is two miles away, please look for a different location.	Comment noted.	-
101	-	I am a resident from Eldorado. Given your deeply flawed proposal, the impacts and your project has galvanized [the community]. Do you understand we have significant concerns? How many AES projects have not got through?	We cannot provide this info. Perhaps one out of 10 move forward, but few get denied by CUP.	Projects may be canceled or denied for different reasons.
102	-	Eldorado resident: Santa Fe County has declined to get involved. AES and the county need to work together to figure out a strategic plan for solar in the area, not ill-advised projects in the community.	We will produce power without air pollutants.	-

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
103	-	Different sites are all different. The AES Seguro project is an example. This project is about money. Are you really trying to improve? [AES is a] toxic company, [creating] water and air toxicity. Coal ash in the community in Puerto Rico, for example. Lots of environmental violations, \$3.1 million for the Puerto Rico plant. Indiana plant pollutants. Your portfolio is not renewable. 30% coal, 30% gas, and now trying to do renewable energy. A 30,000 [gallon] water tank is not enough. The Otay Mesa fire used much more water. The 30,000 gallons is not enough. The natural resource report is substandard. Really poor report. Nesting season should be avoided. We don't want you here.	We cannot clear and grub during the nesting season. The power will be deployed to the nearby load, Santa Fe.	According to the latest AES sustainability report, AES' portfolio is 53% renewable, 27% gas, 18% coal, and 2% other. AES intends to exit the majority of coal by year-end 2025. AES is leading the transition to clean energy. Additional information about AES' sustainability efforts can be found at www.aes.com . Vegetation will be cleared outside the nesting season (March 15–September 15) where feasible to discourage birds from establishing nests in Project work areas. • To avoid impacts to nesting burrowing owls, preconstruction nesting surveys will be conducted up to 2 weeks beforehand to establish the occupancy status of any potentially suitable nesting burrows detected within the analysis area. Rancho Viejo will coordinate with NMDGF for the appropriate avoidance buffers and survey protocol.
104	-	How important is it to AES to have this project going?	<i>None offered.</i>	-
105	-	Your maps should have a scale.	We will look into that.	-
Comments Received after Meeting				
106		Will the BESS modules use lithium-iron phosphate chemistry or more conventional lithium - nickel-cobalt chemistry?	-	The current specification is to use a Li-Nickel Manganese Aluminum Oxide (NMA) battery chemistry.
107	L. Graeser	I am now quite confident that the revised design will meet or exceed all state, national and international fire codes and will be state of the art. The testimony that the project will be fully insured against fire risk and that insurance will be required to obtain financing for this \$200 million + project was compelling.	-	-
108		According to a statement by Josh Mayer, insurance is required to assure investors that their investments will be fully protected for the duration of the bond payments. I would like to know the value of insurance which will be provided and the portion of this risk that will be borne by AES as deductibles or percentage participation.	-	Insurance acquired for the project will be equal to the Fair Market Value (FMV) of the system. The further details requested will be considered for a response in future presentations or email follow up.

#	Name	Comment Received	Design Team Response during Meeting	Design Team Response after Meeting
109		<p>Josh Mayer confirmed that AES would apply for an industrial revenue bond for the Rancho Viejo Solar project. However, I have significant concerns that the county does not have sufficient expertise to negotiate a suitable payment-in-lieu-of-taxes (PILT), which AES will offer to the County with the IRB application and subsequent negotiation. I am quite accustomed to this calculation and offer to calculate this appropriate amount. It was apparent from Josh Mayer's answer to the IRB question and from the PowerPoint slide that listed the anticipated taxes that AES expects to pay over the 35-year life of the project that AES may have some misconceptions about the very nature of the state's gross receipt tax and the property tax as imposed on utility scale renewable projects when the project has been accepted as an IRB project by a sponsoring government entity.</p>	-	<p>AES is working with appropriate tax counsel to determine what reasonable amounts could be anticipated in effective property tax and gross receipts tax produced from this project. The Industrial Revenue Bond application cannot be submitted to Santa Fe County until after an approval of the CUP, and hence final determinations of property tax payments to the County and other collecting tax entities will be subject to that process.</p>
110		<p>Is there any plan or intent for the 800+ project acres or the full 8,358.48-acre tract to become a donor property for transfer of development rights (TDRs)?</p>	-	<p>The landowner is in fact considering transferring development rights on a substantial portion of the buffer acreage around the project; however that is a choice and process pursued at their discretion.</p>

APPENDIX D

Public Meeting Presentation Slides and Handouts

Rancho Viejo Solar + Storage Project



Accelerating Santa Fe's clean energy transition with locally-sourced, dispatchable solar power!

Pre-Application Neighborhood Meeting

August 22, 2024 presented by AES

115 MWdc / 96 MWac / 192 MWh
Solar + Battery Energy Storage System (BESS)

2 miles east of Hwy 14. Santa Fe County,
New Mexico

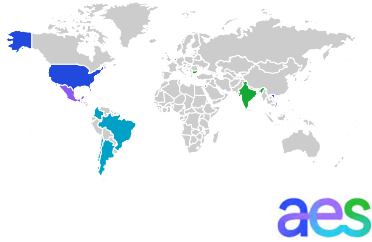


Presentation Agenda



- The AES Corporation / AES Clean Energy
- Project Location
- Project Overview
 - Updates for Revised CUP Application
 - Solar Photovoltaic Modules
 - Battery Storage Design and Safety
- Project Diligence
 - Visual Simulations
 - Noise Study
- Conditional Use Permit Process Overview
- Estimate Project Timeline
- Economic Benefits
- Environmental Benefits

The AES Corporation



34.9 GW

Gross MW in operation*

* 54% renewables

12.6 GW

Renewable generation under construction or with signed PPAs

\$12.7 billion

Total 2023 revenues

\$45 billion

Total assets owned & managed

4 Continents

13 Countries

4 Market-oriented strategic business units

6 Utility companies

22 million

Number of people served by energy we generate annually in countries where we operate

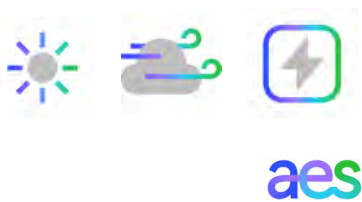
9,600 people

Our global workforce

Recognized for our commitment to sustainability



AES' US Renewables business overview



1,400+ People

550 Projects

26 States

7.2 GW

Operating clean energy resources

51 GW

Clean energy projects in development

FLUENCE
A Siemens and AES Company

Fluence Energy, our joint venture with Siemens, was recognized in 2023 as the #1 Global Provider of Battery-Based Storage Systems by S&P Global Commodity Insights, reflecting AES' global leadership in energy storage.

4

Recognized for our commitment to sustainability

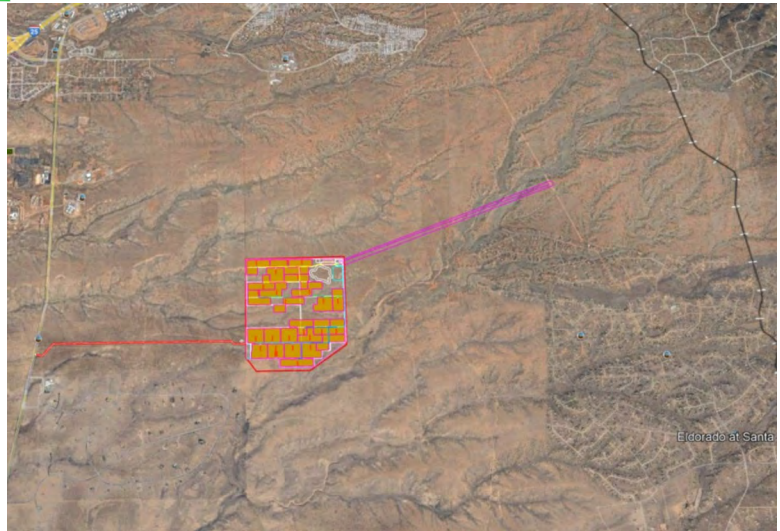


Bloomberg
NEW ENERGY FINANCE

We are proud to be recognized by BloombergNEF for the past three years as one of the top two Sellers of Clean Energy to Corporations Through PPAs, reflecting our leadership in co-creating innovative energy solutions with our partners.

Project Location - Summary

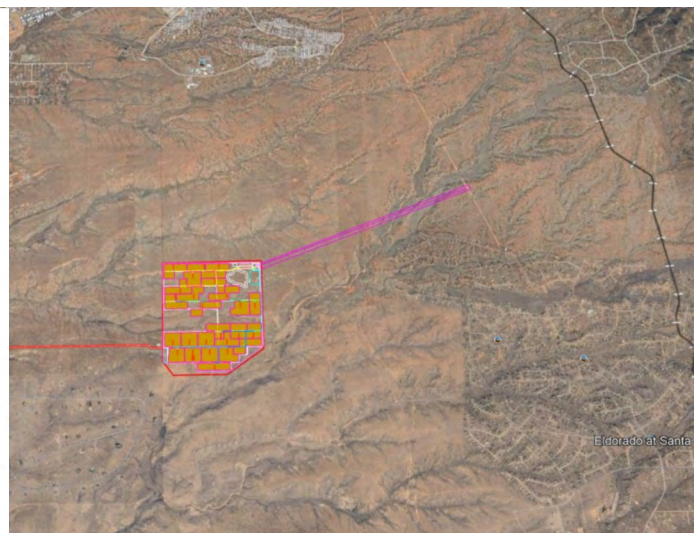
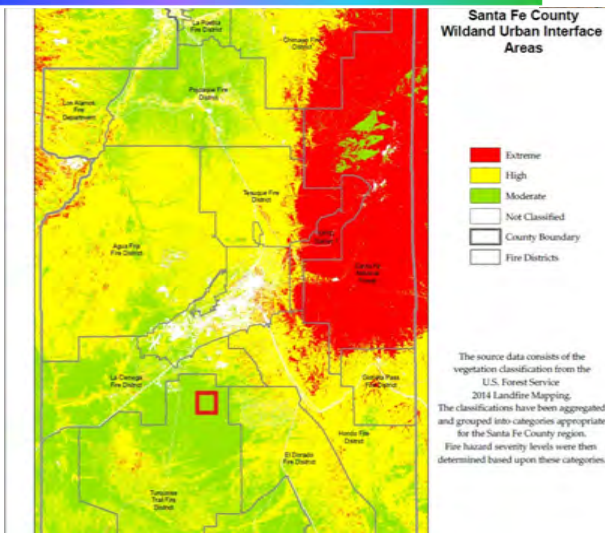
- 3 miles south from Santa Fe
- 2 miles east of Hwy 14
- 1.3-1.5 miles west of El Dorado neighborhood
- 1/3 mile from nearest residence in San Marcos
- BESS sited 1.5 miles from both San Marcos and El Dorado neighborhoods
- 680 fenced acres for project
- Located on private property, within a larger 8,225-acre tract providing substantial buffer between surroundings



5



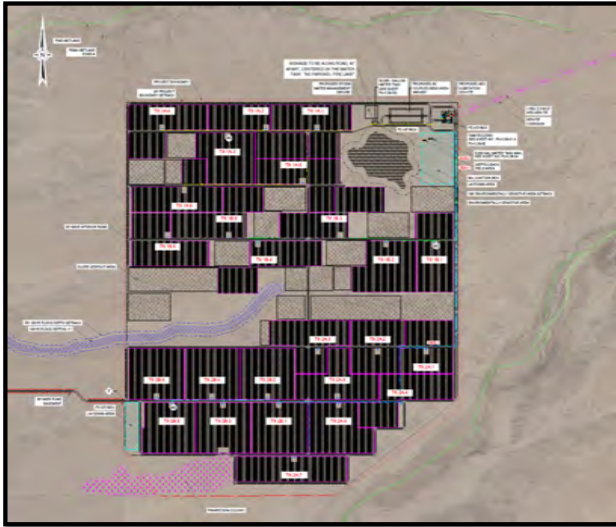
Project Location – Lowest Wildfire Risk



6



Project Overview



7

Technical Specifications

- 115 MW DC solar photovoltaic source
- 96 MW AC output
- 48 MW / 192 MWh battery storage (4 hours)

Utility-Scale Project

- Feed into PNM transmission grid
- 268 GWh of clean energy, equivalent of entire annual residential load of Santa Fe
- Fully power Santa Fe at times of max output
- 100% renewable energy goal by 2045

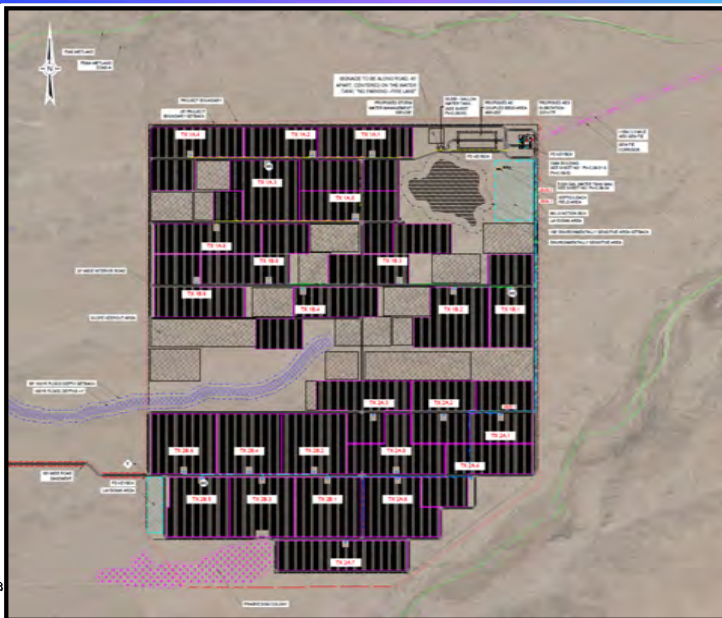
Temporary Use

- 35-year asset life
- Decommissioning and Restoration

Construction and Operation

- Year-long construction process
- Remote & on-site operation with limited site traffic
- Low impact - minimal noise, water, lighting

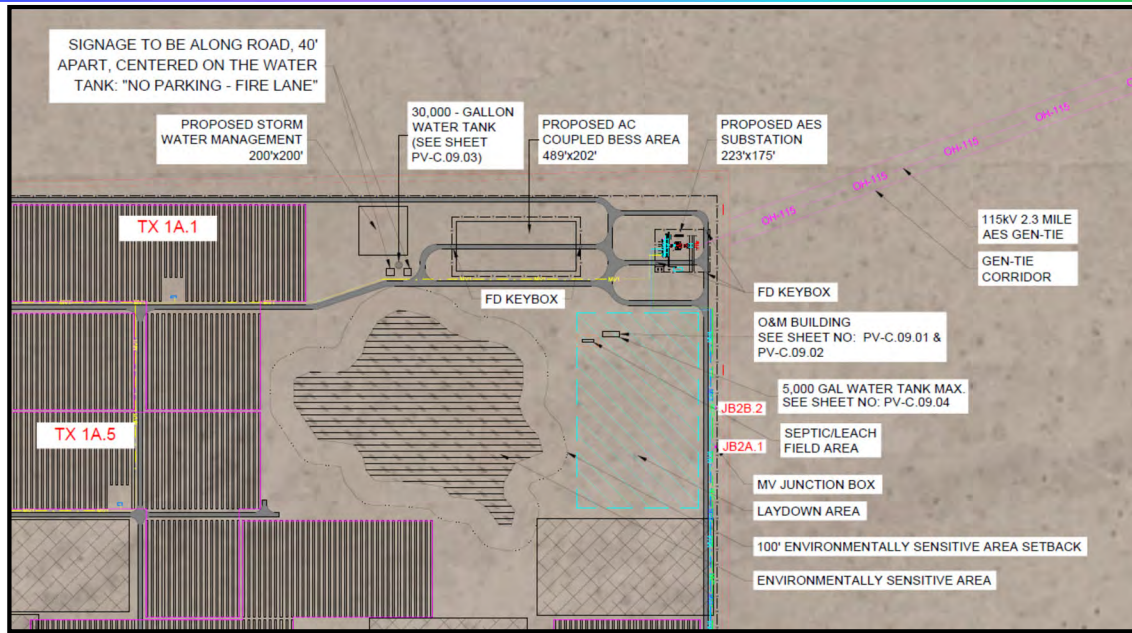
Project Overview – Site Plan Updates



8

- **Removed array north of San Marcos**
- **Max panel height reduced to 8'**
 - Previously specified 12'
- **Perimeter access road**
 - Consultation with SFCFD
- **Water storage tank – 30,000 gallon**
 - 2021 IFC Chapter 5, Fire Service Features, Section 507, Water Supply
- **O&M building – 1400 sq ft**
 - IFC Chapter 12, Energy Systems, Section 1207.1.6.1, Fire mitigation personnel.
- **Monopole vs. H-frame gen-tie**

Project Overview – Site Plan Updates



9

Project Overview - Solar Photovoltaic Modules



Structure Dimensions

- ~8' max height at full 52° tilt in early morning/late evening
- 5' 4" clearance at central rack and at flat tilt, or stow mode.
- 14' 6" aisles between modules / 22' post to post
- Currently specified with New Mexico-built racking & trackers
- Potential for sourcing New Mexico solar panels

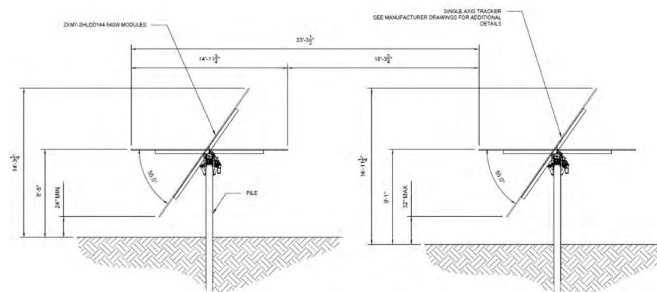


Image representative of tilt and function, clearances are not related to Rancho Viejo specifications

10

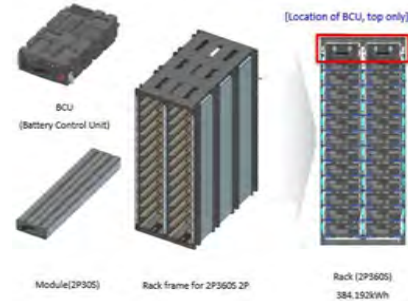
Project Overview - Battery Storage System



Table 4: E5S BESS System Specification Summary	
ESS System Manufacturer:	AES
ESS Model #:	AES Spec CEN-E5S
ESS Electrical Ratings:	8,068 kWh
ESS Max Voltage:	1494 Vdc
ESS Enclosure Dimensions:	40'-0" (L) x 8'-0" (W) x 9'-6" (H)
ESS Layout / Construction:	Non-Occupiable, Non-Walk-in, Non-Combustible 252 Modules per enclosure



Representative image from earlier containerized BESS solution



Project Overview - Battery Storage System

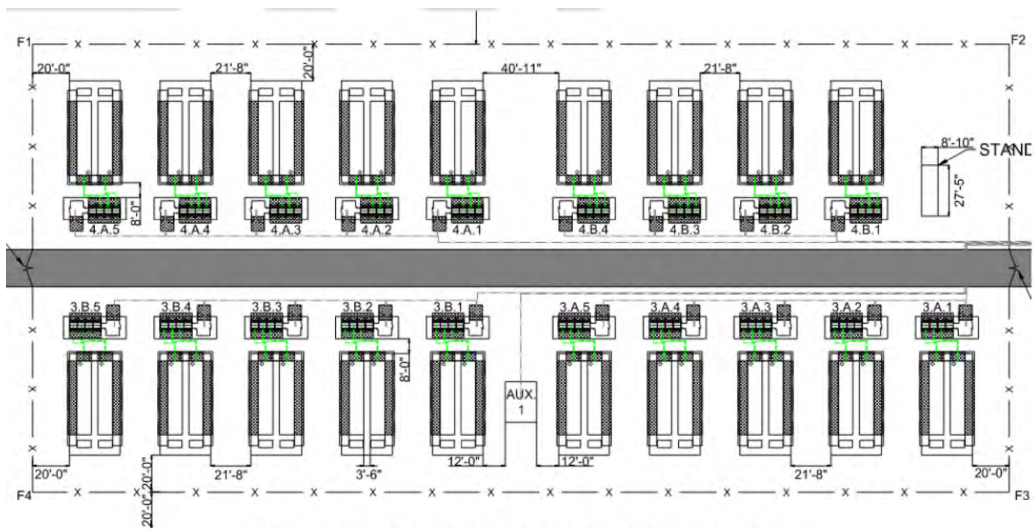


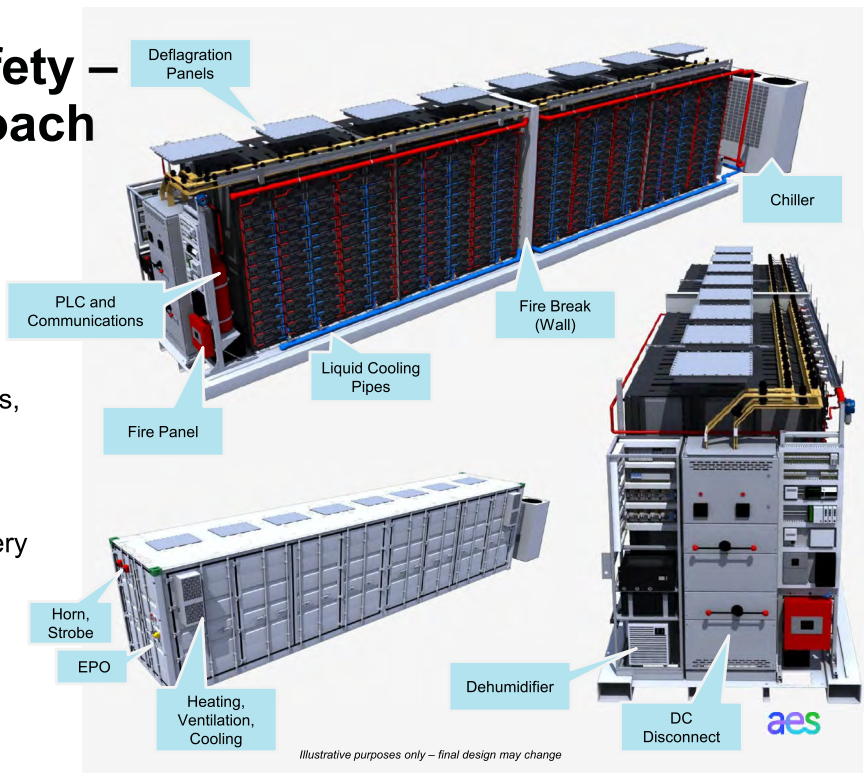
Figure 1 - Rancho Viejo BESS Site Plan



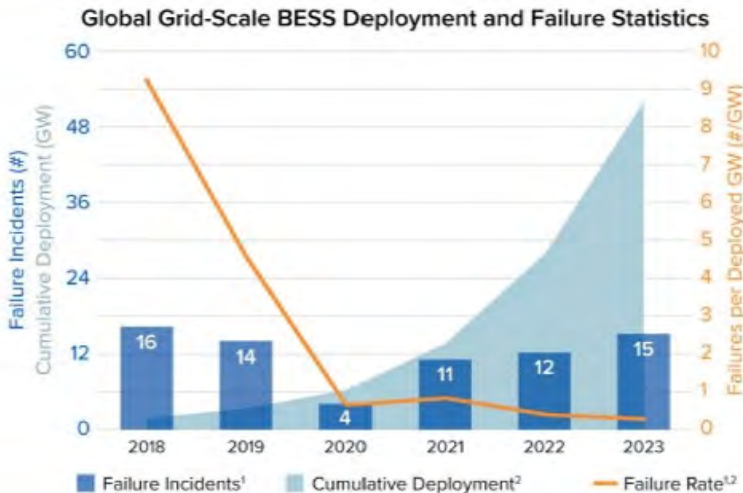
Battery Storage Safety – A Multi Layer Approach

- 40' shipping container design basis
- Up to 8 MWh per enclosure
- Liquid cooled with external chiller
- Direct injection fire suppressant at module level
- Active monitoring of air, coolant and cell temperatures, smoke, cell off-gas, voltage, and current. All tied to auto-shutdown, and alarm features
- NFPA 855, 68/69 compliant
- Isolated, fire rated partitions for battery and electrical compartments
- Factory-listed to UL9540 & UL1973
 - Test results indicate successful suppression of thermal runaway

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Battery Storage Safety – Incidents in Decline



Sources: (1) EPRI Failure Incident Database, (2) Wood Mackenzie. Data as of 12/31/23.

Figure 1. Global Grid-Scale BESS Deployment and Failure Statistics

- 2023 Installed BESS capacity globally: **+50 GW**
- 2023 Installed BESS capacity in USA: **16 GW**
- 2024 BESS capacity will double to **30 GW**
- AES is a **global leader in BESS**
 - Safety is AES' #1 priority and company value
 - Pioneer of technology for grid storage
 - Operator of BESS for more than 15 years
 - Over 850 MW of BESS in operation
 - Over 700 MW of BESS construction in 2024
 - Majority of AES' new renewable projects include battery storage



Battery Storage Safety – In Growing Demand



KVUE abc News Weather Sports VERIFY KVUE+
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ERCOT, experts credit renewables, battery storage with meeting near-record power demand

As temperatures soar, ERCOT credits new solar, wind and battery storage for helping meet the state's power demand.



In Texas, Batteries are Keeping the Lights On and Saving Residents Money



During times of both typical and extreme weather, battery storage systems are proving essential to the notoriously fossil-fuel reliant Texas grid. In one instance, when certain power plants were undergoing maintenance and temperatures rose into the night, two gigawatts of battery storage was deployed to the grid, narrowly avoiding potential brownouts for the 26 million Texas utility customers, while also reducing utility costs. Earlier this year, battery storage deployment at strategic times, during a wave of freezing temperatures, saved customers \$750 million by providing essential grid services and allowing power generated by gas power plants to meet customer demand, all without increasing prices.



15

Battery Storage Safety – In Growing Demand

≡ EAST BAY TIMES

Environment | 'A game changer': How giant batteries...



'A game changer': How giant batteries are making California's power grid stronger, and reducing the risk of blackouts during heat waves

The same batteries in cell phones are cranking out more electricity than nuclear power, allowing solar to be used at night

ENERGY NEWS NETWORK

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Study suggests a big role for grid battery storage as Illinois shuts its coal power plants

Transmission and renewables aren't being built quickly enough to allow fossil fuel plants to close by state deadline, experts argue. Storage appears to be the most realistic path, a new analysis finds.

by Kari Lydersen
August 22, 2024



16

Battery Storage Safety – In Growing Demand

Solar Batteries, Solar Energy Renewable Energy Australia, solar battery, solar battery storage, solar power

Solar Batteries to the Rescue: How Australia is Storing Solar Power to Meet Growing Demand



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New energy storage facilities in high demand

Klaus Deuse
02/18/2021

Wind and solar farms do not generate enough electricity at all times and in all weather conditions. Germany's energy transition hinges on the storage of power from renewables — and batteries come to the rescue.

17



Project Diligence

Site Studies Performed



- **ALTA and topographical survey**
- **Aquatic Resources Inventory Report** – gen-tie to span crossing of jurisdictional feature
- **Biological Survey Report** – no federal/state T&E species, prairie dog/burrowing owl avoided
- **Phase I Environmental Site Assessment** - no REC, CREC, & HREC
- **Hydrologic and Hydraulic Study** - minimal flood hazard for solar project development
- **Cultural Resources Pedestrian Survey** – sensitive resources avoided
- **Site Thresholds Analysis** – additional traffic impact studies are not warranted
- **Visual Impact Assessment** – would not unduly impair visual resources
- **Appraisal Solar Impact Study** – no anticipated impacts to values; Matched Pair Analysis done to Uniform Standards of Appraisal Practice by Appraisal Institute



18



Project Diligence

Site Studies Performed



- **Environmental Impact Report** – no significant resource issues
- **Noise Technical Report** – Operational noise would not be perceived by a human observer
- **Geotechnical Investigation Report** – Completed to inform project design
- **Decommissioning Plan** – Prepared in accordance with the 2021 IFC; Section 1207.2.3 of the Santa Fe Fire Code; and the applicable sections of the Santa Fe County SLDC
- **Preliminary Hazard Mitigation Analysis** – Prepared in accordance with NFPA 855, Standard for the Installation of Energy Storage Systems and IFC
- **First Responder Mitigation Guidelines** – Developed to provide BESS response guidance, emergency planning and training to first responders and AES BESS personnel and contractors
- **Pre-Incident Plan** – Identifies fire protection, fire alarm and safety systems, special conditions and hazards, and response and staging information



19

Visual Simulation – View from Hwy 14

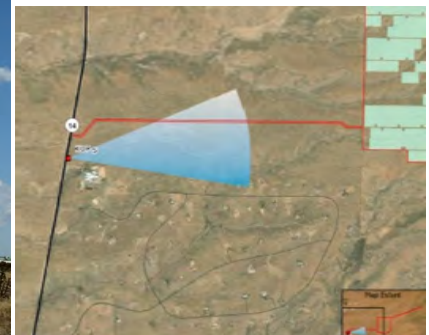
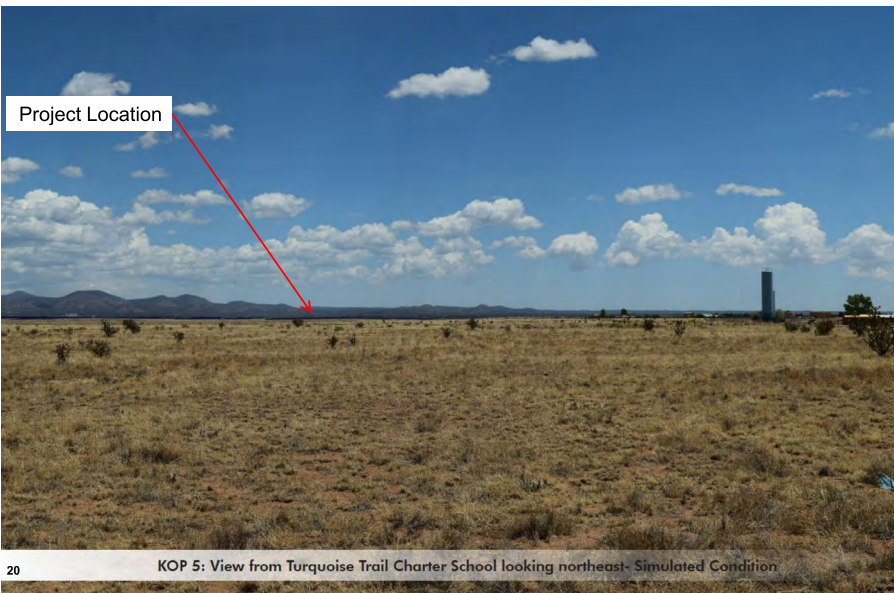


Photo capture location

20



Visual Simulation - Camerada Loop (H-Frame)

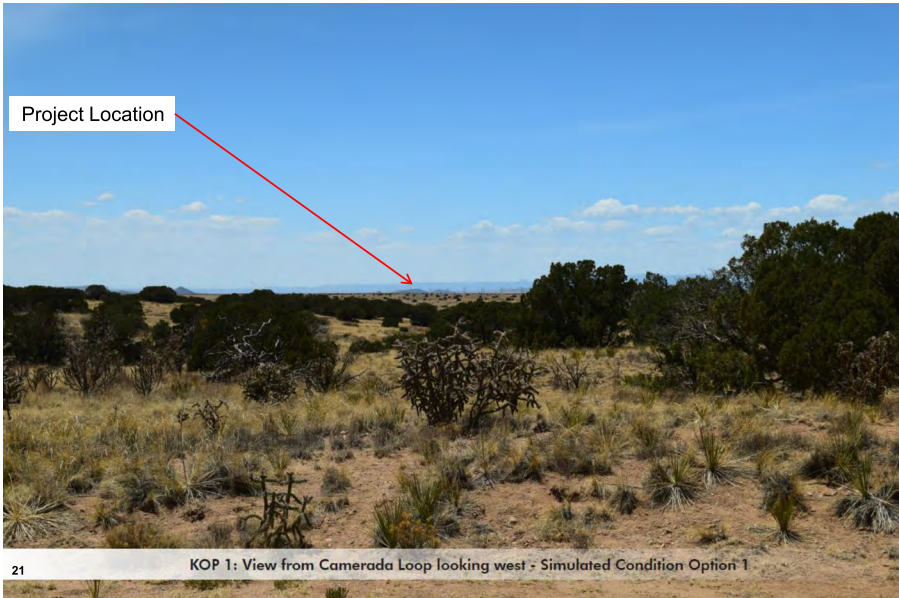


Photo capture location

H-Frames structures up to 50 feet in height with structure spans ranging from 250 feet to 350 feet.



Visual Simulation – View from Camerada Loop (Monopole)

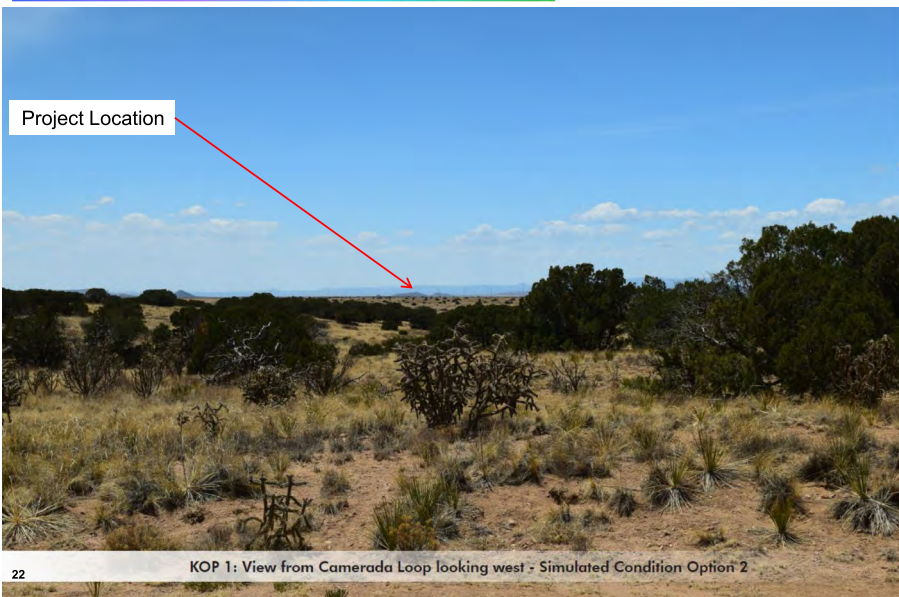
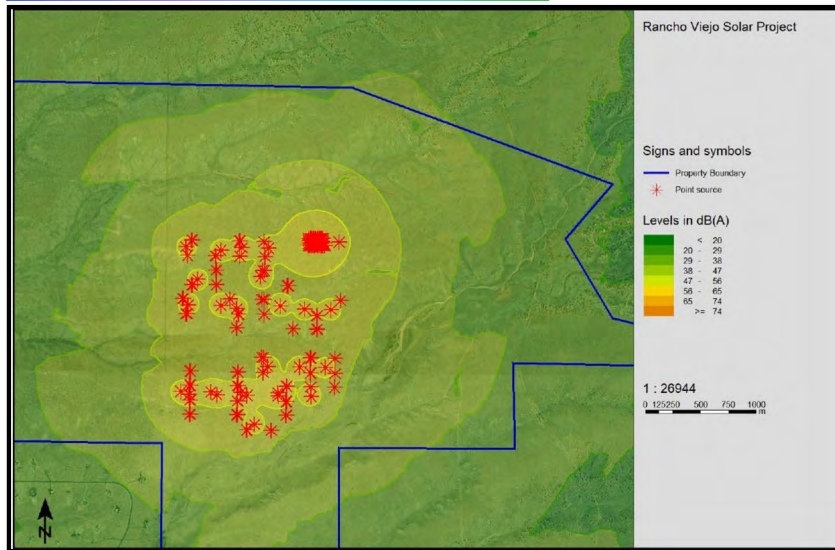


Photo capture location

Monopole structures up to 70 feet in height with structure spans ranging from 250 feet to 450 feet.



Noise Technical Study



- Detailed operation-related noise modeling completed using SoundPlan
- Noise level at the closest property boundary of 48.3 dBA during daytime hours and 43.5 dBA during nighttime hours
- Calculated noise levels emitted by the project would be below Santa Fe County Ordinance No. 2016-9 Chapter 7 – Sustainable Design Standards
 - Daytime 55 dBA, or 10 dBA above ambient
 - Nighttime : 45 dBA, or 5 dBA above ambient



23

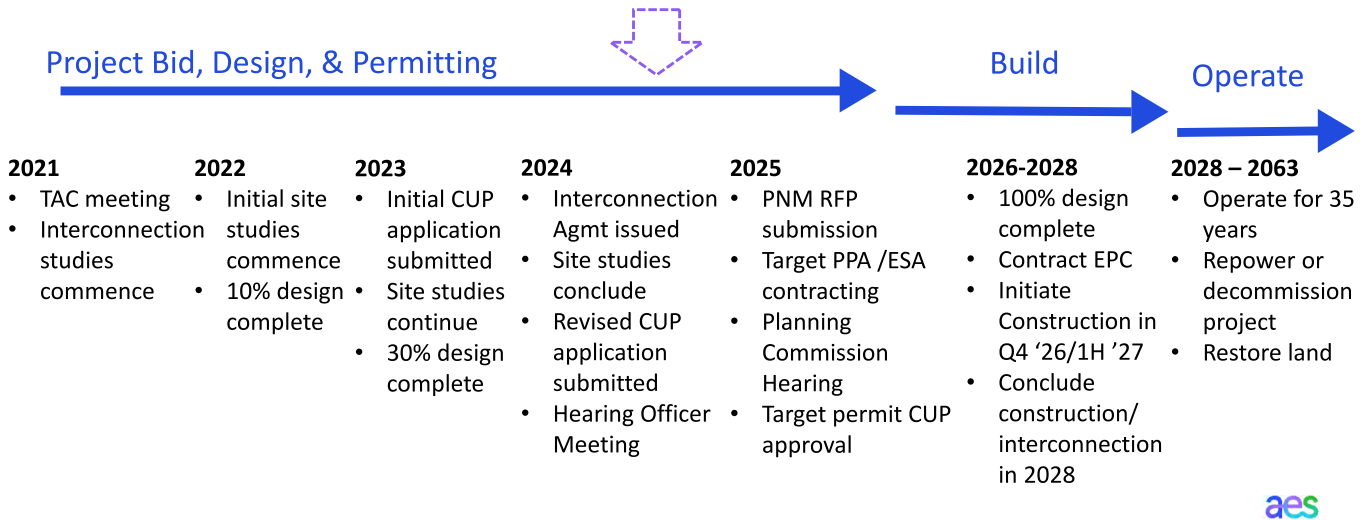
Conditional Use Permit – Review Process

- Technical Advisory Committee Meeting – November 24, 2021
- **Pre-Application Neighborhood Meeting** – August 22, 2024
- CUP Update Application Submitted – On or before August 30, 2024
- County Review, including Referral and Third-Party Review
- **Hearing Officer Meeting** – December 12, 2024 (tentative)
- **Planning Commission Meeting** – January 16, 2025 (tentative)
- Planning Commission issuance of Development Order, approving with conditions (or denying application) with written findings
- Appeals Period (30 working days)
- Appeal of Planning Commission shall be placed on the docket of the Board of County Commissioners



24

Estimated Project Timeline



Rancho Viejo Solar + Storage

Benefits: Economic

Market-competitive supply of clean energy at a long-term fixed cost to PNM ratepayers

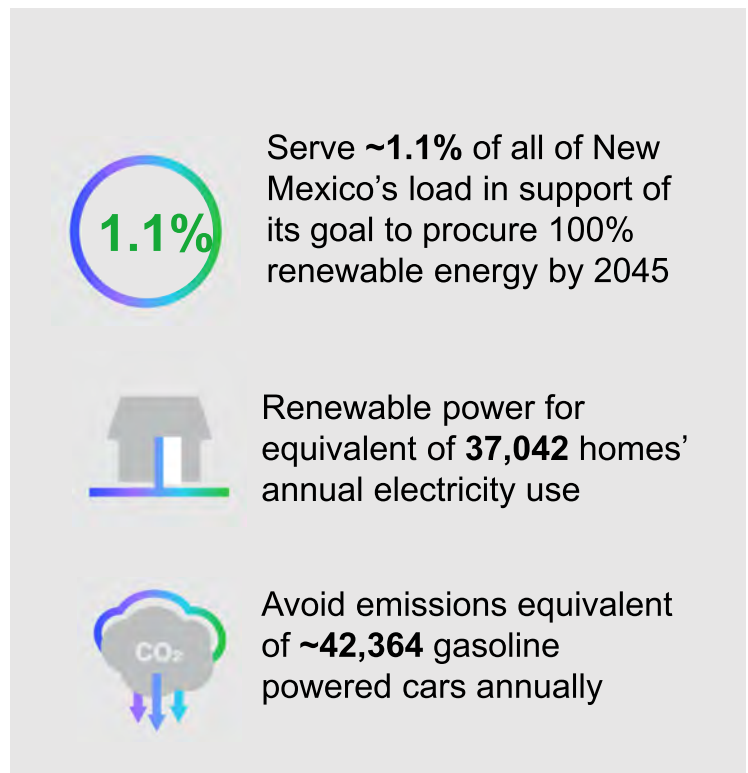
- ~200 construction jobs** (direct)
- ~Contributions to local services** (accommodation, restaurants, professional services)
- >\$200 million** capital investment
- ~\$28 million** in labor and wages
- ~\$5 million** in wages/material within Santa Fe county
- ~>\$18M** in NM mfg output
- ~>\$10 million** in property taxes
- ~\$5.9 million** in est. GRT tax

Rancho Viejo Solar + Storage

Benefits: Environmental

Low impact development that diversifies and strengthens grid resiliency in Santa Fe county

27



Serve **~1.1%** of all of New Mexico's load in support of its goal to procure 100% renewable energy by 2045

Renewable power for equivalent of **37,042** homes' annual electricity use

Avoid emissions equivalent of **~42,364** gasoline powered cars annually

Thank you!



The sun sets on the horizon, but Rancho Viejo Solar will keep the lights on for Santa Fe into the night

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Questions?

Contact us:

Email: RanchoViejoSolar@aes.com
Web: www.aes.com/rancho-viejo-solar

ADVANCING ENERGY STORAGE SAFETY STANDARDS



Energy Storage is a Critical Part of America's Energy Future

Energy storage is an increasingly important component of America's electric grid infrastructure, serving as a leading technology for enhancing grid reliability and keeping electricity costs low. Energy storage can mitigate the impact of power outages by providing backup power during emergencies, support an efficient and cost-effective energy system, and ensure broader electric grid reliability and stability.

AS ENERGY STORAGE DEPLOYMENT GROWS, SAFETY IS A TOP PRIORITY

Energy storage safety incidents are very rare — there have been less than 20 incidents at operating energy storage facilities in the United States. However, as part of an effort for continuous improvement, the industry is prioritizing the incorporation of the latest best practices and strategies to maintain safety. State and local governments can support the responsible deployment and operation of energy storage by pursuing clear, uniform, and rigorous standards.

The clean energy industry, represented by the American Clean Power Association (ACP), encourages state and local jurisdictions to incorporate or adopt **National Fire Protection Association (NFPA) 855, Standard for the Installation of Stationary Energy Storage Systems**, to guide energy storage safety.



ESTABLISHED SAFETY STANDARDS MAKE ENERGY STORAGE SAFE

Fire Professionals, fire protection experts, and safety leaders have developed a suite of standards that keep energy storage projects safe. These standards play an important role in guiding consistent safety strategies and practices across the United States.

Adopting the most up-to-date edition of the National Fire Protection Association standard for energy storage systems ensures evidence-based, expert-driven rules govern the safety of energy storage projects. Uniformity in adopting and implementing this standard across states and jurisdictions will ensure that clear, evidence-based rules guide the future development and operation of energy storage facilities.

- **NFPA 855** provides mandatory requirements for the design, installation, commissioning, operation, maintenance, and decommissioning of energy storage facilities. The standard includes requirements for metrics such as maximum energy and spacing between units and lists several submittals that must be made to the regulating governmental entity, including 1) hazard mitigation analyses (HMA), 2) emergency Response plans, 3) details of all safety systems, and more.
- **UL 9540** is the safety standard for energy storage equipment, including batteries, that is required under NFPA 855. NFPA 855 requires that batteries included in energy storage projects are listed to the safety specifications included in UL 9540 and undergo rigorous fire testing. This standard ensures that equipment incorporated into battery energy storage facilities are tested, certified, and safe for operation on the electric grid.

COLLABORATION BETWEEN ENERGY STORAGE COMPANIES AND THE FIRE SERVICE IS ESSENTIAL

Energy storage companies and fire professionals engage in frequent collaboration throughout both the development and lifetime operation of the project. Regular and transparent communication, training, and site visits foster partnerships that enhance coordination and maintain safety during the life of an energy storage facility. The energy storage industry is committed to proactively engaging the fire service, and energy storage developers and operators engage in early, frequent, and ongoing communication with the fire service of jurisdiction for every project.



Energy Storage & Safety



Safety is a Critical Aspect of the Entire Electrical System, from Power Lines to Your Outlets

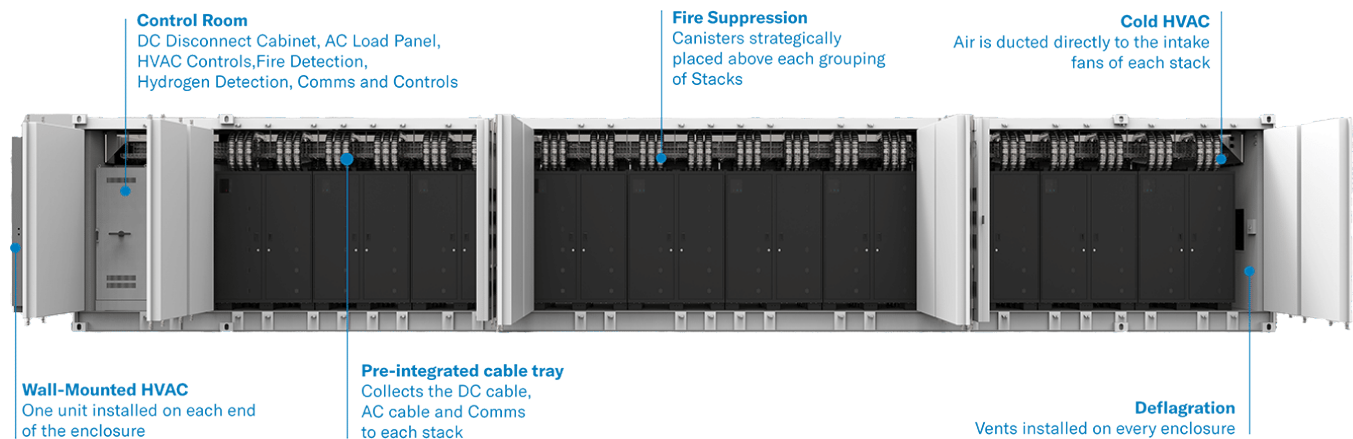
Safety is fundamental to all parts of our electric system, including energy storage. Each component of the electric system presents risks—from transformers and gas lines to power plants and transmission lines—and their safe operation is critical to provide the electricity that keeps our lights on, our refrigerators running, our homes air conditioned and heated, and our businesses operating. Energy storage is no different: with use of best practices and the proper design and operations, these facilities can mitigate risks and maintain safety while supporting reliable, clean electric service.

Battery Energy Storage Uses Technologies We Rely on Each Day

Batteries are present in every part of our lives, from mobile phones to laptops to electric vehicles – even toothbrushes and lawn mowers. Energy storage projects that power the electric grid, homes, and businesses utilize the same core technology as the battery that powers the phone in your pocket, just at a larger scale.

Energy Storage Systems are Regulated & Held to National Safety Standards

Because we rely on batteries in so many ways, the technologies have some of the most well-established safety features. On top of that, all energy storage projects must meet rigorous codes and standards to be permitted to operate – just like any other part of the electric system. Every battery technology that is installed on the electrical grid comes from a certified source. Every energy storage project integrated into our electrical grid is required to comply with national fire protection standards that are frequently updated to incorporate the best practices for hazard mitigation tools and strategies. State and local governments ensure energy storage facilities are installed and operated in compliance with their current standards.



Best Practices For Energy Storage Safety

Energy Storage Projects Use Numerous Strategies to Maintain Safety

Energy storage facilities use established safety equipment and strategies to ensure that risks associated with the installation and operation of the battery systems are appropriately mitigated. At every stage, from manufacturing to installation to operation, battery technologies and storage facilities use a variety of strategies to keep them safe. These strategies can include:

- **Pre-Installation Standards and Testing:** All modern batteries are designed and manufactured to adhere to and pass standard safety tests prior to operation. These safety standards and performance tests help to ensure that the technologies deployed in energy storage facilities uniformly comply with the highest global safety standards.
- **Proper Temperature Management:** All energy storage projects have thermal management systems, such as fans, ventilation, and heating and cooling equipment to maintain safe operating temperatures for the batteries.
- **Sensors that Regulate Temperature:** All projects are equipped with sensors that track battery temperatures and enable storage facilities to turn off batteries if they get too hot or too cold. A Battery Management System manages the charging and discharging of batteries similar to the system in your phone or computer.
- **Safety Equipment:** Energy storage facilities include equipment and systems designed to detect and suppress fires, to vent gasses, and incorporate fire-proof barriers. This safety equipment includes well-established tools deployed at all types of facilities across our electrical system.
- **System & Component Certification:** The Occupational Safety and Health Administration's (OSHA) Nationally Recognized Testing Laboratories (NRTL) provide screening, testing, and evaluation for battery energy storage technologies and components. Many energy storage technologies are also contained within certified enclosures designed to safely house them.
- **24/7 Monitoring by Trained Personnel:** Energy storage facilities are monitored 24/7 by trained personnel prepared to maintain safety and respond to emergency events.
- **Emergency Response Plans:** All energy storage operators develop and maintain emergency response plans to ensure that, if there were an event, it is handled safely and according to best practices. Energy storage developers work with local fire departments and first responders for training and to share information about risks, response plans, and safety measures.



Relying on these measures, energy storage facilities are operated with a safety record consistent with the other technologies we rely on every day for electric service.

Energy Storage Leading on Safety

Utility-scale battery energy storage is safe and highly regulated, growing safer as technology advances and as regulations adopt the most up-to-date safety standards.

Background

Energy storage systems (ESS) are critical to a clean and efficient electric grid, storing clean energy and enabling its use when it is needed. Installation is accelerating rapidly—as of Q3 2023, there was seven times more utility-scale energy storage capacity operating than at the end of 2020. This growth is driving job creation, investment in American manufacturing, and is improving grid resilience and energy security.

However, because energy storage technologies are generally newer than most other types of grid infrastructure like substations and transformers, there are questions and claims related to the safety of a common battery energy storage technology, lithium-ion (Li-ion) batteries. All of these questions and claims can be addressed with facts. The industry continues to address these concerns to ensure community confidence in this increasingly essential electric grid infrastructure.

CLAIM: The incidence of battery fires is increasing.

FACTS: Energy storage battery fires are decreasing as a percentage of deployments.

- Between 2017 and 2022, U.S. energy storage deployments increased by more than 18 times, from 645 MWh to 12,191 MWh¹, while worldwide safety events over the same period increased by a much smaller number, from two to 12².
- During this time, codes and standards regulating energy storage systems have rapidly evolved to better address safety concerns.



Photo credit: Fluence

CLAIM: Today's larger battery systems use tens of thousands of cells, so fires are inevitable.

FACTS: Cell failure rates are extremely low, and safety features in today's designs further reduce the probability of fires.

- One estimate from 2012 quotes a failure rate ranging from 1 in 10 million to 1 in 40 million cells³, and there are undoubtedly improvements from these levels.
- Lithium-ion batteries experience extremely low failure rates, as shown by electric vehicle data.
 - Tesla alone sold nearly 900,000 vehicles in the first half of 2023⁴. These sales of new vehicles represent around three-quarters of a billion cells, but safety events involving all EVs on the road globally, from all manufacturers, amounted to just a few dozen fires.
- Today's energy storage systems (ESSs) predominantly use safer lithium-iron phosphate (LFP) chemistry, compared with the nickel-manganese-cobalt (NMC) technology found in EVs.
 - LFP cell failure results in less energy release and a lower probability of fire.
- ESS designs incorporate features to avoid propagation of cell failure within the battery, contributing to improved safety.

1 US Energy Storage Monitor, Q1 2023 full report and 2022 Year in Review, Wood Mackenzie Power & Renewables/American Clean Power Association, <https://www.woodmac.com/industry/power-and-renewables/us-energy-storage-monitor/>

2 Electric Power Research Institute, BESS Failure Event Database, https://storagewiki.epri.com/index.php/BESS_Failure_Event_Database

3 D. Doughty, Vehicle Battery Safety Roadmap Guidance, National Renewable Energy Laboratory, October 2012, <https://doi.org/10.2172/1055366>.

4 EV sales: Hyundai overtakes GM, but Tesla's U.S. dominance continues

CLAIM: E-bike and e-scooter fires have resulted in deaths—so large batteries for energy storage may be even more deadly.

FACTS: No deaths have resulted from energy storage facilities in the United States. Battery energy storage facilities are very different from consumer electronics, with secure, highly regulated electric infrastructure that use robust codes and standards to guide and maintain safety.

- E-mobility devices have been lightly regulated in the past, and some products have used poor-quality battery cells and ineffective safety systems.
- They are also charged inside homes, sometimes along egress routes, creating a high level of risk.
- Like EV batteries, ESS battery systems are highly regulated and subject to stringent certification and testing requirements.
- The difference in regulation is evident in vehicle statistics. Worldwide, for the first half of 2023, EV FireSafe cites 500+ light electric vehicle (E-bike and E-scooter) battery fires, but only 44 passenger EV fires⁵.
- Additionally, utility-scale energy storage systems are located within secure facilities with site plans explicitly designed around maximizing safety of those operating the facilities and their neighbors.
- The ESS industry meets with and shares best practices with first responders and communities.
- Lessons learned from earlier ESS incidents have been reflected in the evolution of codes and standards. Often, companies go beyond mandatory testing to test more extreme failure scenarios.
- Altogether, like other electric grid infrastructure, energy storage systems are highly regulated and there are established safety designs, features, and practices proven to eliminate risks to operators, firefighters, and the broader community.
- The industry is committed to meeting these standards, such as NFPA 855, which are regularly updated to reflect the latest evidence-based best practices.



Photo credit: AES

CLAIM: Battery fires emit toxic fumes and pose a risk to the community

FACTS: Past incidents demonstrate that fires are contained within the facility, and air quality in neighboring areas remains at safe levels.

- Laboratory testing of emissions from Li-ion cells in thermal runaway shows that emissions are similar to those found in plastics fires⁶.
- During an ESS battery fire, only trace amounts of chemicals are detected in sampling around the event, and overall air quality remains at safe levels.
- During a fire at a Tesla Megapack at Moss Landing in California, air-quality testing showed no hazards to human health⁷.

CLAIM: Fire suppression systems should be mandatory for all lithium-ion battery systems.

FACTS: Regulations that aren't vetted by organizations like the National Fire Protection Association or are inconsistent with the International Fire Code may make projects less safe.

- Established national and international codes and standards already require BESS to incorporate the appropriate safety features to contain any potential fires or thermal events.
- Successful suppression of a fire does not guarantee that the underlying thermal runaway event has been terminated, so containing a fire is the best way to protect first responders and communities.
- The energy storage industry is working to avoid events such as the explosion at an installation in McMicken, Arizona, in which four firefighters were injured⁸. Prior to this event, the industry was focused on extinguishing fires as quickly as possible, but McMicken showed that explosion can be a greater hazard and fire containment is a better strategy.
- The accepted best practice for the rare ESS fires that do occur is to contain them, managing the burn of the limited affected unit in a controlled manner while protecting nearby structures and equipment. This strategy eliminates any explosion hazard, avoids issues with stranded energy and reignition, and minimizes contaminated runoff of firefighting water.
- Codes and standards are changing to reflect this practice, placing an emphasis on explosion prevention. One proposal for the 2026 edition of NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems*, would forbid installation of traditional clean-agent or aerosol fire suppression systems unless testing demonstrates that use of such systems does not create an explosion risk.

⁵ EV FireSafe, All Electrified Transport LIB Fire Incidents, Global, 1st January to 30th June 2023, <https://www.evfiresafe.com/ev-battery-fire-overview>.

⁶ DNV-GL, *Considerations for ESS Fire Safety, Report for Consolidated Edison and NYSEERDA*, 2017

⁷ Air quality testing showed no hazards to human health amid battery fire in Moss Landing

⁸ Arizona ESS Explosion Investigation and Line of Duty Injury Reports Now Available

What Is Energy Storage?

Energy storage powers our daily lives

We use energy storage all the time in our everyday lives. The batteries that power your phone, computer, and other electronic devices are small-scale forms of the battery energy storage systems connected to our electrical grid. The same technology that powers your personal devices is used today to provide back-up power to homes and businesses, limit power outages, make our electrical grid more reliable, and to enable our communities to run on clean, affordable energy.

How does it work?

Just like charging your phone while you sleep, energy storage systems efficiently and conveniently capture electricity so that it can be used when it's most needed. Grid-connected energy storage doesn't move or emit any pollution. A grid-connected battery storage system consists of batteries, racks for the batteries, inverters that convert DC energy to AC energy, communications equipment that allow control and monitoring of the batteries, and equipment that ensures the batteries can operate safely. These components and battery systems are housed in specially engineered enclosures. Various types of energy storage have been utilized for more than a century, and the oldest battery storage projects currently in operation have been serving the electrical grid for more than a decade.

What does it look like and where is it located?

Energy storage systems connected to the electrical grid are housed in specially engineered shipping containers, outdoor-rated cabinets, or purpose-built buildings. While customer-sited residential systems are generally installed on the exterior of homes and about the size of whole-home HVAC systems, grid-scale facilities vary in size. A typical new utility-scale project can have dimensions ranging from a hockey rink or basketball court to a soccer field. There are currently hundreds of utility-scale energy storage projects operating and in construction throughout the entire United States, including in extremes of arctic and desert environments, each tailored for the unique setting and community it serves. Energy storage facilities are located in dense, urban centers as well as rural and remote areas. These operating energy storage projects, wherever they are located, provide valuable services to electrical grid in communities across the country.



To learn more about energy storage technologies, visit cleanpower.org.

How is energy storage useful?

Enhancing Reliability, Reducing Costs, Protecting the Environment, and Supporting Local Economies

Energy storage systems enable a more efficient and resilient electrical grid, which produces a variety of benefits for consumers, businesses, and communities. Deployment of energy storage:

- **Reduces outages and enhances resilience:** Similar to household devices operating with back-up batteries, like smoke alarms, or back-up generators, energy storage systems can support entire buildings or even the larger electrical grid during extreme weather events and other disruptions. Keeping the lights on, air-conditioning or heating systems operating, and critical infrastructure working is important to keeping people safe.
- **Reduces costs & saves money:** By storing energy when the price of electricity is low and discharging that energy later during periods of high demand, energy storage can reduce costs for utilities and save families and businesses money. Also, by enhancing grid resilience and providing back-up power, energy storage can prevent costly damages to families and businesses associated with power outages.
- **Bolsters a sustainable electrical grid:** Energy storage enables electricity to be saved and used at a later time, when and where it is most needed. By introducing more flexibility into the electrical grid, energy storage helps integrate more clean, renewable power sources—like solar, wind, and hydropower—and enables more people to rely on distributed energy resources, like rooftop solar and electric vehicles. All of these resources enabled by energy storage contribute to reducing local air pollution and greenhouse gas emissions from our electrical grid.
- **Supports local economies:** Energy storage projects boost local economies and broaden tax bases, reducing local tax burdens without adding pressure on other governmental services. The U.S. energy storage industry supports over 60,000 jobs at companies leading cutting-edge technological innovations, advanced manufacturing, engineering and construction, and more.



AES

Solar as a Neighbor: Living Near a Solar Project



Key Takeaways

- 1 Solar Provides Community Benefits:** Solar projects will improve air quality and provide communities with real economic benefits through land lease payments and local tax revenue.
- 2 What to Expect During Construction and Operations:** Solar projects involve site preparation, manageable noise during construction, and minimal traffic, glare, and noise once operational.

Background

The cumulative operating capacity for utility-scale solar in the U.S. has grown to over 100,000 MW (as of June 2024). Millions of Americans live near utility-scale solar projects, which can be found in all 50 states, the District of Columbia, and Puerto Rico.¹

If a new solar project is proposed in your community, it is important to understand how the project will fit into the existing landscape. This fact sheet explores what it is like to live near a solar project.

How Will a Solar Project Help My Community?

Health Benefits: Citing clean air benefits, the North Carolina State University notes “the overall impact of solar development on human health is overwhelmingly positive.”² Health benefits from solar come from avoiding the air pollution and greenhouse gas emissions from other sources of generating electricity. Pollution and greenhouse gas emissions have immediate, long term and cumulative negative health effects.³ Unlike other forms of electricity generation, operating solar facilities do not produce greenhouse gas emissions, odors, smoke clouds, or vapor.

Economic Benefits: Additionally, solar facilities represent a stable source of revenue for localities and impose few costs on public services.⁴ The American Clean Power (ACP) Association estimates that utility-scale solar projects pay over \$550 million annually in land lease payments to landowners across the U.S., and pay over \$375 million in annual tax payments to state and local jurisdictions.

What Happens During Project Construction?

Solar project construction can take approximately one year or more in total for large systems.

Phase 1: Site Preparation

Open, flat spaces are generally preferable for solar projects. To prepare the site to accommodate solar panels, maintenance building and other equipment involved in building the project, most sites still require a degree of site preparation.

Equipment used during this phase can include chainsaws, chippers, dozers, scrapers, end loaders, and trucks. Topsoil is typically stripped during construction but preserved onsite before performing cut/fill operations.

Cut/fill operations level out the slope of the land, help control runoff and enable panels to be spaced appropriately.

Next, the developer will place fencing and temporary job site trailers on the site. Then, they’ll construct an area to temporarily store panels and prepare them for installation, along with access roads to facilitate entry and exit from the site.

Phase 2: Construction

During construction, daily activities include transporting people, panels, and equipment to the site over the course of several weeks. During installation of the solar panels, racking system, and associated project infrastructure, the typical onsite construction equipment includes backhoes, pile drivers, scrapers, bulldozers, dump trucks, watering trucks, pile drivers, forklifts, bucket or concrete trucks and compactors. Light duty trucks will also be used to transport construction workers to and from the site daily.

Maximum noise from equipment does not exceed 72 decibels from 200 feet away, according to the Federal Highway Administration Construction Handbook.⁵

- This is equivalent to the noise of a busy office or a vacuum cleaner.⁶

The panel racking system is installed by pile drivers, placing steel posts into the ground to support the system. The panel racking system can include a tracking capability to change the angle of the panels to follow the sun throughout each day, increasing energy production. Trackers can also help address stormwater management issues by allowing the panels to tilt and minimize rainwater concentration on site.

The wiring that connects panels to electrical equipment may be above ground or buried via a trench. An inverter converts power from the solar panels from direct current (DC) into alternating current (AC), and transformers change the AC voltage. Individual components can be the size of a refrigerator, or multiple inverters can be assembled together on a skid with transformers, control systems and other necessary components.

Phase 3: Revegetation & Operations

As parts of a project near completion, temporary staging, laydown areas, and other temporary disturbance areas are restored.

After construction, topsoil is reapplied to help revegetate the site and establish ground cover. Revegetation helps prevent erosion, manage stormwater, and support the surrounding ecosystem. The vegetation used will be determined by a site-specific assessment.

Once the project is operating, operations personnel maintain the vegetation, inspect the facility, make necessary repairs, and ensure efficient operations.

How Much Traffic Can I Expect After the Project is Built?

Once solar projects are built, there is little traffic in and out of the project site. Most of the vehicular traffic will be made up of light duty trucks to transport the operations personnel responsible for maintaining the vegetation around the project or cleaning panel surfaces to ensure maximum power production.

How Much Noise Do Solar Projects Make?

Solar panels do not emit sound when they convert sunlight into electricity. Rather sources of sound at solar facilities are associated with converting solar panels electrical output from DC to AC and adjusting the voltage such that it can be transmitted to the electrical grid. This is done via inverters and transformers. The inverters and transformers may have fans and cooling systems to ensure proper operation when operating at full load during the heat of the day. Sound emitted from inverters can be calculated using software during project design and can be minimized with proper planning and siting. Generally, when permitting solar facilities, the expected sound levels fall within the accepted limits established by land use or zoning ordinances.

Can I Expect Glare from the Panels?

Solar panels are designed to capture light rather than reflect it. Nonetheless, the glass from solar panels can produce glare. Studies indicate that the potential glare from solar arrays is comparable to glare from a body of smooth water.⁷ Modern PV panels reflect as little as two percent of incoming sunlight, which is about the same as water and less than soil or even wood shingles.⁸

To further reduce visual impacts from solar facilities, developers may plant vegetation along the perimeter of the project to provide visual barriers in accordance with local ordinance requirements.

Do Solar Projects Make the Surrounding Area Warmer?

The Ohio Department of Public Health has found “Information to date **does not indicate a public health burden from heat generated by PV panels** or from the heat island effect.”⁹

Solar photovoltaic (PV) “heat island effect” refers to a limited warming effect in and around solar facilities at certain times of the day and/or year—depending on other conditions such as wind speed and cloud cover. This phenomenon is conceptually like the “urban heat island effect,” that has been observed in which heat-absorbing elements of cities—such as concrete—increase the temperature when compared to surrounding areas.^{10,11}

Existing studies on the “heat island effect” at solar facilities have found varied results with respect to daytime and nighttime temperature effects.^{12,13}

- Note: current research has been conducted on sites that do not have planted vegetation underneath panels, which is not representative of solar PV facilities in many parts of the country.¹⁴
- Vegetation can help cool an area.

1 American Clean Power Association, Clean Power Annual Market Report, 2023. https://cleanpower.org/resources/clean-power-annual-market-report-2023/?token_refresh=cf1950c0-7aad-44d5-b872-78baf8363ef8&mrcid=1713385403

2 NC State University, Health and Safety Impacts of Solar Photovoltaics, <https://content.ces.ncsu.edu/health-and-safety-impacts-of-solar-photovoltaics> (2017)

3 CDC. Climate Change Decreases the Quality of the Air We Breathe. https://www.cdc.gov/climateandhealth/pubs/AIR-QUALITY-Final_508.pdf

4 Mangum Economics. The Economic Development Contribution of Utility-Scale Solar to Virginia. May 2020. Available: <https://mdvseia.org/wp-content/uploads/2020/06/MDVSEIA-Report-.pdf>

5 U.S. Department of Transportation. FHWA Highway Construction Handbook. 2006. https://rosap.nhtl.bts.gov/view/dot/8837/dot_8837_DS1.pdf

6 Yale Environmental Health and Safety, Decibel Level Comparison Chart. <https://ehs.yale.edu/sites/default/files/files/decibel-level-chart.pdf>

7 National Renewable Energy Laboratory (NREL). Research and Analysis Demonstrate the Lack of Impacts of Glare from Photovoltaic Modules. July 2018. <https://www.nrel.gov/state-local-tribal/blog/posts/research-and-analysis-demonstrate-the-lack-of-impacts-of-glare-from-photovoltaic-modules.html>

8 NREL, *Ibid.*

9 Ohio Department of Public Health, “Solar Farm and Photovoltaics Summary and Assessment,” Updated April 2022, available at: <https://odh.ohio.gov/know-our-programs/health-assessment-section/media/summary-solarfarms>

10 V. Fthenakis and Y. Yu, “Analysis of the potential for a heat island effect in large solar farms,” 2013 IEEE 39th Photovoltaic Specialists Conference (PVSC), 2013, pp. 3362–3366, doi: 10.1109/PVSC.2013.6745171.

11 Barron-Gafford, G., Minor, R., Allen, N. et al. The Photovoltaic Heat Island Effect: Larger solar power plants increase local temperatures. *Sci Rep* 6, 35070 (2016). <https://doi.org/10.1038/srep35070>

12 Broadbent, A. M., E. S. Krayenhoff, M. Georgescu, and D. J. Sailor, 2019: The Observed Effects of Utility-Scale Photovoltaics on Near-Surface Air Temperature and Energy Balance. *J. Appl. Meteor. Climatol.*, 58, 989–1006. <https://doi.org/10.1175/JAMC-D-18-0271.1>

13 Devitt, Dale A., Lorenzo Apodaca, Brian Bird, John P. Dawyot, Jr., Lynn Fenstermaker, and Matthew D. Petrie. 2022. “Assessing the Impact of a Utility Scale Solar Photovoltaic Facility on a Down Gradient Mojave Desert Ecosystem” *Land* 11, no. 8: 1315. <https://doi.org/10.3390/land11081315>

14 *Ibid*

Solar Panels are Safe for Your Community

Key Takeaways

- Solar panels are made of** materials like glass, aluminum, copper, and semiconductors commonly found in household appliances and technology.
- In the U.S., the **two most used solar cells**—Crystalline Silicon (c-Si) at 62%¹ of current installations, with Thin Film Cadmium Telluride (CdTe) making up the majority of the remaining market—**do not pose a danger** to human health or the environment.
- Testing shows that **both c-Si and CdTe panels are safe** in worst-case conditions of abandonment or damage in a disaster.

Background

Solar energy continues to grow rapidly across America. As facilities are proposed in more communities, community members have questions about what materials are included in solar photovoltaic (PV) panels, and if they pose an environmental or health risk to surrounding neighbors.

Explore below the materials in solar panels and how **utility-scale solar facilities are safe for your community**.

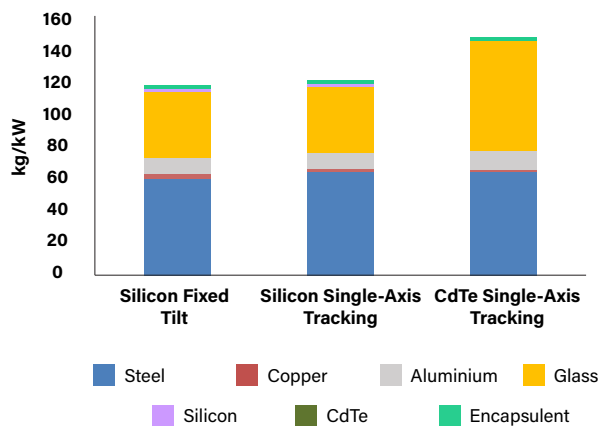
What's inside of a solar panel?

Solar panels are made up of glass, aluminum, copper, and solar cells.

Solar cells are semiconductor materials, made up of thin layers of silicon or other photovoltaic material responsible for converting energy from sunlight into electricity. The thin layer of solar cells is sealed on both sides and covered with glass, a polymer sealant, and—sometimes—an aluminum frame for protection from outside elements.

The main solar cell technologies are crystalline silicon (c-Si) and thin film cadmium telluride (CdTe).

20 MW PW Plant Component Materials by Weight (kg/kW)



Source: U.S. Department of Energy Solar Energy Technologies Office. Photovoltaics End-of-Life Action Plan. March 2022. Accessible: https://www.energy.gov/sites/default/files/2022-03/Solar-Energy-Technologies-Office-PV-End-of-Life-Action-Plan_0.pdf

Can solar panels leach chemicals or metals?

Solar panels are designed and manufactured to withstand harsh environmental conditions and extreme weather events. These hardened structures protect the solar cells from the elements and support plans to keep the facilities operating for up to 40 years.

Extended-stress testing² and leaching tests reflective of real-world conditions show that crystalline silicon and thin film cadmium telluride **solar panels pose little risk of leaching during operation, removal and disposal**, including in the event of a natural disaster. In order to operate, the internal components of modules must be protected from the elements, particularly moisture, to prevent corrosion and the release of materials.³

Furthermore, the Environmental Protection Agency requires that solar panel modules pass toxicity characteristic leaching procedure (TCLP) testing before being disposed of in a landfill. TCLP testing assesses impacts of landfill conditions on solar panels, including leaching potential. This test is typically conducted during manufacturing to ensure the solar panels will meet the requirements of disposal at end-of-life.⁴ **Testing shows that both c-Si and CdTe panels are safe in worst-case conditions of abandonment or damage in a disaster.**⁵

Are the materials in solar panels safe?

Solar panels do not contain sufficient hazardous materials to pose a danger to the environment and human health.

Even in the event of breakage or fire, studies show that crystalline silicon and thin film cadmium telluride solar panels do not pose a danger to the environment or human health.^{6,7}

Crystalline Silicon (c-Si) Panels

The primary component in crystalline silicon solar cells is silicon, the second-most common element on earth and found in most consumer electronics, from cell phones to computer chips.^{8,9}

- An assessment by the Ohio Department of Health highlighted the safety of crystalline silicon panels, concluding "Information to date does not indicate a public health burden from the use of crystalline silicon (c-Si) in solar farms...[as] crystalline silicon itself is **non-toxic to humans**."¹⁰

Other components used in c-Si cells include gallium, which is increasing in popularity over boron for putting cells together,¹¹ and phosphorus—both of which are also non-hazardous to the environment and human health. Most commercially available crystalline silicon panels contain trace amounts (less than 0.1%) of lead used to join the c-Si cells; however, manufacturers are seeking to decrease the use of lead for this purpose.¹² While a large solar energy project contains hundreds of panels, the leaded portions of the panel are enclosed in nonporous, non-toxic substances like glass and polymer, preventing the lead material from escaping or leaching into the ground.^{13,14}

- The amount of lead needed to solder the cells is roughly 1/750th of the amount used in a conventional car battery, or half of the amount in a single 12-gauge shotgun shell.

Cadmium is sometimes used in trace amounts in c-Si solar panels for glass frit, the material used in the electrodes to make electrical contact with the PV cell. It may also be found in the solder that is used to join cells. According to the North Carolina Clean Energy Technology Center, research demonstrates the amount of **cadmium found in c-Si solar panels poses negligible toxicity risk to public health** and safety, even in the case of breakage.¹⁵

Thin Film Cadmium Telluride (CdTe) Panels

Thin film cadmium telluride (CdTe) panels are increasing in popularity, making up about 32% of total installations from 2007-2022, and 38% of new (2022) installations.¹⁶

CdTe solar panels consist of a semiconductor layer fully encapsulated between two sheets of glass and sealed with an industrial laminate. The CdTe semiconductor layer is approximately 3% of the thickness of a human hair. CdTe is a highly stable compound that differs from elemental cadmium due to its strong bonding and extremely high chemical and thermal stability.¹⁷

CdTe also has a much lower risk of being released and does not dissolve in water.¹⁸

- Because coal and oil-fired generators routinely emit cadmium, increased use of solar energy reduce public exposure to cadmium.¹⁹

For every five megawatts of solar power installed, it is estimated that 157 grams of cadmium are prevented from being released into the environment because of the reduction in traditional energy generation.²⁰



To discover more about decommissioning solar facilities and disposal, visit [What Happens When a Solar Project is Decommissioned and Solar Panel Recycling and Disposal.](#)



- 1 Bolinger, Mark, Joachim Seel, Julie Mulvaney Kemp, Cody Warner, Anjali Katta, and Dana Robson."Utility-Scale Solar, 2023 Edition: Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States." (2023). <https://emp.lbl.gov/publications/utility-scale-solar-2023-edition>
- 2 IEC. 2021. IEC TS 63209-1 & -2 - Photovoltaic modules – Extended-stress testing – Part 1, Modules; - Part 2: Polymeric component materials. IEC TS 63209-1:2021 | IEC Webstore; IEC TS 63209-2:2022 | IEC Webstore.
- 3 NC Clean Energy Technology Center, 2017.
- 4 North Carolina Department of Environmental Quality and the Environmental Management Commission. 2021. "Final Report on the Activities Conducted to Establish a Regulatory Program for the Management and Decommissioning of Renewable Energy Equipment." Accessed at: https://files.nc.gov/ncdeq/documents/files/DEQ_H329%20FINAL%20REPORT_2021-01-01.PDF
- 5 NC Clean Energy Technology Center, 2017.
- 6 P. Sinha, G. Heath, A. Wade, K. Komoto, 2018, Human health risk assessment methods for PV, Part 1: Fire risks, International Energy Agency (IEA) PVPS Task 12, Report T12-14:2018. https://iea-pvps.org/wp-content/uploads/2020/01/HHRA_Methods_for_PV_Part1_by_Task_12.pdf
- 7 P. Sinha, G. Heath, A. Wade, K. Komoto, 2019, Human health risk assessment methods for PV, Part 2: Breakage risks, International Energy Agency (IEA) PVPS Task 12, Report T12-15:2019. ISBN 978-3-906042-87-9. https://iea-pvps.org/key-topics/iea-pvps-t12-15_human-health-risk-assessment-methods-for-pv-part-2/
- 8 Department of Energy. 2022. "Solar Photovoltaic Cell Basics." Accessed at: <https://www.energy.gov/eere/solar/solar-photovoltaic-cell-basics>
- 9 U.S. Geological Survey. 2016. "A World of Minerals in Your Mobile Phone." Accessed at: <https://pubs.usgs.gov/gip/0167/gip167.pdf>
- 10 Ohio Department of Health. 2022. "Ohio Department of Health Solar Farm and Photovoltaics Summary and Assessments." Accessed at: https://ohiodnr.gov/wps/wcm/connect/gov/fc124a88-62b4-4e91-b30b-bc1269d0dde5/ODH+Solar+Farm+and+PVs+Summary+Assessments_2022.04.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_K91401S01H7F40QBNUJ3SQ1F56-fc124a88-62b4-4e91-b30b-bc1269d0dde5-o3S-Ssh
- 11 Yuyan Zhi et al., Ga-doped Czochralski silicon with rear p-type polysilicon passivating contact for high-efficiency p-type solar cells, Volume 230, 2021, 111229, ISSN 0927-0248, <https://doi.org/10.1016/j.solmat.2021.111229>.
- 12 Mireletz et al. "Unfounded concerns about photovoltaic module toxicity and waste are slowing decarbonization." Nature Physics, Oct 2023. <https://www.nature.com/articles/s41567-023-02230-0>
- 13 Ohio Department of Health, 2022.
- 14 U.S. Department of Energy, Solar Photovoltaics Supply Chain Deep Dive Assessment, 2022. <https://www.energy.gov/sites/default/files/2022-02/Solar%20Energy%20Supply%20Chain%20Report%20-%20Final.pdf>
- 15 NC Clean Energy Technology Center. 2017. "Health and Safety Impacts of Solar Photovoltaics." NC State University. Accessed at: <https://content.ces.ncsu.edu/health-and-safety-impacts-of-solar-photovoltaics>
- 16 Ibid.
- 17 Cleveland, T. (2017, May). Health and safety impacts of solar photovoltaics. NC Clean Energy Technology Center. <https://nccleantech.ncsu.edu/wp-content/uploads/2019/10/Health-and-Safety-Impacts-of-Solar-Photovoltaics-PV.pdf>
- 18 Bonnet, Dieter and Meyers, Peter. 1998. "Cadmium-telluride-Material for thin film solar cells." Journal of Materials Research. Accessed at: <https://www.cambridge.org/core/journals/journal-of-materials-research/article/abs/cadmiumtelluridematerial-for-thin-film-solar-cells/8BEF27C9423BD204A4BC0AD1C34F2983>
- 19 Fthenakis VM, Hyung CK, Alsema E. Emissions from photovoltaic life cycles. Environ Sci Technol 2008;42:2168-74. <https://doi.org/10.1021/es071763g>.
- 20 NC Clean Energy Technology Center. 2017. "Health and Safety Impacts of Solar Photovoltaics." NC State University. Accessed at: <https://content.ces.ncsu.edu/health-and-safety-impacts-of-solar-photovoltaics>