

# Light Up Navajo

## Mutual Aid without a Storm

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General Manager  
Navajo Tribal Utility Authority

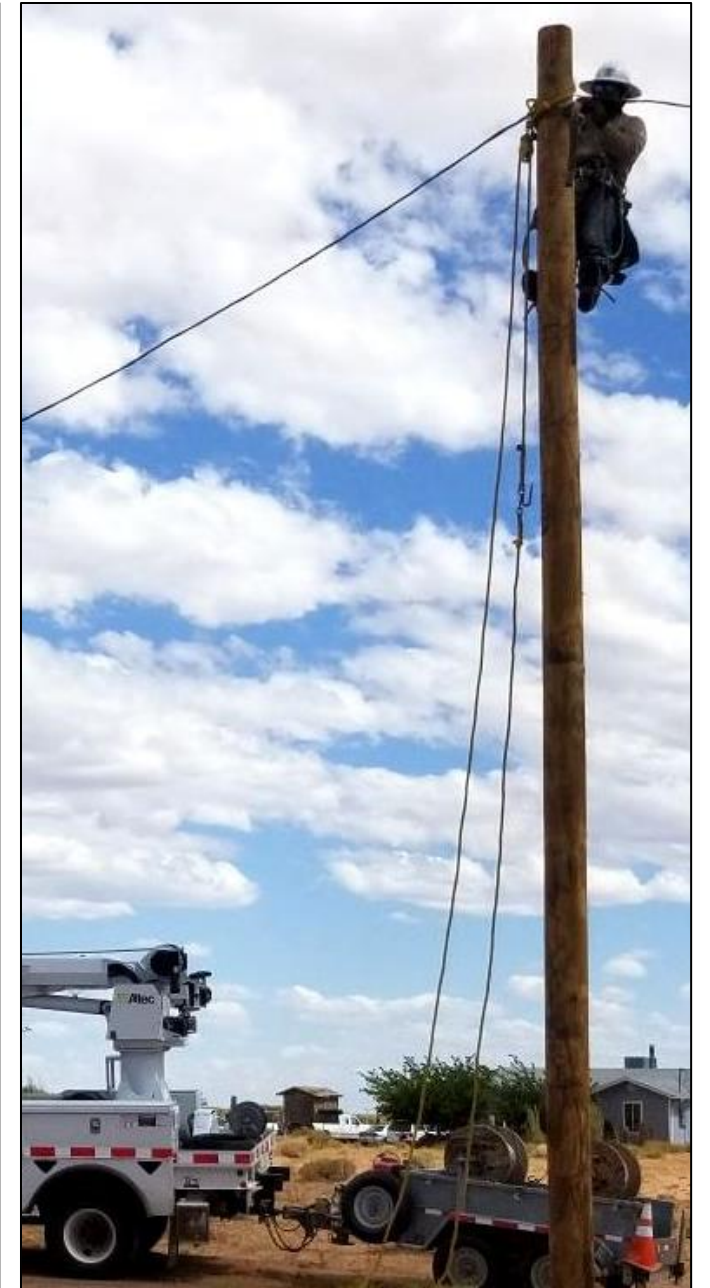
CALPLUG/IAC Workshop  
April 22, 2024





## Navajo Tribal Utility Authority

- Created in 1959
- A not-for-profit enterprise of the Navajo Nation
- Service Territory – 27,000 square miles across the Navajo Nation
- Extends – Electricity, Water, Wastewater Treatment, Natural Gas, Off-grid Residential Solar
- Recent years: Communications – Broadband/Internet & Mobile Phones Data Storage Services, and Solar Energy Generation





# Navajo Nation – Southwest USA

## Service territory larger than State of West Virginia

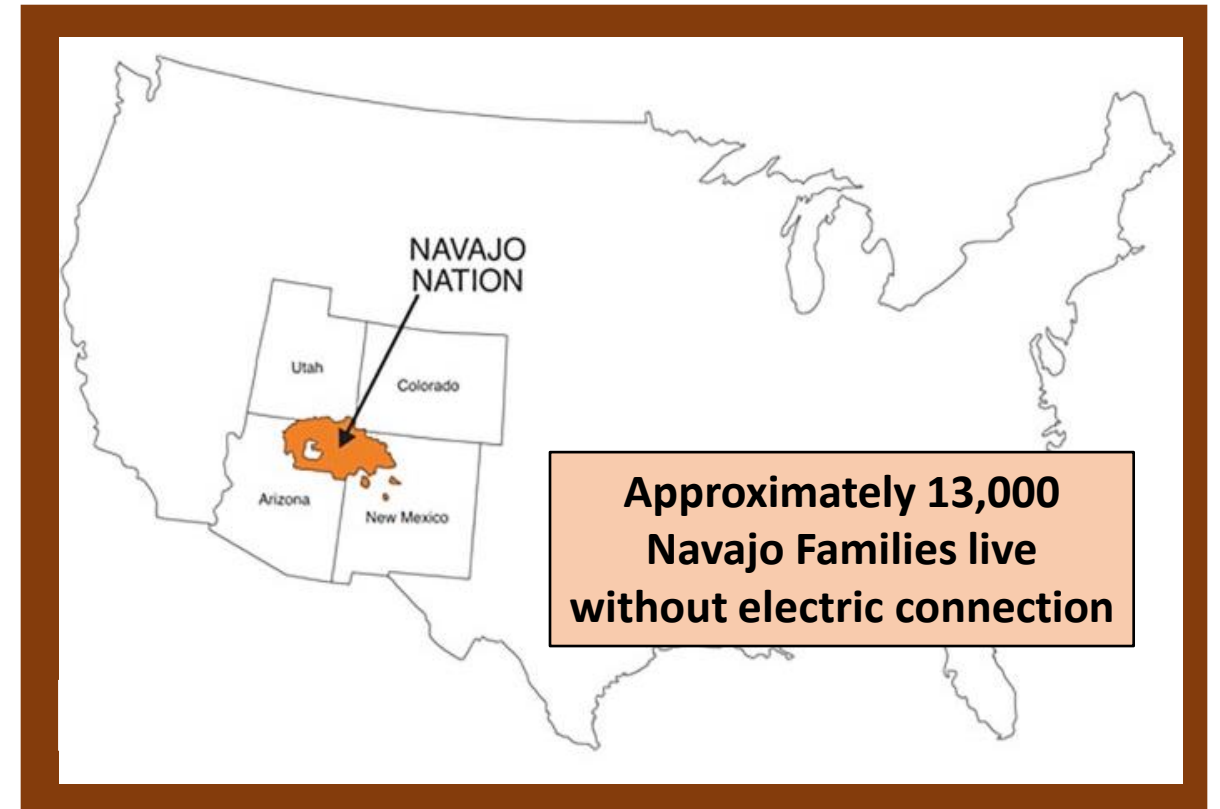
- **Out of approximately 400,000 Navajo citizens, about 186,500 live on the Navajo Nation**
- **Navajo Nation is among the lowest levels of socio-economic indicators for any geographic region in the United States**
- **Unemployment rate over 14.6% (3x times more than current U.S. average)**
- **37% of Navajo people live below poverty line**

## According to 2020 US Census

**Average per capita Navajo income    \$15,110**

**Medium Navajo household income    \$30,759**

**Average US median income                \$74,580**



**32% lack electricity**

**40% lack water**

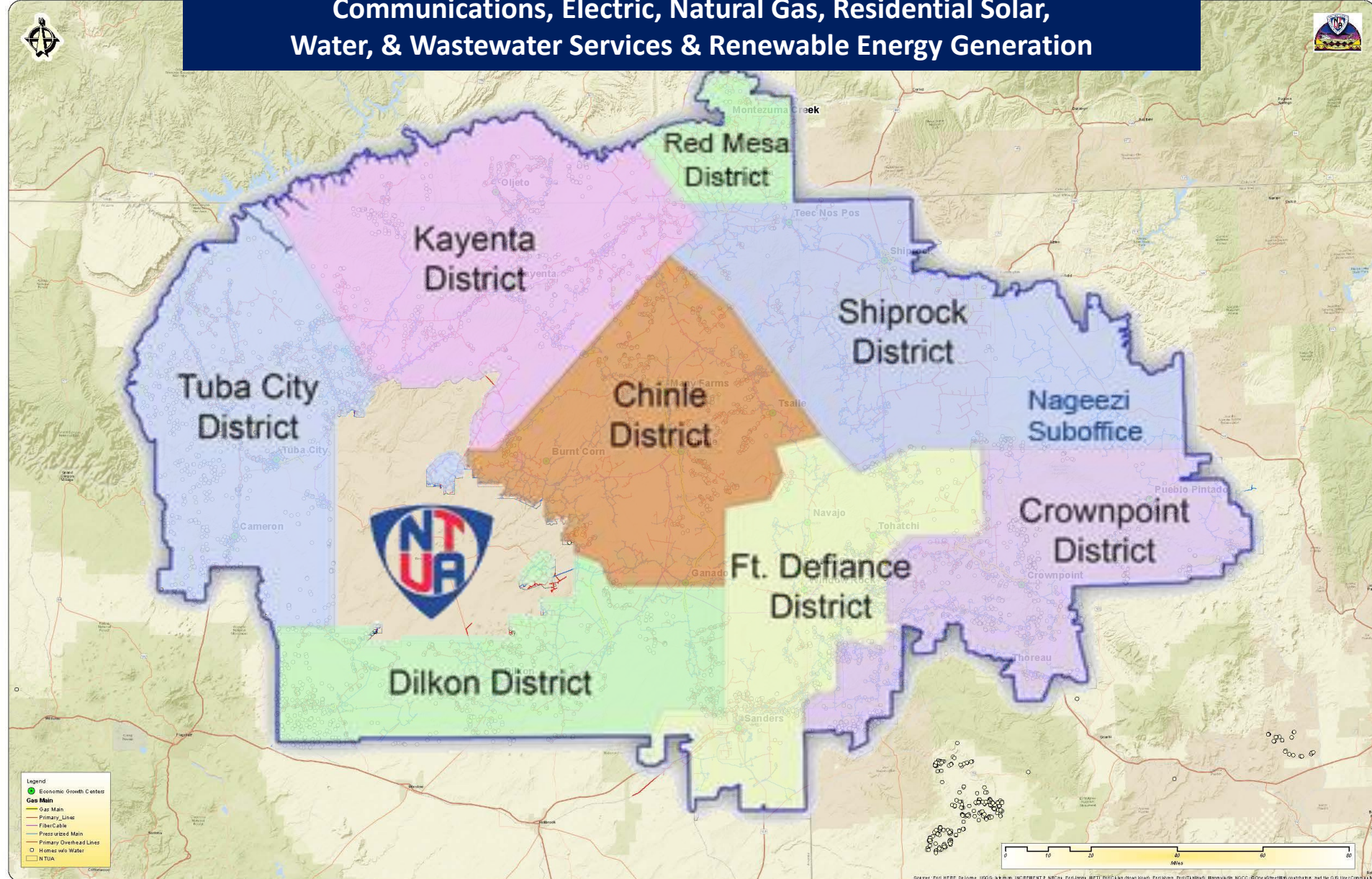
**86% lack natural gas**

**31% of all Navajo homes lack plumbing**

**60% lack landline phone services**

# NTUA Utilities Service Area

Communications, Electric, Natural Gas, Residential Solar,  
Water, & Wastewater Services & Renewable Energy Generation







**There are still approximately 13,000 families that still do not have basic access to electricity**

**Refrigeration of fresh food is a constant challenge**



**Thousands of families haul water at least three times a week – often driving more than 20 miles one way**

**Without water connections - outhouses are very common throughout the region**



**Thousands more rely on chopped wood and coal for heating and cooking**

**Heavy winters from November - April**

**Elevation on Navajo is 6,000 to 7,000 feet**

# What NTUA residential customers paid in 2022

## Per Residential Customers

**Average Yearly Revenue - 2022** **\$945.17**

**NTUA net margin on this sale is 5% or \$47.25**

- Each family receives a \$1,500 credit on the cost of connecting their home to the electric grid
- Cost to pay off the \$1,500 is over 40 years which is longer than depreciated life of equipment

If NTUA seeks low-cost loans for electric connections – all NTUA residential customers would pay 4x more each year

- Average Yearly cost for all customers would increase from **\$945/year to \$6,000 per year**





## **The average cost to connect one family in last several years has been approximately \$40,000**

- **Approximately 13,000 families are without electricity @ \$40k per home = \$540 million**
- **\$350 million for transmission lines and electric substations**
- **\$108 million for House wiring**

**\$998 million to \$1.0 Billion to extend electricity to all 13,000 families**

**To connect all families in 10 years with borrowed money from USDA over 40 years – @ zero interest rate - the average annual NTUA residential bill will go from \$945.17 per year to over \$6,000 per year**



## **16-year Residential Electric Connections – 7,788 families**



**Reduced need of unserved 18,000 families to approximately 13,000 homes w/o power**

**While keeping electric rates affordable with no rate increase in 16 years**

Year	Families
2023	383
2022	475
2021	446
2020	811
2019	460
2018	335
2017	409
2016	322
2015	256
2014	308
2013	407
2012	509
2011	782
2010	748
2009	677
2008	460



## NTUA Off-Grid Residential Solar

- Approximately 600 units deployed
- Sizes vary: 680 watt, 880 watt, 1080 watt, 1800 watt, 3000 watt systems
- Off-grid residential solar started early 1990s with small 200 watt solar units







**138 volunteer Line Workers representing 28 communities from 13 states helped to connect 233 Navajo families to the electric grid for the 1<sup>st</sup> time**

## 2020 - Light Up Navajo II



 - **Confirmed LUN II**       - **2019 Pilot Project**       - **Considering LUN II**

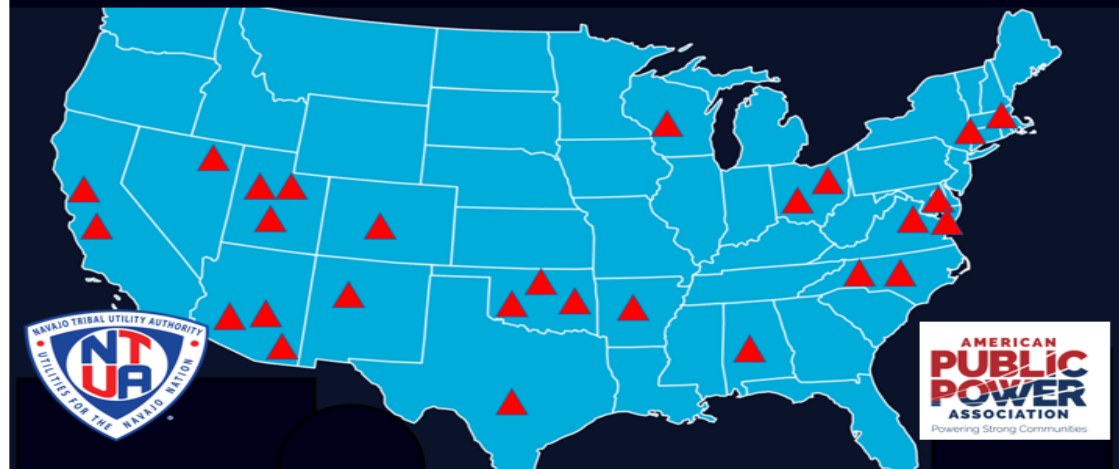
**179 volunteer Line Workers signed up, representing 48 communities 15 states**

## 2022 Light Up Navajo Mutual Aid Initiative



**69 volunteer Line Workers representing 14 utilities from 10 states helped to extend electricity to the homes of 137 Navajo families**

## 2023 Light Up Navajo IV Mutual Aid Initiative



**176 volunteer Line Workers representing 26 utilities from 16 states helping to extend electricity to 159 Navajo homes**



# MUTUAL AID TRAINING 2021 – 2022 – 2023



**Meter Loops/House wiring**

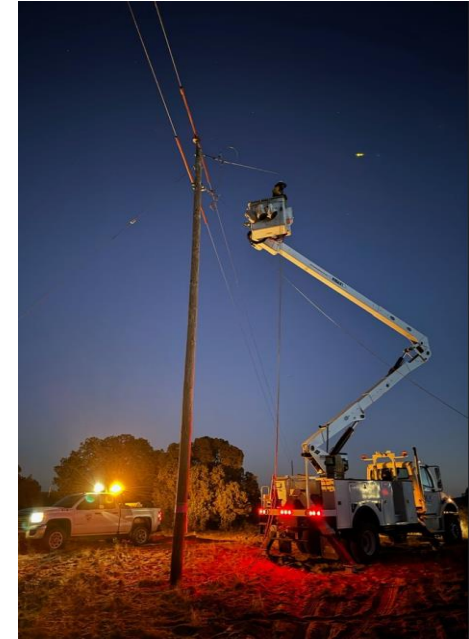
**97 Families**

**Electric Connections**

**183 Families**

**# of Visiting Line workers**

**208 Volunteers**



# Overall Summary – Light Up Navajo Initiative & Mutual Aid Training Programs

Electrification Campaign	Year & Season	No. of Families Connected	# of Volunteer Line Workers	# of Visiting Utilities # of States	Miles of Power Line
LUN I – Pilot Project	2019 Spring/Summer	233	138	28 from 13 states	58.35
LADWP Mutual Aid Training	2021 Fall	80	65	1 from CA	16.03
LUN III	2022 Spring/Summer	137	69	14 from 10 states	25.02
LADWP Mutual Aid Training	2022 Fall	53	103	1 from CA	18.05
LUN IV	2023 Spring/Summer	159	176	26 from 16 states	51.68
LADWP Mutual Aid Training	2023 Fall	37	20	1 from CA	15.22
Austin Energy Mutual Aid Training	2023 Fall	13	20	1 from TX	8.38
<b>OVERALL TOTAL</b>		<b>712</b>	<b>591</b>	<b>70 from 19 states</b>	<b>192.73</b>



**2024 Light Up Navajo V – April 7<sup>th</sup> – July 20<sup>th</sup>**

## 41 - Utilities – highlighted in Red are Returning

- **Alabama Rural Electric Association – AL**
- **Austin Energy – TX**
- **Central Wisconsin Electric Co-op - WI**
- **City of Cuyahoga Falls Electric - OH**
- **Columbus Electric Co-op – NM**
- **CPS Energy - TX**
- **Delta-Montrose Electric Association – CO**
- **Eau Claire Energy Co-op - WI**
- **Edmond Electric - OK**
- **Fayetteville Public Utilities – NC**
- **Farmington Electric Utility – NM**
- **Grand River Dam Authority – OK**
- **Gunnison Colorado Rural Electric – CO**
- **Lakeview Light & Power – WA**
- **Lehi City – UT**
- **Merrimac Municipal Light Dept. – MA**
- **Mountain Parks Electric – CO**
- **Mountain View Rural Electric – CO**
- **Murray City Power - UT**
- **Northcentral Tech College - WI**
- **Norwich Public Utilities – CT**
- **Oklahoma Municipal Power - OK**
- **Parkland Light & Water - WA**
- **Provo Power – UT**
- **Poudre Valley REA– CO**
- **Public Service Company of NM**
- **Riverland Energy Cooperative – WI**
- **Roseville Electric Utility – CA**
- **Sacramento Municipal Utilities District – CA**
- **Salt River Project – AZ**

- **Sangre de Cristo Electric Association– CO**
- **Santa Clara City - UT**
- **Spanish Fork Power & Light – UT**
- **Sulphur Springs Valley Electric Co-op – WI**
- **Tillamook People's Utility District - OR**
- **Town of Middleton – DE**
- **Town of Smyrna – DE**
- **Tucson Electric Power - AZ**
- **Trico Electric Cooperative, Inc. – AZ**
- **United Power - CO**
- **Village of Yellow Springs - OH**

## 16 - States

- **Alabama**
- **Arizona**
- **California**
- **Colorado**
- **Connecticut**
- **Delaware**
- **Massachusetts**
- **New Mexico**
- **North Carolina**
- **Ohio**
- **Oklahoma**
- **Oregon**
- **Utah**
- **Texas**
- **Washington**
- **Wisconsin**



4/15/2024

*\*Subject to change*

# Light Up Navajo V Utility Schedule



Dates	Crew 1	Crew 2	Crew 3	Crew 4	Crew 5
Week 01 Sunday, April 7, 2024	SRP (Arizona)	SRP (Arizona)	Grand River Dam Authority (Oklahoma)	Grand River Dam Authority (Oklahoma)	
	Dilkon District	Dilkon District	Fort Defiance District	Fort Defiance District	
	Comm: Navajo Station SLAs: Cornfields  <i>Orientation: Fort Defiance</i>	Comm: Navajo Station SLAs: Cornfields  <i>Orientation: Fort Defiance</i>	Comm: Naschitti Little Badger SLAs: Naschitti, St. Michaels  <i>Orientation: Fort Defiance</i>	Comm: Naschitti Little Badger SLAs: Tohatchi, Twin Lakes  <i>Orientation: Fort Defiance</i>	
Week 02 Sunday, April 14, 2024	SRP (Arizona)	SRP (Arizona)	Edmond Electric (Oklahoma)	Roseville Electric Utility (California)	SMUD (California)
	Dilkon District	Dilkon District	Fort Defiance District	Tuba City District	Tuba City District
	Comm: Navajo Station  SLAs: DK, Indian Wells, Jeddito, Whitecone  <i>Orientation: Fort Defiance</i>	Comm: Navajo Station  SLAs: Birdsprings, Leupp  <i>Orientation: Fort Defiance</i>	Comm: Naschitti Little Badger  SLAs: Fort Defiance, Sawmill  <i>Orientation: Fort Defiance</i>	Comm: Kaibeto (Rabbit Hill)  SLAs: Cameron, Coalmine Canyon, Tuba City  <i>Orientation: Tuba City</i>	Comm: Kaibeto (Rabbit Hill)  SLAs: Tonalea/Red Lake  <i>Orientation: Tuba City</i>
Week 03 Sunday, April 21, 2024	Austin Energy (Texas)	Austin Energy (Texas)	DEMEC (Delaware)	Roseville Electric Utility (California)	SMUD (California)
	Fort Defiance District	Fort Defiance District	Dilkon District	Tuba City District	Tuba City District
	Comm: Naschitti Little Badger (Or Forest Lake)  SLAs: Crystal, Naschitti  <i>Orientation: Fort Defiance</i>	Comm: Naschitti Little Badger (Or Forest Lake)  SLAs: Naschitti  <i>Orientation: Fort Defiance</i>	Comm: Jacqueline Riggs  SLAs: Jeddito  <i>Orientation: Fort Defiance</i>	Comm: Kaibeto (Rabbit Hill) - <i>Service Drops</i>  SLAs: N/A  <i>Orientation: Tuba City</i>	Comm: Kaibeto (Rabbit Hill) - <i>Service Drops</i>  SLAs: N/A  <i>Orientation: N/A</i>

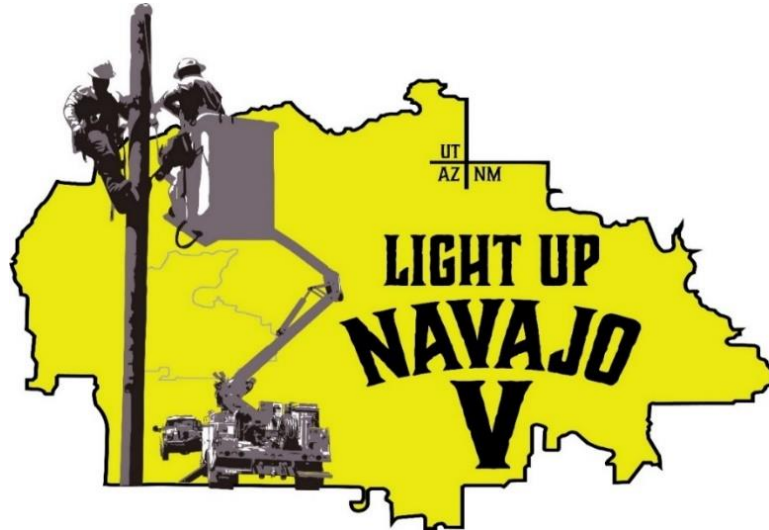


Week 03 Sunday, April 21, 2024	Austin Energy (Texas)	Austin Energy (Texas)	DEMEC (Delaware)	Roseville Electric Utility (California)	SMUD (California)
	Fort Defiance District	Fort Defiance District	Dilkon District	Tuba City District	Tuba City District
	Comm: Naschitti Little Badger (Or Forest Lake)	Comm: Naschitti Little Badger (Or Forest Lake)	Comm: Jacqueline Riggs	Comm: Kaibeto (Rabbit Hill) - <i>Service Drops</i>	Comm: Kaibeto (Rabbit Hill) - <i>Service Drops</i>
	SLAs: Crystal, Naschitti  <i>Orientation: Fort Defiance</i>	SLAs: Naschitti  <i>Orientation: Fort Defiance</i>	SLAs: Jeddito  <i>Orientation: Fort Defiance</i>	SLAs: N/A  <i>Orientation: Tuba City</i>	SLAs: N/A  <i>Orientation: N/A</i>
Week 04 Sunday, April 28, 2024	Austin Energy (Texas)	Austin Energy (Texas)	Tucson Electric Power (Arizona)	Tucson Electric Power (Arizona)	Northcentral Technical College (Wisconsin)
	Fort Defiance District	Fort Defiance District	Tuba City District	Tuba City District	Chinle District
	Comm: Naschitti Little Badger (Or Forest Lake)	Comm: Naschitti Little Badger (Or Forest Lake)	Comm: Kaibeto (Rabbit Hill)	Comm: Kaibeto (Rabbit Hill)	<i>Over a Mile: Berlinda Simpson (Nazlini) - Scattering &amp; Framing</i>
	SLAs  <i>Orientation: N/A</i>	SLAs  <i>Orientation: N/A</i>	SLAs: Tonalea/Red Lake  <i>Orientation: Tuba City</i>	SLAs: Tonalea/Red Lake  <i>Orientation: Tuba City</i>	SLAs: Chinle, Many Farms, Tsaille- Wheatfields  <i>Orientation: Tuba City</i>
Week 05 Sunday, May 5, 2024	Open	Open	Tucson Electric Power (Arizona)	Tucson Electric Power (Arizona)	Northcentral Technical College (Wisconsin)
			Tuba City District	Tuba City District	Chinle District
			Comm: Kaibeto (Rabbit Hill)	Comm: Kaibeto (Rabbit Hill)	<i>Over a Mile: Berlinda Simpson (Nazlini) - Scattering &amp; Framing</i>
			SLAs: Tonalea/Red Lake  <i>Orientation: N/A</i>	SLAs: Tonalea/Red Lake  <i>Orientation: N/A</i>	SLAs: Ganado, Kinlichee, Lukachukai  <i>Orientation: N/A</i>

Week 06 Sunday, May 12, 2024	Open	Open	Provo Power (Utah)	Santa Clara City (Utah) Central Wisconsin Electric Cooperative (Wisconsin) <i>Orientation: Tuba City</i>	<u>Note:</u> Santa Clara City / Central Wisconsin Electric Cooperative / Provo Power / Merrimac Municipal Light Department Orientation date and time TBD.  Orientation site: Tuba City
			Tuba City District	Tuba City District	
			Comm: TBD SLAs: Kaibeto, LeChee  <i>Orientation: Tuba City</i>	Comm: Ruby Tallsalt SLAs: Coppermine  Merrimac Municipal Light Department (Massachusetts) <i>Orientation: Tuba City</i>	
Week 07 Sunday, May 19, 2024	Lakeview Light & Power (Washington)	Parkland Light & Water Company (Washington)	Sulphur Springs Valley Electric Cooperative (Arizona)	PNM (New Mexico)	
	Chinle District  <i>Over a Mile: Berlinda Simpson - Nazlini</i> SLAs:  <i>Orientation: Chinle</i>	Chinle District  <i>Over a Mile: Berlinda Simpson (TBD) - Nazlini</i> SLAs:  <i>Orientation: Chinle</i>	Dilkon District  <i>Orientation: Chinle</i>	Shiprock District  Comm: Shaun Eskee  <i>Orientation: Shiprock</i>	
Memorial Week Sunday, May 26, 2024					
Week 08 Sunday, June 2, 2024	Fayetteville Public Works Commission (North Carolina)	Fayetteville Public Works Commission (North Carolina)	Norwich Public Utilities (Connecticut) Mountain Parks Colorado Rural Electric (Colorado)	PNM (New Mexico)	
	Fort Defiance District  Comm: Mexican Springs  <i>Orientation: Fort Defiance</i>	Fort Defiance District  Comm: Mexican Springs  <i>Orientation: Fort Defiance</i>	Chinle District  <i>Over a mile: Audrey Gray (Black Mesa)</i>  SLAs: Black Mesa  <i>Orientation: Fort Defiance</i>	Shiprock District    <i>Orientation: Fort Defiance</i>	



<b>Week 09</b> Sunday, June 9, 2024	Fayetteville Public Works Commission (North Carolina)  Comm: Manuelito (Tentative)	Fayetteville Public Works Commission (North Carolina)  Comm: Manuelito (Tentative)	Norwich Public Utilities (Connecticut)	Trico Electric Cooperative (Arizona)	
			Gunnison County Electric Association (Colorado)		
			Chinle District  <i>Over a mile: Audrey Gray (Black Mesa)</i>		
<b>Week 10</b> Sunday, June 16, 2024	Edmond Electric (Oklahoma)	Trico Electric Cooperative (Arizona)	Village of Yellow Springs (Ohio)	CPS Energy (Texas)	
<b>Week 11</b> Sunday, June 23, 2024	City of Cuyahoga Falls Electric (Ohio)	Tillamook People's Utility (Oregon)	Delta Montrose (Colorado)	Riverland Energy Cooperative (Wisconsin) 1/2 Crew - 2	
				Murray City Power (Utah)	
<b>4th of July</b> Sunday, June 30, 2024					
<b>Week 12</b> Sunday, July 7, 2024	Oklahoma Municipal Power Authority (Oklahoma)	Sangre de Cristo (Colorado) Colorado Rural Electric	Poudre Valley (Colorado) Colorado Rural Electric	United & Mtn. View Colorado Rural Electric (Colorado)	Farmington Electric Utility System (New Mexico)
<b>Week 13</b> Sunday, July 14, 2024	Alabama Rural Electric Assoc. (Alabama)	Alabama Rural Electric Assoc. (Alabama)	Columbus Electric Co-op (New Mexico)	Eau Claire Energy Cooperative (Wisconsin) 1/2 Crew - 2	Farmington Electric Utility System (New Mexico)
				Open (1/2 - Crew)	



**For More Info:**

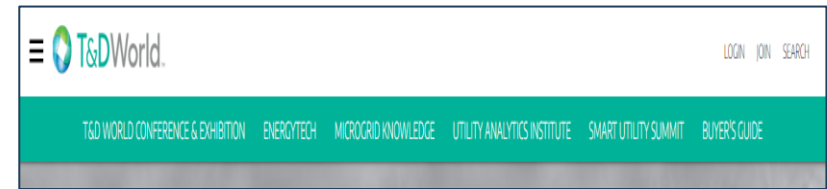
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OVERHEAD DISTRIBUTION

## Mutual Aid Without a Storm: The Light Up Navajo Project

Sept. 21, 2023

Volunteer lineworkers bring first-time electricity to American homeowners through the Light Up Navajo project.

Amy Fischbach

When the lights go out in communities nationwide, crews join forces to rebuild infrastructure and restore power. Through the Light Up Navajo project, volunteer lineworkers provide mutual assistance — but without a storm.

The humanitarian project, which launched in 2019, brings the line trade together to illuminate the 13,500 homes without electricity on Navajo Nation. About 75% of all U.S. households without power live in this 27,000-square-mile region, which spans parts of Arizona, New Mexico and Utah, has 300,000 residents and a total of 55,000 homes.







# NTUA – Navajo Generation, Inc. Solar Development Helping Navajo Communities Prosper

- **Infrastructure development**
  - Increase electric distribution lines
  - Increase water distribution lines
  - Increase communication assets
  - Solar Generation for Navajo use
- New Tax dollars to Navajo Nation for more infrastructure construction and utility use
- Creating a new energy workforce to increase job opportunities for Navajo
  - Providing specialized solar training for the Navajo people
- Create expenditure of dollars in the local community, e.g., hotels, food, arts and crafts vendors, and local services
- Increase additional scholarship/internship opportunities for students in development area chapters
- Use exceeds proceeds from the solar projects are being used to pay for the electrification of Navajo Homes, including the Light Up Navajo mutual aid initiative and to stabilize NTUA residential electric rates



# RENEWABLE ENERGY PROJECTS DEVELOPMENT TIMELINE

