# Long-Term Opportunity for Navajo Nation in Post-Coal Reclamation Economy

## Proper Cleanup of NGS and Kayenta Mine Will Require Hundreds of Skilled Workers for Years to Come

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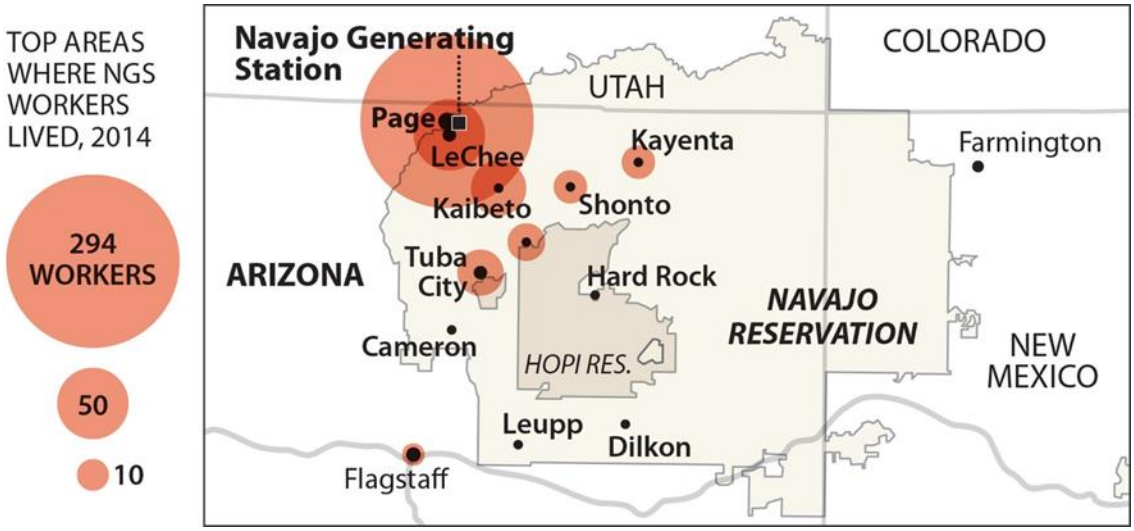
# Overview

Imminent closure of the coal-fired Navajo Generating Station (NGS) and its companion Kayenta Mine are portrayed sometimes as economically apocalyptic events that will drive the irreplaceable loss of hundreds of jobs that support households and businesses over thousands of square miles.

Often overlooked in these discussions, however, is the likelihood that reclamation work at the mine and the power plant will take years to complete and will require hundreds of skilled employees, many of whom work now at NGS or Kayenta Mine.




The map above, based on permit filings, shows the payroll reach of NGS and, by extension, the jobs base for a post-coal reclamation economy around the plan. The mine, which is close to the town of Kayenta, has a jobs-footprint distribution similar to NGS's. Cleanup work at NGS and Kayenta will take at least five years to complete, by federal government estimates, activity that can create a viable bridge toward a more diversified regional economic base.

A successful transition following closure of the power plant and the mine complex will require that the responsible parties be held accountable for their cleanup obligations. Public pressure may be required for proper reclamation of Kayenta Mine, which is owned by Peabody Energy, part of an industry that is not especially well known for its reclamation track record.

It will require also that other opportunities be exploited around the post-coal repurposing of NGS infrastructure, which can be retooled for utility-scale solar power generation of the type already being developed on Navajo lands and for which there is a growing market.

The Navajo Tribal Utility Authority just this fall announced an aggressive expansion[1],[2] into

[1] Gallup Independent: NTUA adds to Its solar footprint on Navajo (November 2018).
[2] IEEFA: Growing Interest in Developing Navajo Utility-Scale Solar Industry: Policy Momentum and Grassroots Support; Vast Tribal Natural Resource Remains Largely Untapped (October 2018).

utility-scale solar, and recent record-low bids[3] for utility-scale solar elsewhere in Arizona and neighboring Nevada indicate a solar market in ascendance.

This report describes the potential for elements of a post-coal cleanup economy based on the following:

- An emerging body of research that suggests substantial economic opportunity in power plant and coal mine cleanup;
- Federal assessments of long-term reclamation work associated with the Kayenta Mine after its closure;
- Projections for NGS land and water remediation requirements that will take perhaps a generation to complete;
- A growing realization of the need for responsible transition policy that will support a post-coal economy.

# Why Is This Issue of Such Local Importance?

Navajo Generating Station and the Kayenta mine have been crucial components of the economy of northeastern Arizona and neighboring parts of New Mexico and Utah since the early 1970s.

The NGS-Kayenta complex has been especially important over the years to the towns of Page and Kayenta, which are almost 100 miles apart, and to smaller communities in the area. However, the plant, because of its increasingly uneconomic footing, is slated for closure at the end of 2019, and its retirement will spell the end of activity at the mine too, because NGS is Kayenta Mine's only customer.

As recently as 2014, the Kayenta Mine, which is owned by Peabody Energy, logged a $60.8 million payroll. That figure included pay ($34.6 million) and benefits ($26.2 million), and pencilled out wage-and salary-wise to about $78,000 per year per employee, an average most likely inflated by executive and managerial salaries.[4]

Trends in coal-worker pay in recent years reflect growing pressure on an industry that is in decline nationally and is likely to continue to shrink.[5] While U.S. coal industry executives have engineered enormous gains for themselves since 2004—many of those occurring through bankruptcy proceedings—rank-and-file coal-worker pay has lagged:

"Executive pay averaged $200,000, up 60 percent from $125,000, while paychecks for truck and tractor operators rose just 15 percent, to $43,770 from $38,060. Pay for construction jobs in mining rose just 11 percent, to $35,080 from $31,470."[6]

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[3] GreenTech Media: Nevada's 2.3-Cent Bid Beats Arizona's Record-Low Solar PPA Price (June 2018).
[4] Office of Surface Mining and Reclamation: Kayenta Mine SMCRA Permit Renewal AA-4 Environmental Assessment (4834-0139-7058.1), Page 257 (August 2017).
[5] IEEFA report: Record Drop in U.S. Coal-Fired Capacity Likely in 2018 (October 2018).
[6] New York Times/Bureau of Labor Statistics: Coal Jobs Prove Lucrative, but Not for Those in the Mines (May 2017).

Jobs at the power plant pay about the same.[7]

These wages and salaries at the mine and the plant stand out regionally, where "incomes are highest for mine workers and for those employed in tourism or government," as noted in a 2017[8] assessment and where the NGS-Kayenta complex, which employs about 800 workers, offers among the best-paying jobs.[9]

Further, jobs of any kind in the area are hard to come by. The unemployment rate among Navajo and Hopi reservation populations, for instance, is about 50 percent.[10] Arizona's statewide unemployment rate, by comparison, is less than 5 percent.[11]

The importance of any single paycheck in northeastern Arizona is further magnified by the local "dependency ratio," which measures employment per household by comparing "the size of the economically dependent population age groups to the size of the working-age population."[12] Put another way, every job in the region typically supports several members of extended families.

The sheer scarcity of good-paying work is why the fate of NGS and the Kayenta Mine are such intensely debated issues and why some leaders continue to advocate[13] for keeping the complex open—even in the face of its increasingly precarious footing and as the coal-fired electricity generation business continues to lose market share to natural gas, wind and solar.[14]

NGS decommissioning, driven by market forces, will begin in early 2020.

The essential economic problem at NGS mirrors national realities as well: The plant produces electricity that cannot compete pricewise with other forms of generation, including from natural gas-fired plants and, increasingly, from wind and solar.

The economic feasibility of NGS in fact is not at issue. The question, rather, is how to responsibly manage a transition toward a more diversified regional economy[15] that can function without NGS.

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[7] Arizona State University: The Economic Contribution of the Navajo Generating Station on the City of Page, Page 6.
[8] Office of Surface Mining and Reclamation, ibid., Page 3-95 (July 2017).
[9] Bureau of Reclamation/Bureau of Indian Affairs: Environmental Assessment Navajo Generating Station Extension Lease, Page 3-94.
[10] Office of Surface Mining and Reclamation, ibid., Page 363 and 446 (August 2017).
[11] Bureau of Labor Statistics: Unemployment Rates for States, Seasonally Adjusted (October 2018).
[12] Office of Surface Mining and Reclamation, ibid., Page 3-91.
[13] Navajo Nation Office of the President and the Vice President and Navajo Nation Office of the Speaker: Press release (November 2018).
[14] IEEFA fact sheet: Why Navajo Generating Station Is No Longer Commercially Viable (October 2018).
[15] IEEFA/DinéHózhó L3C: A Transition Plan for Communities Affected by the Closings of Navajo Generating Station and Kayenta Mine (June 2017).

# What Job Security Do NGS/Kayenta Offer If Kept Open (Not Much), and What Job Security Does Reclamation/Remediation Work Offer? (Five Years+)

Given that NGS is scheduled to close at the end of 2019, remediation and reclamation work offers far better long-term job prospects than those at either the power plant or Kayenta Mine (Table 1).

(Note: While "reclamation" and "remediation" are often used interchangeably, reclamation more typically applies to mine-land restoration and remediation to ash and toxic-waste plant-site cleanup. "Decommissioning" has to do with the initial phases of plant shutdown).

**Table 1: Job Outlook for NGS-Kayenta Operations Versus Remediation and Reclamation**

| | Jobs Outlook |
|---|---|
| **Coal-fired NGS operations** | 1 year |
| **Primary NGS remediation** | 5 |
| **Ongoing NGS remediation (limited jobs)** | Up to 30 years |
| **Kayenta mining operations** | 1 year |
| **Primary Kayenta Mine reclamation** | 5 to 7 years |
| **Ongoing Kayenta Mine reclamation (limited jobs)** | 7 to 35 years |

Granted, most of this work could be finished within five years, but full remediation and reclamation will take years to complete and will require an array of skilled work.

The utility-industry owners of NGS, primarily the Tempe-based Salt River Project, and Peabody Energy, the owner of the operations at Kayenta Mine, are obligated to pay for remediation and reclamation—and to do so at prevailing wage and salary levels. Their responsibilities, by contract, include post-closure activities.

The verbatim bullet-point list[16] below from the September 2017 environmental assessment for an NGS renewal permit application illustrates the scope of work required, spelling out "major tasks that may include, but are not limited to the following," none of which are overnight jobs:

- "Identify all assets suitable for salvage or recycling, such as scrap metals, operating equipment, spare equipment, warehouse stock, process chemicals and fuels, and catenary railroad equipment."
- "Use a variety of heavy equipment including cranes, loaders, dozers, scrapers, and excavators to implement retirement activities. Use blasting to bring down some structures."

[16] Bureau of Reclamation/Bureau of Indian Affairs: ibid., Page 20.

- "Remove all foundations and concrete structures to no less than 12 inches below final grade."
- "Remove all hazardous and universal wastes and regulated substances, and drain and remove all fluids from equipment, pipes, and storage facilities."
- "Remove oil-containing subgrade structures where practicable."
- "Cap and abandon in place large underground piping and electrical utilities, filling those where traffic is anticipated."
- "Demolish and remove the overhead catenary system, electrical distribution lines, supporting superstructure, concrete foundations, and transformers for the railroad."
- "Close and cap in place the solid waste landfill using a minimum of 12 inches of cover soil with vegetation to reduce erosion of the cover."
- "Transport generated wastes to the existing solid waste landfill or to a newly constructed solid waste landfill designated within the ash (CCR) disposal area but not within the existing ash (CCR) landfill."
- "Close in place the ash (CCR) landfill in accordance with U.S. Environmental Protection Agency (EPA) rules and regulatory guidance (80 Fed. Reg. 21301; 40 CFR Part 257; EPA 2017f)."
- "Identify the extent, amount, and quality of perched water and develop and implement methods to remove the perched water."
- "Modify the existing topography to maintain proper drainage and replant native vegetation with a seed mix developed in consultation with the Navajo Nation Division of Natural Resources during restoration following removal of non-retained facilities."
- "Use the existing (or new) on-site solid waste landfill for suitable inert demolition debris."
- "Transport and dispose of hazardous materials in compliance with the Resource Conservation and Recovery Act (RCRA; 42 USC §6901 et seq. (1976) and other applicable requirements."
- "Develop and implement a drainage plan around the remaining structures."
- "Repair roads damaged during retirement activities and retain perimeter fences."

How long might such work take?

"Five years for the Salt River Project Agricultural Improvement and Power District to complete plant retirement and 30 years for long-term monitoring and remediation," concludes[17] the U.S. Bureau of Reclamation, which has NGS cleanup oversight.

Reclamation across thousands of acres of land in and around Kayenta Mine will be no less involved or demanding. An August 2017 environmental assessment[18] for a permit renewal application for Kayenta Mine puts a hard figure on the job requirements:

> *"The number of employees at the Kayenta Mine would decrease from 317 employees to the approximately 175 employees required to conduct reclamation."*

The numbers cited here appear to be approximate. Current Peabody filings with the federal government show that Kayenta employs a total of 418 people, including 338 in strip-mining operations and 80 in administrative positions.

[17] Bureau of Reclamation: Press Release (November 2017).
[18] Office of Surface Mining and Reclamation: ibid., Chapter 2, Page 9.

Regardless, reclamation work at Kayenta, according to the mine renewal-permit environmental assessment, will last longer than the remediation work at NGS:

> *"Some of these activities will extend 35 years into the future and possibly beyond."*[19]

Mine reclamation activity will encompass thousands of acres in and around Kayenta Mine itself and the nearby former Black Mesa Mine. The project will include at least 7,000 acres within the Kayenta Mine footprint that are required by law to be "reclaimed in accordance with permit requirements to meet post mining land uses of livestock grazing, wildlife habitat, and cultural plant use."[20] Thousands of other acres in the area are subject to similar reclamation obligations.

Collectively—at NGS and Kayenta Mine—these are epic requirements that will take time to meet.

# Toward a Post-Coal Reclamation and Remediation Economy

Other traditionally coal-dependent economies are going through transitions much like the one that is unfolding in northeastern Arizona.

In the Powder River Basin of Montana, for instance, the Colstrip coal mine-and-power plant complex that is the economic heart of the area also has a limited future because of the same difficulties facing NGS. Here, discussions are occurring now between various parties around plans for a post-coal remediation/reclamation industry.

A study published jointly this year by the Northern Plains Resource Council and the International Brotherhood of Electrical Workers Local 1638 details how "remediation can be a significant contributor to job creation in natural resource extraction communities."[21]

Data cited in the report indicates that the costs for requisite cleanup work will run into the hundreds of millions of dollars and will take years to complete. The study includes detail from several Duke Energy coal-plant remediation projects that employ hundreds of people in North Carolina. And it quotes a Duke Energy official as an example of an emerging mindset around post-coal economic development:

> *"It's a whole body of work that's going to happen across the nation and it's a huge opportunity for all of us."*

The study notes also that much of the heavy lifting around remediation and reclamation is not unrelated to jobs already performed by mine and plant workers: "The local workforce in Colstrip already has many of these skills."

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[19] Office of Surface Mining and Reclamation: ibid., Chapter 2, Page 9.
[20] Office of Surface Mining and Reclamation: ibid., Chapter 2, Page 9.
[21] Doing it Right: Colstrip's Bright Future With Clean-up (July 2018).

Similarly, a report published this year by the Powder River Basin Resource Council in Wyoming outlined some of the core arguments, capturing the growing push for a post-coal reclamation economy in the following passage:

> *"As a part of the diversification and stabilization of the Wyoming economy, a greater emphasis on contemporaneous reclamation of our coal mines is a logical and beneficial step to take. Increasing contemporaneous reclamation will ensure the coal mines that have contributed so much to Wyoming's economy do not become a financial drain as market forces change the picture for coal sales. And, at the same time, accelerated reclamation will increase economic activity and provide good jobs."*[22]

In northeastern Arizona, competing views over how best to transition away from a coal-dependent economy revolve around an increasingly commonly accepted point of view: That change is inevitable.

This acceptance, at the center of a "replacement lease"[23] that allows NGS to continue to operate through December of next year, is of "historic importance" in many ways, the plant's manager wrote in an op-ed in the daily Navajo Times, a newspaper published by the Navajo Nation government in Window Rock, Ariz.

The lease, which expires in 12 months, provides the "glide path" needed to smooth the huge economic transition that will occur when NGS finally closes," the author wrote, adding that it:

> "… will ensure continued employment for Navajos during the years-long decommissioning process."[24]

While this is a notable jobs-outlook acknowledgement, it is important to add that post-coal job opportunities in remediation and reclamation will not support the regional economy forever, but they can offer a vital bridge to diversification that includes build-out of a modern regional power-generation industry.

Such an industry can emerge from some of the existing components of the NGS complex and from development of Navajo natural resources that include some of the best solar-power potential in the world.[25]

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[22] Powder River Basin Resource Council: Reclaim Wyoming: Prioritize Coal Mine Reclamation (July 2018).
[23] Bureau of Reclamation, Replacement Lease Between the Navajo Nation and Salt River Project Agricultural Improvement and Power District (July 2017).
[24] Navajo Times: Guest Essay: Ratifying NGS Replacement Lease the Right Thing to Do (June 2017).
[25] IEEFA: Growing Interest in Developing Navajo Utility-Scale Solar Industry: Policy Momentum and Grassroots Support; Vast Tribal Natural Resource Remains Largely Untapped (October 2018).

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