

NARUC Presentation: San Juan CCUS Project
Featuring **NATHAN DUCKETT**, Mayor of Farmington, New Mexico and
DR. DAVE GOLDTOOTH, Interim Superintendent, Central Consolidated
School District, Shiprock, New Mexico

February 2020



**Four Corners
Region**

**Impacts to
Region**

**Impacts to
Navajo Nation
& Central
Consolidated
School District**

The Team

The Project

**Additional
Information**

WIN, WIN, WIN

**Project
Support**



Navajo Nation



Farmington



FARMINGTON

WHERE OUTDOOR LOVERS AND ACTIVE FAMILIES

thrive

Downtown

Mountains

Parks

Rivers

Lakes

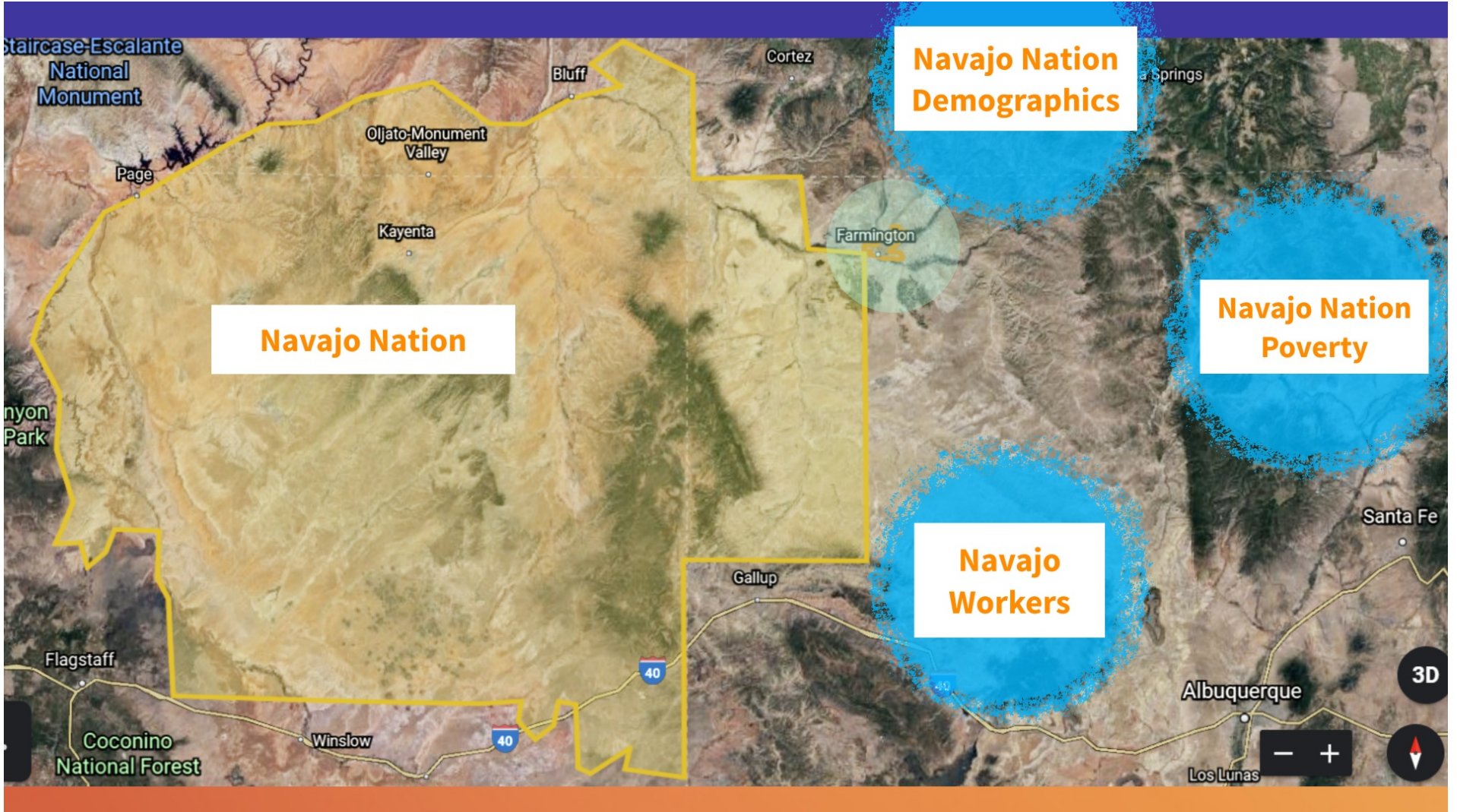












- **The Navajo Nation is the largest reservation in the United States, covering more than 27,000 square miles and extending from Arizona into Utah and New Mexico - with a population of approximately 173,667 people. (The size of West Virginia).**

Shiprock

Bisti Badlands

Monument Valley







Navajo Nation Poverty

• “The systemic poverty that pervades in Navajo Nation is nothing short of a national travesty.” *

o On the reservation, an estimated 32% of all homes lack electricity, 31% do not have indoor plumbing, and 38% lack running water. In America. In 2019.

o The Navajo Nation is home to the poorest of the 10 largest Indian tribes. The poverty rate among the Navajo is three and a half times the national mean. The lowest median family income, \$13,940. The Navajo also had the lowest per capita income, \$4,788.

o More than 75% of Navajo school age children live in poverty. 100% of Navajo seniors over age 85 live in poverty.

o Approximately only 1/2 of Navajo students graduate high school.

*Vincent DeGennaro, Jr., internal medicine physician providing medical services to Navajo residents, <https://www.kevinmd.com/blog/2019/05/the-systemic-poverty-in-navajo-nation-is-a-national-travesty.html>













Navajo Workers



- Navajo workers support not just their immediate families, but support their extended families: Each salary derived from mine and plant salaries supports on average 20 to 30 people.
- Unemployment in Navajo Nation officially sits at 11% — nearly triple the U.S. average — but this number doesn't account for the 56% of adult Navajos who aren't considered to be part of the labor force at all. Taking those people into account, the unemployment rate is pushing 70%.
- A significant amount of the Nation's coal production facilities are located on Native American reservations. Coal Mines and coal fired plants are the primary employers on Navajo and many other reservations. Shut-down of coal mines and plants will have a disproportionate impact on Native Americans.

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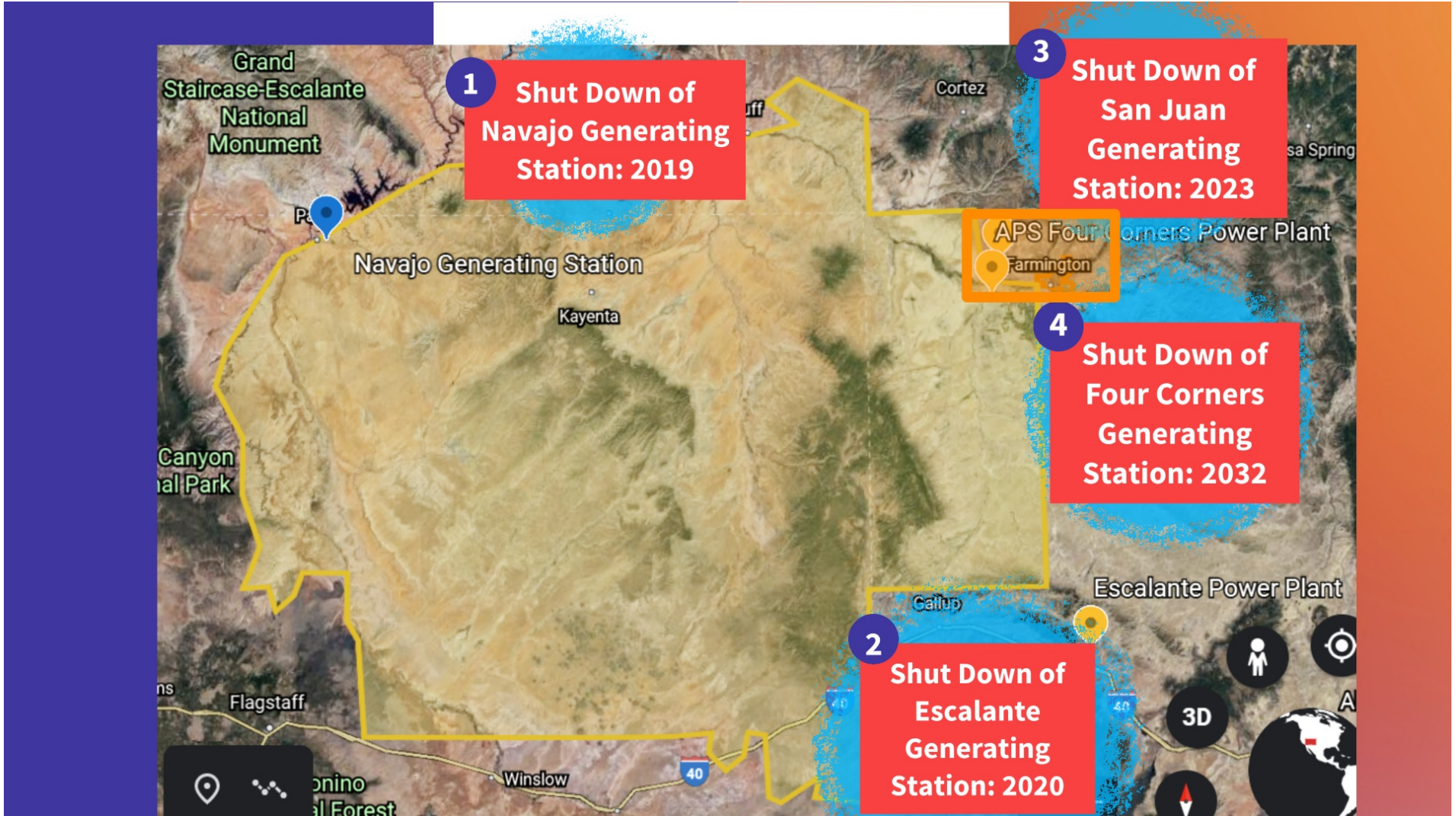
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Based on independent third party review conducted by Four Corner's Economic Development:

- **Loss of at least 1500+ Direct workers including contractors, which figure does NOT include additional third-tier community job loss due to the reduction of worker-spending on goods and services within the local economy**
- **Loss of over \$ 50 million annually in state and local tax revenues**
- **Loss of over \$100 million in private wages**
- **Wipes out middle class in impoverished area**
- **Accelerated Erosion of Community and Families**
- **Loss of important educational property tax revenues**
- **Loss of Sizeable Corporate Charitable Donations to aid in social programs and educational scholarships**









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Impacts to Navajo Nation & Central Consolidated School District

About 80% of the Navajo Nation's annual budget comes from revenues associated with extractive industry and supplies a majority of Navajo workers with good paying jobs, which has created a viable middle class.

Navajo Generating Station has already closed, Escalante is set to close in 2020, San Juan Generating Station is slated to close in 2022, and Four Corners Power Plant closure is set for 2032.

CCSD is comprised of over 90% Navajo Children - with some of the worst poverty rates in the country

SJGS and Four Corners are 80% of the Property Tax Revenues for CCSD. These funds are critical to the education of CCSD children

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City of Farmington



ENCHANT ENERGY

Westmoreland Mining

**Farmington
Receives 100%
Ownership of the
Plant**

**Community
Stakeholders**

**Enchant Installs
Carbon Capture
Project and
Operates SJGS**

**Farmington
Partners with
Enchant**

**Enchant Partners with Top-Tier Global
Leaders Mitsubishi Heavy Industries as the
Technology provider, and Kiewit Power
Constructors Co. and Sargent & Lundy as
the combined Engineering, Procurement
and Construction Contractor**

**Enchant &
Farmington Partner
with Westmoreland
on Coal Supply**

To achieve a Win, Win, Win for the community the Team is conducting ongoing community listening tours and outreach to:

- **Central Consolidated School District**
- **San Juan College**
- **Surrounding Communities**
- **Navajo Central and Local Governments**
- **Charitable Groups**
- **Economic Development Groups**
- **Environmental Advocates**

Farmington Receives 100% Ownership of the Plant

- **PNM and other owners of SJGS have agreed to exit the plant by 2022.**
- **This means that PNM and other exiting owners will regulatorily abandon the plant and that Farmington and Enchant will operate the plant as a non-utility merchant plant**
- **City of Farmington is the last remaining owner of the plant.**

Farmington Partners with Enchant





Enchant Partners with Top-Tier Global Leaders
Mitsubishi Heavy Industries
as the Technology provider,
and Kiewit Power Constructors Co. and Sargent & Lundy as the combined Engineering, Procurement and Construction Contractor

A stylized, grey, curved graphic element resembling a wave or a stylized letter 'S' that forms part of the Sargent & Lundy logo.

Sargent & Lundy



**Enchant &
Farmington
Partner with
Westmoreland on
Coal Supply**



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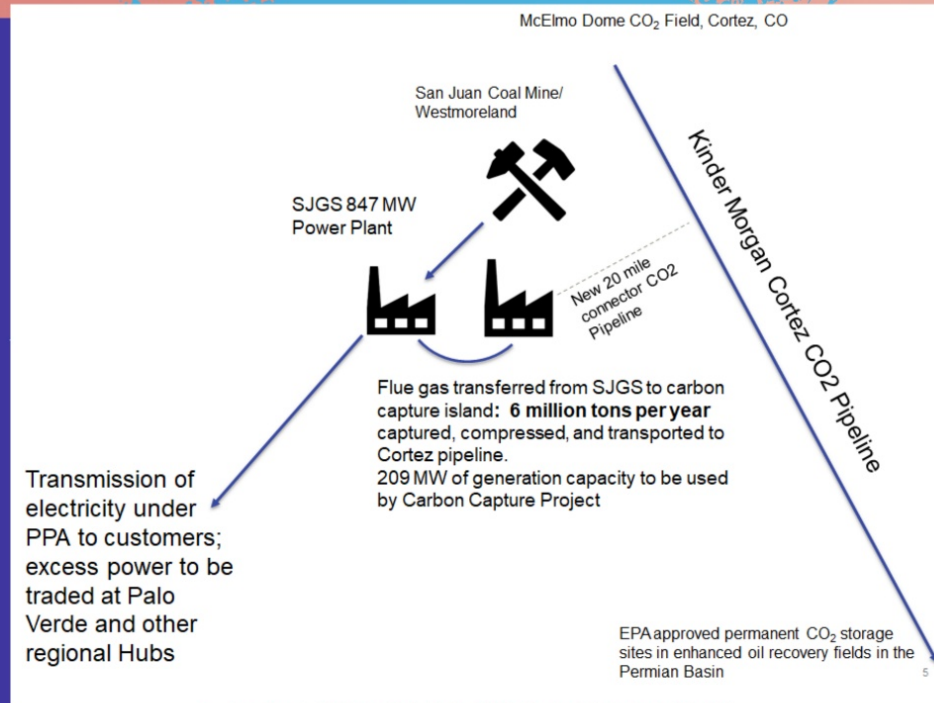
Project
Diagram



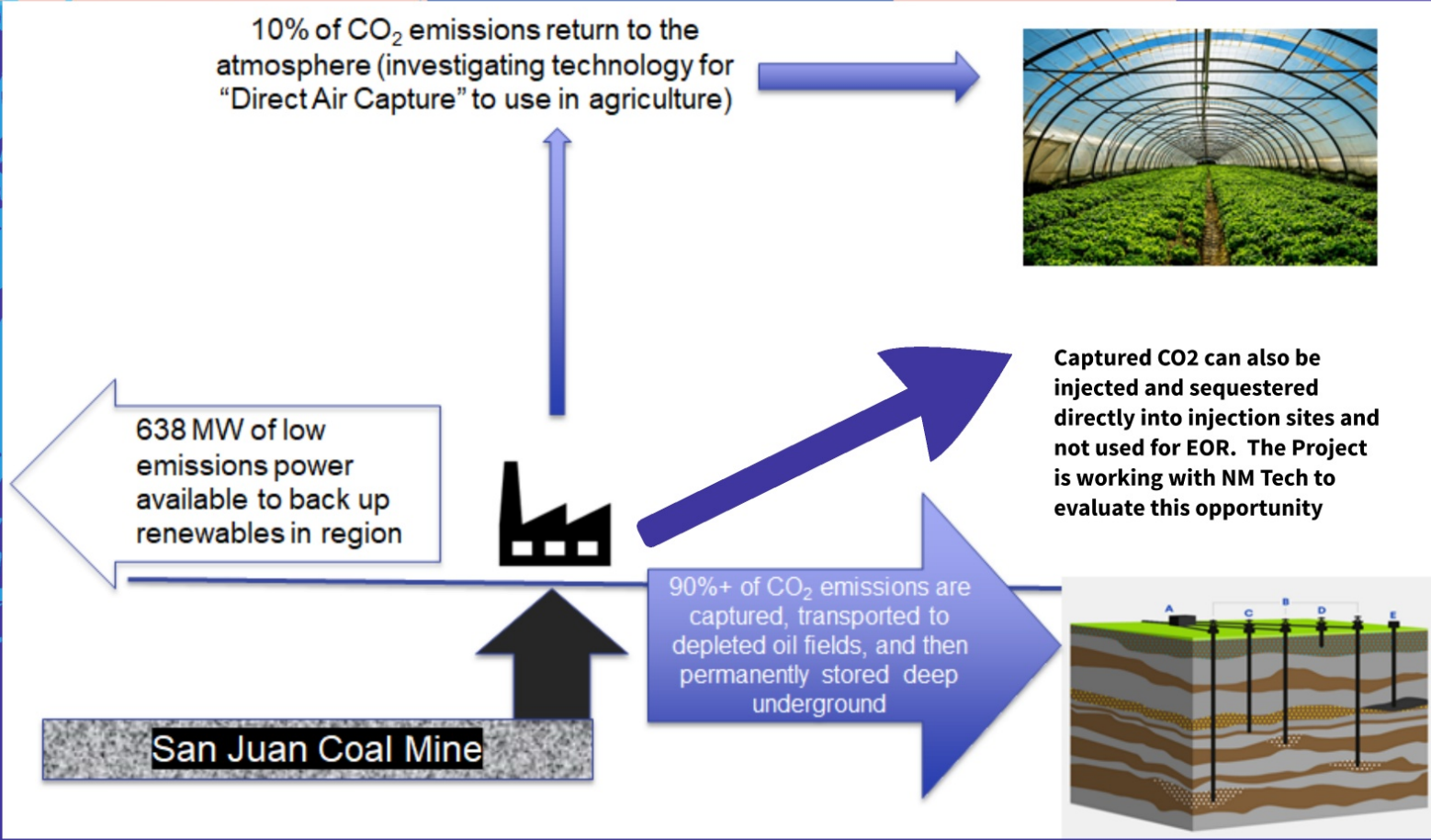
NM PBS.org

Operations

Project Diagram



Operations



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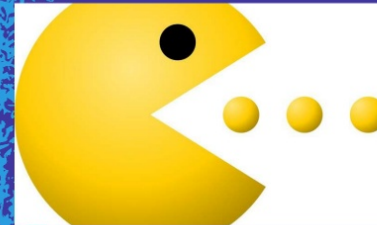
Close to a Century of Proof

Amine-based CO₂ removal process has been used since the 1930s to treat natural gas streams. Thousands of Amine units are currently in operation in the US.

Essentially, amine is chemically attracted to and naturally binds to CO₂, which allows the CO₂ to be removed from emissions

DOE Multi-Million Dollar Project Award and Los Alamos Study

Proven Technology



Bi-Partisan Support

The Buzz About the Enchant/Farmington CCUS Project

Global Momentum

DOE Multi-Million Dollar Project Award and Los Alamos Study

- **\$2.69 Million DOE Grant**
- **Los Alamos Labs has published a report supporting the Project**



LANL: San Juan CO2 capture feasible
December 19, 2019 • By Kevin Avila-Robinson

"The study concluded that the technology, to be supplied by Mitsubishi Heavy Industries Engineering Ltd., is well proven and can capture up to 90% of carbon emissions at San Juan, which is Enchant Energy's goal. The technology is already deployed at Petra Nova in Texas, which is the only commercial carbon capture plant currently operating in the U.S.

"Recent research by the Computational Earth Science group at Los Alamos National Laboratory has demonstrated that using CO2 for carbon capture, utilization and storage (CCUS) can be commercially viable under the recently revised 45Q tax regulation."



**New approach to extracting fossil fuels
has benefits**
August 30, 2018 • By Hari Viswanathan and
Richard Middleton

The Technology is Proven

- Petra Nova
 - Retrofit of 240 MW unit in multi-unit coal-fired power plant near Houston
 - Completed December 2016 after 30-month construction period: on time and under budget
 - Capturing 1.4 million metric tons per year with 90% capture rate for over 2 years
 - Technology from Mitsubishi Heavy Industries
- Boundary Dam
 - Retrofit of 110 MW unit in multi-unit coal-fired power plant in Saskatchewan, Canada
 - Currently capturing 2,400 tons per day equivalent to 876,000 metric tons per year
 - Commissioned in October 2014
 - Technology from Cansolv division of Shell
- San Juan Generating Station
 - Retrofit 2 coal-fired units with combined 847 MW of electric generation capacity with CCUS equipment.
 - Will Capture 6 million metric tons per year starting in 2023 or earlier if possible.





**Federal Bi-Partisan and International
Support:**

**Applying the Amine process to power
plants was developed over ten-year
period with support from Obama DOE,
Canadian Department of Energy, and
Trump DOE.**

Carbon Capture Technology is Gaining Momentum: *large scale has global impact*

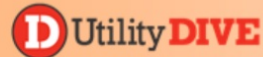
Proportionate share of emissions globally - can be leader to create global change and support climate change

Somebody needs to take carbon capture to the next level – why not us?

Perfect situation for carbon capture retrofit with the greatest circumstances for success:

- **proximity of the Kinder Morgan CO2 Pipeline**
- **\$500 million in state-of-the-art pollution control equipment**
- **economies associated with mine-mouth coal**
- **ready CO2 market**
- **regional need for reliable, economic baseload power**

The Buzz About the Enchant/Farmington CCUS Project



New Mexico must apply clean energy law to the San Juan coal retirement, but CCS could still save plant

January 31, 2020 • By Catherine Morehouse

"Farmington and Enchant said the ruling does not deter their plans for the plant — which include retrofitting the facility with carbon capture technology and taking over 95% of its ownership. The ETA leaves the door open for carbon capture until 2045 and PRC staff advocated for this method in November testimony on the proceeding."

"Carbon capture and storage (CCS) technologies must be part of the portfolio of solutions to decrease emissions from energy-intensive sectors and existing infrastructure, as well as remove CO2 already present in the atmosphere."

"To achieve net-zero, mitigating emissions will not be sufficient. Removing CO2 from the atmosphere will be needed, and the deployment of negative emissions technologies is gaining traction."



US leads new wave of carbon capture and storage deployment

January 5, 2020 • By Brad Page



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December 19, 2019 • By Kevin Avila-Robinson

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Bloomberg Green

Energy chiefs tout CO2 capture as Thunberg slams lack of action

January 21, 2020 • By Francine Lacqua and Jeremy Hodges

"Capturing carbon dioxide from the fossil-fuel industry is key to slowing dangerous global warming, energy chiefs said in Davos, as climate concerns dominated the annual business forum more than ever before."

"Oil and gas producers are under mounting pressure to help prevent a damaging rise in temperatures, and carbon capture is increasingly luring investors as a tool to curb emissions."

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WIN, WIN, WIN

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Support**



**WIN:
Community**



**WIN:
Education**

WIN, WIN, WIN



**WIN:
Environment**

WIN: Community



SJGS: 1,500+ Jobs Stay in the Community
Preserve existing and promote new construction and permanent jobs

SJGS: \$50 million+ annually in state and local tax revenues are preserved by using Carbon Capture to extend life of plant

SJGS: \$1.3 Billion+ Federal and Private Investment of Carbon Capture construction.

International Pioneer
New Mexico becomes a global leader in Carbon Capture and develops workforce to apply Carbon Capture Technology in other high CO2 emitting plants across the United States.



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WIN: Education



Tax Revenues
Fund Schools



Additional
Learning
Opportunities and
Career Paths

Protects the Well-
Being of
the Community

Tax Revenues Fund Schools

Together with Four Corners, SJGS and the Mine represent over 80% of the tax base for CCSD. PNM plans to close Four Corners in 2032.

Keeping the plant and mine open keeps important tax revenues in the community for the education of our children.

Additional Learning Opportunities and Career Paths

Installation of Carbon Capture Technology provides additional learning opportunities and career paths for our children so they can raise their families with family right here at home.



**Protects the Well-Being of
the Community**

**The Project Benefits the Community
environmentally, economically and socially**

**The Project will include community
stakeholders and will work with CCSD,
Chapters and other educational and
governmental entities**

**The Project will help avoid disruption to
families and the education of our children**

WIN: Environment



CLEAN PLANT

Approximately \$500 Million in Pollution Control Scrubbers Installed at the Plant in 2015 Already Make the Plant one of the Cleanest in the Country

CLEANEST PLANT

The Emissions from SJGS with Carbon Capture are about 2/3 LESS than Emissions from natural gas backup to wind or solar

CLEANER PLANT

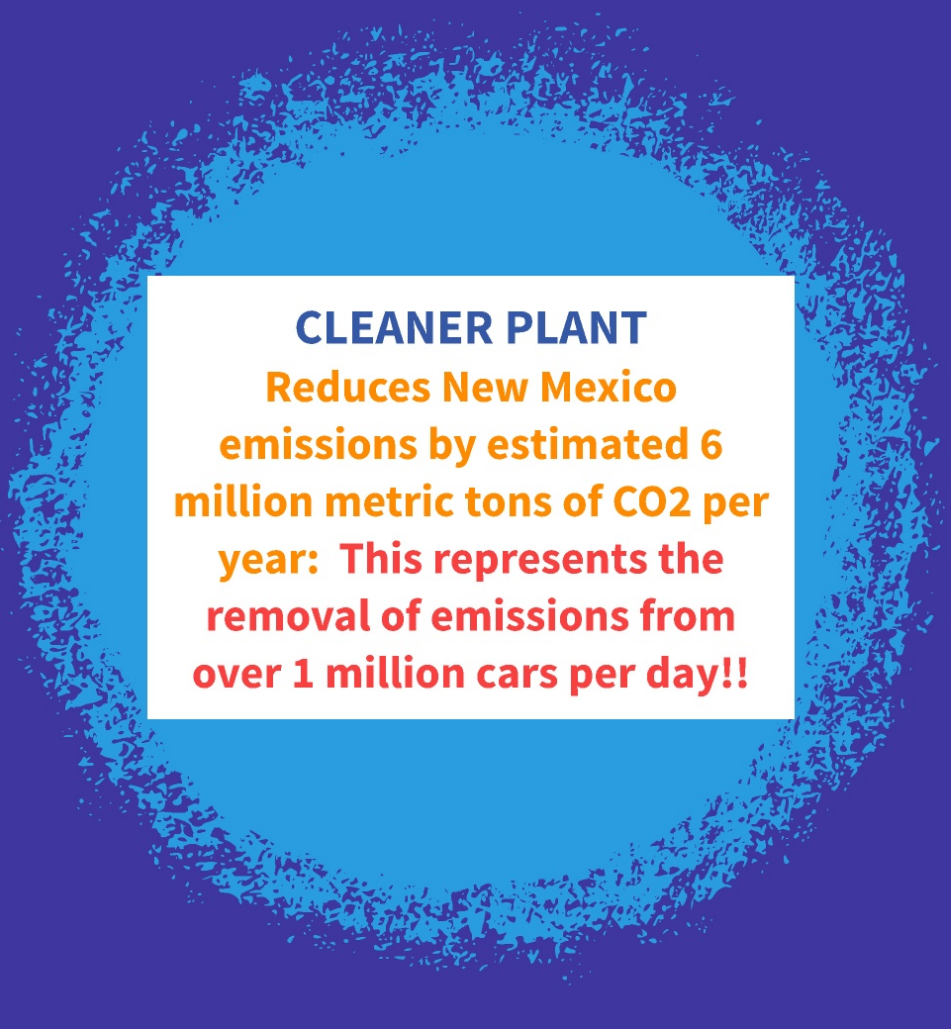
Reduces New Mexico emissions by estimated 6 million metric tons of CO2 per year: This represents the removal of emissions from over 1 million cars per day!!

CUTTING EDGE GLOBAL STEWARDSHIP:

Carbon capture technology, which is generally agreed to be necessary to fight global climate change, will be advanced through its largest deployment to date at SJGS.



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Our SJGS Project By The Numbers:



Helps preserve \$ millions in school funding for CCSD and creates new career pathways



\$1.3 billion in private investment based on \$2.6 billion in IRS 45Q tax credits



90% decrease in CO2 emissions, along with pre-existing SCR scrubbers



1,500 direct and contractor jobs, as well as 1,000s of indirect jobs saved



Complies with the ETA emissions limitations



More than \$50 million in state and local revenue preserved annually

For Additional Info Please Visit <https://www.enchantenergy.com/>

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