

Enchant Energy City of Farmington

San Juan Generating Station
Carbon Capture Update

Science, Technology &
Telecommunications Committee

September 28, 2020



Presenters

Hank Adair
Electric Utility Director
Farmington Electric Utility System

Cindy Crane
Chief Executive Officer
Enchant Energy Corporation



Public-Private Partnership, Farmington & Enchant Energy Corp

- City of Farmington through its Farmington Electric Utility System (Farmington) has partnered with Enchant Energy since August 16, 2019 on a project for the continued operation of San Juan Generating Station (SJGS) past 2022, by adding carbon capture technology to the plant
- The public-private partnership intends to run the legacy coal plant until at least 2035 by adding carbon capture technology that will allow the plant to comply with the stringent carbon dioxide emissions standards of the New Mexico Energy Transition Act
- Addition of carbon capture will also allow for electricity sales delivered into California, under CA's stringent decarbonization standards
- Under an existing agreement, the current and former owners legally committed to transferring all of the assets of SJGS to Farmington by June 30, 2022
- Under a signed agreement, Farmington committed to transferring 95% of SJGS assets to Enchant Energy. Farmington retains its original 5% ownership of SJGS
- Currently Farmington, Enchant Energy, and current and former SJGS owners are negotiating the definitive agreements that will transfer the SJGS assets



Farmington Key Officials in the Public-Private Partnership

- **Nate Duckett**
Mayor
- **Rob Mayes**
City Manager
- **Hank Adair**
Electric Utility Director
Farmington Electric Utility System
- **Jennifer Breakell**
City Attorney



Enchant Energy Management Team

- **Cindy A. Crane, Chief Executive Officer**

Former President and CEO of Rocky Mountain Power, she had a 27-year career at PacifiCorp, a subsidiary of Berkshire Hathaway, and brings broad energy and electric utility experience across thermal electric generation, wind generation, nuclear energy, coal mining, and hydroelectric generation. While at Rocky Mountain Power, she was responsible for 9,000 megawatts of thermal generation in seven western states. She also serves as the Chair of the School of Energy Resources at the University of Wyoming, and Chair of the Salt Lake City, Utah Olympic Games Committee

- **Peter Mandelstam, COO and Chief Development Officer**

Thirty years of experience as the founder and or CEO of several wind and non-profit solar project development companies including GRID Alternatives Tri-State Inc., Green Sail Energy LLC, Bluewater Wind LLC, and Arcadia Windpower Ltd. AB in Government; 1983 Harvard University



Events Leading to the Carbon Capture Project

- Beginning in 2015, PNM agreed to shut-down two units of SJGS and install state-of-the-art pollution control equipment and other improvements in the remaining 2 units
- In 2018, PNM and all other owners, except the City of Farmington, gave notice that they would be exiting SJGS and planned to shut down all 4 units
- Based on independent third-party review, the closure of SJGS and the San Juan Mine is anticipated to result in a loss of over 1,500 jobs, \$53 million annually in state and local tax revenues, and critical losses to the Central Consolidated School District (CCSD)
- In order to avoid this drastic result, and in accordance with the underlying Participation Agreement among the owners of SJGS, the City of Farmington conducted a nationwide search to market the opportunity to continue to operate SJGS
- After evaluating a number of interested parties, the City of Farmington chose to work with what is now Enchant Energy due to its proposal to utilize carbon capture equipment to continue operations at SJGS in compliance with the Energy Transition Act
- In partnership with the City of Farmington, Enchant Energy Corporation has obtained the **right to acquire the 847 MW Coal-fired San Juan Generating Station (SJGS)** for \$1 effective June 30, 2022 when the current owners exit the plant: 95% to Enchant, and 5% to City of Farmington Municipal Utility
- **PNM has received permission from NM Public Regulation Commission (PRC) to regulatorily abandon** its portion of the plant with the Energy Transition Act (ETA) as part of that decision. On April 1, 2020, PNM received 100% cost recovery of its stranded assets totaling \$360 million, enabling the transfer the SJGS assets to Farmington & Enchant



New Mexico Energy Transition Act (ETA) Compliance

- Under the ETA, the plant would have to **comply with a new CO₂ emissions intensity limit of 1,100 lbs. per MWh**. SJGS currently has an intensity of 2,200 lbs. per MWh
- ETA implementation regulations have yet to be promulgated
- Farmington & Enchant Energy plan to retrofit the plant with proven, post-combustion Carbon Capture technology that will **lower the CO₂ emissions by 90+%**. **The Project does not require any State or local subsidies**
- Post-retrofit, SJGS will have **CO₂ emissions reduced to ~249 lbs. per MWh – becoming Low Emissions Electricity (LEE)**
- LEE produces **70% less CO₂ emissions than a typical, new combined-cycle gas turbine (CCGT), and 80% less emissions than a gas peaking plant**



Project is Win for Ratepayers, Workers and Community

- **Win for Ratepayers:**

- Farmington Electric Utility System customers avoid stranded costs of San Juan Generating Station and costs of replacement power
- New Mexico and regional electric customers gain access to environmentally friendly, reliable, cost effective, dispatchable merchant power

- **Win for Workers and Community:**

- Preserve ~1,500 direct and indirect jobs, and more than \$53 million in state and annual local tax revenues (from NM independent assessment). CCUS will extend life of plant which would otherwise close given New Mexico regulations for coal plants
- CCUS will create new construction jobs exceeding 2 million worker-hours for the ~\$1.4 billion Carbon Capture construction
- New Mexico becomes a national pioneer in Carbon Capture and develops workforce to apply Carbon Capture technology in other high CO₂ emitting plants in New Mexico and across the United States
- With the closure of Navajo Generating Station, and the announced closures of Four Corners as well as Escalante, finding a way to avoid extreme economic impact to the Four Corners region is even more important



Project is Win for Schools & Students, Environment & Climate

- **Win for Schools and Students:**

- Preserves millions in tax and other revenues for Central Consolidated School District (CCSD)
- Expands educational and career pathways in Carbon Capture and related fields
- Potentially expands tax revenues for education into the Severance Tax Fund

- **Win for Environment and Climate:**

- Reduces New Mexico emissions by ~5.8 million metric tonnes of CO₂ per year
- Carbon Capture technology, which is the centerpiece of the DOE strategy to fight Climate Change, will be advanced through its world's largest deployment to date at SJGS



Special Focus on the Navajo Nation's Role at SJGS

- **Long and important history at the San Juan Generation Station (SJGS):**
 - Navajo Nation members helped build the San Juan Generating Station, and the adjacent San Juan Mine
- **Significant part of the workforce:**
 - Approximately 40% of the plant workers and miners are Navajo
 - Multiple generations of Navajo workers have earned middle class wages, supporting immediate and extended family
 - Average SJGS wages today are more than 12 times the per capita income on the Navajo Nation
- **Preserving regional Navajo jobs:**
 - The San Juan Generation Station Retrofit Project will preserve hundreds of Navajo family-sustaining jobs
 - The Navajo Nation has had significant job loss from closure of the Navajo Generation Station and the downturn in the regional oil & gas industry
 - Further job losses are looming with the planned closures of the Escalante and Four Corners Power Plants
 - Disproportionate impacts of COVID-19 on the Navajo Nation has illustrated the critical needs of the Navajo Community, needs that will be made exponentially worse if jobs are not preserved
- **Expanding workforce development :**
 - Enchant is committed to ongoing workforce development and job training of the already skilled Navajo workforce needed to build the Carbon Capture Island retrofit at SJGS
- **Essential Stakeholders:** Farmington and Enchant will continue to work in collaboration with Navajo leadership

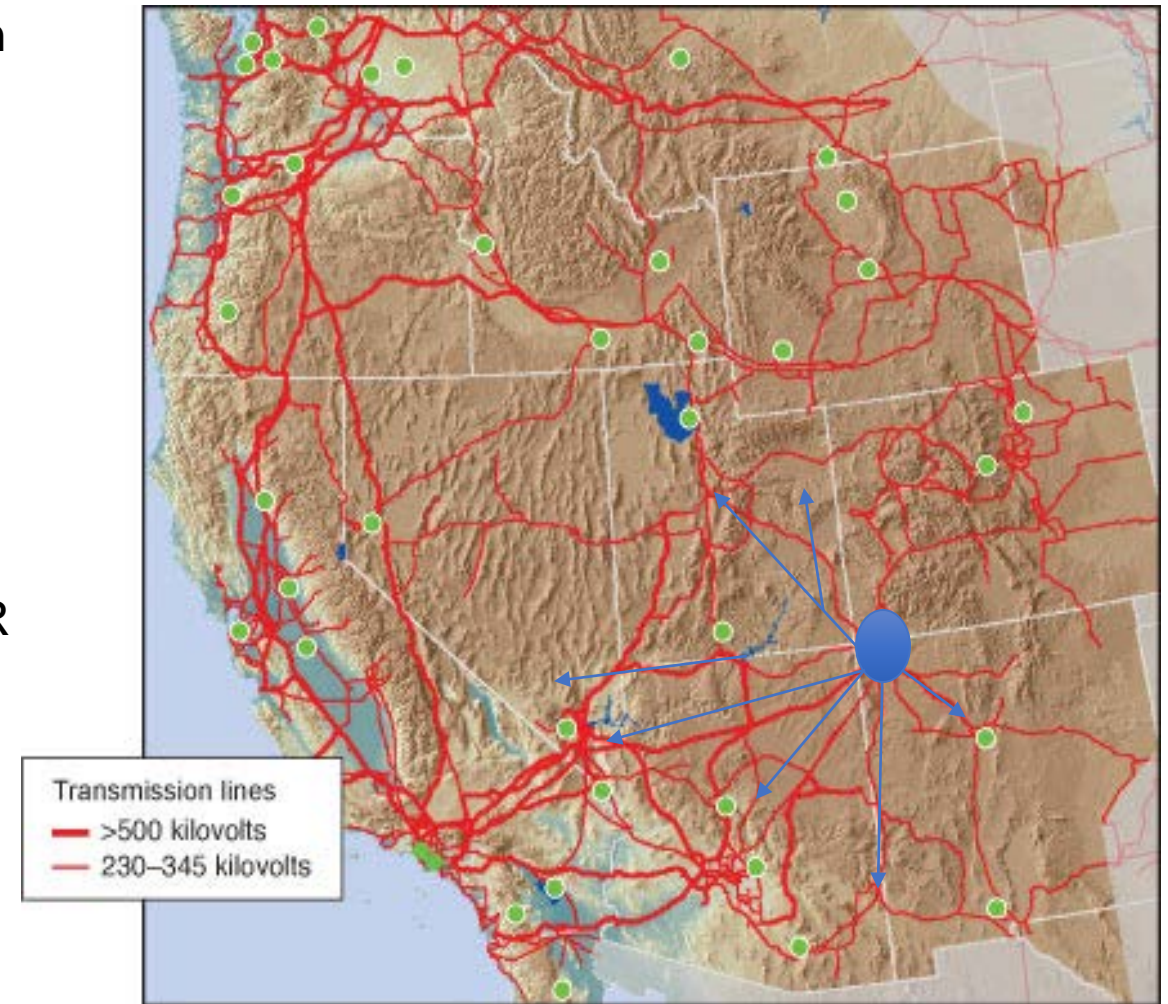


San Juan Generating Station (SJGS)

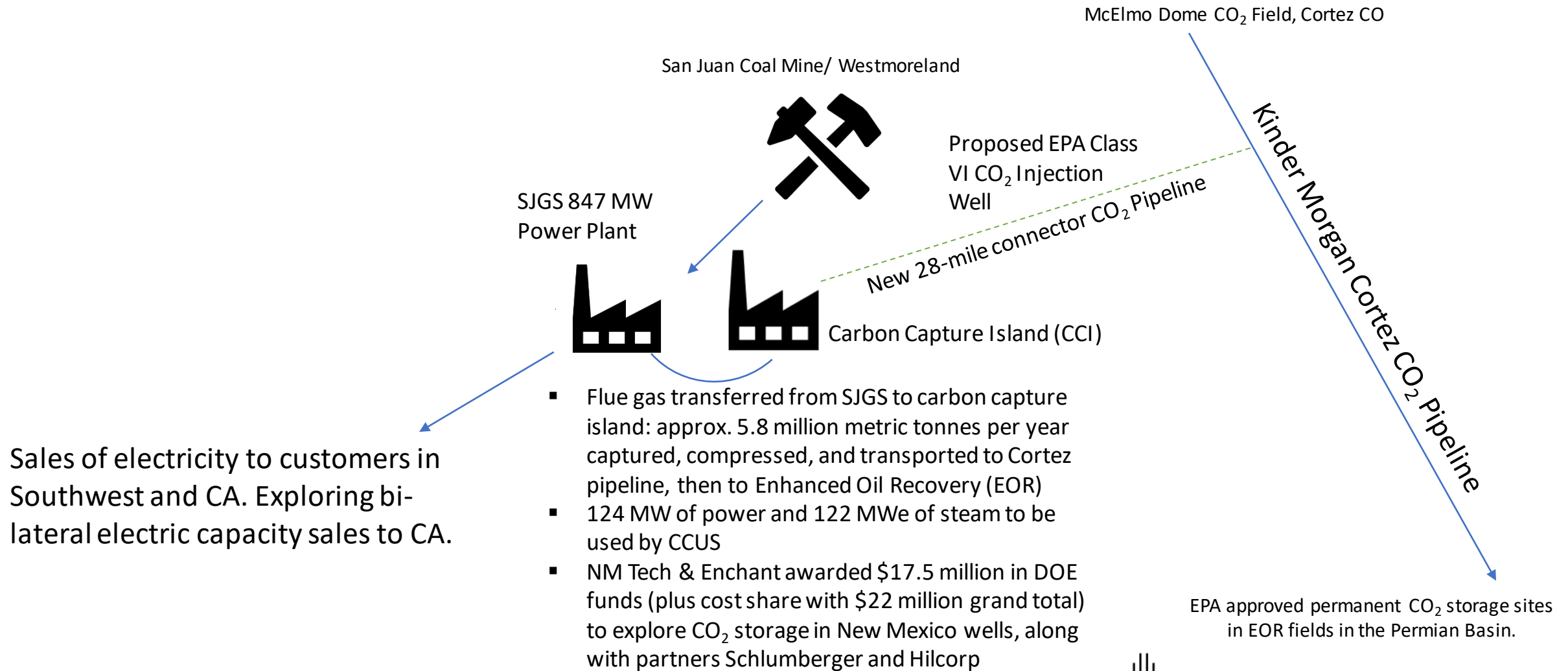
A wide-angle photograph of the San Juan Generating Station (SJGS) at sunset. The sky is a vibrant orange and yellow, with the sun low on the horizon. In the foreground, there is a dark, silhouetted landscape with sparse vegetation. In the middle ground, the industrial complex of the power station is visible, featuring several tall smokestacks emitting plumes of white smoke. The background consists of a range of mountains under the hazy, orange light of the setting sun.

Why San Juan Generating Station

- 847 MW (net) Coal-fired Electricity Generation Station in Northwest New Mexico originally built in the 1970s, expanded in the 1980s
- High BTU Coal is supplied by the adjacent San Juan coal mine, owned by Westmoreland Mining Holdings. Enchant signed MOU to extend coal supply through 2035
- Low NO_x/SO₂/Mercury/Particulates emissions, but currently significant CO₂ emissions
- Nearby CO₂ Pipeline with access to Permian Basin EOR
- Located at the center of the Southwestern transmission grid, with connections to rest of New Mexico, Arizona, California, Colorado, Nevada, and Utah
- Able to Acquire 95% Interest in SJGS for \$1
- Ability to Strip 90% of CO₂ guaranteed by MHIA
- Ability to obtain fixed-price EPC construction full project wrap



SJGS w/CCUS Project Schematic



San Juan Generating Station CCUS Project

- SJGS w/CCUS will be the largest CCUS project in the world
- With decarbonization, SJGS will be the lowest emitting CO₂ per MWh large-scale fossil-fueled power plant in the world
 - CO₂ intensity of ~250 lbs./MWh, less than 30% of most efficient gas-fired power plants
- DOE cooperative funding agreements: \$2.9m FEED study, \$17.5m drilling of a CO₂ sequestration well, planned for 2021
 - FEED study underway with Mitsubishi Heavy Industries America and Sargent & Lundy
 - Partnering with NM Tech on drilling a sequestration well in 2021 which provides alternative plan for permanent sequestration
- Bank of America has been retained to raise the ~\$1.4 billion for carbon capture island construction and the tax equity during the 12 years of operation
- Advanced negotiations with CO₂ off-takers to take 100% of the CO₂, approximately 5.8 million metric tonnes per year, combined CO₂ sales and 45Q tax credits pay for carbon capture island construction and operation
- Power sales start with 34% of output committed to City of Farmington and carbon capture island; additional 550 MW of electricity sales under negotiations



All Union Work for Enchant Carbon Capture Construction

- EPC Team and Labor Leaders have finished negotiating Project Labor Agreement (PLA) for \$1.4 Billion Carbon Capture construction
- Enchant has agreed to full union job and PLAs for 1) Significant plant deferred maintenance for SJGS, and 2) Construction of CO₂ Pipeline. Enchant is urging that the sequestration wells be union labor
- Major Trades for Carbon Capture Work include:
 - New Mexico Building Trades Council
 - Boilermakers
 - Plumbers and Pipefitters
 - Electricians
 - Laborers
 - Operators
 - Millwrights
 - Operating Engineers



Estimated Union Work Hours for CCUS Construction

Trade	Project Work Hours	Annual Full-Time Equivalent Jobs
Boilermakers	500,000	240
Pipefitters	300,000	144
Electricians	500,000	240
Laborers	400,000	192
Operators	200,000	96
Millwrights	<u>100,000</u>	<u>48</u>
	2,000,000	960

Note: There will be significant additional work hours for A) SJGS power plant deferred maintenance and B) CO₂ pipeline construction.



Partners and Service Providers

- **Westmoreland Mining LLC** owns and operates 12 coal mines in the US and Canada, including the San Juan mine which supplies the fuel for the San Juan Generating Station.
- **Kiewit Power Constructors** offers construction and engineering services in a variety of markets including transportation; oil, gas and chemical; power; building; water/wastewater; industrial; and mining. Kiewit had 2018 revenues of \$9 billion and employs 20,000 staff and craft employees. **A subsidiary of Kiewit completed Petra Nova CCUS Project on time and under budget in 2016.**
- **Mitsubishi Heavy Industries, Ltd. (MHI)** is one of the world's leading industrial firms with 80,000 group employees and annual consolidated revenues of \$38 billion U.S. dollars. MHI delivers innovative and integrated solutions across a wide range of industries from commercial aviation and transportation to power plants and gas turbines, and from machinery and infrastructure to integrated defense and space systems. **MHIA, wholly owned MHI subsidiary, provided the technology for the successful Petra Nova CCUS Project.**
- **Sargent & Lundy (S & L)** is a global leader in power and energy engineering with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. **Sargent & Lundy was NRG's Owner's Engineer for Petra Nova CCUS Project.**
- **US Department of Energy.** Major funder of CCUS technology development under the current and two past Administrations as a way for the US to contribute to the reduction of global CO₂ emissions. Provided ~\$250 million of funding for the Petra Nova project and is providing \$3.4 million of funding for the SJGS FEED study and \$22 million in funding for the development of a sequestration well adjacent to the San Juan Generating Station.
- **Bank of America.** Retained as lead financial advisor for \$1.4 billion tax equity, and project financing planned for 2021. Top-ranked tax equity placement bank in 2018 & 2019



Project Milestones

- **2020**

- Raise development equity
- Initiate carbon capture plant permitting
- Continued expansion of the management team
- Continued CO₂ off-take and associated transportation and storage negotiations
- Continued power off-take negotiations
- Continued transfer negotiations with non-extending owners

- **2021**

- Finalize EPC contract negotiations with construction consortium
- Sequestration well drilling and core samples extracted for CO₂ permeability tests
- Complete carbon capture plant permitting
- Close financing of carbon capture island, plant deferred maintenance, and CO₂ pipeline
- Commence construction of CCUS, if granted permission by current and former owners of SJGS

- **2022 - 2024**

- Transfer SJGS ownership of 95% to Enchant Energy Corporation
- Complete plant deferred maintenance construction
- Energize first of 4 units (trains), and begin commercial operation of CCUS
- Full, 4-train commercial operation of CCUS System



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A sunset over a landscape with a power plant in the distance. The sun is low on the horizon, casting a warm orange glow across the sky. The clouds are illuminated from below, creating a dramatic, layered effect. In the foreground, there is a dark, silhouetted landscape with sparse vegetation. In the middle ground, a power plant with several tall smokestacks is visible, emitting a faint glow. The background shows a range of mountains under the sunset sky.

Thank You