



Arizona Coal Plant Valuation Study Factsheet

Background

Across the country, falling costs for renewable energy generation has increased economic pressure for utilities to retire coal plants, paving the pathway to a renewable energy economy. Arizona, with its significant solar resource, is primed for a low-cost, coal-free future. On behalf of the Sierra Club, Strategen conducted an economic analysis to better understand which of Arizona's coal plants are most suitable for replacement with renewable energy resources, how much Arizona ratepayers could save by moving beyond coal, and the societal costs associated with greenhouse gas emissions from the plants.

Coal in Arizona

Arizona hosts five coal-burning generation stations. Two of those plants, Navajo and Cholla, are scheduled to be retired in 2019 and 2025 respectively and were not examined in this study. The three remaining plants, with seven generating units, that are scheduled to operate until 2035 or later were analyzed in this study. Additionally, Arizona draws power from four coal-burning generation units at three plants outside the state — Craig, Four Corners, and

Hayden — which were also examined. Together, the 11 coal-burning units that this study analyzed have a combined operating capacity of 4,792 Megawatts (MWs).

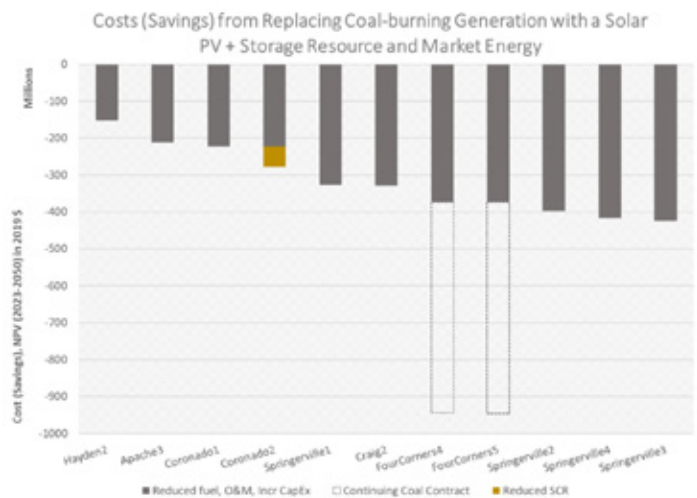
The state has four major electric utilities with varying business and regulatory structures. Arizona Public Service (APS) and Tucson Electric Power (TEP) are both regulated by the Arizona Corporation Commission (ACC), as is the sister company to TEP, UNS Electric. Salt River Project is not regulated by the ACC, but instead has a board that sets its prices and makes decisions about its coal fleet.

Key Findings:

- Among replacement options, solar generation plus storage is less expensive on a levelized cost of energy basis when compared to all the coal-burning units analyzed.
 - Replacing all 11 coal units analyzed in the study by 2023 with solar and battery storage would save ratepayers \$3.5 billion.
 - Replacing Four Corners, the largest coal plant to service Arizona after Navajo Generating Station's (NGS) closes in 2019, with solar and battery

storage is cheaper than continuing to burn coal despite the coal supply agreement with the Navajo Transitional Energy Company through 2031.

- Similarly, Unit 2 of Coronado Generating Station is more expensive than solar and storage even without accounting for the expense of required coal pollution controls to adhere to clean air protections.
- Replacing all of Arizona’s coal units with market purchases starting in 2023 is cheaper than burning coal, saving Arizona customers \$2.8 billion.
- Replacing the coal units with wind transmitted from New Mexico was the least cost-effective option, however, New Mexico wind is cheaper than coal in four units of the Springerville plant, unit 3 of the Apache plant, and unit 2 of Hayden with a resulting in total savings of \$263 million.
- All three replacement options are cheaper than coal when accounting for the societal cost of burning carbon and emitting greenhouse gases from coal plants.
 - Net benefits when accounting for societal cost of carbon (SCC) when replacing all 11 units with solar and storage are \$10.2 billion.
 - Net benefits when accounting for SCC when replacing all 11 units with wind are \$7.3 billion.
- Tuscon Electric Power customers can save \$23 million by refinancing through securitization and retiring Unit 1 of Springerville with net savings of \$326 million when replacing the unit with equivalent solar plus storage.



Moving Beyond Coal in Arizona

Arizona’s utilities can both save families money on their electricity bills and reduce pollution out of our communities and national parks by quickly replacing all coal power with new solar and battery infrastructure to take advantage of the state’s abundant solar resource. Solar PV generation plus storage in sun-rich Arizona has the greatest potential to produce energy at a lower cost than coal-burning power, even after including market purchases to provide an equivalent amount of energy output and peak capacity contribution. The savings realized by retiring coal only increase when accounting for the economic damage wrought by greenhouse gas emissions from coal plants. Tools such as refinancing coal plants through securitization can ease the transition away from coal for ratepayers.

The **Sierra Club** is America’s largest and most influential grassroots environmental organization, with more than 3 million members and supporters. In addition to helping people from all backgrounds explore nature and our outdoor heritage, the Sierra Club works to promote clean energy, safeguard the health of our communities, protect wildlife, and preserve our remaining wild places through grassroots activism, public education, lobbying, and legal action.

Strategen is a mission-driven professional services company that specializes in strategies for a decarbonized grid. Strategen works across the power sector ecosystem with public sector leaders, global technology corporations, utilities, and project developers to help them achieve their clean energy goals via the firm’s synergistic platforms of consulting, association management, and events. Strategen was founded in 2005 and is a minority and woman-owned business headquartered in Berkeley, California, USA.

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