

Water, Energy and Air Quality

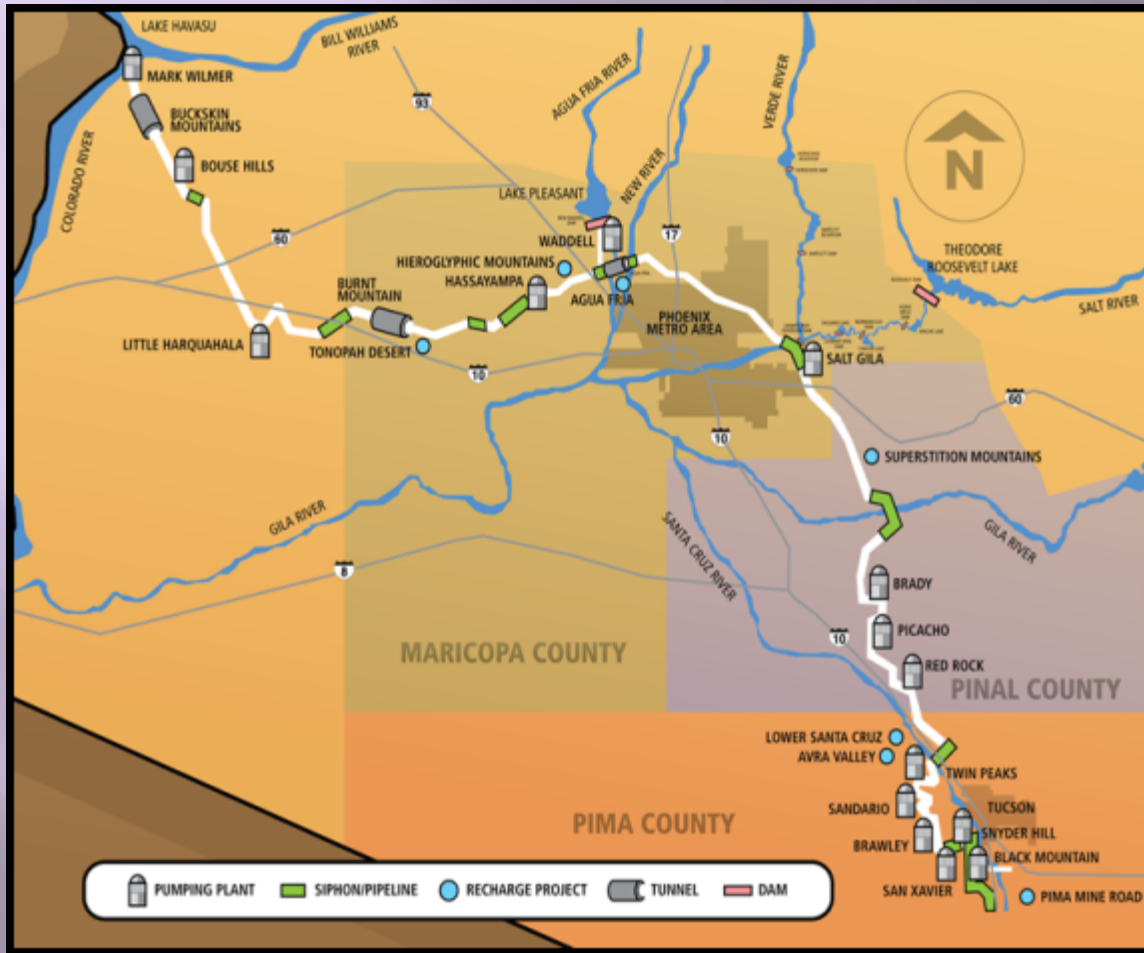
A Confluence of Challenges at CAP

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WESTMARC Water Committee
September 7, 2010



A Word About Central Arizona Project



336-mile aqueduct stretches from Lake Havasu to Tucson

14 pumping plants lift water nearly 3000 feet

8 siphons, 3 tunnels

Lake Pleasant/New Waddell Dam

Delivers 1.6 million acre-feet of Colorado River water annually

Three Challenges



A Drying West



A Question of Power

A Cost to Consider



A Drying West

After 10 years of severe to extreme drought



April 1999



January 2009

Lake Mead has dropped more than 125 feet
and is currently at 42% of capacity

Is this the new "normal"?

A Drying West

A Multi-Pronged Response

Improve Colorado River Management
Shortage Sharing Agreement

Conserve and reduce “lost” water
Yuma Desalter, Drop 2

Augment the Colorado River
Desalination, Importation

Store Excess Water in Arizona
Recharge projects

Plan for Future Water Supplies
Stakeholder Collaboration



A Question of Power



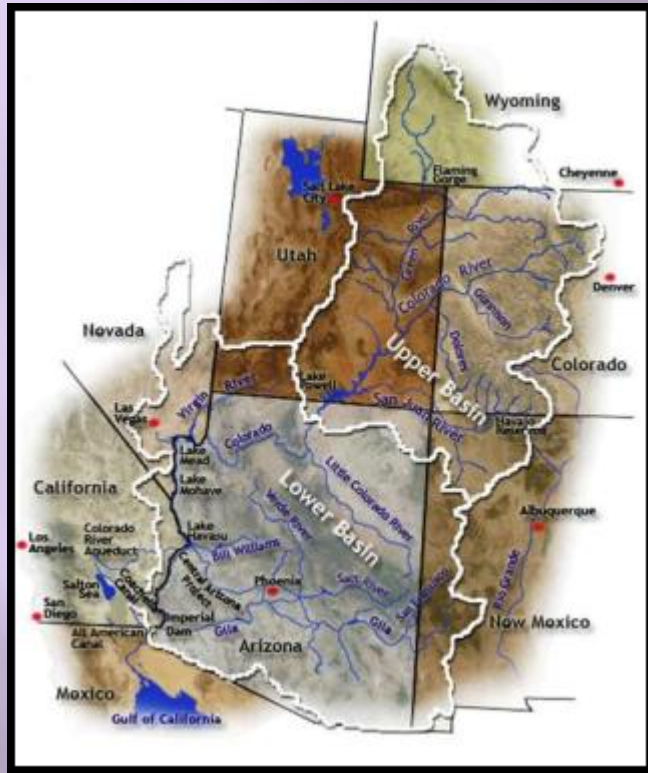
CAP uses about 2.8 million megawatt hours of electrical energy each year

To deliver about 1.6 million acre-feet of water for municipal, agricultural and industrial uses



CAP is the single largest end user of power in Arizona

A Question of Power



The Colorado River Basin Project Act authorized the US to participate in a coal-fired power plant to provide power for CAP pumping as an alternative to building additional dams in the Grand Canyon (*the Udall Compromise*)

95% of the energy used by CAP is produced at the Navajo Generating Station near Page, AZ

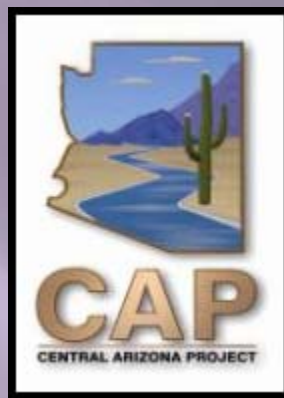


A Question of Power

Navajo Generating Station Participants



SRP (21.7%)



US/CAP
(24.3%)



LADWP
(21.2%)



APS (14.0%)



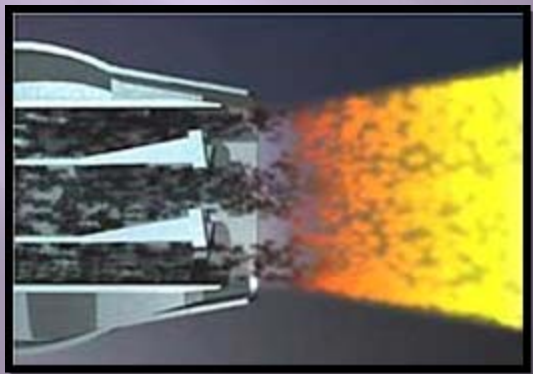
Nevada Power
(11.3%)



TEP (7.5%)

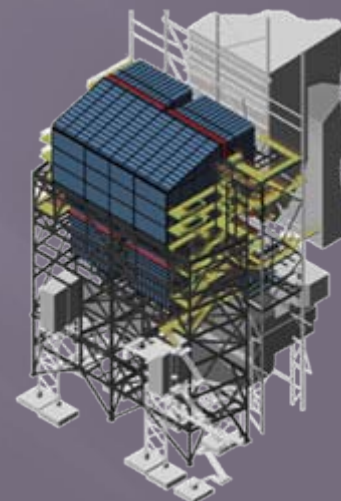
A Question of Power

EPA is currently evaluating additional nitrogen oxide (NO_x) controls for NGS under its Regional Haze rules to further improve visibility in the area



Low NO_x Burners with Separated Overfire Air

Two types of controls are under consideration to reduce NO_x emissions at NGS



Selective Catalytic Reduction (SCR)

A Question of Power

Preferred NOx Control Alternative

The NGS participants are voluntarily installing low NOx burners, at a cost of over \$47 million

This technology will reduce NOx emissions significantly and should improve visibility at a fraction of the cost of selective catalytic reduction

CAP and many others are asking EPA to determine that Low NOx burners meet the requirement for the Best Available Retrofit Technology for Navajo Generating Station



A Cost to Consider

Selective Catalytic Reduction would:

Cost approximately \$700 million in capital costs – more than 15 times the cost of the low NO_x combustion technology

Add \$13 million in annual operation and maintenance costs

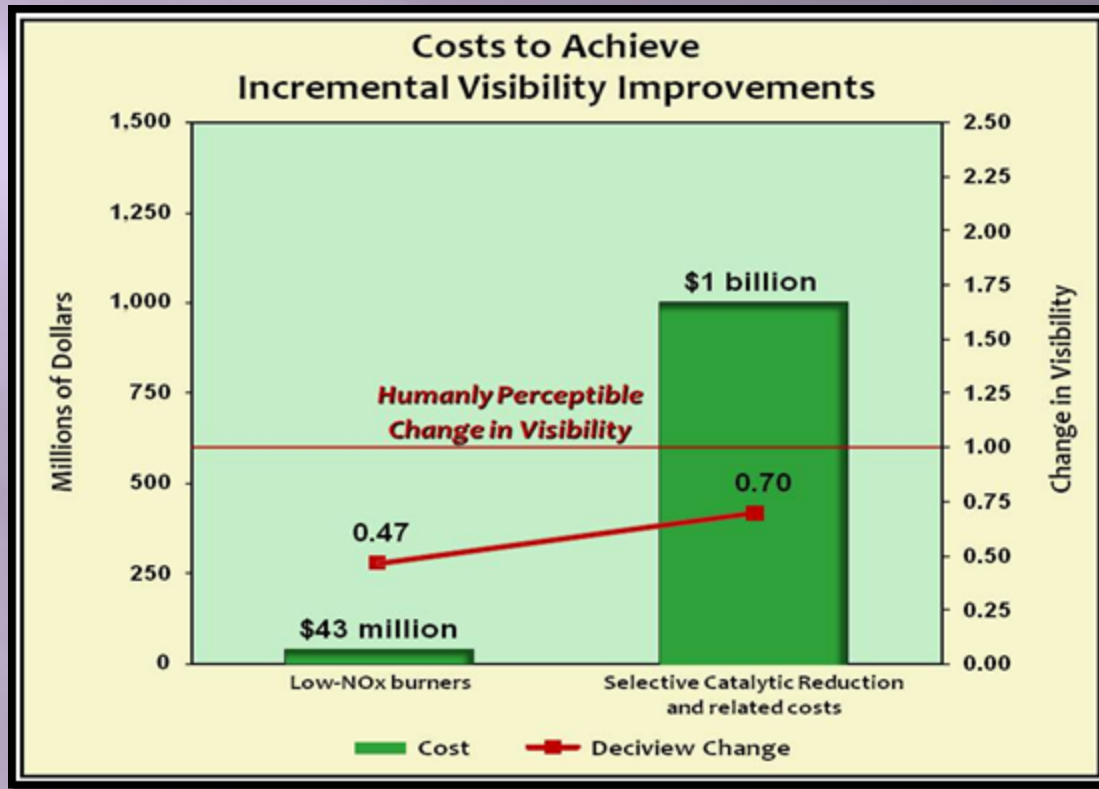
Require the importation of 31 tons of anhydrous ammonia (about two tanker trucks) a day to support the control equipment

If downstream particulate controls are also required, total capital costs could reach \$1.2 billion

Requiring SCR would raise concerns about the very future of NGS



A Cost to Consider



Recent research on the two technologies using EPA data and testing methods does show an improvement in reduction of NO_x with SCR

However, there is no true benefit to visibility as the difference cannot be distinguished by the human eye

A Cost to Consider

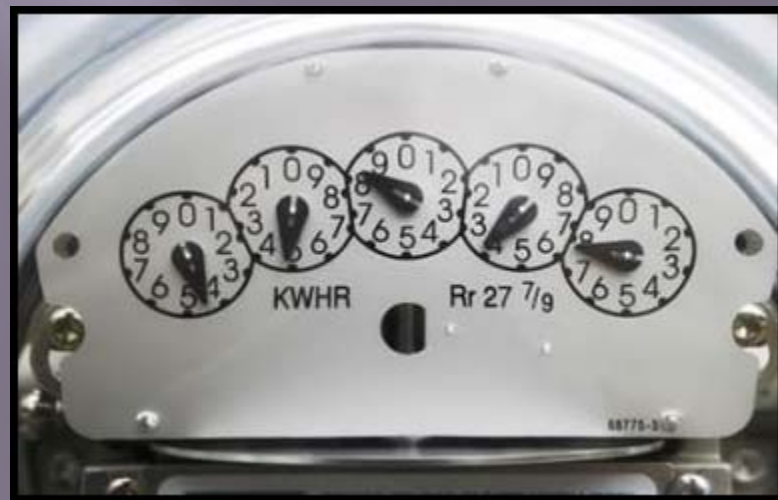
Surplus Power Sales Fund CAP Repayments



CAP's annual share of the NGS output is approximately 4.3 million megawatt hours of energy

CAP sells about 1.5 million megawatt hours of excess energy each year

NGS power not used for CAP pumping is sold to help repay Arizona's share of the costs of constructing the CAP



A Cost to Consider

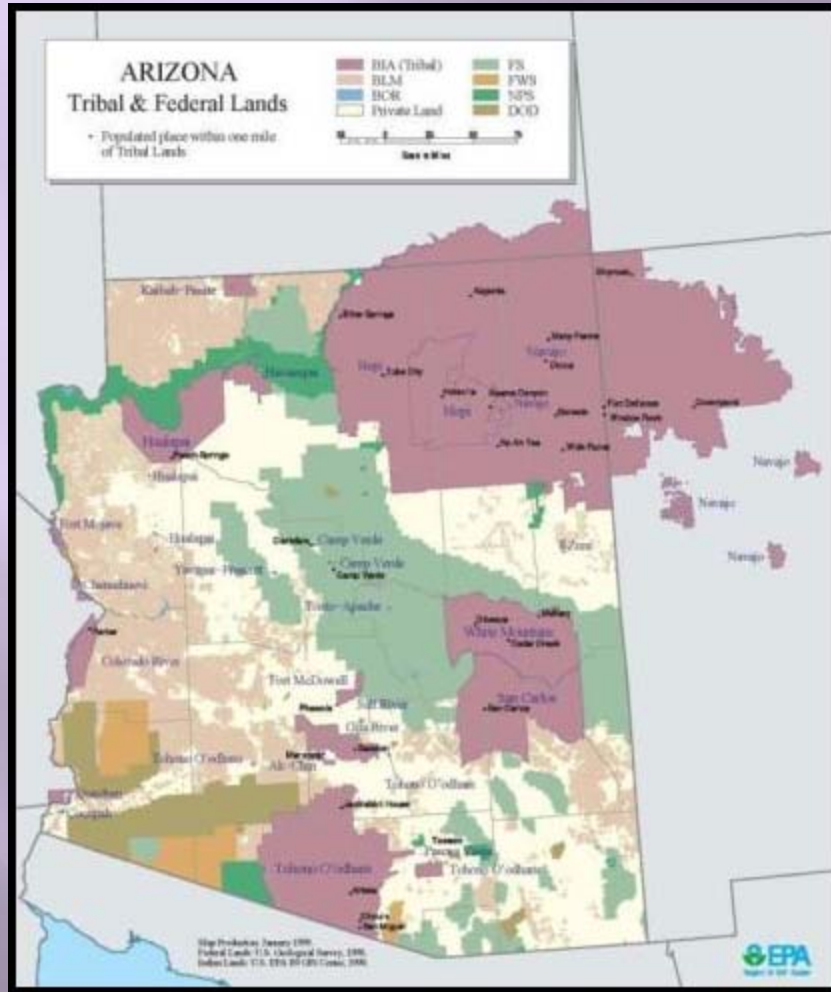


CAWCD owes the United States about \$57 million a year in CAP repayment

Revenues from surplus NGS power sales contribute about \$22 million per year toward CAP repayment

After 2011, surplus power sales are expected to contribute \$50 million/year or more toward repayment

A Cost to Consider



The Arizona Water Settlements Act of 2004 allows revenues from NGS power sales to be used to help fund the costs of Indian water rights settlements in Arizona after being applied to CAWCD's repayment obligation.

A Cost to Consider

NGS Provides Significant Economic Benefits to the Navajo Nation

Wages – Plant	\$51.4 Million
Wages – Mine	44.4
Coal Royalties – Mine	23.9
Electricity (NTUA) – Plant and Mine	12.6
Annual Lump Sum Payment – Mine	3.5
Site Lease – Plant	0.6
Air Permit – Plant	0.4
Scholarships / Donations	0.4
Navajo Way – Plant and Mine	0.1
TOTAL	\$137.30 Million

A Cost to Consider

The Economy of the Hopi Tribe is also tied to NGS



The revenues from NGS and the Peabody coal mine near Kayenta, AZ provide \$12 million each year to the Hopi Tribe, funding the majority of their government operations



A Cost to Consider

The Financial Impact of Greenhouse Gas Legislation

Current Status:

The House has passed a bill to cap Greenhouse Gas emissions and establish a trading program for carbon allowances

The Senate is working on its own version

Both bills contain free carbon emission credits for most electrical utilities to offset a portion of the costs

Allowances are not provided to cover carbon emissions at NGS for energy used to pump CAP water and for the surplus power CAP sells on the open market



A Cost to Consider

Some “Back of the Envelope” Estimates



A \$10/ton tariff on carbon emissions is included as a base rate in the House bill. More recent discussions suggest a much higher tariff

Preliminary calculations suggest a \$25/ton tariff would result in a 100% increase in CAP energy rates to customers

Should the additional costs of emission controls or Greenhouse Gas legislation force NGS to close, replacing the power and revenues from NGS could double or triple water rates

If CAP water rates were to double, the City of Tucson would pay an additional \$15.6 million a year for its CAP water

Adding it All Up

Uncertainty About Our Water Supplies



The flow in the Colorado River is expected to decrease

New supplies will likely be needed

The competition for water in the West is expected to increase

Adding it All Up

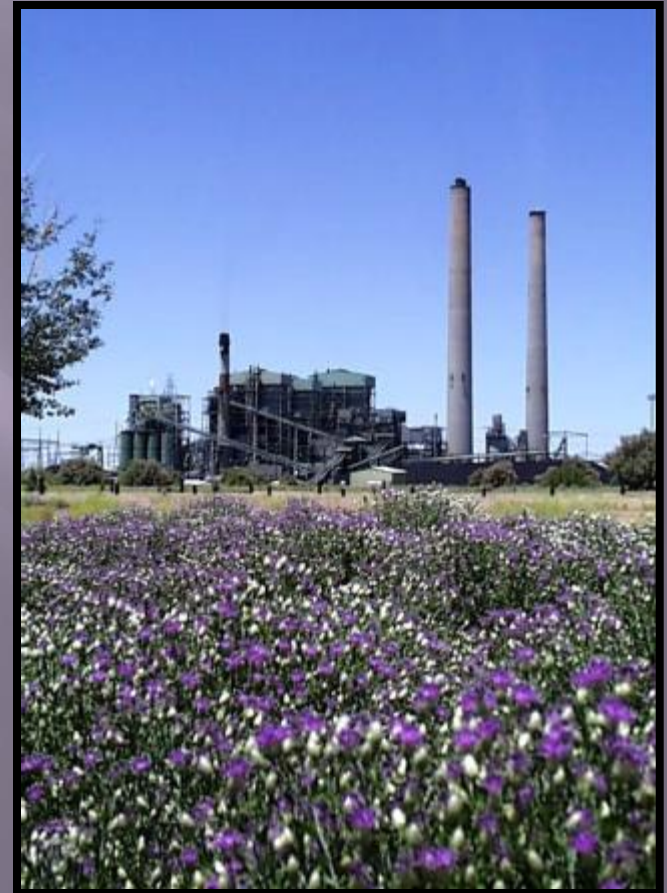
Vulnerable Energy Supplies and Higher Costs

The Navajo Generating Station near Page provides 95% of the energy used by CAP

NGS is a coal-fired plant targeted by EPA

Retrofitting the plant to reduce emissions could approach \$1 billion

“Carbon Emission” legislation is on the horizon and could lead to significant increases in CAP water costs



A Confluence of Challenges at CAP

Questions?

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or visit

www.CAPSmartEnergy.com



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