Arizona’s Electricity Future: The Demand for Water

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Arizona – A dry and growing state

Arizona population growth (in millions)

(2010-2025 figures projected)
Sources of Arizona water usage

- Groundwater: 40%
- Colorado River: 39%
- In-state rivers: 20%
- Reclaimed water: 1%
Arizona – A dry and growing state

- Historical water planning for Arizona
  - Dams
  - Central Arizona Project
  - 1980 Groundwater Management Act
    - Assured Water Supply Program
Arizona water usage: total fresh water used (in millions of gallons)
Arizona water usage – historical

![Graph showing historical population and water usage per capita in Arizona from 1960 to 2000. The graph displays two trends: a decrease in population from 5000 million in 1960 to 4500 million in 2000, and an increase in water usage per capita from 2500 gallons per day per person in 1960 to 4500 gallons per day per person in 2000. The graph is labeled with axes for population in millions (x-axis) and usage (gallons per day per person) on the y-axis, with data points marked for each year from 1960 to 2000.]

- Population (Millions)
- Usage (Gallons per Day Per Person)
Arizona water use by major category – 2000

- Irrigation: 80%
- Residential & Business: 16%
- Self-supplied: 4%
Year 2006 Water Use
APS Power Plants

% Ground Water, 20.9%
% Surface Water, 22.3%
% Effluent, 56.8%
Water use at APS power plants

Acre-feet of water

Ground water
Surface water
Treated effluent

2000 2001 2002 2003 2004
APS’ projected energy demand

- Still needed: 2,563 MW
- DSM / Conservation: 511 MW
- Renewables: 1,281 MW

2015:
- Still needed: 257 MW
- DSM / Conservation: 317 MW
- Renewables: 1,989 MW

2025:
- Still needed: 511 MW
- DSM / Conservation: 1,281 MW
- Renewables: 5,506 MW

Total: 7,298 MW
Estimated water use by plant type

Gallons per megawatt-hour

- Nuclear
- Pulverized coal wet
- Combined cycle wet
- Integrated gasification CC wet
- Pulverized coal dry
- Combined cycle dry
APS’ ongoing efforts to reduce water usage

- Continuing review of water use systems
- Brine concentrators/crystallizer systems
- Dry cooling plants
- Hybrid cooling systems
- Renewable technologies
What to expect in the future

- In planning, expect more water usage, not less due to growth.
- Renewable sources & conservation hold promise, but in the near term – water use will likely increase.
Conclusion

Water & Energy Planning are Inextricably Linked