

# Charting a New Path for Arizona's Electricity Generation and Use



## Arizona's energy future is at a crossroads

One path leads to increased dependency on fossil fuels—threatening our economy and fueling global warming. The other leads to a new, smarter energy future for Arizona. Investing in clean energy alternatives—like solar and wind power—can create and protect jobs in Arizona, save families and businesses money, and make America more energy independent. Clean energy is also the most effective solution to the threat of global warming. We can start making progress right away using proven technology, and then draw on American innovation to take us the rest of the way with new technologies.

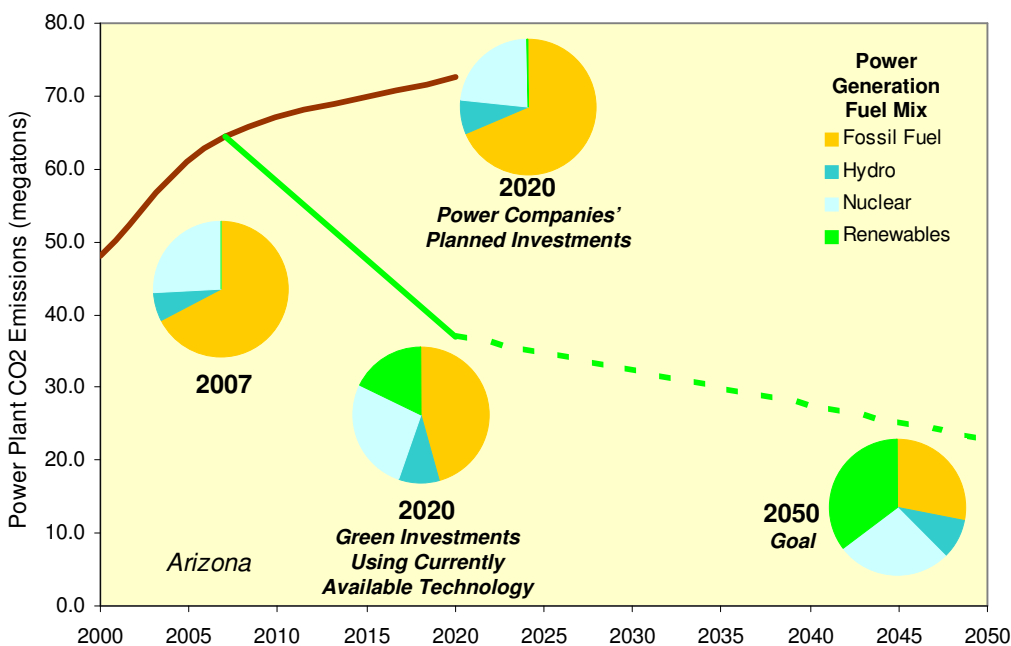
### How does Arizona generate electricity today?

In 2007, electric power generated in Arizona primarily came from coal (41.7 percent), gas (18.8 percent), hydro (7.0 percent), and nuclear (26.0 percent). Most utilities intend to continue relying heavily on fossil fuels in the coming decade. Arizona power companies plan to increase the energy generation from coal by 8.6 percent, gas by 18.6 percent. Less than 0.1 percent of electricity generated in Arizona is expected to come from renewable sources like wind, solar, geothermal, and biomass under current plans.

### Arizona has a choice to invest in a cleaner energy future

Arizona can achieve a new energy future by making better investments as utilities replace increasingly aged infrastructure and expand capacity. An important first step is for Arizona to generate at least 20 percent of electricity from renewable sources by 2020, a goal readily achievable with today's technology. Continuing to convert 15 percent of the state's energy portfolio to renewable energy sources each decade could yield an energy profile of at least 65 percent renewables by 2050.

Arizona can also benefit from improved energy efficiency. Technologies are available that could reduce demand nationally by 20 to 30 percent over the next decade. Innovations in energy efficiency should allow us to keep demand constant after 2020, even as the population grows.



**About the chart:** 2000, 2007 and 2020 Power Companies' Planned Investments from CARMA 1.0 ([www.CARMA.org](http://www.CARMA.org)). The 2020 Green Investments projection assumes that, using currently available technology, Arizona makes (1) improvements in efficiency to reduce overall demand by 25 percent and (2) shifts away from fossil fuels so that 20 percent of power generation is from renewable energy sources. The 2050 Goal assumes (1) hydro and nuclear are unchanged, (2) continued efficiency improvements keep total demand flat, and (3) renewable energy replaces at least 65 percent of power generation formerly done through fossil fuel burning. Note that the projection of future CO<sub>2</sub> emissions from fossil fuels assumes no investment in carbon capture and storage.

## Making a Difference in Arizona

Arizona's sun-drenched landscapes provide the state with vast solar power potential. The Springerville Generating Station Solar System, one of world's largest solar power generating farms, currently produces 4.6 megawatts of power annually from 34 solar arrays over a 44-acre plot. Other solar plants are in the works, including construction of a 3-square mile solar farm about 50 miles south of Phoenix. This new plant will use concentrated heat from the sun to create steam and turn a turbine, generating 280 MW by 2011—enough to power 70,000 homes each year.

Not to be left out, Arizona State University is also taking steps to increase its use of renewable energy. The University will cover 135,000 square feet of roofs with solar panels in 2008. They expect to be able to produce 7 percent of the campus energy needs and save \$425,000 in electricity costs. The long-term goal is to produce 20 percent of its energy needs within the next three years.

### Sources:

<http://www.universitybusiness.com/newssummary.aspx?news=yes&postid=16076>

<http://www.msnbc.msn.com/id/23464740/>

<http://www.pvresources.com/en/sgs.php>



## Making a dent in global warming pollution

Simply by shifting to renewable energy sources and improving energy efficiency over the next decade or so, Arizona can reduce its future carbon dioxide (CO<sub>2</sub>) emissions from electricity generation by 49 percent compared to the business-as-usual path that utilities are following now.

Given that 53 percent of Arizona's CO<sub>2</sub> emissions come from electricity generation, diversifying and updating our power sources is critical for cutting the state's total global warming pollution.

## Increasing Arizona's energy and economic security

Investing in renewable energy sources will reduce Arizona's dependence on fossil fuels and at the same time create new green collar jobs. A new energy future in Arizona could include:

**Expanded solar power.** Arizona has enough solar resources to produce 5,500 to 6,500 Whr per square meter using photovoltaic systems and 6,000 to 7,000 Whr per square meter using concentrating solar power systems. This means that devoting just 1 square mile in Arizona to

solar power can provide enough electricity for about 1,600 households each year.

**Expanded wind power.** Arizona is currently ranked 37th for wind power. The American Wind Energy Association ranks Arizona 30th in terms of its future wind potential, with 1,090 MW of potential capacity.

**Biomass power.** Arizona has 1.1 million dry tons of biomass available each year that could be used to generate about 200 MW of electricity.

**Geothermal power.** Arizona has 1 geothermal project under development, with the potential to produce as much as 20 MW of new power capacity.

**New jobs.** Committing to a 30 percent growth in solar energy use in the United States will bring 2,122 jobs and \$1,708 million investment to Arizona.

### How does Arizona use electricity?

Arizona's energy is used to power:

- homes (44 percent),
- businesses (39 percent), and
- industry (17 percent).

Per capita residential electricity use is 5,250 kilowatt hours per year, 16 percent greater than the national average.

### References and Additional Reading:

American Council for an Energy-Efficiency Economy, [www.aceee.org](http://www.aceee.org).

American Wind Energy Association, [www.awea.org](http://www.awea.org).

Bioenergy Feedstock Information Network, [bioenergy.ornl.gov](http://bioenergy.ornl.gov)

CARMA (Carbon Monitoring for Action), [www.CARMA.org](http://www.CARMA.org).

Database of State Incentives for Renewables and Efficiency, [www.dsireusa.org](http://www.dsireusa.org).

Department of Energy, Energy Efficiency and Renewable Energy, [apps1.eere.energy.gov/states/alternatives/electricity.cfm](http://apps1.eere.energy.gov/states/alternatives/electricity.cfm).

Energy Information Administration, State Energy Data System, [www.eia.doe.gov/emeu/states/\\_seds\\_updates.html](http://www.eia.doe.gov/emeu/states/_seds_updates.html).

Environmental Protection Agency, Energy CO<sub>2</sub> emissions by state, [www.epa.gov/climatechange/emissions/state\\_energyco2inv.html](http://www.epa.gov/climatechange/emissions/state_energyco2inv.html).

Geothermal Energy Association, [www.geo-energy.org](http://www.geo-energy.org).

McKinsey Global Institute, 2007: *Wasted Energy: How the U.S. Can Reach its Energy Productivity Potential*.

Political Economy Research Institute, [www.peri.umass.edu](http://www.peri.umass.edu).

Renewable Energy Policy Project, [www.repp.org](http://www.repp.org).

*For more information, visit [www.nwf.org/globalwarming](http://www.nwf.org/globalwarming).*