



An Overview of Energy Efficiency

Energy efficiency means reducing the amount of energy that you need to perform a particular task. When you practice energy efficiency, you increase or maintain your level of service, but you decrease the energy used to provide that service through efficient technologies. Examples include ENERGY STAR appliances, compact fluorescent light bulbs, better insulation for buildings, more efficient windows, high efficiency air conditioning equipment, and vehicles with higher miles per gallon (mpg). Another distinct strategy is energy conservation, which means that you change your behavior or lifestyle to reduce energy use. Examples include carpooling, using mass transit, turning thermostats down in the winter and up in the summer, and other changes.

Improving energy efficiency is a “win-win” strategy — it saves money for consumers and businesses, reduces the need for costly and controversial new power plants, increases the reliability of the energy supply, cuts pollution and greenhouse gas emissions, and lowers energy imports. There is vast potential for improving the energy efficiency of homes, appliances, businesses, and vehicles throughout Arizona.

Quick Facts:

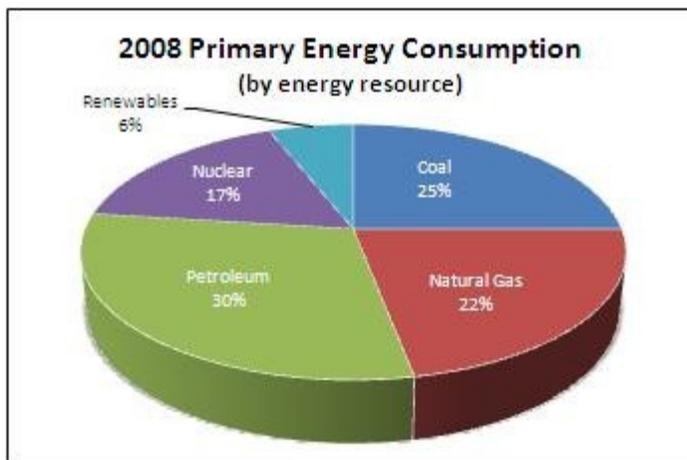
- ◆ Population, 2009: 6,595,778
- ◆ Population growth rate, 2000-2009: 2.83% per year
- ◆ Number of households, 2009: 2,752,991

Primary Energy Consumption (2009)

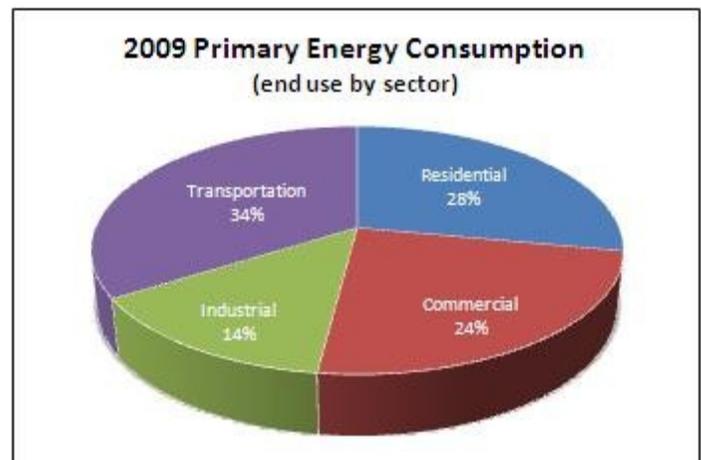
- ◆ Primary energy consumption: 1,454 trillion Btu
- ◆ Growth rate, 2006-2009: -1.27% per year
- ◆ Primary energy consumption per capita: 221 million Btu
- ◆ Ranking, energy consumption per capita: 46
- ◆ Ranking, total energy consumption: 24

Energy Expenditures (2008)

- ◆ Total energy expenditures: \$22.6 billion
- ◆ Ranking, energy expenditures: 24
- ◆ Energy expenditures per capita: \$3,479
- ◆ Ranking, energy expenditures per capita: 51



2008 Net exports/losses of electricity: 16.2%
 Renewables include hydropower, wood, solar, geothermal and waste materials.



Primary energy use includes the losses in electricity generation and distribution.
 Rankings are position among US states plus DC (1 is highest, 51 is lowest).

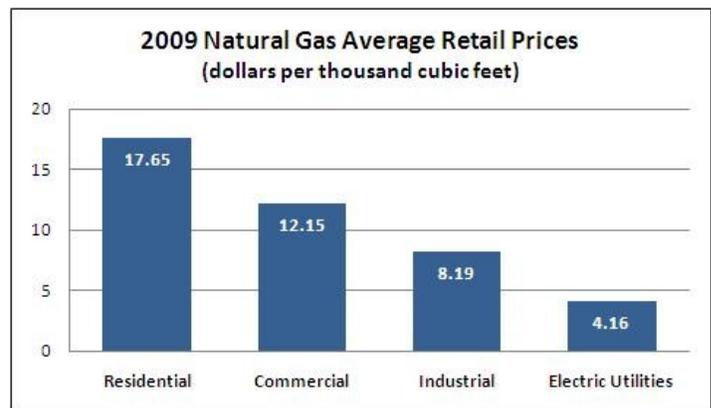
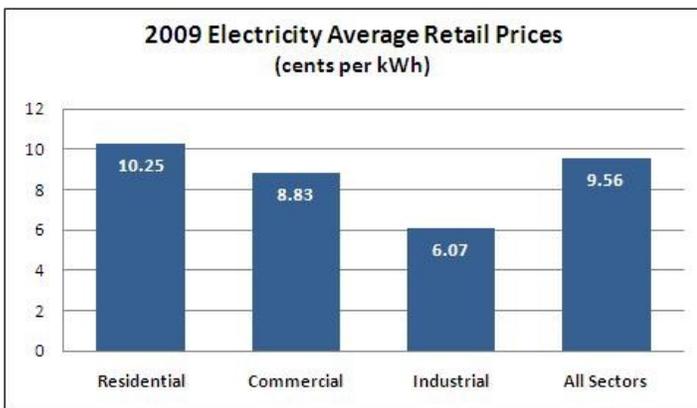
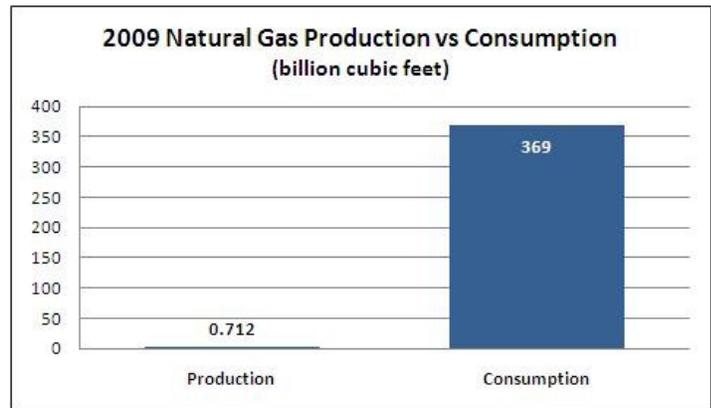
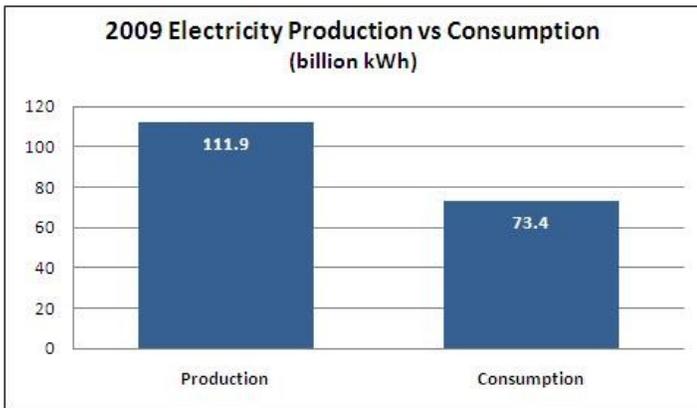
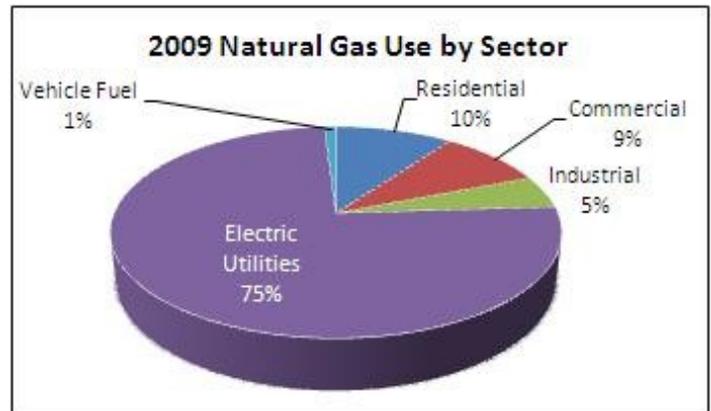
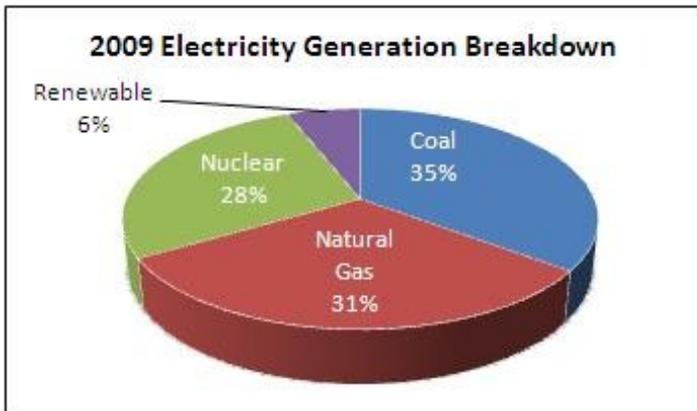
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Electricity Use (2009)

- ◆ Total retail sales: 73.4 billion kWh
- ◆ Ranking, total retail sales: 21
- ◆ Consumption growth rate, 2007-2009: -1.58% per year
- ◆ Electricity use per capita: 11,128 kWh
- ◆ Residential electricity use per household: 11,061 kWh
- ◆ Average retail price, all sectors: 9.56 cents/kWh
- ◆ Ranking, average electricity price: 19

Natural Gas Use (2009)

- ◆ Total consumption: 369 Bcf
- ◆ Ranking, total consumption: 19
- ◆ Consumption growth rate, 2007-2009: -2.08% per year
- ◆ Natural gas use per capita: 55,945 cf
- ◆ Residential natural gas use (per residential consumer): 37,083 cf



Sources: U. S. Energy Information Administration (www.eia.doe.gov) and U. S. Census Bureau (www.census.gov)

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Status of Energy Efficiency in Arizona

Electricity Demand-Side Management

The Arizona Corporation Commission (ACC) has adopted stringent energy efficiency standards that require investor-owned electric utilities to achieve 20% electricity savings by 2020. As a result, Arizona Public Service and Tucson Electric Power offer a wide variety of energy efficiency programs for residential and business customers. Salt River Project implements efficiency programs as well. Total spending on electric utility energy efficiency programs in 2011 is estimated at \$119 million, or 1.9% of utility revenues.

- ◆ ACC order: <http://swenergy.org/news/news/default.aspx?Year=2010#294>
- ◆ Arizona Utility Programs: <http://swenergy.org/programs/utilities/arizona.htm>

Natural Gas Demand-Side Management

The ACC has also adopted energy efficiency standards for investor-owned gas utilities. As a result, Southwest Gas Corporation implements energy efficiency programs, including promotion of ENERGY STAR[®] gas appliances, low-income home retrofit, ENERGY STAR homes, commercial high efficiency equipment, and distributed generation programs. Significant program expansion is expected in 2012.

- ◆ Arizona Utility Programs: <http://swenergy.org/programs/utilities/arizona.htm>

Status of Building Energy Codes

No mandatory statewide energy codes. The cities of Phoenix, Scottsdale, Tucson and some other local jurisdictions have adopted the 2006 version of the International Energy Conservation Code (IECC) and some cities and counties are in the process of adopting the 2009 IECC. The U.S. DOE estimates that new homes built in Arizona complying with the 2009 IECC rather than the 2006 version will save \$211-223 per year in energy costs.

- ◆ More info: <http://swenergy.org/programs/buildings/codes/status/arizona.htm>

Energy Efficiency Standards

In 2005 Arizona adopted minimum efficiency standards for 12 products not covered by federal standards. These standards took effect in 2008. In 2009, Arizona adopted minimum efficiency standards for pool pumps and spas.

Climate Change

In 2006, former Governor Janet Napolitano established a statewide goal to reduce Arizona's future greenhouse gas (GHG) emissions to year 2000 levels by 2020, and to 50% below 2000 levels by 2040. Key strategies include improving energy efficiency for buildings and appliances and reducing energy demand by consumers and businesses.

- ◆ More info: <http://www.azclimatechange.gov/>

State Energy Efficiency Scorecard

The American Council for an Energy-Efficient Economy (ACEEE) has ranked states based upon scores in six categories of energy efficiency commitment and policy support as of 2010. The categories include: 1) utility and public benefits of energy efficiency programs; 2) combined heat and power (CHP); 3) building energy codes; 4) transportation policies; 5) appliance and equipment efficiency standards; and 6) state government initiatives. In this national ranking, Arizona was ranked 18th among all states with a score of 23 out of a possible 50 points.

Electricity Conservation Potential and Impacts in Arizona*

Savings potential in 2020:	34%
Avoided new power capacity:	6,100 MW
Net dollar savings (2003-2020):	\$10.5 B
Net increases in jobs by 2020:	24,100
Water savings by 2020:	2 2B gallons/year

*Based on the High Efficiency Scenario in SWEEP's study *The New Mother Lode: The Potential for More Efficient Electricity Use in the Southwest*.

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Residential Energy Consumption Survey (2009)

The Energy Information Administration has recently published housing characteristics data from the 2009 Residential Energy Consumption Survey. Residential energy consumption data will be published and included in this fact sheet when it becomes available.

Housing Characteristics:

The table below indicates the fraction of households in Arizona that report having, using or practicing the following equipment and/or behaviors in their homes:

Poor insulation:	9%
Home is too drafty during the winter some or most of the time:	13%
Single pane glass in windows:	48%
Energy-efficient light bulbs:	65%
Two or more refrigerators:	26%
ENERGY STAR refrigerator:	35%
ENERGY STAR dishwasher:	30%
ENERGY STAR clothes washer:	39%
Three or more televisions:	39%
Keep some or all portable tools and appliances chargers always plugged in:	17%
Turn off computers when not in use:	48%
Keep some or all cell phone and other electronic device chargers always plugged in:	26%
Electric resistance heating as a main heating source:	30%
Have and use a programmable thermostat:	30%
Central air conditioning:	87%
Evaporative cooling:	13%
Use ceiling fans quite a bit or all summer:	65%
Electric resistance water heating:	52%
Insulation blanket on main water heater:	9%

Source: U. S. Energy Information Administration, 2009 Residential Energy Consumption Survey: Preliminary Housing Characteristics Tables.

More Information on Energy Efficiency

- ◆ American Council for an Energy-Efficient Economy (ACEEE) www.aceee.org
- ◆ Alliance to Save Energy www.ase.org
- ◆ Consortium for Energy Efficiency www.cee.org
- ◆ ENERGY STAR® Products www.energystar.gov
- ◆ Southwest Energy Efficiency Project www.swenergy.org
- ◆ U.S. DOE's Energy Efficiency & Renewable Energy Programs www.eere.energy.gov