



Cesar Chavez Library, LLC design, photo by Bill Timmerman



James Learning Center, Highlands Center for Natural History



Armory Park: John Wesley Miller



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BUILDING CODES

A few Arizona municipalities have implemented beyond-code standards, including Marana, Tucson, Buckeye, Pima County, Scottsdale, and Apache Junction. These programs exceed current energy efficiency requirements and are voluntary Green Building programs or other higher code development, such as Leadership in Energy and Environmental Design (LEED).

Scottsdale

In 1998, The City of Scottsdale introduced the first Green Building Program in Arizona – ten years before any other jurisdiction. Additionally, in 2005, Scottsdale became the first U.S. city to require that all new or major renovated city buildings meet LEED Gold standards.

Scottsdale's voluntary Green Building Program encourages a whole-systems approach, taking multiple factors into consideration: energy, site use, indoor air quality, building materials, solid waste, and water.

Pima County

In Pima County, the Board of Supervisors created a five-year Sustainable Action Plan requiring the county to reduce water use, save fuel, construct green buildings, use renewable energy, buy sustainable products, practice conservation and waste reduction.

A key component of the plan, the Regional Residential Green Building Council's Rating System, created a guide for builders, developers, and property owners to help with the design and construction of energy efficient, water-conserving, healthy homes.

PUBLIC BUILDINGS

At the state and local level, public buildings provide an opportunity for universities and government to lead by example. Designing and retrofitting public buildings to be greener and more energy efficient is a growing trend.

James Learning Center, Highlands Center for Natural History, Prescott

Located on the Prescott National Forest, the center is off the grid with 70% of the building's heating and cooling load achieved passively. Solar panels on the roof supply the remaining energy needs for the facility. Landscaping uses harvested rainwater, native plants, and landforms that control erosion and drainage.

The James Learning Center is the first project in Prescott to achieve LEED certification. Awarded LEED Gold certification by the U.S. Green Building Council in 2008, it is the first Gold project for Yavapai County.

Maricopa Community Colleges, Arizona

Maricopa Community College District (MCCD) includes ten colleges, two skill centers, and many smaller centers. The Facilities Planning and Development Department has significantly reduced energy use at MCCD through the installation of energy efficient windows, high efficiency air handlers, upgraded insulation, occupancy sensors for HVAC and lighting, along with numerous other efficiency improvements. In recognition of their efforts, the Facilities and Development Department received the Governor's Energy Conservation Award in 1999. Saving money by reducing the cost of energy freed up funds to pay teachers and achieve education goals.

RESIDENTIAL CONSTRUCTION

Much of Arizona's projected electricity use and, therefore, emissions of greenhouse gases and other pollutants is related to houses that have yet to be built. By 2030, an estimated 50% of the buildings in our state will have been built after 2000.

Architectural design can have a substantial impact on reducing energy use in new home construction. However, there are only a handful of homebuilders in Arizona that are building highly efficient homes. As a high growth state, Arizona is a crucial place to address this issue.

Pepper-Viner Homes, Tucson

Pepper-Viner Homes is bringing High Performance Building into the mainstream building industry in Southern Arizona. Pepper-Viner uses the ENERGY STAR® label because it is a recognizable sign of quality, is measurable, requires third party verification, and outlines the schedule and direction of the project.

The company is building new homes that are innovative, creative, and built to conserve natural resources and lower energy costs. Completed homes save 40-50% of energy consumption when measured against a home built to current code in Tucson. Further, the company just completed construction of a demonstration High Performance Home at the project that saves 80% on energy and meets the Environmental Protection Agency's Indoor Air Plus level. This house is projected to be the first home to reach the Emerald (highest level) rating of the Pima County Regional Green Building Rating System.

Armory Park: John Wesley Miller, Tucson

John Wesley Miller, a Tucson-based home builder and solar pioneer, is a national leader in green building practices. Miller works with local utilities, building departments, and universities to develop energy-saving products, technologies, and policies. He is one of four builders selected by the U.S. Department of Energy to develop Net Zero Energy Homes, which use photovoltaic generation to offset utility-supplied power.

One development is the 14-acre Armory Park del Sol, located in downtown Tucson, which includes 99 single-family solar homes designed to blend in with surrounding neighborhoods. New technology and construction methods incorporated into these homes include dual-pane windows, efficient HVAC, among other measures. On average, Armory Park del Sol homes use half the energy of a typical regional home, and the two Net Zero Energy Homes produce more energy than they consume.

Local Action for Global Impact!

Acting locally to reduce energy use through efficiency, will benefit the people of Arizona by lowering energy costs, providing cleaner air to breathe and protecting water resources.

Buildings are responsible for approximately half of all U.S. energy consumption and carbon dioxide emissions annually. In reducing greenhouse gases produced by the building industry in Arizona we can have an effect on climate change on a regional, national and global scale.

Utility Demand-Side Management/Utility Programs

To assist customers, Arizona's major utilities offer Demand-Side Management programs for residential, commercial, and industrial construction and remodeling projects.

Arizona Public Service (APS) Residential New Construction

In APS's ENERGY STAR® Homes program, homes are 15-20% more efficient than 2006 building codes. The program covers new construction elements such as HVAC, windows/thermal envelope, lighting/appliances, performance testing and inspections, builder incentives, training, and sales assistance and information for consumers.

Tucson Electric Power (TEP) Guarantee Home Program

TEP guarantees a lower electric bill for homes that meet specific energy efficiency construction requirements. TEP has an Efficient Home Cooling Program that provides rebates toward the purchase of qualifying high-efficiency HVAC systems. TEP works with local retailers and lighting manufacturers to provide customers discounted pricing on energy-efficient lighting. TEP also provides free information and opportunities for residents and builders on Green Building practices and sponsors a Trees for Tucson shade tree program

Salt River Project (SRP) Power Wise Homes

SRP's program for residential energy-efficient building includes two tiers of energy efficiency standards. The first tier offers an incentive of 50% of Contribution in Aid of Construction (CIAC), which are capital funds paid by the customer as an up-front payment toward design and construction; the second tier offers an additional incentive of 100% of CIAC. SRP also has a builder incentive of \$400 per home, plus additional incentives based on CIAC payment.

For more information on utility programs offered in your area, visit the utility websites.

Arizona Energy Efficiency Project

The Arizona Energy Efficiency Project is a collaborative venture among five Arizona groups to significantly increase energy efficiency in Arizona. Project funding is generously provided by the Edwards Mother Earth Foundation. For more information on the groups, this project, and what you can do to help improve energy efficiency in our state, please contact the following:

Sierra Club – Grand Canyon (Arizona) Chapter
arizona.sierraclub.org

Southwest Energy Efficiency Project
www.swenergy.org

Western Resource Advocates
www.westernresourceadvocates.org/index.php

Arizona Public Interest Research Group
www.arizonapirg.org

Arizona Center for Law in the Public Interest
www.aclpi.org

Additional energy efficiency resources can be found at the following sites:

Arizona Department of Commerce, State Energy Office
www.azcommerce.com/Energy

Arizona Corporation Commission
www.cc.state.az.us

American Council for an Energy-Efficient Economy (ACEEE) www.aceee.org

Alliance to Save Energy
www.ase.org

Consortium for Energy Efficiency
www.cee1.org

U.S. Dept. of Energy's Energy Efficiency and Renewable Energy Network
www.eere.energy.gov

ENERGY STAR® Products
www.energystar.gov



Arizona PIRG



What if we could reduce energy use and save money too? What if we could build and retrofit more energy-efficient buildings and reduce pollution and water use? We can, and, in some cases, we already are!

Arizonans rely primarily on coal, gas, and nuclear power to generate electricity. The impacts associated with generating electricity from these sources, include air pollution, use of limited water resources, emissions that contribute to global climate change and significant impacts from mining or drilling for conventional fuels.

Energy efficiency is a source of energy similar to coal, gas, or nuclear. Instead of drilling using derricks and mines, we can use this clean energy source by doing more with the energy we already generate. Energy efficiency is the cleanest and lowest cost energy resource. For every kilowatt hour (kWh) that is not used, we actually save more than a kWh with the decrease in transmission losses.

In every home, office, public building, and school, we can use energy more efficiently by putting to work currently available products such as advanced lighting, ENERGY STAR® appliances, better insulation, efficient windows, and high-efficiency heating, ventilation and air conditioning (HVAC) equipment. Opportunities are endless as new technologies come online.

Energy efficiency measures are cost effective and help provide some protection against volatile fuel costs associated with conventional electricity generation. The Western Governors' Association's Energy Efficiency Task Force Report indicates that the average cost for energy efficiency programs is \$0.02 to \$0.03 per lifetime kWh saved – much lower than the cost of new conventional generation (\$0.05 to \$0.09/kWh) and lower than current electric rates (about \$0.10/kWh).

Promoting energy efficiency in Arizona will accomplish the following:

- save consumers and businesses money on their electricity bills
- make homes more affordable
- reduce the need for costly and controversial new power plants
- increase the reliability of energy supply systems
- reduce dependence on oil and natural gas imports
- reduce emissions of air pollutants that are harming public health and contributing to global warming
- create jobs in the housing and construction sectors

Already, we have examples of how Arizona is stepping up to advance energy efficiency – from improving building codes to building energy-efficient public buildings to utility-based demand-side management.

In a slumping construction industry, energy efficiency retrofits and new buildings create jobs for an already trained workforce. Still, more can and must be done to improve efficiency in our state. That is why several Arizona-based organizations are involved in the Arizona Energy Efficiency Project – to ensure that our homes, offices, government buildings, and schools are all more efficient in order to better protect our resources and our pocketbooks. Your participation in this effort will ensure a greener future for Arizona.