

A healthy community ensures significant and sustained progress toward a clean energy future.

Energy & Conservation



Photo provided by Durango Recycling Center



Photo provided by SW CO Council of Governments



Photo provided by Four Corners Office for Resource Efficiency



La Plata County **Energy Council**

ENERGY AND CONSERVATION

In 2005, this section was added to the Southwest Colorado Index to capture activities around energy use, conservation, sustainability and alternative technologies. Since the last publication, much progress has been made toward improving conservation efforts, recycling and developing alternative energy. These efforts support the original Community Vision of *ensuring significant and sustained progress toward a clean-energy future*.

2015 brought dramatic change in energy prices impacting several counties in our region that are highly dependent on oil and gas revenues for taxes and employment. The average price of oil from 2011 to 2015 fell by 48.7%, an average annual decline of 12.5%.

Lower energy prices are a double edged sword. First, lower fuel prices contribute to lower travel costs for both residents and tourists. Lower prices will have a positive impact on domestic vehicle tourism; models suggest that a 10% decrease in gas prices yield about 2% more miles driven. Add to that rising income levels and we should see pretty healthy increases in vehicle miles driven for the foreseeable future, oil futures prices predict oil prices to remain below \$60/bbl for the next 10 years.¹

On the other hand, our counties which rely on extraction taxes could find it more difficult to fund services such as education, fire protection, and finance infrastructure investments.

Energy Use

China currently leads the world in energy consumption at 3,034 Million Tonnes of Oil Equivalent (Mtoe - unit of energy defined as the amount of energy released by burning one million tons of crude oil) with the United States second with 2,224 Mtoe. These two nations far exceed others, with India ranked third at 872 and Russia fourth at 751. Overall, world oil consumption continues to climb.

Colorado is 34th in the U.S. for total energy consumed per capita, which translates to state residents consuming 15% more than the average U.S. household. Colorado ranks 7th in the production of natural gas, 10th in crude oil, and 12th in coal.²

Colorado is a major natural gas-producing state in the U.S., with output doubling since 2001. Eleven of the nation's largest natural gas fields are located wholly or partly in Colorado. In 2015, Southwest Colorado operators produced 76% of the State's coalbed methane natural gas and 19% of the State's total natural gas production.

¹ Personal Communication – Dr. Robert Sonora, , Professor of Economics at Fort Lewis College in Durango and Director of the Office of Business and Economic Research.

² www.coloradoenergy.org

The San Juan Basin, which underlies part of New Mexico, was the largest in the country, but due to commodity prices and technology advancement in fracking of shale deposits for natural gas in the rest of the U.S., production is down. "Instead of drilling more traditional natural-gas wells or coal-bed methane wells – the kind that are found in the San Juan Basin – companies now drill shale oil wells, which often produce natural gas as a byproduct".³ The shale deposits in both Archuleta and La Plata Counties have not yet been drilled.

The state uses only about one fourth of the natural gas it produces.⁴ The largest consumers are residences, with nearly three fourths using natural gas for home heating. Electricity generation is the second largest consumer. Colorado crude oil production, primarily in Weld County, increased by 400% between 2004 and 2014. Three of every 100 barrels of U.S. crude oil is supplied by Colorado (EIA Colorado).

The State holds substantial coal reserves from both surface and underground mines, with the San Juan Basin, primarily in New Mexico, one of the three largest producers. Nearly half of Colorado's coal is used for power production and the remainder is exported. Initially coal was used to power steam locomotives and to make steel, but electricity generation is now the main usage (ibid). Coal-fired power plant consumption and production has increased from 44% to over 60% in the last decade. Coal from southwest Colorado is also used in the manufacturing process of cement and as fuel for the Durango & Silverton Narrow Gauge Railroad.

Colorado's electric utilities rely almost exclusively on coal, but natural gas surpassed coal in April 2015. Colorado also has alternative energy sources with geothermal, wind, biomass and hydro resources. Biomass is a growing resource, being promoted by the Colorado Energy Office, with anaerobic digestion leading the way, converting cow or hog manure and food waste into biogas, which can be refined into pipe-line grade natural gas. This produces energy and removes methane, a powerful greenhouse gas, from the atmosphere and removes waste from the watershed. The state also has the seventh largest solar photovoltaic market and the tenth largest wind market in the U.S.⁵

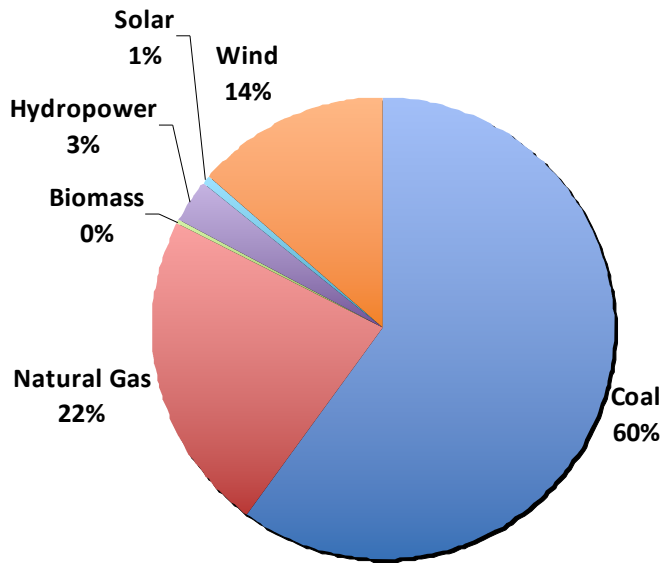
In 2004 Coloradoans approved the first voter-led Renewable Energy Standard in the nation, requiring certain Colorado utilities to obtain a percentage of their electrical power from renewable energy resources by 2007. The legislature has increased the minimum requirements three times since 2004, leading to the development of hundreds of new renewable energy projects across the state.

³ <http://www.durangoherald.com/article/20130807/NEWS01/130809614/Shale-boom-passing-by-SW-Colorado>

⁴ U.S. Energy Information/Colorado ~ www.eia.gov/state/analysis.cfm?sid=CO

⁵ www.acore.org

Colorado Energy Usage 2015



Renewable energy has substantial benefits, including diversification of the state's electricity energy portfolio, insulating customers from volatile fuel prices, and supporting jobs and economic development.

Colorado is ranked ninth in the nation for installed solar capacity. Colorado's energy demand is projected to grow by approximately 2% per year through 2025. Per the chart on the left, nearly 83% of Colorado's electrical power is from fossil fuels.

Renewable Energy

Green Power, defined as energy produced from renewable or non-extractive sources, has been an option offered by area electric companies in Southwest Colorado for a number of years. La Plata Electric Association (LPEA), Empire Electric Association (Empire) and San Miguel Power Association purchase power from Tri-State Generation and Transmission (Tri-State).

Tri-State's green power is generated primarily from wind resources. It has agreements with commercial wind farms (located in Colorado and New Mexico), hog farms (biomass), and hydropower facilities both federal and local (including Vallecito Lake and Jackson Gulch near Mancos) to supply the required green electricity. Tri-State also recently developed the largest solar photovoltaic project by an electric cooperative. The Cimarron facility in New Mexico is one of the largest solar photovoltaic facilities in the world.

| Green Power Usage per Kilowatt Hour | | | |
|-------------------------------------|--|--|---|
| Year | La Plata Electric Association (Archuleta & La Plata) Blocks/# Customers | Empire Electric (Dolores & Montezuma) Blocks/% or # Customers | San Miguel Power Association (San Juan) Blocks/% Customers |
| 2001 | 133/38 | * | * |
| 2007 | 16,891/1,357 | * | 936/24% |
| 2015 | 355,467/1,462 | 14,400/120 | 46,095/3% |

* Data unavailable

Customers can support the production of solar, wind, biomass, and hydro-generated power by paying a higher price for their electricity.

In 2006 at LPEA, a 100 kWh block of Green Power cost \$2.50. In 2008 the cost was \$0.80. LPEA's price for Green Power has decreased markedly, now being offered at \$0.09 per 100 kWh block. These reductions have dramatically increased participation in the program. LPEA's goal is for 20% of their electric energy purchases to be generated locally by alternative means by 2020. Empire does not have a specific green power goal. Empire also offers Green Power at \$0.09 per 100 kWh block.

Conservation

Conservation goals include reducing the amount of energy consumed per household. LPEA offers a Time-of-Use plan, in which residents sign up for special billing and receive a lower rate for using electricity during off-peak hours. LPEA and Empire offer Renewable Energy Credits to customers who install renewable generation systems such as solar photovoltaic.

All regional power co-ops provide Net Metered Accounts for customers who produce more energy than they expend. LPEA's metered customers have increased from 52 in 2007 to 779 currently, and Empire had 105 Net Metered Accounts in 2015.

| Average Monthly Residential kWh Usage | | | | | |
|---------------------------------------|----------|--------|------------|----------|-------|
| Year | La Plata | Empire | San Miguel | Colorado | U.S. |
| 2001 | 654 | * | * | 774 | 1,113 |
| 2006 | 667 | 667 | 793 | 797 | 1,168 |
| 2015 | 662 | 668 | 785 | 687 | 911 |

* Data unavailable

La Plata Electric Association serves Archuleta, La Plata and portions of Hinsdale and Mineral Counties.

Empire Electric Association serves Cortez, Dolores, Mancos, Dove Creek, Towaoc and Monticello.

San Miguel Power Association, Inc. serves all or parts of Ouray, San Juan, San Miguel, Mesa, Hinsdale and Dolores Counties.

Projected energy trends include the construction of larger homes and more air-conditioning in the state. Offsetting some of these increased power demands are programs such as home energy audits to identify money and energy-saving options, improving weatherization and insulation, use of Energy Star appliances, and use of efficient lighting, such as Compact Fluorescent Light (CFL) or Light Emitting Diodes (LED).

Energy credits are also offered for purchasing electric water heaters or heating systems. SmartHub is an online account management tool for electric co-op members that feature daily and hourly usage data access. Due to such conservation measures LPEA and Empire expect to see an overall downward trend in energy usage.

Colorado legislation in 2007 enabled the Public Utilities Commission (PUC) to establish a multi-year energy savings goal for electric utilities in the state. Targeted savings were 1.35% of sales in 2015 with an increase to 1.68% by 2020. Utility companies file a plan with the PUC each year.

Solid Waste and Recycling Programs

Municipal Solid Waste (MSW) – more commonly known as trash or garbage – consists of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint and batteries. The largest component of MSW consists of organic materials, such as paper and paperboard at 29%, and yard trimmings and food scraps account for another 27%. Other components are: plastics 12%; metals 9%; rubber, leather and textiles 8%; wood is approximately 6.4% and glass 5%. Miscellaneous wastes make up approximately 3.4%.

Several MSW waste management practices, such as source reduction, composting, combustion and recycling prevent or divert materials from landfills. Landfills are engineered areas where waste is deposited; these typically have liner systems and other safeguards to prevent groundwater contamination. In 1986, there were over 7,000 dump sites in the United States. By 2009, there were only 1,908 landfills nationwide, a 75 % decline in less than 25 years. However, much of the decrease is due to consolidation of multiple landfills into single, more efficient facilities. Also, each acre of landfill generally can take 30% more waste due to technological innovations.

There are 63 landfills and 52 transfer stations in the state of Colorado that accept waste from the public, this does not include commercial composters or recyclers.⁶

- **Source reduction** involves altering the design, manufacture, or use of products and materials to reduce the amount and toxicity of what is thrown away.
- **Composting** decomposes organic waste, such as food scraps and yard trimmings, with microorganisms (mainly bacteria and fungi) to produce a humus-like substance.
- **Combustion** is another MSW practice that has helped reduce the amount of landfill space required. Combustion facilities burn MSW at high temperature, reducing waste volume, and generating electricity. The number of waste incinerators in the U.S. has not increased substantially in the last decade, with incinerators being controversial due to emissions.

However, since recycling rates have stagnated nationally, combustion is seeing new municipal facilities being constructed. The most cutting edge technology is mechanical-biological waste-to-fuel plants, or mechanical biological treatment (MBT), the first of which will start up in 2017 in Martinsburg, West Virginia.

Of the 254 million tons of MSW collected in the U.S. in 2013 (about 4.4 pounds per person per day), 87 million tons were recycled – equivalent to a 34% recycling rate. According to the U.S. Environmental Protection Agency, this prevented the release of approximately 186 million tons of carbon dioxide into the air; equivalent to taking over 39 million cars off the road for a year.

⁶ (www.Colorado.gov/swfacilities).

Energy recovery from waste, or "waste-to-energy," by a variety of methods, including combustion, accounted for approximately 15% of MSW. The U.S. can aspire to international waste-to-energy success stories such as Sweden, which converts over 50% of MSW to energy yearly.

Municipal Solid Waste (MSW) Collection

The amount of municipal waste being collected is increasing in the region. Population growth may account for the increase in some areas, while the types of materials collected, such as construction waste, may also account for the rise in cubic yards collected. Local landfill procedures have evolved through the years to include compaction of tonnages into cubic yards, making the waste stream more efficient and increasing waste storage in landfills.

| Municipal Solid Waste (MSW) Generation | | | |
|--|-------------|------------------------------|------------------------------|
| Solid Waste Collection Site | Year | Cubic Yards Collected | % Change 2007 to 2015 |
| Archuleta County Landfill | 2001-2015 | * | * |
| WCA Waste | | | |
| Durango, Bayfield, Ignacio | 2001 | 171,222 | |
| some of Dolores | 2007 | 243,487 | |
| Aztec, Bloomfield | 2015 | 260,528 | 7% |
| City of Durango | 2001 | 19,398 | |
| | 2007 | 23,285 | |
| | 2015 | 24,826 | 7% |
| Durango Waste Management Transfer Station | | | |
| General public drop-offs | 2001 | 72,375 | |
| & collection from unincorporated | 2007 | 129,196 | |
| areas of La Plata County | 2015 | 128,659 | 0% |
| Montezuma County Landfill | 2001 | 39,818 | |
| Montezuma & Dolores Counties | 2007 | 49,717 | |
| | 2015 | 56,887 | 14% |
| Silverton | 2001 | 5,296 | |
| | 2007 | 1,480 | |
| | 2015 | 4,540 | 207% |

Southwest Colorado is served by both public and private MSW collection services. The Public Works Departments of Durango and Cortez serve most households within those city limits.

Phoenix Recycling, Baker Sanitation, now owned by Texas-based Waste Management and Waste Corporation of America (Transit Waste) serve unincorporated areas of the region with privately contracted pick-up services and transfer stations (temporary holding and processing sites for trash).

* Data unavailable

Bruin Waste Management, of Naturita, CO provides for the Silverton community’s solid waste services, which include commercial collections, operation of the Town-administrated transfer station and recycling.

The U.S. per capita generation of MSW has remained fairly consistent for decades with a high in 1990 at 4.6 pounds per capita daily (ppcd) and the 2013 rate at 4.4. In the Southwest Colorado area, solid waste generation rate is about 5.9. This is significantly below the Colorado average of 8.8 ppcd.

Recycling

Recycling diverts items such as paper, glass, plastic and metals from the waste stream. These materials are collected, sorted, processed, manufactured, sold and purchased as new products. This region (Archuleta, Dolores, La Plata, Montezuma and San Juan Counties) has an overall average rate of 14% of materials diverted from landfill, versus a national rate of 34%. However, La Plata County leads the region at 32%. Waste diversion faces a number of obstacles in southwest Colorado, such as: reliance on drop site collection; less peer pressure to recycle – burning is common, and distances required for shipping recyclables to markets up to 400 miles away.

| Recycling Programs | | | | |
|--|------|--------------|--|----------------------------|
| Recycling Program | Year | Total Pounds | Compacted Cubic Yards Diverted from Landfill | Pounds Recycled per Capita |
| Durango: serving La Plata County and private haulers from Montezuma and Archuleta Counties | 2001 | 5,034,490 | 16,358 | 61 |
| | 2006 | 7,065,088 | 22,885 | * |
| | 2015 | 19,022,000 | ****24,826 | 1,069 |
| Phoenix Recycling: serving La Plata County | 2007 | * | 21,270 | * |
| | 2015 | * | | * |
| Cortez: serving Montezuma and Dolores Counties | 2001 | 602,699 | **49 | 23 |
| | 2007 | 687,655 | * | * |
| | 2015 | 855,690 | * | 99 |
| Silverton: serving San Juan County | 2001 | * | 1,313 | * |
| | 2007 | * | 1,481 | * |
| | 2015 | * | ***948 | * |

Prior to single stream recycling, Durango Recycling Center did not charge a fee. Presently Durango Recycling is the only drop off site in the La Plata County. There are drop off sites in Montezuma County including the Landfill. The daily average for public drop-off is around 65 customers and the daily route pickup at curb-side averages 600 homes a day.

* Data Unavailable

**Tons of cardboard diverted from Montezuma County Landfill

***Non-compacted cubic yards

****This data does not include e-waste, asphalt or mulching

Future progress to increase recycling depends on education, changes in public policy, outreach programs, developing local processing, increased drop sites, and leadership prioritizing waste diversion. According to a recent study by the SW Colorado Council of Governments⁷, enhanced composting infrastructure to support organics recovery and provide soil amendment for this semi-arid region would likely be the biggest bang for the buck in terms of waste diversion.

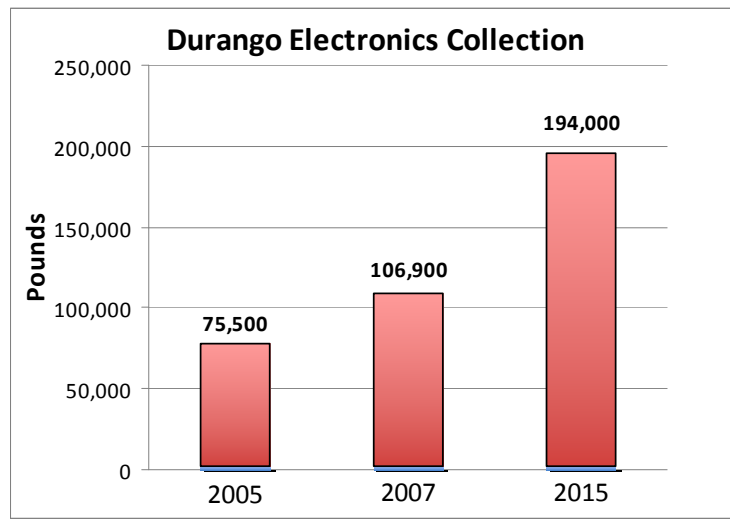
In recent years, per-capita recycling rates have increased substantially in the area. Durango has increased from 61 pounds per person in 2001 to 1,069 pounds in 2015. Cortez has seen a 400% increase in recycling per person during that same period.

⁷ <http://www.swccog.org/projects/environment/recycling/>

The City of Durango began "single stream" recycling in 2013 to encourage more participation in recycling and to conserve resources. Phoenix Recycling provides curbside recycling to La Plata County customers every other week and just received a Class II permit for a new facility. Phoenix accepts metals, cardboard, paper and certain plastics. They hand sort construction materials for wood, cardboard and metals. Waste Management also offers curbside recycling biweekly in their service area.

Single stream recycling is considered to be more convenient for the community as it does not require sorting and uses a single container for all recyclables excluding glass. Glass is the responsibility of each household, and is recycled for free at the Durango Recycling Center 24 hours a day, with no proof of residency required. Non-city residents and commercial interests are welcomed to use the Durango Recycle Center also for drop-offs. Non-city residents are charged \$3 per 60 gallons of single stream material. Drop-off commercial recycling is \$3 per cubic yard and is collected from 9 am to 2 pm Monday-Friday only. Commercial recycling pickup is charged according to container size and number of pick-ups per week.

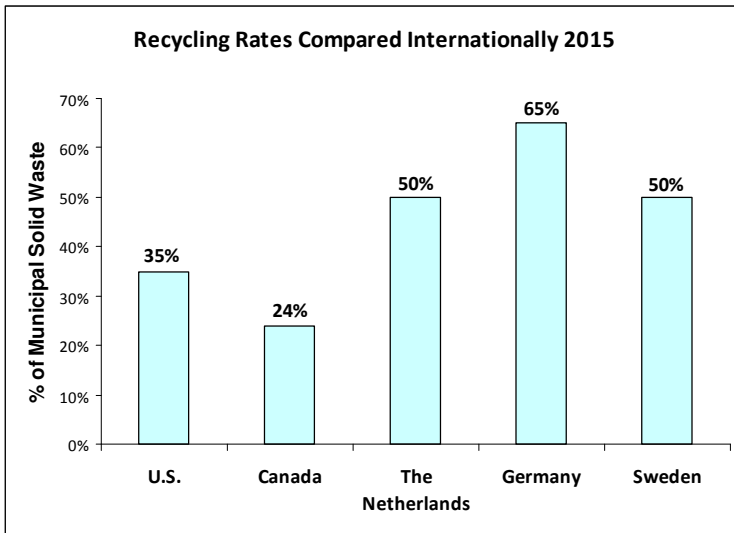
Dry-cell batteries are recycled separately at the Durango Recycle Center and several regional businesses have volunteered to accept rechargeable batteries and cell phones. Electronics, or E-waste, are accepted at the Durango Recycle Center on Saturdays for residents and Fridays for businesses. Costs are \$2 per pound for household batteries, most small electronics \$5 or under, and rates up to \$25 for large items. Collection of E-waste grew 157% from 2005 to 2015.



The Montezuma Landfill collects batteries and also advertises special clean-up events for tires and electronics. Regional programs vary by county, depending on resources, budgets and marketability of recycled materials. Currently, Durango ships recycling products to Albuquerque, Salt Lake City and the Front Range. The charge for these items varies.

Archuleta County initially used Durango for all recycling, but in 2014 obtained a grant and purchased a bailer for recycled material. The material is baled at the transfer station; the recyclables are then sold. Proceeds from aluminum cans are donated to Pagosa High School environmental scholarships, at around \$4,000 per year. Archuleta County residents may use Durango Recycling Center for materials that the county does not accept, such as batteries, e-waste and household hazardous waste.

Silverton previously brought its recyclables to Durango, but now it takes those materials to Montrose or Grand Junction. Cortez, Mesa Verde and Telluride used Durango Recycling in years past, but have now made other arrangements. The Montezuma Landfill purchases recyclables including: cardboard, paper, metals and certain plastics.



The U.S. and Canada lag behind European Countries in recycling efficiency.

Household Hazardous Waste (HHW)

Household Hazardous Waste consists of common household items such as cleaners, paints and solvents, automotive products and fluids, batteries, pesticides, expired medication, fluorescent bulbs, mercury thermometers and thermostats, all of which contain toxic components. The leftovers of these products, if mishandled, can be dangerous to our health and environment, potentially making its way into the atmosphere and water supply.

The average American household generates 15 pounds of HHW per year. The City of Durango collects HHW as part of its recycling program. In 2007 Durango collected 76,814 pounds of HHW, or 17,607 gallons, from 629 participant households, mostly from La Plata County, but drop-offs are also accepted from residents of area counties. The initial years of the program generated very large quantities as many residents had been storing these materials. Recent years have seen more moderate participation. Due to costs incurred by Durango, the HHW event is held every other year.

The Southern Ute Tribe has an HHW disposal and recycling program (including electronics and batteries) with spring and fall pickups and drop-offs available at the Utilities Division Transfer Station. The state established a "Paint Care" program in 2015 that arranges for paint pickup at local retailers throughout the state. In Durango and Cortez, Ace Hardware and Sherwin Williams accept latex paint. In Pagosa Springs, GreenSheen Paint, Sherwin Williams and Terry's Ace also have retail pickup sites.

More Resources

Colorado Governor's Energy Office ~ www.colorado.gov/energy/

Colorado Oil & Gas Conservation Commission ~ <http://cogcc.state.co.us/data.html#/cogis>

Colorado Waste Disposal Data ~ www.colorado.gov/pacific/cdphe/swfacilities

Four Corners Office of Resource Efficiency ~ www.fourcore.org

Home Energy Saver ~ www.energyguide.com

Southwest Colorado Renewable Energy Society ~ www.swcres.org

Sustainability Alliance of SW Colorado ~ www.sustainablecolorado.org

Colorado Energy Data ~ www.coloradoenergy.org/data/default.htm

U.S. Department of Energy, Energy Efficiency & Renewable Energy ~
www.apps1.eere.energy.gov/states/residential.cfm/state=CO