

## ENERGY & CONSERVATION

**Community Vision -- Ensure significant and sustained progress toward a clean-energy future.**

| Municipal Solid Waste (MSW) Generation  |           |                       |
|---|-----------|-----------------------|
| Solid Waste Collection Site   | Year      | Cubic Yards Collected |
| Archuleta County Landfill   | 2001-2007 | *                     |
| Bondad Landfill (Transit Waste)<br>Durango, Bayfield, Ignacio, Aztec,<br>Bloomfield, some of Dolores, Mancos<br>Cortez        | 2001      | 171,222               |
|   | 2002      | 208,938               |
|   | 2003      | 217,768               |
|   | 2004      | 277,218               |
|   | 2005      | 227,768               |
|   | 2006      | 236,304               |
|   | 2007      | 243,487               |
| City of Durango   | 2001      | 19,398                |
|   | 2002      | 20,622                |
|   | 2003      | 20,145                |
|   | 2004      | 20,800                |
|   | 2005      | 20,661                |
|   | 2006      | 21,740                |
|   | 2007      | 23,285                |
| Waste Management Transfer Station<br>General public drop-offs &<br>collection from unincorporated<br>areas of La Plata County | 2001      | 72,375                |
|   | 2002      | 83,314                |
|   | 2003      | 78,603                |
|   | 2004      | 83,040                |
|   | 2005      | 106,979               |
|   | 2006      | 128,035               |
|   | 2007      | 129,196               |
| Montezuma County Landfill<br>Montezuma and Dolores Counties   | 2001      | 39,818                |
|   | 2002      | 41,741                |
|   | 2003      | 46,521                |
|   | 2004      | 44,582                |
|   | 2005      | 39,983                |
|   | 2006      | 42,959                |
|   | 2007      | 49,717                |
| Silverton Trash   | 2001      | 5,296                 |
|   | 2002      | 5,503                 |
|   | 2003      | 5,782                 |
|   | 2004      | 6,544                 |
|   | 2005      | 2,932                 |
|   | 2006      | 2,790                 |
|   | 2007      | 1,480                 |

\*Data unavailable

Sources: Transit Waste, City of Durango, Waste Management  
Montezuma County, Town of Silverton

In 2005, this section was added to the *Index* to capture activities around conservation, sustainability, and alternative technologies. Since that last publication, much progress has been made toward developing alternative energy and fuels and improving conservation efforts.

### 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. In 2006, U.S. residents, businesses, and institutions produced more than 251 million tons of MSW, equal to approximately 4.6 pounds of waste per person per day. In 2001, U.S. residents generated waste at a rate of 4.4 pounds per person per day, and in 1960, the rate was 2.7 pounds per person per day (U.S. Environmental Protection Agency website). Currently in the United States, 32.5 percent of our waste is recovered and recycled or composted; 12.5 percent is burned at combustion facilities; and the remaining 55 percent is disposed in landfills.

### Municipal Solid Waste (MSW) Collection

Southwest Colorado is served by both public and private MSW collection services. The Public Works Departments of Durango and Cortez serve most households within city limits; Phoenix Recycling, Baker Sanitation, 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.

Locally, the Montezuma County Landfill changed procedures in 2005 and increased compaction of tonnages into cubic yards. So while tonnages are higher, the waste stream is compacted more efficiently. San Juan County trash-collection volumes have declined significantly from 2004, although the same provider used the same measurement criteria over time. Silverton’s recycling rates also increased during this period and may explain the decline in trash volumes.

**Recycling** diverts items such as paper, glass, plastic, and metals from the waste stream. These materials are sorted, collected, processed and then manufactured, sold, and purchased as new products. Recycling – including composting – diverted 82 million tons of materials nationwide from disposal in 2006, up from 15 million tons in 1980, when only 10 percent of waste materials was recycled. Back then, 90 percent of MSW was burned for energy recovery or disposed in landfills. Today, 52 percent of all paper, 31 percent of all plastic soft drink bottles, 45 percent of all aluminum beer and soft drink cans, 63 percent of all steel packaging, and 67 percent of all major appliances are now recycled.

In recent years, per-capita recycling rates have increased substantially in the region. Common recyclables include aluminum cans, corrugated cardboard, brown- and mixed-colored glass, clear glass, mixed paper, steel cans, steel or iron scrap, yard waste, and in some areas, plastics, ink cartridges, and electronics. Programs vary by county, depending on resources, budgets, and marketability of recycled materials.

The City of Durango collects nine materials for recycling from glass and aluminum to plastic and yard waste. The city’s recycling center also serves surrounding counties.

Archuleta County brings paper, cardboard, and plastics to the Durango center. Archuleta has temporarily suspended glass and can collections because of budgetary concerns.

The City of Cortez brings some glass to the Durango recycling center, and Mesa Verde drops off items from time to time.

| Recycling Rates  |      |              |  |                            |
|--|------|--------------|--|----------------------------|
| Recycling Program  | Year | Total Pounds | Compacted Cubic Yards Diverted from Landfill | Pounds Recycled Per Capita |
| <b>Durango</b><br>Serving: <b>La Plata</b><br>and <b>Archuleta</b><br>Counties | 2001 | 5,034,490    | 16,358                                       | 61                         |
|  | 2002 | 5,092,237    | 19,021                                       | 60.7                       |
|  | 2003 | 6,216,812    | 20,346                                       | 73.2                       |
|  | 2004 | 4,050,930    | 15,926                                       | 69                         |
|  | 2005 | 6,512,497    | 21,365                                       | 109                        |
|  | 2006 | 7,065,088    | 22,885                                       | *                          |
| Phoenix Recycling Serving <b>La Plata</b>                                      | 2007 |              | 21,270                                       | *                          |
| <b>Cortez</b><br>Serving:<br><b>Montezuma</b> and<br><b>Dolores</b> Counties   | 2001 | 602,699      | **49.45                                      | 23.3                       |
|  | 2002 | 548,037      | **71.20                                      | 21                         |
|  | 2003 | 689,705      | **78.53                                      | 26.1                       |
|  | 2004 | 646,135      | **92.97                                      | 24.2                       |
|  | 2005 | 620,104      | *  | 21.7                       |
|  | 2006 | 699,640      | *  | *                          |
|  | 2007 | 687,655      | *  | *                          |
| <b>Silverton</b><br>Serving: <b>San Juan</b><br>County                         | 2001 | *            | 1,313  | *                          |
|  | 2002 | *            | 1,202  | 2.13                       |
|  | 2003 | *            | 1,342  | 2.35                       |
|  | 2004 | *            | 1,538  | 2.67                       |
|  | 2005 |              | 1,763  | 3.03                       |
|  | 2006 |              | 1,225  | *                          |
|  | 2007 |              | 1,481  | *                          |

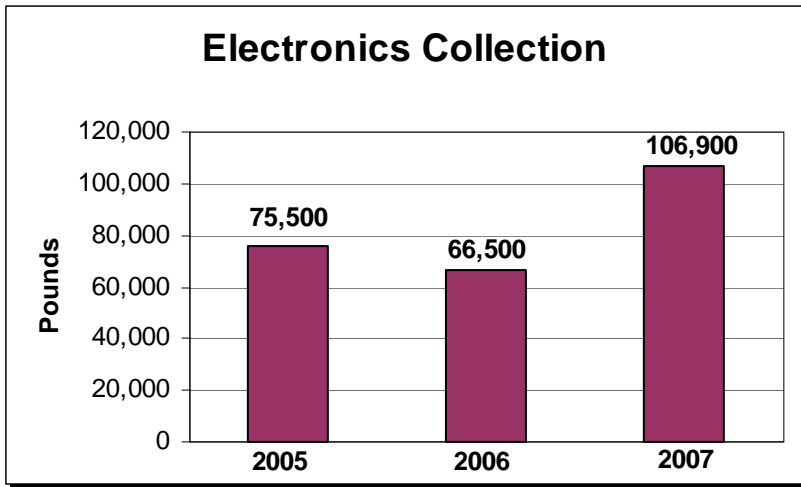
\*Data unavailable

\*\*Tons of Cardboard diverted from Montezuma County Landfill

Sources: Durango Recycling, City of Cortez Public Works, Town of Silverton

Silverton previously brought its recyclables to Durango, but now it takes most of its materials to Montrose. The Durango center occasionally receives paper from Telluride.

Common household items such as paints, cleaners, oils, batteries, and pesticides contain hazardous components. Leftover portions of these products are called **Household Hazardous Waste (HHW)**. These products, if mishandled, can be dangerous to our health and environment. The City of Durango is currently the only regional entity that collects household waste as part of its recycling program. During the first year of HHW collections in 2005, the city gathered 73,000 pounds of waste (16,971 gallons) from 578 households in Durango, Bayfield, and Ignacio. In 2006, Durango collected 13,983 gallons from 437 households in La Plata, Archuleta, Dolores, and Montezuma counties. In 2007, the city collected 76,814 pounds of waste, or 17,827 gallons, from 629 participants: 608 from La Plata County and 21 residents from outside of the county.



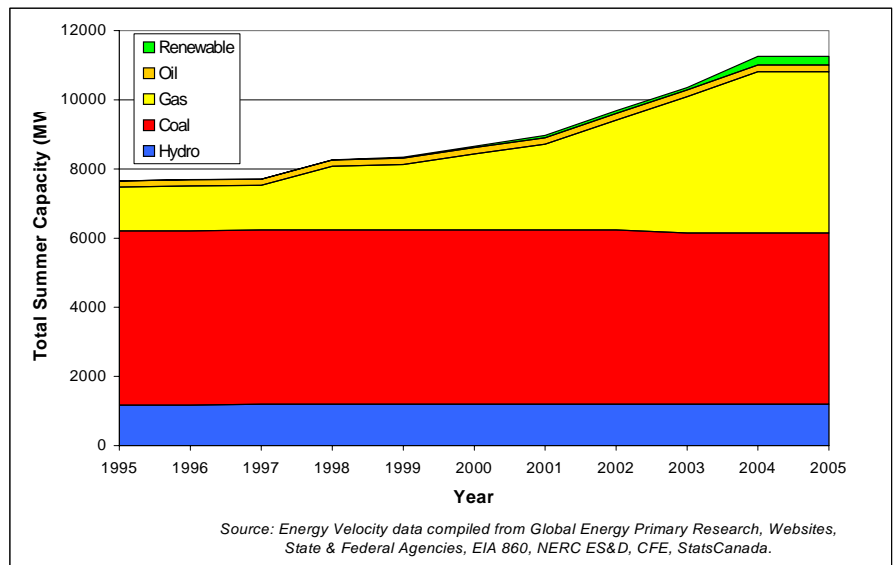
Durango also has sponsored E-Cycle events – computers and electronics recycling – twice a year since November 2005 with participants from La Plata, Archuleta, Montezuma counties.

**Alternative Energy**

The need to explore alternative and renewable energy sources and make them more readily available for general public use is growing. Since 1950, our population has doubled, our use of oil and petroleum products has tripled, and Coloradoans use 12 times the electricity. The electricity supply is not keeping up with

demand. Coal-fired power plants currently meet 44 percent of our energy needs, but building more is not a politically popular solution. The chart below shows the sources of Colorado’s electrical power, 95 percent of which is fossil-fuel-based. Natural gas accounts for 44 percent of electrical power production, and renewable resources account for about 3 percent. **Colorado’s energy demand is projected to grow by approximately 2 percent per year through 2025**

In November 2004, Coloradoans approved *Amendment 37* requiring certain Colorado utilities to generate or purchase a portion of their electrical power from renewable energy resources by 2007. House Bill 07-1281 requires utilities to derive a percentage of their retail electricity sales through renewable sources by 2020. Under this bill, Rural Electric Associations must purchase 10 percent of their power from renewable resources. Eligible renewable energy resources are solar, wind, geothermal, biomass, and hydroelectricity with a nameplate rating of 10 megawatts or less.



**Green Power** has been an option offered by area electric companies in Southwest Colorado for the last several years. Empire Electric Association, La Plata Electric Association, and San Miguel Power Association purchase power from Tri-State Generation and Transmission. Tri-State currently has agreements with commercial wind farms and hog farms (biomass) in Wyoming to supply the required green electricity. Some green power also is generated by local hydroelectric plants.

Customers can support the production of wind, biomass, and hydro-generated power by paying a higher price for their electrical usage. In 2006 at La Plata Electric, a 100kWh block of Green Power cost \$2.50; in 2007, \$1.25; and in 2008, 80 cents. Empire Electric offers a low 40 cents per 100kWh rate. These reductions have dramatically increased participation in the program.

| Green Power Usage per Kilowatt Hour |   |  |  |
|-------------------------------------|---|--|--|
| YEAR                                | La Plata Electric Association<br>(Archuleta & La Plata) | Empire Electric<br>(Dolores & Montezuma) | San Miguel Power Association<br>(San Juan) |
|                                     | Blocks / Customers                                      | Blocks / % customers                     | *  |
| 1999                                | 83 / 24   |  |  |
| 2000                                | 88 / 25   |  |  |
| 2001                                | 133 / 38  |  |  |
| 2002                                | 295 / 84  |  |  |
| 2003                                | 401 / 115   |  |  |
| 2004                                | 1,399 / 409   |  |  |
| 2005                                | 1,512 / 426   |  |  |
| 2006                                | 3,109 / 795   | 12,460 / 24%                             | 804 / 21%                                  |
| 2007                                | 16,891 / 1,357  | 39,625 / 74%                             | 936 / 24%                                  |

\*This is the estimated total number of electric meters in San Juan County. The San Miguel Power Association also serves portions of San Miguel, Montrose, Dolores, Mesa, and Ouray counties.

| Average Monthly Residential kWh Usage |      |        |            |          |       |
|---------------------------------------|------|--------|------------|----------|-------|
| Year                                  | LPEA | Empire | San Miguel | Colorado | U.S.  |
| 1996                                  | 664  |        |            | 785      | 1,087 |
| 1997                                  | 664  |        |            | 770      | 1,090 |
| 1998                                  | 659  |        |            | 766      | 1,095 |
| 1999                                  | 637  |        |            | 756      | 1,080 |
| 2000                                  | 663  |        |            | 769      | 1,111 |
| 2001                                  | 654  |        |            | 774      | 1,113 |
| 2002                                  | 651  |        |            | 775      | 1,154 |
| 2003                                  | 638  | 650    |            | 787      | 1,137 |
| 2004                                  | 657  | 650    | 797        | 769      | 1,136 |
| 2005                                  | 655  | 660    | 784        | 782      | 1,186 |
| 2006                                  | 677  | 667    | 793        | 797      | 1,168 |
| 2007                                  | 673  | 668    | 798        |          |       |

**Conservation** goals include a reduction in the amount of energy consumed per household. Average monthly consumption in Southwest Colorado is lower than both state and national averages. Montezuma County residents appear to consume less electricity than their La Plata and Archuleta counterparts.

Projected trends indicate energy usage will increase due to many factors, including construction of larger homes and more air-conditioning installations. The regional electrical co-ops are all providing programs to encourage conservation and energy efficiency.

Programs include home-energy audits to identify money- and energy-saving options such as weatherization, increased insulation, use of Energy Star appliances, and use of efficient lighting. They also offer energy credits for members who purchase an electric water heater or heating systems. San Miguel Power began a solar-rebate program in June 2008. All regional co-ops also provide **Net Metered Accounts** for customers who produce more energy than they expend. LPEA currently has 52 net metered customers.

**Biofuel**

**Biomass** can be converted directly into liquid fuels for combustion engines. The two most common biofuels are ethanol and biodiesel. **Ethanol**, an alcohol, is made by fermenting any biomass high in carbohydrates (like corn) in a process similar to brewing beer. It is mostly used as a fuel additive to reduce a vehicle's carbon-monoxide and other smog-causing emissions. **Biodiesel**, an ester, is made from vegetable oils, animal fats, algae, or even recycled cooking grease. It can be used as a diesel additive to reduce vehicle emissions or in its pure form to fuel a vehicle.

| Fuel Comparison |               |                           |
|-----------------|---------------|---------------------------|
| Fuel            | *Energy Yield | Net Energy (loss) or Gain |
| Gasoline        | 0.805         | -20%                      |
| Petrodiesel     | 0.843         | -16%                      |
| Ethanol         | 1.34          | 34%                       |
| Biodiesel       | 3.2           | 220%                      |

Ethanol and biodiesel fuels show a positive energy ratio in the chart at left because of the solar energy collected by the crops from which the fuels are made. This energy is considered "renewable" because a new crop is raised each year.

Source: <http://www.mda.state.mn.us/ethanol/balance.html>

\*Life cycle yield in liquid fuel BTU's for each BTU of fossil fuel consumed

Fossil fuels, on the other hand, are not renewable – they originate

from fossilized plants and animals stored beneath the earth's surface in a process that took millions of years.

Biodiesel and biodiesel blends can be used in diesel-powered vehicles, shipping equipment, irrigation systems, mining equipment, and electrical generators. Biodiesel blends are mixtures of pure biodiesel and petroleum diesel. For example, B100 is pure biodiesel. B20 is a blend of 20 percent biodiesel and 80 percent diesel fuel. The ASTM D6751 standard for biodiesel has established high quality fuel specifications. Diesel-fuel-industry stakeholders can now be assured of high quality biodiesel fuel if it meets ASTM D6751 certification standards .

Biodiesel has been available sporadically in Durango since 2004. It's supplied by Durango-based Brennan Oil and purchased through Blue Sun Biodiesel. However, no biodiesel fuel has been available through Brennan Oil since March 2008, and company officials don't expect any shipments until Spring 2009, at the earliest, because of increased corn production for ethanol. Higher corn production takes up fields once used to cultivate other commodities, creating a nationwide shortage of wheat and soybeans. Blue Sun, the Brennan's biodiesel supplier, uses soybeans. Therefore, Brennan Oil cannot obtain high quality biodiesel fuel at a competitive price. (May 2008 prices were estimated at \$6 a gallon for biodiesel.) Biodiesel sold in Durango was B20. B100 is not available because it gels in our colder climate and therefore requires specific – and expensive – additives and storage in specially heated tanks.

A regional biodiesel facility is projected to open in Dove Creek by 2009. The plant is expected to produce 250,000 gallons of biodiesel and 1.25 million gallons of food-grade oil per year. The plant is expected to be a fully integrated bio-energy facility and is currently contracting with local growers for sunflower, safflower, and canola crops ([www.sanjuanbioenergy.com](http://www.sanjuanbioenergy.com)).

**Local Resources:**

Colorado Governor's Energy Office ~ [www.colorado.gov/energy/](http://www.colorado.gov/energy/)

Empire Electric ~ [www.eea.coop](http://www.eea.coop)

Environment Colorado ~ [www.environmentcolorado.org](http://www.environmentcolorado.org)

Four Corners Office of Resource Efficiency ~ [www.fourcore.org](http://www.fourcore.org)

Home Energy Saver ~ [www.energyguide.com](http://www.energyguide.com)

La Plata Electric Association ~ [www.lpea.com](http://www.lpea.com)

San Miguel Power Association ~ [www.smpa.com](http://www.smpa.com)

Southwest Colorado Renewable Energy Society ~ [www.swcres.org](http://www.swcres.org)

Sustainability Alliance of SW Colorado ~ [www.sustainablecolorado.org](http://www.sustainablecolorado.org)

Montezuma Climate Action Network (M-CAN)