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**energy
& buildings**





INTRODUCTION

Boulder County strives to foster building practices that improve environmental, economic, and social sustainability through the Comprehensive Plan and Land-Use Codes, complemented by the BuildSmart, EnergySmart, and Housing & Human Services programs.

The Boulder County Comprehensive Plan sets a policy vision for a compact development pattern that locates development in urban areas and preserves distinct buffers between communities. The goals of this vision policy are to avoid sprawl and conserve natural resources. In 2008, the county adopted BuildSmart, a green building program for residential construction and major remodels that sets mandatory requirements to improve energy efficiency, conserve water and resources, and reduce landfill waste generated by new construction projects.

In 2011, EnergySmart, a residential and commercial energy program, began helping building owners take advantage of energy efficiency and

renewable energy opportunities. EnergySmart has offered free, one-on-one energy advising, financial incentives and unique programming to meet the needs of each participant.

Longs Peak Energy Conservation (LPEC), part of Boulder County's Housing & Human Services Department, offers weatherization services for low-income residents. This service provides cost-effective, energy-efficient improvements, such as high-efficiency light bulbs and showerheads, insulation, and furnace replacements, at no cost to qualifying homeowners and renters. The weatherization service helps decrease the cost of energy for families in need while improving the health and safety of their homes.





energy and buildings goal

Reduce energy consumption, promote energy efficiency in new and existing buildings, increase the use of clean energy, and transition away from fossil fuels.



COUNTY OPERATION STRATEGIES

Reduce Boulder County's internal energy consumption

- All newly constructed county-owned buildings shall be constructed to a minimum Gold level as defined by the U.S. Green Building Council's (USGBC) Leadership in Energy & Environmental Design (LEED) for New Construction, while striving to attain all the available points under the Energy and Atmosphere category.
 - Annually track building energy intensity, perform energy assessments and retro commissioning, upgrade mechanical equipment and lighting, and reduce plug loads in county-owned buildings.
 - Require that all existing, eligible county buildings achieve ENERGY STAR recognition by 2020.
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Increase Boulder County's adoption of renewable energy

- Continue the cross-departmental task force, which works to address challenges related to Land-Use Code in siting renewable energy and other sustainability facilities in the county.
 - Meet all of Boulder County's electrical needs with 100% renewable energy by 2025.
 - Expand capacity of on-site solar electric and solar thermal generation.
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**COMMUNITY STRATEGIES**

Increase energy efficiency and renewable energy in residential and commercial properties across Boulder County

- Continue to offer EnergySmart and Partners for a Clean Environment (PACE) services to Boulder County residents and businesses, and to explore new opportunities to address greenhouse gas (GHG) emission reductions through these programs.
- Provide low-interest financing through Elevations Credit Union's Energy Loan,¹⁵ the Clean Energy Credit Union,¹⁶ the Colorado Commercial Property Assessed Clean Energy Program (CoPACE), and other financing instruments to enable residents and businesses to complete energy efficiency upgrades and install renewable energy.
- Increase outreach and education efforts with the local solar installers, energy efficiency contractors, residents, and business owners.
- Support additional community solar garden capacity in order to increase the availability of renewable electricity to the residents and businesses of Boulder County.
- Continue to offer free and subsidized weatherization services and solar incentives to qualifying low- and moderate-income residents.
- Work toward equity in our PACE services for underrepresented business groups.
- Support fuel-switching pilots that help residents adopt renewable heating and cooling technologies as replacements to natural gas appliances and inefficient electric appliances.
- Utilize the Energy Impact Offset Fund (EIOF) to offset industries with disproportionately high electricity usage.
- Continue to explore opportunities to address energy sustainability through the Land-Use Code and the Comprehensive Plan, particularly as it relates to siting solar and other renewable energy facilities.
- Continue to strengthen the BuildSmart residential program to move toward net-zero energy use in new residential construction by 2022, and enhance and improve commercial codes to achieve net-zero energy by 2028.
- Use the experience and insights we have gained locally to work with the International Code Council (ICC) to strengthen the nationally published energy codes for both commercial and residential structures.



CLEAN CLOTHES, CLEAN ENERGY

With the help of Boulder County’s PACE service, John’s Cleaners paired energy efficiency with renewable energy for a clean-energy makeover.

Working with a PACE advisor, this family-owned cleaner in Lafayette installed new LED lighting throughout, which improved light quality and lowered the amount of energy they used. They then installed a ground-mounted, 46 kilowatt solar array.

John’s Cleaners used CoPACE financing for the upgrades with no upfront, out-of-pocket costs. They repay the loan along with their property taxes, and the loan stays with the property if they sell it.

**SOLAR PHOTOVOLTAIC (PV)
PAYBACK & SAVINGS**

Costs covered by incentives	46%
Project Cost	\$128,686
Federal Tax Incentive	\$38,606
PACE Rebates	\$20,000
Cost after Rebates	\$70,080
Payback	4.3 years
Energy Saving Cost/Year	\$19,066
LBS of CO ₂ Savings/Year	98,454



Generating our own power instead of relying on fossil fuels helps save money but also makes our business more competitive in the environmentally conscious Boulder community.

—Wendy Ellwood, Co-owner







CLEAN ENERGY FOR ALL

Throughout Boulder County, homeowners are investing in clean and energy efficient technologies such as solar PV and high-performance heating systems. However, for some residents, the up-front costs of these measures can be a barrier. Ensuring access to money-saving, climate-friendly upgrades for all is a county priority.

Beginning in 2013, Boulder County's weatherization agency, LPEC, teamed with the county's EnergySmart service to address a gap in energy-related county services for low- to moderate-income families. This collaboration, called EnergySmart IQ (for Income Qualified), offers a county-funded subsidy to cover half the cost of energy efficiency improvements, such as insulation and high-efficiency furnace replacements, to qualifying families making 80% of the Area Median Income or less.

As a result of this effort, by the end of 2017, 63 households received energy efficiency improvements that led to lower utility bills and safer, more comfortable homes. In addition, 26 households, not previously identified, were able to qualify for the Weatherization Assistance Program (WAP), thereby receiving free energy efficiency upgrades on their homes.

In 2017, EnergySmart IQ was expanded to offer enhanced assistance for low-and moderate-income families looking to install solar generated electric systems on their roofs. Not only did the program help these families reduce their electric bills and carbon footprint, but it also generated more jobs in the local solar workforce.

Committed to ensuring access to money-saving, climate-friendly upgrades for all



POLICY PRIORITIES

The following are environmental sustainability policy priorities adopted through Boulder County's legislative agenda:

POLICY

WHAT YOU NEED TO KNOW

Assist communities impacted by the reduced use of fossil fuels for power production

To reduce heat-trapping emissions and avoid the worst effects of climate change, the world must rapidly transition to a clean-energy future, one built upon the pillars of energy efficiency and renewable energy, while dramatically cutting its reliance on oil, coal, and natural gas for energy production. While increased investments in energy efficiency

and renewable energy will generate millions of new jobs, workers and communities whose livelihoods depend on the fossil fuel industry will unavoidably face challenges. Strategies to advance a rapid transition to a clean energy future must include programs that serve as catalysts for bringing displaced workers and communities into the clean-energy economy.

Support the early decommissioning and replacement of existing fossil-fuel-based generation facilities with clean-energy supplies

The costs for deploying new, clean electricity generation from wind are now low enough to replace the generation from most of Colorado's aged coal-fired power plants, and ratepayers are saving money. However, many of these old plants, or stranded assets, still have capital investment debt that must be paid off by the utilities that own them, even if they are

retired. Boulder County supports the use of financing tools, including those that need approval from the General Assembly, such as ratepayer-backed bonds, to relieve utilities of this capital investment debt. This strategy will speed the development of new clean-energy electricity generation and lower costs of repayment for consumers.



POLICY

WHAT YOU NEED TO KNOW

Support policies and programs to improve the energy performance of new and existing buildings in Colorado

Residential and commercial buildings account for more than 44% of the electricity and natural gas consumed in Colorado. Research suggests that by using tools such as green building codes, energy consumption disclosure requirements, and demand-side management programming, energy use in Colorado's buildings could be effectively reduced by more than 30%. Within this context, Boulder County supports efforts that will lead to improvements in the energy performance of Colorado's building stock. Such efforts could include a statewide "green building" code, to require new and existing commercial

and residential buildings to improve their energy performance over time and ultimately meet green building standards, such as the U.S. Department of Energy's Zero Energy Ready Home Program standard or the USGBC's LEED commercial building standards; energy use disclosure requirements for raising the awareness of building owners, managers, and tenants about the impacts and costs of a building's energy consumption; and the provision of demand-side incentives for all building owners, including those in jurisdictions with green building codes or other energy performance requirements.

Support actions to achieve energy efficiency savings of 2% per year from Colorado's electric utilities

Executive Order D 2017-015 establishes new state goals for reducing emissions from the electricity sector that are consistent with what the state had under consideration to comply with the U.S. EPA's Clean Power Plan. However, Boulder County believes that emission reductions greater than those called for in the executive order are possible, and

that further reductions are needed into mid-century. Boulder County supports concrete actions by the Colorado Public Utilities Commission and/or the Colorado Department of Public Health and Environment to ensure that the new goals in the executive order are met, and to achieve greater reductions beyond them.



POLICY

WHAT YOU NEED TO KNOW

Support ongoing funding for the WAP

Low-income and vulnerable households spend a disproportionately large percentage of their income on energy utility bills. The federal WAP, created 40 years ago, addresses this problem by improving the energy efficiency of homes and thereby reducing home energy consumption, lowering energy utility bills, and, ultimately, helping to offset the high cost of housing. LPEC, Boulder County's weatherization program serving the residents of Boulder, Larimer, Broomfield, and Gilpin Counties, weatherizes about 300 homes per year, with average

annual energy bill savings approaching \$500. With Colorado's WAP programs funded through federal allocations and state severance tax dollars, both of which can be volatile sources of revenue, stability in annual WAP appropriations can be difficult to achieve. Boulder County supports long-term, sustainable funding for Colorado's state weatherization program, in support of the dual goals of assisting families in reducing their energy bills and promoting safe, comfortable, and energy-efficient housing.

Support enabling legislation to implement local energy efficiency policies and programs

Unlike their home-rule municipal peers, Colorado counties and statutory cities and towns, in many cases, lack authority to adopt and implement energy conservation policies and programs. For example, energy conservation ordinances are proven policy tools for improving the energy efficiency and performance of the existing residential and commercial building

stock, but only Colorado home-rule cities have statutory authorization to enact such ordinances. Boulder County supports enabling legislation to provide Colorado's counties and statutory cities and towns with the authority necessary to enact policies and programs that can support and promote energy conservation within their jurisdictions.





POLICY

WHAT YOU NEED TO KNOW

Support state net metering policies

Colorado's net metering policies ensure that electricity customers who own renewable energy facilities, primarily rooftop solar systems, receive a fair credit on their utility bills for the clean power that they contribute to the electric grid. In place in 43 states, net metering is a critical state-level policy for supporting renewable energy at the consumer (versus utility) level. Colorado's multi-pronged policy and programmatic approach in support of renewable energy, including solar, has seen the state rise to ninth in the nation in installed solar capacity, enough to power more than 100,000 homes. In addition to supporting the widespread

use of distributed generation—small generation units typically located at customers' homes and businesses—net metering helps foster the voluntary reduction of GHG emissions, contributes to the reliability of the electricity supply and distribution systems, supports the residential and small-commercial renewable energy industry, and helps to more quickly replace coal-fired power plants with cleaner sources of energy. Boulder County opposes any legislative, regulatory, or administrative action to weaken Colorado's net metering policies, and encourages the application of these policies to all Colorado utilities.

Support requiring the Public Utilities Commission (PUC) to consider all environmental and health costs of the fuels used to generate electricity

Existing electric resource planning standards, as applied by the Colorado PUC, fail to include the financial costs associated with the externalities of the carbon dioxide emissions that result from the burning of fossil fuels for electricity generation. Requiring investor-owned utilities to include

a "social cost of carbon" when developing their long-term integrated resource plans will provide regulators with critical information for assessing the costs and benefits of regulations or measures designed to reduce carbon dioxide emissions.



Leadership in Energy

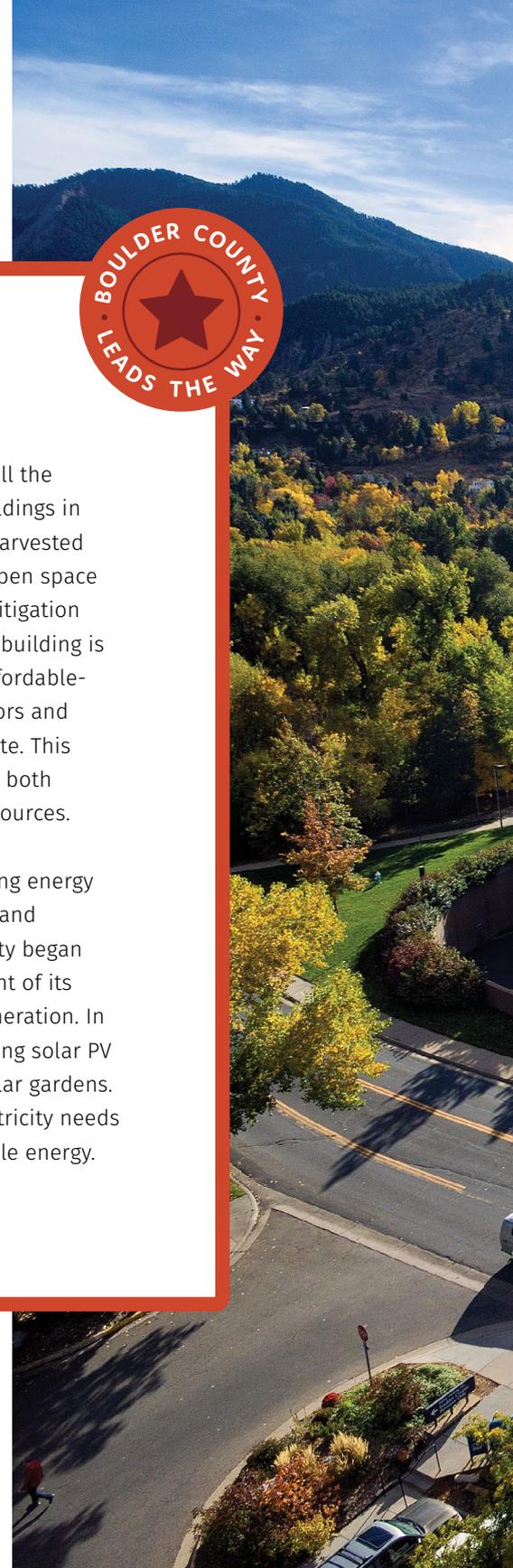
Energy reduction and the use of renewable energy are top priorities in county-owned buildings. The county started performing energy audits, lighting efficiency projects, building controls upgrades, and heating/ventilation/air conditioning improvements in the 1980s, and these efforts continue today.

In 1998, the county began benchmarking energy use with the EPA's ENERGY STAR program. Several county buildings have achieved ENERGY STAR labels, designating them as top energy performers. In addition, three county buildings have achieved high USGBC LEED ratings—two Gold and one Platinum.

Some of the exciting measures the county has taken include the use of biomass boilers at the Boulder County Jail and the Open Space and Transportation

Complex. The boilers provide all the heating required for these buildings in the winter, using wood chips harvested from Boulder County-owned open space properties during forest fire mitigation work. Another energy efficient building is Josephine Commons, a new affordable-housing development for seniors and low-income families in Lafayette. This housing development features both geothermal and solar energy sources.

Boulder County is also offsetting energy use at our facilities with solar and wind energy. In 2005, the county began purchasing a significant amount of its electrical power from wind generation. In 2008, the county began installing solar PV systems and subscribing to solar gardens. A majority of the county's electricity needs are now sourced with renewable energy.





Since 1990, the county has added 40% more building square footage but has kept greenhouse gas emissions constant at 1990 levels, thanks largely to these sustainable energy efforts.



One of the Greenest Jails in the Country

The Boulder County Jail, opened in 1988, was designed to hold 287 beds. The jail has been reorganized over the years, though it still sits at just 103,400 square feet and now holds 536 beds. In 2009, Boulder County engaged an engineering firm (M. E. Group) to complete a baseline energy model assessment of the county jail. Through that process, it was determined that the majority of the energy usage for the jail was attributed to space heating.

With Boulder County's integration of alternative energy, upgrades to existing systems, and other changes, the jail is on track to reduce energy use by 59%. To optimize heating and energy performance, Boulder County Jail made the following energy upgrades:

- 2006**
Installed laundry unit to reduce hot water use
- 2009**
Added roof insulation and white, heat-reflecting roof
- 2010**
Installed new roof over office and cell block, installed 99.75 kW solar PV system
- 2011**
Upgraded building HVAC controls, upgraded chiller system, began new biomass-burning heating system
- 2012**
Upgraded exterior lights to LEDs, added solar hot water system
- 2016**
Replaced two air handlers with new units containing heat recovery wheels to improve efficiency and provide ventilation for the increased beds



3200 AIRPORT ROAD
Boulder County Jail



**Loading Dock
Deliveries
Work Release
Communications
Center/EOC**



**Public Entrance
Jail/Court
Intake/Release**



TAKE ACTION

Call to Action

To reach these goals, we need collective community action to reduce community-wide reliance on fossil fuels, to not waste energy, and to shift to a clean-energy economy. Here are great ways you can make a difference!

- ❑ Make your home tight, efficient, quiet, and comfortable. Participate in the EnergySmart program or WAP to optimize and finance your energy efficiency projects.
- ❑ Wondering where your business stacks up in energy efficiency? PACE can help identify efficiency projects, rebates, and the energy performance rating of your building.
- ❑ Make your home or business fossil fuel free and powered by the sun. Rooftop solar PV or a solar garden subscription are great ways to power your home or business with clean energy.
- ❑ Check out financing for energy efficiency and rooftop solar (as well as electric vehicles and electric bikes) through the Clean Energy Credit Union and through local solar companies and contractors.
- ❑ Share with your friends, family, and colleagues all the changes you are making in your life, home, and workplace to improve our environment and quality of life for current and future generations.





RESOURCES

More Information

**Boulder County
Comprehensive Plan**

[bouldercounty.org/
property-and-land/
land-use/planning/
boulder-county-
comprehensive-plan](http://bouldercounty.org/property-and-land/land-use/planning/boulder-county-comprehensive-plan)

**Resolution for
Sustainable Energy**

[assets.bouldercounty.org/
wp-content/
uploads/2017/03/
sustainable-energy-path-
resolution-2005-137.pdf](http://assets.bouldercounty.org/wp-content/uploads/2017/03/sustainable-energy-path-resolution-2005-137.pdf)

BuildSmart

[bouldercounty.org/
property-and-land/land-
use/building/buildsmart](http://bouldercounty.org/property-and-land/land-use/building/buildsmart)

15 Elevations Credit Union

[elevationscu.com/
personal/loans/
energy-loans](http://elevationscu.com/personal/loans/energy-loans)

16 Clean Energy Credit Union

cleanenergycu.org

Resources for Businesses

PACEpartners.com

copace.com

Resources for Homes

EnergySmartYES.com

[BoulderCounty.org/
weatherization](http://BoulderCounty.org/weatherization)

