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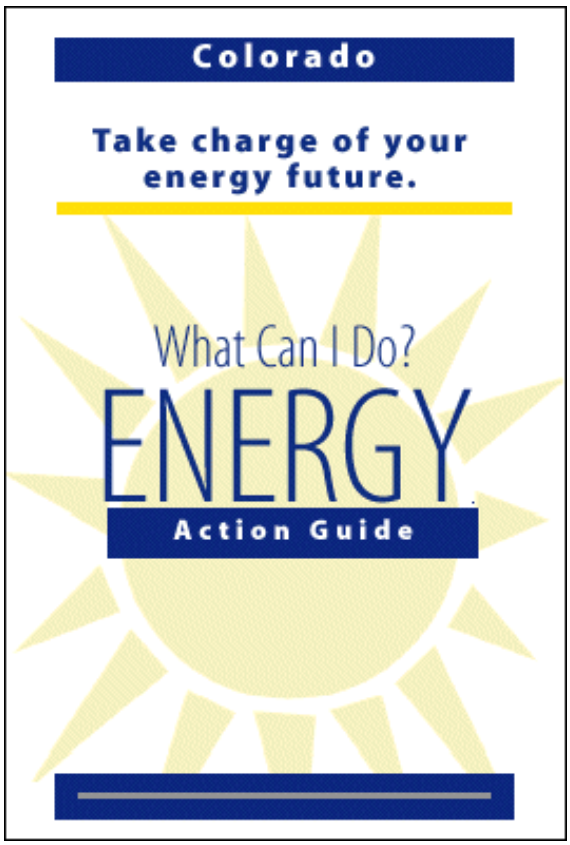
Energy Action Guide



Energy for the next thousand years

A world of new energy choices is opening up. People in Colorado already are getting electricity from the wind and sun, and they're building homes that cut

energy use to a fraction. And it's only just begun.

This action guide is designed to remind you of some things you already know about energy and tell you about a few things you may not know. It's designed to make you stop, think and look where we're going.

We don't think about energy ...we don't have to.

Here at the turn of the millennium we live our lives without giving energy much thought. Energy comes to us over power lines, through pipes and from the gas pump nozzle, and all we have to do is reach for some change. Never before have humans had it so good. A thousand years ago we were stoking wood fires, and a large portion of our daily work was devoted to keeping the home fires burning.

Since then we've mastered the art of combustion, and it's liberated us. The efficient little fires that heat our homes, generate our power and turn our crankshafts are a far cry from the fire pits of a thousand years ago.

Yet for all this ease and efficiency, we are consuming huge amounts of energy. All around us, energy is being created and used by our furnaces, lights, appliances and cars. In a way we're still stoking fires -- we just have machines to do it for us.

And every year for the last couple centuries, these machines have gotten better. But despite this, the amount of fuel that each of us consumes continues to rise. We gain benefits like convenience and greater freedom to travel, but we lose something, too. Every barrel of oil is one fewer barrel for the future. Does it make sense to burn it all up now when instead it could be used in plastics or medicines for centuries to come? And what about air quality and the likelihood that we are changing our climate?

Look where we're going.

The good news is that we're on the cusp of some very big changes. In our lifetime we may see the end of the combustion age. New technologies already offer a glimpse into the next millennium. Fuel cells that create electricity through chemical reaction may be the first big leap, and these may be powering our cars within a decade. A new generation of affordable solar cells are already powering some Colorado homes.

Thousands of Colorado families are buying wind power for a few extra dollars a month, and the costs of all these technologies drop year by year.

So where do we want to be in 50 years? Can we imagine a world that's worth working toward? As a picture starts to emerge, can we leave behind some of our less lovable habits and fashions?

Our cars and appliances are tomorrow's antiques, and so are a lot of our assumptions. So let's not be too stuck where we are. We will do amazing things in the coming years. Let's look around and challenge ourselves a little. We can do better with energy.

What Can I Do?

You can power your home with wind.

Thousands of Coloradans already have begun to power their homes with wind.

For about the cost of a cappuccino, customers can upgrade to wind power from Xcel Energy. An extra $2.50 a month buys one 100 kilowatt-hour (kwh) block of

wind power. Since the average home uses 600 kwh a month, customers willing to add $15 to their monthly bill can go to wind power exclusively.

That wind sweeping across the plains is now being captured as clean energy, and you can be a part of it. Your willingness to invest in Colorado's wind energy will, in turn, make your utility company more willing to invest in more wind turbines. It all starts at home.

The public response to programs like Public Service Company's Windsource℠ has been overwhelming. People are enthusiastic because this is an easy opportunity to do something that matters. We can now buy electricity the way we buy clothes and food, making choices that weigh price, personal values and quality. People buy wind power because it says they care about the air they breathe, their community and the future. All electricity is not the same. Not anymore. To sign up for wind power, call 303-571-3434 or 1-800-894-3368.

What Can I Do?

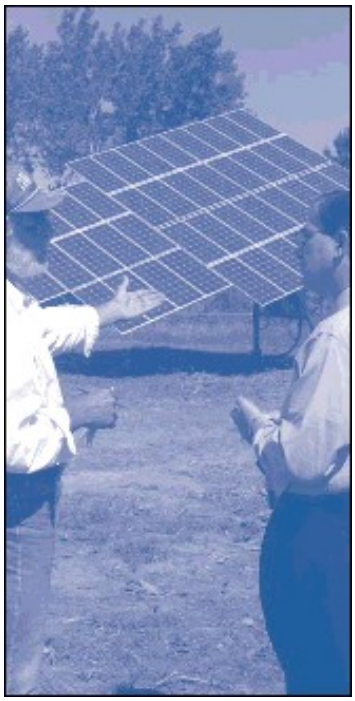
You can power your home with the sun.

Neat rows of solar electric cells are dressing up rooftops across Colorado. Once used exclusively by NASA for powering satellites, these photovoltaic (PV) panels convert sunlight directly into electricity. Solar PV power is probably the cleanest and most reliable source of electricity invented to date. It is still relatively expensive (an average home system might cost $10,000 to $20,000) but the cost continues to drop. For remote mountain homes needing costly power line extensions from the utility power grid, PV systems are already a cheaper option.

To understand the growing popularity of PV power for homes connected to the utility power grid, it helps to remember that people often choose homes and features that reflect their tastes and values. Some people choose solar PV because of its environmental qualities. To others, solar PV offers a degree of independence from utility power, and by adding a battery backup system, a homeowner can

Retiring the energy monster.

Despite advances in technology we are consuming much more energy per person than our grandparents did. Inexpensive fossil fuels give us little incentive to be energy conscious, and they encourage us to be over-dependent on them. Most of us understand the value of efficiency, clean air and saving resources for the future. It's just that until now we haven't had a lot of good alternatives, but this is changing rapidly. We are on the verge of a new era. We will use our diminishing supply of fossil fuels more efficiently and make better use of renewable energy sources and new technologies. Chances are in 50 years our grand-children will have shaken this dependency, and our energy monster will be history.



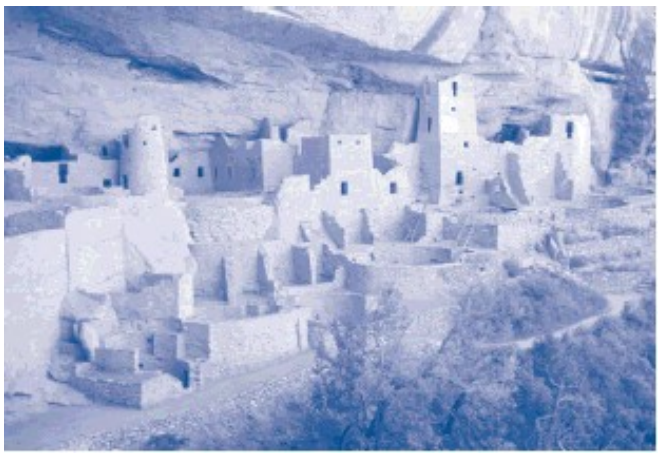
protect against power outages. Whatever the reason, people are willing to pay extra for PV just as they are willing to pay extra for granite countertops or home entertainment systems.

Perhaps the greatest contribution of these PV pioneers is their participation in an early market for home PV systems. Their leadership allows manufacturers to achieve greater economies of scale and cut the cost of PV. To help share the cost with these leaders, many Colorado utility companies will buy your excess PV power at full retail rate up to your monthly electricity cost.

What Can I Do?

You can let the sun shine in.

One of the best ways to use solar energy is to design with the sun. This can be as simple as putting windows in the right places to gain heat and light exposure. South-facing windows, overhangs and designing for natural ventilation should be a part of your home building or remodeling plans. This is passive solar design, and it is as old as the hills. The cliff dwellings at Mesa Verde demonstrate classic passive solar heating and cooling -- using summer shade and winter sun.



One of the best features of passive solar design is that it costs little extra, if anything, and it can cut your heating costs in half. It also can greatly improve the comfort of your home. Imagine the winter pleasures of curling up to read in a bright sunny spot and you have a sense of the benefits of passive solar and natural daylighting. In the summer, your home's design features can shade the sun and create natural airflows to keep you cool. As you plan your next remodeling or building project, learn about passive solar design and talk to designers and architects with experience in this field.

Rebates ease the costs for solar pioneers.

Two Colorado organizations have joined to offer rebates for photovoltaic (PV) and solar hot water systems and radiant heat floors through December 31, 1999. As much as $2,500 may be available if you install a PV system on a home. Up to $1,000 is available for solar hot water systems. These rebates are offered in a public-private partnership of the Governor's Office of Energy Management and Conservation and the Colorado Solar Energy Industries Association. For details, call 303-750-9764 or 1-800-633-9764.

Cutting electricity use cuts pollution.

Did you know that only one-third of the electricity generated by power plants makes it to the customer due to resistance and line loss in our power grid? For each unit of power plant electricity you can cut, you are cutting more than three units of energy at the source. This is three units of pollution, too.

If you replace an old refrigerator with a new one, its energy efficiency could save you its entire cost in less than 10 years. That's because refrigerators use a significant amount of electricity. If you use electricity to heat your water or dry your clothes, you can convert to gas if it's readily available. You'll recoup your investment in less than five years. Use the energy-saving setting on your dishwasher. Use compact fluorescent light bulbs and turn off lights when you're not using them. And, remember that every dollar you save is a triple whammy against pollution.

What Can I Do?

You can heat your hot water with the sun.

Today's new solar hot water technologies are more affordable and efficient than ever. New factory-built systems offer high reliability, advanced controls and warranty protections that often were not available during solar's first heyday in the 1970s. These new systems also are designed to lie flat on your roof, blending their low profile into your home's architecture. Companies now typically offer two-panel systems designed to supply a portion of your hot water needs and optimize the economic benefit to you.

More than 95 percent of our electrical power comes from coal.

It's the good news and the bad news, too. In Colorado we're fortunate to have vast supplies of coal to power us well into the future. The downside is that coal-fired power generation is a significant source of pollution.

Combustion technologies may someday improve. In the short-term we need to remember that behind that flick of a light switch is a chunk of coal that gives off greenhouse gases and other pollutants as it burns.

Above all, don't waste energy.

Just as you would never think of throwing trash out your car window, don't be cavalier about energy. Even if you think you can afford to waste it, remember that you, as an individual, are not paying the full cost. The full cost of your energy use is not what you pay at the gas pump or on your utility bill.

The full cost of your energy use includes pollution, and we've only begun to put a price on this. We can begin to estimate some of the direct economic costs of dirty air and acid rain, for example, but what if our energy use leads to climate change? Then the costs borne by all of us -- and our children -- will be huge.

As with many of the new energy options now available, solar hot water systems are generally not chosen solely on the basis of cost; many buyers prefer solar because it's environmentally friendly. At about $4,000 for a premium system, it may take about 30 years of energy savings to pay back the cost of a system. That's assuming you heat your water with natural gas (and that gas prices stay the same). If you heat your water with electricity (which is much more expensive than gas), the payback is about 12 years. Rebates can help cut these costs and payback periods.

What Can I Do?

You can give your home an energy check up.

Some of your best energy investments may be right under your nose. If your home has drafty doors and windows, you could earn big savings without spending much money. A little caulk and weatherstrip can work wonders. But if you've taken care of the easy stuff you may want to call a professional who can identify less obvious ways to tighten up your home. E-Star Colorado (1-800-877-8450) can tell you about the benefits of an energy rating and give you a list of raters in your area.

The cost of a rating can be less than $200. For this you get a top to bottom inspection and analysis of your home energy picture. Your rater can help you prioritize measures so that you can

plan improvements wisely. Your rater will perform a blower-door test using a large fan to depressurize your house and look for air leaks. You may want to have your rater use infrared imaging to check for voids in your insulation. You should discuss your options to ensure that you get an inspection that meets your needs.

What Can I Do?

You can build green.

Green building is the use of construction techniques and materials that are energy-efficient and environmentally friendly. Colorado is home to the largest and most successful green builder program in the country, and with so many qualified green builders around, it's easy to find one that meets your needs. Built Green [a] homes can be built in any price range and style, and even though they can save energy costs and increase your comfort, they don't necessarily cost more.

A home is certified Built Green if it meets certain energy requirements and includes features from the Built Green checklist. This checklist identifies the best techniques and materials for energy efficiency and green construction. If you are planning to build or remodel, this checklist can help you plan your project even before you begin talking to builders. Visit http://www.builtgreen.org/ or call 303-778-1400.

Knowledge is power.

Your E-Star Colorado certified rater can help you find ways to button up your home for greater comfort. If you're handy around the house you may first want to give it a once-over yourself. Here are some cost-effective measures you can take:

- Use caulk and weatherstrip to seal air leaks
- Install storm windows if your windows are single-glazed
- Insulate your water heater
- Install water-saving showerheads and faucets
- Install a programmable thermostat
- Change your furnace filter once a month during the winter

Your Built Green™ home might feature:

- High-performance windows
- Solar hot water or solar electric system
- Engineered lumber
- Water-wise landscaping
- Better insulation and sealing
- Recycled-content materials like decking, carpeting and siding
- A high efficiency furnace and sealed ductwork
- Paints and adhesives low in volatile organic compounds ('Low VOC')
- A minimum 4-star rating from E-Star Colorado

What Can I Do?

You can pay attention to energy.

Don't take energy for granted. Think about the energy that goes into powering your life, and pay attention to opportunities to save energy. Maybe a compact fluorescent light bulb would work in your favorite reading lamp. Maybe there's a way to save that trip across town. Maybe there's a Built Green™ home or hybrid car in your future.

Awareness and action can start with the little things. Take that newfangled compact fluorescent light bulb, for example. While it costs a little more at the store, during it's 10,000-hour life it can cost half as much as standard bulbs because it saves energy and lasts longer. It also will keep three-quarters of a ton of carbon dioxide out of the air.

Where do I go from here?

To keep up with the latest on energy innovation and opportunity, visit http://www.coloradoenergy.org/ or call toll-free, 1-877-WE-RENEW (1-877-937-3639). Here you'll find out about Colorado organizations and businesses that can help you be a part of the future of energy. You'll also find links to a national network of energy information and expertise. Be in touch. Be aware.

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