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**Everything You Need to Know About:**

**Appliances**

* Quick facts
  + Appliances may account for 38% (or more) of your home’s energy usage[[1]](#footnote--1)
  + Up to 20% of your home’s electricity is being consumed while your appliances are “off”
  + Tax rebates/incentives are common for consumers who purchase energy efficient appliances
  + 4 million pounds of ozone-depleting chemicals escape from appliances at disposal, annually
    - These gases may survive up to 150 years in the stratosphere
  + The United States throws away about 8 million refrigerators and freezers every year
  + Americans discard 100 million electronic devices every year = 274,000 devices a *day*
    - Approximately 1 billion computers will be potential scrap by 2010[[2]](#footnote-0)
  + Colorado is among the “most improved” states for energy efficiency, having climbed at least 8 spots in ranking since 2008[[3]](#footnote-1)
* Labels to look for
  + EnergyGuide (washers, dryers, refrigerators, freezers, dishwashers, and HVAC equipment)
    - Implemented in 1980 by the U.S. Department of Energy
    - Yellow and black informational label
    - Comparison of energy efficiency between brands and models
      * Estimated operating cost and energy use
      * No special designation for appliances with best rankings
      * Does not include non-energy factors, such as water usage
  + ENERGY STAR (HVAC, major home appliances, lighting, electronics, office equipment)
    - Partnership developed in 1992 between the industry and U.S. government through the Environmental Protection Agency
    - Blue star logo awarded to appliances and buildings that excel in energy efficiency
* Refrigerators and Freezers
  + Greatest energy consumers in the home
    - Specialty features (ice makers, filtered water, electronic screens, etc.) increase energy usage
  + Give off the most CO2 of any appliance
  + Most difficult appliance to recycle
    - Since 1992, law requires that ozone-depleting coolants must be extracted by a certified agency for any service, maintenance, or disposal
  + Freezer-on-top models offer the most space with the least energy consumed
    - Side-by-sides use 10% more electricity[[4]](#footnote-2)
    - One larger refrigerator is more efficient than two smaller ones
    - Chest freezers are more efficient than uprights
  + Tips for saving energy
    - Cover all foods – retains food quality and limits the load on the defroster
    - Keep the freezer as full as possible – reduces cold air lost when door is opened
    - Keep away from heat ducts, direct sunlight, and warm appliances (stoves and dishwashers)
    - Vacuum/clean the condenser coils at least twice a year
    - Replace broken seals to maximize thermal efficiency
* Ranges, Cooktops, and Ovens
  + No minimum efficiency standards in the U.S.
    - Not labeled or rated by EnergyGuide or ENERGY STAR
  + Gas (natural or propane)
    - Uses less energy overall
    - Home must be equipped with natural gas hookups
    - Adequate ventilation to outside is necessary
  + Electric
    - Heat up slower, but ovens cook more evenly than gas
    - Good for homes equipped with alternative energy sources (solar, wind)
  + Other options (may be more expensive up front, less familiar to consumers)
    - Hybrid range is a good compromise (gas range, electric oven)
    - Halogen-bulb cooktops with glass ceramic surfaces (80% more energy efficient)
    - Magnetic induction (70% more energy efficient)
      * Generate heat through electromagnetic field activated by iron or steel pans (required for use)
  + Convection ovens speed up cooking process by circulating air, uses 33-50% less energy
  + Considerations
    - Large oven spaces are especially unefficient, seals can be leaky
    - More efficient alternatives
      * Pressure cookers (50-75% reduced energy usage)
      * Slow cookers, toaster ovens, and microwaves
  + Tips for saving energy
    - Use the smallest pan, smallest, burner, smallest and most energy-efficient appliance
      * Flat-bottomed pans work better on smooth surfaces and electric elements
    - Turn off oven or stovetop a few minutes before cooking is complete
      * Radiant heat will continue to cook the food
    - Defrosted food uses 33% less cooking time than frozen food (better for food safety!)
    - Minimize preheating – 10 minutes MAXIMUM
    - The oven loses 25° every time the door is opened
      * Use oven light to check for doneness
      * Replace broken seals to maximize thermal efficiency
    - Bake several items at once, then freeze for later use
    - Use self-cleaning feature while oven is still hot from cooking
* Range Hoods and Downdraft Ventilation
  + Required by building codes
  + Charcoal filter (poorer indoor air quality) and exterior ventilation (better IAQ) options
  + Should be proportional to the range size
  + Updraft vents are more efficient than downdraft
* Microwaves and Small Appliances
  + More efficient for small meal preparation
  + Consider frequency of use before purchasing small appliances
* Dishwashers
  + Accounts for 1-2% of total home energy usage
  + Newer models can save 50% more water than hand washing
  + Features to look for
    - Booster heaters
      * Allow for lower water heater temperature settings while maintaining a sanitizing rinse
    - Reduced wash and dry time, air drying option (cuts out heater)
  + Tips for saving energy
    - Avoid unnecessarily rinsing dishes
    - Run full loads using shortest dry cycle or hand-dry dishes
* Garbage disposals
  + Some regions require garbage disposals by code
  + Water propelled units are slightly better than electrically powered units, but don’t decrease organic waste
  + Composting is a better (greener) solution
  + Tips for saving energy
    - Use cold water to solidify fatty and greasy waste
* Washing machines
  + Largest water user in your home
  + 95% of energy used by the washing machine is to heat the water
  + ENERGY STAR
    - New standards for Modified Energy Factor (MEF) increased in 2007
      * Evaluates capacity and energy consumption for washers and dryers
      * Higher MEF = more efficient
    - Washers also evaluated for Water Factor (WF) since 2007
      * Lower WF = less water consumption
  + Front loading (or horizontal axis) washers
    - More expensive, but use 33-50% less water, less energy per load than top-loading
      * Savings of 7000 gallons of water every year[[5]](#footnote-3)
      * Study of 204 families resulted in 56% lower energy usage[[6]](#footnote-4)
    - Better ability to remove water during spin cycle = less time in the dryer
    - Since 2007, California requires all new washing machines to be horizontal axis types[[7]](#footnote-5)
  + Tips for saving energy
    - Wash only full loads using coolest and lowest water setting possible
    - Use maximum spin cycle to lessen energy used by dryer
* Dryers
  + Not required to display Energy Guide labels, not certified by ENERGY STAR
  + Most dryers use similar amounts of energy, but gas is slightly more efficient
    - Alternative power may give electric the advantage
  + Consider client preference, cost, system already in place (220-outlet or gas hookup?)
  + Features to look for
    - Automatic shutoffs and moisture sensors (15% better than timers)[[8]](#footnote-6)
  + Tips for saving energy
    - Consider using a clothes line instead
      * Americans could save 30 million tons of coal yearly if we used clotheslines
    - Keep your lint filter clean
* Computers, Printers, Office Equipment
  + Computers were the original ENERGY STAR appliance
    - ENERGY STAR considers “sleep”, “hibernation”, “idle”, and “off” modes
      * “Sleep” mode saves 70-90% more energy than office equipment without it
    - Laptops are more energy efficient than desktops but may not last as long
    - Some greener, more recyclable options are being developed
    - May contain toxic levels of lead, cadmium, mercury, etc.
  + Equipment quickly becomes obsolete and replacement parts can be difficult to find
    - Consider upgrading software or purchasing a used or refurbished model
    - Some states require retailers and manufacturers provide recycling for electronics
  + Tips for saving energy
    - Use power strips for easy shut-off (eliminates stand-by power usage)
    - Activate power-saving features on devices
    - Rechargeable batteries are more eco-friendly than disposable ones
* Things to consider when replacing an appliance
  + Is the appliance wasting resources unnecessarily? Can order replacement parts?
  + What size appliance do I really need?
    - 12 cubic feet of refrigeration space for 2 people, 13-15 for a family of four, add 2 cubic feet for each additional person[[9]](#footnote-7)
  + Things to specify
    - ENERGY STAR appliances with best efficiency ratings (check EnergyGuide labels)
    - Maximum water-conserving features
    - Recyclable materials for new appliances, recycling of old appliances
    - Avoid unneeded luxury features and unnecessary small appliances
  + Installation
    - Maintain proper clearances (suggested by manufacturer) for air circulation
    - Adequate ventilation and secure hookups
  + Maintenance
    - Keep appliances clean and dust-free
    - Use biodegradable, eco-friendly and safe detergents and cleansers
      * Less corrosive and abrasive
      * Don’t contain toxic fumes
      * Don’t destroy the environment
* Resources
  + American Council for an Energy-Efficient Economy
    - A non-profit organization that researches, analyzes, and educates on energy policies
    - www.aceee.org
  + American Water Works Association
    - An organization that funds research and provides information for the advancement of water treatment
    - www.awwa.org
  + Earth911.com
    - A source for sustainability news, links, and local resources
  + EnergyGuide
    - Provides information and links regarding the EnergyGuide label
    - www.eere.energy.gov/consumer/tips/energyguide.html
  + ENERGY STAR
    - Provides information and links regarding the ENERGY STAR label
    - www.energystar.gov
  + EPA, Water Efficiency Measures for Residences
    - Government program responsible for maintaining potable water systems
    - www.epa.gov/owm/water-efficiency/resitips.htm
  + Green Remodeling by David Johnston and Kim Master, LEED AP
    - Good overview of general guidelines for residential greening processes
  + H2ouse.org
    - Maintains and sets standards for best usage of water in urban areas in California
  + National Kitchen and Bath Association
    - Professional organization that sets standards for good kitchen and bath design
    - www.nkba.org
  + Project Laundry List
    - Promotes and offers advice and tips for cold water clothes washing and line drying
    - www.laundrylist.org
  + Rocky Mountain Institute
    - A think-tank organization promoting education and integration of green materials
    - www.rmi.org
  + U.S. Department of Energy, Energy Efficiency and Renewable Energy
    - Governmental website promoting the study of U.S. energy policies and practices
    - www.eere.energy.gov

1. U.S. Department of Energy website <http://www1.eere.energy.gov/consumer/tips/home\_energy.html> [↑](#footnote-ref--1)
2. Consumer Reports Greener Choices <www.eco-labels.org> [↑](#footnote-ref-0)
3. American Council for an Energy-Efficient Economy website < http://www.aceee.org/pubs/e097.htm> [↑](#footnote-ref-1)
4. Rocky Mountain Institute website <www.rmi.org> [↑](#footnote-ref-2)
5. Consumer Energy Center <www.consumerenergycenter.org> [↑](#footnote-ref-3)
6. Department of Energy <www.energy.gov> [↑](#footnote-ref-4)
7. California Energy Commission <www.energy.ca.gov> [↑](#footnote-ref-5)
8. ACEEE <www.aceee.org> [↑](#footnote-ref-6)
9. ENERGY STAR website <www.energystar.gov> [↑](#footnote-ref-7)