

# 8 Energy-Saving Solutions on the Horizon

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Click here to watch “Saving You Energy and Money at Home”: <https://youtu.be/IZRH0h3i3LI>

From heating and cooling to electronics and appliances, it takes a lot of energy to power our daily lives. Our homes use 37 percent more energy today than they did in 1980. But without energy efficiency -- through technology innovation and federal [energy conservation standards](#) -- this number would be a lot higher. In fact, even though our total energy use has grown, our energy use per household is down about 10 percent, despite that our homes are larger and contain more devices.

Thanks to breakthroughs by our [National Labs](#), industry and academia, equipment we use in our homes is more energy efficient than ever before, saving consumers money and slashing carbon pollution. Let’s take a look at a few technologies we can expect to see in the marketplace within the next few years that will make our homes even more sustainable.

## 1. Smarter, More Connected Homes

We live in an increasingly connected world -- the same is true for our homes. New electronic devices and appliances can now be linked to the Internet to provide real-time data that makes it easier to understand and lower energy use.

Soon these technologies will be more cost effective and smarter as a result of a project supported by the Energy Department’s [Building Technologies Office](#). New [wireless sensors](#) developed at Oak Ridge National Laboratory will boost home energy efficiency through automated control systems for heating and cooling units, lighting and other systems that access data such as outside air and room temperature, humidity, light level and occupancy all at a fraction of a cost of typical wireless sensors you see on the market today. Pacific Northwest National Laboratory, National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory are also [developing new protocols and standards](#) that will improve how smart appliances communicate with each other and interact with the electric grid.

## 2. Ultra-Efficient Heat Pumps

The Building Technologies Office is ushering in the next generation of [heat pump systems](#), which warm and cool your home by moving heat from one space to another. These include:

- [A fuel-fired, multi-function residential heat pump](#) that can reduce primary energy consumption by 30 percent.
- [A natural gas heat pump and air conditioner](#) that uses an ultra-low-emission combustion burner and other equipment to provide home heating, cooling and hot water.
- [A low-cost gas heat pump](#) designed to reduce heating costs by 30 to 45 percent compared to conventional gas furnaces and boilers.

### 3. Carbon-Fighting Clothes Dryers

The same concept behind heat pump technologies that keep your home comfortable can also be used for another important application: drying your clothes. Oak Ridge National Laboratory and General Electric are developing [a new type of clothes dryer](#) that uses a heat pump cycle to generate hot air needed for drying. The result: a more efficient dryer that has the potential to lower energy consumption by 60 percent compared to conventional ones on the market today.

### 4. Magnetic Refrigerators (That's Right, Magnets)

Oak Ridge National Laboratory and General Electric have teamed up to create a [revolutionary new type of refrigerator](#) that uses magnets to create cold, also known as the [magnetocaloric effect](#) (lowering or raising the temperature of material by changing the magnetic field). For the past 100 years, refrigerators have relied on a process called vapor compression that uses coolants which can be harmful to the environment. The new refrigerator is a revolutionary technology that uses a water-based cooling fluid, making it better for the environment and more efficient, which means lower energy bills and less carbon pollution.

### 5. Advanced Window Controls

Lawrence Berkeley National Laboratory and Pella Windows are working on [new highly insulated windows](#) that use sensors and microprocessors to automatically adjust shading based on the amount of available sunlight and the time of day to ensure proper lighting and comfort, saving consumers energy and money.

### 6. Next-Gen Insulation

[Insulation](#) is one of the most important ways to reduce your home heating and cooling costs. The Industrial Science & Technology Network is [developing new foam insulation](#) made with environmentally friendly and advanced composite materials that ensure heat doesn't escape from the attic, walls and other areas of the home during cold winter months.

### 7. Reflective Roofing Materials

[Cool roofs](#) coated with materials containing specialized pigments reflect sunlight and absorb less heat than standard roofs. Expect these types of roof systems to get even "cooler" due to [new fluorescent pigments](#) developed by Lawrence Berkeley National Laboratory and PPG Industries that can reflect nearly four times the amount of sunlight of standard pigments.

## 8. Brighter, Better Lighting

LEDs (light emitting diodes) have come a long way, with today's highest-performing lights consuming [85 percent less energy than incandescent bulbs](#). The Building Technologies Office's Solid State Lighting Program supports [research and development](#) to lower the cost of LEDs, while making them even more efficient and long lasting. In fact, LED efficiency is expected to double from the current [125-135 lumens per watt to 230 lumens per watt](#) in the next few years as result of continued R&D.

Go to [buildings.energy.gov](http://buildings.energy.gov) to learn how the Energy Department is advancing building technologies that improve the energy efficiency and comfort of American homes and businesses. Also, check out [Energy Saver](#) for more ways to save energy and money at home.

### MORE ON ENERGY SAVINGS

[INFOGRAPHIC](#): Find out how energy efficiency standards are saving you money and slashing carbon pollution.

Learn about the [new energy efficiency standards](#) for commercial air conditioners and furnaces that are expected to save businesses \$167 billion and reduce carbon pollution by 885 million metric tons.

Go to [buildings.energy.gov](http://buildings.energy.gov) to stay updated on the Energy Department's work to improve the energy efficiency of homes and buildings throughout America.

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