THE INFLATION REDUCTION ACT

Treasury FAQ on 25C and 25D here →

IRA Savings Calculator

REWIRING AMERICA

25C Residential Energy Efficiency Tax Credit and 25D Residential Clean Energy Tax Credit

Timing: Available now (new version of 25D also retroactive to all of 2022); **Administration:** IRS

THE BIG PICTURE

The 25C and 25D tax credits incentivize household electrification by lowering the total cost of qualified electrification upgrades. 25C provides a capped 30 percent tax credit for heat pumps, heat pump water heaters (HPWHs), qualifying electrical panel upgrades, select weatherization measures, and energy audits. **For the first time, air source heat pumps for space heating/cooling and HPWHs will be eligible for a tax credit of up to $2,000 per year, and electrical panel upgrades installed in conjunction with a heat pump or HPWH will be eligible for a tax credit of up to $600.**

25D provides an uncapped 30 percent tax credit for rooftop solar, battery storage (for the first time), and geothermal heating. IRS has also allowed 25D to be applied to an electrical panel upgrade as long as it is installed in conjunction with and enables another eligible energy installation.

The details on 25C: heat pumps, heat pump water heaters, and more

→ Available now

→ 30 percent capped tax credit for residential efficiency and electrification upgrades, up to $3,200 per year (see chart)

- Annual total credit for heat pumps and heat pump water heaters capped at $2,000
- Annual total credit for other upgrades capped at $1,200; limits per upgrade may apply
- Covers purchase and installation costs for heat pumps, HPWHs, and panel upgrades; covers just purchase costs for other listed upgrades
- Upgrades subject to efficiency requirements

→ Up to $600 for electrical panel upgrades if they are installed in conjunction with and enable a heat pump or HPWH

→ Credit limit is annual (not lifetime), so it resets each year and can be used again

→ Nonrefundable, so households must have adequate tax liability to offset

25C Tax Credit
For Qualified Electrification Upgrades

Total Annual Credit	**$3,200**
Heat pumps and HPWHs	**$2,000**
Other upgrades	**$1,200**
Annual Credit for Heat Pumps and HPWHs	**$2,000**
Heat Pump	**$2,000**
HPWH	**$2,000**
Annual Credit for Other Upgrades	**$1,200**
Insulation	**$1,200**
Doors	**$500**
Windows	**$600**
Electrical panel	**$600**
Energy Audit	**$150**

The details on 25D: rooftop solar, battery storage, and geothermal heating

- → Available now (new version of 25D also retroactive to all of 2022)
- → 30 percent uncapped tax credit for rooftop solar, battery storage, and geothermal heating
- Should include electrical panels if they are installed in conjunction with and enable any of the above installations
- Covers purchase and installation costs
- → Nonrefundable, so households must have adequate tax liability to offset
- → Carry-forward ability applies, so households may roll over unused tax credits year over year

Frequently Asked Questions

Will 25C and 25D be retroactive?

25C and 25D were available starting January 1, 2023, so save your receipts for filing season! If you installed rooftop solar in 2022, it is eligible for the new, 30% 25D tax credit. If you installed a heat pump in 2022, it is elgible for the old 25C tax credit: 10% of costs up to $300.

Will 25C and 25D reduce up-front costs for consumers?

No, but they will reduce total costs.

Can renters utilize 25C and 25D?

Yes! Renters may be specifically interested in the 25C credit for portable, window-unit heat pumps once the Consortium for Energy Efficiency releases relevant efficiency standards (hopefully by 2024).

Who qualifies for 25C and 25D?

Anyone with adequate tax liability to offset can qualify for 25C and 25D.

Can 25C and 25D stack with other incentives?

Yes! 25C and 25D can stack with other federal incentives like the Electrification Rebates and the Efficiency Rebates.

Do 25C and 25D cover electrical panel upgrades?

25C and 25D cover panel upgrades if they are installed in conjunction with and enable the installation of another covered upgrade, like a heat pump or rooftop solar, respectively.

Do smart panels qualify for 25C and 25D?

Yes, as long as they have capacity of at least 200A.

Do 25C and 25D apply to new construction?

No for 25C; yes for 25D.

Which tax credits cover which heat pumps?

25C covers air-source heat pumps, and 25D covers geothermal heat pumps.

Does 25C have efficiency requirements?

Yes. 25C is applicable only to heat pumps and HPWHs that meet the Consortium for Energy Efficiency's highest non-"advanced" tier. ENERGY STAR-certified doors and ENERGY STAR Most Efficient-certified windows also are eligible.

What does it mean that 25C resets every year?

By resetting every year, 25C will be available to households for multiple upgrades over multiple years. For example, if a household maxes out 25C in one year by claiming a $2,000 credit for a heat pump and a $1,200 credit for insulation, that household can utilize 25C again in a future year for a HPWH and an electrical panel upgrade.

Does 25D cover community solar?

25D may cover community solar in some cases, if you're a partial owner of a community solar installation. If you're a "subscriber" to a community solar project owned by a developer (including nonprofits, co-ops, and local governments), you'll likely not be eligible for 25D, but the developer may be eligible for the supplier-facing Section 48 investment tax credit.

MAREA

Mid-Atlantic Renewable Energy Association

Directory of Pennsylvania Solar Electric Installers

Scan to view

Visit
www.theMAREA.org
for free download

https://themarea.org/downloads/MAREA-Directory-of-PA-Solar-Electric-Installers.pdf

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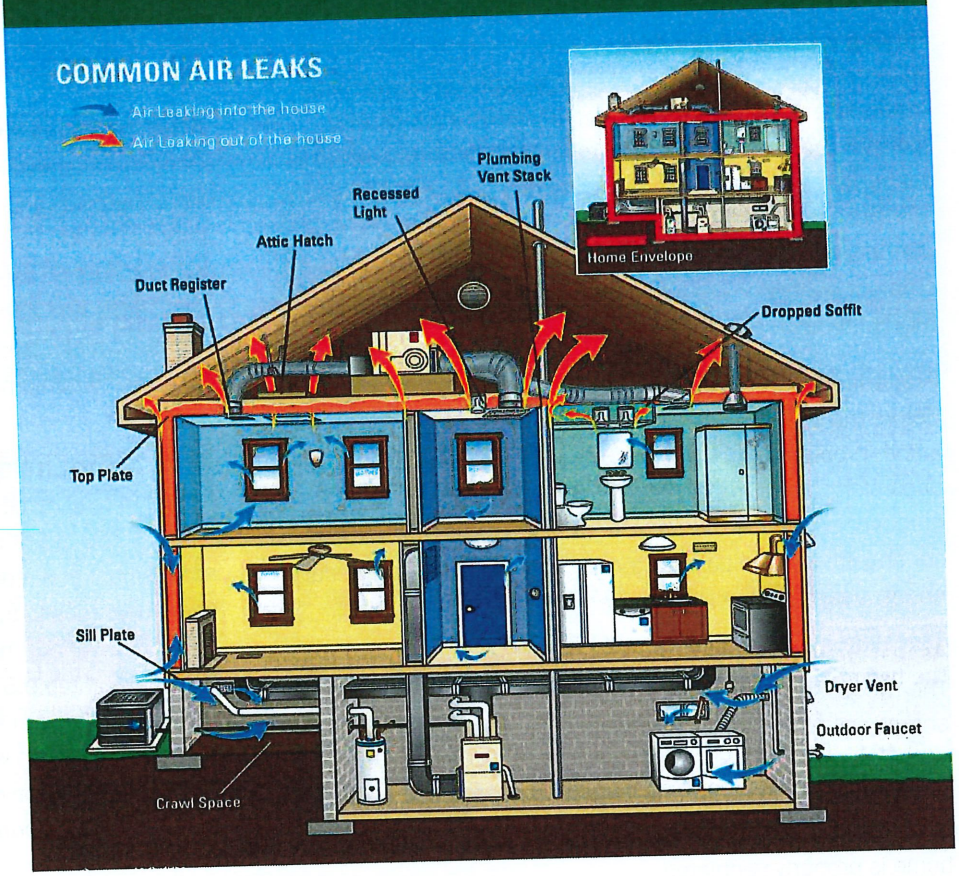
Consumer Guide to Home Energy Assessments

A home energy assessment is the essential first step to lowering your energy bills.



IDENTIFYING AIR LEAKS

Depressurization Test

If you have difficulty locating air leaks, try conducting a basic building depressurization test (ideally on a cool, windy day).

1. Close all exterior doors, windows, and fireplace flues.
2. Turn off all combustion appliances, including gas-burning furnaces and water heaters. Note: If you do not wish to turn off your furnace, you can omit step 2 and go to step 3.
3. Turn on all exhaust fans that blow air outside, such as bathroom fans or stove vents.
4. Light a smoke candle or incense stick and pass it around the edges of common leak areas. If smoke is drawn into or out of a room, then there is an air leak.

Other DIY Air Leak Detection Methods

You can also detect air leaks by shining a flashlight over potential gaps at night. You will need a partner to observe the house from outside for large gaps or cracks that will show up as rays of light. This method may not locate small gaps. You can also detect air leaks by shutting a door or window on a piece of paper. If you can remove the paper without tearing it, you have an air leak.

Why Have a Home Energy Assessment?

A proper home energy assessment (also called a home energy audit) will tell you how much energy you use in your house and guide you on cost-effective measures to improve the energy efficiency of your home.

Do-It-Yourself Home Energy Assessment

You can conduct a simple home energy inspection on your own or hire a professional for a comprehensive analysis. The DIY assessment involves a walk-through of your home during which you look carefully at the main areas where air leaks occur:

- Look at places where different materials, such as brick and wood siding, meet — between foundation and walls, and between chimney and siding.
- Inspect the areas around electrical outlets, switch plates, windows and door frames, baseboards, attic hatches, wall or window-mounted air conditioners, mail chutes, electrical and gas service entrances, cable TV and phone lines, and vents and fans.
- Check to see that caulking and weather stripping are applied properly and are in good condition.

Professional Home Energy Assessment

The professional home energy assessment is a much more detailed, equipment-based look at the energy efficiency of a house (or any building). The energy assessor uses special equipment to measure the rate of air flow between the inside and outside of the house.

Finding a Certified Provider

Make sure you use a certified energy assessor, sometimes known as an energy auditor. Such assessors are usually licensed contractors in the home building and remodeling industry with experience installing heating and cooling systems, windows, and lighting. To find a certified assessor, check with your local electric or gas utility provider, your state or local government energy or weatherization office, or follow the ENERGY STAR® link under Further Reading.

Preparing for an Assessment

Before the energy assessor arrives, make a list of any existing indoor problems you have noticed, such as condensation and uncomfortable or drafty rooms. Have copies or summaries of recent energy bills to share with the assessor. The assessor should do an initial walkthrough of your home to see daily energy usage patterns, both overall and in specific rooms.

Assessment Techniques and Equipment

The two most common techniques for carrying out a home energy assessment are the blower door test and an infrared camera scan, which are often done together. During these tests, the assessor may also inspect your heating and cooling systems, test for natural gas leaks, and check to see if your home is properly ventilated.

Blower Door Test

The blower door test measures the airtightness of a house. A powerful fan called a blower door is mounted into a flexible panel and frame that fits in a doorway. The fan draws air out of the house, resulting in lower pressure inside the house. This allows outdoor air to flow in through unsealed gaps and other unwanted openings. Using a smoke pencil, the auditor can then find the location of air leaks.

Make sure the assessor uses a calibrated blower door, which is connected to a pressure gauge called a manometer that measures the pressure difference between two locations as the fan is running. This results in an exact measurement of the air flow through the house. Blower doors that don't use such measurement can spot air leaks in the home, but not the amount of air leakage.

The energy assessor may also use a duct blower, a variable-speed fan attached to a duct system with a hose to measure the amount of air leakage inside ductwork.

Thermographic Scan

A thermographic scan uses an infrared scanner to detect differences in temperature in a building, such as along walls, roofs, and around windows and doors. These differences show up in a video or camera still image as whiter (warmer) or darker (cooler) areas. Assessors use the images to determine the location of air leaks. When done together with a blower door test, air leaks show up as black streaks in the infrared image.

After the Assessment

Once the assessment is completed, the energy assessor should provide you with a report of the findings and ideas for improvements. You can decide what upgrades to make to your home based on these findings. You may only need to air seal small gaps and add attic insulation. Or it may be cost-effective for you to make bigger upgrades, such as replacing heating and cooling equipment.

Cost & Financials

A professional home energy assessment can cost from approximately $250 to $600 or more. Many contractors will perform the assessment at a reduced rate if you hire them to make subsequent upgrades to the energy efficiency of your home based on the report. Various incentives may be available to lower income families, and the U.S. Department of Energy's Weatherization Assistance Program also provides states with funding to help low-income families weatherize their homes. There are also incentives for switching to energy-efficient products. Please see below for more information.

FURTHER READING

DOE Weatherization Assistance Program
energy.gov/eere/wap/weatherization-assistance-program

Energy Saver: Home Energy Assessments
energy.gov/energysaver/weatherize/home-energy-audits

Home Performance with ENERGY STAR Locations
energystar.gov/campaign/improvements/find_local_help/full_list

Financial Incentives
Tax credits, incentives and rebates may be available in your area. Please visit **energystar.gov/about/federal_tax_credits** for more information.

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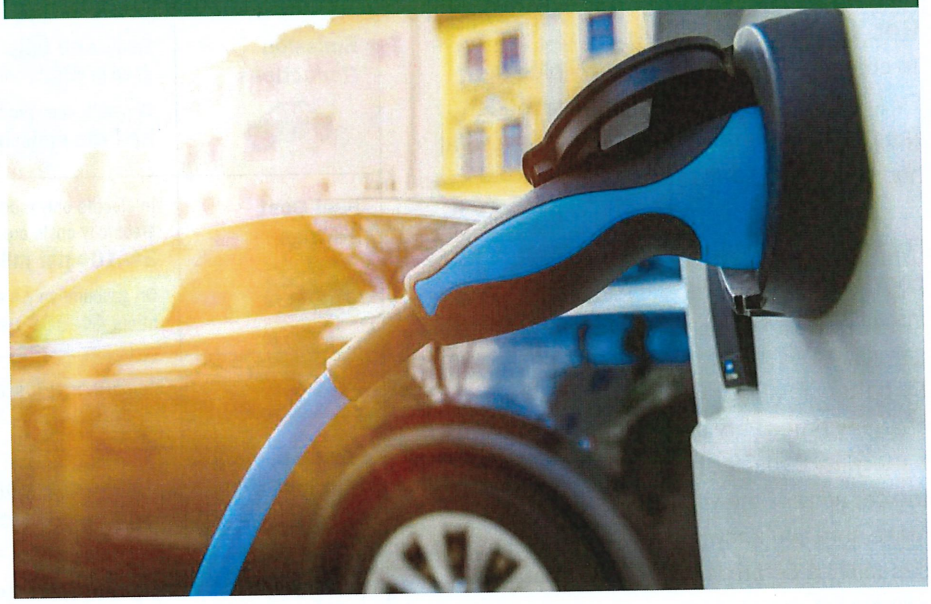
Consumer Guide to Electric Vehicles

Electric vehicles (EVs) are on the move, literally. There are more EV choices now than at any time in automotive history, and consumer sales of EVs have skyrocketed as EVs have achieved greater battery power, faster charging times, and lower fueling and maintenance costs. As EVs continue to become more affordable and economical, they will become even more commonplace.



A Tale of Two EVs

EVs, by definition, include battery electric vehicles (BEVs), which are all-electric, and plug-in hybrid electric vehicles (PHEVs). EVs offer several benefits compared with vehicles with internal combustion engines (ICEs), including better fuel economy.

Perhaps the biggest difference between the two EVs is their driving range and operating efficiency. BEVs are limited in how far they can travel based on their battery charge. For example, in 2020 the average range of a light-duty BEV was 260 miles before needing to be recharged, with some models exceeding 400 miles on a full charge. Alternatively, PHEVs can travel much greater distances on a single battery charge because they also use an ICE to get power. But without charging the battery, PHEVs won't achieve maximum fuel economy or provide the full environmental and cost-saving benefits of EVs.

Both EV types help reduce greenhouse gases; BEVs virtually eliminate tailpipe emissions, whereas PHEVs produce no tailpipe emissions when in electric-only mode. For a comparison of vehicle emissions by state, see the Alternative Fuels Data Center's (AFDC) comparison tool at **afdc.energy.gov/ev-emissions.html**.

The Bottom Line: What an EV Means for You

A major consideration for EVs is the sizable improvement in fuel economy. EVs are more than three times more efficient than cars powered by today's conventional engines! This means the payback from fuel savings will offset the higher cost in less time. To find fuel economy ratings and fuel/vehicle cost comparisons among current models, visit fueleconomy.gov or, for a comparison of fuel prices over time, visit **afdc.energy.gov/fuels/prices.html**.

DID YOU KNOW?

Nearly all major auto manufacturers have EV models available, and some automotive companies have committed to having electric-only models by 2030. For up-to-date information on available models, go to AFDC's "Vehicle Search" tool at **afdc.energy.gov/tools** or the "Find a Car" tool on **fueleconomy.gov/feg/findacar.shtml**.

You can also look for available federal and state tax credits, as well as private and utility rebates, to help offset the cost of purchasing EVs, by searching AFDC's Federal and State Laws and Incentives database at **afdc.energy.gov/afdc/laws**.

Get Your Charge On

To charge an EV at home, simply plug the EV's 110-volt cord into an electrical outlet. Note that charging this way may take several hours to achieve full power.

For faster charging, you can purchase a portable 240-volt unit or have an electrician install a hard-wired 240-volt outlet in your garage. A 240-volt outlet can fully charge an EV battery in as little as 20 minutes, though charging times vary based on the type of battery, its capacity, how depleted it is, and the capacity of the vehicle's internal charger. Make sure you know your EV's charging capabilities before you purchase charging equipment or upgrades.

Benefits of Electric-Drive Vehicles *compared to conventional vehicles*

	PHEVs	BEVs
Fuel Economy	Most achieve combined fuel economy ratings **higher than 90 mpge**.	Most achieve fuel economy ratings **higher than 100 mpge**.
Emission Reductions	Produce **no tailpipe emissions** when in electric-only mode. Generally, they produce **less than half the emissions**.	Produce **no tailpipe emissions**. Generally, they produce **one-third the emissions**.
Fuel Cost Savings	In electric-only mode, PHEV electricity costs are about **3¢–10¢ per mile**. On gasoline only, fuel costs are about **4¢–36¢ per mile**.	All-electric vehicles run on electricity only. Electricity costs are **2¢–6¢ per mile**.
Fueling Flexibility	Can fuel at **gas stations**. Can charge at: **· home · public charging stations · some workplaces**	Can charge at: **· home · public charging stations · some workplaces**
Electricity is produced from varied, domestic sources:		

Source: AFDC (**afdc.energy.gov**), **FuelEconomy.gov**

Nationwide there are 40,000 public rapid-charging stations with more than 100,000 ports. The Federal Highway Administration is increasing this network of fast-charging stations along designated EV highway corridors. To locate a charging station, visit the AFDC's station locator at **afdc.energy.gov/stations/#/analyze?country=US&fuel=ELEC** or AFDC's map at **afdc.energy.gov/stations#/find/nearest?country=US**, which is also available as an iPhone and Android app for instant mobile access. Many EVs also have built-in station locators in their on-board navigation system.

Drive with Confidence

EVs adhere to the same rigorous Federal Motor Vehicle Safety Standards as conventional vehicles sold in the United States.

EVs lack conventional engines and have far fewer moving parts and fluids to change, so they typically require less maintenance than conventional vehicles or even PHEVs. EV electrical systems (battery, motor, and associated electronics) require minimal scheduled maintenance. Battery warranties typically cover eight years or 100,000 miles, and the average expected battery lifetime is 12-15 years under normal operating conditions in moderate climates. BEV brake systems typically last longer than conventional vehicles, because regenerative braking reduces brake wear.

For more information, refer to the AFDC's Maintenance and Safety of Hybrid and Plug-In Electric Vehicles webpage at **afdc.energy.gov/vehicles/electric_maintenance.html**.

KNOW BEFORE YOU GO!

Thinking about buying an EV? Make sure you understand your options and the benefits EVs provide, compared to ICE vehicles. To learn more, visit AFDC's Electric Vehicle Benefits and Considerations webpage at **afdc.energy.gov/fuels/electricity_benefits.html**.

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Consumer Guide to Residential Renewable Energy

Installing residential renewable energy systems, such as geothermal heat pumps and wind or solar energy systems, can save energy, lower utility bills, and earn homeowners money.

Start with Energy Efficiency

Making the home energy-efficient before installing a renewable energy system will save money on electricity bills. Energy-efficiency improvements can conserve energy and prevent heat or cool air from escaping. Homeowners can obtain home energy assessments and install proper insulation, air sealing, and ENERGY STAR®–qualified windows, heating and cooling equipment, kitchen appliances, and lighting systems. Smart water use, available daylight, proper landscaping, and native vegetation can also improve home efficiency.

Incorporate Renewable Energy

Once home energy-efficiency improvements have been made, homeowners are best positioned to consider options for installing a renewable energy system.

Geothermal Heat Pumps

Geothermal heat pumps, also known as ground source or water source heat pumps, transfer heat into and out of the home, using the ground as both a heat source and a heat sink. These pumps can achieve efficiencies two to three times greater than commonly used air source heat pumps (ASHPs), because they rely on the relatively consistent ground temperatures to transfer heat to or from a home. Across much of the United States, the temperature of the upper 10 feet of the ground remains between 45°F and 75°F, and often between just 50°F and 60°F. By contrast, air temperatures can range, over the course of a year, from below 0°F to over 100°F.

Geothermal heat pumps are long-lasting and durable, and specially equipped systems can also supply hot water during the summer. While purchasing and installing a geothermal heat pump costs more than installing an ASHP system with similar capacity, the additional costs can be recouped through energy savings in 10 to 15 years compared with ASHPs.

DID YOU KNOW?

Solar water heaters use sunlight to heat water for the home. Solar water heating systems use insulated storage tanks and solar collectors to capture and retain heat from the sun, and heat circulating water. Solar water heaters require a backup system, such as conventional hot water heaters, when there is insufficient sunlight.

Solar Energy Systems

Solar photovoltaic (PV) systems convert sunlight into electricity. Solar energy can generate all or some of a home's electricity needs, depending on the number of solar panels used, and can heat water as well. With ample sunlight, PV systems can harness energy in hot and cold climates. The basic building block of a PV system is the solar cell. Multiple solar cells form modules called solar panels that range in output from 10 to 400 watts. Panels are designed to survive storm and hail damage and are resistant to degradation from ultraviolet rays. They are highly reliable and require little maintenance. Panels are typically grouped together on a building rooftop or at ground level in a rack to form a PV array. The array can be mounted at a fixed angle or on a tracking device that follows the sun to maximize sunlight capture.

Wind Energy Systems

Small residential wind energy systems can generate all or some of a home's electricity needs (if sufficient land area and average wind speeds are available) and can be integrated with solar and battery storage to provide emergency backup power. Wind turbines use the motion of the wind to turn a shaft attached to a generator, which makes electricity. The size of the turbine and the speed of the wind determine how much electricity it will make.

Typical residential wind energy systems have power ratings ranging from 5 to 30 kilowatts. To be a suitable candidate for a wind system, a homeowner should have at least one acre of land and live in an area that has an average annual wind speed of at least 10 miles per hour. The turbine tower height should be selected based on the height of nearby wind obstructions, such as buildings or vegetation, and are typically 60 to 140 feet high.

Estimated Costs

Federal and state incentives can significantly reduce the upfront costs of installing a renewable energy system. The Database of State Incentives for Renewables & Efficiency can help homeowners find incentives near them. Plus, renewable energy systems can pay for themselves over time. Grid-connected solar and wind systems are particularly cost-effective because excess electricity is sent back to the power grid and can earn homeowners direct rebates or credits from local utility providers.

- Solar PV systems cost about $3 per watt installed. A 7,000 watt (7 kilowatt) system therefore costs about $21,000 to install. Such a system would provide 20 to 35 kilowatt-hours of electricity per day, depending on climate, and could meet most of a household's demand.
- Solar hot water systems can meet 50% of the hot water needs for a family of four and generally cost between $5,000 and $7,000 to install.
- Small wind energy systems cost an average of $5 per 120 kilowatts to install. Purchasing and installing a system can range from $10,000 to $70,000, depending on local zoning, permitting, and utility interconnection costs.

Selling Energy

Many homeowners can sell any excess energy their solar and wind systems produce back to their utility providers and, therefore, pay off their renewable energy investments more quickly. Most states have established "net metering" rules for customers who generate excess electricity through solar, wind, or other systems and feed it into the grid. In net metering, a bi-directional meter records both the electricity the home draws from the grid and the excess electricity the homeowner's system feeds back into the grid.

FURTHER READING

Energy Saver Consumer Guides
energy.gov/energysaver/publications

Energy Saver: Geothermal Heat Pumps
energy.gov/energysaver/geothermal-heat-pumps

Energy Saver: Buying and Making Electricity
energy.gov/energysaver/buying-and-making-electricity

Wind Exchange Small Wind Guidebook
windexchange.energy.gov/small-wind-guidebook