High Efficiency Appliances

Overview

High efficiency appliances are designed to deliver comparable or improved performance over conventional appliances, while using fewer resources such as electricity, gas and water. High efficiency designations exist for a wide variety of appliances, and knowing the best efficiency ranking will help you select the best product. While some high efficiency appliances may have a slightly higher up-front cost, they will save resources and money during use, delivering a quick return on your investment. Your utility company may offer incentives for replacing older appliances or buying new high efficiency appliances.

When is This Applicable?

Replacing old appliances with new, energy efficient ones makes sense when renovating or when an appliance wears out, but it's also worth looking at if you notice a jump in your utility bills. If an appliance is 15 years old or older, it may be a good candidate for a high efficiency replacement. When you're building a new home, high efficiency appliances should be your first choice.

What Makes it Green?

High efficiency appliances offer a third party evaluation of energy & water efficiency as well as performance, so you'll be sure to save on resources and operational costs. Additional resource and money saving features of high efficiency appliances include:

Look for the ENERGY STAR label when choosing appliances such as dishwashers, refrigerators, and clothes washers/dryers.
Source: O'Brien & Company.

- Lower overall water, gas and electricity usage;
- Automatic water level adjustment on clothes washers to prevent over-filling;
- Less detergent and other laundry products needed per wash;
- Soil sensors on dishwashers to reduce wash and rinse time;
- Less standby heat loss from water heaters;
- More controllability for various types of wash cycles; and
- Finer control of refrigerator and freezer temperature.
- Northwest ENERGY STAR Homes requires ENERGY STAR labeled appliances and high efficiency water heaters, and you can earn additional points in Built Green and LEED for Homes for choosing high efficiency appliances.

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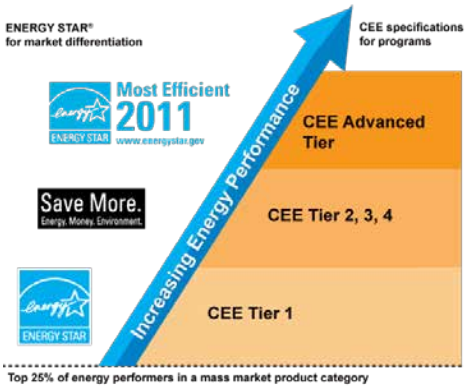
Best Practices

In order to find the most efficient appliances, look for a third party efficiency label such as ENERGY STAR or Consortium for Energy Efficiency (CEE). The ENERGY STAR label signifies a measurable improvement in efficiency, while CEE goes beyond ENERGY STAR and delivers greater savings. In conjunction with product selection, check your local utility providers and the ENERGY STAR website for rebates on high efficiency appliances.



This graph shows the relationship between ENERGY STAR and CEE Tiers. Source: http://www.cee1.org/content/cee-tiers-and-energy-star.

ENTRY LEVEL AND HIGHER EFFICIENCY CONSIDERATIONS FOR HOME APPLIANCES

Appliance	Entry level label	Most efficient label	Considerations
Dishwasher	ENERGY STAR	CEE Tier 1	ENERGY STAR dishwashers are not more expensive than a comparable non-ENERGY STAR unit. Dishes don't need to be pre-rinsed – they can simply be scraped.
Refrigerator	ENERGY STAR	CEE Tier 1, 2 or 3	ENERGY STAR and CEE Tier 1 both are 10 percent more efficient than federal minimum standards. CEE Tier 2 is 15 percent more efficient and Tier 3 is 20 percent more efficient. Side-by-side refrigerator freezers use more electricity than over-under. Further energy savings is possible through purchasing the smallest fridge that meets your needs. Products without ice makers use the least energy, while through-the-door ice models use the most.

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Appliance	Entry level label	Most efficient label	Considerations
Clothes washer	ENERGY STAR	CEE Tier 1, 2 or 3	Tier 3 is most efficient. Higher modified energy factor (MEF) means more clothes washing with less electricity and remaining water. Lower water factor (WF) means more efficient use of wash water.
Clothes dryer	ENERGY STAR	ENERGY STAR heat pump clothes dryer	Dryers with a higher Combined Energy Factor (CEF) mean a more efficient appliance. Look for low heat drying, moisture sensors and/or auto-cycle termination.
Range and Oven	Induction range (if electric)		Cooking typically consumes only 5 percent of annual household energy, so savings opportunities are relatively low. Avoid gas units with a standing pilot light. Convection style ovens cook more effectively at lower temperatures. Keep cook-tops and ovens clean for more efficient cooking.
Water Heaters			
Gas storage tank water heater	ENERGY STAR or CEE Tier 1	CEE Tier 2	For highest efficiency and indoor air quality, pick a direct vent or sealed combustion model.
Gas tankless water heater	ENERGY STAR or CEE Tier 1		For highest efficiency and indoor air quality, pick a direct vent or sealed combustion model.
Electric storage tank water heater	Not applicable	Not applicable	Northwest ENERGY STAR Homes requires 0.93 EF for electric resistance tank water heaters.
Heat Pump Water Heaters	ENERGY STAR		ENERGY STAR labeled units are the most efficient as they use heat pump technology.

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Tank or Tankless Water Heaters?

Storage tank water heaters are the most common style among U.S. households – with 60 percent of the market using natural gas for water heating. Storage tanks are inexpensive, simple, and the easiest to maintain.

Tankless water heaters do not have a large storage tank and instead contain a small chamber for heating water. One significant advantage of a tankless unit is the smaller footprint. They are compact, typically wall mounted and leave more usable space in a room or garage. Drawbacks of tankless water heaters include the high up-front cost, mechanical and electronic complexity, as well as the need for a larger gas line compared to a tank heater. The projected savings originally touted by tankless manufacturers may not be realized in all situations.

Gas or Electric?

When considering a water heater in a new home or a replacement heater in an existing home, consider the following:

- Gas water heaters, both tank and tankless, require venting. Think about how the appliance will be vented to the outside.
- Electric tank water heaters do not require venting, but heat pump models need access to more room air for efficient operation, and may perform better with access to outside air.
- Gas tankless water heaters typically require a 120v electrical outlet at the appliance, which may complicate or increase install cost. This adds a new plug load in the house as well.

See the links in Resources for more guidance and calculators to help find the least expensive and most energy efficient way to heat water in your home.

Maintenance

Keep your appliances running as efficiently as possible and prolong their life by following these best practices:

- If you have a tank water heater, check the outside for corrosion, which can lead to cracks and leaks.
- Remove mineral buildup from your dishwasher by running an empty machine using a cup of vinegar or a biobased detergent as a cleaning agent. If your dishwasher has a removable filter, rinse out any built up food debris. Clean the door gaskets to make sure the seal is secure.
- Check washer and dryer hoses, vents and wiring for broken or kinked lines every couple of months. Make sure the exterior dryer exhaust is free from lint build up or debris.

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Resources

For the complete King County Green Building Handbook and individual Green Sheet PDF files, please visit our website at: http://kingcounty.gov/property/permits/publications/greenbuild.aspx. For additional information, please email dperwebinquiries@kingcounty.gov or call 206-296-6600.

See these related DPER Green Sheets (GS):

- Alternative Heating Systems, GS Number 19
- Duct Sealing, GS Number 11
- Fresh Air Ventilation, GS Number 14
- Furnace Replacement, GS Number 18
- Insulation, GS Number 13
- Right Sizing Heating/Cooling Systems, GS Number 17
- Routine Maintenance, GS Number 5
- Thermostats, GS Number 16

PSE Rebates and Offers: PSE offers numerous rebates; click on "Appliances" to find appliances-related rebates and current offers.

ENERGY STAR; Qualified Products: Database of efficient appliances and key criteria. Use the gallery of menu items under "For Your Home."

American Council for an Energy-Efficient Economy; Water Heating: Consumer page on water heating that includes guidance on fuel choice, sizing, and life cycle costs.

Consortium for Energy Efficiency; Program Resources: Database of efficient appliances and key criteria. Be sure to expand the menu for "Residential."

Energy cost calculator for electric and gas water heaters: This resource from DOE helps you calculate potential savings from various choices of water heaters.