

# When Solar Cookies Beat Conservation Veggies

By Christopher Dymond, Oregon Department of Energy

People often ask me if solar is cost effective. Solar energy now compares favorably to many big-ticket energy efficiency measures.

## SMALL CONSERVATION MEASURES FIRST

Of course, before you do any BIG-ticket items, make sure you've done the basic low-cost conservation measures. For example:

- Replace the light bulbs in your house with compact fluorescents.
- Eliminate the infrequently used second refrigerator in your garage.
- Have your heating and cooling equipment tuned up to ensure maximum efficiency.
- Use your thermostat's programmable features to reduce unnecessary heating and cooling.
- Weatherstrip your doors to reduce air leakage.
- Replace your furnace filter regularly.



"Some quick conservation veggies before you eat your solar cookies."  
Artist: Jan Dymond

## BIG CONSERVATION MEASURES VS. SOLAR

The following table compares some common big-ticket energy measures with solar. Costs and incentives are based on statewide averages. Savings are estimated on a constant future cost. The payback is based on the full cost after typical incentives.

## BIG CONSERVATION MEASURES

So how do you decide which measures to implement? A lot has to do with timing.

**Furnace** – Consider replacing an old furnace with a high-efficiency model when it is more than 15 years old or it is inefficient (cycles on and off more than three times per hour during cold weather). Only the upgrade cost between an average unit and a top efficiency unit will need to be "paid back" through energy savings. See the Oregon Department of Energy Web site ([www.oregon.gov/energy](http://www.oregon.gov/energy)) for list of top efficiency units.

**Heat Pump or AC** – Installing a heat pump to replace an electric furnace has a good payback because heat pumps are typically two to three times more efficient. However, upgrading an existing heat pump or air conditioner should only be done when the existing unit no longer functions efficiently. Keep your equipment maintained and coils clean.

**Kitchen Appliances** – The time to replace your appliances is when you are remodeling the kitchen or the old unit (clothes washer, dishwasher, and refrigerator) is noisy or fails to meet your needs. Use the state tax credit list ([www.oregon.gov/energy](http://www.oregon.gov/energy)) to help guide you to the most efficient models.

**New Windows** – Upgrading to Energy Star™ windows only makes sense if you are installing new windows anyway. Reasons to replace your windows are to improve appearance, eliminate condensation, reduce drafts and decrease noise.

Measure (with specifications noted)	Cost	After incentives*	Savings per year	Payback years	Lifespan years
Air source heat pump (HSPF 9.0)	\$8,000	\$6,900	\$540	13	20
Gas furnace (95 AFUE)	\$4,000	\$2,850	\$150	22	20
On-demand gas water heater	\$2,500	\$1,700	\$120	14	20
Premium efficient clothes washer	\$900	\$700	\$26	23	10
Energy Star windows (U < 0.35)	\$14,000	\$13,800	\$220	62	50
Solar water heater (56 ft <sup>2</sup> )	\$7,500	\$3,300	\$230	14	20
Solar electric power (2,500 watt)	\$20,000	\$6,300	\$250	25	30

\*State, federal, and utility incentives vary with type of equipment and local requirements.

**Sealing Ducts** – Leaky duct work accounts for 30 percent of the average homes heating bill. Energy Star™ and Earth Advantage™ rated homes include performance tested duct work. Reducing duct leaks also prevents outside air and garage exhaust fumes from being drawn into the house. There is a Residential Energy Tax Credit for duct sealing and testing on new and existing homes. See the Web site for more information ([www.oregon.gov/energy](http://www.oregon.gov/energy)).

## SOLAR ENERGY PAYBACK

**Water Heating** – Standard gas or electric water heaters are not much more efficient than older ones, so don't upgrade to the same technology. Consider either upgrading your gas water heater to an on-demand/tankless unit or install a solar water heater. Both offer about the same payback. Unlike most big-ticket conservation measures, however, water heater replacements should be considered anytime. If you wait until your current unit fails, it's unlikely that you will be patient enough to hire the contractor to install an on-demand or solar water heater.

**Solar Electric** – If you have done the low/no-cost conservation measures and do not need to purchase any of the big-ticket measures soon, solar electric is likely your best option. As the table shows, with state, federal and utility incentives, the payback on solar is comparable to other big-ticket measures.

In addition to the direct energy savings, solar can increase the value of your home. The standard rule of thumb used in property assessment for solar property value is to multiply the energy savings per year by 20 years. For example, a solar photovoltaic (PV) system that saves \$250 per year should increase the value of the building by \$5,000 provided

it is well built and has good aesthetics. Oregon law also prevents the local government from assessing property tax on this additional value.

This means that if you subtract the value the system added to your home, the payback of a solar system can drop to a very cost-effective 6 to 7 years. ■