

Energy Answers



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In most Canadian houses, the water heater is the second largest user of energy. However, the efficiency of most gas or propane fired water heaters is quite anaemic, with annual efficiency values typically less than 60%. What can be done to improve the efficiency of the heaters?

Here is my top ten list of things to improve the efficiency of your hot water system.

1. Lower your tank water temperature setting *is the cheapest efficiency measure you can employ.* Some people have their water heaters set as high as 145 °F (63°C). This is too high, resulting in substantial heat losses and the risk of scalding from the hot water. Conversely, some years ago there were recommendations to lower water temperatures as low as 105 °F (41°C). This is too low, and will allow legionella and other bacteria to grow inside the water heater. A good water temperature is about 125 °F (52°C), high enough to prevent legionella, yet low enough to limit tank losses and prevent scalding.

Lowering the temperature is not recommended if there is insufficient hot water capacity in the house. However, the temperature of electric hot water heaters should not be set lower than 131 °F (55°C).

2. Reduce your use of hot water by installing water conserving shower heads, aerating taps, and a horizontal axis clothes washer. Horizontal axis clothes washers use less than half the water of the standard vertical axis (top-loading) machines. The smaller the demand for hot water, the lower the bill.

3. Insulate the water heater to limit heat loss from the jacket. Most water heater blankets on the market are only about one or two inches thick. A better insulation thickness can be achieved by adding R20 (6 inch thick) batts. The trick is to place the batts vertically against the water heater, and to cover the batts with an aluminum or vinyl-backed blanket insulation material. The batts need to be cut like barrel staves so that they fit properly. With any of the natural gas, propane, or oil fired water heaters, it is VERY IMPORTANT that the air supply to the burners and to the draft hood at the top are not obstructed.

I used this insulation technique on an electric water heater, and the standby heat loss was reduced from 100 watts (341 Btu/hour) to 25 watts. I have

found that a thin wire is the best for holding the insulation against the tank. Most duct tapes do not have enough staying power.

4. Put the water heater near the end uses. This, of course, is easiest to do in a new house. By having only a short distance for the water to travel, the heat loss from the piping is reduced. Even if the pipes are insulated, the water in the pipes will cool quickly and the heat from the standing water in the pipes is lost.

5. Install an uninsulated preheat tank (30 or 40 gallons) upstream of the water heater. This preheat tank will absorb heat from the air in the house throughout the year. Although you are 'robbing' heat from the house during the heating season, the tank will draw heat from the house during the summer period. Incoming water temperatures can be quite cold. In Saskatoon, the ground water temperature is as low as +3°C (38 °F) in the late winter months, rising to about +18°C (65°F) in the summer.

6. Place insulation on the cold water inlet and the hot water outlet piping. Most water heaters have the piping at the top of the heater. Considerable thermal convection can occur on the pipes. You can notice this on water heaters that do not have pipe insulation. Quickly touch the pipes near the top of the water heater. Even if there has been no water draw in the last half hour, they will be hot.

7. Install anti-convection loops on the water heater. The easiest anti-convection loop to make is to use a soft copper loop about 6 inches in diameter on the inlet and outlet pipes

8. Install a vent damper on the water heater. Several U.S. companies produce a thermally-activated vent damper that can be retrofit on water heaters. Be sure to check that they are legal in your area.

9. Install a solar water heater. These are not cheap, but are financially attractive in most parts of Canada especially where electricity is the fuel of choice.

10. Install a condensing water heater. There are at least two companies that produce condensing water heaters for domestic water heating. These units are not cheap, and tend to be quite large in capacity. However, the units can also be used to provide space heating in well insulated houses.

After The Flood Recovering from a Flood

Regrettably, springtime in many areas is also flood time. We hope there will not be too many disasters this year, but if there are, we thought we would summarize a CMHC publication on how to deal with the aftermath of a flood.

After a flood, it is important to restore a home to good order as soon as possible to protect the health of occupants and prevent further damage to the house and belongings.

Before starting clean up, shut the power off to the flooded area at the breaker box. Wear rubber boots in any flooded area with standing water 2" or more deep. Keep extension cords out of the water.

Record details of damage, with photos or video if possible. Set up a step-by-step action plan to:

- ☛ remove all water, mud and other debris;
- ☛ dispose of contaminated household goods;
- ☛ rinse away contamination inside the home,
- ☛ remove the rinse water;
- ☛ disinfect and dry out the house and salvageable household goods

Household goods contaminated by sewage or wet for a prolonged time should be thrown out, except for solid material products (wood, metal or plastic) that can be cleaned and disinfected.

Always use gloves, masks and other protective gear, as chlorine bleach and non-ammonia dishwashing detergent will be needed. Never mix bleach with ammonia - the fumes are toxic. Clothing and bedding should be hung out to dry. Valuable papers should be placed into a freezer for later work.

Starting Site Work

- ☛ Immediately add small amounts of chlorine bleach to standing water
- ☛ Remove standing water with pumps or pails, then with a wet/dry shop vacuum.
- ☛ Remove all soaked and dirty materials and debris, including wet insulation and drywall, residual mud and soil, furniture, appliances, clothing and bedding.
- ☛ Hose down any dirt sticking to walls and furnishings, then rinse several times, removing the remaining water with a wet/dry shop vacuum.
- ☛ Wash and wipe down all surfaces and structures with chlorine bleach, ensuring that there is adequate cross ventilation to remove fumes. Then rinse again.

Wipe down surfaces that have not been directly affected with a solution of one part chlorine bleach to four parts cold or tepid water. Ventilate or dehumidify the house until it is completely dry.

Work from the top down. Remove wall materials that have been soaked at least 500 mm (20 in.) above the high-water line.

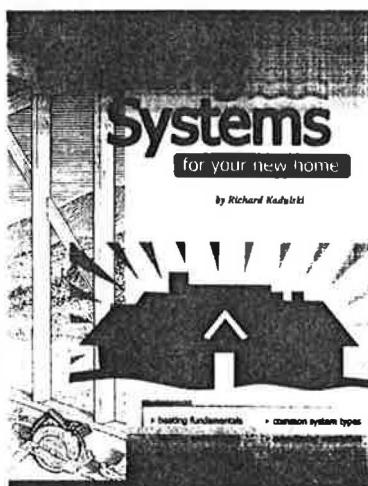
Rinse, then clean all floors as quickly as possible. Replace flooring that has been deeply penetrated by flood water. Carpets must be dried within two days, otherwise they should be taken out. Sewage soaked carpets must be discarded.

Clean all interior cavities with a solution of water, chlorine bleach and non-ammonia dish detergent and dry thoroughly, checking for mould and killing it with chlorine bleach. Ensure that structural members are dry.

Flooded appliances, electrical outlets, switch boxes or fuse/breaker panels should be tested before use. If they have been soaked, replace the furnace blower motor, switches and controls, insulation and filters. Inspect all flooded forced air heating ducts and have them cleaned out or replaced. Replace insulation inside water heater, refrigerators and freezer if it has been wet.

Flush and disinfect floor drains and sump pits using undiluted chlorine bleach, and scrub them to remove greasy dirt and grime.

Always make sure workers wear protective gear and the house is well ventilated, using large fans and all windows open.



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