

Business / Government / Housing Organizations

Instantaneous Gas Water Heater

Benefits

Reduced Energy Consumption

- Heats water only as it is needed (on-demand).
- High-efficiency units are 92% to 95% efficient.
- Saves fuel with an ignition device (IID) instead of a standing pilot light.
- Eliminates energy loss associated with continuously keeping water warm in a storage tank.

Reduced Energy Costs

- Reduces utility bills through energy saving 'on-demand' features.

Reduced Environmental Impact

- Lowers on-site emissions from fuel-fired systems.
- Reduces consumption of non-renewable fuel resources.
- No exposure to standing water that can cause rust and corrosion, or lead to problems associated with hard water, sediment, or mineral build-up.

Reduced Space Requirements

- Frees up floor space as the units are relatively compact and are wall mounted.
- Can be located close to hot water appliances, fixtures, hot tubs, etc.

Description

- Instantaneous (also referred to as "tankless" or "on-demand") water heaters heat hot water on an as-needed basis. These units do not store hot water, eliminating the energy load required to keep a tank of water hot enough for use at any time (the 'stand-by' energy loss). The units are wall mounted and relatively compact. Natural gas, propane (LP), and electric versions are available with varying energy efficiency.

- Heating capacity varies for different applications: larger heating capacity units are available for whole-house water heating and space heating applications; smaller capacity units can be used to serve a remote bathroom or hot tub. The units can also be used to boost water temperature for appliances such as dishwashers and clothes washing machines. They can supplement the heating capacity of solar or wood-fired domestic hot water systems.
- The heating capacity of the unit is based on the maximum temperature rise possible at a given flow rate. Typically, demand water heaters provide hot water at a rate of 15 – 40 litres per minute (LPM) but larger units are available.
- Instantaneous tanks can provide continuous hot water. Although convenient, this can also result in higher energy and water consumption if not used with conservation in mind.

Figure 1 — Instantaneous Gas Water Heater



Design/Installation/Operation/Maintenance Considerations

- Space must be available to hang the unit on a wall and to side wall vent fuel-fired unit outdoors.
- Provision must be made for the safe venting of fuel-fired units.
- Natural gas/propane service pipe sizes may have to be increased to accommodate required gas flows that are higher than that used to conventional storage type water heaters.
- Professional installation by qualified contractors is required.
- Proper sizing of the heater, or the installation of two heaters in parallel, is important to avoid the situation where overlapping demands for hot water outstrip the ability of an instantaneous heater to generate sufficient hot water. If an undersized unit is in place, or the hot water demand increases, use timers or delay functions on appliances to avoid overlapping demands.
- For some units, water must flow through the unit, at a sufficient flowrate, before it activates and this can increase the amount of time water has to run before hot water arrives at the taps, shower or bath. This can be an irritant and cause a slight increase in water consumption. Properly sizing and locating the units as close to the end-use points are important considerations.

What Does it Save?

The cost savings associated with the replacement of a standard hot water tank with an instantaneous water heater is dependent upon a number of factors including the efficiency, condition and location of the original equipment, energy type and cost, and hot water usage.

Here is an example of the possible savings a family of four could see with a high-efficiency instantaneous gas water heater. The example family lives in a 2-storey house built in 1973. They use 225 litres of hot water each day, and the temperature is set at 55°C (130°F). The existing hot water tank is in the basement. The replacement unit has a 27 – 30 litres (5.9 – 6.6 gal) per minute flow at a 20°C (68°F) temperature rise and an Energy Factor of 0.92.

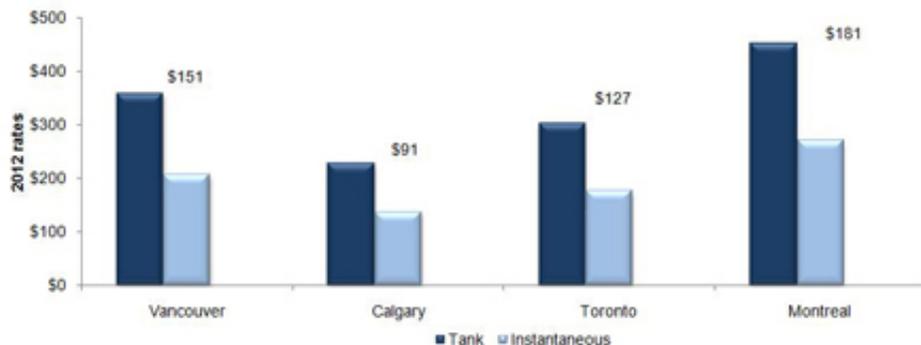
Example 1: Replacing a 58% efficient, 151 litre conventional storage type **natural gas-fired** hot water tank with a gas-fired instantaneous water heater:

This upgrade can reduce the energy used for water heating by up to 40% to 42%, depending where the house is located. Currently low natural gas prices (2013) are reflected in the

relatively low annual cost savings of \$91 to \$181. If the original hot water tank was newer and of higher energy-efficiency, lower cost savings would be realized. The figure below shows the estimated annual hot water heating costs for several cities for both storage tank and instantaneous type water heaters. The estimated annual energy cost savings is also shown.

Annual Energy Cost Saving

58% Gas Hot Water Tank to 92% Instantaneous Water Heater



Annual Energy Cost Savings — 58% gas hot water to 92% instantaneous water heater

Vancouver Calgary Toronto Montreal

Annual Energy Cost — Tank
 Vancouver: 358, Calgary: 227, Toronto: 302, Montreal: 451

Annual Energy Cost — Instantaneous
 Vancouver: 207, Calgary: 136, Toronto: 175, Montreal: 270

Instantaneous

Annual Energy Cost Savings
 Vancouver: 151, Calgary: 91, Toronto: 127, Montreal: 181

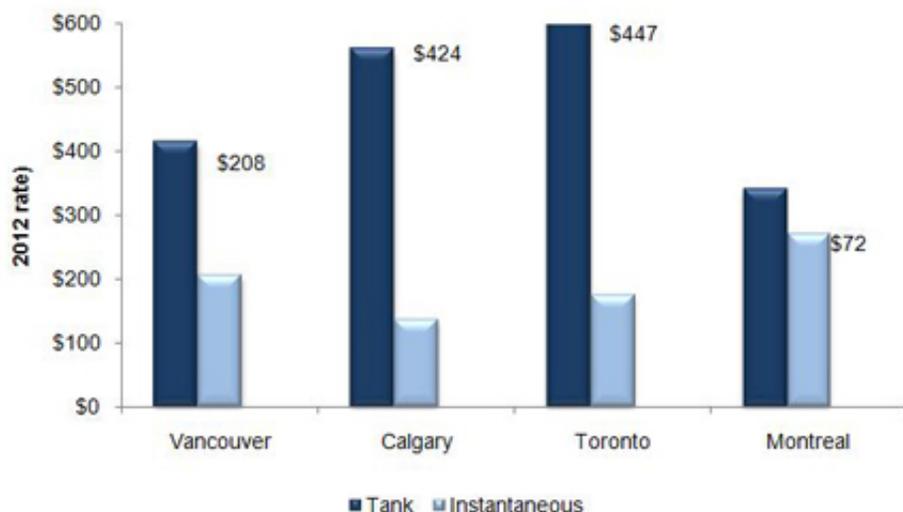
Example 2: Replacing a conventional 151 litre electric hot water tank with a gas-fired instantaneous water heater:

This upgrade reduces the amount of energy used for water heating by 12% to 14%, depending on where the house is located, but in general, shows a higher savings in purchased electricity because of the higher cost of electricity than natural gas in most regions of the country. Annual savings can range from \$72 to \$447.

Annual Cost Savings

Conventional Electric Hot Water Tank to 92%

Instantaneous Water Heater



Annual Energy Cost Savings — Conventional electric hot water tank to 92% instantaneous water heater

Vancouver Calgary Toronto Montreal

Annual Energy Cost — Tank

Vancouver	415	560	623	342
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Annual Energy Cost — Instantaneous

Vancouver	207	136	176	270
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Instantaneous

Annual Energy Cost Savings

Vancouver	208	424	447	72
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