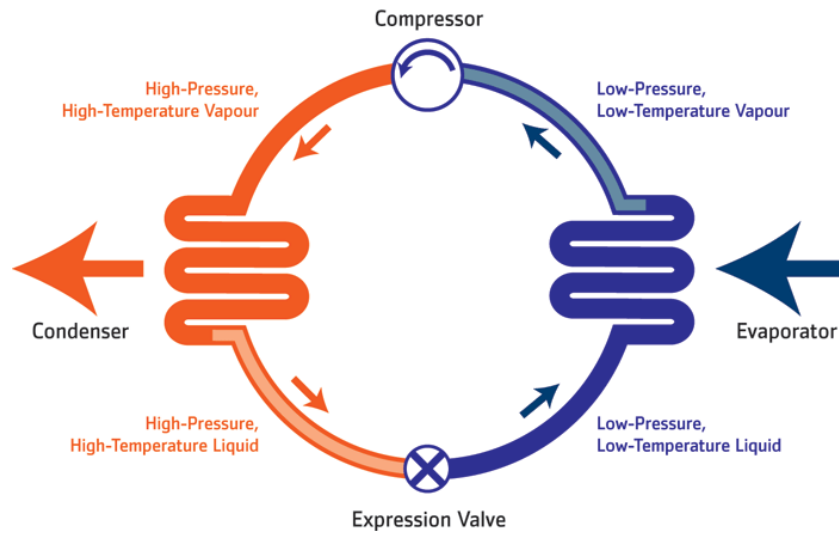


North Road Technologies LLC

1. How does the GEYSER work?

The GEYSER from North Road Technologies is a Heat Pump Water Heater that, when added to your existing water tank, makes use of a renewable energy source – the air in your basement, garage or utility room – to heat your water. It is unique because moving heat from the air to water consumes a fraction of electrical power required to heat water directly with an electric resistance element or fossil fuels. The energy savings typically range from 60% to 70% depending on your lifestyle and geographic location.



2. How much money can I save with the GEYSER?

Heating water should be an easy subject but it is not. It is complex and savings will depend on a number of factors. The major influences are your local **energy costs**, the **temperature** and **humidity** of the surrounding air and **how much hot water your family uses**. Several utility companies have monitored the field performance of the GEYSER, and the test results have shown that energy savings compared with standard electric resistance water heaters are at least 60% and usually near 70%.

One can get a conservative estimate of savings versus electric, gas or other fossil fuel going to our **Savings Calculator** on the [our website](#). This calculator uses 2009 numbers provided by Environment Protection Agency - Department of Energy. For a more precise estimate, you can check your utility's website. Simply find the average annual cost for a kWh of electricity and change it on the online calculator. Many utilities have summer and winter rates, so you may need to average these. A few utilities have time of use rates which must be considered.

A family of 4 typically uses 6,000 kWh of energy per year for water heating. With the 2009 average of 11.5 cents per kWh they will spend at least \$690 in electric energy to heat water. The GEYSER can save \$427 per year. In the northeast, where the average electricity rates are 17.89 cents/kWh, the typical savings are \$664.71 per year! We are using average typical numbers, but some families spend easily over \$1500 a year, for them, the savings will be even more because higher water usage pattern improves efficiencies in heat pumps. The GEYSER also provides free dehumidification and half a ton of free air cooling which is not negligible.

A comparison with natural gas, propane or other sources will depend on your local cost for fuel and electricity. Gas prices can vary widely from month to month and from location to location. Still, GEYSER will always be less expensive to operate and far greener than the burning of fossil fuels. Furthermore, tanks that burn fossil fuels have a flue or chimney in the center of the tank leading to unavoidable standby heat losses. Again, please check our **Savings Calculator** on the website.

3. When does the GEYSER heat pump water heater make the most sense?

With current energy prices, heat pump water heaters saves energy in all applications compared to any fuel or power source and will considerably reduce your carbon footprint. As long as your room temperatures where the GEYSER will be located range from 40-120°F, you have a good application for the GEYSER.

4. Are 60 to 70% savings estimates real?

The GEYSER is the improved successor to the Nyletherm and Hot-Shot units from Nyle Corp, which has been successful in the marketplace for 10 years. Oak Ridge National Laboratory Building Technology Center has found 64% average savings with older Hot-Shots units. The new GEYSER is more efficient and reliable.

Do not take our word for it, go to the [Energy Star website](#) and read what DOE/EPA says about the technology. With a COP of 4.0 and 2.8 energy factor rating, the GEYSER is a top of the line appliance and 40% more efficient than the DOE/EPA Energy Star program posted results!

5. Does my local utility offer any special rebates or incentives for utilizing a renewable energy source?

Probably! Please talk to your utility to find out if they are offering any special programs that will allow for the investment in energy saving products. You can also go to the [DSIREUSA](#) website to see if any additional rebates or incentives apply for your area.

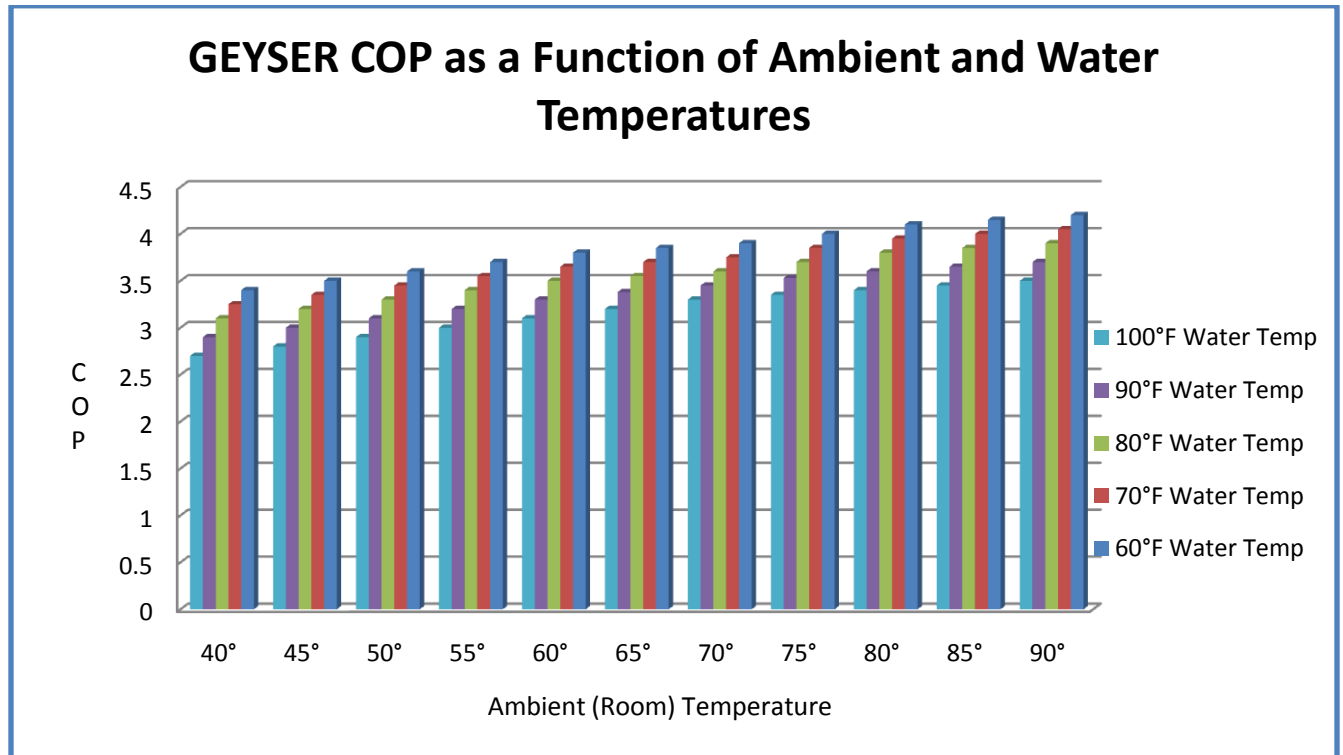
6. Does the GEYSER qualify for the 30% Federal Tax Credit on High Efficiency Equipment?

Absolutely! Check the information below. The GEYSER exceeds Energy Star requirements. The 30% credit is for the cost of an installation (including labor) up to \$5000. The maximum credit amount is \$1500. Here are the rules:

- Must be "placed in service" from January 1, 2009 through December 31, 2010.
- Must be for taxpayer's principal residence.
- \$1,500 is the maximum total amount that can be claimed for all products placed in service in 2009 & 2010 for most home improvements.
- Must have a Manufacturer Certification Statement to qualify.
- For record keeping, save your receipts and the Manufacturer Certification Statement.
- Improvements made in 2009 will be claimed on your 2009 taxes (filed by April 15, 2010) — use IRS Tax Form 5695 (2009 version) — it will be available late 2009 or early 2010.

7. What is the meaning of COP?

COP stands for Coefficient of Performance. Simply said: it is the ratio of energy output to energy input. The COP is calculated at a specific operating condition and does not take into account any value for the cooling and dehumidification provided. Furthermore, COP does not accurately reflect the benefit of waste energy and standby heat losses being recycled by the GEYSER back to a water heater when appliances such as cloth washer and dryer, pumps, refrigerator or freezer or other equipment are in close proximity to the GEYSER. A heat pump COP of 4.0 means that 4 kW of energy are delivered to the water heater tank for every 1 kW of electricity consumed by the GEYSER. Heat pumps do not create heat, they simply moves renewable ambient heat to a heat sink (storage tank). The GEYSER is a high performance HPWH. See the performance data (COP) under several water inlet and ambient air temperatures.



8. What is the life expectancy of the GEYSER heat pump water heater?

The expected life should be at least 10 to 15 years.

9. Can I use the GEYSER with a gas or propane water heater?

Absolutely! The GEYSER can be installed on gas, oil or propane heaters. Because an improper connection to a gas or propane heater could pose a safety issue, it is recommended to have a licensed specialist do the installation.

10. Can one just buy a storage tank and what size should the tank be?

Yes. There must be a tank of some kind to hold the heated water, so any insulated tank will work well.

11. What kind of electric water heater is best to purchase?

The GEYSER heat pump water heater works well in conjunction with any standard electric water heater. The upper heating element is used for quick recovery and emergencies. The requirements of the electric water heater are: **minimum 40 gallon storage (larger is better). Maximum tank elements size of 4500 Watts and 240/208 V. AC, 1 phase, 60 Hertz power.**

12. Will we run out of hot water?

No one should notice any difference in the supply of hot water. The GEYSER is designed to replace your present water heater and to gain maximum efficiency. To this effect, it has a built-in recirculation pump eliminating stratification. That is why we say you should not notice any difference. The GEYSER will heat approximately 300 gallons of water per day at 120°F. If properly sized, your existing tank should be fine. In any systems, tank size is an important consideration so if you have a say and about to get a new tank pick a larger tank if you have room. This will improve the overall efficiency of the GEYSER. Because your old system (existing tank) or new tank is the back-up, it does not make sense to have hot water shortage.

13. Does one need a plumbing or electrical permit to install the GEYSER heat pump water heater?

If you are doing the work yourself in your own home a permit may not be required. However, it is your responsibility to check with your local building, electrical and plumbing code authorities. If there are any discrepancies between these instructions and the local codes, adhere to the code requirements. Some counties and municipalities require a building permit before installation. GEYSER units sold by dealers must always be installed by qualified persons in the electrical and plumbing fields. As long as the guidelines in the manual are followed, the warranty covers DIY installation.

14. Can I install the GEYSER myself?

Yes! The GEYSER is relatively easy to install together with most existing electric tank water heaters. If you are comfortable with general plumbing and DIY tasks you should review the technical data page for more information [here](#). If, however, you are installing the GEYSER together with a gas, oil, or propane water tank, it is recommended that you contact a professional installer.

15. Where can I go to have my units installed professionally?

North Road Technologies partners with a group of professional dealers and installers who are trained experts in all areas of domestic HVAC applications. Please note that we have only recently begun to build our dealer/installer network and welcome any referrals for areas where we currently do not yet have a dealer/installer. To find out if there is dealer installer in your area, please [contact us](#) for a listing of local partners.

16. How big an area is needed for the GEYSER heat pump water heater to operate properly?

The requirement is for a minimum of 1,500 cubic feet, this correspond to a single spot garage. If such space is not available consider ordering longer hoses to install the GEYSER in a suitable location. When the GEYSER is located in a small closet or utility room, the exhaust air must be ducted out of the closet or the room and the door should be louvered for the intake. The required minimum air flow area of the

louvers is 150 inches; assume that wood louvers have a 20% to 25% free area and metal louver have a 60 to 75% free area.

17. How far away from the water heater can I install the GEYSER?

The GEYSER can be installed 50 feet away, but the closer it is to the tank, the better. The concern is not distance but heat loss. Keeping the lines well insulated will minimize this effect. The GEYSER can be left on the floor (it has rubber pads) or mounted on a shelf. Keep the GEYSER below the top of the water heater tank to prevent an airlock in the pump. If the GEYSER is mounted above the tank, bleed the line properly prior to starting the unit. You can also install an automatic air vent.

18. Where should the GEYSER be installed?

The GEYSER should not be exposed to the outdoor elements or corrosive environment or exposed to freeze. The GEYSER can be mounted anywhere, in a dry and covered location such as laundry and utility rooms, closet, garage, basement, crawl space, shed, loft, we heard of a customer that has her GEYSER in the kitchen. If you live in warm to moderate climate it can be mounted in an attic, loft or other space for higher efficiency. However the unit should not be operated in spaces over 120°F or under 40°F. A solar roof fan is an excellent way to keep temperature in an attic under 120°F. Adding a thermostat (\$15) set at 80, can prevent exhausting warm air in the winter and allow the GEYSER to recapture rising heat. The possibility of a water leak in an attic is always a serious concern as such the unit should always be installed with a tray and proper condensate drain. A condensate pump is available from North Road Technologies.

19. What are the GEYSER's electrical requirements?

The GEYSER connects to a typical household 115-120 volts outlet / 15 Amperes circuit. A dedicated circuit is recommended if possible. The GEYSER draws between 5 and 6 amperes to operate. A surge protector is a good protection for your investment.

20. Is it noisy? How long does the GEYSER run for?

The GEYSER tests at 55-50 db. The GEYSER hums like a small bar refrigerator. The GEYSER can run 30% of the time depending on your hot water consumption. Accordingly, the more hot water you use the higher the savings, and the more cooled air and dehumidification it provides.

21. What tools and material are required to install the GEYSER?

A basic install requires only a **pipe wrench, electric tape, safety gloves and glasses. Phillips and flat screw drivers.** Your local plumber/HVAC installer may want to install rigid lines, a shelf and extra insulation on the tank and hoses.

22. If I move, can I take the GEYSER to another location?

Yes, simply disconnect it when you leave, and re-connect it to the tank in your new home!

23. Can the GEYSER be installed with a Marathon water heater?

Yes! This may require a modification of our standard installation, but it is certainly possible. Please see our alternative installation suggestions in the IOM Manual.

24. How much hot water can the GEYSER produce?

The GEYSER capacity is approximately 300 gallons of water at 120°F per day. This is a lot of hot water. The capacity is adequate for a large household. Your old system is left in place as a back-up and works in tandem with the GEYSER. Let's be clear, there should be absolutely no reason to run out of hot water, if your storage tank is properly sized.

25. Is the GEYSER heavy and how does it ship?

The GEYSER weight is around 70 pounds and comes with stainless steel side handles for easy moving. Shipping box is 36" X 32" X 22" and weighs 92 pounds. Shipping box is lined with expanded foam, mounted on a wood pallet and shipped LTL, Fedex or UPS.

26. What is the warranty on the GEYSER?

Customers get one year warranty from defects in workmanship and materials. Five years limited warranty on the sealed refrigeration system only. Limited warranty begins on the original date of purchase or 180 days from the date the unit was manufactured whichever comes first. Original bill of sale must be presented upon request. See our Limited Warrantee for details. Some dealers offer extended warranty plans.

27. What refrigerant is used?

We use R401A, also known as MP-39.

28. What brand of pump do you have, what materials, what performance, size, etc?

We utilize a Taco Model 006 circulator constructed of stainless steel for optimum performance and longevity.

29. What brand of heat exchanger do you use? What materials?

We use a Turbotec heat exchanger that is double walled and vented to allow us to achieve and maintain the UL listing for our GEYSER. This also provides the optimum in safety in case of a leakage as the vented heat exchanger will assure that the refrigerant will never enter the water supply.

30. With a vented heat exchanger, in case of a problem, where does the liquid go?

If there is a leak on the refrigerant or on water side they do not mix. Both will drain around the outside casing of the heat exchanger on to the GEYSER base.

31. What brand of compressor do you use?

We use a Samsung rotary compressor providing the best combination of performance, efficiency, and price.

32. Does the GEYSER qualify for the Buy American Act?

Yes! Most of the components are sourced in the USA, and we are proudly manufactured, tested, and serviced from our production facility in Maine.

33. What are the specifications for the hoses that are used to connect the tank to the GEYSER?

They are 200 psi and 800 burst pressure, steel nut with brass insert. These are the same specifications you would use on a washing machine.

34. You say the GEYSER is UL Listed, but there is no UL sticker on the product. What gives?

The GEYSER has been tested to meet the applicable UL and CSA safety standards. It has been third-party tested for performance according to the relevant DOE testing guidelines. Based on these tests the Energy Factor (EF) is 2.3 at a tank temperature of 135°F. The First Hour Rating (FHR) is 64 Gallons. At the DOE recommended tank temperature of 120°F, the energy factor is 2.8.

35. How do I adjust the temperature of the water?

We ship the GEYSER with the initial setting for the water temperature set to 120°F. To make an adjustment to the tank temperature setting, remove the outer cover of the GEYSER by removing the bolts at the bottom of the unit (be sure to disconnect the power source first!) and slide the adjustment lever to the desired temperature. Re-assemble the cover, plug the unit in, and let it run!

36. Can I mount the GEYSER above the tank?

Yes! However, we highly recommend the use of an air-release vent installed at the highest point possible to remove all air from the system.

37. How do I connect the GEYSER vent kits? Is there any loss in efficiency?

The vent kits (or duct adapter) are an available option from North Road Technologies to allow the users to duct the drier, cooler air from the discharge of the GEYSER into a different space or into the duct work of the home. Connect the duct adapter to the GEYSER with the adhesive supplied, and then connect your 8" flexible duct (not supplied) in to your home system. Note that depending on the length of duct work required, a duct booster fan (not supplied by North Road Technologies) may be required to achieve the maximum benefit from the duct kit.

38. Do I need to heat the room where the GEYSER is located so that the GEYSER can take that heat to convert it to hot water?

No! The GEYSER will utilize the available heat from the room to heat the water, provided the ambient temperature in the room is over 40°F. Note that the efficiency of the GEYSER will be higher in areas with warmer temperatures (up to a maximum of 120°F).

39. Can I mount the GEYSER in my garage or attic?

Yes, provided the temperature ranges are from 40-120°F. Remember that if the GEYSER is mounted in the attic (above the water tank) that an air release vent should be installed to remove any air from the system to ensure proper operation. Additionally, if the distance from the tank to the GEYSER is longer, then the connection hoses or pipes must be properly insulated to prevent heat loss.

40. Can I connect the GEYSER to an indirect (side-arm) water tank?

Yes, the installation is the same as on an electric hot water tank, in most cases without using the Lockout Cable, some others are more difficult and some you cannot. Please contact us for specific information according to your tank.

41. I have two water tanks, now what do I do?

The GEYSER can be connected to more than one tank! If the tanks supply different parts of the home (tanks in parallel), then the GEYSER would also be installed in parallel to the tanks, where water would be pulled from both tanks and discharged back in to both tanks. An additional set of installation accessories will be required to make this connection. If the tanks are mounted in series, the recommended installation would be to mount the GEYSER to the first stage tank which would heat the water in the most efficient manner, which would then feed the second tank with efficiently heated water.

42. What maintenance is required for the GEYSER?

We recommend the cleaning (or replacement) of the inlet filter at least once per year (or more often as needed depending on the environment where the GEYSER is located) to assure proper flow of air to the inlet of the unit.

43. Glossary and Formulas:

Energy Factor (EF): The Energy Factor is the ratio of useful energy output from the water heater to the total amount of energy delivered to the water heater. The higher the EF is, the more efficient the water heater, the more money you save and the smaller is your carbon footprint. EF is measured at an ambient temperature of 67.5°F and inlet temperature of 58°F and relative humidity of 50%. In this test, 64.3 gallons of hot water at 135°F are removed from the hot water tank in six equal draws (10.7 gallons per draw) occurring at the beginning of each of the six hours of the testing period.

First-Hour Rating (FHR): First-Hour Rating is the amount of hot water in gallons a storage water heater can supply per hour (starting with a tank full 50 gallons of hot water at 135°F).

Miscellaneous Heat Pump Water Heater Facts: A HPWH gains efficiency when the temperature spread between the inlet water and ambient temperature is the greatest (differential). In southern climates, HPWH efficiency can improve by as much as 20% when operating at 90% relative humidity because of increased latent heat but some of the gains are offset by warmer water inlet. HPWH also do well in the north if ambient room temperature is warm because ground water is very cold which provides a good differential. Some of the heat lost by a storage tank walls (water heater) is recovered by a HPWH when in close proximity.