

Point of Use (POU) Domestic Hot Water

Highly efficient on-demand domestic hot water that reduces emissions and maintenance costs.

tech overview

applicable
building types
**hotel, large
commercial, and
institutional**
implementation
at equipment
replacement, mid-
cycle or refinance
fast facts

- eliminates standby energy loss
- reduces GHG emissions
- offers design flexibility
- reduces maintenance costs



costs & benefits*

GHG Savings



Tenant Experience Improvements



Utility Savings



Capital Costs



Maintenance Requirements



*ratings are based on system end use, see back cover for details.



getting to know POU heaters

Point-of-use (POU) electric domestic hot water (DHW) heaters are a decentralized, highly efficient retrofit option to electrify a commercial office building's domestic hot water system.

how do POU heaters work?

Most commercial office buildings have centralized domestic hot water systems, most often supplied by on-site boilers. Electric point-of-use (POU) water heaters, also known as "tankless" or "instantaneous" water heaters, create a decentralized heating system to provide hot water on demand without the use of storage tanks and distribution piping. Energy that would otherwise be consumed by keeping hot water at the desired temperature in storage tanks and throughout distribution piping is saved by heating water on demand, directly where water is needed.

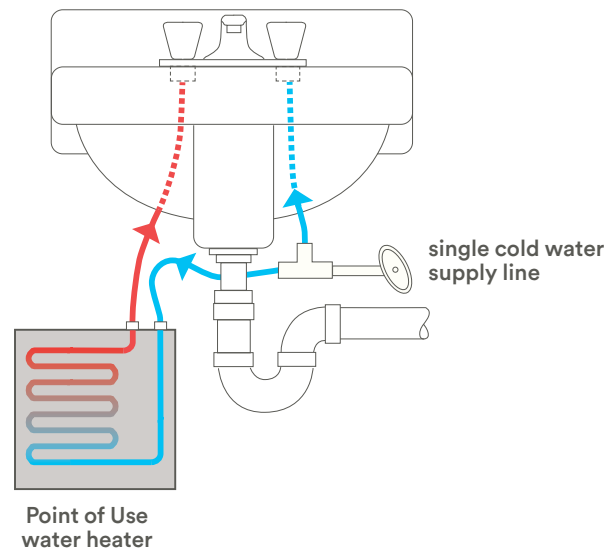
POU water heaters are particularly effective for commercial buildings, which have a lower domestic hot water demand per occupant compared to residential buildings, and where storage tanks tend to experience longer standby periods during unoccupied hours, resulting in significant energy loss. Additionally, conventional storage tank heaters or boiler supplied DHW systems are typically located in the basement or a remote location far from the end use, resulting in heat loss as hot water travels through distribution piping.

The initial cost of a POU heating system is dependent on the number of POU heaters needed and may be greater than that of a conventional storage tank water heater or boiler supplied DHW system. However, POU heaters last longer and have lower operating and maintenance costs,

offsetting the higher upfront costs. Since POU heaters are a decentralized system, if a unit requires replacement, only the demand which that unit serves is without hot water.

By either replacing or supplementing a traditional gas, oil, or steam hot water heating system, electric POU heaters can significantly reduce greenhouse gas emissions and save energy.

Fig 1. When a hot water tap is turned on, cold water travels from a supply line into the POU unit where an electric element heats the water. The rate at which the water is heated varies with the rate of water flow and the required temperature rise.



Assess

Always consult a qualified service provider before undertaking any building upgrades.

Installation

There are several considerations to keep in mind when installing POU heaters:

- Identify that bathrooms have additional electric supply and sufficient power outlets for the POU units. Otherwise, it may be necessary to make upgrades to the electric service.
- For faucets equipped with low flow fixtures select a POU heater that matches the flowrate of the faucet.

- Adjust domestic hot water temperature set point according to building guidelines.

- For commercial office buildings that feature locker rooms with showers where DHW demand is higher, consider installing a POU heater with storage capacity.

costs & benefits of POU heaters*

Greenhouse Gas (GHG) Savings



Converting a commercial office building's DHW system to a POU system can greatly reduce DHW related GHG emissions.

Tenant Experience Improvements



Tenant experience will remain largely unchanged, however POU's allow the building to reduce emissions while maintaining consistent domestic hot water availability.

Utility Savings



Although POU's consume significantly less energy than systems that use natural gas, fuel oil, or district steam, utility costs for operating POU's can be high due to the current cost of electricity. Future changes in utility costs should be considered when evaluating project feasibility.

Capital Costs



The initial cost of a POU heating system is greater than that of a conventional storage tank water heater or boiler supplied DHW system, depending on the number of POU heaters to be installed. POU heaters will typically last longer and have lower operating costs, which could offset the higher purchase price. Plan for replacement of traditional domestic hot water systems with POU systems at end-of-life.

Maintenance Requirements



There is little to no maintenance requirements for self-contained POU heaters. POU heaters are a decentralized DHW system. If a single unit requires replacement, only that unit is without hot water.

**The Costs & Benefits rating system is based on a qualitative 1 to 4 scale where 1 (lowest) is lowest and 4 (highest) is highest. Green correlates to savings and improvements, orange correlates to costs and requirements. Ratings are determined by industry experts and calculated relative to the system end use, not the whole building.*

Note: GHG & utility savings are dependent on existing equipment and fuel type. Energy savings are dependent on domestic load profile and existing equipment stand-by losses.

Take Action

This document is one of more than a dozen High Performance Technology Primers prepared by Building Energy Exchange and the NYC Accelerator to introduce decision-makers to solutions that can help them save energy and improve comfort in their buildings. Access the complete library of Tech Primers here:

be-exchange.org/tech-primers

NYC Accelerator is a City program that helps New Yorkers implement building energy and water efficiency upgrades to reduce carbon emissions. The NYC Accelerator provides free, individualized support for building decisionmakers to cut operating costs, meet local law compliance, access financing and boost building performance. NYC Accelerator is here to help you navigate the complexities related to local energy laws so your buildings, and our city, are more livable for all.

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The Building Energy Exchange (BE-Ex) is a center of excellence dedicated to reducing the effects of climate change by improving the built environment. BE-Ex accelerates the transition to healthy, comfortable, and energy efficient buildings by serving as a resource and trusted expert to the building industry.

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This report is financed in part through the NYSERDA Cleaner, Greener Communities Program.