

solution package

Domestic Hot Water

A guide to domestic hot water solutions that improve comfort, marketability, and energy efficiency.

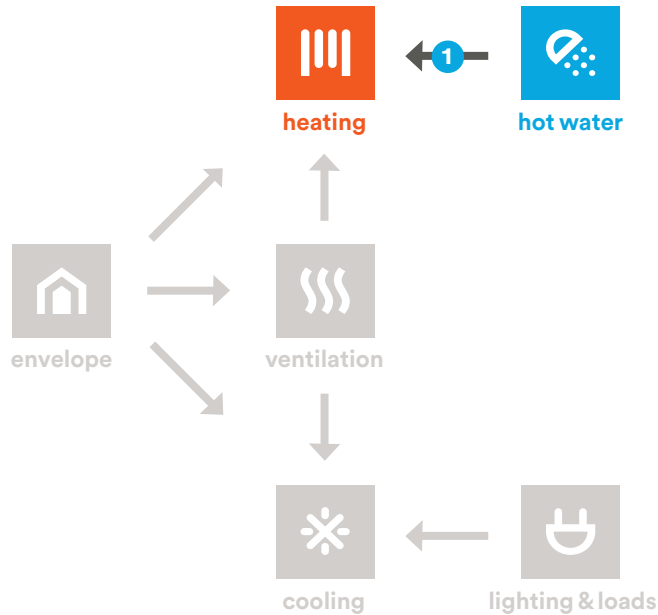
The BE-Ex solution packages are a suite of six documents compiled from the *Anatomy of an Energy Efficient Building* exhibit on view at Building Energy Exchange's downtown resource center, or virtually at be-exchange.org/anatomy

COMFORTABLE
HEALTHY
AFFORDABLE
SUSTAINABLE
ENERGY EFFICIENT
ATTRACTIVE
INTEGRATED
COST EFFECTIVE
BETTER!!!

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system interaction

The performance of domestic hot water systems is often contingent on the function of other building systems. Domestic hot water upgrade decisions should be made in the context of how other systems will impact hot water heating operation and performance.



1

hot water → heating

Domestic hot water systems that rely on the same boiler used for heating the building waste considerable amounts of fuel during warmer months when heating is not required.

operations & maintenance



Investing in operations and maintenance best practices ensures that building systems run optimally, enabling proper performance in existing equipment and maximizing return on investment in new systems. Best practices for domestic hot water systems include:

- Install low-flow fixtures and aerators.
- Insulate pipes and tanks.
- Monitor pipes and hot water heaters for leaks using leak-detection software or periodic field inspections.
- Repair leaks and clean pipes of buildup.
- Reduce set points to appropriately reflect building hot water needs.
- Conduct routine surveys and continual commissioning of equipment to ensure optimal system functioning.

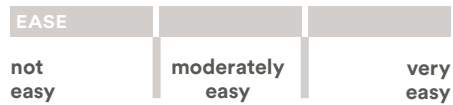
hot water efficiency measures



Installing high-efficiency heating equipment and implementing simple maintenance measures, such as installing pipe insulation and adjusting set points, reduces heat and water waste and reduces utility costs.

Key

EASE OF IMPLEMENTATION



Ease of Implementation reflects technical and financial feasibility.

Measures marked “not easy” are typically expensive, complex, highly disruptive, or pay back slowly, while “very easy” measures tend to be in-expensive, quick, and straightforward.

PROJECT IMPACT



Project Impact reflects potential to reduce energy and emissions and to improve system performance.

“Low impact” measures typically yield minor savings and incremental improvements, while “high impact” measures achieve major savings and comprehensive improvements.

ADDED BENEFITS

operations & maintenance
Keeps building performing optimally when completed on a routine basis

health & comfort
Enhances indoor environmental quality and advances occupant wellbeing

marketability
Improves aesthetics and upgrades occupant spaces, increasing appeal to potential tenants

future-ready
Puts building on path for long-term emissions reduction and legislative compliance

RATING SYSTEM METHODOLOGY

Ratings and benefits of energy conservation measures were assigned based on NYC energy audit data and analysis by industry experts. Actual results will vary by building type, use, and baseline conditions.

Reduce Water Loss

Install Low Flow Fixtures & Appliances

Install low-flow fixtures that use far less water than conventional fixtures (e.g. WaterSense labeled models) and high-efficiency, ENERGY STAR-certified clothing and dish washers.



Clean & Repair Piping

Clean and repair piping as needed. Old pipes are susceptible to leaks and mineral buildup that can reduce flow rates.



Reduce Water Loss, cont.

Install Aerators

Install aerators to reduce the flow of water from faucets without reducing pressure.



Install Leak Detection Sensors

Install sensors to identify when and where leaks occur.



hot water efficiency measures



Reduce Domestic Hot Water Heat Loss

Insulate Pipes & Tanks

Add insulation to reduce standby and distribution heat losses from hot water sitting in storage tanks and traveling through pipes to fixtures.

EASE		
IMPACT		
ADDED BENEFITS		

Add Steam Condensate Heat Recovery

Install a heat exchanger and storage tank to recycle heat from steam condensate and use it to pre-heat DHW.

EASE		
IMPACT		
ADDED BENEFITS		

Install Recirculation Controls

Install and program variable speed recirculation controls that respond to demand or time-of-day scheduling to reduced heat waste.

EASE		
IMPACT		
ADDED BENEFITS		

Decrease DHW Temperature

After taking measures to reduce heat loss, lower the DHW temperature set-point to save energy and reduce risks of scalding.

EASE		
IMPACT		
ADDED BENEFITS		

Reduce Domestic Hot Water Heating Demand

Separate DHW from Steam Boilers

Avoid running an over-sized boiler for DHW in the summer. Install a smaller, dedicated DHW boiler and/or storage tank.

EASE		
IMPACT		
ADDED BENEFITS		

Consider Tankless or Instantaneous DHW Heaters

Buildings with low DHW demand should consider installing tankless water heaters, which are more efficient and have a longer lifespans than systems that use a storage tank.

EASE		
IMPACT		
ADDED BENEFITS		

Upgrade DHW Boiler

Choose a high-efficiency hot water boiler (e.g. condensing models) for fuel-fired systems.

EASE		
IMPACT		
ADDED BENEFITS		

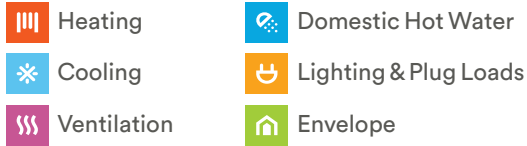
Convert to Air-To-Water Heat Pump

Consider installing air-to-water heat pumps—a high efficiency electric system that transfers heat from air to water, even at low outdoor temperatures.

EASE		
IMPACT		
ADDED BENEFITS		

Further Reading

The BE-Ex solution packages cover the following building systems:



To access the suite of solution packages, visit:
be-exchange.org/anatomy-solutions

Acknowledgements

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