NEW YORK STATE OF OPPORTUNITY. | Climate Smart Communities

PE4 Action: Heat Pumps

9 — 22 Points

A. Why is this action important?

Currently, fossil-fuel based thermal energy – primarily natural gas, propane and oil – is the main energy source for space heating and domestic hot water in the residential and commercial sectors. Conventional heating and cooling systems are responsible for about 30 percent of New York State's greenhouse gas (GHG) emissions, according to NYSERDA. This Climate Smart Communities (CSC) action is designed to help municipalities realize the benefits of heat pumps and receive points for installing these technologies in municipal buildings.

Clean heating and cooling technologies such as ground- and air-source heat pumps provide environmental benefits, energy bill savings, increased comfort levels, and health benefits compared to conventional heating and cooling technologies. Local governments can lead by example and play an important role in encouraging adoption of ground- and air-source heat pump systems.

B. How to implement this action

Points for this CSC action are available for installing heat pumps at new or existing facilities owned by the local government. As long as the clean heating and cooling system is currently in use, the installation may have been completed at any time to be eligible for points. The system should be designed and installed by qualified professionals, such as those approved by NYSERDA.

In addition, for each installation, local governments must display signage describing the installation and must announce the installation(s) to help build awareness in the community of the benefits of heat pump technology. The signage can be a simple, low-cost poster that describes the technology and informs visitors to the facility that it is heated and cooled by a ground-source or air-source system. At minimum, a press release announcing the installation must be issued as part of the effort to educate the community about the local government's investment in the clean heating and cooling system.

Local governments can also earn CSC points for completing the NYSERDA Clean Energy Communities (CEC) Clean Heating and Cooling Demo high-impact action. Guidance on implementation can be found in the toolkit of resources that is available at www.nyserda.ny.gov/cec.

Local governments considering retrofitting or remodeling an existing building, or in the process of designing a new building, should consider a variety of renewable energy options, based on their heating and cooling needs. Working with the engineering and design team, local government staff should evaluate whether geothermal technology is appropriate for the building, location, and climate through a feasibility study. Local governments should also assess the payback period and policy considerations for such technology and consider how it could be used as an example for other buildings or projects in the community. Such assessments may be part of *PE4 Action: Renewable Energy Feasibility Studies*.

A basic table showing the overview, life expectancy, benefits, operations and maintenance, and other considerations of each clean heating and cooling technology type can be found on the NYSERDA Heat Pump Options webpage.

In general, NYSERDA and its contractors may to offer technical and financial assistance. Contact cec@nyserda.ny.gov for more information.

See below for more details More background on ground- and air-source heat pumps is below.

Ground-source Heat Pumps

Geothermal technology harnesses the heat of the earth to provide for heating and cooling needs inside a building. Ground-source heat pumps (GSHP) take advantage of the relatively constant temperature (50-60°F) of the earth's surface layer as a heat source in winter and a heat sink in summer GSHP extract heat from the ground during cold weather via an underground pipe system, which is then distributed throughout a building. During warmer months, the process is reversed to provide cooling. Geothermal heat pumps are also known as geothermal heat pumps, low-temperature geothermal, or geo-exchange systems.

Investments in GSHP often produce significant net cost savings due to the high efficiency of ground-source heating and cooling and the long-term reduction in energy costs. Other benefits of implementing geothermal technology include reducing fossil fuel use, lowering GHG emissions, and helping your community understand the benefits of adopting the technology in homes and businesses.

Air-source Heat Pumps

Similar to GSHP, air-source heat pumps (ASHP) extracts heat from the air outside and distributes it inside a building. During warmer months, the process is reversed to provide cooling by pulling heat out of a building. This process may seem complex but it's similar to how a refrigerator cools food. There are two main types of ASHP – ducted central systems or ductless mini-split systems. Central systems connect to a single indoor unit (often a furnace), pushing air through a series of ducts, which gets exhausted through vents throughout a home. Central systems rely on an outdoor compressor/condenser. Ductless mini-split systems consist of an outdoor compressor or condenser unit that connects to an indoor unit to distribute heat or cool a home.

C. Time frame, project costs, and resource needs

The time frame, project costs, and resource needs depend on whether the heat pumps are implemented in a new or existing facility, and the size or output of the system. Local governments should work with their contractors or consultants to develop an estimate for the additional cost and payback period for the proposed technology.

D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this?

This action is applicable to any local government that owns and operates buildings. Departments of facilities or public works would likely implement this action.

E. How to obtain points for this action

Points for this action are tiered based on the number of municipal facilities with ground- or air-source heat pumps that have been installed in a manner consistent with the requirements described above. The facilities must be owned by the local government, but they can be new or existing buildings. An additional three points are available for completion of the NYSERDA Clean Energy Communities (CEC) high-impact action called Clean Energy Heating and Cooling Demo.

	POSSIBLE POINTS
Install heat pumps at 1 municipal facility	9
Install heat pumps at 2 municipal facilities	14
Install heat pumps at 3 municipal facilities	17
Install heat pumps at 4 municipal facilities	19
Complete the NYSERDA CEC Clean Heating and Cooling Demo high-impact action	3

F. What to submit

Submit a brief description of the heat pump installation(s), including location, installation date, size, specification or purchase documents, and, if available, estimates of energy savings. Show that the installation is actively in use at the time of applying for CSC certification. Also provide evidence that the systems were designed and installed by qualified professionals, such as those approved by NYSERDA.

For each installation, submit one photograph of posted educational signage, a press release, and a description of activities announcing the installation for public education.

For three additional points, submit a copy of the approval from NYSERDA that indicates completion of the Clean Energy Communities Clean Heating and Cooling Demo high-impact action.

All CSC action documentation is available for public viewing after an action is approved. Action submittals should not include any information or documents that are not intended to be viewed by the public.

G. Links to additional resources or best practices

- NYSERDA Ground-source Heat Pumps and Helpful Information Links
- NYSERDA Heat Pump Incentives
- NYSERDA NYS Clean Heat Contractors
- NY-GEO is a nonprofit trade association dedicated to promoting the use of ground-source heat pumps to heat and cool buildings in New York State; the members of NY-GEO include geo designers, installers, manufacturers, drillers consultants and distributors, interested in promoting the use of ground-source heat pumps to heat and cool buildings in New York State.
- U.S. Department of Energy Air-source Heat Pumps
- International Ground Source Heat Pump Association Business Directory: This page provides information on installers.
- Geothermal Exchange Organization Directory: This page provides information on installers.

H. Recertification requirements

The recertification requirements are the same as the initial certification requirements.