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EXECUTIVE POLICY ORDER

GREENHOUSE GAS IMPACTS OF HVAC IMPROVEMENT PROJECTS

I. PURPOSE

The purpose of this Executive Policy Order is to establish a greenhouse gas (GHG) emission evaluation procedure for all municipal heating, ventilation and air conditioning (HVAC) improvement projects to ensure that these types of City investments are consistent with and contribute to: the City of Northampton's pledge to becoming a Net-Zero community by 2050; the City's support for the climate change mitigation goals enshrined in the Paris Agreement; the City's commitment to the Global Covenant of Mayors for Climate and Energy; and Northampton City Council's Resolutions in Support of 100 Percent Renewable Energy and Opposing the Expansion of Gas Infrastructure.

II. SCOPE

This Executive Policy Order applies to the procurement and installation of all heating, ventilation and air conditioning (HVAC) systems and appliances including heating systems for domestic hot water and stand-alone heating and cooling appliances. This policy pertains to municipal and school facilities including Northampton Public Schools and Smith Vocational and Agricultural High School (SVAHS) buildings.

This policy does not pertain to non-capital equipment parts replacements needed for maintenance and ongoing operation of existing HVAC systems.

III. DEFINITIONS

Net-Zero Community: One hundred percent of the community's energy needs must be supplied by non-fossil fuel renewable energy on a net annual basis.

GHG Emissions: Air emissions that have a global warming impact as measured in terms of the amount of carbon-dioxide that would have an equivalent impact – carbon-dioxide equivalent (CO_2e) – and determined by CO_2e conversion factors as defined by the Massachusetts Department of Environmental Protection.

HVAC equipment: For the purpose of this policy, this includes all central and stand-alone heating, ventilation and air conditioning equipment for space heating and cooling and domestic hot water.

Stand-alone HVAC appliances: For the purpose of this policy, this includes portable and window-mounted air conditioning units and portable electric-resistance heating appliances.

IV. POLICY

The process to procure (replace or add) any heating, ventilation or air conditioning system or appliance shall identify and use the lowest life-cycle cost solution that prices in a cost for GHG emissions produced by that system or appliance over its lifetime. Whenever possible, this selection will be made within the context of a long-term capital improvement plan to convert the facility in which the equipment will be employed to a net-zero building.

V. PROCEDURES and RESPONSIBILITIES

- Over the next three years, Central Services shall develop for each city and school building that uses more than 400 MMBTU of natural gas, oil, or propane a year, a plan to replace the existing HVAC systems with alternative low-carbon systems with a preferred outcome being the elimination of on-site fossil fuel combustion and the elimination of low-efficiency stand-alone heating and AC appliances.

    - Central Services, in coordination with SVAHS and other city departments, shall prioritize development of plans for (a) buildings that the city anticipates keeping in operation for at least 10 years, (b) buildings that have the greatest need for HVAC system improvements and (c) buildings with the highest combined natural gas, oil and propane use.

    - Central Services shall fund these studies through the annual capital improvement process and through grants and other outside funding sources.

    - Such plans will include and prioritize energy use reduction measures to the building shell and reduction of heat loss through mechanical ventilation through energy recovery so as to minimize the size of alternative HVAC systems and maximum GHG emission reductions from the building's HVAC operations.

    - Such plans will consider each HVAC function individually and optimize solutions so as to maximum GHG emission reductions from the building's HVAC operations.

    - Such plans will include high-efficiency replacement systems for regularly-used stand-alone heating and AC appliances.

    - If elimination of on-site fossil fuel combustion is impractical in the short term, high-efficiency natural gas combustion should be prioritized, and steam systems should be phased out or left in place for emergency or supplementary heating only.

    - Systems that use circulating hot water shall be designed with thermal storage capacity to accept sources of heat such as solar thermal, heat rejection and heat recovery.

- New hydronic heating and cooling distribution systems and, where practical, existing hydronic heating and cooling distribution systems shall be designed so as to enable the potential future use of renewable resources and maximize the efficiency of heat pumps.

- HVAC system design shall include due consideration of an anticipated future increase in need for space cooling and/or dehumidification.

- Central Services shall establish an advisory group consisting of capital planning leadership and staff and/or outside voluntary experts skilled in GHG calculations and familiar with alternative low-carbon HVAC solutions. This advisory group will provide advice on specific projects and identify the process and metrics used to price in a cost of GHG emissions when evaluating suggested low-carbon HVAC solutions.

    - If an HVAC system upgrade is needed in a building that does not yet have a low-carbon HVAC upgrade plan, Central Services should seek the advice of the advisory group and, as much as it practically can, follow the policy guidance described in this document.

    - Central Services shall ask the advisory group to review each building's low-carbon HVAC upgrade plan every three years after publication of the plan to determine if technology, the price of HVAC systems and/or the price of energy has changed enough to indicate that Central Services should upgrade or replace the plan.

- Use of stand-alone HVAC appliances should be minimized and should not be considered a long-term solution to an increased need for heating or air-conditioning.

VI. SOURCES FOR ADDITIONAL INFORMATION

The MassEnergyInsight database (log in required) provides a Table of **Current Emissions and MMBTU Conversion Factors** that include metric tons of CO_2e per energy unit for all typical energy sources.

https://www.massenergyinsight.net: Log in information held by Central Services

Massachusetts Greenhouse Gas (GHG) Reporting Program Data can be found at:
https://www.mass.gov/lists/massachusetts-greenhouse-gas-ghg-reporting-program-data

VII. AUTHORIZED BY

Dated: SEPTEMBER 24, 2019

David J. Narkewicz
Mayor, City of Northampton