

Chapter 8 Addressing Climate Change

We will continue to be a model community by reducing our energy consumption and making bold transitions to rely solely on renewable sources of electricity by 2030 and renewable sources of fuel for heating and transportation by 2050. We recognize the potential adversity being brought about by climate change and will commit our resources to preparing and adapting local and regional systems and resources.

Goals and Strategies for Addressing Climate Change

Goal 8-1. Hanover’s programs, policies, and regulations will move the Town closer to its 2017 Ready for 100 Pledge and mitigate effects of climate change.



- ▶ **Strategy 8-1.1:** Encourage higher-density mixed-use development in suitable areas and promote infill development using regulatory incentives.



- ▶ **Strategy 8-1.2:** Incentivize carbon reduction on new development projects, with exceptions (e.g., unconditioned buildings, temporary buildings, buildings meeting net zero standards).

- ▶ **Strategy 8-1.3:** Update floodplain protections in the Zoning Ordinance to address future flooding potential.



- ▶ **Strategy 8-1.4:** Promote renewable energy development and green building construction. For example, through:
 - Exploring solar access laws that would protect solar energy developments from unwanted shading.
 - Offering incentives for using renewable sources of energy, such as solar and geothermal.



- ▶ **Strategy 8-1.5:** Encourage developers of new construction to achieve at least a **net-zero** energy standard.



- ▶ **Strategy 8-1.6:** Accelerate progress to 100 percent renewably generated electricity for all electricity users by offering, through entities like Hanover Community Power, options with higher renewable content than available through the utilities.



- ▶ **Strategy 8-1.7:** Reduce the cost of installing systems that generated renewable electricity to make it more affordable to go “green.”



- ▶ **Strategy 8-1.8:** Promote the installation of charging equipment for EVs, including **micro-mobility devices**, and bicycle infrastructure at all multi-family residential, institutional, and commercial developments.



- ▶ **Strategy 8-1.9:** Ensure that the electric distribution capacity is adequate to handle increased loads given the move away from fossil fuels.



- ▶ **Strategy 8-1.10:** Complete a formal GHG emissions inventory for Town operations and activities.













- ▶ **Strategy 8-1.11:** Prepare a community- wide GHG emissions inventory to understand where emission reductions might be possible.



Goal 8-1. Performance Metrics: (1) Zoning Ordinance provisions supporting higher-density residential and mixed-use developments within the downtown area and areas connected to public transit; (2) Incentive to reduce carbon footprint for new development projects; (3) Zoning Ordinance provisions that fully address future flooding potential; (4) Total solar capacity (megawatt [MW]) installed and maintained within the Town; (5) Number of community-based buildings designed and built to a net zero energy standard; (6) Percent of electricity users obtaining 100 percent of their electricity load from renewably generated electricity; (7) Average cost of renewably generated electricity per kilowatt hour (kWh); (8) Number of new charging installations and bicycle shelters; (9) Number of multi-family residential, institutional, and commercial developments with installed EV chargers; (10) GHG emissions (metric tons carbon dioxide equivalents [MT CO₂e]) from local government operations by scopes, sectors, and sources; (11) GHG emissions (MT CO₂e) from community-scale activities by scopes, sectors, and sources; (12) Establishment of a philanthropic fund to provide incentives for developing renewables sources of energy and using energy that is renewably sourced

Goal 8-2. Municipal energy consumption will be reduced to the greatest extent practicable.




-  ▶ **Strategy 8-2.1:** Update energy audits at all Town-owned facilities.
-  ▶ **Strategy 8-2.2:** Fund a program of deep energy retrofits.
-  ▶ **Strategy 8-2.3:** Eliminate all fossil fuel-consuming end uses.

-  ▶ **Strategy 8-2.4:** Adopt an LED streetlighting standard for all remaining Town streetlights, crosswalk lighting and other independently metered outdoor lighting.
-  ▶ **Strategy 8-2.5:** Establish policy that requires all new public building construction and major public building renovations to be **net-zero** or **net-positive**.
-  ▶ **Strategy 8-2.6:** Register and certify existing buildings above 5,000 square feet that are Town-owned to LEED or an equivalent green building rating system.
-  ▶ **Strategy 8-2.7:** Conduct a needs assessment of Town-owned buildings where a Building Energy Management System (BEMS) might be beneficial to monitor, measure, and control energy use.
-  ▶ **Strategy 8-2.8:** Transition the Town-owned vehicle and equipment fleet to zero emission alternatives on a schedule consistent with lifecycles and market availability.
-  ▶ **Strategy 8-2.9:** Establish a policy that requires all Town entities to purchase manual or electric-powered equipment. Where feasible electric alternatives are not available (e.g., heavy equipment), identify opportunities for qualifying alternative fuels/alternative fuel retrofits under the Town’s clean energy targets.
-  ▶ **Strategy 8-2.10:** Train all Town staff to understand and support GHG emissions reduction strategies in the operation of all Town facilities.

Goal 8-2. Performance Metrics: (1) Energy use intensity (EUI) (British thermal unit [Btu] per square foot) of municipally-owned or operated buildings; (2) Fossil fuel EUI (Btu per square foot) of Town-owned or operated buildings; (3) Adoption of an LED streetlighting standard; (4) Number of Town-owned buildings that are certified


under the LEED rating system, or equivalent; (5) Percent of Town-owned vehicles and equipment that are zero emission; (6) Percent of Town staff trained in GHG emissions reduction strategies

Goal 8-3: Local renewable energy generating capacity will be increased and contribute substantially to Hanover’s clean energy targets.

-  ▶ **Strategy 8-3.1:** Assess renewable energy generation potential for solar photovoltaics, wind energy, and geothermal projects at publicly-owned properties and other appropriate sites within the community.
-  ▶ **Strategy 8-3.2:** Evaluate connecting new municipal renewable energy developments with microgrid technologies to enhance operational resilience. Encourage such developments within the private sector.
-  ▶ **Strategy 8-3.3:** Invest in community-scale energy and storage projects through entities such as Hanover Community Power.

Goal 8-3. Performance Metrics: (1) Town-wide renewable energy assessments by generating source; (2) Total solar capacity and storage (megawatt [MW]) installed and maintained within the Town; (3); Number of public and private microgrid installations; (4) Total capacity of community-scale solar energy and storage projects

Goal 8-4: Community-based greenhouse gas (GHG) emissions reductions will be enabled through partnerships and education.

-  ▶ **Strategy 8-4.1:** Centralize information on weatherization programs on Sustainable Hanover’s website, with regular updates.



▶ **Strategy 8-4.2:** Support Hanover’s largest employers and property owners in their efforts to reduce their dependence on non-renewable energy resources.



▶ **Strategy 8-4.3:** Advocate for state-level legislation, policies, and incentives that decarbonize the state’s power supply and expand access to energy efficiency programs and technologies.



▶ **Strategy 8-4.4:** Educate the public about common concerns and misconceptions regarding solar PV development (e.g., light reflection, property values, etc.).

▶ **Strategy 8-4.5:** Promote the use of geothermal heating and cooling by providing educational materials to homeowners and businesses.

Goal 8-4. Performance Metrics: (1) Using building permit data, number of homes weatherized; (2) Number of public-facing education events on renewable energy and other sustainable practices; (3) Community-wide GHG emissions (metric tons CO₂e)

Goal 8-5: Hanover will be more resilient to climate change.

- ▶ **Strategy 8-5.1:** Invest in public green spaces to protect the community against heat waves and intensified flooding. Prioritize projects in neighborhoods with disproportionately low access to [open space](#) resources.
- ▶ **Strategy 8-5.2:** Develop a plan to install green infrastructure throughout Hanover’s built environment to better absorb additional annual rainfall, minimize potential flooding events, and prepare for extreme heat and high winds.
- ▶ **Strategy 8-5.3:** Encourage and incentivize new development to implement low-impact development strategies, such as



land clearance minimization and reducing impervious surfaces.

- ▶ **Strategy 8-5.4:** Require property owners to monitor and maintain drainage measures approved in site plans, such as retention facilities, swales, and wetland buffers.



- ▶ **Strategy 8-5.5:** Continue to protect Hanover’s nature-based systems through conservation easements and restrictions, natural resource management plans (e.g., creating **old growth** forest ecosystems), and regulations (e.g., zoning for wetlands protection).



- ▶ **Strategy 8-5.6:** Develop management objectives and plans for restoring and sustaining the health of the natural environment utilizing the current natural resource assessment and existing forest-management plans for publicly-owned properties.



- ▶ **Strategy 8-5.7:** Educate the public about **re-wilding** and forest management plans to preserve biodiversity and create **old growth** forest ecosystems.

- ▶ **Strategy 8-5.8:** Conduct climate vulnerability assessments for publicly-owned assets and require that these assessments be performed for new private developments.

- ▶ **Strategy 8-5.9:** Develop enhanced flood response plans among emergency management personnel, public works, and regional/state partners.

- ▶ **Strategy 8-5.10:** Ensure resilient stormwater infrastructure for intensifying storms. Assess culverts for geomorphic capacity and aquatic organism passage. Encourage groundwater recharge.

- ▶ **Strategy 8-5.11:** Adopt a sustainable landscaping policy.

- ▶ **Strategy 8-5.12:** Develop demonstration sites to model best practices for stormwater management and sustainable landscaping.
- ▶ **Strategy 8-5.13:** Prepare the community with information on what to do and where to go during extreme weather events.
- ▶ **Strategy 8-5.14:** Annually educate residents to prepare for storm-related power outages.
- ▶ **Strategy 8-5.15:** Evaluate and expand, as necessary, the existing capacity of emergency shelters for the community.
- ▶ **Strategy 8-5.16:** Identify areas that experience flooding or are otherwise more vulnerable to climate change impacts. Prioritize funding for these areas to enhance their social, infrastructural, and environmental resilience.
- ▶ **Strategy 8-5.17:** Improve **floodplain** connectivity to further enhance the health of the **floodplain** and the ecosystems services that they provide.
- ▶ **Strategy 8-5.18:** Plan for an increase in climate migrants wishing to relocate to Hanover.

Goal 8-5. Performance Metrics: (1) Acres of impervious surfaces converted to pervious surfaces; (2) Number of green infrastructure projects; (3) Acres of natural working lands protected or restored; (4) Implementation of natural resource management plans; (5) Flood Emergency Response Plan; (6) Percent of municipal stormwater infrastructure that is future flood ready; (7) Number of new and existing developments within FEMA flood hazard areas; (8) Observed status of local flooding hotspots (e.g., no longer flooding during design floods or percent decrease in flooding events per year); (9) Adoption of Sustainable Landscape Policy; (10) Number of demonstration sites to model best practices for stormwater management and sustainable landscaping;



(12) Emergency Shelter Assessment; (13) Municipal Climate Vulnerability Assessment; (14) Number of public-facing education events on nature-based climate adaptation measures; (15) Number of public-facing emergency preparedness trainings

Define:

micro-mobility devices light-weight human powered or motorized transportation such as electric scooters, skateboards, wheel chairs and bicycles.

net-zero emissions the state in which greenhouse gas emissions going into the atmosphere are balanced by removal of such gases from the atmosphere

net-zero energy using a combination of energy efficiency and renewable energy, producing at least as much energy as would be used over the course of a year

net-positive the state in which off-setting actions absorb more greenhouse gas emissions than those actions release into the atmosphere

re- wilding a form of ecological restoration with an emphasis on recreating an area's natural uncultivated condition

