



North Salem | Climate Smart Community

CLIMATE ACTION PLAN



PREPARED BY:
Chairwoman Katherine Daniels and the Climate Smart Community Leadership Committee



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CLIMATE ACTION PLAN TOWN OF NORTH SALEM

CONTENTS

PURPOSE	PAGE 1
GOALS	PAGE 2
BACKGROUND	PAGE 3
PRIORITIES/ACTION AREAS	PAGE 5
<ul style="list-style-type: none">1. Preserving and Protecting Water, Land and Air2. Ensuring a Clean Electric Supply3. High-Performance Buildings4. Transportation5. Waste/Recycling6. Sustainable Food Practices7. Carrying the Work Into the Future	
CONCLUSION	PAGE 19
RESOURCES	PAGE 20
APPENDIX A	PAGE 22



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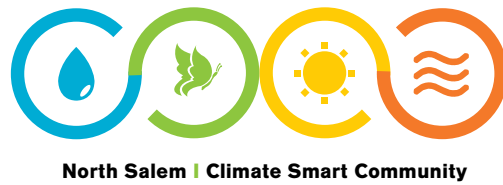
CLIMATE ACTION PLAN TOWN OF NORTH SALEM

● PURPOSE

This Climate Action Plan for the Town of North Salem sets goals and identifies actions that will be most effective in responding to the threats to human health and safety posed by climate change in the decades to come.



Vail Lane, North Salem, NY



● GOALS

The priorities as outlined in this plan will put the Town of North Salem on a path to reach net carbon neutrality as follows: At least a 25% reduction in greenhouse gas (carbon dioxide (CO₂), methane and nitrous oxide) emissions reductions from the 2019 base year levels by 2030, with a stretch target of 40% reduction by 2030 from 2019 levels and “net zero emissions” by 2050. These goals are consistent with the Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050 (Published by the United States Department of State and the United States Executive Office of the President, Washington DC November 2021). The term “net zero emissions” refers to achieving an overall balance between greenhouse gas emissions produced and greenhouse gas emissions taken out of the atmosphere by, for example, the trees and plants in our jurisdiction.



Baxter Road, North Salem, NY

● BACKGROUND

Since 1750, humans have emitted more than 1.5 trillion tons of CO₂ into earth's atmosphere.¹ Although China is currently the largest emitter, the United States is responsible for just over one quarter (25.5%) of the total historic emissions, more than any other country.

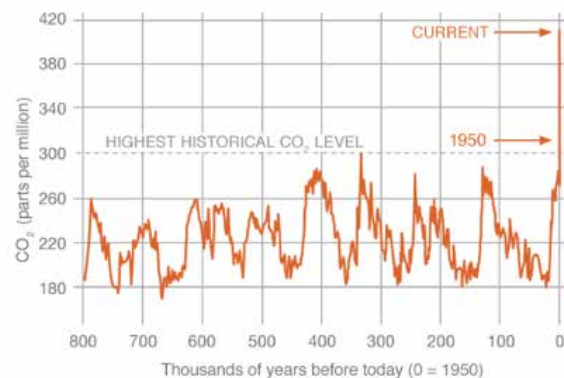
The United Nations' Intergovernmental Panel on Climate Change Report of 2021 (2021 IPCC Report) finds that "[i]t is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred." These changes are responsible for unprecedented flooding, rising seas, droughts and other extreme weather. If left unchecked, they will likely lead to major disruptions to environmental and political stability including mass migration, extinctions, starvation and death.

The most recent report from the Intergovernmental Panel on Climate Change (IPCC) vividly illustrates, with robust scientific confidence, the need to limit warming to 1.5 degrees C, or as close as possible to that crucial benchmark, to avoid these severe climate impacts. Achieving this target will require cutting global greenhouse gas (GHG) emissions by at least 40% below 1990 levels by 2030, reaching global net-zero GHG emissions by 2050 or as soon after as possible.

From a purely scientific point of view, the empirical data shows that CO₂ levels in the atmosphere have fluctuated from about 180 parts per million (PPM) to 300 PPM over the last million years. However, since 1950 the CO₂ level has increased significantly beyond the previous peaks. The additional CO₂ in the atmosphere causes heat to be trapped, which causes global temperature rise.

Increases in the earth's temperature causes ice sequestered in Antarctica and Greenland to melt, altering the salinity of the local seawater which can potentially alter currents. Melting ice will cause a rise in water levels around the globe. It is anticipated that, even if we curtail CO₂ releases to the targets set by the IPCC, sufficient ice will melt in quantities that cause the oceans to rise just over 10 feet. Geologic history tells us both of these things, with ocean current changes and rising water levels occurring millions of years ago during periods of higher CO₂.

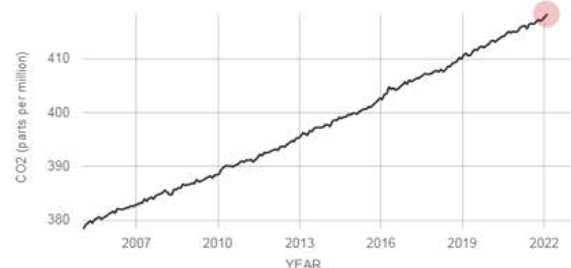
Data source: Reconstruction from ice cores.
Credit: NOAA



Historic CO₂ Levels

DIRECT MEASUREMENTS: 2005-PRESENT

Data source: Monthly measurements (average seasonal cycle removed). Credit: NOAA



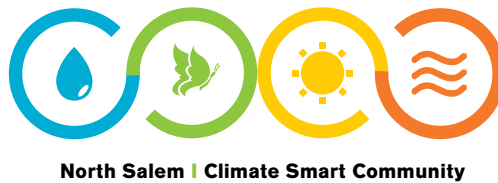
Click+drag
to zoom

RESET

Get Data: [HTTPS](https://climate.noaa.gov/data/monitoring/global/CO2) | Snapshot: [PNG](#)

Recent CO₂ Concentration Increases

¹Hannah Ritchie and Max Roser (2020) - "CO₂ and Greenhouse Gas Emissions".
Published online at www.ourworldindata.org/co2-emissions.



A 10-foot rise in seawater levels will inundate coastal cities. If we do not get the temperature rise under control, there is sufficient ice on Antarctica to increase sea levels by 230 feet if it were all to melt. While this may be a worst case scenario, it is imperative to get CO₂ emissions under control. It is an undeniable fact that the CO₂ levels in our atmosphere are now at 418 parts per million and increasing yearly.²

The Town of North Salem recognizes the urgent need to do its part to mitigate and adapt to climate change. We commend the State of New York, which has set climate action goals to limit statewide greenhouse gas emissions to 40% of 1990 levels by 2030 and 85% below 1990 levels by 2050. In light of the latest IPCC Report, however, North Salem has set a more aggressive reduction goal to reach net zero emissions by 2050. North Salem has had a long-term commitment to protecting and preserving open space over many years and that has put us in a strong position to be able to achieve these goals.

North Salem has been working diligently on multiple fronts to reduce greenhouse gas emissions since 2011. The Town has conducted efficiency studies on Town-owned buildings, retrofitted building envelopes, replaced all incandescent lights and street-lights with energy saving LED lights, established a community choice aggregation program (CCA) to ensure that affordable clean energy sources are available to us, established a Unified Solar permit and authorized open C-PACE financing among other measures. Besides reducing CO₂, saving energy and being good for the planet, the initiatives we have implemented have saved the Town tens of thousands of dollars each year in energy costs.

In 2020, the Town stepped up these efforts by passing a resolution to become a Climate Smart Community. It established a Climate Smart Community Leadership Committee, responsible for shaping and guiding the Town's efforts to achieve its goals. To date, the Committee has conducted a community solar campaign, successfully advocated for the adoption of the NYStretch Energy Code-2020, sponsored community educational events and, most importantly, conducted a benchmark analysis of municipal greenhouse gas emissions to inform the development of this Climate Action Plan. A copy of the "Town of North Salem, NY Local Government Operations Greenhouse Gas Emissions Inventory Report 2019-21" is attached as Appendix A. Phase 2 of the analysis will seek to quantify town-wide greenhouse gas emissions, including residential, business and school district using a similar protocol.

The work of this committee has been supported and informed by other Town Committees (such as the Conservation Advisory Council) local civic organizations, other municipalities, Westchester County, New York State, the federal government and utilities.

The Climate Smart Community Leadership Committee has identified multiple priorities and action areas for the town to consider as it shapes policies and programs relating to climate designed to engage and benefit residents and local organizations going forward.

²<https://climate.nasa.gov/vital-signs/carbon-dioxide/> Both charts are from this NASA website.

● PRIORITIES/ACTION AREAS

1. Preserving and Protecting Water, Land and Air

The Comprehensive Plan for the Town of North Salem adopted in December of 2011 lists as its top priorities preserving the rural character of the town, protecting open space and promoting environmentally friendly policies and practices. As a result of North Salem's longstanding commitment to preserving open space, our town is home to approximately fifty percent (50%) of the usable agricultural land left in Westchester County. Roughly ten percent (10%) of this land is permanently protected from development. Half of that is forested woodland, ideal for natural carbon sequestration. Increasing the amount of protected acreage has been, and continues to be, a critical component of the action plan.



Mills Woodland Preserve

Land protection is an important factor in maintaining and improving water quality. It also creates healthier corridor environments for wildlife movement, reduces fragmentation of habitat and provides a haven for public recreation and relaxation. Protecting water requires a combination of sound strategies that include responsible land use and zoning policies, eliminating or greatly reducing the use of pesticides, herbicides and fertilizers, planting trees and shrubs along riparian ecosystems and recycling plastics and toxic materials. Coupled with efficient, proper lighting to protect insect and bird populations and the downsizing of lawns and increase in meadows and forests, water and land protection remains an important catalyst to reach the goals of this Climate Action Plan.

The United States has recognized the need to protect the air from harmful pollution since passage of the Clean Air Act in 1963. While many consider the air in North Salem to be pristine — it is not. Most of the airborne contaminants are from areas outside of our Town, however, local sources of air pollution in North Salem are primarily from vehicular traffic and our buildings' heating equipment. It is estimated that over the winter of 2021-2022, the buildings (including business and residential) in our Town burned the equivalent of 1.5M gallons of fuel oil.³ We will be studying business and residential emissions in more detail in the second phase of our GHG inventory.

The Algonquin Natural Gas pipeline runs through the southern part of the Town of Southeast, just above North Salem's northern border. Operating pipeline compressors and planned and unplanned 'blowdowns' from the pipeline facilities have also adversely affected local air quality.

³1,900 homes using on average about 800 gallons or equivalent of heating oil.

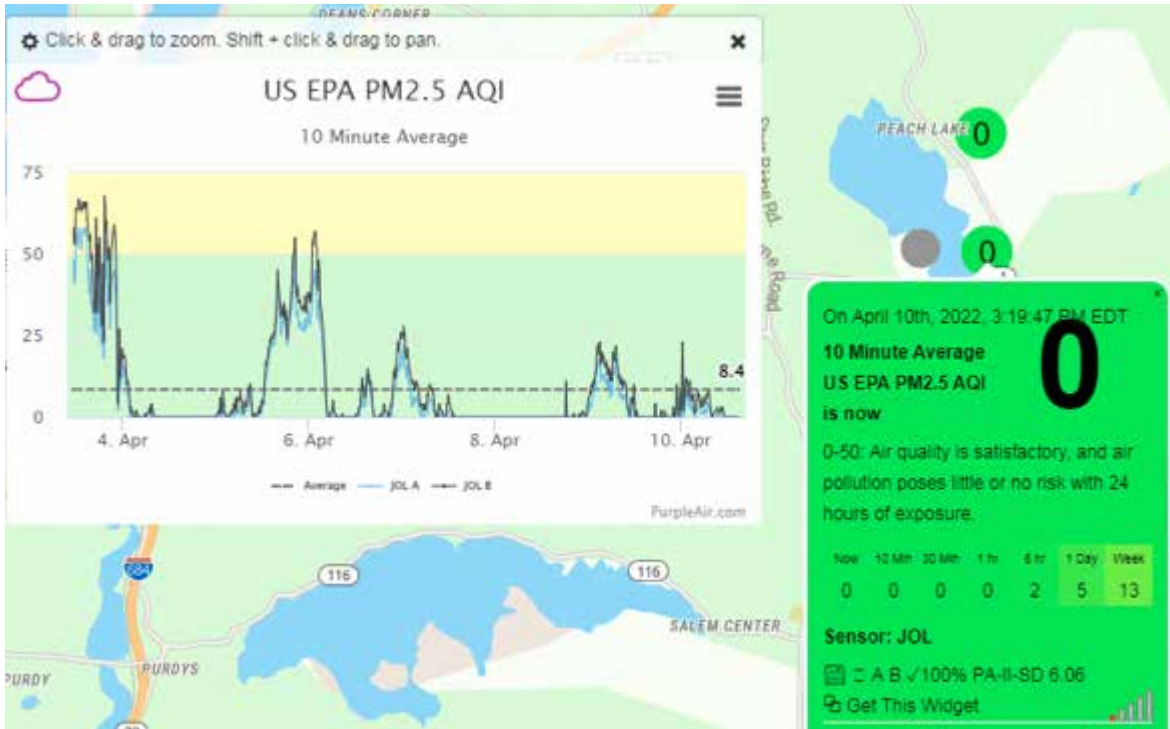
Success to Date

- 10% of private land (over 1,300 acres) is permanently preserved, including usable farmland and forested woodlands for carbon sequestration.
- Reduced salt on roadways by using advanced brining techniques and live-edge plows.
- Eliminated use of herbicides and pesticides on municipal properties.
- Enacted a “dark sky ordinance” to reduce light pollution.
- Implemented a stormwater management and erosion and sediment control plan and ordinance.
- Passage of North Salem Resolution #155-18 on May 8, 2018 to request the New York State Department of Conservation to modify the compressor station technology and emission requirements for natural gas infrastructure facilities. North Salem has been reviewing current legislation and has been involved in commenting on the industry requirements. In February 2022, the State did amend this legislation controlling Natural Gas infrastructure to limit pollution. The legislation requires that the controls be in place by January 2023.
- *PurpleAir* monitors that measure Volatile Organic Compounds (VOCs) and PM 2.5 (2.5 micron particulate matter) have been installed in North Salem by citizens and others in the surrounding area. The monitors cost about \$300 and allow for immediate feedback on local air quality, tracking PM 2.5 and VOCs. Data from monitors is integrated with weather data to plot the emissions maps as can be seen in the picture below. The data can be seen by anyone who accesses the Purple Air website <https://map.purpleair.com/>. Consider installing one outside at your home.⁴





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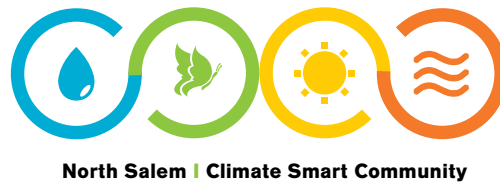


- Reduced use of fertilizer on municipal fields.
- Ongoing support for North Salem Open Land Foundation educational programs, including carbon recapture, protecting pollinators, eliminating herbicides, pesticides and fertilizers, composting and mulching and highlighting the detrimental impact of invasive plants and best management practices for the removal of invasive plants in wetlands.

Goals for the Future

- Conserving farmland and woodlands must remain a top priority, with the goal of permanently preserving no less than 25% of all usable farmland and forested woodlands by 2050.
- Research new paving materials for municipal parking lots and identify municipally-owned paved areas that can be converted to planted areas.
- Establish a plan to replace the Town's gas-powered landscaping equipment with electric equipment.
- Implement a no-pesticide/herbicide pledge program for residents to eliminate use of pesticides, herbicides and other harmful chemicals and consider encourage reduction of the use of

⁴Chart from Purple Air website. Purple Air is a relatively inexpensive monitoring unit.



fertilizers, herbicides and pesticides on residential and commercial properties.

- Conduct educational programs to encourage use of perennial ground cover instead of mulch.
- Make people aware of local air quality, what impacts it, and how to improve it both inside and outside of their homes. Using the Purple Air monitor to build a community awareness campaign on air quality.
- Conduct a carbon sequestration study to quantify the amount of carbon currently being sequestered in forested woodlands located within the Town of North Salem and to identify new parcels for future protection.
- Work with the North Salem Central School District to educate children about the importance of, and strategies for, protecting their land, air and water.
- Continue to support the North Salem Open Land Foundation and Conservation Advisory Council's efforts to educate residents about the value of plants and trees for carbon recapture and landscaping techniques to protect pollinators and other wildlife.
- Implement an ongoing program to remove vines and other invasive plants from municipal properties.
- Replace certain town-owned lawn spaces with trees and other carbon absorbing plants.
- Conduct educational programs for landscapers and homeowners on carbon capture and low environmental impact landscaping techniques.
- Implement incentive programs for tree planting and woodland preservation.
- Implement incentive programs for preserving usable farmland.
- Implement incentive programs to shift from impermeable and barren surfaces to soil covered with permeable surfaces and plants.
- Create programs to incentivize the use of electric machinery for residential landscaping.
- Conduct educational programs on the use of goats and other herbivores to control invasive plants.
- Upgrade infrastructure to improve storm water management and water quality.
- Conduct educational programs to encourage compliance with dark-sky requirements.

2. Ensuring a Clean Electric Supply

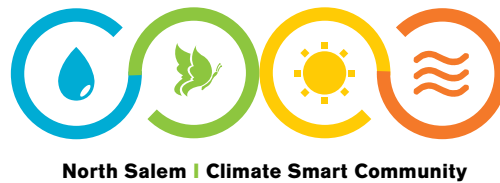
North Salem's Comprehensive Plan establishes as a top priority the need to promote solar, hydropower and other renewable energy sources. This includes encouraging the Town's electricity supplier to obtain power exclusively from clean, renewable sources. To this end, the Town participates in Sustainable Westchester's Community Choice Aggregation Program, using its collective buying power to require NYSEG to purchase electricity solely from renewable sources, including hydropower, wind and solar. Residents are automatically enrolled in the program but can opt out if they so choose. The Town has also started to identify municipal sites for the installation of solar panels and is conducting educational programs to encourage businesses and residents to consider installing solar power on their homes and commercial buildings.



Comfortside Farm, North Salem, NY

Success to Date

- In 2015, North Salem elected to participate in Sustainable Westchester's Community Choice Aggregation Program, which requires NYSEG to purchase enough electricity from wind, solar and hydro and other renewable sources to cover 100% of the usage of all North Salem's residents and small commercial customers.
- In October 2021, North Salem launched a program to encourage residents to participate in Sustainable Westchester's Community Solar program. To date, 16 residents have signed up for the program.
- North Salem is also launching a Clean Energy/Heat Pump campaign to encourage residents to invest in electric heating systems that don't emit GHGs on site.
- On October 23, 2021, the North Salem Climate Smart Community Leadership Committee hosted an educational seminar entitled Solar Power for Horse Farms at Old Salem Farm to encourage horse farm owners to consider installing solar panels and battery storage units.
- North Salem is currently assessing the feasibility of installing rooftop solar panels on the highway garage, the courthouse and police garage and the Peach Lake Sewer Plant.



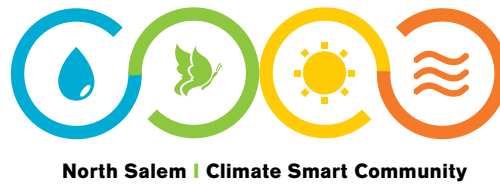
Goals for the Future

- Continue to encourage NYSEG to source its energy from renewable energy suppliers.
- Encourage and incentivize NYSEG to “smarten” and “harden” our electric grid by installing smart meters, burying power lines and improving capacity to deal with future demand, including from electric vehicles and equipment. The Town has been working closely with NYSEG and it is expected that the smart meter installation will occur in the fall of 2022.
- Identify suitable municipal sites for municipal solar and geothermal installations.
- Research funding sources for municipal solar and geothermal installations.
- Encourage all building owners in Town to work at better insulating their homes and installing solar where possible and using heat pumps to significantly reduce their energy footprint.
- Continue to participate in Community Choice Aggregation and encourage participation by residents.
- Continue to encourage residents and other eligible entities to sign up for Community Solar.
- Continue to encourage the owners of commercial properties and large horse facilities to install solar.
- Continue to encourage residents to install roof-top solar, heat pumps and geothermal.
- Conduct educational programs for residents to encourage the installation of solar and/or geothermal systems.
- Encourage manufacturers of clean energy products to think holistically about, and take responsibility for, the entire life cycle of their products, including recycling and disposal.

3. High-Performance Buildings

In addition to the important goal of using clean energy, a critical component of the work to be done is to conserve energy. The Town needs to educate people on the importance of installing LED lighting, better insulating their homes and using heating systems such as geothermal heat pumps.

The Town of North Salem owns and operates three historic buildings, Delancey Hall, Lobdell House and a small building called the Annex (originally Lobdell Store and Post office) which currently houses the Building Department. Delancey Hall was built in the 1760's and serves as the Town Hall. Lobdell House was built in 1883 and moved to its current location in 1893 due to its proximity to the reservoir. It currently houses the Recreation Department, the offices of the Tax Assessor, Tax Receiver, town Historian and Planning Department. Lobdell Store and Post Office (Annex) was built c. 1848 and originally stood across from Delancey Hall on the banks of the Titicus River. In 1995, it was moved to its present location and underwent extensive



renovations to accommodate town Court and Police. After the court and police moved to 66 June Road, the interior was remodeled again for the Building Department in 2017.

In addition, the Town owns several newer structures, including a Highway Garage built in 1950 and a salt shed built in 1995, both located at 250 June Road; a Courthouse and Police Station built in 2014 located at 66 June Road; and a 2,400 square foot garage for police vehicles built in 2021. The town recently purchased an historic building (built in the mid-1920's and initially used as an elementary school) in Croton Falls at 3 Owens Road (formerly known as the Schoolhouse Theater). When renovations are complete, the building will serve as a community and senior center, recreation venue and theater. It will also be the new home for the Recreation Department.

The Town also operates the Peach Lake Sewer and Water Treatment Plant and pump station and pump stations and water towers for four (4) water districts, which are owned by the respective districts.

Success to Date

- Conducted energy audit in 2012.
- Adopted NYStretch Energy Code 2020 in 2022.
- Replaced air conditioning units and ducting and added foam insulation at the Annex which reduced cooling and heating requirements by half.
- Replaced municipal lights and light fixtures, including street lights, with energy saving LEDs.
- Completed greenhouse gas benchmarking of municipal buildings in 2021.
- Evaluated the Town Highway Garage at 250 June Road as possible location for solar installation.
- Conducted LED Lightbulb Swap event for residents in 2021.

Goals for the Future

- Improve energy efficiency of historic and other buildings.
- Produce sufficient renewable energy on town property to meet 100% of town building energy demands.
- Consider adopting NY Stretch to Zero, the next iteration of NYStretch that seeks to address green-house gas emissions even further than NYStretch Code-2020.
- Educate residents about energy saving ideas, the use of LED lighting, more efficient appliances and more efficient heating systems.



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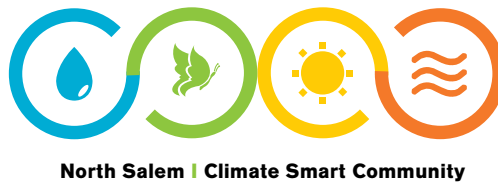


Traffic in Croton Falls July 2020

4. Transportation

The residents of North Salem perceive traffic congestion as one of the key problems affecting the quality of life in Town. The Town's roads are burdened by work and school commuting exacerbated by incremental housing development in surrounding communities. Promoting land use planning that accommodates vehicle traffic but places greater importance on pedestrians, bicycles and safety has long been a priority in North Salem. To this end, the Comprehensive Plan encourages the preservation of dirt roads, slower travel speeds through vigorous enforcement of speed limit reductions on major thoroughfares (June Road, Titicus Road and Bloomer Road), improving intersections, encouraging ride-sharing, and finding ways to reduce fuel consumption, by for example, encouraging the use of hybrid and electric vehicles. These are sound recommendations that should be continued. The Comprehensive Plan also recommends that the Town conduct a bicycle study to determine the best routes for accommodating bicycle travel. That recommendation is repeated here.

In April of 2014, the Town of North Salem created the I684-I84 Consortium (which includes neighboring Towns). Over time that municipal group grew to include Putnam County and Ridgefield, CT. The shared objective was to improve the I684 and I84 corridor so that vehicles no longer needed to take over local side roads each rush hour. At the urging of the Consortium, by May of 2021, the New York State Department of Transportation (NYS DOT) completed a \$1.5M comprehensive study of the northern section of the I684 and I84 corridor. The goal of the study was to support the "safe, efficient, reliable and environmentally sound



movement of people and goods, minimizing diversions on to secondary roadways.” Among the recommendations arising from the study are the following: continue to focus on maintaining the quality of life for residents in the corridor; study feasibility of adding more park-and-ride locations; continue to make safety improvements; add peak-use shoulder lanes between Katonah and Brewster; add a third lane east on I84 beginning at the 684 interchange; add a third lane on I684 between Exits 5 and 6; and continue to study ways to improve the I684/I84 interchange. Proposals to widen the roadways at Exit 6A (Golden’s Bridge) and Exit 7 (Purdys) on I684 were not advanced but were recommended for further study.

North Salem’s transportation fleet is made up of a variety of vehicles, including heavy-duty trucks used for plowing and road maintenance, a variety of lighter weight trucks, police cars as well as a small number of cars and vans. Appendix D of the GHG Emissions Report contains a complete listing of the Town’s fleet as of the end of 2021. Fleet GHG emissions fluctuate from year-to-year depending upon the volume of usage, particularly as it relates to snow removal. However, according to the 2021 GHG Emissions Report, North Salem’s Town-owned vehicle fleet is the largest contributing sub-sector of governmental GHG emissions by a large margin and a good place to focus reduction efforts.

Success to Date

- Completed GHG emissions study of transportation sector.
- Increased speed limit enforcement.
- Added optional bus service for North Salem Day Camp at Mountain Lakes in 2011. Bus service became mandatory for all campers and staff in 2021.
- Purchased our first two hybrid police vehicles.
- Working with the Metropolitan Transportation Authority (MTA) and DOT, the Town has championed the bi-modal access project to the Purdy’s train station (expected completion 2022). This includes the building and repair of sidewalks and the installation of a new elevator to access the depot parking lot directly from Route 116.
- Preservation of two historic dirt roads.

Goals for the Future

- Establish a vehicle replacement schedule with the goal of replacing the Town’s fleet with newer, more energy efficient hybrid and electric vehicles and plan to replace municipal-owned gas vehicles with hybrid and electric vehicles whenever feasible.
- Install electric vehicle charging stations at municipal buildings and commuter parking lots and incentivize EV commuters by offering reduced parking fees at EV stations.

- Enact noise restrictions for trucks, cars and motorcycles.
- Continue to monitor and encourage improvements to the I84/684 corridor.
- Encourage the use of hybrid and electric vehicles by hosting electric vehicle shows and other events.
- Continue to encourage slower travel through rigorous enforcement of speed limit reductions.
- Encourage the DOT to study the impact of traffic applications such as Waze and Google Maps on traffic volumes in North Salem and encourage them to add code to (i) keep drivers off back roads not designed for heavy traffic and (ii) allow drivers to find the most fuel-efficient routes.
- Conduct formal study to determine the best ways to accommodate and encourage safe bicycle travel in and through North Salem.
- Continue to encourage families to take advantage of bus transportation to and from school and require bus transportation to summer camp.
- Establish plan to replace municipal-owned gas vehicles with hybrid and electric vehicles.
- Purchase hybrid van for use by senior citizens.
- Install new and improve existing sidewalks in the hamlets of Croton Falls and Purdys.



Charlotte Harris (early EV adopter) and her five-year-old Tesla named “Sparky”



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Tour of the WinWaste
Materials Recovery Facility
(February, 2022)

PURPOSE

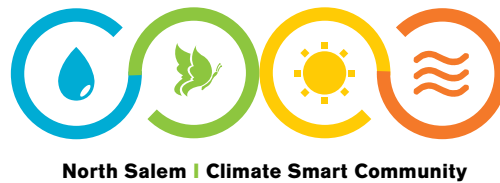
GOALS

BACKGROUND

PRIORITIES/ACTION
AREAS

CONCLUSION

RESOURCES



5. Waste/Recycling

According to the EPA, Americans generate over 250 million tons of trash each year. Most of that trash ends up in landfills and incinerators, polluting the communities that house these facilities and exacerbating the climate crisis. The EPA also found landfills to be the third-largest source of human-related methane emissions in the United States. Landfills can also give off harmful gasses and odors that can permeate neighborhoods causing potentially serious health problems. Run-off from landfills carries with it toxic chemicals that can end up in the water supply and contaminate nearby communities. Recycling provides multiple benefits including reducing the amount of waste sent to landfills and incinerators, conserving natural resources such as timber, water and minerals and creating jobs in recycling and manufacturing industries.

Success to Date

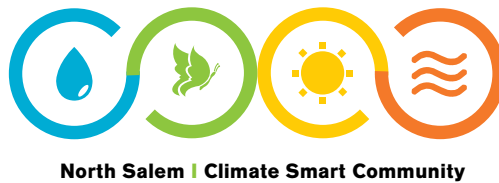
In September of 2019, the Town moved from single stream to dual stream recycling in response to an overseas ban that affected the market for recycled paper. Dual stream recycling allows for flexibility in distribution of recycled products in response to market fluctuations. The Town's paper, as well as bottles/cans/plastics, is being sorted at the Win-Waste Transfer Station in Somers and further processed at the Materials Recovery Facility in Stamford, CT.

The North Salem Improvement Society has been engaged in extensive waste reduction educational initiatives over the past years including:

- promoting use of e-waste container.
- providing information on how and where to dispose of items ranging from prescription drugs to trees to toner to wine corks to gently used clothing.
- explaining the benefits of reusable items such as metal straws and reusable bags.

Goals for the Future

- Determine what portion of North Salem's recyclables are actually being recycled.
- Work with existing efforts to promote the reduction of single use items such as napkins, plastic straws, cups and bottles.
- Conduct public education campaigns about reuse and choosing reusable items.
- Encourage elimination of plastic water bottles.



- Plan and conduct Earth Day events in conjunction with North Salem Improvement Society, Conservation Advisory Council, Open Land Foundation, Lions Club, and the Ruth Keeler Memorial Library that will include a family-oriented activity (i.e. Animal Embassy).
- Encourage businesses and Town-affiliated organizations to reduce/eliminate the use of single use plastics.

6. Sustainable Food Practices

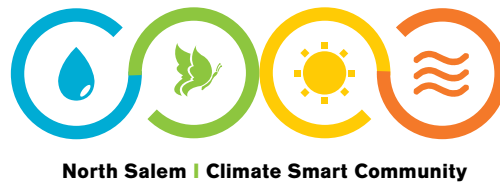
Food waste in the US is an epidemic. The carbon footprint of food results from the greenhouse gas emissions produced by growing, rearing, farming, processing, transporting, storing, cooking and disposing of the food we eat. On average, U.S. household food consumption emits 8.1 metric tons of CO₂ each year. This suggests that livestock agriculture produces approximately half of all human-made emissions. According to the EPA, 34 percent of methane emissions in the U.S. are attributed to landfills. Additionally, the environment suffers from the resulting greenhouse gas emissions of farming and transporting organic materials – only to be transported once again to the landfill.

In addition to reducing greenhouse gas emissions, reducing food waste saves water. An estimated 25 percent of the total freshwater used in agriculture in the U.S. is attributed to the production of food waste. Also wasted are the 300 million barrels of oil used in the farming and manufacturing of food, which will inevitably become waste.

Goals for the Future

Reducing Food Waste

- Increase the number of families that compost throughout town through an educational campaign and work with Cornell Cooperative Extension to identify sustainable bins.
- Encourage reuse of items purchased when shopping (i.e. – plastic containers).
- Promote upcycling and buying gently used items instead of new when possible.
- Partner with the North Salem Schools in waste reduction efforts.
- Provide resources to the Town residents on the Climate Smart Community webpage and through print and online media that promote current waste reduction initiatives with partners including the North Salem Improvement Society, Sustainable Westchester and others.



Growing Initiatives and Local Food Buying

- Promoting benefits of a vegetable garden.
- Partner with local groups and farms/restaurants as resources.
- Multi-prong educational program on vegetable gardening/planting (greens and tomatoes)
- Donate extra tomato plants to residents (collect donations or slight increase price to pay for the free plants) – at Library Fair.
- Support the rejuvenation of the community garden at North Salem Schools.
- Install a hydroponic garden in a Town or school building and conduct an instructional program.
- Promote Local Food Buying.
- Seek ways to make sustainable food more broadly available and promote equity in access.
- Promote local CSAs and Farmer’s Markets through social media.

Meatless Monday Campaign

- Embark upon a 12-week campaign via the online tool and link to Meatless Mondays website.
- Have residents sign up for the challenge.
- Use as part of a public education campaign to encourage plant-based eating.

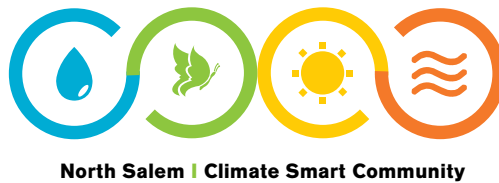
7. Carrying the Work Into the Future

The Climate Smart Community Leadership Committee seeks to build partnerships where possible, both to enhance current efforts, and to develop initiatives going forward. To carry its work into the future, the Climate Smart Community Leadership Committee seeks to form a 501(c)(3) to enable fundraising and hire an executive director to develop and manage educational and other climate smart programs.

● CONCLUSION

This Climate Action Plan establishes the goals and identifies the actions that the Town of North Salem has determined to be most effective in responding to the threats posed by climate change. The Plan is designed to be updated periodically as action items are completed, new opportunities arise and scientific knowledge evolves. We ask that the Town Board and administration formally adopt this Plan and remain committed to achieving the goals set forth in this Plan.





● RESOURCES

General Climate Information

IPCC

www.ipcc.ch/report/ar6/wg1/

<https://www.ipcc.ch/report/ar6/wg2/>

<https://www.ipcc.ch/report/ar6/wg3>

<https://www.un.org/en/climatechange/>

<https://ncar.ucar.edu>

<https://www.ncei.noaa.gov>

[ipcc-climate-change-2022-impacts-report-why-it-matters](https://www.ipcc.ch/report/ar6/wg1/)

www.ourworldindata.org

<https://climate.nasa.gov>

<https://climate.nasa.gov/evidence/>

<https://www.c2es.org>

<https://www.globalchange.gov>

<https://www.nytimes.com/article/climate-change-global-warming-faq.html>

www.nrdc.org/stories/greenhouse-effect-101

<https://www.nrdc.org/stories/global-climate-change-what-you-need-know>

<https://www.nytimes.com/2022/02/28/climate/climate-change-ipcc-report.html>

<https://www.northsalemny.org/climate-smart-community-leadership-committee>

<https://sustainablewestchester.org/>

<https://www.northsalemimprovementsociety.info/>

<https://www.nsof.org/>

<https://bedford2030.org/>

<https://www.hastingsgov.org/home/pages/sustainability-environment>

Pollinator links and websites

www.pollinator-pathway.org

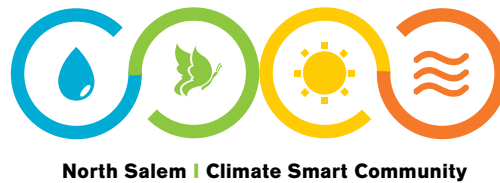
www.healthyyards.org

Meatless Monday Campaign

<https://www.mondaycampaigns.org/meatless-monday/about>

Cornell Cooperative Extension

<http://westchester.cce.cornell.edu/>



Noteworthy Books on Climate

UNDER A WHITE SKY, THE NATURE OF THE FUTURE, by Elizabeth Kolbert (Crown).

THIS CHANGES EVERYTHING: CAPITALISM VS. THE CLIMATE, by Naomi Klein (Simon & Schuster)

LOSING EARTH, A RECENT HISTORY, by Nathaniel Rich (MCD)

STORMING THE WALL, CLIMATE CHANGE, MIGRATION AND HOMELAND SECURITY, by Todd Miller (City Lights Publishers)

HOW TO AVOID A CLIMATE DISASTER: THE SOLUTIONS WE HAVE AND THE BREAKTHROUGHS WE NEED, by Bill Gates (Knopf)

WINDFALL: THE BOOMING BUSINESS OF GLOBAL WARMING, by McKenzie Funk (Penguin Press HC)

OUR HOUSE IS ON FIRE: GRETA THUNBERG'S CALL TO SAVE THE PLANET, by Jeanette Winter (Beach Lane Books)

DON'T EVEN THINK ABOUT IT, WHY OUR BRAINS ARE WIRED TO IGNORE CLIMATE CHANGE, by George Marshall (Bloomsbury USA)

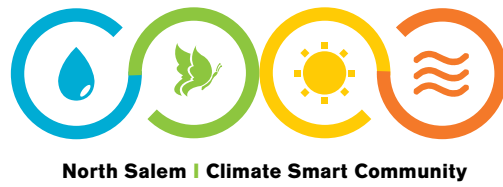
HOW TO PREPARE FOR CLIMATE CHANGE, by David Pogue

AS LONG AS GRASS GROWS: THE INDIGENOUS FIGHT FOR ENVIRONMENTAL JUSTICE, FROM COLONIZING TO STANDING ROCK, by Dina Gilio-Whitaker (Beacon Press)

THE MEDEA HYPOTHESIS, by Peter Ward (Princeton University Press)

THE OMNIVORE'S DILEMMA, by Michael Pollan (Penguin Books)

Special thanks to Supervisor Warren Lucas and the town of North Salem Town Board for their support and to Roe Intrieri for design and layout.



● APPENDIX A

LOCAL GOVERNMENT OPERATIONS
GREENHOUSE GAS EMISSIONS
INVENTORY REPORT 2019-2021

PREPARED BY
NINA EISENMAN



North Salem
Climate Smart Community

**TOWN OF NORTH SALEM, NY
LOCAL GOVERNMENT OPERATIONS
GREENHOUSE GAS EMISSIONS
INVENTORY REPORT
2019 – 2021**



ABOUT NORTH SALEM, NY

North Salem, NY (North Salem) is the northern most town in Westchester County, bordered by Putnam County, NY to the north and Connecticut to the east. Only 55 miles and roughly an hour and fifteen minutes by train or car from New York City, North Salem is 23 square miles of rolling hills, horse paddocks, meadows, and woods. Incorporated in 1788, North Salem is prized by its 5,243 residents (Division of Local Government Services, 2021) and visitors for its historic charm, scenic beauty, horse farms, orchards, as well as its preserves and parks with their many miles of hiking and riding trails.

About the 2019–2021 greenhouse gas inventory report

This local government operations greenhouse gas (GHG) inventory report (the Inventory) has been conducted by Nina Eisenman (the Consultant) on behalf of North Salem, NY's municipal government, the Town of North Salem, NY (the Town). Sponsors of The Inventory include North Salem Town Supervisor Warren Lucas (Town Supervisor Lucas), North Salem Town Councilwoman and Climate Smart Community Program Coordinator Katherine Daniels (Town Councilwoman Daniels), and the Town Climate Smart Community (CSC) Leadership Committee (CSC Leadership Committee). the Town's primary, day-to-day point person for The Inventory is North Salem Town Clerk, Maria Hlushko (Town Clerk Hlushko).



CONTENTS

Climate Action Partners	2
Goals Served by The Inventory	4
Approach and GHG Protocol	5
GHG Emission Results and Analysis	11
Opportunities for Energy Efficiency, Innovation, and Risk Management	21
Future GHG Benchmarking Goals	22
Conclusion	23
Appendix A – Emissions Factors, Global Warming Potential and Conversions	24
Appendix B – 2019–2021 Energy Use Activity Data by Source	25
Appendix C – 2019–2021 Scope 1 and 2 GHG Emissions Data by Subsector and Gases	26
Appendix D – 2019–2021 Vehicle Fleet by Vehicle Make and Fuel Type Used	28
Appendix E – 2021 Scope 3 Employee Commutation GHG Emissions	29
Sources	30



Local Government Profile	
Jurisdiction Name:	Town of North Salem, NY
Street Address:	266 Titicus Rd.
City, State, Zip:	North Salem, NY 10560
Country:	USA
Size (sq. miles):	22.84
2021 Population:	5243
2021 Budget:	\$10,201,228
Full-time Employees:	30
Climate Zone:	4

CLIMATE ACTION PARTNERS

New York State Department of Environmental Conservation Climate Smart Communities

The Town registered as a Climate Smart Community (CSC) and took the CSC pledge in October 2009. In May 2021, the Town Councilwoman Daniels formed the CSC Leadership Committee to help the Town achieve CSC certification status and accelerate climate action. The CSC Leadership Committee is a volunteer task force comprised of employees of the Town as well as North Salem residents. Publishing a Climate Action Plan is one of the requirements for CSC Bronze Certification. The CSC Leadership Committee is currently developing the Town's Climate Action Plan which will include 2030 emissions reductions goals and a net-zero target date as well as a step-by-step road map for reducing GHG emissions.

NY State Climate Smart Communities

Climate Smart Communities (CSC) is a New York State program that helps local governments take action to reduce greenhouse gas emissions and adapt to a changing climate. The program offers free technical assistance, grants, and rebates for electric vehicles.



Members of North Salem's Climate Smart Community Leadership Team, along with Sustainable Westchester and NYSEG representatives at North Salem's first LED Light Bulb Swap held October 16, 2021 during National Energy Awareness Month.

New York State Energy Research and Development Authority Clean Energy Community

North Salem participates in New York State Energy Research and Development Authority (NYSERDA)'s Clean Energy Community (CEC) program which "promotes energy efficiency and the use of renewable energy sources" (The State of New York, 2021) among New York State municipalities. CEC is a points-based system that offers grants to communities who implement a specific set of "High Impact actions". The Town currently has completed 11 High Impact Actions including an LED lighting program, a Community Solar Campaign and Community Choice Aggregation (CCA) earning the Town a total of 4,300 CEC Scorecard points and \$20,000 in NYSEDA grants to be used for clean energy programs.

Sustainable Westchester

Town Supervisor Lucas is on Sustainable Westchester's Board. North Salem participates in Sustainable Westchester's Community Choice Aggregation (CCA) program, "Westchester Power", a "community-based bulk energy purchasing program intended to control costs and increase the use of renewable energy in Westchester County" (Sustainable Westchester, 2021) as well as their Community Solar and other clean energy programs.

NYSEDA Clean Energy Communities

NYSEDA's Clean Energy Communities Leadership Round program helps local governments "create a healthy and sustainable environment by investing in future-focused clean energy solutions". NYSEDA provides resources and grants to help communities achieve their clean energy goals.



North Salem had completed 11 of NYSEDA's Clean Energy Community high impact actions earning the Town 4,300 Clean Energy Community points as of December 7, 2021.

Sustainable Westchester

Sustainable Westchester is a nonprofit, consortium of Westchester County local governments that facilitates effective collaboration on sustainability initiatives.

GOALS SERVED BY THE INVENTORY

The Inventory provides the data-driven insights needed to set the Town's Climate Action Plan 2030 GHG emission reduction goal and net-zero target date. In addition, The Inventory will support the Town's July 13, 2021 "Resolution #208-21 To Establish Energy Benchmarking Requirements for Certain Municipal Buildings." The Inventory establishes 2019 as the Town's emissions base year, facilitating future reporting and tracking of emissions reductions initiatives against base-year emissions. The Inventory will identify which of the Town's energy use sectors, sub-sectors and properties are the largest consumers of energy and the largest sources of GHG emissions. This information will allow the CSC Leadership Committee, the Town executive leadership, and the Town Board to prioritize energy efficiency initiatives and set realistic municipal energy and GHG emissions reduction targets and identify the highest value operational energy efficiency initiatives. The Inventory is a tool that can be updated yearly to help the Town lower its energy use and operating expenses, reduce its GHG emissions, gain CSC certification and become a leading Clean Energy Community.

New York State's CSC and NYSEERDA's CEC are both points-based systems tied to financial grant awards. Once a municipality registers for CSC it can advance to Bronze, Silver or Gold Certification levels by earning points awarded for completing specific actions. The benefits of CSC Certification include better scores on grant applications and state-wide recognition. To merit CSC Bronze Certification a municipality must earn 120 CSC points. So far, the Town has earned 47 CSC points. Producing a Government Operations GHG inventory is CSC Certification Action "Pledge Element 2: Inventory emissions, set goals, and plan for climate action" and has a value of 16 CSC points. Publishing the GHG inventory report will bring the Town 16 points closer to achieving its 2022 goal of CSC Bronze Certification Status.

A GHG inventory also counts towards NYSEERDA's "Benchmarking" High Impact Action. Filing a GHG Inventory report will improve the Town's CEC ranking and ability to secure future CEC grants.

"The priorities outlined in this Climate Action Plan will put the Town of North Salem on a path to reach net carbon neutrality as follows: TBD% reduction in greenhouse gas (carbon dioxide, methane and nitrous oxide) emissions by 2030 and net zero emissions by 20XX-TBD."

–Town of North Salem Climate Action Plan: Goals

The Inventory provides data-driven insights the Town can use to set realistic, achievable 2030 GHG emission reduction goals and a net-zero target date in its Climate Action Plan.

APPROACH AND GHG PROTOCOL

To align with New York CSC PE2 Action: Government Operations GHG Inventory (The State of New York, 2021B) guidelines, The Inventory follows the **ICLEI Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories Version 1.1** (The Protocol), May 2010. Partial, estimated Scope 3 emissions calculations follow the methodology of the World Resource Institute's (WRI) *Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions*, Category 7: Employee Commuting (WRI, 2013).

Per CSC PE2 Action: Government Operations GHG Inventory, The Inventory is "an accounting, analysis, and report of the GHG emissions resulting from the day-to-day operations of" the Town (The State of New York, 2021B). The Inventory summarizes the GHG emissions from the consumption of energy and materials in government buildings, from wastewater and water treatment facilities, from municipal vehicle fleets, from government-owned outdoor lighting, and from other sources" (The State of New York, 2021B).

Base Year and Reporting Time Frame

The Inventory follows a regular calendar year with a base year of 2019. The Inventory reports on Scopes 1 and 2 emissions for 2019 through 2021 and Scope 3 emissions for 2021. 2019 and 2021 energy use and emissions are partially estimated (Please see Estimates section, below, for details). The Consultant set 2019 as the base year and three-year, 2019–2021 time frame for The Inventory's accounting of Scopes 1 and 2 emissions for the following reasons:

1. The Town implemented an energy efficiency LED retrofit project in October 2019. The 2019–2020, year-over-year inventory results demonstrate the GHG emissions reductions resulting from that program.
2. The Town had complete data for 2020 and partial (~80%) data for 2019 and 2021.
3. Including partially estimated 2021 results in The Inventory, provides insights on trends and, importantly, validates whether the emissions reductions resulting from 2019 energy efficiency initiatives were short-term or permanent reductions.

Stakeholders

Stakeholders of this inventory include the Town's executive leadership, the Town Board, the Town CSC Leadership Committee, the Town's employees, and North Salem residents.

GHG Inventory Parameters	
GHG Protocol	ICLEI Local Government Operations Protocol for the quantification and reporting of GHG emissions inventories Version 1.1
Base Year	2019
Time Frame	2019-2021
Organizational Boundary	Operational Control
Operational Boundary	Scopes 1, 2 and partial 3 (See page 6 for definitions of scopes 1, 2 and 3)

Definition of Boundaries

Organizational boundary

The Inventory employs an Operational Control (ICLEI, 2010) organizational boundary encompassing the emissions produced by buildings, vehicles water districts and street-lights owned, leased, and operated by the Town. Scope 3 emissions encompass emissions produced by full-time employees' vehicles used during their commutes to work.

Operational boundaries

As specified in The Protocol, this GHG inventory categorizes direct and indirect emissions into "scopes" following the WRI/WBCSD GHG Protocol Corporate Standard. This GHG inventory covers Scopes 1, 2 and 3 as follows:

SCOPE 1:

Direct GHG emissions (excluding direct biogenic CO₂ emissions) from heating fuel used in buildings and facilities, and fuel used for transportation under the operational control of the Town.

SCOPE 2:

All indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling used by buildings, streetlights and traffic signals, water delivery facilities, and wastewater facilities under the operational control of the Town.

SCOPE 3:

Estimated indirect 2021 emissions resulting from the Town's full-time employees' commutes to and from work.

Note: Fugitive emissions are not included in The Inventory as data was not available.

Categorization of Emissions – Local Government Sectors

The Inventory categorizes emissions sources under two broad sectors – Stationary and Transportation – and the following local government sub-sectors:

Stationary	Buildings and other facilities	Transportation	Vehicle Fleet
	Streetlights and traffic signals		
	Water delivery facilities		Employee Commuting
	Wastewater facilities		

The Town does not operate port, airport, power generation or solid waste facilities, or a transit fleet so these sectors are not covered in The Inventory.

The Town's GHG Emission Sources

The Town's GHG emissions sources include buildings, water delivery and wastewater facilities, streetlights and traffic signals, and vehicles under the Town's operations control. The Town's Buildings and Waste-water Facilities use electricity as well as a variety of heating and energy generation fuels. Please see Appendix B for fuel use by building and facility. The Town's Streetlights and Traffic Signals, and Water Delivery Facilities are powered by electricity. The Town's Vehicle Fleet includes a variety of gasoline- and diesel-powered internal combustion engine vehicles and equipment. Please see Appendix D for a list of vehicles and fuel used.

**The Inventory is a
year-over-year
analysis of
GHG emissions by:
Sector • Subsector •
Property •
Energy Source • Scope**

Town of North Salem GHG Emission Sources

Stationary		Transportation
Buildings and Other Facilities	Streetlights and Traffic Signals	Vehicle Fleet
<ul style="list-style-type: none"> • 66 June Road • Annex • Lobdell House • North Salem Highway Department • Ruth Keeler Memorial Library • Town Hall 	<ul style="list-style-type: none"> • 667 Titicus Rd Barn – Balanced Rock Street Light • Route 116 Lights • Purdy's Lighting District Street Lights • Street Lights at Large • Croton Falls Lighting District Street Lights • Near 28 Sunset Drive – Joe Bohdrum Park Lights • 4 West Cross Street Parking Lot Lights • Near 2 Cross Street Parking Lot Lights • Back Street Lot Lights • June Road – Courthouse Parking Lot • Close Hill Road Christmas Tree 	<ul style="list-style-type: none"> • Highway Department Fleet • Police Car Fleet • Animal Control Van • Building Department Cars • Senior Services Car • Recreation Department Vehicle <p>Please see Appendix D for a complete list of The Town's fleet of vehicles</p>
Water Delivery Facilities	Wastewater Facilities	Employee Commutation
<ul style="list-style-type: none"> • Jessitar Road Pump – Candlewood Park Water District Well Pump • Nash Road – Candlewood Park Water District Source of Supply • Lakeview Road – Salem Acres Water District Source of Supply • 8 Close Hill Road Pump Station • Mahopac Ave. Pump House – Croton Falls Water District • Route 22 – Croton Falls Water District • Ridgeway Ave. – Sunset Ridge Water District 	<ul style="list-style-type: none"> • Peach Lake Sewer District – 10 Maple Lane • East Peach Lake Road Pump House • Bridge Street Pump House – Peach Lake Sewer 	<ul style="list-style-type: none"> • 30 full-time employee cars • Estimate assumes all employee vehicles are gas-powered, internal combustion engine cars

GHG Emission Factors and Global Warming Potential (GWP)

The Inventory uses emission factors from the EPA.gov GHG Emissions Factors Hub, April 2021 to calculate Scope 1 Stationary Source GHG emissions including #2 fuel oil, natural gas, and propane; Scope 1 Transportation emissions including diesel and gasoline; and Scope 3 Employee Commuting emissions (EPA, 2021). The Inventory uses the EPA eGRID Summary Tables 2019 for the sub-region NYCW (NPCC NYC/Westchester) to calculate emission factor for Scope 2 electricity for Stationary and Transportation source emissions (EPA, 2021).

GWP values from IPCC AR4 of 25x for Methane (CH₄), and 298 for Nitrous Oxide (N₂O) were used (IPCC, 2007).

Please see Appendix A for a complete list of Emissions Factors, GWP and Conversions used in The Inventory.

GHG Gases Included in the Inventory

Emissions from the following greenhouse gases are included in the Inventory:

- ♦ Carbon Dioxide, CO₂ (GWP=1x)
- ♦ Methane, CH₄ (GWP=25x)
- ♦ Nitrous Oxide, N₂O (GWP=298)

Global warming potential (GWP) is how much a GHG contributes to global warming relative to one unit of CO₂. CH₄ and N₂O retain 25 and 298 times more atmospheric heat, respectively than CO₂.

Carbon Dioxide equivalent (CO₂e) is the combined impact of CO₂ + CH₄ + N₂O emissions adjusted for their GWPs.

Data Collection Process

Interviews

In addition to collecting data from the sources listed below, The Consultant conducted interviews with Town Supervisor Lucas and Town Clerk Hlushko.

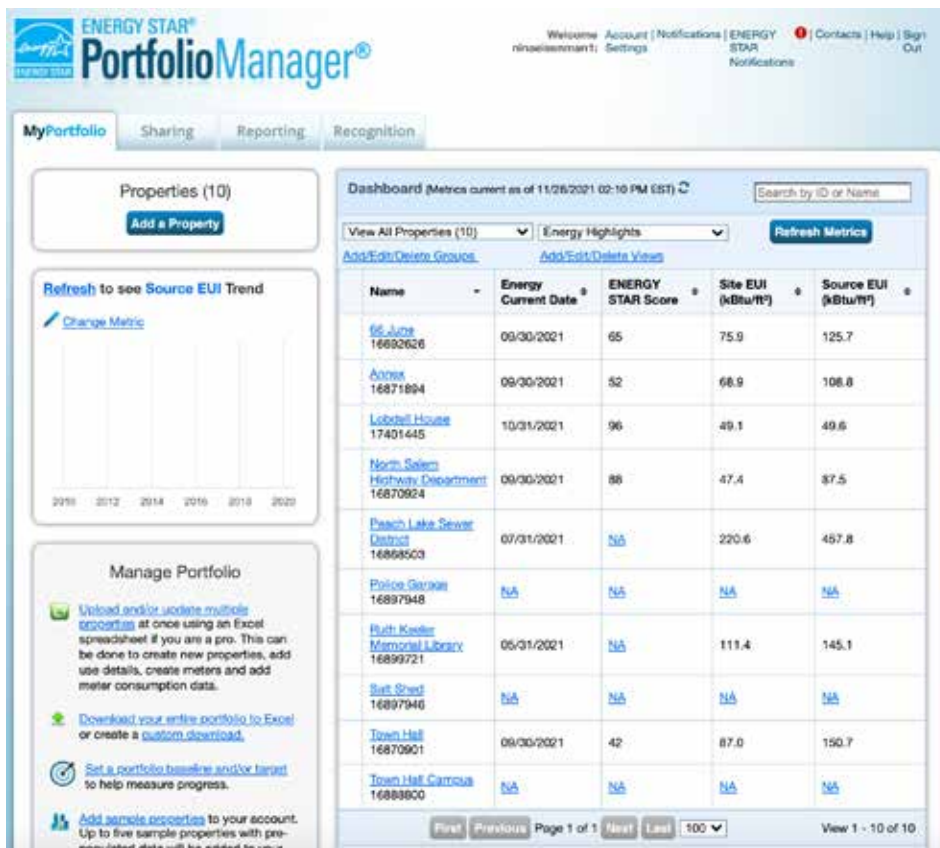
Buildings and Other Facilities

The Town uses the Energy Star® Portfolio Manager® (Portfolio Manager) online platform to record and track energy use data for buildings operated by the Town. The Consultant was provided with a Portfolio Manager account and given an orientation on how to access building energy data. It was found that some energy use data was missing or had to be updated or amended. Town Clerk Hlushko reviewed all 2019 to 2021 Portfolio Manager data for accuracy and made adjustments as necessary. The Consultant then designed a three-year electricity and fuel use report for all buildings using Portfolio Manager's reporting feature. Portfolio Manager reports convert raw energy bill data into energy use activity data with units that can easily be used for GHG emissions analysis segmented by yearly or monthly time periods. However, Portfolio Manager's reporting function requires a full year of data to generate a report. The Town's 2019 and 2021 energy use data was incomplete and so the three-year report only generated 2020 results with "Not Available (NA)" results for 2019 and 2021. Consequently, The Consultant downloaded individual Excel files from Portfolio Manager for each energy source used by each property. This method provided all the necessary data, however the exported data was the raw electricity and fuel bill data the Town had entered into the system. Importantly, this data was segmented by billing cycles, rather than months or year. Some billing cycles span two years. Estimates were made for energy use attributable to each specific year for billing periods that overlapped two years.

Data for the Wastewater Facility, Peach Lake Sewer District Sewage Plant, was also sourced from the Portfolio Manager platform using this same method.



Maria Hlushko, North Salem Town Clerk



ENERGY STAR®

“ENERGY STAR® is a joint program of the Environmental Protection Agency (EPA) and the Department of Energy (DOE). Its goal is to help consumers, businesses, and industry save money and protect the environment through the adoption of energy-efficient products and practices” (Glickman, 2021)

The Town uses the Energy Star® Portfolio Manager® (Portfolio Manager) online platform to record and track energy use data for buildings operated by the Town.

Streetlights and Traffic Signals, Water Delivery Facilities, and Wastewater Facilities

Town Clerk Hlushko provided The Consultant with a spreadsheet with 2019, 2020 and 2021 electric bills for all meters including all streetlights, parking lights, water delivery facilities and sewers under the Town’s operational control.

Transportation – The Town Fleets

“Fuelmaster” vehicle fuel use reports, as well as the number and types of vehicles in the Town’s fleets were provided by The Highway Department. The fuel data for all Highway Department Fleet vehicles was provided as yearly totals, in gallons, of diesel and gasoline used for the Highway Department Fleet, the Police Car Fleet, and other vehicles under the Town’s operational control. (Please see Appendix D for a full list of vehicles).

Scope 3 – Employee Commuting

Town Clerk Hlushko provided The Consultant with a spreadsheet specifying the number of full-time employees and the towns they commute from. Please see Appendix E for Employee Commuting data.

Tools and calculations used to report emissions

CO₂, CH₄, N₂O and CO₂e emissions from all sources within the Town's operational boundary were calculated using emissions factors and GWPs listed above in section "GHG Emission Factors and Global Warming Potential (GWP)". An "Activity Data" Excel worksheet containing all raw data was created. Please see Appendix B for Activity Data. Individual Excel worksheets for Stationary and Transportation emissions used data from the Activity Data sheet and conversion factors to make all units consistent with emission factor units and calculate emissions for all activities under the Town's operational control. A separate Excel worksheet was created for Scope 3 Employee Commuting emissions calculations. Excel pivot tables and charts for various subsets of data were created to chart year-over-year GHG emissions. A 2020 Portfolio Manager GHG Emissions report encompassing the Town's buildings was generated and used to validate the estimated emissions values calculated using the method described above.

Energy Use and GHG Emissions Estimates

The Inventory relies on estimated energy use data in certain circumstances for the following reasons:

- ◆ 2021 energy use data was incomplete. For most of the Town's GHG emissions sources, 2021 energy use data was available for January 2021 through October 2021, however in a few cases data was only available through June 2021. Estimates for missing 2021 energy use data were made using average 2019 and 2020 energy use for the same time periods.
- ◆ Energy use data based on the Town's electricity and heating fuel bills is segmented by billing cycles, rather than by month or year. Billing periods for electricity and heating fuel vary and some billing periods span two years. When a single billing period spanned two years, the energy used attributed to each year was estimated.
- ◆ Streetlight and traffic light energy use is

estimated. NYSEG, the Town's electric company, does not calculate Streetlight energy use using individual electric meters. Instead, NYSEG calculates daily streetlight energy use by multiplying wattage of each light fixture and bulb by the number of non-daylight hours in the specific day. If a streetlight bulb burns out or a fixture is broken, NYSEG will report and bill for energy use as if the fixture and bulb are working, rather than reflecting zero energy use.

- ◆ Water delivery and wastewater facility energy use for 2020 and 2021 as stated on NYSEG electricity bills was estimated. Energy use for these sources is relatively steady year over year. NYSEG crews were not reading electric meters during the height of the COVID-19 pandemic and NYSEG's bills based on estimates rather than actual meter readings ranged widely, resulting in a false appearance of energy use fluctuations.
- ◆ The Town's Highway Department vehicle fuel use data was provided as total, consolidated yearly fuel use for all Highway Department fleet vehicles. Vehicles included a mix of on and off-road trucks and maintenance equipment. The Consultant used emissions factors for "Agricultural Off-road Trucks" as the best approximation for the mix of Highway Department vehicles to calculate Diesel CH₄, Diesel N₂O, Motor Gasoline CH₄, and Motor Gasoline N₂O emissions. Please see Appendix D for a list of Highway Department vehicles.

GHG EMISSION RESULTS AND ANALYSIS

Town of North Salem GHG Emissions by Subsector and Scope 2019–2021 (tCO ₂ e)									
	Stationary					Transportation			
	Buildings and Other Facilities	Streetlights and Traffic Signals	Wastewater Facilities	Water Delivery Facilities	Stationary Total	Town Fleet	Employee Commuting	Transportation Total	Total
2019	124	30	145	41	341	326		326	667
Scope 1	80		44		124	326		326	450
Scope 2	44	30	101	41	217				217
2020	115	17	130	30	291	296		296	587
Scope 1	71		39		110	296		296	405
Scope 2	43	17	91	30	182				182
2021	116	17	124	26	283	319		319	603
Scope 1	76		40		116	319		319	435
Scope 2	39	17	85	26	167				167
Scope 3							49		49

Overview

The Town's total 2019, 2020 and 2021 combined Scope 1 and 2 emissions were 667, 587 and 603 metric tons of CO₂ equivalent (tCO₂e) respectively. This represents a 12% year-over-year (YoY) decline in combined Scope 1 and 2 GHG emissions from 2019 to 2020, a 3% increase from 2020 to 2021 and a three-year decline of 10% from 2019 to 2021. The largest contributing sub-sector to combined Scope 1 and 2 GHG emissions was Vehicle Fleet by a wide margin at 326, 296 and 319 tCO₂e followed by Wastewater Facilities at 145, 130 and 124 tCO₂e and Buildings and Other Facilities at 124, 115 and 116 tCO₂e for 2019, 2020 and 2021 respectively. See Appendix C for a complete accounting of GHG emissions by source and gas.

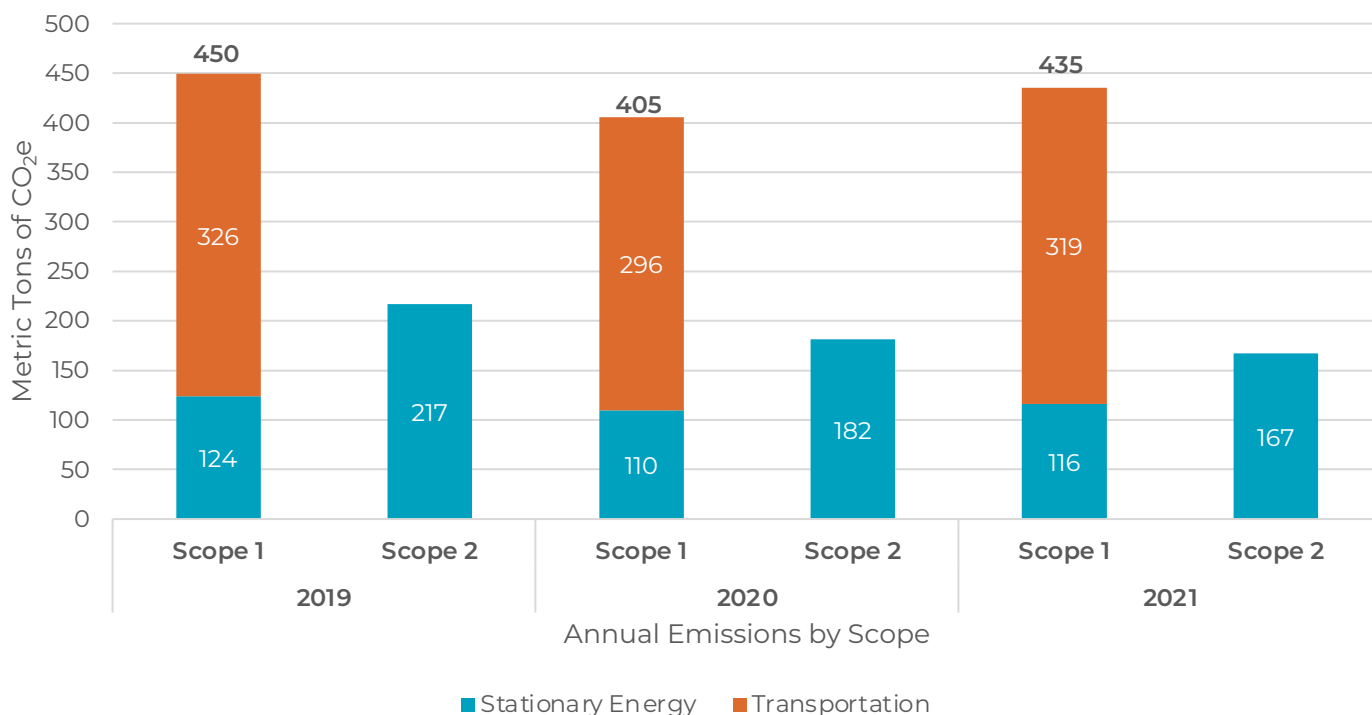
In all three years, the Town's Scope 1 emissions were more than double Scope 2 emissions. Scope 1 emissions declined 10% YoY from 450 to 405 tCO₂e in 2019 to 2020 respectively, primarily due to lower Vehicle Fleet fuel, use but bounced back up 7% to 435 tCO₂e in 2021. Scope 2 emissions declined 16% YoY from in 2019 to 2020 respectively and declined an additional 8% in 2021 due to the Town's LED energy efficiency program.

Estimated Scope 3 GHG emissions attributable to full-time employee commuting was 59 tCO₂e, higher than GHG emissions from Streetlights and Traffic Signals, and Water Delivery Systems, Scope 2 emissions from Buildings and Other Facilities and Scope 1 emissions from Wastewater Facilities. Please see Appendix E for 2021 Scope 3 emissions calculations.

Details about GHG emissions by sector and sub-sector follows.



Town of North Salem GHG Emissions by Scope and Sector



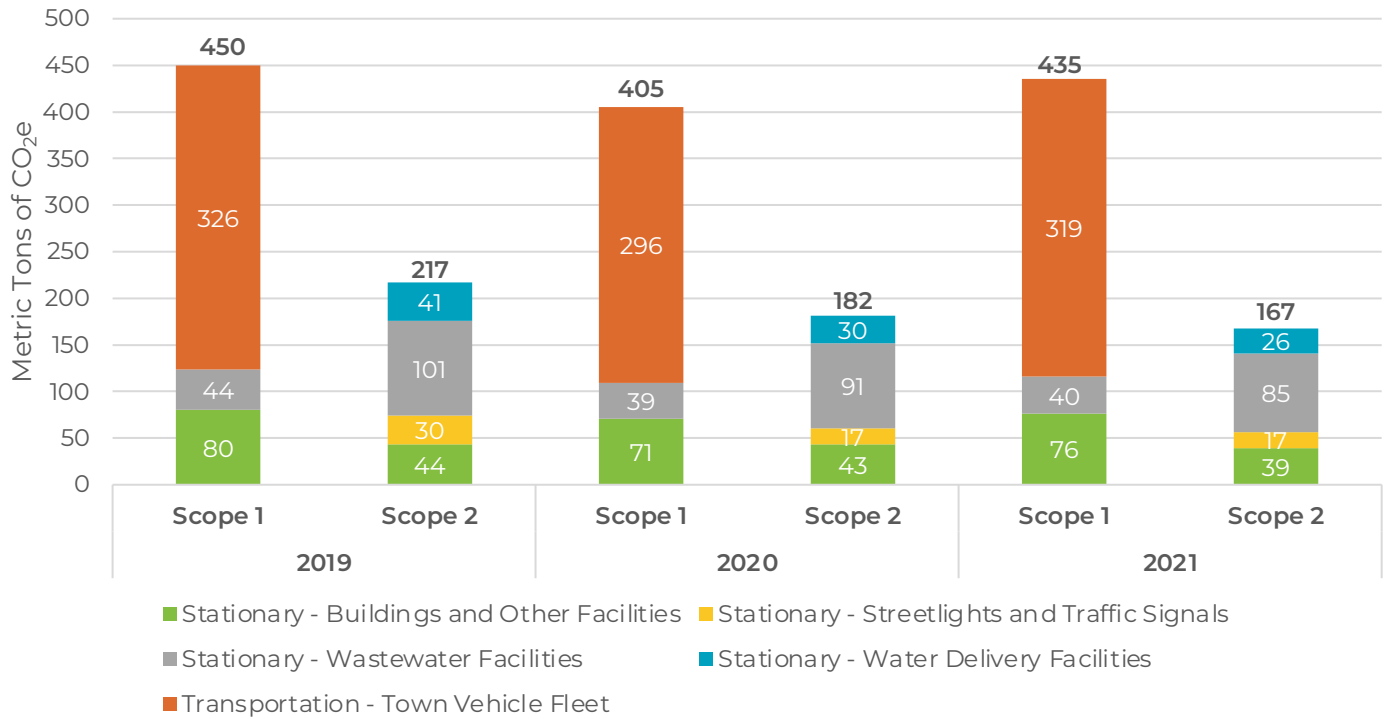
Stationary vs Transportation

In base year 2019, the Stationary sector was responsible for the majority of the Town's GHG emissions at 341 tCO₂e. That is 5% greater than the 326 tCO₂e of emissions from the Transportation sector in the same year. In October 2019, the Town implemented an LED energy efficiency upgrade to its streetlights and some of its building as part of the NYSEG Energy Saver Program. The LED retrofit initiative resulted in YoY Stationary GHG emissions reductions of 15% from 2019 to 2020 of 341 to 291 tCO₂e respectively and a further 3% YoY reduction to 283 tCO₂e in 2021. Transportation sector emissions declined 9% in 2020 YoY from the base year to 296 tCO₂e but exceeded emis-

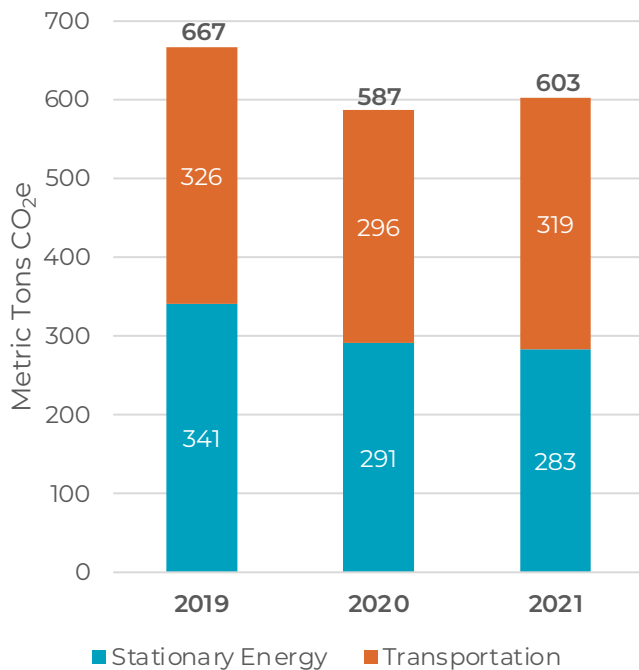
sions from stationary sources by a narrow margin. The 2020 reduction in Transportation sector emissions was due to a mild winter (January – March 2020) with almost half the snow fall of the corresponding 2019 or 2021 time periods. The unusually light snowfall resulted in reduced Highway Department snowplows and other vehicles use. Emissions from the Transportation sector bounced back up 8% to 319 tCO₂e in 2021. In 2021, emissions from the Transportation sector's diesel and gasoline powered fleet were the Town's largest sources of emissions, exceeding emissions from the Stationary sector by 13%.

In 2021, the Town's diesel and gasoline powered fleet were largest sources of emissions. Transportation sector emissions exceeded emissions from the Stationary sector by 13%.

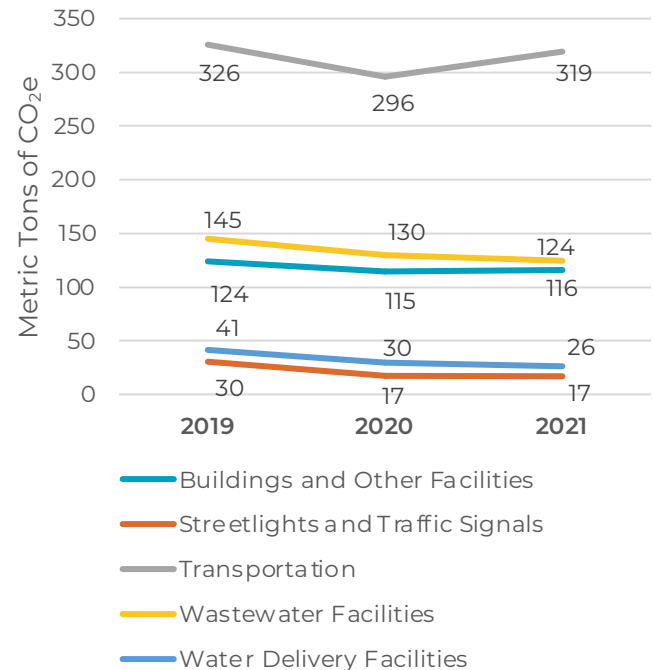
Town of North Salem GHG Emissions by Scope and Subsector



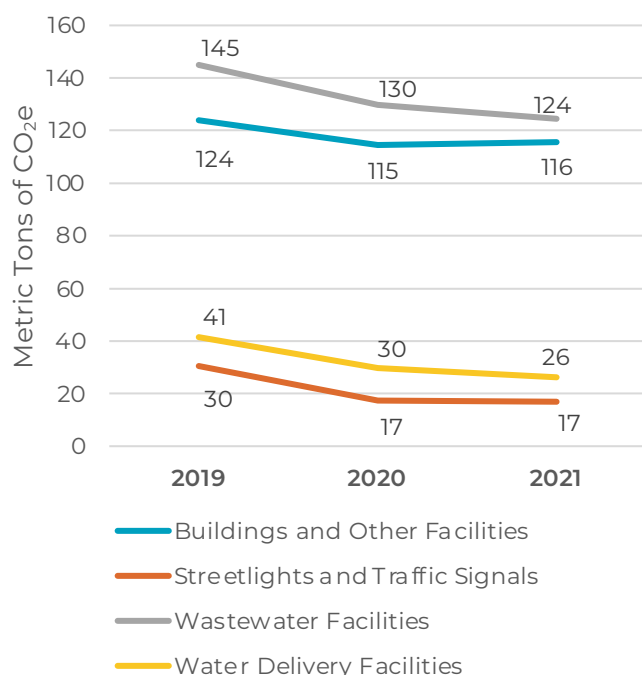
Town of North Salem GHG Emissions Stationary vs Transportation



Town of North Salem GHG Emissions Trends by Subsector



Town of North Salem Stationary GHG Emissions by Subsector



Stationary

Of the Stationary sector, the largest GHG emissions contributing sub-sector is Wastewater Facilities followed closely by Buildings and Other Facilities.

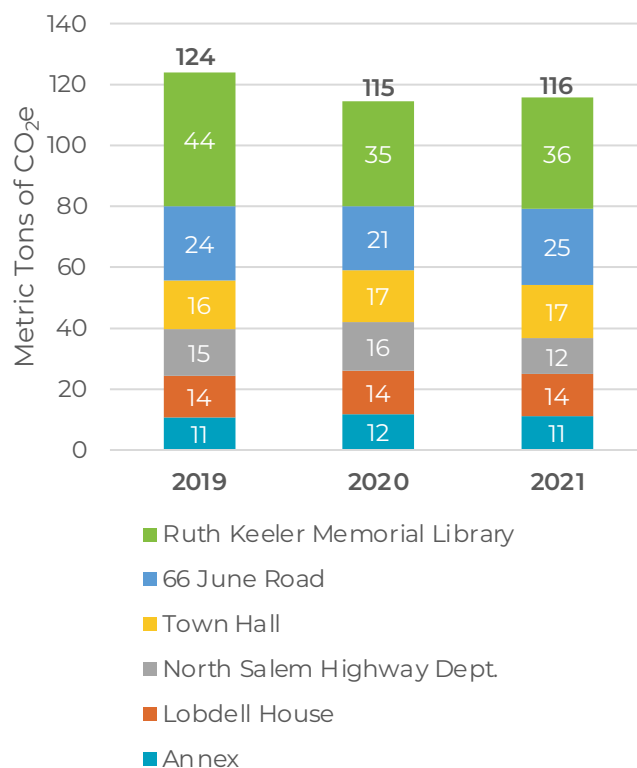
Buildings and Other Facilities

Emissions from Buildings and Other Facilities declined 6% from 2019 to 2020 primarily due to a NYSEG-sponsored LED lighting retrofit project that the Town implemented in late 2019. According to Town Supervisor Lucas, building fixtures and bulbs, including 66 June Road's fluorescent light fixtures and bulbs as well as the North Salem Highway Department's mercury halide vapor fixtures and bulbs were replaced with LED bulbs that use half the energy of the bulbs they replaced. Building and Other Facilities emissions come from a combination of energy sources, including electricity, #2 fuel oil,

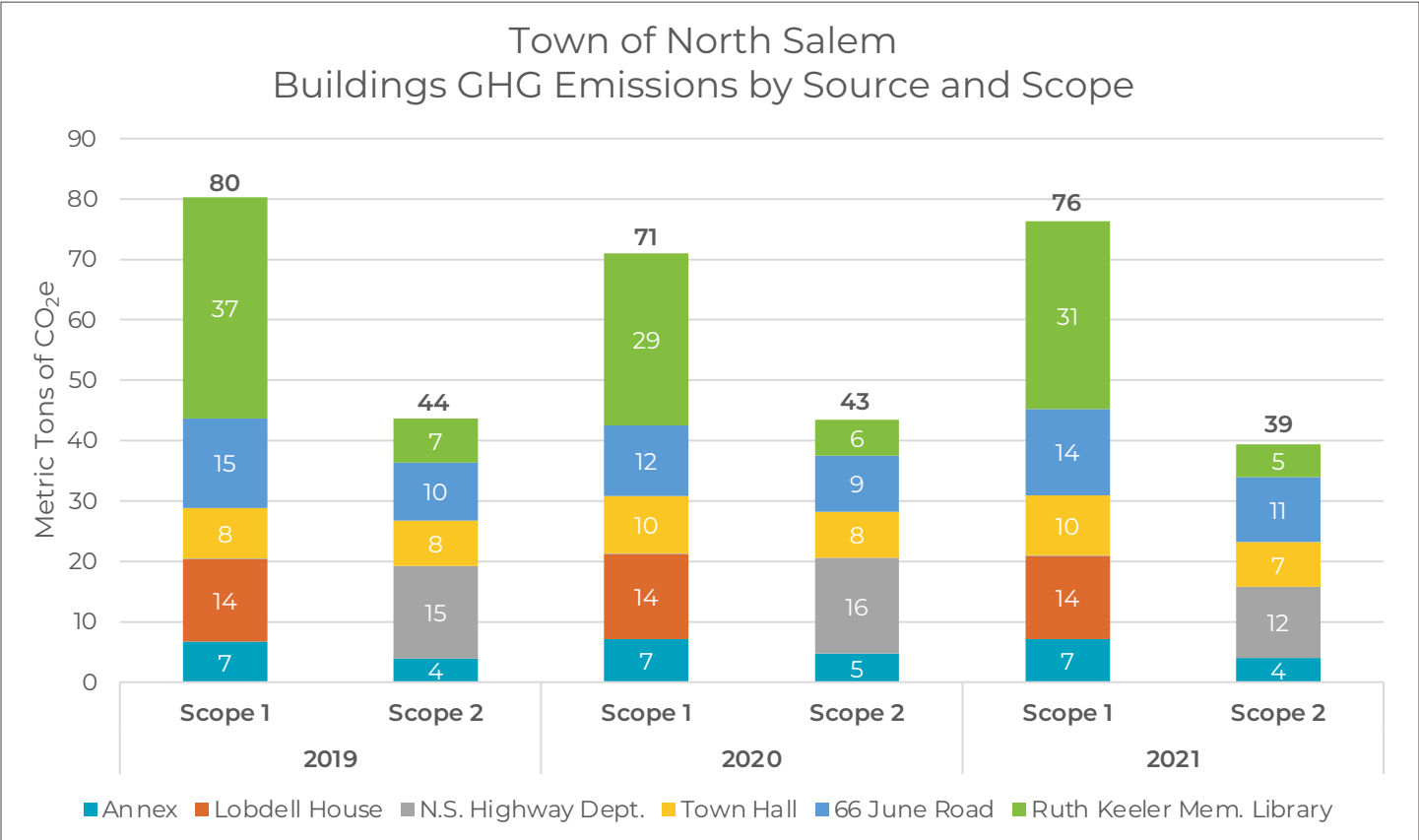
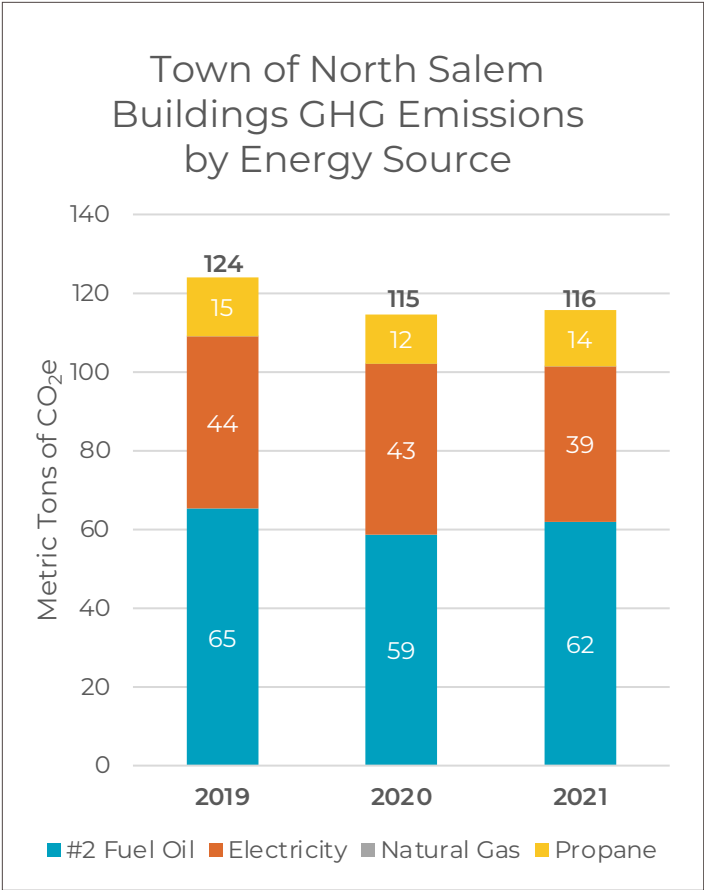


**Ruth Keeler Memorial Library
emits the most GHG of all
Buildings and Other Facilities
with ~89% of the library's
emissions attributable to
#2 fuel oil.**

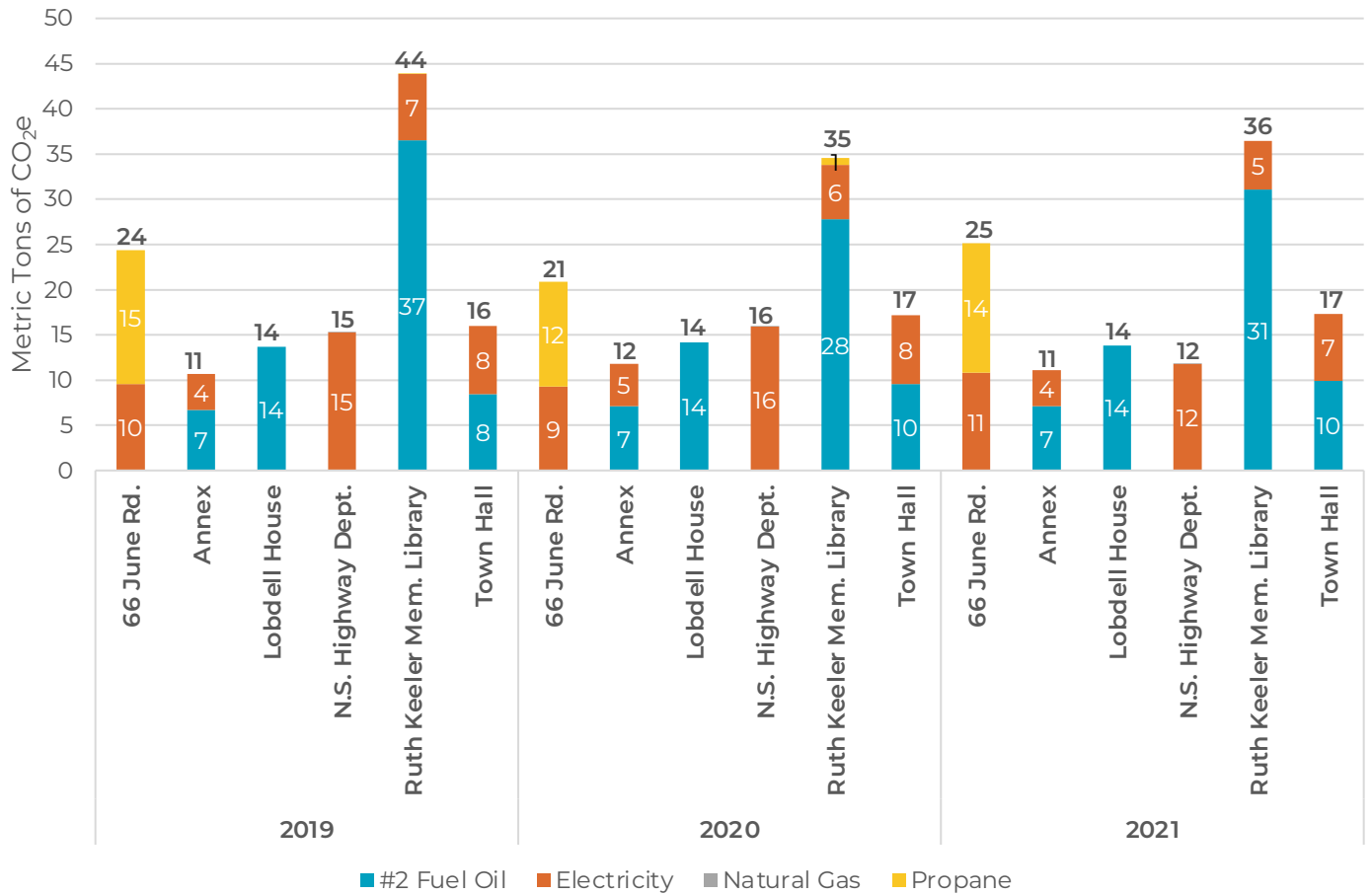
Town of North Salem Buildings GHG Emissions by Source



propane, natural gas. In all three years, over half of all building emissions were attributable to #2 fuel oil. Ruth Keeler Memorial Library contributed the most GHG emissions of all Buildings and Other Facilities in all three years with ~89% of the library's emissions attributable to #2 fuel oil, 10% to electricity and 1% to propane in 2020. The library's energy use declined 18% YoY from 2019 to 2021 and an additional 10% due to the LED light bulb program as well as reduced public programming related to COVID-19. It is interesting to note that, although the North Salem Highway Department's yearly electricity use is more than double that of Ruth Keeler Memorial Library, the Highway Department's 2020 Scope 1 and 2 GHG emissions were less than a third that of the library. The library's comparatively higher GHG emissions are due to the building's use of #2 oil for heating.



Town of North Salem Buildings GHG Emissions by Energy Source



Although the North Salem Highway Department building's yearly electricity use is more than double that of Ruth Keeler Memorial Library, the Highway Department's 2020 Scope 1 and 2 emissions were 32% that of the library. The library's comparatively higher GHG emissions are due to #2 oil use.

Wastewater Facilities

The Wastewater Facilities subsector contributes approximately 44% of all Stationary Scope 1 and 2 GHG emissions, making it the largest subsector contributor to the Town's Stationary GHG emissions. 96% of the Town's Wastewater Facilities energy use is attributable to the Peach Lake Sewer District sewer plants with the remaining 4% used by the Sewers. 98% of the Peach Lake Sewer District Wastewater Facilities emissions are attributable to the electricity used to power its pumps with the remaining 2% attributable to propane. According to billing data used for The Inventory, total Wastewater Facility emissions from the Peach Lake Sewer District and Sewers appears to have declined 14% from 2019 to 2021. However, according to the Town Supervisor, energy use by the Town's Wastewater Facilities is relatively stable. The dramatic variations in energy use reflected in data from NYSEG electric bills is due to NYSEG not reading meters during the height of COVID-19 which led to highly inaccurate energy use estimates, as noted in the section, "Energy Use and GHG Emissions Estimates", above.

The Wastewater Facilities subsector contributes ~44% of the Town's Stationary Scope 1 and 2 GHG emissions. 96% of the Town's Wastewater Facilities energy use is attributable to the Peach Lake Sewer District.



Lobdell House, North Salem, NY



Salt Shed, North Salem, NY

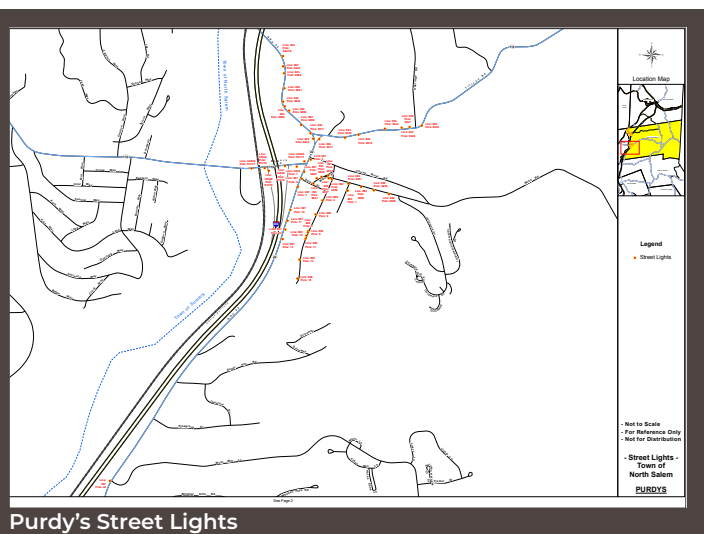
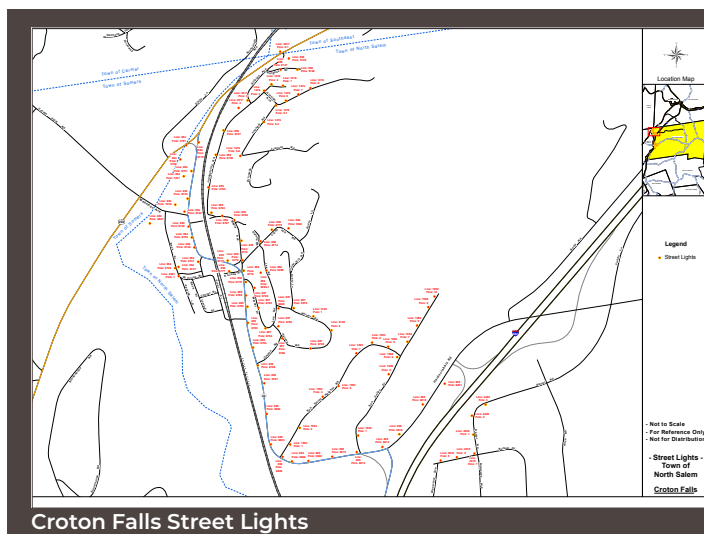
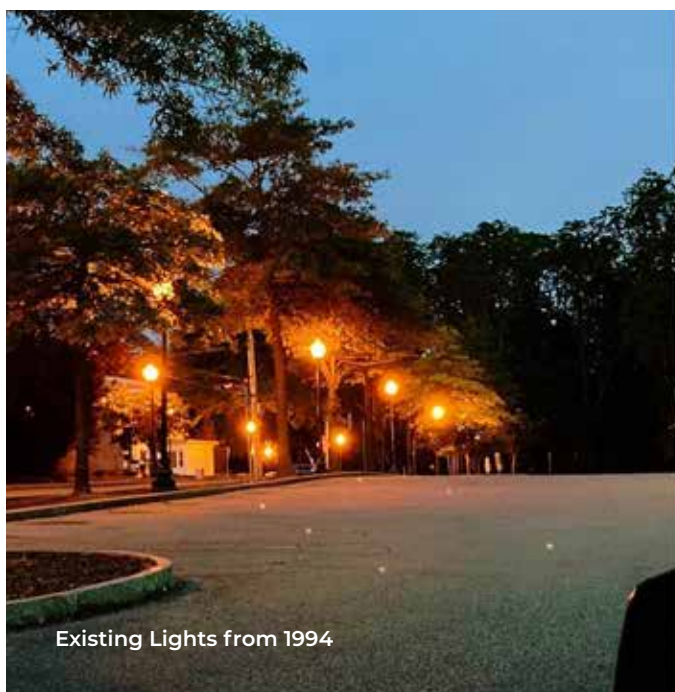
Water Delivery Facilities

Water Delivery Facilities are responsible for, on average, 11% of the Town's Stationary sector emissions. Prior to the base year, the Town installed energy efficient variable frequency device (VFD) pumps that prevent start-up and shut-down amperage spikes wherever possible making the water delivery system's pumps very energy efficient. Water Delivery Facilities energy use is usually stable. Energy use data for The Inventory was sourced from the Town's NYSEG electric bills and as noted above, the accuracy of that data was negatively impacted by NYSEG's COVID-19-related lack of meter reading and inaccurate estimating. Overall water delivery facility energy use declined in 2020 due to a pump shutdown caused by invasive watercress flooding the Cottage Lane area of Peach Lake, submerging a manhole with lake water, and burning out the pump.



Streetlights and Traffic Signals

In 2019, Streetlights and Traffic Signals emitted 30 tCO₂e, accounting for 9% of the Town's Scope 1 and 2 Stationary emissions. In October 2019, North Salem implemented an NYSEG-sponsored energy efficiency LED streetlight program, retrofitting all town streetlights with LED fixtures and bulbs. This initiative led to a reduction in Streetlights and Traffic Signals' reported energy use (and associated energy costs) of 50% and reduced GHG emissions from 30 to 17 tCO₂e. Not all lights included in this sub-sector are streetlights. The overall 2019 to 2020 reduction in emissions from the Streetlights and Traffic Signals sub-sector was 43%. The LED initiative dropped the subsector's contribution to Stationary GHG emissions from 9% to 6%. As noted in the Estimates section of the Inventory, Streetlights and Traffic Signals daily energy use is estimated by NYSEG by multiplying the wattage of each streetlight by the number of non-daylight hours.

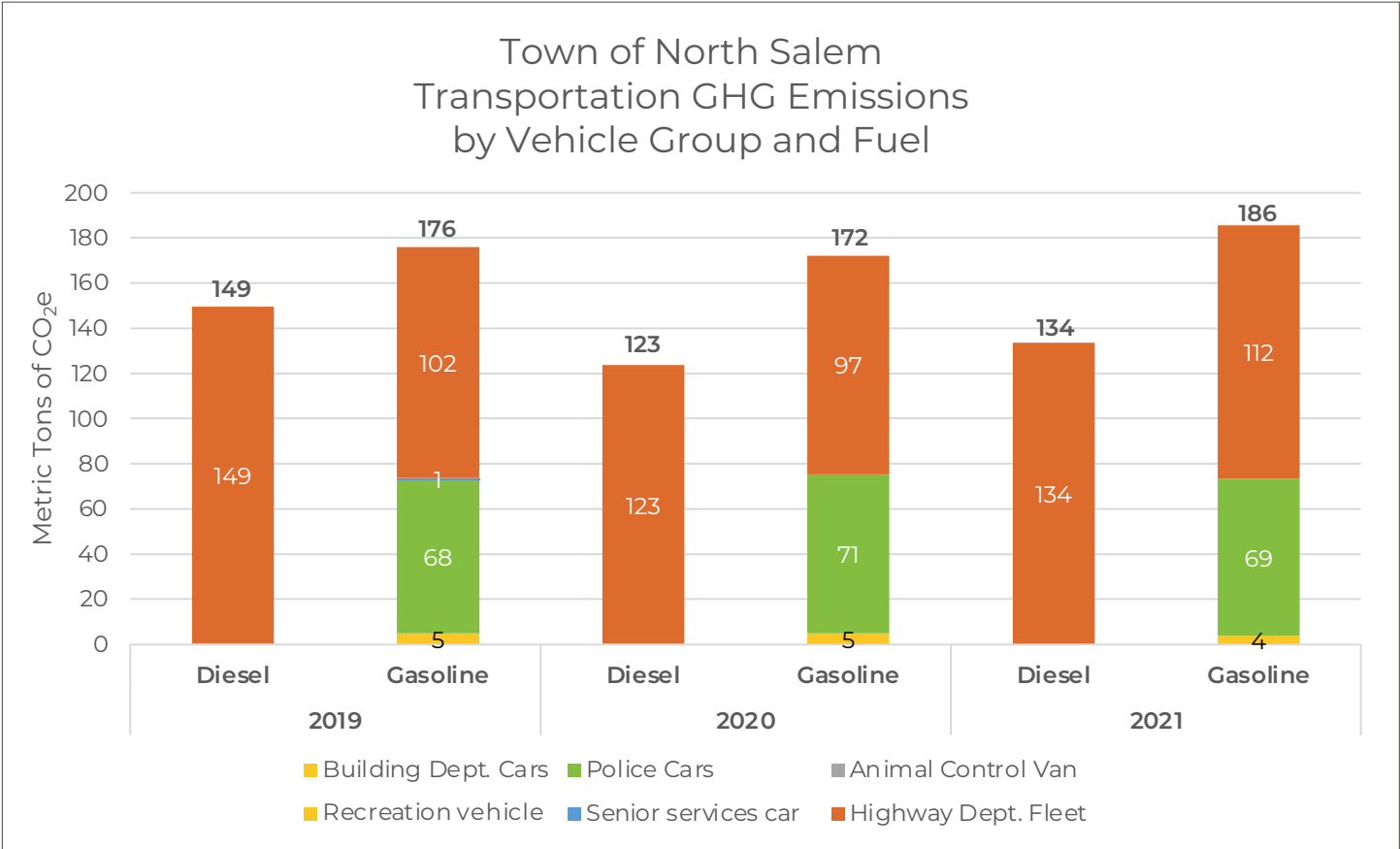


Transportation

Town Fleets

The Transportation sector is responsible for 51% of the Town’s Scope 1 and 2 GHG emissions, on average. Approximately 75% of Transportation sector emissions and 39% of all the Town’s Scope 1 and 2 emissions are attributable to the Highway Department’s fleet of diesel and gasoline powered, internal combustion engine (ICE) vehicles. The fleet includes snowplows, dump trucks, pickup trucks, and lawn maintenance equipment. Please see Appendix D for a list of all Town Fleet vehicles and the fuel they use. ~56% of the Highway Department fleet’s emissions come from diesel-powered vehicles. Although diesel engines are ~20% more thermal efficient than gas-powered engines, translating into 20% better fuel economy, (UTI, 2019) diesel is 16% more GHG intensive than gasoline with a GHG emission factor of 10.21 kg CO₂/gallon compared to gasoline’s 8.78 kg CO₂/gallon. Another 21–24% of Transportation emissions are attributable to the Town’s fleet of gasoline-powered, ICE police cars.

The Transportation sector is responsible for roughly 51% of Scope 1 and 2 GHG emissions. Approximately 75% of Transportation emissions and 39% of all of the Town’s Scope 1 and 2 emissions are attributable to the Highway Department’s diesel and gas-powered, internal combustion engine (ICE) vehicles.



OPPORTUNITIES FOR ENERGY EFFICIENCY, INNOVATION, AND RISK MANAGEMENT

Stationary

Wastewater Facilities and Buildings and Other Facilities are the Town's two largest contributors to Stationary GHG emissions. The Town has already implemented several energy efficiency measures including the NYSEG LED light project and the switch to VFD pumps described above. The Town should consider additional energy efficiency measures, including solar power, to lower electricity related GHG emissions in these two subsectors. #2 fuel oil is the largest energy source of Building and Other Facility emissions. The Town should therefore explore investing in lower emitting heating options such as electric heat pumps and geothermal systems. Prior to the Inventory base year, The Town installed radiant heat floors and improved insulation in the North Salem Highway Department building, lowering the building's heating fuel use significantly and, according to the Town Supervisor "paying dividends". The results of this inventory encourage further investments in energy efficiencies. Ruth Keeler Memorial Library emits the most GHG of Buildings, predominantly due to #2 fuel oil. The library should be targeted for energy efficiency heat pumps, geothermal and solar upgrades. By switching from #2 fuel to a heat pump, the library could lower its emissions by roughly 18 tCO₂e a year or 53% of its total emissions (New Hampshire Electric Co-op, 2021).

Transportation

Transportation was the largest contributor to the Town's combined Scope 1 and 2 emissions in 2020 and 2021 with Highway Department Vehicles responsible for, on average, 77% of Transportation GHG emissions. Conversion of the transportation fleet to EV or hybrid vehicles is the Town's greatest opportunity for energy efficiency and emissions reductions. The Town recently placed orders for three hybrid police cars and a fourth has been donated by a North Salem resident. As mentioned above, diesel engines are more energy efficient than gasoline-powered engines, but diesel has a higher GHG emission factor. The Town should convert as many of its Highway Department Vehicle Fleet as practicable to hybrid or EV. Retrofitting a snowplow truck with a hybrid electric system can reduce emissions by 20% while a plug-in hybrid retrofit can reduce emissions by 33% on average (SnowPlowNews, 2021). Reducing the Highway Department Fleet's 2021 emissions of 246 tCO₂e by 20% would equate to a reduction of 49 tCO₂e which is 8% of the Town's total 2021 Scope 1 and 2 emissions. A 33% reduction in the Highway Department Fleet's 2021 emissions would reduce the Town's overall Scope 1 and 2 emissions 13%.

FUTURE GHG BENCHMARKING AND GOALS

Going forward, a yearly GHG Inventory should be conducted using 2019 as the base year. The yearly GHG inventory should be conducted as soon as a full year of energy use bills are available, in February (if possible) with the yearly GHG Inventory Report to be published in March or April. This Inventory and the Excel document created for The Inventory, including the Activity Data and Stationary and Transportation Emissions templates are tools that can be updated yearly to track the Town's municipal emissions and its progress against GHG emissions reductions goals. The Inventory shows that in three years, from the base year of 2019 to 2021, the Town lowered its Scope 1 and 2 GHG emissions by 10%. It is not unreasonable to suggest that **the Town set a conservative 2030 GHG emissions reduction target of 25% emissions reduction from the 2019 base year levels by 2030.** This would represent a reduction of 166.75 tCO₂e from base year 2019 down to 500.25 tCO₂e total Scope 1 and 2 by 2030. The Town should consider **a stretch 2030 target of 40% reduction** of GHG emissions from 2019 levels which would mean bringing emissions down 266.8 tCO₂e to 400.2 tCO₂e. Recommended "Phase II" GHG inventory and reporting steps are to: include optional indicators from The Protocol Section 13.1.2.4 including "drinking water treated" and "total vehicle miles traveled by on-road vehicles"; conduct a more comprehensive Scope 3 analysis for the Town; and conduct a Community Wide GHG inventory for North Salem.

Recommended Goals



CONCLUSION

The Town has taken proactive energy efficiency and emissions reductions actions but there are ample opportunities for more reductions across Stationary and Transportation sectors. In 2021, transportation-related emissions accounted for 73% of Scope 1 emissions and 53% of all scope 1 and 2 emissions. Converting the Town's Transportation fleets from ICE to hybrid or EV presents the greatest opportunity for rapid emissions reductions. Using solar and heat pumps or geothermal to lower Building and Other Facilities emissions is also an opportunity for further emissions reductions. Conducting yearly GHG Inventories will help the town pinpoint the highest value emissions reductions opportunities. Improving the accuracy of the GHG Inventory data will result in more accurate accounting of current and YoY emissions efforts. Electricity bills reflect inconsistent time periods. YoY, quarter over quarter (QoQ) or month to month energy use and emissions comparisons must be estimated if electric bills are used as the data source. The Consultant recommends recording data from all electric meters at regular monthly, quarterly, or even yearly intervals to increase accuracy of period-over-period emissions data. In addition, one person should be responsible for entering all energy bills into Portfolio Manager and a second person should proof the entries for accuracy. The Inventory demonstrates that the Town is poised to be a Certified CSC and has the potential to be Westchester's leading Clean Energy Community.

Since taking the CSC pledge, the Town has made progress in lowering its GHG emissions. There are opportunities for further reductions. Converting the Town's Transportation fleets from ICE to hybrid or EV presents the greatest opportunity for rapid emissions reductions. Installing solar, heat pumps and/or geothermal to lower Building and Other Facilities emissions is an opportunity for significant emissions reductions as well.

APPENDIX A – EMISSIONS FACTORS, GLOBAL WARMING POTENTIAL AND CONVERSIONS

Emissions Factors, Global Warming Potential and Conversions			
Stationary (Source: GHG Emissions Factors Hub April 2021)			
	(kg CO ₂ /mmBtu)	(kg CH ₄ /mmBtu)	(kg N ₂ O/mmBtu)
Nat Gas	66.88	0.003	0.0006
	(kg CO ₂ /scf)	(kg CH ₄ /scf)	(kg N ₂ O/scf)
Propane	0.15463	0.000007548	0.00000151
Transportation (Source: GHG Emissions Factors Hub April 2021)			
	(kg CO ₂ /gallon)	(kg CH ₄ /gallon) (Agricultural offroad trucks)	(kg N ₂ O/gallon) (Agricultural offroad trucks)
Diesel	10.21	0.00013	0.00049
Motor Gasoline	8.78	0.00724	0.00021
	(kg CO ₂ /gallon)	(kg CH ₄ /gallon)	(kg N ₂ O/gallon)
#2 Fuel Oil	10.21	0.00041	0.00008
Scope 3 Category 7: Employee Commuting (Source: GHG Emissions Factors Hub April 2021)			
	(kg CO ₂ /vehicle-mile)	(kg CH ₄ /vehicle-mile)	(kg N ₂ O/vehicle-mile)
Distance-based Commuting – Passenger Car	0.341	0.000009	0.000008
Electricity – total output emission factors (Source: eGRID 2019 NYCW)			
lbsCO ₂ /MWh	lbsCH ₄ /MWh	lbsN ₂ O/MWh	lbsCO ₂ e/MWh
553.8	0.021	0.002	555.1
kgCO ₂ /MWh	kgCH ₄ /MWh	kgN ₂ O/MWh	kgCO ₂ e/MWh
251.20368	9.53E-03	9.07E-04	251.79336
Global Warming Potential (Source: IPCC AR4)			
CO ₂	1		
CH ₄	25		
N ₂ O	298		
Conversions			
Liters/gallon	3.785	CCF/Therm	1.0
kg/lbs	0.4536	scf/gallon propane	35.97
MMBtu/therm	0.0999761	mmBtu/Therm	0.0999761
Therms/CCF	1.037		

APPENDIX B – 2019–2021 ENERGY USE ACTIVITY DATA BY SOURCE

Sector	Source	Units	Sub-sector	2019 Activity amount	2020 Activity amount	2021 Activity amount	ESTIMATED
	Buildings and Other Facilities						
Stationary Energy	Electricity	kWh	66 June Road	37,933	36,752	43,073	
	Propane Use	gallons	66 June Road	2,654	2,082	2,562	
	Electricity	kWh	Annex	15,678	18,662	15,775	
	B5 #2 fuel oil	gallons	Annex	656	693	694	
	B5 #2 fuel oil	gallons	Lobdell House	1,336	1,384	1,352	
	Electricity	kWh	North Salem Highway Department	60,798	63,096	46,818	
	Natural gas	therms	North Salem Highway Department	2,760	1,893	1,718	
	Electricity	kWh	Ruth Keeler Memorial Library	29,051	23,844	21,411	
	Propane Use	gallons	Ruth Keeler Memorial Library	7	137	-	
	B5 #2 fuel oil	gallons	Ruth Keeler Memorial Library	3,565	2,712	3,033	
	Electricity	kWh	Town Hall	29,967	30,304	29,385	
	B5 #2 fuel oil	gallons	Town Hall	821	930	969	
	Streetlights and Traffic Signals						
	Electricity	kWh	667 Titicus Rd Barn – Balanced Rock Street Light	2,317	3,327	4,449	
	Electricity	kWh	Route 116 Lights	2,247	1,432	1,181	
	Electricity	kWh	PURDYS LTG DIST – Purdy's Lighting District Street Lights	24,355	8,628	8,645	
	Electricity	kWh	Street Lights at Large	16,259	5,182	5,575	
	Electricity	kWh	Croton Falls Lighting District Street Lights	34,734	14,556	16,243	
	Electricity	kWh	Near 28 Sunset Drive – Joe Bohdrum Park Lights	1,156	1,288	1,178	
	Electricity	kWh	4 W CROSS ST LOT LGTS – Parking Lot Lights	15,713	13,921	10,496	
	Electricity	kWh	NEAR 2 CROSS ST PKNG LOT Lights	17,686	14,173	11,066	
	Electricity	kWh	BACK ST LOT LGTS	6,577	6,246	1,963	
	Electricity	kWh	JUNE RD – Courthouse Parking Lot	20	40	18	
	Electricity	kWh	Close Hill Road Christmas Tree	-	-	6,365	
	Water Delivery Facilities						
	Electricity	kWh	JESSITAR RD PUMP – Candlewood Park Water District Well Pum	980	1,046	1,147	
	Electricity	kWh	NASH RD – Candlewood Park Water District Source of Supply	16,217	14,559	9,560	
	Electricity	kWh	LAKEVIEW ROAD – Salem Acres Water District Source of Supply	-	-	9,788	
	Electricity	kWh	8 CLOSE HILL RD Pump Station	107	129	127	
	Electricity	kWh	MAHOPAC AVE PUMP HSE – Croton Falls Water District	46,977	32,191	13,658	
	Electricity	kWh	ROUTE 22 – Croton Falls Water District	57	57	24	
	Electricity	kWh	RIDGEWAY AVE – Sunset Ridge Water District	100,320	69,600	69,760	
	Wastewater Facilities						
	Electricity	kWh	Peach Lake Sewer District – 10 Maple Lane	372,150	340,400	314,800	
	Propane Use	gallons	Peach Lake Sewer District – 10 Maple Lane	7,800	6,899	7,098	
	Electricity	kWh	E PEACH LAKE RD PUMP HOUSE	21,833	14,753	15,178	
	Electricity	kWh	BRIDGE ST PUMP HOUSE – Peach Lake Sewer	8,770	7,105	6,998	
	Vehicle Fleet						
Transportation	Unleaded gasoline	gallons	Highway Trucks – (XX dump trucks, XX plows, XX pickup trucks & XX mowers)	11,348	10,734	12,439	
	Diesel	gallons	Highway Trucks – (XX dump trucks, XX plows, XX pickup trucks & XX mowers)	14,408	11,919	12,898	
	Unleaded gasoline	gallons	7 police cars	7,547	7,822	7,696	
	Diesel	gallons	Animal control	18	17	-	
	Unleaded gasoline	gallons	2 building department cars	536	536	439	
	Unleaded gasoline	gallons	Senior services car	80	-	-	
	Diesel	gallons	Recreation Dept	25	-	-	

APPENDIX C – 2019–2021 SCOPE 1 AND 2 GHG EMISSIONS DATA BY SUBSECTOR AND GASES

Buildings and Other Facilities				
	tCO2	tCH4	tN2O	tCO2e
2019	123.6	5.00E-03	8.14E-04	123.9
Scope 1	80.0	3.35E-03	6.56E-04	80.3
Scope 2	43.6	1.65E-03	1.57E-04	43.7
2020	114.2	4.60E-03	7.36E-04	114.5
Scope 1	70.8	2.95E-03	5.79E-04	71.0
Scope 2	43.4	1.64E-03	1.57E-04	43.5
2021	115.4	4.67E-03	7.66E-04	115.7
Scope 1	76.1	3.18E-03	6.24E-04	76.3
Scope 2	39.3	1.49E-03	1.42E-04	39.4

Wastewater Facilities				
	tCO2	tCH4	tN2O	tCO2e
2019	144.6	5.95E-03	7.89E-04	145.0
Scope 1	43.4	2.12E-03	4.24E-04	43.6
Scope 2	101.2	3.84E-03	3.65E-04	101.4
2020	129.4	5.32E-03	7.03E-04	129.7
Scope 1	38.4	1.87E-03	3.75E-04	38.5
Scope 2	91.0	3.45E-03	3.29E-04	91.2
2021	124.1	5.14E-03	6.91E-04	124.5
Scope 1	39.5	1.93E-03	3.86E-04	39.6
Scope 2	84.6	3.21E-03	3.06E-04	84.8

ESTIMATED

Transportation				
	tCO2	tCH4	tN2O	tCO2e
2019	318.8	1.43E-01	1.12E-02	325.7
Scope 1	318.8	1.43E-01	1.12E-02	325.7
2020	289.5	1.40E-01	9.86E-03	295.9
Scope 1	289.5	1.40E-01	9.86E-03	295.9
2021	312.3	1.51E-01	1.06E-02	319.3
Scope 1	312.3	1.51E-01	1.06E-02	319.3
Streetlights & Traffic Lights				
	tCO2	tCH4	tN2O	tCO2e
2019	30.4	1.15E-03	1.10E-04	30.5
Scope 2	30.4	1.15E-03	1.10E-04	30.5
2020	17.3	6.55E-04	6.24E-05	17.3
Scope 2	17.3	6.55E-04	6.24E-05	17.3
2021	16.9	6.40E-04	6.09E-05	16.9
Scope 2	16.9	6.40E-04	6.09E-05	16.9

Water Delivery Facilities				
	tCO2	tCH4	tN2O	tCO2e
2019	41.4	1.57E-03	1.49E-04	41.5
Scope 2	41.4	1.57E-03	1.49E-04	41.5
2020	29.5	1.12E-03	1.07E-04	29.6
Scope 2	29.5	1.12E-03	1.07E-04	29.6
2021	26.1	9.91E-04	9.44E-05	26.2
Scope 2	26.1	9.91E-04	9.44E-05	26.2

APPENDIX C (CONT.) – 2019–2021 SCOPE 1 AND 2 GHG EMISSIONS DATA BY SOURCES AND GASES

Property	Year	Sector	Sub-sector	Scope	Source	Units	Activity amount	tCO ₂	tCH ₄	tN ₂ O	tCO ₂ e
66 June Road	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	37,933	9.53	3.61E-04	3.44E-05	9.55
66 June Road	2019	Stationary	Buildings and Other Facilities	1	Propane	scf	95,472	14.76	7.21E-04	1.44E-04	14.82
Annex	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	15,678	3.94	1.49E-04	1.42E-05	3.95
Annex	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	656	6.70	2.69E-04	5.25E-05	6.72
Lobdell House	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	1,336	13.64	5.48E-04	1.07E-04	13.68
North Salem Highway Department	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	60,798	15.27	5.79E-04	5.52E-05	15.31
North Salem Highway Department	2019	Stationary	Buildings and Other Facilities	2	Natural gas	mmBtu	276	0.07	8.28E-04	1.66E-04	0.14
Ruth Keeler Memorial Library	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	29,051	7.30	2.77E-04	2.64E-05	7.31
Ruth Keeler Memorial Library	2019	Stationary	Buildings and Other Facilities	1	Propane	scf	255	0.04	1.93E-06	3.86E-07	0.04
Ruth Keeler Memorial Library	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	3,565	36.40	1.46E-03	2.85E-04	36.52
Town Hall	2019	Stationary	Buildings and Other Facilities	2	Electricity	kWh	29,967	7.53	2.85E-04	2.72E-05	7.55
Town Hall	2019	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	821	8.38	3.36E-04	6.57E-05	8.41
Street lights & Parking Lot Lights	2019	Stationary	Streetlights and Traffic Signals	2	Electricity	kWh	121,064	30.41	1.15E-03	1.10E-04	30.48
Water districts, source of supply, well pumps	2019	Stationary	Water Delivery Facilities	2	Electricity	kWh	164,658	41.36	1.57E-03	1.49E-04	41.46
Peach Lake Sewer District	2019	Stationary	Wastewater Facilities	2	Electricity	kWh	372,150	93.49	3.54E-03	3.38E-04	93.70
Peach Lake Sewer District	2019	Stationary	Wastewater Facilities	1	Propane	scf	280,555	43.38	2.12E-03	4.24E-04	43.56
Sewers	2019	Stationary	Wastewater Facilities	2	Electricity	kWh	30,603	7.69	2.92E-04	2.78E-05	7.71
Town Vehicle Fleet	2019	Transportat	Town Vehicle Fleet	1	Gas & Diesel	Gallons		318.83	1.43E-01	1.12E-02	325.74
66 June Road	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	36,752	9.23	3.50E-04	3.33E-05	9.25
66 June Road	2020	Stationary	Buildings and Other Facilities	1	Propane	scf	74,900	11.58	5.65E-04	1.13E-04	11.63
Annex	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	18,662	4.69	1.78E-04	1.69E-05	4.70
Annex	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	693	7.08	2.84E-04	5.55E-05	7.10
Lobdell House	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	1,384	14.13	5.67E-04	1.11E-04	14.18
North Salem Highway Department	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	63,096	15.85	6.01E-04	5.72E-05	15.89
North Salem Highway Department	2020	Stationary	Buildings and Other Facilities	1	Natural gas	mmBtu	189	0.07	5.68E-04	1.14E-04	0.11
Ruth Keeler Memorial Library	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	23,844	5.99	2.27E-04	2.16E-05	6.00
Ruth Keeler Memorial Library	2020	Stationary	Buildings and Other Facilities	1	Propane	scf	4,921	0.76	3.71E-05	7.43E-06	0.76
Ruth Keeler Memorial Library	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	2,712	27.69	1.11E-03	2.17E-04	27.78
Town Hall	2020	Stationary	Buildings and Other Facilities	2	Electricity	kWh	30,304	7.61	2.89E-04	2.75E-05	7.63
Town Hall	2020	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	930	9.50	3.81E-04	7.44E-05	9.53
Street lights & Parking Lot Lights	2020	Stationary	Streetlights and Traffic Signals	2	Electricity	kWh	68,793	17.28	6.55E-04	6.24E-05	17.32
Water districts, source of supply, well pumps	2020	Stationary	Water Delivery Facilities	2	Electricity	kWh	117,582	29.54	1.12E-03	1.07E-04	29.61
Peach Lake Sewer District	2020	Stationary	Wastewater Facilities	2	Electricity	kWh	340,400	85.51	3.24E-03	3.09E-04	85.71
Peach Lake Sewer District	2020	Stationary	Wastewater Facilities	1	Propane	scf	248,139	38.37	1.87E-03	3.75E-04	38.53
Sewers	2020	Stationary	Wastewater Facilities	2	Electricity	kWh	21,858	5.49	2.08E-04	1.98E-05	5.50
Town Vehicle Fleet	2020	Transportat	Town Vehicle Fleet	1	Gas & Diesel	Gallons		289.48	1.40E-01	9.86E-03	295.91
66 June Road	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	43,073	10.82	4.10E-04	3.91E-05	10.85
66 June Road	2021	Stationary	Buildings and Other Facilities	1	Propane	scf	92,153	14.25	6.96E-04	1.39E-04	14.31
Annex	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	15,775	3.96	1.50E-04	1.43E-05	3.97
Annex	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	694	7.08	2.84E-04	5.55E-05	7.11
Lobdell House	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	1,352	13.80	5.54E-04	1.08E-04	13.85
North Salem Highway Department	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	46,818	11.76	4.46E-04	4.25E-05	11.79
North Salem Highway Department	2021	Stationary	Buildings and Other Facilities	1	Natural gas	mmBtu	172	0.07	5.15E-04	1.03E-04	0.11
Ruth Keeler Memorial Library	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	21,411	5.38	2.04E-04	1.94E-05	5.39
Ruth Keeler Memorial Library	2021	Stationary	Buildings and Other Facilities	1	Propane	scf	0	0.00	0.00E+00	0.00E+00	0.00
Ruth Keeler Memorial Library	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	3,033	30.97	1.24E-03	2.43E-04	31.07
Town Hall	2021	Stationary	Buildings and Other Facilities	2	Electricity	kWh	29,385	7.38	2.80E-04	2.67E-05	7.40
Town Hall	2021	Stationary	Buildings and Other Facilities	1	#2 fuel oil	gallons	969	9.89	3.97E-04	7.75E-05	9.92
Street lights & Parking Lot Lights	2021	Stationary	Streetlights and Traffic Signals	2	Electricity	kWh	67,179	16.88	6.40E-04	6.09E-05	16.92
Water districts, source of supply, well pumps	2021	Stationary	Water Delivery Facilities	2	Electricity	kWh	104,064	26.14	9.91E-04	9.44E-05	26.20
Peach Lake Sewer District	2021	Stationary	Wastewater Facilities	2	Electricity	kWh	314,800	79.08	3.00E-03	2.86E-04	79.26
Peach Lake Sewer District	2021	Stationary	Wastewater Facilities	1	Propane	scf	255,329	39.48	1.93E-03	3.86E-04	39.64
Sewers	2021	Stationary	Wastewater Facilities	2	Electricity	kWh	22,176	5.57	2.11E-04	2.01E-05	5.58
Town Vehicle Fleet	2021	Transportat	Town Vehicle Fleet	1	Gas & Diesel	Gallons		312.33	1.51E-01	1.06E-02	319.27
ESTIMATED											

APPENDIX D – 2019–2021 VEHICLE FLEET BY VEHICLE MAKE AND FUEL TYPE USED

North Salem Highway Truck Fleet

<u>TRUCK #</u>	<u>YEAR</u>	<u>MAKE</u>
1A	2018	Ford F350 (Ward) #0588
2	2019	Ford F350 (Bo) #3186
3A	2010	Ford F350 (Ward's old Truck 1) #4586
4	2010	Ford F350 (Bo's old truck 2) #4585
5B	2019	Ford F350 #3185
6		
7B	1986	Chevy Pickup (Surplus) #3410 (old Tk 5A)
8		
9	2022	Freightliner (#2109) - NEW
10A	2009	Freightliner (Surplus) #3140
11A	2002	2002 Freightliner (Surplus) #8488
12A	2008	Freightliner (Surplus) #3012
13	2011	New International #0264
14	1994	International Tank (Surplus) #1439
15	2010	Freightliner (Surplus from CA) #1245
16	1998	Freightliner (Surplus) #2076
17A	2002	- Ford F6S (#01771)
18	2006	Freightliner (Surplus) #4083
19	1995	International (Surplus) #2463
20A	2017	Ford 550 Dump (Van Bortel Ford) #0823
21A	2017	Ford 550 Dump (Van Bortel Ford) #0822
22		
23A	2015	Ford F-550 #3777
24	2012	Ford F550 #9108
25	2006	New Holland Grader #0214
26	2001	Sweeper – Surplus (TX) #8881
27	2006	New Holland Backhoe #4706
28	2016	Komatsu 2016 Wheel Loader
29	2017	New Holland Tractor with Alamo Interstater mower
30		
31	1976	Ford Tractor #6428
32		
33		
34	2011	Case Loader #1569
35		
36	1994	Bucket Truck (Surplus) #3193
37	2016	2016 Freightliner VacAll #6647
38	2016	Skid Steer Loader #8541
39	2002	Dog Control (blue truck) #8256
40		
41		Bandit 18" Chipper
42	2013	Kubota Excavator #26275

APPENDIX E – 2021 SCOPE 3 EMPLOYEE COMMUTATION GHG EMISSIONS

TOWN OF NORTH SALEM 2021 Employee Data

Scope 3: Employee Commuting – GHG Protocol Distance-based Method									
						Yearly Distance-based Commuting GHG Emissions – Passenger Car			
	FULL TIME	PART TIME	RESIDENCY/TRAVEL	Fulltimers daily commute (miles)	Fulltimers yearly commute (miles)	tCO2	tCH4	tN2O	tCO2e
TOWN SUPERVISOR	2	1	2 NS Residents, 1 PT from Brewster 3 days/week	28	6,720	2.29	6.05E-05	5.38E-05	2.31
TOWN BOARD		4	NS Residents		0	0.00	0.00E+00	0.00E+00	0.00
ASSESSOR	2		1 North White Plains, 1 Brewster	74	17,760	6.06	1.60E-04	1.42E-04	6.10
BUILDING DEPT	4		1 NS Resident, 1 Katonah, 1 Peekskill, 1 Mahopac	94	22,560	7.69	2.03E-04	1.80E-04	7.75
FINANCE	1		Travels from Pawling	40	9,600	3.27	8.64E-05	7.68E-05	3.30
HIGHWAY	14		9 NS Residents, 1 Carmel, 3 Brewster, 1 Stormville	247	59,280	20.21	5.34E-04	4.74E-04	20.37
HISTORIAN		1	NS Resident		0	0.00	0.00E+00	0.00E+00	0.00
PLANNING	1		1 Carmel	23	5,520	1.88	4.97E-05	4.42E-05	1.90
POLICE		14	5 NS Residents, 4 Brewster, 1 Somers, 1 Pawling, 2 Carmel, 1 Peekskill		0	0.00	0.00E+00	0.00E+00	0.00
RECREATION	1	5	NS Residents	14	3,360	1.15	3.02E-05	2.69E-05	1.15
TAX RECEIVER	1	1	NS Residents	14	3,360	1.15	3.02E-05	2.69E-05	1.15
TOWN CLERK	2		NS Residents	28	6,720	2.29	6.05E-05	5.38E-05	2.31
TOWN JUSTICE	2	3	NS Residents	28	6,720	2.29	6.05E-05	5.38E-05	2.31
TOTAL	30	29				48.29	1.27E-03	1.13E-03	48.66
North Salem Town Hall (miles) (Source: Google Maps)									
North Salem	14								
Brewster	16								
North White Plains	58								
Katonah	18								
Pawling	40								
Peekskill	40								
Mahopack	22								
Somers	20								
Carmel	23								
Stormville	50								
Working weeks per year, assuming holidays and personal time off (PTO)	48								
Days in a week	5								
Days in a working year	240								

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ACKNOWLEDGMENTS

The Inventory would not have been possible without the generous support and invaluable input of Town Supervisor Warren Lucas, Town Clerk, Maria Hlushko, North Salem Town Councilwoman and Climate Smart Community Program Coordinator Katherine Daniels, Confidential Secretary to the Supervisor, Janine Kourakos, and Town Highway Department Administrative Assistant, S. Gayle Soto. Thank you to Helen Houghton and Maria Hlushko for the providing the photographs. Thank you to Professor Jon Dickinson of Columbia University for his guidance, wisdom and humor.

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