# Public Facilities Committee Report

## City of Newton
## In City Council

### Wednesday, February 17, 2021

Present: Councilors Leary (Chair), Laredo, Kelley, Danberg, Crossley, Gentile, and Norton

Public Safety & Transportation Committee: Councilors Downs (Chair), Malakie, Markiewicz, Bowman, Grossman and Lipof

Programs & Services Committee: Councilors Krintzman (Chair), Greenberg, Albright, Wright, Humphrey, Noel, Baker and Ryan

Absent: Councilor Kalis

City Staff Present: Commissioner of Public Works Jim McGonagle, Co-Directors of Sustainability Ann Berwick and Bill Ferguson, Chief Operating Officer Jonathan Yeo, Senior Planner Jennifer Steel, and Director of Transportation for the Planning Department Nicole Freedman

**#62-21** **Appointment of Barbara Lietzke to the Design Review Committee**
PRESIDENT ALBRIGHT appointing Barbara Lietzke, 68 Highland Avenue, Newton, to the DESIGN REVIEW COMMITTEE as the Community Representative for the duration of the NewCAL project. (60 days: 04/17/21)
**Action:** **Public Facilities Approved 6-0 (Councilor Norton not voting)**

**Note:** Ms. Lietzke explained that she has lived in Newton for over 30 years and has been a real-estate agent for 18 years. She was also the Development Director at the West Suburban YMCA and for the Newton Free Library. Ms. Lietzke noted that she has also volunteered as a member of the League of Women Voters, a board member of the YMCA and a trustee of the Newton Library. Recently, she has joined the Newton Cultural Alliance where they are working on a capital campaign for the restoration of the Nathaniel Allen House. Ms. Lietzke expressed her excitement to be involved in the NewCAL project.

Committee members thanked Ms. Lietzke for her willingness to serve.

Councilor Danberg motioned to approve which passed 6-0 with Councilor Norton not voting.

## Referred to Public Facilities and Finance Committees

**#65-21** **Approve $1,000,000 for snow and ice removal**

HER HONOR THE MAYOR requesting authorization to transfer the sum of one million dollars ($1,000,000) from Acct # 0110498-579400 Comptroller's Reserve for Snow/Ice Removal as follows:

Regular Overtime
(0140123-513010)..... $500,000
Rental Vehicles/Contractors
(0140123-527300)..... $500,000

**Action:** **Public Facilities Approved 6-0 (Councilor Norton not voting)**

**Note:** Commissioner of Public Works, Jim McGonagle presented the request for $1 million for snow/ice removal. Commissioner McGonagle explained that as of February 11, 2021 the City has dealt with 22 snow and ice events with about 52 inches of snow. He noted that depending on the snow expected later in the week the funds may be amended before reaching the Finance Committee. There was $3 million in the DPW budget and $1.5 million in the Comptroller's reserve budget for snow/ice removal.

Councilor Crossley motioned to approve which passed 6-0 with Councilor Norton not voting.

## Referred to Public Facilities and Finance Committees

**#66-21** **Appropriate $447,000 for the Sewer Pump Station Rehabilitation CIP Project 1**

HER HONOR THE MAYOR requesting authorization to appropriate and expend the sum of four hundred and forty-seven thousand dollars ($447,000) from the Sewer Fund Surplus- available for appropriation account to fund the Engineering Design of the Sewer Pump Station Rehabilitation CIP Project 1.

**Action:** **Public Facilities Approved 6-0 (Councilor Norton not voting)**

**Note:** Commissioner of Public Works, Jim McGonagle presented the request to appropriate and expend $447,000 to fund the Engineering Design of the Sewer Pump Station Rehabilitation CIP Project 1. There are 15 Pump Stations across the City and the last time they were updated was in 1991. Commissioner McGonagle noted that the lifespan of the majority of this equipment is 25 to 40 years. The elevation was done last year and the department has prepared a list of the priorities for these repairs. The Commissioner will need to return to the Committee for construction funding and will explain more details about what repairs need to be done. This project is on the CIP.

Commissioner McGonagle explained that some of the pumps are not variable pumps which run at one speed at all times. The new technology will allow the City to purchase variable speed pumps which are more energy efficient. The department has been replacing pumps with the new technology as pumps fail. He noted that it is a part of the City's Climate Action Plan is to have more energy efficient motors.

Councilor Crossley motioned to approve which passed 6-0 with Councilor Norton not voting.

**Chair's Note:** *The Public Safety & Transportation and Programs & Services Committees joined Public Facilities to discuss the following item.*

**#60-20** **Update on the Climate Action Plan**
PUBLIC FACILITIES COMMITTEE requesting updates on the status of the Climate Action Plan.
**Action:** **Public Facilities Held 7-0**

**Note:** The Substantiality Team, including Co-Directors of Sustainability Ann Berwick and Bill Ferguson, Senior Planner Jennifer Steele, Director of Transportation for the Planning Department Nicole Freedman and the Co-Chair of the Citizens' Commission on Energy Halina Brown presented the updates on the Climate Action Plan. The group's presentation is attached.

Councilors asked the following questions:

Q: Is the City considering purchasing large electric vehicles (EV)?

A: Ms. Freedman explained that she has spoken to the fleet manager at DPW regarding the larger vehicles and they are actively investigating what is on the market.

Q: Is there plan to help renters/ landlords with Newton Power Choice?

A: Ms. Berwick explained that landlords may not be opting out of the program and this question will continue to be investigated.

Outstanding questions:

Q: Has there been consideration to partnering with a non-profit to make it easier for people to purchase electric vehicles?

Q: Has the City worked with private shuttle services so that residents could use these resources?

Councilors made the following comments:

Councilors thanked the Sustainability Team, Citizen's Commission on Energy, Green Newton, and others who have helped implement the Climate Action Plan.

Green Newton's Building Standards Committee has been instrumental in zoning ordinances regarding Climate Action Plan.

The Council should receive the complete job description for the new Energy Coach and a time should be set to meet the Energy Coach.

There needs to be an energy assessment of the municipal building envelopes. It was noted that the CPC funds would cover the costs of an assessment if the building is deemed historically significant.

It was noted that there is a need to see if the goals are set high enough within the Climate Action Plan. There is the technology out there to be able to deal with 80% of the greenhouse gasses. The 20% that is more difficult to deal with are gas leaks and the pollution from landfills. For relatively the same cost the City should be able to reach the goal with the 80% in 2040 instead of 2050.

The City needs to look at the goals for the percentage of EVs that should be on the road and find ways to reduce the number of miles traveled. Additionally, the City needs to add more protected bike lanes to encourage more residents to ride bicycles.

The City should track the miles of continuous bikeways, their condition and how many children are biking or walking to school.

There should be consideration to putting a councilor on the Sustainability Team who would be able to translate the work into proposed ordinances.

There is new construction happening throughout the City that are not using green technology, and this should be addressed.

A resident should be able to reach the Energy Coach portion of the City's website easily.

Ms. Brown gave the committees a brief demonstration on how to find that portion of the website. The link is as follows https://www.newtonma.gov/government/sustainability-and-climate

It was noted that there is minimal public transportation on the south side of the City and this needs to be resolved. Blue Bikes on this side of the City should also be investigated.

In the new Trio Development, there are two EV parking spots, but one is also a handicapped spot. There should be more EV parking spots and ports in these developments.

The City is limited to changing ordinances because of state law and regulations. Newton can't challenge state law except by Home Rule Petition. This will be discussed in regard to electrification.

Ms. Brown noted that the HERS rating for buildings should be listed in a way so that the public can see them.

The Council should receive more frequent updates on the implementation of the Climate Action Plan.

Councilor Danberg motion to hold which passed unanimously.

**#294-20** **Discussion to require or encourage the use of efficient electric technology**
COUNCILORS CROSSLEY, KELLEY, LEARY, NORTON, ALBRIGHT, GREENBERG, AUCHINCLOSS, MARKIEWICZ, NOEL, DANBERG, KALIS, DOWNS, LAREDO & HUMPHREY requesting a discussion with the Sustainability Team to consider creating an ordinance that may require and/or encourage the use of efficient electric technology for heating, cooling, hot water, cooking and other appliances in new and substantially renovated buildings.

**Action:** **Public Facilities Held 7-0**

**Note:** Ann Berwick, Co-Director of Sustainability explained that the question before the committee is should it be required/encouraged for new construction and substantially renovated buildings use efficient electric technology for heating, cooling, hot water, cooking and other appliances. The Attorney General has ruled on the Town of Brookline's attempt to require this and has said that a city or town can't take this action because it goes against state law. In order for a city to do this they would need to be authorized by a Home Rule Petition. Ms. Berwick noted that several communities in Massachusetts are working on or have approved Home Rule Petitions.

The Chair noted that tonight's discussion is based on whether Newton should draft a Home Rule Petition. Andrew Lee, Assistant City Solicitor, provided the attached memo on the subject.

Councilors made the following comments:

The Committee will need to have a conversation on how they would want to draft the petition. There will also need to be a discussion if the petition should be broader so there is more flexibility when drafting ordinances and because technology is changing quickly.

There needs to be a more in-depth conversation on what new a substantially renovated building is. Additionally, there needs to be more research on what this will cost a resident. It was noted that there should be a conversation with the community on electrification.

Ms. Berwick noted that the installation cost and heating cost are comparable, which is shown in her attached cost comparison chart. Natural Gas is cheaper right now by that could change for a number of reasons.

It was noted that Inspectional Services has a definition for substantially renovated buildings and the Council would need to decide if they are comfortable with that definition.

The Committee does need to hear from an opposing side of the argument so that an informed decision can be made. Developers should also be brought in to these conversations. There is a concern on mandating electrification on residents in their homes for new construction or substantially renovated buildings. It was noted that there is a need to be able to have a back-up in case of emergencies.

The Chair noted that she will take recommendations from councilors on who should be invited to this discussion.

Natural Gas is dangerous to the environment and to be able to move forward in improving the climate there must be the elimination of fossil fuels. The electrification of buildings is vital to the City's Climate Action Plan.

Fossil fuels could be used as a back-up in case of emergencies once homes have been changed to all electric.

New construction regardless if it is residential or commercial should be required to use efficient electric technology for heating, cooling, hot water, cooking and other appliances.

Councilor Laredo motioned to hold which passed unanimously.

The Committee adjourned at 9:38 p.m.

**Respectfully Submitted,**

**Alison M. Leary, Chair**

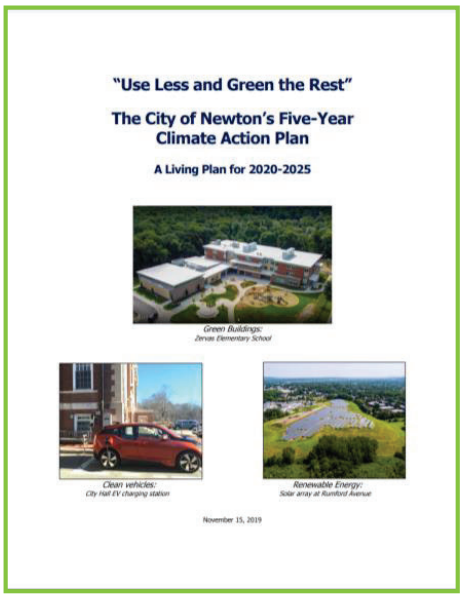
# City of Newton's Climate Action Plan Annual Status Report

February 2021

## Background

The City's **5-Year** Climate Action Plan (CAP) outlines the steps the City will take from 2020-2025 to significantly reduce greenhouse gas emissions across the community and meet our goal of a carbon-neutral Newton by 2050.

- **Adopted December 2019**
- **Sets strategies, milestones, and metrics**
- **Has 60+ actions** over the following areas
  A. Administration
  B. Clean/Renewable Energy
  C. Green Transportation
  D. New Construction
  E. Existing Buildings
  F. Consumption & Disposal
- **Actions and metrics are added as we learn**



# Top 10 Strategies

**2020 was a year of laying foundations** … and dealing with COVID-related challenges. These are the strategies identified in the CAP.

1. Form City **implementation team**
2. Work with **NCCE** and other **partners**
3. Increase **green mobility** (biking, walking, shuttles, etc.)
4. Advocate for more **progressive building codes**
5. Update zoning to incentivize **high-efficiency performance**, such as Passive House and/or net-zero new construction
6. Increase the amount of electricity provided by New England renewable energy resources through **Newton Power Choice** and the **City's municipal energy contract**.
7. "**Green**" **municipal operations**
8. **Incentivize EV ownership** to achieve 10% goal
9. Encourage **electrification of heating and cooling**
10. **Engage residents and businesses** to reduce GHG emissions

# The Team

Creating and implementing this vision is a **collaborative effort** of City staff, the Newton Citizens Commission on Energy, and many other invaluable partners.

- **City**
  - Mayor's Office
  - Schools
  - Sustainability
  - Planning
  - Inspectional Services Dept. (ISD)
  - Public Works
  - Public Buildings
  - Transportation
  - Newton Citizens Commission on Energy (NCCE)
- **Partners**
  - Building Standards Committee
  - Green Newton
  - HeatSmart Newton
  - EV Task Force
  - 350 Mass-Newton Node
  - Communications Strategy Group
  - Mothers Out Front
  - Volunteer Citizen Advisors/Coaches
  - Eversource & National Grid
  - … and so many more!

# Actions Taken To-Date

## A. Administration (Actions Taken)

- Formed **City team** which meets bi-weekly
- Work closely with **volunteer team** which meets regularly
- Organized **project-based working groups** (**City staff & partners**)
- Developed a master **tracking** spreadsheet
- Created and filled **City Energy Coach** position
- Secured **MOU w/ Utilities** & began implementation
- Partnered with **UMass/Mt. Ida's Living Lab** courses
- Created **City Sustainability website** linked to:
  - Green Newton & MassEnergize's **Take-Action website**
  - **Volunteer Energy Coach website**
  - **EV Taskforce website**

# B. Clean Energy (Actions Taken)

- **Solar Phase 1 & 2 = 12 projects *(complete)*** → **4.4** MkWh/yr → **$ 577 K** per year
- **Solar Phase 3 = 17 projects** *(in progress*)* → **3.7** MkWh/yr → **$ 167 K** per year
  - Roof Installations
    - **FD #3, Ed Center, Zervas**, Cabot*, Carr*, Angier*, and Williams* Schools
  - Carport Installations
    - **NNHS #1**, **NNHS #2**, Newton Free Library*, Ed Center*, Pleasant Street Parking Lot*; Wheeler Road Parking Lot*; and Memorial-Spaulding*, Mason Rice*, Brown*, Oak Hill* Schools

**Total Municipal Solar Production (all phases) = 40% of annual municipal electricity use**

**8.0** MkWh/yr

**$ 740 K** per year

# B. Clean Energy (Actions Taken, cont'd)

- **Newton Power Choice**
  - Adopted **1st contract** with **62%** MA Class 1 RECS as default
    - 8 % (1,974 customers) opted to 100% under 1st contract
  - Adopted **2nd contract** with **80%** MA Class 1 RECS as default, see graphic

# C. Green Transportation (Actions Taken)

- **Bluebikes bikeshare** and **Park & Pedal stations**
  - Installed 8 Bluebikes bikeshare stations (2020)
  - Installed 3 Park & Pedal electric bike rental stations – Albemarle Field, Forte Park, City Hall (2020)
- **Bike Lanes**
  - Installed 4.3 miles of bike lane - NSHS, Walnut St., Comm. Ave Nahanton St., Braeland Ave., Washington St., (2019)
  - Installed 0.4 miles of bike lane - Hagen Rd., Crafts St. (2020)
- **Bike Racks**
  - Installed 28 racks in multiple village centers (2018)
  - Installed 35 racks and 2 shelters installed at 19 schools and 3 village centers (2019)



# C. Green Transportation (Actions Taken cont.)

- **Electrifying the City Fleet**
  - Currently all non-emergency sedans are EVs (32 vehicles)
- **EV charging stations**
  - Installed 7 chargers - War Memorial 5, NSHS, and Elliot Yard (2018)
  - Installed 3 chargers - Richardson, 110 Crafts, and Lexington lots (2019)
- **Electric car-share: GreenSpot** public-private partnership

  GreenSpot pays the City for space to provide cars and charging stations
  - Operational: Richardson and Lexington
  - Pending: Adams, Pearl, and Austin
- **Private electric vehicles**
  - Newton (at 1.3%) is ahead of many other municipalities in EV ownership

# D. New Construction (Actions Taken)

- **City Zoning Ordinance Amendments**
  - Passed **Setbacks** (Ch. 30 §1.5)
    - Heat pump compressors, exterior insulation & vestibules may project
  - Passed **Sustainable Development Design** (Ch. 30 §5.13)
    - Purpose: Increase renewable energy, electrification, EV chargers, and high-efficiency buildings; and minimize embedded carbon and waste in and from construction
    - Requires a green building rating system for new construction > 20K sf & major renovation
  - Docketed **Special Permit Review** (Ch. 30 §7.3)
    - Grant of Permit, 5th criterion: "contribute significantly to the efficient use and conservation of natural resources and energy" (§7.3.3.C.5)
    - Site Plan Approval, criterion: "Significant contribution to the efficient use and conservation of natural resources and energy" (§7.4.5.B.8)
- **Major Developments**
  - **Riverside** will meet LEED Neighborhood and be partly electrified and Passive House
  - **Northland** will meet LEED Neighborhood standard and be partly electrified and Passive House
  - **Riverdale** will meet LEED Residential standards and be partly electrified and Passive House
  - **Dunstan East** (under appeal) will undertake a Passive House feasibility study

# E. Existing Buildings (Actions Taken)

- **Support Residents/Contractors in Energy Performance Upgrades**
  - **City Energy Coach hired – Welcome Liora Silkes!**
    - Assist residents, contractors, and developers
  - **Energy Coach website** *(City and NCCE)*
    - Expert citizen coaches and City Energy Coach provide 1:1 advice
  - **HeatSmart Program**
    - 2 installers, webpage, marketing initiatives,
    - 36 contracts signed (~$^1/_3$ for "whole house" installations)
  - **Home Energy Rating System (HERS) rating in Assessor's database and on map**
  - **City website**
    - Links to **City programs**, **MassEnergize Take Action webpage** (*Green Newton)* **& Energy Coach website** *(NCCE)*

HEATSMART NEWTON COOLSMART Sponsored by the City of Newton

NEWTON CLIMATE ACTION Official Partner

# E. Existing Buildings (Actions Taken)

- **Improve City Buildings** (*Public Buildings Dept.)*
  - Converted the **Auburndale Library from oil/steam heating to an electric heat pump**
  - Developed **heating transition plan for 687 Watertown St** (Horace Mann School) using electric heat pumps
  - Implemented "**Public Building Design & Construction Sustainability Guidelines**"
  - Converted to **LED lighting** at NSHS and DPW/Utilities Dept. building
  - Implemented **Solar Phases 1 and 2 (complete),** and **Phase 3 (in progress)**

# F. Consumption & Disposal (Actions Taken)

- **Composting**
  - **Black Earth Compost** curbside collection program subscriptions rose from 1,200 to 2,000 households
  - Launched **organics drop-off pilot** at Resource Recovery Center on Rumford Ave.

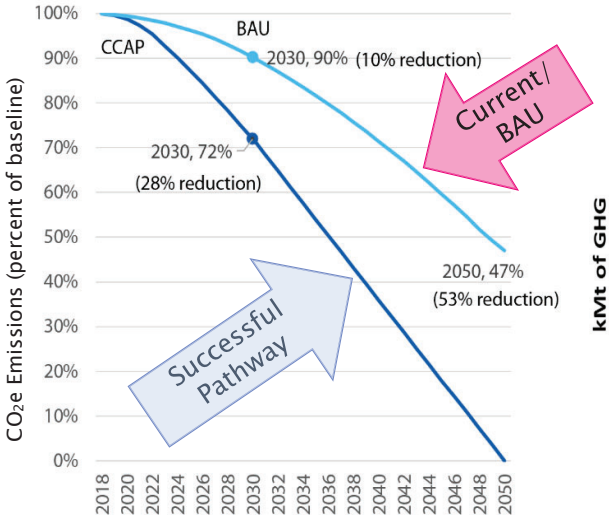

- **Tree Planting**
  - Advertised a tree planting program in **Newton's Sister City, San Juan del Sur, Nicaragua** for cost-effective carbon sequestration

# Outcomes

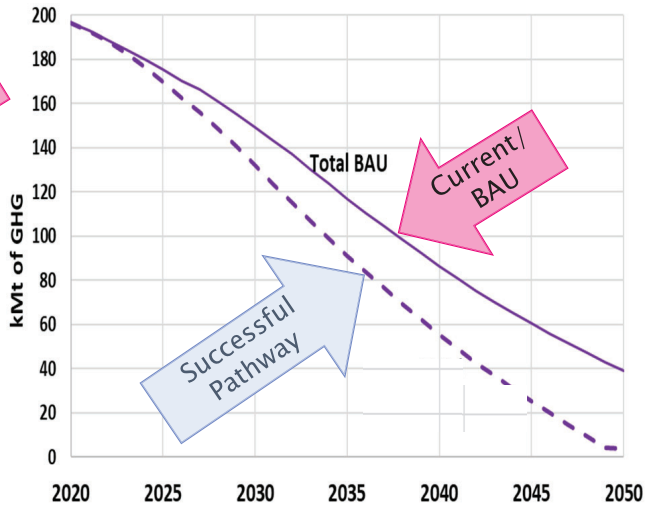
## Pathways to Success: Dramatic Changes Needed

***Graphic from the Citizens' Climate Action Plan***

### Residential Sector




### Transportation Sector



# Original Metrics from CAP

| Metrics | 2025 Milestones | 2050 Goals |
|---|---|---|
| **B. Clean Energy** | | |
| Percent renewables as Newton Power Choice base | 100% | 100% |
| Percent of residents opted up to 100% NPC match | 15% | n.a. |
| **C. Transportation** | | |
| Percent reduction in vehicle miles traveled | 5% | 20% |
| Percent of private cars in Newton that are electric | 10% | 100% |
| **D. New Construction** | | |
| Percent of all-electric buildings | 100% | 100% |
| **E. Existing Residential Buildings** | | |
| Number of home energy (re)assessments/year | 4000 | TBD |
| Number of insulation installations/year | 800 | all homes are insulated |
| Number of heat pump installations/year | 450 | all homes have heat pumps |
| Percent reduction in total energy consumption | 3% | 20% |
| Percent of all-electric buildings | 5% | 100% |
| **F. Existing Commercial Buildings** | | |
| Percent reduction in total energy consumption | 15% | 50% |

# New Metrics Going Forward

| Metric | Occurrences 2020 | MOU 2021 Goal | 2025 Milestone | 2050 Goal |
|---|---|---|---|---|
| **B. Clean energy** | | | | |
| 1. Default or standard level of MA Class 1 RECs under NPC | 80% | N/A | 100% | 100% |
| 2. # of small-scale solar installations in Newton | 177 | No goal set | No goal set | No goal set |
| 3. # of large-scale solar installations in Newton | 29 | No goal set | No goal set | No goal set |
| **C. Transportation** | | | | |
| 4. % (and #) of vehicles registered in Newton that are EVs | 1.3% (913) | N/A | 10% | 100% |
| 5. # of EV charging stations available to the public in Newton | 102 ports,16 loc | No goal set | No goal set | No goal set |
| 6. # (and % reduction) of vehicle miles traveled | No data yet | N/A | 5% | 20% |
| **D. New Construction and Major ("Gut") Renovations** | | | | |
| 7. Average HERS rating in Newton (compare to requirement of 55) | 50.4 | N/A | No goal set | No goal set |
| 8. % per year new housing units that are heat pump electric-heated | No data yet | N/A | 100% | 100% |
| 9. % per year of commercial/retail buildings heated using all-electric | No data yet | N/A | 100% | 100% |
| 10. # of Mass Save RNC* project participations (low rise 1-4 units) | No data yet | 75 | ~100 | No goal yet |
| 11. # of Mass Save RNC* project participants (renovations/additions) | No data yet | 15 | ~50 | No goal yet |
| **E. Existing Residential Buildings** | | | | |
| 12. # of Mass Save energy assessments per year (2019 + 2020) | 1964 | 2135 | 4000 | TBD |
| 13. # of insulation installations per year (2019 + 2020) | 580 | 640 | 800 | all homes |
| 14. # of heat pump installations per year (through HeatSmart, 2020) | 36 | 62 | 450 | all homes |
| **F. Existing Commercial Buildings** | | | | |
| 15. # of Mass Save energy assessments | No data yet | 175 | 225 | N/A |
| 16. # of Mass Save project implementations | No data yet | 95 | N/A | N/A |

**RNC= Residential New Construction*

# New Metrics – Data Sources

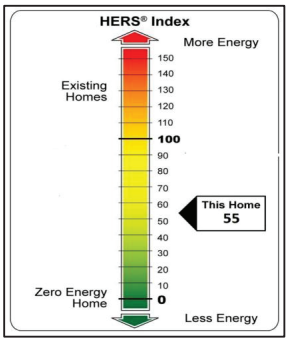
| Metric | Source of data |
|---|---|
| **B. Clean energy** | |
| 1. Default or standard level of MA Class 1 RECs under NPC | Peregrine Energy Group |
| 2. # of small-scale solar installations in Newton | Production Tracking System https://www.mass.gov/doc/smart-solar-tariff-generation-units |
| 3. # of large-scale solar installations in Newton | |
| **C. Transportation** | |
| 4. % (and #) of vehicles registered in Newton that are EVs | https://mor-ev.org/program-statistics and Assessing database |
| 5. # of EV charging stations available to the public in Newton | Plugshare https://www.plugshare.com/ |
| 6. # (and % reduction) of vehicle miles traveled | https://datacommon.mapc.org/browser/datasets/330 |
| **D. New Construction and Major ("Gut") Renovations** | |
| 7. Average HERS rating in Newton (compare to requirement of 55) | Assessor's Database |
| 8. % per year new housing units that are heat pump electric-heated | Special Permits and Building Permits |
| 9. % per year of commercial/retail buildings heated using all-electric | Special Permits and Building Permits |
| 10. # of Mass Save RNC* project participations (low rise 1-4 units) | Utility Quarterly Reports |
| 11. # of Mass Save RNC* project participants (renovations/additions) | Utility Quarterly Reports |
| **E. Existing Residential Buildings** | |
| 12. # of Mass Save energy assessments per year (2019 + 2020) | Utility Quarterly Reports |
| 13. # of insulation installations per year (2019 + 2020) | Utility Quarterly Reports |
| 14. # of heat pump installations per year (through HeatSmart, 2020) | Utility Quarterly Reports |
| **F. Existing Commercial Buildings** | |
| 15. # of Mass Save energy assessments | Utility Quarterly Reports |
| 16. # of Mass Save project implementations | Utility Quarterly Reports |

# Next Steps: Priority Actions for 2021

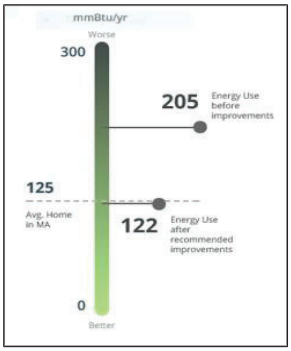
# Priority Actions for 2021

## Existing Buildings (E): Heat Pumps & Insulation

- Conduct **targeted marketing** *(Energy Coach with grassroots organizations, realtors, and utilities)*
- Facilitate **training of contractors** in heat pumps and energy saving *(Energy Coach through Utilities MOU)*
- Investigate **regulatory policies regarding efficiency retrofits** *(NCCE and Sustainability)* e.g.:
  - Requiring contractors to include energy saving options in their proposals
  - Requiring (and posting) a Scorecard for home renovations above a yet-to-be-determined size
- Implement the **UMass/Mt Ida's Living Lab course** *(City Team with UMass/Mt. Ida and Jumbo Capital)*




**HERS** Index used by construction industry




**Scorecard** developed by MA Dept of Energy Resources (DOER)

# Priority Actions for 2021 (continued)

## New Construction/Major Renovations (D)

- Promote **building electrification**
  - Consider regulatory means to require electrification *(State Leg. & City Council)*
  - Educate regarding electrification during design and review *(Energy Coach and Planning Dept., DRTs)*
- Promote **building efficiency**
  - Update Zoning Ordinance to increase energy efficient and electrified construction and appropriately dense village centers *(City Council)*
  - Develop a sustainability special permit criterion for residential buildings *(City Council)*
  - Streamline HERS data management using new system *(ISD)*
  - Continue to promote Passive House and electrification in large developments *(Building Standards Committee and City Council)*
  - Continue advocacy for Net Zero Stretch Code *(Mayor, City Council)*

# Priority Actions for 2021 (continued)

## Green Transportation (C)

- **Install more EV chargers** in public locations *(Public Buildings and DPW)*
  - 3 at public parking lots (Adams Lot = 1, Pearl Lot = 1, Austin Lot = 1 )
  - 8 at public buildings (NNHS = 4, Library = 4)
  - 14 at the municipal solar canopies
- **Advance** 7.9 miles of **bike lanes** *(Planning and DPW)*
  - Beacon Street, Parker Street
  - Protected: West Newton Square, Needham Street, Hammond Pond Parkway, Washington Street, Carriageway
- Develop a plan to **promote adoption of EVs** *(grassroots organizations)*
- **Purchase 3 PHEV SUVs & 1 PHEV sedan** for City use *(DPW)*

# Priority Actions for 2021 (continued)

## Administrative (A)

- Activate **Implementation Strategy Group**, take advantage of talent
- Initiate **Energy Coach communications**, e.g., e-mails, DRTs *(Energy Coach)*
- **Advocate** for state climate/energy legislation and building codes *(Sust.)*
- Strengthen City **messaging**, e.g., "Climate in Everything" *(Sustainability)*
- Develop a plan to include **equity** in the City's energy programs *(Sust.)*
- Update **GHG inventory** and analysis *(NCCE)*
- Work with Utilities to develop **data sharing** protocols *(Sustainability)*
- Develop an integrated system for effective data gathering and **metrics tracking** *(Sustainability)*

# Priority Actions for 2021 (continued)

## Clean Energy (B)

- Celebrate **City's electricity supply** increasing its share of "100% Massachusetts Class 1 Renewables" from 5% to 10% *(everyone)*
- Discuss **City's next electricity contract** and the most effective use of City funds *(Mayor's Office, Sustainability)*
- Finish **Solar Phase 3** *(Sustainability, Public Buildings)*
- Oversee **Newton Power Choice 2nd contract** at 80% green energy default *(Sustainability)*

# Use Less, Green the Rest: Accomplishments, Challenges, and Opportunities

**Thank you, City Council.**
**We look forward to working closely with you to achieve the goals of the CAP!**

TO: Public Facilities Committee
FROM: Councilors Alison Leary & Emily Norton
RE: Building Electrification: Next Steps
DATE: February 17, 2021

The Public Facilities Committee has been discussing the concept of building electrification since December 2019, because replacing fossil fuels with renewable sources of energy is a key strategy for reducing greenhouse gas emissions.

- The Newton Climate Action Plan (adopted 2019) lists building electrification as an important component to fight climate change and achieve net zero greenhouse gas emissions by 2050.
- Building electrification is referenced in Governor Baker's Interim Clean Energy and Climate Plan for 2030: "increasing building energy efficiency and electrifying end uses, especially heating, represent a significant opportunity to decrease emissions from this sector while reducing homeowner costs and increasing comfort."

Over the last year we have held meetings with speakers discussing high efficiency electric powered heating and cooling technologies and their relative costs. From these presentations it is clear there are many technologies available for heating one's home and/or water. As Sustainability Co-Director Ann Berwick's October 5, 2020 memo lays out, the cost estimates were quite varied, but as we are only talking about new construction and major renovations, the cost differential for heat pump technologies versus gas-fired combustion is well under 1% of the annual operating costs of a new home in Newton. In addition it is expected that over time costs for heat pumps will come down with increased market demand, as they have for all other new technologies (computers, cell phones, solar panels, wind turbines).

**Possible Next Steps**

The City Council may initiate a home rule petition.

One of the options we discussed early on in committee was to seek an ordinance requiring that new construction and major renovations use only electric-powered, high efficiency heating technologies (i.e., heat pumps) to reduce or eliminate the on-site combustion of fossil fuels (oil or natural gas). Unfortunately it appears Newton does not have authority under State law to take such a step, as evidenced by Attorney General Healey striking down Brookline's by-law requiring electrification in new construction.

What the City Council may do is send a home rule petition to the State Legislature requesting authority for the City of Newton to pass an ordinance requiring the electrification of heating and cooling in new construction and significant renovations. Arlington and Brookline have already approved Home Rule petitions. Lexington, Acton, Concord, and Belmont are moving forward. A couple of others cities are moving forward as well, but don't have confirmed dates for consideration.

Anyone following the recent news might reasonably ask, “Will a net-zero stretch code obviate the need for a building electrification ordinance?” The state legislature voted in favor of an ambitious climate change bill in December that was subsequently vetoed by Governor Baker, but the legislature recently approved the same Bill. It was approved by a veto-proof majority so it will likely pass, although possibly with amendments. It includes a directive to create a “net-zero” stretch code, but this code would not necessarily eliminate the need for an electrification requirement. This is because, at one end of the spectrum, a net-zero stretch code could be written so as to explicitly require electrification; at the other end, a net-zero code could allow low-value offsets to compensate for significant on-site deficits. It is highly unlikely that a net-zero code will require electrification, and likely that it will include a good deal of flexibility.

The Council should consider whether it wishes to initiate a home rule petition, along with several neighboring communities.

**CITY OF NEWTON**
**LAW DEPARTMENT MEMORANDUM**

DATE: February 11, 2021

TO: Allison Leary, Chair of Public Facilities Committee
All Members, Public Facilities Committee

FROM: Andrew S. Lee, Assistant City Solicitor

RE: Home Rule Petition

The Chair of the Public Facilities Committee has requested that the law department explain the requirements and procedural steps for the City of Newton to seek special legislation.

1. **The Home Rule Amendment**

The Home Rule Amendment to the Massachusetts Constitution, adopted in 1966, affirmed the right of municipalities to self-government and to the exercise of powers not inconsistent with Massachusetts law. M.G.L. c. 43B. Under the Home Rule Amendment "any city or town may, by the adoption, amendment, or repeal of local ordinances or by-laws, exercise any power or function which the General Court has power to confer upon it, which is not inconsistent with the constitution or laws enacted by the general court in conformity with the powers reserved to the General Court…" Bloom v. City of Worcester, 363 Mass. 136, 145 (1973).

The clear limitation on a municipality's authority under the Home Rule Amendment is that any local legislation must not be inconsistent with state law. A local ordinance is beyond the scope of a municipality's general Home Rule authority if it is either: 1. facially inconsistent with state law; or 2. The ordinance frustrates the purpose of state legislation that was intended to preempt local regulation of the subject matter.

Section 8 of the Home Rule Amendment authorizes a municipality to petition the General Court for special legislation, known as a Home Rule Petition. A Home Rule Petition may seek specific authority for a municipality to enact local legislation that would otherwise be beyond the municipality's general Home Rule authority. If the special legislation is approved, the resulting local action or ordinance is safe guarded against attacks to the enacting municipality's legal authority.

2. **Home Rule Petition Process**

Local Approval – Section 8(1) of the Home Rule Amendment requires that a Home Rule Petition must be approved by the City Council. In Newton, the approval to file the petition with the General Court requires a simple majority vote of all City Councilors present and voting, provided a quorum is present. The petition must also be filed with the approval of the Mayor. The Mayor's decision to not approve the filing of the petition cannot be overridden by local veto procedures.

Form of the Home Rule Petition – There is no particular form of a Home Rule Petition prescribed in Section 8(1). Typically, the vote of the City Council authorizing the Mayor to petition the General Court is accompanied by a draft bill. The draft bill often identifies the state law that either requires or is inconsistent with the proposed special legislation and sets forth the requested local authority. The law department assists the City Council or the Mayor in drafting the petition. Although not required, a municipality may add a condition on the draft bill that the special legislation, once approved by the General Court, requires acceptance by the municipality's voters at an election. Whether to add such a condition is a policy decision and is recommended for controversial proposals.

Filing the Home Rule Petition – Once the City Council and Mayor approve the submission of the Home Rule Petition, a copy of the Petition certified by the City Clerk will be sent to a representative of Newton's local legislative delegation with a request that it be filed on the City's behalf. The General Court has its term to approve the special legislation.

AGB draft, 10.2.20

To: Public Facilities Committee
From: Ann Berwick, Co-Director of Sustainability
Re: Relative Cost of Gas versus Heat Pump System for New Residential Construction
Date: October 5, 2020

I've tried here to answer four questions for **new residential construction**[1]:

1. Which is more expensive to purchase and install: a gas-fueled[2] or an electric heat pump system for heating, cooling, and hot water?
2. What are the relative annual operating costs of these systems?
3. If only a water heater is installed, is a heat pump or gas water heater more expensive?
4. On this stand-alone basis, how do the annual operating costs of these hot water heaters compare?

**Executive Summary**

It's impossible to give a precise answer to these questions. Everyone who tries to estimate these costs, as well as studies of the issue, make different assumptions (for example, size and design of the house, local labor costs, local climate, amount of home insulation, quality of system installed, future prices of gas versus electricity).

That said, here's what various estimates tell us about heat pump technology in new residential construction:

- Equipment/installation costs for gas versus heat pump heating, cooling, and hot water systems are comparable.
- Annual operating costs for a heat pump heating, cooling, and hot water system is probably at least $500 more than for a gas system. That is largely a function of the relative cost of electricity and natural gas.
- Equipment/installation costs for a gas versus a heat pump water heater, on a stand-alone basis, are hard to determine. This is the area where the estimates are least aligned, perhaps because I've been able to find more estimates for water heaters than for whole system installations.

[1] For both annual operating costs and installation costs, it is important to note that estimates refer to new home construction and not to retrofits.

[2] Throughout, the comparison is of gas to heat pumps. No one would build a new home in Newton using oil or propane for heating. Heat pumps would always win on cost as compared to these other fuels.

  - Comparing a more commonly used tank variety water heater to a heat pump water heater, the heat pump is more expensive by about $1,000 to $1,400.
  - Comparing a less commonly used tankless type of gas water heater to a heat pump water heater, by some estimates the gas heater is more expensive.

- Annual operating costs for a gas versus heat pump water heater, on a stand-alone basis, are very similar.

I draw two overall conclusions:

1. An expert from New Ecology, Inc.[3] opined to me, "There is more variability among the gas and electric system options than there is between the two on price." This seems to me, when all is said and done, the most useful conclusion.
2. Heat pump technology is not, given current policy, a money-saver; nor are its additional costs, if any, burdensome in the context of new home construction in Newton (at well less than 1% of annual home ownership costs). Of course, all of these cost comparisons could look quite different—and more favorable for heat pump technology—with a price on carbon and a greener electric grid.

**Discussion**

These are my information sources:

- Jeremy Koo (Cadmus Group) and Jesse Gray (Brookline Town Meeting member) presented their estimates to the Public Facilities Committee of the Newton City Council.
- The NMR Group published a report on the relative costs of gas versus heat pump systems (based on new home construction in Worcester)[4].
- Bill Ferguson estimated costs separately from these three, based on empirical inquiry as opposed to modeling. (Bill's estimates are for installation, but not annual operating expenses.)
- For different types of water heaters, Consumer Reports gives equipment, purchase, and operating costs[5].
- I spoke with various energy experts.

However, it emerged that both Jeremy's and Jesse's estimates derive from the same NMR report, although they contain significant adjustments: in Jeremy's case, for labor costs in

[3] Email communication from Tom Chase, New Ecology, Inc., to Ann Berwick, July 29, 2020.

[4] RLPNC 17-14: "Mini-Split Heat Pump Incremental Costs Assessment," Final Report, NMR Group, Inc., November 27, 2018.

[5] "Tankless Water Heaters vs. Storage Tank Water Heaters," Consumer Reports, January 25, 2019, https://www.consumerreports.org/water-heaters/tankless-water-heaters-vs-storage-tank-water-heaters/.

Newton (as compared to labor costs in Worcester, as modeled in the NMR report) and for ducting[6]; in Jesse's case, for the availability of State rebates and incentives.

I also reviewed the Rocky Mountain Institute (RMI) report, *The Economics of Electrifying Buildings* (2018)[7], and discussed the relative cost issues with staff at New Ecology, Inc. and with other experts.

**Equipment/installation costs for gas versus heat pump heating, cooling, and hot water systems**

Although I cannot answer the question precisely as to which system costs more to install in a new home, here's the available information:

- As among the estimates in Table 1 *for a heat pump system*, NMR's/Jesse's (approximately $12,000) and Bill's ($14,160)[8] are the most closely aligned. Jeremy's ($23,300) is an outlier. Note that NMR's/Jesse's estimates derive from modeling and that Bill's are empirical, which should increase confidence in the estimates. It's possible that Jeremy over-adjusted for the cost of ducting/labor as between Worcester and Newton, in his (explicit) effort to be conservative.
- For a *gas system* as shown in Table 1, and putting aside Jeremy's high number for a gas system, the estimates range from $11,700 to $16,700. **In other words, the installation costs of the heat pump and gas systems are comparable.**
- There are at least two reasons why all of these estimates—and not just Jeremy's—may be on the high side for a heat pump system:

    - None of these estimates takes into consideration the cost of a gas hook-up, which a new all-electric home could avoid.[9]

[6] This includes a significant increase in total labor hours needed to install a new whole-building ductwork system (determined through RSMeans and in consultation with Newton building experts), and an adjustment in labor costs to reflect the higher cost of labor in Newton compared to Worcester as assumed in the original NMR study (sourced from RSMeans City Cost Index 2020).

[7] "The Economics of Electrifying Buildings: How Electric Space and Water Heating Supports Decarbonization of Residential Buildings," Rocky Mountain Institute.

[8] Bill's sources for his figures are unclear as to whether the costs of duct work are included in the heat pump system estimates Those sources do not include an energy recovery ventilator (ERV). The NMR report (and, hence, Jeremy's and Jesse's estimates) does include ERV costs, which the NMR report lists at $1,173.

[9] Most streets in Newton already have gas infrastructure, so the cost of a gas hook-up that could be avoided for an all-electric house is for a gas "service," not a gas main (highly variable for a service, but estimated at between $1,500 and $3,000).

- At least at present, Massachusetts rebates for heat pumps are higher than for gas systems.[10]
- As discussed in the section below on water heaters standing alone, NMR's and Jeremy's estimates include the assumption that the water heater is the tankless variety.

**Annual operating costs for gas versus heat pump heating, cooling, and hot water systems**

As for annual operating costs, it appears that Jesse and Jeremy relied solely on the NMR report, concluding that **the heat pump system costs $500 more per year than the gas system**. (Bill does not provide estimates for annual operating costs.) This is a function of the relative price of gas versus electricity. Gas prices are currently low, but it is difficult to predict the future price differential. Experts I've discussed this with believe this number may be on the slightly low side.

By contrast, one other observation comes from the Rocky Mountain Institute report, *The Economics of Electrifying Buildings* (2018), which concludes: "In many scenarios, notably for most new home construction,… **electrification reduces costs over the lifetime of the appliances** when compared with fossil fuels" (emphasis added). Table 2 reflects this, with cost estimates based on the city in the RMI study with a climate most similar to Newton's, i.e., Providence, RI. The RMI estimates suggest that electrification is cost-competitive with gas for new residential construction. However, we are aware that some of its assumptions are optimistic, e.g., for the installed cost of heat pumps.

**Equipment/installation costs for gas versus heat pump water heater, on a stand-alone basis**

The equipment and installation cost estimates for a gas water heater, whether a tank or a tankless variety, versus a heat pump hot water heater are, frankly, hard to interpret.

The gas water heater cost estimate in the NMR report ($2,512) is based on the less commonly used tankless heater as opposed to the more familiar tank variety. Consumer Reports' estimate for the purchase and installation of a tankless hot water heater is $1,987. Consumer Reports' and Bill's estimates for a tank variety water heater are $1,300 and $1,700, respectively. Tankless water heaters are less common but growing in popularity, according to Consumer Reports. Thus, it seems clear that the NMR report, and Jeremy, are on the high side for the type of water heater that is most commonly installed.

[10] I have not included the availability of rebates in the calculations, because they may vary substantially over relatively short time periods.

For heat pump water heater equipment/installation, the numbers range from approximately $1,600 (Consumer Reports and NMR) to $2,700 (Bill), but experts I've conferred with seem to think that Bill's estimate is more accurate. I've been unable to explain the magnitude of this difference. If Bill's estimate is correct, a heat pump hot water heater is more expensive than both tank variety and tankless hot water heaters. If NMR is more accurate for a heat pump hot water heater, then the costs of a gas water heater and heat pump water heater are comparable, even using Bill's relatively high estimate for a heat pump water heater.

**Annual operating costs for gas versus heat pump water heater, on a stand-alone basis**

As appears from Table 3, the annual operating costs for a gas water heater, whether a tank or tankless variety, as compared to a heat pump water heater, are extremely close.

**Conclusion**

Having struggled to reconcile these various estimates, I think that to some extent the search for precision obscures rather than elucidates the meaningful conclusions.

From the discussion above, here's what the numbers tell us:

- Equipment/installation costs for gas versus heat pump heating, cooling, and hot water systems are comparable.
- The annual operating cost for a heat pump heating, cooling, and hot water system is probably at least $500 more than for a gas system. That is largely a function of the relative cost of electricity and natural gas.
- Equipment/installation costs for a gas versus a heat pump water heater, on a stand-alone basis, are hard to determine. This is the area where the estimates are least aligned, perhaps because I have more estimates.
    - If we use Bill's figure for a gas water heater, assume the tank heater variety and, conservatively, use Bill's figure for a heat pump water heater, the heat pump heater is $1,000 more expensive than the gas water heater.
    - If we use Consumer Reports' figure for a gas water heater, assume the tank heater variety and, conservatively once again, use Bill's figure for a heat pump water heater, the heat pump heater is $1,400 more expensive.
    - However, according to some estimates, the heat pump water heater is less expensive than the tankless type of gas water heater, by varying amounts.
- Annual operating costs for gas versus heat pump water heaters, on a stand-alone basis, are very similar.

In all cases, the differences in cost are minimal when taken in the context of an important point that Jeremy makes. Recall that what we are discussing here is new construction. The median

price of a new home in Newton is approximately $1.2 million.[11] Jeremy's calculations, which use his cost estimates for a gas versus mini-split heat pump system (which, as already noted, are higher than the other projections included here), estimate the annual cost of homeownership (including heating, cooling, water, sewer, electricity, insurance, property taxes, mortgage) for a gas home is $72,969, as compared to $73,544 for an all-electric home. This estimate implies a difference of $575 in annual home ownership costs, or 0.78% of yearly homeownership costs. We emphasize that this is using Jeremy's cost estimate for a heat pump system, which is higher than the other estimates. In other words, whatever difference, up or down, exists between the costs of a gas and a heat pump system for a new home is extremely small compared to the annual costs of homeownership in Newton. This observation does not take into consideration the point made above, that a price on carbon and a greener electric grid would be favorable for the cost of heat pump technology.

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**Cost Estimate Tables**

To the extent possible, the cost estimates that follow in the tables below are for a single-family home that complies with the Massachusetts Stretch Energy Code, with two floors, an unfinished basement, and 2,500 square feet of living space.

**Table 1: Cost comparison, installation and annual, for gas vs. ducted heat pump heating and cooling, and hot water**

| | **Gas furnace and hot water, with central AC, installed cost** | **Heat pump system, installed cost** | **Difference in installed costs** | **Gas furnace and hot water, with central AC, annual cost** | **Heat pump system, annual cost** | **Difference in annual costs** |
|---|---|---|---|---|---|---|
| **Gray/Brookline** | $11,700 | $12,100 adjusted to remove rebates) | Heat pump system $400 more expensive | $1,500 | $2,000 | Heat pump system $500 more expensive |

[11] This figure appears to refer to new home sales in Newton, not to new construction alone. Many newly constructed homes in Newton are much larger than the existing homes sold, making Jeremy's estimate of the cost of an all-electric home as a percentage of the cost of home ownership likely to be conservative. However, his estimate is close enough for the purposes of the point made here.

| | | | | | | |
|---|---|---|---|---|---|---|
| **NMR report**, tankless water heater | $11,724 | $12,478 | Heat pump system system $754 more expensive | $1,511 | $2,007 | Heat pump system, $496 more expensive |
| **Koo/Newton**, tankless water heater | $20,000 (adjusted for ductwork labor costs) | $23,300 (adjusted for ductwork labor costs) | Heat pump system $3,300 more expensive | $1,511 | $2,007 ($1,362 with solar) | Heat pump system $496 more expensive |
| **Bill's estimates**, Rheem 50-gal tank style ( (no annual cost estimates provided) | $16,700 | $14,160 | Heat pump system $2,540 less expensive | Not provided | Not provided | |

**Table 2: Another point of comparison (net present costs) for gas versus heat pump heating, cooling, and hot water**

| | **Gas system** | **Heat pump system** | |
|---|---|---|---|
| **RMI REPORT COMPARISON OF 15-YEAR NET PRESENT COSTS OF WATER HEATING AND SPACE CONDITIONING FOR PROVIDENCE RI (THOUSAND $)** | $16,600 | $14,300 | Heat pump system $2,300 less expensive net present costs |

**Table 3: Cost comparison, installation and annual, for gas vs. heat pump hot water, stand-alone installation**

| | Gas water heater, installed cost | Heat pump water heater , installed cost | Difference in installation costs | Gas water heater, annual cost | Heat pump water heater, annual cost | Difference in annual costs |
|---|---|---|---|---|---|---|
| **Gray/Brookline** (no separate water heater costs provided) | | | | | | |
| **Bill's estimates**, Rheem 50-gal **tank style** gas (no annual cost estimates provided) | $1700 | $2,700 | Heat pump $1,000 more expensive | Not provided | Not provided | |
| **NMR report (tankless gas)** | $2,512[12] | $1,680 | Gas heater $832 more expensive | $127 | $146 | Heat pump $19 more expensive |
| **Koo/Newton (tankless gas)** | $2,900[10] | $1,800 | Gas heater $1,100 more expensive | $127 | $146 ($99 with solar) | Heat pump $19 more expensive (Heat pump $28 less expensive with solar) |
| **Consumer Reports (tankless gas)** | $525-$1,150 plus $800-$1,500<br><br>Median = $1,987 | $1,200 for equipment but doesn't specify installation amount | Difficult to ascertain, because installation cost not included | $195 | $240 | Heat pump $45 more expensive |
| **Consumer Reports (tank style gas 50-gal)** | $600 plus $700 = $1,300 | $1,200 for equipment but doesn't specify | Difficult to ascertain, because installation | $245 | $240 | Gas $5 more expensive |

[12] However, Jeremy's view is that for a tank style as opposed to a tankless hot water heater, Bill's estimate is "close" to what he "would guess." Email communication to Ann Berwick, September 15, 2020.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | installation amount | cost not included | | | |