

2/24/19 WL

MINUTES

NET ZERO NINTH SCHOOL (NZNS) SUBCOMMITTEE of the Select Board's Climate Action Committee (SBCAC)

February 19, 2019 (Tuesday), 8:00 a.m.
Brookline Town Hall, Room 310

PRESENT

Subcommittee Members: Alan Leviton, Werner Lohe (chair), Susan Martin, David Pantalone,
David Pearlman, Deborah Rivers

Staff: none

Guest Speakers: none

Others: none

Werner Lohe convened the meeting at 8:05 a.m.

APPROVAL OF PRIOR MINUTES

Minutes of the January 15, 2019 meeting (with a correction to ¶ 2(ii)) were approved.

DISCUSSIONS, DECISIONS, ACTIONS, & VOTES

1. Virtually the entire meeting was spent discussing improvements, mostly additions, to the draft final report that Susan Martin prepared. David Pantalone noted there are four crucial elements needed to make new buildings climate friendly and fossil fuel free: design, renewable energy sources, energy storage, and energy management and operations. The group agreed that these should be incorporated in the final report. A number of other specific improvements were agreed upon, and these can be seen by comparing version 4 of the draft to version 3.
2. It was agreed that the final report should be presented to the full Select Board's Climate Action Committee (SBCAC) for approval soon. Werner Lohe will update the current draft (version 3) immediately working with Susan. Subcommittee members may also submit any further, last-minute suggestions within 48 hours (by email to Werner only to comply with the Open Meeting Law). He will prepare the final draft (version 5), and circulate it to the full SBCAC before its upcoming meeting.
3. It was agreed that if the final report is approved by the SBCAC, this will likely be the last meeting of this Net Zero Ninth School Subcommittee. It has accomplished a lot during the two years of its existence, educating itself, staff (including the Building Department), Town Meeting members, and the public. Indirectly, it has played a major role in the Town's recent commitment to not only highly-energy efficient buildings, but also fossil-fuel-free buildings.

The meeting was adjourned at 9:25 a.m.

DOCUMENTS USED AT THE MEETING

Final Report and Recommendations of the NZNS Subcommittee (attached in version 4)



Town of Brookline

Final Report and Recommendations of the Net Zero Ninth School Subcommittee of the Selectmen's Climate Action Committee

DRAFT – 2/19/19 (v. 4, with changes discussed at 2/19/19 subcommittee meeting)

February 25, 2019

Introduction

Before the Brookline Select Board's Climate Action Committee (SBCAC) formed the Net Zero Ninth School (NZNS) Subcommittee, it had received public comments and had its own discussions concerning whether the Town's already energy-efficient school building projects could be made even better by focusing specifically on the need to address climate change through state-of-the-art design.

The decisions to construct a ninth elementary school and to expand the high school were recognized as prime opportunities to explore this issue, and, in response, the SBCAC created the NZNS Subcommittee in late summer 2016.

The subcommittee met regularly throughout 2017 and 2018 and into 2019. During that time, it worked with representatives from the School, Building, and Planning departments, as well as with the state Department of Energy Resources, and other municipalities and individuals—including making site visits—to research Net Zero Energy concepts and the practical opportunities and obstacles to making them a reality in Brookline.

The subcommittee issued an interim report and recommendations in October 2017 to share what it had learned. This report is the next step in sharing information and making recommendations.

Major Changes

Since the committee's inception in 2016, changes in awareness, understanding and commitment to deal with climate change have taken place on a town level and a global level, and have had significant impact on the work of the committee. The recent interest and concern about fuel choices in the town, for example, is unprecedented. A brief history:

May 2017: Brookline Town Meeting passed Warrant Article 20, which committed Brookline to uphold the Paris Agreement on Climate Change, and Warrant Article 21, which established energy-efficiency goals and minimums for the 9th school and the Brookline High expansion.

September 2018: the Brookline Select Board, in adopting Brookline's 2018 Climate Action Plan, revised its goal—originally set to conform with the state Global Warming Solutions Act goal of a 90% reduction of GHG emissions—to a goal of achieving zero greenhouse gas emissions for the government and the community by 2050.

October 2018: The Intergovernmental Panel on Climate Change, a group of scientists convened by the United Nations, released its report, which said that to prevent a catastrophic rise of 2.7 degrees of warming, greenhouse pollution must be reduced by 45 percent from 2010 levels by 2030, and 100 percent by 2050. The prospect of 12 years to make a difference has galvanized many in town.

November 2018. The National Climate Assessment report stated that without "substantial and sustained reductions" in greenhouse gas emissions, climate change will hurt people, economies, and resources across the U.S.

December 2018: Brookline Town Meeting passed amendments to Warrant Articles 2 and 3, which imposed a condition that no funds be used during schematic design for non-emergency fossil-fuel operated building systems for the 9th school and also the Driscoll School.

Where We Are Now

With increasing knowledge, our sub-committee has progressed from exploring Net Zero Energy school buildings to the simpler and more stringent target of Fossil-Fuel-Free school buildings. A fossil-fuel-free building uses only electricity for its building systems. The electricity generated on site would be required to be provided by wind, solar, ground-sourced or air-sourced heat pumps, or a combination. Since the building typically cannot generate all the power it needs on-site, the long-term goal is to purchase electricity only from renewable sources on the power grid.

The committee not only supports fossil-fuel-free school buildings, but believes it is important to expand the concept to include all municipal building and substantial renovation projects (beyond school buildings). Therefore, the committee recommends the following high priority step:

1. **Commitment to Fossil Fuel Free Buildings:** The Town will commit to designing and constructing Fossil Fuel Free buildings on all new construction and major renovations of municipal facilities, to include (1) achieving high-energy-efficiency design¹ and operation; (2) generation, consumption, and storage of renewable energy; and (3) achieving fossil-fuel-free operation by using all-electric systems. A written policy should be promulgated by the end of 2019 by either the Select Board or the Building Commission or such a policy could be pursued by bylaw change or resolution of Town Meeting.

While not as urgent, the following steps should also be considered because they support and document the process that will ensure achievement of the goals. The tasks would be completed by town staff in consultation with the SBCAC:

2. **Prepare a procedures manual:** This manual would document best practice procedures for (1) achieving fossil-fuel-free buildings using whole-building design principles and (2) continuing to assess building occupancy behavior to ensure long-term low energy use. The document will be informed by this committee's research, as well as by lessons learned from the high school expansion project.
3. **Propose changes to the Building Commission Bylaw:** The current bylaw as of May 2013 should be updated to be consistent with procedures, particularly life-cycle cost analysis procedures, that ensure the exploration of and achievement of fossil-fuel-free buildings, as well as continually improving energy-efficiency and cost-saving measures.

¹. Achieving a minimum LEED silver certification and an Energy Intensity Use (EUI) of 30 kBtu/sf² was approved by Town Meeting in the Warrant Article 21 resolution of May 2017. The committee recommends exploring whether these key requirements should be increased.

Where To Go Next

The two warrant-article amendments passed by Town Meeting in December 2018 dictated no fossil fuel building systems for the two upcoming school building projects – the 9th school and the Driscoll School. As a result, the NZNS Subcommittee has achieved its initial objective of studying, educating the public, and improving school building design, and other members of the community—particularly in Town Meeting—have embraced its goals and exceeded its original expectations.

However, we have gathered considerable knowledge and feel that the Select Board's Climate Action Committee (SBCAC) could benefit from establishing a new subcommittee to build on that knowledge and work toward future goals that the SBCAC may identify.

Some thoughts:

Continue to focus on buildings. Looking beyond Brookline's schools to the larger community, buildings annually account for nearly 40% of greenhouse gas emissions and 54% of energy used in Massachusetts.² In order to meet our GHG emissions reduction target, we must significantly reduce the carbon footprint of buildings.

- Expand the focus beyond municipal buildings to include commercial and residential property (rentals, condos, and 1, 2 and 3-family homes). In Brookline, the municipal sector accounts for only 3% of the town's carbon footprint. Commercial accounts for 23%, while residential accounts for 74%. If we want to meet the ambitious goal of zero greenhouse gas emissions for the government and the community by 2050 or earlier, we must focus on the commercial and, especially, the residential sector.
- Investigate procedures for site selection of new buildings more thoroughly.
- Consider preservation and renovation of existing buildings.
- Explore if local zoning requirements can be used to encourage/require greener buildings.
- Consider better sourcing of building materials, including analysis of embodied energy.
- Utilize new approaches for on-site energy storage and other new technologies that are consistent with fossil-fuel-free buildings.
- Move toward purchase of electricity from 100% renewable energy sources.
- Consider design features that will enable buildings to be used as places of refuge during extreme weather events.
- Develop policies, user manuals, "energy dashboards," and occupant education for municipal buildings to monitor energy usage and improve energy management and operations.
- Continue to research and support techniques for better financial analysis as it pertains to building systems.

². Mass Department of Energy and Environmental Affairs.

Focus on transportation. Transportation accounts for 28% of greenhouse gas emissions in the United States and 43% in Massachusetts.³

- Require EVs for the municipal fleet.
- Require EVs for all town-contracted transportation needs, for example, school buses – the current committee has done research relating to this.
- Ensure that any new municipal building projects take transportation into consideration during site selection.
- Build out the transportation recommendations in the town's climate action plan.

Committee Members

Werner Lohe, Chair

Michael Berger

Benjamin Chang, School Committee Representative, stepped down summer 2018

Alan Leviton

Susan Martin

Kathleen Scanlon, stepped down fall 2018

David Pantalone, joined fall 2018

David Pearlman, School Committee Representative, joined fall 2018

Deborah Rivers, joined fall 2018

Staff Members

Maria Morelli, Senior Planner

Ray Masak, Project Manager, Building Department

³. <https://www.mass.gov/service-details/ma-ghg-emission-trends>