

Statement of the Zero Emissions Advisory Board  
on the Design of the Brookline Ice Rink Recreation Facility  
as a Zero Emissions Facility

September 21, 2022

ZEAB applauds the attention given to climate change and “net zero” design in the February 2022 Brookline Ice Rink Recreation Facility Preliminary Feasibility Report (e.g., pp. 22-25). ZEAB believes that the new rink can and should be the town’s first Zero Emissions and Low Carbon Construction facility.<sup>1</sup> This will not be easy. It will require a strong commitment to integrated design, and may require capital investments not always associated with new buildings. It will require design to very low Energy Use Intensity (EUI), likely using state-of-the-art technologies such as geothermal/ground-source-heat-pumps, low-e (low thermal emissivity) ceiling materials, and thermal energy storage, as well as very high Renewable Energy Intensity (REI), likely provided by extensive photovoltaics, including solar panels over parking areas.

Going forward, ZEAB hopes to be a helpful resource to the design process, and it expects that all documentation for this project, including the design “program” required by the Building Commission Bylaw § 3.7.2(a) (which includes environmental and sustainability goals and objectives), requests for proposals, and other documentation, will contain the following specific provisions:

1. The facility shall be a Zero Emissions (ZE) facility.
  - a. A Zero Emissions facility is a facility that is Fossil Fuel Free (FFF) and Net Zero Energy (NZE).
2. Fossil Fuel Free means that the facility uses no fossil fuels for heating, ventilation, or air conditioning (HVAC), for domestic hot water, for cooking, or for any other purpose. For an ice rink, this includes on-site maintenance equipment (including the “Zamboni”). The facility may have emergency electricity generators that use fossil fuels.
  - a. The facility should not only be FFF on site, but also from the source. That is, the electricity used on site should be from renewable sources. This will require the purchase of 100% renewable electricity or renewable energy certificates. Any renewable energy certificates (RECs) associated with either on-site or off-site energy generation must be retained or retired to prevent double counting.
3. Net Zero Energy means that the facility produces as much energy as it consumes over the course of a year. This requires low energy consumption (gross EUI or Energy Use Intensity measured in kBtu/ft<sup>2</sup>/year) along with on-site renewable energy generation (gross REI or Renewable Energy Intensity also measured in kBtu/ft<sup>2</sup>/year), presumably provided by solar photovoltaic (PV) panels. Net Zero Energy means that gross REI equals or is greater than gross EUI.
  - a. For the facility, not just site EUI, but rather source EUI should be considered since that more accurately represents the carbon impacts of different fuel sources. Source energy accounts for upstream generation impacts of the fuel

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1. Although the design and construction of the facility is only one piece of the larger picture of addressing the climate emergency, ZEAB is not in a position to comment on whether Larz Anderson Park is the best location for an ice rink, how large any rink should be, or whether skating should be year-round or seasonal.

source, such as natural gas burned to generate electricity.<sup>2</sup> Any renewable energy certificates (RECs) associated with on-site or off-site energy generation must be retained or retired to prevent double counting.

- b. The facility should be Net Zero Energy in its first year of operation. Detailed operating procedures, including frequency of ice resurfacing, should be prepared for the building. If the design is not for year-round skating, it is particularly important that the length of the ice-skating season be specified and a commitment be made that the season not be increased in the future since that would likely significantly increase the EUI and compromise the facility's NZE status. Actual EUI and REI should be reported annually to the Select Board for ten years.
4. The facility shall use Low Carbon Construction techniques and materials in design and construction, including demolition, debris disposal, and site preparation. That is, beginning with the feasibility study conducted pursuant to Building Commission Bylaw, § 3.7.2(b), the consultant preparing that and later studies shall not only "consider... environmental and sustainability goals and objectives" as required by the bylaw, but shall also specifically evaluate what level of life-cycle embodied carbon assessment is practical, using either a cradle-to-completed-construction or cradle-to-grave<sup>3</sup> boundary. The consultants shall then complete such an assessment, which shall, at a minimum, include Environmental Product Declaration (EPD) disclosure for all concrete materials or products used in the facility and for 75% of all steel products used in the facility.<sup>4</sup>
5. Twenty-five percent of parking spaces should be EVSE-Installed.<sup>5</sup> An additional seventy-five percent of parking spaces should be EV-capable.

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2. See [https://newbuildings.org/wp-content/uploads/2016/06/ZNE\\_Tracker\\_FAQ.pdf](https://newbuildings.org/wp-content/uploads/2016/06/ZNE_Tracker_FAQ.pdf)

3. The cradle-to-grave study boundary typically uses either a 30-year or 60-year reference study period.

4. See, e.g., [https://gettingtozeroforum.org/wp-content/uploads/sites/2/2022/01/NBI\\_Lifecycle-GHG-Impacts-in-Codes\\_Jan2022Update.pdf](https://gettingtozeroforum.org/wp-content/uploads/sites/2/2022/01/NBI_Lifecycle-GHG-Impacts-in-Codes_Jan2022Update.pdf)

5. EVSE means Electric Vehicle Supply Equipment. EV-Capable means installed electrical panel capacity with a dedicated branch circuit and continuous raceway from the panel to a future EV parking space. EV-Ready means installed electrical panel capacity and raceway with conduit terminating in a junction box or 240-volt outlet. EVSE-Installed means fully operational Level 2 EV charging station.