

**CLIMATE ACTION COMMITTEE**  
**Wednesday October 15, 2025**  
**7:00 PM**  
**MEETING AGENDA**

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Meeting Location:

- In person: Select Board Meeting Room, Town House, 22 Monument Square, 2nd Floor
- Remotely, through the following Zoom link:  
<https://us02web.zoom.us/j/89658925084?pwd=dqCN47QKgw07ZKlIda071EnKYbbbIfk.1>  
Meeting ID: 896 5892 5084  
Passcode: 771884  
Dial In Toll-Free: 888 475 4499
- Documents relevant to this meeting will be posted when they become available at  
<https://concordma.gov/4043/Meeting-Materials>

1. Welcome – comments and announcements [7:00]
2. Meetings and minutes [7:05]
  - a. Approval of Sept. 17 minutes
  - b. Upcoming meeting and event dates: October/November
3. CAC Chair updates [7:15]
  - a. New members, future recruitment
  - b. Status updates on action items and old business from September 17 agenda
  - c. Sun Day debrief
4. Deputy Town Manager’s update [7:25]
5. MA Climate Action Network presentation: model embodied carbon RFP language [7:40]
6. [Climate Action and Resilience Plan](#) [8:00]
  - a. RFP status and next steps
  - b. Evaluation Committee
7. Other Updates: [8:25]
  - a. Networked Geothermal
  - b. GSEP/non-pipeline alternatives
  - c. MCI-Concord
  - d. School solar/BFRT link projects
8. Public comments [8:40]
9. Adjourn [8:45]

Distribution:

Committee Members: Fran Cummings, Brad Dye (Chair), Kathryn Hopkins, Brad Hubbard-Nelson (Clerk), Shelly Karlin, Paul Kirshen, Bob Shatten

Town: Town Clerk, Wendy Rovelli (Select Board Liaison), Megan Zammuto (Deputy Town Manager), Shannon McAndrew (Management Specialist)

Local Groups: Mothers Out Front, ConcordCAN, League of Women Voters

## Climate Action Committee (CAC) Meeting Minutes - 9/17/25

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Pursuant to a notice duly filed with the Town Clerk, a public meeting of the CAC was held on September 17th 2025 at 7:00 pm in person at the Select Board Meeting Room and via Zoom (hybrid). A recording of this meeting is available on YouTube.

Committee members attending: Brad Dye (BradD, Chair), Brad Hubbard-Nelson (BradHN, Clerk), Shelly Karlin, Bob Shatten, Kathryn Hopkins (online), Megan Zammuto (Deputy Town Manager).

Community Members present:

Amanda Patrick (CMS PTG), Rachel Gibson, Linda Nieman, Betsy Olsson-Mackowski, Camille Venti, Jessica Langsam, Sarah Annunziata

Meeting began at 7:03 pm

1. Welcome – comments and announcements - none
2. Meetings and minutes
  - a. Approval of August 20th minutes, with BradD's minor changes incorporated. *Adopted unanimously (Shelly moved, Bob second).*
  - b. Upcoming meeting and event dates: September/October. *BradD listed several events coming up in the next month, including:*
    - i. 9/17 5:30: LWV of CC is hosting "Together against Hate" at the Concord Library Goodman Forum.
    - ii. 9/20 11am: Local author Susan Edwards Richmond "The Great Pollinator Count", Fowler Library outdoors (weather permitting).
    - iii. 9/21 2-4pm: Sun Day at First Parish Church, outdoors (weather permitting)
    - iv. 9/21 4-7pm: Stone Soup dinner at Verrill Farm
    - v. 9/22: Health Dept and others hosting a talk Climate Extremes and Emergency Preparedness at the Concord Main Library, Goodwin Forum
    - vi. 9/24 1:30-3pm: local Mothers Out Front chapters hosting a virtual meeting with Mike Barrett to detail MOF legislative agenda.
    - vii. 9/24 7pm Metrowest Climate Solutions hosting presentation by Angie Alberto Escobar from HEET on Networked Geothermal
    - viii. 9/27 9am: OARS River Cleanups, sign up at [oars3rivers.org/events](https://oars3rivers.org/events)
    - ix. 10/10 3-5pm: Concord Library Sustainability committee meeting at Fowler Branch on updates to its 5 year sustainability plan
    - x. 10/4 9am-3pm: bi-annual DropOff/SwapOff at Concord public works, visit [reusit.org](https://reusit.org) to volunteer
    - xi. 10/18 hold for Town Clerk Training Session for committee volunteers, details to follow when available.
    - xii. 10/28 9:30-11am: Stantek will present their work to TAC, at Keyes Rd planning building, 2nd floor
    - xiii. 11/19 TAC public meetings pursuant to TAC (HWCC 6:30-8 and morning)
    - xiv. 9/19: Kathryn reported the Harvard Climate Week, open to the public
3. CAC Chair updates
  - a. New members, future recruitment. BradD requesting every CAC member provide one name, so he can add one member to get to full membership.
  - b. Status updates on action items and old business from August 20 agenda

- i. Express thanks to BradHN and Bob for the CAC letter on Endangerment Finding rule. The Select Board submitted their letter yesterday, and Rep. Lori Trahan shared a delegation letter.
    - ii. BradD and Megan both attended a webinar about the [MAPC Climate Resilience Playbook](#), which provides guidance to MA municipalities on building climate resilience..
    - iii. Status on Your Sustainable Home Now brochure: BradD had suggested many edits, and will send to Town staff to update pages on the website.
    - iv. State and Federal Update: BradD working on summary of environmental bond bill. He spoke with Rep. Cataldo, who is interested in working through a bond authorization for geothermal at the MCI site..
  - c. Agriculture Day debrief: went well, with 3 volunteers at the CAC table. Suggesting having candy or something to giveaway since table was between Library and Mothers Out Front (MOF) which both provided climate related things. There were 4 followups from people contacts, and discussion with climate people from other towns (Lincoln and Sudbury) about regional efforts.
4. Planning for Sun Day: coming up on 9/21 2pm at First Parish. BradHN reported that preparations going well, twice weekly planning meetings on promotion, speaker agenda, and logistics. 16 or 17 tables for organizations and multiple art projects. Volunteers asked to come early (1:30). CAC table next to welcome table. BradHN prepared a couple posters for the table, BradD to give him a box of materials. Promotion going well, through social media, to schools (thanks to Betsy O-M), expecting 100-200 people to attend. Will be some music towards the end.
  - a. Suggestion made that the CAC table provide food; Megan said that from the health department perspective, prepackaged is better.
  - b. Betsy working on certificates to recognize organizations in town, what they have accomplished.
5. Deputy Town Manager's update: Megan Zamuto reported:
  - a. Middle School solar procurement for parking lot and rooftop went out to bid, currently reviewing 2 bids
  - b. Megan working on data collection for Green Communities annual reporting, her first time doing it.
  - c. Decarbonization roadmap with Power Options. She met with point person, found what data needed to be provided by the end of September. Power Options will take 5 weeks for their analysis. This is the first such roadmap, for municipal facilities.
  - d. Regarding the Energy Services Company (ESCO), that hasn't gone out for RFQ yet. Megan comments that the industry is changing rapidly. Meeting this week to look at gas contract, opportunity to partner with another agency. Town in process of assessing municipal capital needs and buildings.
    - i. A Land Use working group trying to solve some challenges including subcommittees looking at public works, public safety, consolidated town offices. Looking at Peabody school as a site to fill some needs, facilities director interested in potentially upgrading it with geothermal.
    - ii. BradD: should always be thinking of developing to be better than net zero.
    - iii. BradHN mentioned MCAN work on embodied carbon for new building projects. CAC could get a presentation on that work. He will send the information around again..
  - e. Composting: Megan thinking about the pilot program that ended and what to communicate with residents to clarify the situation and options for residents.

- i. Further work should be part of the revised Climate Action Plan for the next 5 years. Bob interested in working on this and whether there are opportunities for cost savings, including residential and commercial customers.
  - f. Megan shared exciting news, that Concord is receiving the \$450K MVP grant for SuAsCo watershed effort, working together with OARS and MAPC. Grant had been championed by Eric Simms before he left, and is a two year state grant to form a collaborative for the SuAsCo watershed. This model exists in other watersheds and is in line with our Climate Action Plan..
    - i. They are planning a kick off meeting on Oct 1. Hopefully Paul can participate
    - ii. First year is lighter lift, primarily setting up collaboration with other communities.
- 6. Concord Middle School Parent Teacher Group proposal for a Bruce Freeman Rail Trail link. Amanda (Mandy) Patrick from the CMS PTG Sustainability committee gave a presentation “The Possibility of Connection” (included in Attachment 1). Will be proposing to the Concord school committee later this month. Already discussed with Friends of Bruce Freeman rail trail, MOF, TAC. Asking for CAC statement of support.
  - a. Challenge is that rail trail is 30’ lower elevation.
  - b. Paths used by bikers, staff, cross country teams, clubs. Path from field to rail trail is in poor shape, overgrown, poison ivy, erosion, uninviting
  - c. Playing fields get some use, but school putting in new ones
  - d. Proposing a new wooded path, ramps and railings to be accessible, with numerous benefits to health and community. Might take 3 years to get this designed and built.
  - e. CAC voted to support their proposal Bob moved, Kathy Second, unanimous approval
- 7. Climate Action and Resilience Plan update
  - a. Megan reported that RFP has been approved internally to be posted on Monday, with proposals due 10/24. Plan to review proposals 10/27, and potentially Interviews on 10/29.
    - i. Evaluation Committee is a subcommittee issue. Town manager to appoint members, Megan recommending BradHN and Bob from CAC.
  - b. Climate Tracker and Goals:
    - i. BradHN met with Bob Shatten to talk about Concord’s emission estimates using the MAPC GHG inventory tool. Next step: May repeat analysis for 2022 using the updated MAPC tool, and they plan to do the GHG inventory for 2025 next year.
    - ii. BradHN presented an online Community Climate Tracker tool ([https://ma-ghgi-tool.streamlit.app/Climate\\_Goals\\_Tracker](https://ma-ghgi-tool.streamlit.app/Climate_Goals_Tracker)) under development by a Bentley University professor Zana Cranmer, supported by MCAN + MassEnergize + GECA. The tool includes:
      - 1. GHG Inventory Page: shows an estimate of emissions from 2023 (not sure if this agrees with our inventory).
      - 2. Climate Goals Tracker: shows how many EVs, Solar Arrays and Heat Pumps exist (based on state sources and CMLP) and goals for 2030 - according to MA Clean Energy and Climate Plan.
        - a. Suggests goals for each community on these three technologies, to meet the Commonwealth goal. These goals are suggestions, not necessarily achievable.
    - iii. BradHN showed Concord data on EVs and extrapolations to 2030 (see Attachment 2). Concord could reach a goal of 50% EVs by 2030 through continued exponential growth, but the linear growth suggestion from the Climate

Tracker would be challenging, requiring an immediate step up despite removal of federal incentives.

1. Suggested goal from Tracker would require nearly 100% of new registrations to be electric, starting now, which is not realistic. Illustrates how goals become more and more difficult as we get closer to a deadline.
  2. Bob asked whether data included commercially owned vehicles
  3. Kathryn brought up that current incentives (some going away this month) make EVs very inexpensive, especially for leasing.
  - c. Shelly asked a question about Measures of Success, how we should treat outcomes which aren't measurable, such as air quality Shely will follow up with BradD later on specifics.
8. Feedback for EPA on Endangerment Finding. BradHN shared a [draft letter](#) to the committee. A few changes were made by the group.
- a. Vote to approve and send was approved unanimously (Bob moved, Shelly 2nd).
  - b. Megan printed for CAC to sign after meeting, BradD to submit.
9. Other Updates:
- a. Networked Geothermal. BradHN asked by CMLP director Jason Bulger to make a presentation to the light board. Presentation will be made at upcoming 9/23 light board meeting.
    - i. Brad showed one slide from the [Presentation for CMLP Light Board](#) (Attachment 4) with a vision for networked geothermal in Concord through 2050, including studying the business model and technology next year, a pilot project and MCI Concord implementation by 2030.
    - ii. Also showed a slide summarizing the Framingham/Eversource pilot geothermal network.
    - iii. BradHN heard from MAPC (Jeremy Koo) on funding the modeling through a technical assistance grant. Funding will start in 2026.
    - iv. BradD would like a summary at the October meeting.
  - b. GSEP/non-pipeline alternatives. No next meeting scheduled at the moment.
    - i. Laura Scott suggesting there needs to be a commercial anchor site to focus on.
10. Public comments
- a. Rachel Gibson (a new resident) wanted to know about composting, has the town considered paying for curbside composting.
  - b. Linda - asked about CAC involvement in MCI process: Megan reported that the MCI advisory board released a vision plan developed over the summer.
11. Adjourned at 9:05pm. Next meeting scheduled for October 15th.

Attachments:

1. Presentation on proposed Concord Middle School link (Amanda Patrick)
2. [Concord EV adoption data and extrapolations](#) (Brad Hubbard-Nelson)
3. Updated Letter on Endangerment Finding after CAC edits.
4. [Networked Geothermal Presentation](#) (Brad Hubbard-Nelson)

## Climate Action Committee — October Staff Report

*Prepared October 8, 2025*

**Prepared by:** Megan Zammuto, Deputy Town Manager

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### 1) A Sustainable CFPL — Next Steps in the Library’s Climate Action Plan

**What:** CFPL Sustainability Plan Strategy Session

**When/Where:** Friday, October 10, 2:00–4:00 PM, Fowler Branch Library

**Purpose:** Identify next-phase goals building on CFPL’s 2020 five-year plan and recent Sustainable Library Initiative certification.

**Why this matters:** CFPL is a high-visibility municipal asset with strong public reach; aligning its next-phase actions with Concord’s CAP priorities can amplify education, resilience, and emissions reductions (e.g., building performance, electrification, waste reduction, community learning).

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### 2) V2X School Bus Charging — CPS/CMLP + MassCEC Demonstration

**Overview:** Concord Public Schools, in partnership with Concord Municipal Light Plant (CMLP), will install a **bidirectional (V2G/V2X) fast charger** at the **Knox Trail school bus depot**. MassCEC’s V2X Demonstration Program is providing funding support.

**Benefits:**

- Enables electric school buses to **both charge and discharge**, providing peak-shaving and potential emergency support.
- Integrates with CMLP’s grid programs (future managed charging/discharging).
- Advances municipal fleet decarbonization and resilience goals.

**Status & Next Steps:**

- Award confirmed via MassCEC V2X program.
  - Site/equipment coordination underway with CPS Operations and CMLP.
  - Staff will return with commissioning timeline and any policy items (e.g., interconnection agreements, operational protocols).
-

### 3) MVP Action Grant — Contract Executed & Launch

#### Status:

- **Final contract fully executed.**
- **Kickoff meeting completed** with EEA/MVP team and grant partners.
- **Near-term milestone:** Municipal Vulnerability Preparedness (MVP) Program **Grant Celebration — Thursday, October 9 in Haydenville, MA.** Speaking program includes Lt. Gov. Kim Driscoll, Undersecretary Katherine Antos, The Trustees President & CEO Katie Theoharides, Williamsburg Town Administrator Nick Caccamo, Sen. Paul Mark, and Rep. Lindsey Sabadosa.

#### Planned Q4 Activities:

- Partner alignment on scope, roles, and deliverables.
- 

### 4) Decarbonization Roadmap — Data Transfer & Scoping

#### Status:

- Initial energy and operations data transmitted to **PowerOptions** team.
  - Vendor is assessing whether a **site visit** is required to advance modeling and recommendations.
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### 5) Institutional Partner Engagement

#### Concord Academy

- Met with the **Director of Operations**; discussed current sustainability initiatives and interest in participating in aspects of the MVP grant.
- Potential collaboration areas: resilience planning, data sharing, student/community engagement.

#### Fenn School

- Met with the **Sustainability Manager**; reviewed buildings strategy and master planning.
- Potential collaboration areas: building performance benchmarking, electrification pathways.

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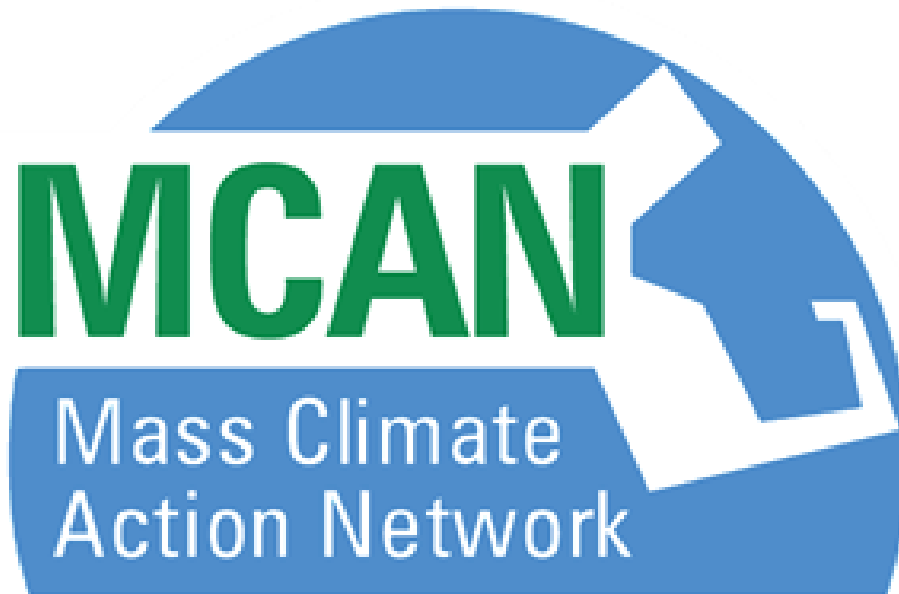
## 6) Middle School Solar Project

**Status at a Glance:** Bids received and under review; rooftop-first with optional canopies; battery siting/economics under evaluation; total cost tracking near the \$7.5M authorization pending final scope and ITC path.

### High-Level Summary

- Scope & funding. Voter-authorized \$7.5M for ~1.2 MW solar (rooftop base with optional canopies) plus energy storage (originally 1–2 MW / 4 MWh). Delivered by CMLP as a ratepayer-funded project; requires a site license from the School District.
- Procurement. Invitation for Bids under M.G.L. c.30 §39M (lowest eligible/responsible bidder). Bid is solar-only with rooftop as base and canopies as an option; includes domestic-content alternates to preserve federal ITC pathways.
- Costs & economics. Planning-level total about \$7.6M vs. \$7.5M authorization. Rooftop alone rarely needs a battery; canopies likely do. A battery can enhance economics and resilience depending on final scope and incentives.
- Bid status & pricing signals. Two bids received (due Sept. 10); qualification review underway and references being checked. Early ranges exceed prelim estimates (rooftop \$3–\$7/W, canopy \$3–\$6/W), driving scope/ITC scenario analysis.
- Constraints/risks. Market inflation, unfavorable soil conditions, battery siting considerations, and ITC domestic-content uncertainty.
- Advisors & ITC posture. Baker Tilly advising on ITC; domestic content currently appears broadly cost-neutral but adds schedule/availability risk.
- Next steps. Continue vetting bidders and procedural review with Town Counsel; coordinate with the School District on site licensing and safety; return with a staff recommendation once evaluation is complete.

# Embodied Carbon Requirements: Model RFP Language



Presented by:

**Jack Lundgren**

Program and Advocacy Director: Embodied Carbon

**Fred Davis**

MCAN Board President

**Khadija Hussaini**

MCAN Board Member

Funding Provided by:

**The Jampart Charitable Trust**

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## Dear Climate Advocate,

MCAN looks to help community climate advocates minimize embodied carbon in upcoming construction projects. Through extensive research and collaboration with professionals across a variety of fields, we have adapted leading policy innovations into model RFP language with embodied carbon requirements. We have drawn from policy implemented in municipalities such as Newton, Cambridge, and Boston; from policy under development in Massachusetts state government; as well as from leading practitioners. MCAN's model language is intended to be inserted into municipal requests for proposals (RFPs) for architectural and engineering services.

Local advocates can take this model language to the appropriate municipal officials on a project-by-project basis. By incorporating it into a project RFP, the model language will assist a selection committee in its due diligence choosing a design team with the greatest capacity to deliver designs that minimize embodied carbon to the fullest extent possible.

The model RFP language has three parts: a purpose and definitions, narrative, and design commitments section. The purpose and definitions section outlines the project objective and gives definitions for relevant terms. It is designed to be paired with one of two narrative and design commitments section versions. One version is for physically smaller projects and the other is for physically larger projects. The three narrative questions are largely the same in both versions, but the design commitments differ due to the limitations and opportunities posed by the expected physical size of the building. Both versions are primarily adapted from credits in LEED v.5 which was released in April 2025. Choosing which version to use is a subjective decision to be made by the selection committee, but a simple benchmark is to use the small project version for projects expected to be smaller than 50,000 square feet.

Below the model RFP language, an appendix provides further explanation, background information, and a potential alternative strategy.

Thank you for your efforts to minimize carbon, now and into the future. MCAN is glad to receive any feedback on this work.

Sincerely,

**Jack Lundgren**

Program and Advocacy Director: Embodied Carbon

Massachusetts Climate Action Network

[Jack@massclimateaction.net](mailto:Jack@massclimateaction.net)

# Acknowledgements

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Thank you to everyone who supported this work!

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# Model RFP Language

**User Note:** This model language is designed to be inserted into municipal Requests for Proposals (RFPs) for architectural and engineering services. Combine the below purpose and definitions with either the version for smaller sized projects or the version for larger sized projects.

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## Purpose and Definitions

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### Embodied Carbon Requirements

#### **Purpose**

The *[committee]* of *[city/town name]* recognizes the urgency of the climate crisis and is committed to minimizing embodied carbon in municipal construction. *[Reference to any municipal Climate Action Plan or related documents can be made here.]* The selection committee will place favorable emphasis on proposals best demonstrating capacity to deliver a building with minimized embodied carbon.

#### **Definitions**

Embodied carbon is the greenhouse gas (GHG) emissions caused by the manufacturing, transportation, installation, maintenance, and disposal of construction materials used in buildings, roads, and other infrastructure.<sup>1</sup>

Global Warming Potential (GWP) is the potential climate change impact of a product or process as measured by a life cycle assessment (LCA). GWP is reported in units of carbon dioxide equivalent (CO<sub>2</sub>e) and is the agreed upon metric for tracking embodied carbon.<sup>2</sup>

Greenhouse gases are any chemical or physical substances that are emitted into the air and that may reasonably be anticipated to cause or contribute to climate change including, but not limited to, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

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<sup>1</sup> See appendix page 11 for a comparison of embodied and operational carbon.

<sup>2</sup> This definition is taken from the International Standardization Organization (ISO). Read more: United States Environmental Protection Agency. "Understanding Global Warming Potentials." Overviews and Factsheets. United States Federal Government, January 16, 2025.

<https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>.

Life Cycle Assessment (LCA) is a systematic set of procedures for compiling and evaluating the inputs and outputs of materials and energy, and the associated environmental impacts directly attributable to a product or process throughout its life cycle.

Cradle to Gate Assessment is a Life Cycle Assessment (LCA) of a product's partial life cycle, from resource extraction (cradle) to the factory gate (before it is transported for distribution and sale). It includes stages A1-A3 and omits the use and the disposal phases of the product.

Whole Building Life Cycle Analysis (WBLCA) is a life cycle assessment that quantifies the total environmental impacts from a building over the duration of its lifespan from the extraction of resources for construction materials (cradle) to the disposal phase (grave).

# Requirements for Projects With a Smaller Physical Footprint

(recommended for projects less than 50,000 square feet)

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## Proposal Requirements

### 1. Sustainability Commitment

Identify your firm’s commitments to sustainability and greenhouse gas reduction (300 words max).

### 2. Minimizing Embodied Carbon and LCA Experience

Identify your firm’s prior experience in minimizing embodied carbon and in using life cycle assessment for comparable projects (300 words max).

### 3. Preliminary Strategy to Minimize Embodied Carbon

Outline your preliminary strategy for ensuring that embodied carbon is minimized for this project (500 words max).

### 4. Commitment to Measuring Upfront Embodied Carbon and Employing Design Alternatives

A commitment to calculating the aggregate product-level embodied carbon in line with LEED v.5 (specifically as found in the BD+C Materials and Resources: Quantify and Assess Embodied Carbon credit).<sup>3</sup> Calculations must be made with the intent to identify and then minimize significant sources of embodied carbon by employing design alternatives. Free tools such as BEAM<sup>4</sup>, CARE<sup>5</sup>, and EC3<sup>6</sup> can be used to assist with these calculations and subsequent design decisions. The minimum expected scope is as follows:

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<sup>3</sup> Read more: U.S. Green Building Council. “Quantify and Assess Embodied Carbon.” Accessed August 28, 2025. <https://www.usgbc.org/credits/new-construction-core-and-shell/v5/mrp2?return=%2Fcredits%2FNew%20Construction%2Fv5%2FMaterial%20&%20resources=>.

<sup>4</sup> The Building Emissions Accounting for Materials (BEAM) tool can be used to estimate the carbon footprint of building materials. Builders for Climate Action. “Introducing the BEAM Estimator.” Accessed August 28, 2025. <https://www.buildersforclimateaction.org/beam-estimator.html>.

<sup>5</sup> The Carbon Avoided: Retrofit Estimator (CARE) tool can be used to compare the carbon cost of renovation vs. new construction. Carbon Avoided: Retrofit Estimator. CARE Tool. n.d. Accessed August 28, 2025. <https://www.caretool.org/>.

<sup>6</sup> The Embodied Carbon in Construction Calculator (EC3) tool is a database of environmental product declarations (EPDs). Building Transparency. “The EC3 Tool.” Accessed September 9, 2025. <https://www.buildingtransparency.org/tools/ec3/>.

- Life Cycle Stages: A1-A3 (cradle-to-gate)
- Physical Scope:
  - Substructure/foundation, superstructure, enclosure, and hardscape materials
  - All asphalt, concrete, masonry, structural steel, insulation, aluminum extrusions, structural wood and composites, cladding, and glass used in the project
- Environmental Indicator: Global Warming Potential (GWP)
- Calculations: Embodied carbon =  $\frac{\text{Product's GWP}}{\text{unit}} \times \text{amount of the material used}$

## 5. Hot Spot Analysis Report

During the design phase, the selected team must deliver a brief report based on initial GWP calculations identifying at minimum:

- GWP calculations for the required materials
- The three largest expected embodied carbon sources on the project
- Specific project changes to the design or procurement process that will minimize the impacts of those sources

# Requirements for Projects With a Larger Physical Footprint

(recommended for projects greater than or equal to 50,000 square feet)

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## Proposal Requirements

### 1. Sustainability Commitment

Identify your firm's commitments to sustainability and greenhouse gas reduction (300 words max).

### 2. Minimizing Embodied Carbon and LCA Experience

Identify your firm's prior experience in reducing embodied carbon and in using life cycle assessment for comparable projects (300 words max).

### 3. Expected Reduction Target and Preliminary Strategy

Design teams will strive to reduce the embodied carbon of the project by at least **30%** relative to a baseline "business-as-usual" model.<sup>7</sup>

Outline your preliminary strategy for pursuing the 30% reduction target (500 words max).

### 4. Commitment to WBLCA

A commitment to using Whole Building Life Cycle Analysis (WBLCA) in line with LEED v.5 (specifically as found in option 1 of the BD+C Materials and Resources: Reduce Embodied Carbon credit) to pursue, with integrity, the 30% embodied carbon reduction target.<sup>8</sup> The scope of the assessment should include, at a minimum, the following:

- Life Cycle Stages: A1-A4, B4, C1-C4 (cradle to grave)
- Physical Scope: Substructure/foundation, superstructure, enclosure, and hardscape materials. All other ancillary structures must also be included.
- Environmental Indicators: Global Warming Potential (GWP)
- Baseline Model Requirements: The baseline and proposed buildings must be of comparable size, function, orientation, and operating energy. The service life of the baseline and proposed buildings must be the same and at least 60 years to consider

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<sup>7</sup> See appendix page 11 for a discussion of the 30% target.

<sup>8</sup> The reduce embodied carbon Leed v.5 credit requires a 20% reduction for a project to be eligible for platinum (the highest) certification. To earn all 6 points on this credit, project teams must reduce embodied carbon by 40%. U.S. Green Building Council. "Reduce Embodied Carbon" Accessed August 28, 2025.

<https://www.usgbc.org/credits/new-construction/v5/mrc2?return=/credits/New%20Construction/v5/Material%20&%20resources>.

impacts from replacement and end-of-life. Baseline assumptions must be based on industry standard design and material selection for the project location and building type. Materials reused from an existing building structure and enclosure can be assigned a GWP of zero for stages A1 to A5. The team must use the same life-cycle assessment software tools and data sets to evaluate both the baseline building and the proposed building. Data sets must be compliant with ISO 14040.

## **5. WBLCA Report**

During the design phase, the selected team must deliver a brief report that outlines the changes made from the baseline building to produce the final project design. The report should also explicitly state the actual percentage reduction achieved by the enhanced design.

# Appendix

## Embodied Vs. Operational Carbon

Holistic building decarbonization requires tackling both embodied carbon and *operational* carbon which is the general power usage in a building for lighting, heating, ventilation, cooling, etc. For the purpose of this project, MCAN presumes that your RFP process is designed to minimize or eliminate operational carbon in the new facility through maximizing energy efficiency. This is achieved by operating at a low energy use intensity (EUI), being low- or zero-site carbon, and otherwise being net-zero carbon or net positive.

Over time, operational carbon can be further reduced as the electrical grid continues to decarbonize. In contrast, embodied carbon is largely a sunk cost since its largest contribution is derived from the production of the building materials themselves.<sup>9</sup> It must be addressed in the short term to reach our climate goals in the long term.

## Whole Building Life Cycle Analysis (WBLCA)

Reusing building materials or deciding against building at all will prevent new embodied carbon emissions all together. But of course, maintaining aging facilities often results in an increasing stream of operational carbon. To the extent that new construction is necessary, employing WBLCA presents a powerful strategy to minimize embodied carbon. As opposed to setting specific limits on certain building materials like concrete, WBLCA gives maximum flexibility to a design team. Used early in design, meaningful reductions can be incorporated when the potential for impact is greatest. This model RFP language adapts WBLCA guidelines both from the latest Leadership in Energy and Environmental Design certification program (LEED v.5) and from the 2023 BE+/MassCEC Embodied Carbon Reduction Challenge.<sup>10</sup>

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<sup>9</sup> For more on operational vs embodied carbon and the critical need to address embodied carbon now: Carroll, Aileen. “Embodied Carbon vs. Operational Carbon .” One Click LCA. Accessed September 9, 2025. <https://oneclicklca.com/en/resources/articles/embodied-carbon-vs-operational-carbon>.

<sup>10</sup> The Carbon Leadership Forum provides educational resources about life cycle analysis; notably: Lewis, Meghan, Brad Benke, Steph Carlisle, and Michelle Lambert. “Building LCA 101: Embodied Carbon Accounting for Buildings.” With Sindhu Raju. The Carbon Leadership Forum, June 2024. <https://carbonleadershipforum.org/building-lca-101/>.

## Target Percentage Reduction

MCAN recommends a 30% reduction target because it is an ambitious but often achievable goal. Industry leaders generally have confidence that achieving a 30% reduction is often not only doable, but also does not require a major design overhaul, a change in primary structural material, or a significant cost increase.<sup>11</sup> This professional sentiment regarding 30% as an appropriate target is supported by case studies published by the Rocky Mountain Institute (RMI) and the Massachusetts Clean Energy Center (MassCEC). In 2021, RMI published a review of a few case study buildings on the West Coast with results indicating that a 19%-46% reduction in embodied carbon was achievable with less than a 1% of a cost increase.<sup>12</sup> In Massachusetts, MassCEC collaborated with Built Environment Plus (BE+) in 2023 to host an embodied carbon reduction challenge that emphasized cost effectiveness in implementing low embodied carbon design alternatives as a grading criteria.<sup>13</sup> Sixteen leading architecture and engineering firms submitted projects of various types over 20,000 square feet in size, located in Massachusetts, that used several different design strategies to reduce embodied carbon. The median achieved embodied carbon reduction across the case studies was 29%<sup>14</sup> and ranged from 3% (major renovation already offsetting much of the embodied carbon associated with new construction) to 58% (new construction of a private university academic building).

Given the examples of low cost embodied carbon reduction strategies, a 30% reduction target for buildings of at least 50,000 square feet seems a reasonable target especially for these larger projects that are better able to leverage the economies of scale that facilitates a more sophisticated approach to design optimization through WBLCA. Design teams already regularly conduct WBLCA for projects of this large size and the Massachusetts cities of Boston, Cambridge,

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<sup>11</sup> A 2022 study of Ontario buildings noted that the ~30% reduction is often readily achievable without major cost increases. MCAN has confirmed this sentiment among Massachusetts firms. Read more about this study: Zizzo, Ryan, and Kelly Alvarez Doran. "Regulating Embodied Emissions of Buildings: Insights for Ontario's Municipal Governments." With Lisa King. August 2022.

<https://drive.google.com/file/d/1VD7RvQdLg7PWAUF2N97Q0-PAhes-k80Z/view>.

<sup>12</sup> Read more: Matt Jungclaus, Rebecca Esau, Victor Olgyay, and Audrey Rempher, Reducing Embodied Carbon in Buildings: Low-Cost, High-Value Opportunities, RMI, 2021,

<http://www.rmi.org/insight/reducing-embodied-carbon-in-buildings>.

<sup>13</sup> Read more: "Embodied Carbon Reduction Challenge." Built Environment Plus & The Massachusetts Clean Energy Center, n.d.

[https://www.masscec.com/sites/default/files/documents/BEPlusEmbodiedCarbonChallenge\\_16CaseStudies.pdf](https://www.masscec.com/sites/default/files/documents/BEPlusEmbodiedCarbonChallenge_16CaseStudies.pdf).

<sup>14</sup> Although the wide range of building types entered in this challenge make direct comparisons difficult, this number is still informative in that it shows relatively high percentage reductions can be achievable while still prioritizing cost effectiveness.

and Newton require WBLCA for most buildings of at least 50,000 square feet. Additionally, a bill in the state legislature would require a minimum embodied carbon reduction of 30% for state-funded projects over 50,000 square feet.<sup>15</sup> Based on these examples, 50,000 square feet seems a good threshold for asking for WBLCA. It is crucial that the practice of WBLCA be expanded and fully leveraged to ensure effective embodied carbon reduction happens across the Commonwealth. Effective WBLCA use can identify strategies for designing lighter with less material, thus saving embodied carbon and material costs.

Based on the preponderance of current thinking, 30% is a helpful target which will often be obtainable. It is crucial that design teams start considering embodied carbon early to ensure a reduction of this magnitude is achievable.

## Massachusetts Municipalities With Embodied Carbon Regulations<sup>16</sup>

Municipality	Regulation	Applicability	Embodied Carbon Reporting	Embodied Carbon Limits	Effective Date	Learn More
Boston	Net Zero Carbon Zoning	≥50,000 sq ft	-Enclosure and structural LCA -Must meet LEED certified criteria	Not specified	7/1/25	<a href="#">Link</a>
Newton	Sustainable Design Development Ordinance	≥20,000 sq ft	-Structural LCA for ≥20,000 sq ft, but <50,000 sq ft -Whole building LCA for ≥50,000 sq ft	10% reduction from LEED reference building for ≥50,000 sq ft	12/11/23	<a href="#">Link</a>
Cambridge	Article 22	Non-residential construction ≥50,000 sq ft	Whole building LCA and narratives	Not specified	7/1/23	<a href="#">Link</a>
Brookline	Article 18	-All new municipal construction -Town must encourage private development to comply	Not specified	Procured concrete must have ≥10% less GWP than average whenever feasible	10/5/21	<a href="#">Link</a>

<sup>15</sup> Read more: The 194th General Court of the Commonwealth of Massachusetts. “Bill H.3337.” The Massachusetts State Legislature. Accessed August 28, 2025. <https://malegislature.gov/Bills/194/H3337>.

<sup>16</sup> This table is adapted from the Boston Society for Architecture presentation “Embodied Carbon: Policy Meets Practice” Watch here: <https://www.youtube.com/watch?v=rhexaknz0cw&t=562s>

## Embodied Carbon Intensity (ECI): An Advanced Alternative Path

One potential limitation of the WBLCA percentage reduction approach used in the model language above is its reliance on a user-generated baseline, or hypothetical, building. While the guidelines above establish expectations for how the baseline should be calculated, they can not fully preclude the possibility of manipulation (“gaming”).

An alternative approach that decouples compliance from user-generated baselines is to set an embodied carbon intensity (ECI) limit based on building use type, normalized by floor area (kg CO<sub>2</sub>e/m<sup>2</sup>). This approach is currently in use in parts of Canada and Europe and relies on existing data sets of individual building WBLCA<sup>17</sup>. In 2022, the city of Toronto became the first North American jurisdiction to adopt mandatory limits, relying on an ECI benchmarking study of Ontario buildings by Mantle Developments, a consultancy group, and the University of Toronto.<sup>18</sup> The city used the median ECI for different building types found in this study to inform their adoption of the current mandate that all municipal new construction must not exceed 350 kg CO<sub>2</sub>e/m<sup>2</sup>. This number aligns with Low Energy Transformation Initiative’s (LETI’s) 2030 recommended 350 kg CO<sub>2</sub>e/m<sup>2</sup> limit for commercial buildings.<sup>19</sup>

Meanwhile, in April 2025, the Carbon Leadership Forum (CLF) published a benchmarking study using WBLCA data from Canadian and American buildings (largely in the Northeast and on the West Coast) to determine if appropriate ECI limit recommendations could be set. CLF used the 25th, 50th, and 75th ECI percentiles and combined them with varying life cycle scopes, physical scopes, and building use designations to establish a wide array of potential limits.<sup>20</sup> For guiding the development of regulations, the study includes a table designed to help policy makers select a specific ECI limit.<sup>21</sup> Importantly, for municipal construction regulation and this project, the study

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<sup>17</sup> Read more: Russell, Jonathan, and Tom Harley-Tuffs. “International Drivers of Low Carbon Structural Design.” The Institution of Structural Engineers, April 3, 2023.

<https://www.istructe.org/resources/guidance/international-drivers-of-low-carbon-structural-des/>

<sup>18</sup> Read more: Zizzo, Ryan, and Kelly Alvarez Doran. “Regulating Embodied Emissions of Buildings: Insights for Ontario’s Municipal Governments.” With Lisa King. August 2022.

<https://drive.google.com/file/d/1VD7RvOdLg7PWAUF2N97O0-PAhes-k80Z/view>.

<sup>19</sup> Read more: Bagenal George, Clara, ed. “LETI Embodied Carbon Primer.” January 2020.

<https://www.aed.consulting/public/climate/LETI%20Embodied%20Carbon%20Primer.pdf>.

<sup>20</sup> Read more: Benke, Brad, Aurora Jensen, Meghan Lewis, Manuel Chafart, and Kathrina Simonen. “The Embodied Carbon Benchmark Report.” The Carbon Leadership Forum, April 2025.

<https://carbonleadershipforum.org/the-embodied-carbon-benchmark-report/>.

<sup>21</sup> MCAN recommends consulting this study when designing a comprehensive municipal policy (beyond RFPs) on embodied carbon using ECI limits.

includes recommended limits for educational and public assembly buildings which can be considered when planning the construction of new schools and community centers.

The policy decision table included in the CLF study is not directly applicable to this RFP context, because it uses different scopes. However, the 25th percentile limit is a good target; being a 25% improvement over the mean and capable of driving progress in embodied carbon reduction. The structure and enclosure (SE) A1-A5 physical and life cycle scope is used by Toronto and should be followed.<sup>22</sup> Please consult the below language when considering the ECI strategy for use in RFPs.

## ECI Model Language

**User note:** If deemed desirable, the below model language can be used *instead of* the recommended proposal requirements language above. Or, the below ECI limit requirements could be added to the above WBLCA percentage reduction requirement as either an additional requirement or alternative compliance route (meaning proposals can select either strategy to pursue and only need to satisfy one). Rewording the model language would be necessary to achieve that effect. When choosing an ECI limit, select from the below list of recommended examples:

### ECI Reference Numbers

- Toronto, for new municipal construction: 350 kg CO<sub>2</sub>e/m<sup>2</sup>
- CLF, for Educational buildings (25th percentile): 360 kg CO<sub>2</sub>e/m<sup>2</sup>
- CLF, for Public Assembly buildings (25th percentile): 400 kg CO<sub>2</sub>e/m<sup>2</sup>

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## Proposal Requirements

### 1. Sustainability Commitment

Identify your firm's commitments to sustainability and greenhouse gas reduction (300 words max).

### 2. Embodied Carbon Reduction and LCA Experience

Identify your firm's prior experience in reducing embodied carbon and in using life cycle assessment for comparable projects (300 words max).

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<sup>22</sup> This scope captures the majority of upfront embodied carbon emissions (typically around 75%) while avoiding the need for the relatively complex modeling assumptions to estimate end-of-life emissions (which generally account for the remainder). Also, WBLCA usually does not require including impacts from building construction (A5), so a CLF recommended practice is to estimate them using the ASHRAE 240p draft standard (or more recent version).

### 3. Embodied Carbon Intensity (ECI): Target and Strategy

Design teams will strive to minimize the embodied carbon of the project and to meet an embodied carbon intensity (ECI) target of [*select target from Toronto general limit, or CLF building-specific limit, as appropriate*].

Outline your preliminary strategy for pursuing this ECI target (500 words max).

### 4. Commitment to Measuring Upfront Embodied Carbon

A commitment to conducting an Upfront Embodied Emissions Assessment for the structure and enclosure in accordance with the Canada Green Building Council (CAGBC) Zero Carbon Building Standard methodology. The scope of the calculations must be as follows:<sup>23</sup>

- Life Cycle Stages: A1-A5
- Physical Scope: Substructure/foundation, superstructure, and enclosure
- Environmental Indicator: Global Warming potential (GWP)
- Calculations: Follow the CAGBC Zero Carbon Building Standard Version 3<sup>24</sup> or later embodied carbon tracking methodology. Calculate the total embodied carbon in kilograms of carbon dioxide equivalent (kg CO<sub>2</sub>e), express the building average in kgCO<sub>2</sub>e/m<sup>2</sup>

### 5. ECI Report

During the design phase, the selected team must deliver a brief report that outlines the materials to be used on the project, the employed embodied carbon reduction strategies, and the emission intensity level reported in kgCO<sub>2</sub>e/m<sup>2</sup>.

The date of this version is Sep 25, 2025

This most current version of this document should be referenced. It can be found at:

<https://docs.google.com/document/d/1C7vqDLUYzhat7YbWwbCusSSw4FTm5tuODUYVERtnOLk/edit>

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<sup>23</sup> Read more about Toronto's ECI compliance guidelines: City of Toronto. "Buildings Energy, Emissions & Resilience." April 26, 2022.

<https://www.toronto.ca/city-government/planning-development/official-plan-guidelines/toronto-green-standard/toronto-green-standard-version-4/mid-to-high-rise-residential-non-residential-version-4/buildings-energy-emissions-resilience/>.

<sup>24</sup> Read more: "Zero Carbon Design Standard: Version 3." Canada Green Building Council, November 2024.

[https://www.cagbc.org/wp-content/uploads/2022/06/CAGBC\\_Zero\\_Carbon\\_Building-Design\\_Standard\\_v3.pdf](https://www.cagbc.org/wp-content/uploads/2022/06/CAGBC_Zero_Carbon_Building-Design_Standard_v3.pdf).

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<https://drive.google.com/file/d/1VD7RvQdLg7PWAUF2N97Q0-PAhes-k80Z/view>.
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[https://www.cagbc.org/wp-content/uploads/2022/06/CAGBC\\_Zero\\_Carbon\\_Building-Design\\_Standard\\_v3.pdf](https://www.cagbc.org/wp-content/uploads/2022/06/CAGBC_Zero_Carbon_Building-Design_Standard_v3.pdf).

## Climate Action and Resilience Plan RFP – DRAFT RESPONSES

1. The RFP says that stakeholder engagement is not listed as an individual task but then on page 13 it is specifically listed as task two. Can the Town please confirm that stakeholder engagement is a specific task or if we should integrate it throughout?

*Stakeholder engagement should be integrated throughout the project. While it is identified as Task Two in the RFP, this reference was intended to emphasize the importance of establishing a clear and inclusive engagement framework early in the process. The Town expects stakeholder engagement to be an ongoing and integrated component of all project phases, informing the development, refinement, and implementation of the Climate Action and Resilience Plan.*

2. Can the Town please clarify what it is hoping to accomplish with a carbon valuation and economic analysis? Is the Town looking to sell credits or participate in a voluntary market and if so, is the Town comfortable knowing that any credit sold is not one that you can technically count as achievement towards your reduction targets?
3. The Town has provided a number of thoughts around when to host certain community outreach events. Is there flexibility for the consultant to offer alternatives based on the Town's desired outcomes or are these required?

*There is flexibility for the consultant to propose alternative approaches or timing for community outreach events. The Town's suggestions were provided to illustrate preferred timing and opportunities for engagement, but consultants can recommend approaches that best align with the proposal's goals and the Town's desired outcomes.*

4. Overall, the Town is asking for a lot for the allocated budget, are there certain areas where there may be flexibility to adjust the scope?
5. The RFP requests examples of prior reports and deliverables be submitted with the proposal submission. Will links to digital examples be sufficient, or would the Town prefer full documents be included as attachments?

*Links to digital examples are sufficient.*

6. Page 10 of the RFP states that proposals must be received by October 10. Please confirm that the official deadline is October 24 at 11am.

*Responses are due on Friday, October 24, 2025 at 11:00 AM to the Town of Concord, Town Clerk's Office on the 1<sup>st</sup> Floor of the Concord Town House, 22 Monument Square, Concord, MA 01742.*

7. Our Umbrella Liability Insurance limits are \$2M/ \$2M- which is common for a project like this, in our experience. Will you consider lowering the Umbrella Liability Insurance limits to \$2M/ \$2M to better accommodate small and diversity business bidders?

Yes.

8. Would the Town consider waiving the Architects and Engineers Professional Liability insurance requirement as it is not relevant to this project?

Yes.

9. Can the town provide a bit more clarity on its expectations and desired outcomes around consideration of goals for 2100? This is a significant additional analysis effort that may not provide much value given the level of assumptions that would have to be incorporated.

10. Although the development of a current year GHG emission inventory is not explicitly called out for in Task 4, will the Town require an updated GHG inventory, and if so, for what year?

*We will not require an updated GHG inventory.*



# Middle School Solar + Storage Project Updates

SEPTEMBER 23, 2025

# History

- ▶ Borrowing authorization: \$7.5M for ~1.2MW solar (rooftop + canopy) plus energy storage, thought to be 1 or 2MW / 4MWh
- ▶ CMLP to complete as a ratepayer-funded project separate from construction.
- ▶ Strong desire for coordination but project risk for simultaneous construction; risk for roof work prior to acceptance
- ▶ To bid this successfully, we needed a site license from the school to site our infrastructure on their property.



# Bid Structure

- ▶ Solar only: Rooftop as the base bid with an option to do the canopies
  - ▶ Alternates for meeting domestic content requirements
- ▶ Invitation for Bids under Chapter 30, Section 39M: Lowest eligible and responsible bidder
  - ▶ Unlike an RFP, this is not decided with subjective criteria
- ▶ Domestic content as an alternate for ITC

# Updated Conditions



ANNUAL  
INFLATION



UNFAVORABLE  
SOIL CONDITIONS



TAX CREDIT  
UNCERTAINTY

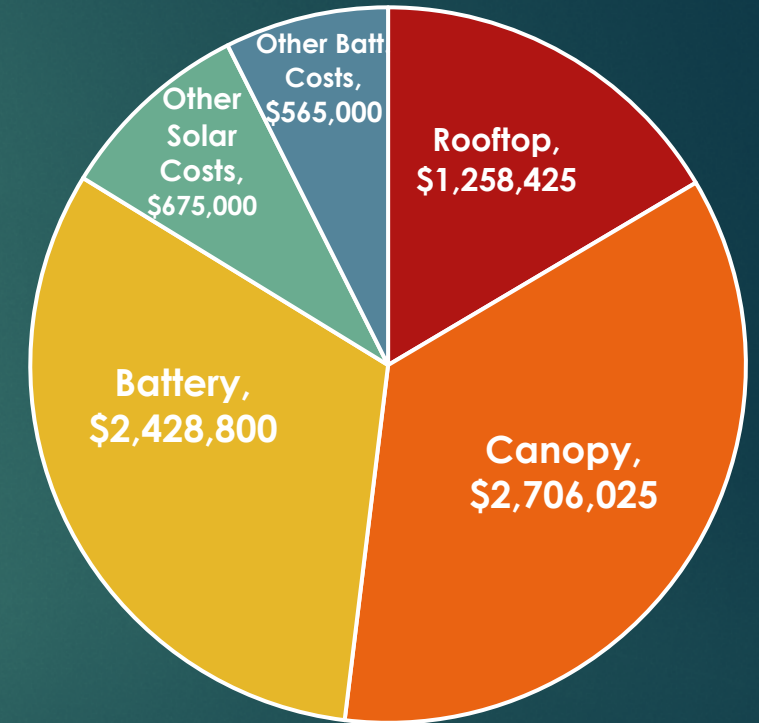


BATTERY SITING  
CONCERNS

# Pricing Estimates

**Borrowing Authorization:**  
**\$7.5M**  
**Project Cost: ~7.6M**

- ▶ Rooftop solar was estimated at \$2.50/Watt.
- ▶ Canopy solar was estimated at \$3.50/Watt (prior to soil sampling).
- ▶ The school will rarely push back with the rooftop solar alone; the canopies tip the scale for needing a battery.
- ▶ The battery made costs more favorable.



■ Rooftop      ■ Canopy  
■ Battery      ■ Other Solar Costs  
■ Other Batt. Costs

# Bid Process Update

- ▶ Bids were due on September 10, 2025
- ▶ Two bid packages were submitted
- ▶ We are still determining if the bidders are eligible and qualified
  - ▶ Interviews for previous project holders are ongoing
- ▶ Prices are in this ballpark:

Project	Estimate	Bid Range
Rooftop (base)	\$2.50/Watt	\$3-\$7
Canopy	\$3.50/Watt	\$3-6

# Complexity

- ▶ Due to the nature of the bid process and ongoing vetting, more information will be provided once the review process is complete.
- ▶ Options and alternates are not required, but they require careful vetting
  - ▶ Baker Tilly has been advising us on ITC eligibility.
  - ▶ Right now, the domestic content appears to be a wash but with some additional risk.
- ▶ Public bid processes in projects like this are guided by statute and have less flexibility than private processes.

# Next Steps



Continue vetting the projects completed by the bidders



Work with counsel to identify a process forward



Keep stakeholders updated as the process moves on



Work with the school to make sure any potential project is successful for both parties