CONCORD MUNICIPAL LIGHT PLANT
ELECTRIC | BROADBAND | ENERGY MANAGEMENT

Date: September 15, 2025

To: Municipal Light Board: Warren Leon, John Dalton, Brian Foulds, Bianca Taylor and Chris Schaffner

From: Jason Bulger, CMLP Director

Subject: Agenda for virtual Light Board meeting on **Tue., September 23, 2025, at 7:30 A.M.** (link below)

7:30 AM 1. **Call to Order**

7:30 AM 2. **Meetings and Minutes** 5 Minutes Chair Information

- Vote to approve the regular session minutes of August 13, August 26, and September 10, 2025.

Upcoming Meetings:
Oct 8, 2025; Oct 29, 2025; Nov 12, 2025; Dec 10, 2025; Jan 14, 2026; Feb 11, 2026

7:35 AM 3. **Time of Day Implementation Schedule** 25 Minutes Director Discussion

Background: CMLP is working on a roll-out of a default opt-out time-of-use rate for residential customers. The goal was to implement the rates as of 1/1/2026.

Purpose: With rates slated for approval in September, discuss the remaining action items and determine if the implementation should be moved to April 2026.

8:00 AM 4. **Networked Geothermal** 25 Minutes Guest Discussion

Background: The Concord Climate Action Committee has a subcommittee specifically focusing on networked geothermal. They have had plans to seek grant funds to study networked geothermal.

Purpose: To receive a presentation on networked geothermal and have a discussion with the Board.

8:25 AM 5. **Middle School Solar Project** 25 Minutes Director Discussion

Background: Bids for the rooftop and canopy solar at the middle school were received on September 10, 2025.

Purpose: To discuss the project goals and scope now that we have received pricing information.

8:50 AM 6. **Liaison & Public Comments** 5 Minutes Chair Information

8:55 AM 7. **Adjourn**

Distribution: Select Board (1 copy)

Kerry Lafleur	Joe Repoff	Laura Scott	Nan Okarma
Dale Hartling	Jennifer Clougherty	Cameron McKennitt	Don Kupka

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Zoom Meeting information:

https://us02web.zoom.us/j/82941453662?pwd=lx90IzJ5GaaNB8tk8vGFOvUL6vMw5a.1

Meeting ID: 829 4145 3662
Passcode: 988158

Link to view recordings of previous Light Board Meetings:
https://www.youtube.com/playlist?list=PL1TTzrWEKOOn0RlJ2MdE2SnNZMWYeoeat

Link to view the Director's Updates (in meeting packets):
https://concordma.gov/1106/Municipal-Light-Board

Link to view the Broadband Monthly Updates:
https://www.concordma.gov/3148/Monthly-Updates

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Concord Municipal Light Board Minutes
August 13, 2025

Pursuant to a notice duly filed with the Town Clerk, a meeting of the Concord Municipal Light Board was held on Wednesday, August 13, 2025, at 7:30 am, via a Zoom meeting. Present were Board Members: Warren Leon, John Dalton, Brian Foulds, and Chris Schaffner. Also in attendance were Jason Bulger, CMLP Director; Laura Scott, Assistant Director of Power Supply and Energy Management; Joe Repoff, Assistant Director of Engineering and Operations; Nan Okarma, Financial Manager; Karin Farrow, Office Administrator; UFS President Mark Beauchamp; and residents Fran Cummings, Gail Hire, Brad Hubbard-Nelson and Pamela Dritt.

Note definitions for acronyms used in these minutes:

- **CMLP**: Concord Municipal Light Plant
- **TOD**: Time of Day
- **UFS**: Utility Financial Solutions

CALL TO ORDER

Mr. Leon called the meeting to order at 7:31AM. Meeting recording will be posted to the Minuteman Media YouTube page as soon as it is available.[1]

MEETINGS & MINUTES (0:16)

Mr. Foulds moved to approve the July 18, 2025 regular session meeting minutes as distributed. Mr. Dalton seconded the motion, and with all members present in favor, the motion carried 3-0. (Mr. Schaffner had not yet arrived and Ms. Taylor were absent.)

DIRECTOR'S UPDATE (1:21)

Director Jason Bulger provided updates on operations and the organization, including:

- CMLP extends its gratitude to Carole Hilton, our Customer Service Manager for the past 16 years. Carole will be staying around a couple of days per week to assist with the transition to her successor, as well as work on the marketing and implementation of Time-of-Day rates.
- Jennifer Clougherty has been hired and begins at CMLP on September 3rd in the Customer Service Manager role. She has a wealth of experience managing a sizeable Customer Service team for a large technical enterprise.
- CMLP's Director met with the school's team, including the Superintendent and Assistant Superintendent about the middle school solar project. The goal here is a collaborative project where both stakeholders are happy with the results. CMLP has answered many questions through addenda to clarify requests.
- Following up on the Board's guidance regarding the landfill solar expansion and battery, CMLP has received a draft letter of intent from the developer recommended by the Board. They are looking at some costs and system limitations to ensure that both parties can agree to those terms economically, and then it will move to a legal review. If everything is contained within this non-binding letter of intent, CMLP will execute it so that the process of negotiating a contract can begin.
- Mr. Bulger mentioned that CMLP has had four outages in the last few weeks and has issued a public

[1] Minuteman Media YouTube Link: https://www.youtube.com/watch?v=lDkcMgJKCD0

statement on those to offer an explanation to customers. Two of these outages were caused by rodents, one by a transformer that caught on fire, and one by a large tree falling, which took out multiple poles. The Light Plant and the community at large appreciate the hard work and excellent response times from our Engineering team and Line crew. CMLP takes system reliability very seriously and continues to address outdated equipment while adding more monitoring and trimming trees.

- CMLP's Financial audit is hopefully wrapping up soon, with nearly everything we have submitted being approved by our auditors.

BROADBAND UPDATE (9:15)

Broadband Manager provided updates on Broadband operations and organization, including:

- Daniel Chen, Broadband's new Network Engineer, hired a couple of months ago, is performing well and making meaningful contributions.
- Progress is being made on the XGS-PON, the next-generation broadband service designed to deliver 10G symmetric offerings. Equipment is scheduled to ship at the end of August. Preparatory work includes setting up inventory for new equipment, installing 100G switches and planning for temporary power needs during the conversion period.
- LightPath, the newest Internet Service Provider (ISP) is now connected, and all internet routes have been advertised through them, as well as through our other ISPs. Testing is planned to ensure full service through LightPath, which, if successful, will allow CMLP to drop the lowest-speed and highest-cost provider, thereby increasing speed and reducing costs. Additional internet addressing has been secured from the new provider, with deployment underway even before the new equipment arrives.
- CMLP is reviewing an updated broadband model from its consultant to determine appropriate service tiers and pricing for higher-speed offerings. It includes a pricing model for the new Wi-Fi equipment.
- Next-Generation Wi-Fi Trial: A next-generation Wi-Fi trial is in progress with Calix, the broadband solution vendor. New equipment has been ordered, training received, internal testing completed, and provisioning/inventory processes worked through.
- CMLP is experiencing numerous failures in RF gateways and is actively working with Eaton, the vendor, to identify the root cause. Wi-Fi enabled meters have been configured, verified, and tested successfully on a CMLP test meter. The goal is to deploy these meters in areas where RF reads are challenging.

TIME OF DAY RATE CLARIFICATION (17:16)

Mr. Leon stated that the Board's goal was to move towards a rate hearing to accept Time of Day (TOD) rates for the new year. He mentioned that a small modification was required in the proposed rates due to an issue with previous numbers.

Assistant Director of Power Supply and Energy Management Laura Scott then explained that the previous pricing model had an assumption that weekends from 3:00 to 7:00 p.m. would be charged peak prices. She clarified that this was not the Board's intention, as the consensus was that weekends should only have off-peak and super off-peak periods (1:00 to 5:00 a.m.). She informed the Board that Utility Financial Solutions (UFS) had rerun the numbers to reflect no peaks on weekends.

Mark Beauchamp, President of UFS, quickly reviewed the financial modeling and cost of service results. He recalled the Board's direction to stay within a 2% increase or decrease bandwidth for any rate class to move toward cost of service results. He confirmed Ms. Scott's point that the intention for weekends to be off-peak

required a slight tweak to the modeling.

Mr. Beauchamp then detailed the Time of Day setup, explaining that peak hours would be from 3:00 to 7:00 p.m. (a four-hour period), a super off-peak time from 1:00 a.m. to 5:00 a.m., and off-peak for the remaining hours. He presented a two-phase approach to move toward full cost of service results:

- Phase One would adjust the off-peak rate from 21 cents down to 20 cents, further reduce the super off-peak rate, and increase the on-peak rate to approximately 25 cents (standard period to 30 cents).
- Phase Two would further decrease off-peak to about 18 cents, super off-peak to 15.5 cents, and increase on-peak to around 33 cents (with peak to 47 cents).

He also provided Phase One impact analysis, explaining the rate increases and decreases that customers would see and noting that the change from Phase 1 to Phase 2 would be less dramatic.

Mr. Foulds asked to clarify if the opt-out rate had a flat or tiered structure. Ms. Scott clarified that a past Board vote had determined the opt-out rate would be 4% higher as a disincentive and was planned with tiers. Mr. Foulds disagreed, recalling a simpler, flat rate structure with a $20 monthly fee and a $20 meter read fee. He expressed concern that a tiered opt-out rate might incentivize large customers not to participate in time of day.

Mr. Beauchamp reiterated the primary change was the elimination of the on-peak period on weekends for residential time of day rates, which required a slight adjustment to other rates to recover a million-dollar shortfall, resulting in small increases for customers.

The proposed residential TOD rates changes were very small, as shown on the screen. Mr. Foulds confirmed he had no issue with the half-cent increase to allow weekends to be a full off-peak.

The discussion then expanded to solar credits, which Mr. Foulds questioned, specifically a change from 11 cents to 12.5 cents for net metering, arguing that if TOD rates adjusted for off-peak weekends, distribution charges shouldn't change. Mr. Beauchamp explained that the 12.5-cent amount included three components: distribution costs (8.1 cents), an over market component (3.3 cents due to power costs purchased to support community interests), and RECs (~1 cent), clarifying it was not a new methodology but a more detailed breakdown.

Mr. Foulds expressed discomfort with the multiple changes and the use of different methodologies (market-driven marginal costs for credits versus embedded costs for charges), viewing it as a disincentive for solar investment. Ms. Scott clarified that the embedded costs reflect commitments made to projects like wind farms years ago, and CMLP would incur losses if it credited customers for marginal value while still paying higher embedded costs.

Mr. Beauchamp conveyed that marginal costs are intended to create a "when-when" connection between costs incurred and customer behavior. Mr. Foulds asked for more time on this topic.

After further discussion involving other Board members, Mr. Leon concluded that a rate hearing for all rates could not proceed, necessitating an additional Board meeting, particularly for the solar issue. Mr. Bulger expressed concern about the logistical impact, especially on the January Time of Day launch, due to rate interdependencies and marketing schedules. He suggested a late August meeting for solar, followed by a September rate hearing, but worried it might be too late for a January go-live. Ms. Scott asked Mr. Beauchamp if cementing TOD rates today would pose a problem if other rates, like solar, needed adjustments later. He stated it wouldn't cause major issues, though it could lead to a slight under-recovery for the utility. He also indicated

that delaying the TOD rate rollout until April 1st would not be problematic economically for the utility.

HANDLING OPT-OUT CUSTOMER REQUESTS (1:15:04)

The discussion was initiated by Mr. Bulger, who clarified that there are two distinct types of opt-out situations: opting out of the new Time-of-Day rate (which had been discussed earlier) and opting out of the advanced meter (physical equipment), the latter being the focus of this segment of the meeting.

The Board had previously established a $75 one-time fee and a $20 monthly fee for customers who choose to opt out of the advanced meter, which requires a separate meter and manual reading. Approximately 35 out of 8,500 deployed meters currently have opted-out. He then outlined three specific issues for the Board's clarification.

First Issue: Customers with Multiple Meters Located Next to Each Other

Mr. Bulger presented a scenario where a customer has two meters situated right next to each other, and they questioned why they should be charged the $20 monthly reading fee for *each* meter if both can be read simultaneously during a single truck roll. He explained that while the physical reading might be combined, the current policy charges per meter, accounting for administrative and system costs.

Mr. Leon suggested that the fee should ideally be related to the actual costs incurred by CMLP, implying an adjustment if reading two adjacent meters is indeed less expensive than reading meters at two separate addresses. Mr. Foulds countered, stating that the $20 truck roll fee was already set below the actual cost of manual meter reading, and other MLPs often charge considerably more. He emphasized that the Board had previously intended the $20 fee to be non-punitive while still contributing to cost recovery.

Ms. Scott further elaborated, confirming that the $20 fee is nowhere near the cost of a truck roll. She explained that the initial $20 fee was based on generalizations and assumptions about the number and geographical distribution of opt-out meters, making it complex to argue that reading two close meters automatically costs less.

Mr. Leon summarized the Board's choices as either maintaining the $20 per-meter charge (acknowledging it's already an under-recovery) or attempting to make an accommodation. Mr. Schaffner and Mr. Foulds both expressed concern that making accommodations would lead down a rabbit hole of scenarios and result in custom rates for many individual customers. They concluded that it would be best to stay the course and stick with the $20 per meter for now.

Second Issue: Customers with Multiple Meters Not Physically Next to Each Other

Mr. Bulger briefly mentioned a situation involving one customer with two separate meters that are not physically adjacent. This issue was quickly passed over, as the Board had already decided against making special accommodations for multiple meters, regardless of their proximity, to avoid creating custom rate scenarios.

Third Issue: Meter Replacement Refusal for Existing Meters

Mr. Bulger presented the challenge of a customer who requested an opt-out meter but insisted on retaining their existing, older meter, refusing to have it replaced with either a new AMI meter or a new non-RF opt-out meter.

Mr. Bulger outlined CMLP's concerns regarding this refusal, primarily focusing on safety and data integrity. He explained that the old drive-by reading system, including specialized field tools for remote programming and multiplier adjustments, is being decommissioned and transferred to the water department. If an old meter remains, CMLP would no longer maintain support for it, creating potential vulnerabilities where remote access tools could compromise the meter's integrity or inadvertently alter readings. For these reasons, CMLP requires customers to choose either a new non-RF opt-out meter or a smart meter.

Mr. Bulger reiterated that CMLP owns the meters and has broad authority from the Department of Public Utilities (DPU) to service, replace, and maintain them. He then proposed an escalation policy developed with legal counsel:

- An initial notification to the customer, stating they must replace their meter.
- A second, non-negotiable notice after 15 days of non-compliance.
- Escalation to the DPU for an administrative warrant, a legally binding document signed by a judge, confirming CMLP's right to access and replace the meter.
- He also mentioned that disconnection could be a last resort if the warrant cannot be executed and CMLP cannot reliably read or replace the meter, due to security and integrity concerns.

Mr. Foulds confirmed that CMLP had already engaged in direct discussions with this particular customer, who was still refusing access. All Board members found the proposed policy to be appropriate reasonable. Mr. Leon underscored that the meter is CMLP's property, and the utility must have the ability to access and replace it to ensure its effective future operation and the integrity of readings.

Mr. Bulger then requested a Board vote to formally accept the proposed policy.

Mr. Schaffner moved to accept the CMLP automatic meter reading and advanced metering infrastructure opt out policy as presented. Mr. Foulds seconded the motion, and with all members present in favor, the motion carried 4-0.

LIASION & PUBLIC COMMENTS (1:34:47)

- Brad Hubbard-Nelson, a member of the Climate Action Committee, mentioned that a group has been meeting monthly to discuss networked geothermal projects. They are looking at successful projects in Framingham and Dorchester and considering where geothermal could fit in Concord, specifically within areas labeled as "non-pipeline alternatives" by National Grid as part of the Gas System Enhancement Plan (GSEP). They are interested in making a presentation to the Light Board in the next couple of meetings. In the meantime, they plan to reach out to residents and businesses in the fall to gauge interest in a geothermal network or an air-source program in a neighborhood.
- Gail Hire spoke about opting out of analog meters and associated fees, appreciating Mr. Foulds' questions about monthly charges and concerns regarding fairness. She said it would be unfair to impose an additional opt-out fee for the time-of-use rates on customers with non-emitting analog meters, as they cannot access TOU rates. She urged the Board to consider adjusting the opt-out rate for these customers. She also mentioned a large tree that took down utility lines and three utility poles off Bedford Street, reminding the Board about CMLP's undergrounding fund.
- Pamela Dritt commented that all rates, especially time of day rates, need to incentivize behavior as well as cover costs. She believes that when Concord generates its own local green energy, it will become massively cheaper for everyone, advocating for faster investment in this area. She also argued against

buying Renewable Energy Certificates because it doesn't increase local green energy and wanted to focus on fairness for the long-term power supply to everyone, with special help programs for those who cannot afford increased costs. Further, Ms. Dritt proposed that residents installing solar and batteries should receive extremely high benefits to encourage more investment, as this makes power better and cheaper for all. She concluded that all-electric heat pump heating must be made cheaper than natural gas to achieve town-wide non-emitting clean energy, suggesting special rates for all-electric heat pump buildings.

ADJOURN (1:08:16)

Mr. Foulds moved to adjourn and enter executive session without the intent to return to regular session pursuant to the Commonwealth of Massachusetts Open Meeting Law Purpose for Exemption #10, to discuss trade secrets or confidential, competitively sensitive, or other proprietary information related to power supply contracts. Mr. Schaffner offered a second, and all three remaining members voted unanimously to adjourn the regular session meeting at 9:14AM. (Mr. Dalton had left the meeting at this point.)

Respectfully submitted,
Mr. Dalton, Clerk

Concord Municipal Light Board Minutes
August 26, 2025

Pursuant to a notice duly filed with the Town Clerk, a meeting of the Concord Municipal Light Board was held on Tuesday, August 26, 2025, at 7:30 am, via a Zoom meeting. Present were Board Members: Warren Leon, John Dalton, Brian Foulds, Bianca Taylor and Chris Schaffner. Also in attendance were Jason Bulger, CMLP Director; Laura Scott, Assistant Director of Power Supply and Energy Management; Joe Repoff, Assistant Director of Engineering and Operations; Nan Okarma, Financial Manager; Karin Farrow, Office Administrator; Kerry Lafleur, Town Manager; Cameron McKennitt, Select Board liaison to the Light Board; Don Kupka, Finance Committee Liaison to the Light Board; UFS President Mark Beauchamp; UFS Representative Mike Johnson, and residents Andy Puchrik, Brad Hubbard-Nelson and Pamela Dritt.

Note definitions for acronyms used in these minutes:

- **CMLP**: Concord Municipal Light Plant
- **TOD**: Time of Day
- **UFS**: Utility Financial Solutions
- **REC**: Renewable Energy Certificate

CALL TO ORDER

Mr. Leon called the meeting to order at 7:31AM. Meeting recording will be posted to the Minuteman Media YouTube page as soon as it is available.[1]

NET BILLING VALUATION UNDER NEW TIME-OF-DAY RATE (0:10)

Mr. Leon stated he would lead an extended discussion on the solar policy for CMLP and its implementation with time of day (TOD) rates without pushing a specific solution, aiming to highlight the strengths and weaknesses of various possibilities.

UFS Proposal and Key Discussion Points

The UFS proposal suggested that solar customers selling power to the grid would not be credited a distribution rate of 12.53 cents divided into three components.

The primary discussion points were:

1. Whether the 8.145 cents for distribution costs was the correct number.
2. Whether the uncredited distribution rate would include over market power costs and RECs.

Implications for Solar Customers under Time of Day Rates

Ms. Scott and UFS gathered data showing a varied impact on solar customers' electricity bills under the proposed TOD rates. Approximately 33% of customers would see their rates go down, some significantly. These savings were largely attributed to changing time of use patterns (blue bars in charts). About two-thirds of customers would pay more, with the largest group seeing increases of $10 or less per month, but some could see bills go up by as much as $80 per month.

Mr. Dalton questioned what was driving these differences, asking if it was solar output timing or consumption patterns. It was clarified that the impact related to how much power customers sell back to the grid, when and how they produce solar (e.g., array orientation), and their electricity use during peak times.

[1] Minuteman Media YouTube Link: https://www.youtube.com/watch?v=HOlriPsSCxc

The shift from net metering to net billing means solar customers would generally see an increase, as they would no longer offset distribution costs for all power produced, only receiving value for energy, capacity, and transmission when exporting. They pay distribution on what they use. Mr. Beauchamp clarified that CMLP does not measure how much solar a house produces, only what is exported versus imported. When power is exported, customers are reimbursed at a rate that does not include distribution.

Ms. Taylor questioned if this was a disincentive for solar, and it was noted as a "less rich incentive" than before, but still an incentive. An example was provided: under the new structure, a customer importing 400 units and exporting 100 units would pay full price for 400 and receive solar compensation for 100, where compensation is retail time-of-day price minus the distribution charge. The difference between the charge and credit is proposed to be 12.53 cents.

Ms. Scott mentioned that if the Board sought a distribution amount that would leave an equal number of people paying more and less, the distribution rate would be 10.27 cents

Board members discussed whether 8.145 cents was the correct distribution cost base. Mr. Foulds noted a discrepancy with the R1 opt-out rate, which showed a 6-cent distribution cost. Mr. Beauchamp explained that 8.145 cents is the correct distribution rate for the residential class based on a fine-tuned analysis of distribution costs for each class. The 6-cent rate in the opt-out table was a default aimed at balancing a targeted increase. **The board agreed to adjust the opt-out table so that all residential rates would have the same, appropriate distribution rate of 8.145 cents.**

Regarding over market costs, Mr. Beauchamp explained them as the cost incurred by utilities for securing power supply (e.g., building generators, purchasing renewable products like wind) to achieve rate stability, even if these resources are sometimes more expensive than current market prices. Ms. Scott clarified that it includes the premium paid for clean energy versus standard grid emissions.

Arguments for inclusion: All residential customers pay this as part of their energy rate, benefiting from rate stability. When solar customers export power, it doesn't create additional stability for the utility. Arguments against inclusion (or for crediting solar customers for it): Mr. Foulds argued it complicates communication to customers, making it difficult to explain why the round trip cost of a kilowatt goes up beyond the distribution fee. He considered it a pass-through cost that should be credited. Ms. Taylor questioned adding it to the solar distribution charge if it's not exclusively tied to renewable energy market negotiations but broader stability expenses. Mr. Dalton acknowledged Mr. Foulds' point on simplicity but emphasized the need to send the right price signal for investment decisions, especially given potential future investments in batteries to manage excess solar.

Regarding the Renewable Energy Certificates (RECs) 1.038 cents inclusion in the distribution rate, Mr. Beauchamp explained that when solar units produce power, CMLP does not get REC credits for that. If CMLP does not receive the RECs, they still have to purchase RECs from the market at a cost (1 cent/kWh) to meet their clean energy goals.

Arguments against inclusion (or for crediting solar customers for it): Ms. Taylor questioned why CMLP would buy RECs for solar power, suggesting it's illogical if the power is already renewable. Mr. Foulds noted that many customers find it difficult to sell small REC values, and suggested that if CMLP wants the RECs, they should buy them directly. Arguments for inclusion (not crediting solar customers for it): Mr. Schaffner, a solar owner, explained that he sells his RECs to a third party, meaning the electricity he gives back to CMLP is technically not

renewable for CMLP to claim as such. Therefore, CMLP needs to buy RECs to count that power as clean.

It was noted that CMLP has a tariff where customers can donate or sell their RECs to CMLP, which could be an alternative mechanism. A brief tally showed about half of CMLP's solar customers (installed pre-2016) likely have RECs not being actively managed, and CMLP is not benefiting from them.

Board Discussion and Decision
Mr. Dalton asked Mr. Foulds about the financial impact (e.g., payback period) on solar customers. Mr. Foulds stated it would vary widely among the 500+ customers and couldn't provide a general answer. Mr. Foulds advocated for the distribution adder to be solely the 8.1 cents, excluding over market and RECs. Mr. Schaffner, whose solar was cash-flow positive from day one, thought RECs should definitely be included in the rate. He was uncertain about over market, feeling it was a basic cost of electricity. Mr. Dalton leaned towards including the 12.53 cents, to send accurate price signals, especially considering the need for battery investments to manage excess solar. Mr. Leon expressed discomfort with the full 12.53 cents from a public perception standpoint. He noted that with a rate of roughly 10 cents, an equal number of solar customers would gain and lose. He suggested including distribution and RECs (totaling 9.2 cents) as a compromise to avoid public concern during the transition.

Mr. Foulds then suggested that if the REC fee was kept, the Donate-your-RECs riders could be amended to credit those customers the 1 cent, incentivizing them to provide certificates to the utility. The Board said they would address this at a future time.

Mr. Schaffner moved that the Board adjust a total distribution adder to be just a distribution charge of .08145 and the REC charge of .01038 and to not include the over market costs. With a vote of 4-1, the motion passed (Ms. Taylor the "No" vote).

LIASION & PUBLIC COMMENTS (1:15:18)

- Brad Hubbard-Nelson liked the outcome of the Board's decision and suggested the REC piece is messy and hard to explain, recommending it be hidden within the distribution charge. He stressed the importance of encouraging battery adoption and suggested the REC discussion be linked to the future donate program discussion.
- Pamela Dritt expressed continued confusion regarding solar compensation and charges. She advocated for making solar installations financially beneficial to residents, arguing that the entire community benefits from lower electricity costs and local generation. She also questioned whether solar generators pushing power back during peak periods get compensated more (they do, based on TOD structure). Ms. Dritt reiterated concern that solar customers get paid less for exported power than they pay to buy power at the same time, attributing it to the distribution fee and the REC charge. Finally, she argued CMLP needs to get credit for behind-the-meter solar as clean energy, regardless of REC sales, stating RECs are merely an incentive and don't change the energy's green nature.

ADJOURN (1:24:30)

Mr. Schaffner moved to adjourn the meeting. Mr. Foulds offered a second, and members voted unanimously to adjourn the meeting at 8:56AM.

Respectfully submitted,
Mr. Dalton, Clerk

Concord Municipal Light Board Minutes
September 10, 2025

Pursuant to a notice duly filed with the Town Clerk, a meeting of the Concord Municipal Light Board was held on Wednesday, September 10, 2025, at 7:30 am, via a Zoom meeting. Present were Board Members: Warren Leon, John Dalton, Brian Foulds, Bianca Taylor, and Chris Schaffner. Also in attendance were Jason Bulger, CMLP Director; Laura Scott, Assistant Director of Power Supply and Energy Management; Joe Repoff, Assistant Director of Engineering and Operations; Nan Okarma, Financial Manager; Jennifer Clougherty, Customer Service Manager; Carole Hilton, Management Specialist; Donna De Gray, Customer Service Supervisor; Karin Farrow, Office Administrator; Kerry Lafleur, Town Manager; Cameron McKennitt, Select Board liaison to the Light Board; Don Kupka, Finance Committee Liaison to the Light Board; and residents Fran Cummings, Elissa Brown, Brad Hubbard-Nelson, Karlen Reed, Kim Slack, Michael Currie, Peter Fandel and Pamela Dritt.

Note definitions for acronyms used in these minutes:

- **CMLP**: Concord Municipal Light Plant
- **TOD**: Time of Day

CALL TO ORDER

Mr. Leon called the meeting to order at 7:31AM. Meeting recording will be posted to the Minuteman Media YouTube page as soon as it is available.[1]

CHAIR'S UPDATE (0:16)

Mr. Leon mentioned that a second meeting will be necessary in the month of October. The Board settled on Wednesday, October 29th at 7:30am for the date and time.

MEETINGS & MINUTES (1:50)

The Board did not have enough time to review the minutes and plans to approve them at the next meeting.

DIRECTOR'S UPDATE (3:16)

Director Jason Bulger provided updates on operations and the organization, including:

- Mr. Bulger introduced Jennifer Clougherty, the new Customer Service Manager.
- The customer service team is working with Public Works to integrate stormwater and solid waste recycling utilities into their billing system, and this is one of the biggest changes since broadband was implemented for billing entities.
- The bid opening for the middle school solar project was scheduled for 1 PM that day (9/10/2025).
- The solar and battery project at the landfill is moving forward, and CMLP has filed a PP5 with ISO New England to begin the study for the battery's impact on the distribution system.
- The Drive and Save EV savings tool has been made more user-friendly, and a recent campaign resulted in over 100 new users. The commercial charging station rebate has also been updated.
- CMLP staff were present at Ag Day to publicize the Connected Homes program.
- The engineering team hosted SEL, the vendor for the SCADA rollout, on site for three days to verify

[1] Minuteman Media YouTube Link: https://www.youtube.com/watch?v=KoL621sjzHs

measurements and connections. The project is expected to be finished in Q3 or Q4 of next year.
- CMLP staff participated in a mental health training at an all-staff meeting in August, which was well-received and appreciated by many employees.

BROADBAND UPDATE (8:48)

Mr. Bulger provided the broadband report as Dale was unavailable.

- All equipment for the next-generation broadband deployment has been received, and staff are working on racking it. The goal is to cut over to the new system before Thanksgiving.
- New Wi-Fi equipment is being deployed in customer homes and is popular. Mr. Bulger explained that this managed Wi-Fi service will reduce support calls and truck rolls by providing visibility into coverage issues, keeping CMLP competitive with other providers.
- The team has also been working to provide network access to the Peabody School.
- Mr. Foulds asked about the fee for the new Wi-Fi equipment. Mr. Bulger responded that the basic equipment is covered by the $150 installation fee, but CMLP is considering offering additional equipment for a modest cost to customers who need it for larger homes or better penetration.

RATE HEARING (13:40)

Mr. Foulds moved that the Light Board suspend the regular meeting and enter a rate hearing. With a second from Mr. Schaffner, the Board voted 5-0 to enter into a rate hearing.

R-TOD: Residential Time-of-Day Rate

Ms. Scott began the rate hearing discussing the Residential Time-of-Day (R-TOD) rate, which would be the default for all residential customers transitioning from the R1 rate unless they opt out. It retains the $20 per month meter charge, and it is a revenue-neutral rate. The listed costs on the tariff sheet are inclusive of all energy, capacity, transmission, and distribution charges for each time period and season.

- Seasonality: March, April, October, and November are **Shoulder** seasons; the rest of the year is **Standard**.
- Times: **Peak** (3 PM to 7 PM), **Super Off-Peak** (1 AM to 5 AM), and **Off-Peak** (all other hours).

Mr. Foulds pointed out that the language did not cover weekend time periods during weekday peaks. Ms. Scott explained that previous advice to simplify the language by changing Off-Peak to Monday through Sunday was incorrect, and she planned to revert the change to include a separate line for weekends. Mr. Foulds credited Jim Terry, a former board member, for raising this issue.

Mr. Foulds suggested simplifying the language to define peak and super off-peak, with all other hours as off-peak. Ms. Scott expressed concern about potential confusion. The Board didn't care which way it was presented, but they did agree on the timing of the rates.

R-Opt-Out: Residential Opt-Out Rate

Ms. Scott presented the opt-out rate, which she had renamed at Mr. Foulds' request from the R1 rate to "Rate - Opt-Out" for customer-facing communication. This rate maintained the $20 per month customer charge, and based on a previous Board vote, the distribution charge was set to equal the "pure distribution" from the cost of service study plus 1.038 cents for REC costs, but not including the 3 cents of over-market. Mr. Leon clarified that the distribution could have been 12 cents. These opt-out rates were about 4% higher on average for customers compared to the R-TOD rate.

Mr. Foulds asked if the 4% assumed a flat load curve or a typical load curve. Ms. Scott clarified that the

comparison generating the 4% higher figure used a customer's expected hourly load shape under R-TOD, based on a year's worth of load data from new meters. Mr. Leon clarified that while these rates were 4% higher on average, some customers might do better on the opt-out rate if their bills would have increased significantly under R-TOD. Ms. Scott agreed, noting that small users with high on-peak usage could benefit from opting out.

Ms. Taylor asked for clarification on why TOD rates included distribution, energy, and other charges as one standard rate, while the opt-out rate broke them out separately. Ms. Scott confirmed that the Board had earlier decided to collapse these charges into the TOD rate for simplicity, while the opt-out retained the R-1 structure. Ms. Taylor then asked if pricing was on par with Eversource. Ms. Scott clarified that while the opt-out rate was 4% higher than the TOD rate, both were still 25-30% less than Eversource.

Mr. Foulds reiterated his concern from the last meeting that the REC costs were collected in the distribution charge instead of the energy charge. He wanted the distribution charge to be 8.3 cents and the REC collected in the energy charge. Mr. Leon asked him to hold off on the discussion until the next rate (Solar Net Billing) to ensure all Board members understood the implications for solar compensation as well.

Ms. Taylor returned to the pricing, expressing that if the opt-out rate was 4% higher than TOD, and TOD seemed comparable to Eversource, then it might not provide enough incentive to switch. While there was a question of why the super off-peak rate wasn't a bigger incentive, Mr. Leon reiterated the Board's decision for a gradual transition to TOD rates, with smaller differences initially to acclimate customers.

Solar Net Billing Rider

Ms. Scott presented the Net Billing Rate, explaining the change from net metering to net billing. She proposed that the tariff sheet state that power delivered by CMLP to the customer would be billed at the R-TOD rate, and power delivered by the customer to CMLP would be credited at the R-TOD rate minus the distribution charge shown in the opt-out rate.

Ms. Scott noted that while repeating the exact rates for credit on the tariff sheet would aid customer understanding, it was generally not good legal practice due to potential discrepancies if one set of rates was updated but not the other. Mr. Foulds commented that the statement about "less distribution" was incorrect because it also included a penny for RECs. He preferred it to state "less distribution and less the cost to purchase a REC." He also wanted the tariff to indicate that customers in the REC donation program would receive that REC value credited to them. Mr. Leon separated Mr. Foulds' points into two issues: adding language about REC donation (which he preferred to postpone for a full discussion) and the clarity of the REC charge in the opt-out rate.

Ms. Taylor emphasized the importance of clarity regarding charges to solar customers, stating it should be explicit that CMLP is charging solar producers a REC. Ms. Scott clarified that CMLP wasn't charging for the REC, but rather not crediting the customer for it because the REC was not given to CMLP. Ms. Taylor further elaborated on her view that nickeling and diming solar customers was unproductive, especially given that residential solar is a small portion (maybe 10%) of the overall energy portfolio, and the calculations for REC donations were onerous and not super relevant to overall sustainable goals. Mr. Leon acknowledged Ms. Taylor's points but stated he did not hear other Board members wanting to revisit the previous decision on solar customer credits. He then addressed Mr. Foulds' and Ms. Taylor's point about clarifying the REC charge as being in energy rather than distribution. Mr. Foulds clarified that he was not proposing to change the energy charge, but to move the REC collection out of distribution and back into capacity and transmission, where it was before a recent adjustment. Mr. Dalton sought clarification, asking if the net effect was to reverse a previous decision. Mr. Foulds argued it would not change the total collected value. He explained that the distribution fee (8.145 cents) funds light plant operations, while the energy charge funds generation and RECs, and

capacity/transmission are for those fees, but the rounding errors and adjustments often occurred in capacity/transmission. Mr. Leon confirmed the proposed change would not affect people's bills, only where the numbers appeared. Mr. Foulds stated it would not, if the net billing rider language was changed to say, "less the distribution and REC," clearly listing what distribution and REC costs are. Mr. Leon asked if any Board member disagreed with clarifying on the solar billing page that credits do not include distribution and RECs. Hearing none, he concluded they were okay with Mr. Foulds' approach. Mr. Foulds referred to Mr. Bulger's Excel sheet, which showed putting the penny back into capacity and transmission and setting distribution at 8.145 cents, maintaining the same net collection per kilowatt [hour].

	Original	Change	Proposed
Capacity and Transmission Charge			
First 657 kWhs	0.03931	0.01038	0.04969
Next 178 kWhs	0.0524	0.01038	0.06278
All in excess of 835 kWhs	0.07757	0.01038	0.08795
Distribution Charge	0.09183	-0.01038	0.08145
Energy Charge	0.07903		0.07903

R-EV SM: Residential Electric Vehicle Charging Separate Meter

Ms. Scott presented the EVSM (Electric Vehicle Second Meter) rate, which was identical to the TOD rate but with a reduced meter charge of $9 per month instead of $20, exclusively for customers charging EVs through a second meter. Mr. Foulds asked if the rate could simply refer to the TOD rate with the meter fee change. Ms. Scott indicated they would check with counsel, noting other utilities use separate tariffs rather than riders for such rates. Mr. Bulger confirmed a separate tariff would require re-stating the rate. Ms. Taylor confirmed the rates were the same as TOD. Mr. Foulds understood it as an extra $9/month for the second meter, with the same per-kilowatt fees. Ms. Scott confirmed the need to adjust the hours language for consistency with the TOD rate.

Controlled Water Heating Credit Rider

Ms. Scott introduced the Controlled Water Heater Credit Rider. She explained that the consultant's study recommended a credit of $7.31 per month for CMLP controlling a customer's water heater, a decrease from the current $10 per month, reflecting the cost of service study. This adjusted rider reflected the new credit. Mr. Foulds clarified this applied only to eligible customers. He also asked why heat pump water heaters were not eligible. Ms. Scott explained that it was because they use less electricity, and the $7.31 value is based on CMLP avoiding peak-related expenses, which is not as significant for 1KW or 2KW heat pumps compared to a full 5KW water heater. Mr. Foulds found this logical.

G1: Small General Service (SGS)

Ms. Scott moved to the Small General Service (G1) rate. This rate, recommended by the consultant, represented a 2% increase from the previous year, as the cost of service study showed this class was under-collecting. The customer charge was raised from $20 to $24. Mr. Foulds confirmed there were no structural changes, only updated values. Mr. Leon suggested considering a time-of-day option for commercial customers in the future but not at present.

G2: Medium General Service (MGS)

Ms. Scott presented the G2 rate. This rate class was found to be over-collecting, so the overall adjustment, including an increased meter charge (from $59 to $90) and volumetric fees, resulted in a 2% reduction for the average customer. The consultant aimed to move more fixed charges to a fixed collection. The demand rate was increased to move it towards cost of service. The structure and terms of the rate remained unchanged.

G3: Large General Service (LGS)

Ms. Scott presented the G3 rate. The customer charge increased from $477 to $600 per month, and the demand

fee increased from $8.57 to $9.57 per KW. The totality of these changes resulted in an average 2% bill decrease for G3 customers.

Mr. Foulds summarized the changes: G1 customers see a 2% increase, G2 and G3 customers see a 2% decrease, and residential customers are neutral, except for opt-out customers who would be 4% higher. Mr. Bulger confirmed that overall, the rates were designed to collect the same revenue as the previous year, with no planned total increase. Mr. Dalton asked if enough information was available to move commercial customers to time-of-day rates. Ms. Scott stated more study would be needed. Mr. Foulds agreed, noting a lot more studying. Mr. Bulger added that commercial meters were installed after residential ones, so the data set was smaller, but a full year of data should be available in about a year.

G4: General Service – Electric Vehicle Charging

Ms. Scott then brought up the G4 electric vehicle charging rate but suggested removing it from the packet, as she was still discussing the proposed rates with the consultant. She explained that the purpose of this rate was to incentivize business customers to charge EVs under this rate rather than their general service rate, which often had no demand or time-of-day fees, encouraging peak charging. She noted that EV charging during peak times could cost CMLP $1,500/year per EV. The G4 rate was intended to include a time-of-day component to discourage peak charging, while still being more attractive than general service rates. Mr. Leon agreed that it seemed like a good idea but supported taking it out of the packet until the rates were finalized. Ms. Scott agreed. Mr. Foulds noted the proposed values were significantly higher than current rates. Mr. Leon confirmed no action would be taken on this rate today. Mr. Bulger added that no customers were currently on this rate.

Mr. Dalton raised a concern that EV customers choosing the opt-out rate might cause significant costs to the Light Plant (up to $1,500/year) if they charged during peak times without incentives. He asked if there could be a supplemental charge or provision within the opt-out rate for EV customers. Ms. Scott noted the difficulty of isolating EV charging from other uses on a single meter for a volumetric fee. Mr. Dalton suggested increasing the last block rate. Ms. Scott pointed out that not all EV customers are large users. Mr. Leon suggested directing Ms. Scott and Mr. Bulger to examine this and recommend how to encourage opt-out EV customers to avoid peak charging. Ms. Taylor interjected, arguing that this approach was backwards and a wholesale waste of time. She believed that if incentives were properly designed for TOD rates, all customers would want to switch, and there would be no need to hunt down a few non-compliant EV owners. Mr. Leon asserted they were creating proper incentives but also offering an opt-out. He conceded that no new EV charges or incentives would be proposed today but could be revisited.

PCA: Power Cost Adjustment

Ms. Scott presented the Power Cost Adjustment Clause (PCA). She explained that this clause defines the amount in rates set by CMLP to collect for power expenses. Any over or under-collection is returned to or collected from ratepayers, as CMLP must manage power supply as a revenue-neutral budget element. This rate sets the assumed power cost for 2026, and monthly accounting tracks differences, which are then reflected in the PCA charge to customers. Mr. Foulds recalled its use during the Ukraine war when electricity costs jumped, and noted a current 0.4 cent credit on CMLP bills since early 2025 due to power costing less than assumed in 2024. Mr. Leon asked for questions on the PCA. Finding none, he confirmed it was the last page.

Mr. Leon apologized that Network Geothermal and the time-of-day implementation schedule would not be covered due to time constraints. He stated that another meeting would be needed to discuss these topics, in addition to the October 29th meeting, but emphasized keeping the ETS discussion in early October. He then invited public comments on the rates before the vote. Mr. Foulds clarified that public comments would precede closing the rate hearing and the vote.

The Board next took public comments:

- Peter Fandel wished to inquire about ETS rates but learned that there will be a dedicated meeting on that topic on October 8, 2025.
- Don Kupka discussed the 2024 request for borrowing authorization for a utility-scale battery and suggested that the time-of-day messaging was in conflict with the materials presented in support of the battery. He also mentioned the complexity of these rates and expressed concern that rates approaching real-time would be too difficult for customers to follow. He wishes to see Time-of-Day rates for commercial customers as well.
    - Staff clarified that messaging for the utility-scale battery shared data from one day in April, and that load curve was not indicative of the rest of the year.
- Kim Slack asked if he should be advising customers interested in solar to choose west-facing panels based on these rates. He also asked if some solar customers would do better under the TOD rate and others would do better under the Opt Out rate, how are they to know? Next he asked about heat pumps and asked for clarification on that. Finally, he asked what the impact of the battery was on customers.
    - Mr. Leon responded to the solar rate query saying that the majority of solar customers will do better under the standard TOD rate (60/40).
    - Ms. Scott explained that it costs CMLP more to serve heat pump customers than regular electric customers and also that heat pump customers would likely see lower rates on TOD rates because of their usage in the super off-peak period.
    - Mr. Bulger explained that the battery would save money on capacity and transmission costs, and that revenue would lower the Plant's revenue requirement in subsequent years, lowering rates.
- Pamela Dritt urged the Board to look at the opt out rate and try to find ways to make the Time-of-Day rate more financially compelling for customers who have invested in solar and heat pumps.

Mr. Foulds moved that the Light Board adjourn the rate hearing and return to regular session. With a second from Ms. Taylor, the Board voted 5-0 to re-enter regular session.

Mr. Bulger pulled up on the screen a list of the Board's wishes during the rate hearing as amendments to the tariff sheets in the packet. After reviewing them with the Board to confirm they captured the Board's intentions

Mr. Foulds moved that the Board accept the rates in the packet with the changes noted [below]. With a second from Mr. Dalton, the Board approved the rates 4-1 (Ms. Taylor the "No" vote).

1. Adjust the time schedule in any rate listing it to clarify the peak periods in the following way:
    a. Peak: Monday through Friday, 3pm through 7pm
    b. Super Off-peak: Monday through Sunday, 1am to 5am
    c. Off peak: All other times
2. Remove the G-4 Rate
3. In the OPT OUT rate:
    a. Add 0.01038 REC charge to each Capacity & Transmission line and remove it from Distribution
4. In the Solar Net Billing Rider:

Update the description of the "Rates and Credits" section to explain that the amount credited equals the Distribution charge in the OPT OUT rate plus the $0.01038 charge for RECs

TIME-OF-DAY IMPLEMENTATION SCHEDULE
This topic was deferred to a future meeting due to time.

NETWORKED GEOTHERMAL
This topic was deferred to a future meeting due to time.

LIASION & PUBLIC COMMENTS (1:44:46)

No member of the public wished to speak.

ADJOURN (1:45:00)

Ms. Taylor made a motion to adjourn the meeting. Mr. Schaffner offered a second, and with a unanimous vote in the affirmative, the meeting was adjourned at 9:16AM.

Respectfully submitted,
Mr. Dalton, Clerk

Time-of-Day Rates: Timeline

Discussion Points on the Schedule for Implementing New Electric Pricing

Agenda Items

- Overview of Time-of-Day Electric Rates
- Customer Outreach and Education
- Meter Data Management System Integration
- Bill Print Configuration
- Final Preparations and Go-Live Readiness

Definition and Benefits of Time-of-Day Rates

Understanding Time-of-Day Rates

Time-of-day rates vary based on electricity demand at different times, with consumers charged more for energy when it is more expensive to purchase (when peaks are likely to happen).

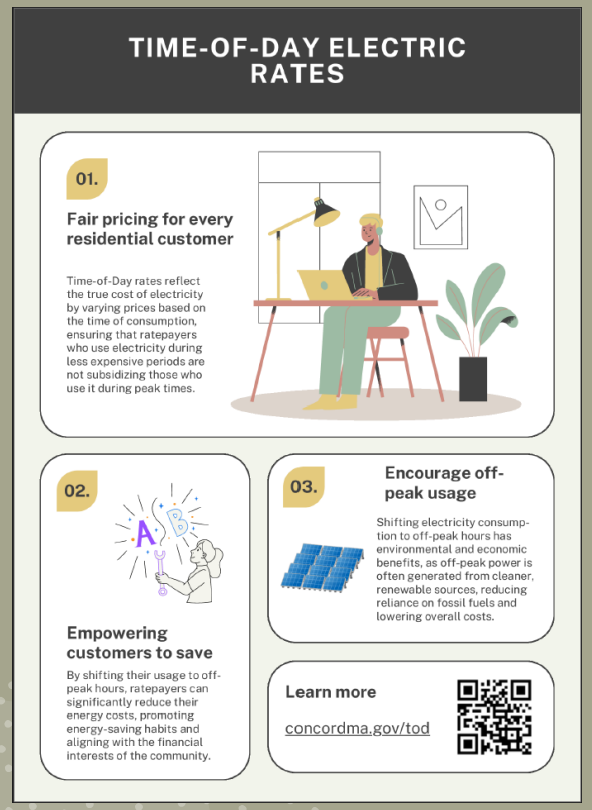
Benefits to Consumers

One major benefit is fairer and lower energy costs for consumers, as they can shift usage to cheaper off-peak times.

Environmental Impact

Time-of-day rates contribute to environmental benefits by promoting a more balanced energy grid and reducing peak demand.

Remaining Steps: Customer Outreach and Education



Customer marketing needs:

- Email and social campaign
- Direct mail or bill inserts
- Tools and Calculators
- Landing pages with information
- Interviews and videos
- Presentations
- Internal team training

Meter Data Management System Integration

Data Integration Needs

- We need to address any coverage or data gaps
- Meter data is fed into the MDM
- Bill calculations need to be tested and proofed
- The process of building rates normally takes about 3 weeks; TOD will likely take twice that.

Bill Print Configuration

Billing needs:

- Incorporating recommendations from the Light Board
- Working with billing vendor to program new rates
- Developing new graphics and tables
- Testing bill prints to ensure accuracy

Success

- A well-informed customer base
- Well-informed staff
- Technical tools perfected
- Systems integrations validated
- Tests and pilots completed
- Clear, understandable bills and web pages

Risks

- We have 3 months prior to go-live; our messaging goal originally was closer to 6 months.
- Stormwater & Solid Waste/Recycling billing integration for Customer Service, billing, and bill print.
- We are relying on a new marketing vendor.
- NISC bill print updates typically take 6 months to perfect.
- Our meter reading has some known issues.
- Staff transitions on onboarding
- Miscommunicating go-live can break trust.

Rolling Out a Pilot Program Before Full Launch

Real-World Testing

Apilot program enables real-world testing to evaluate new rates in a controlled environment and gather valuable feedback.

Gathering Insights

Insights gathered during the pilot phase are crucial for identifying potential improvements and adjustments before the full rollout.

Fine-Tuning the Process

The pilot program provides an opportunity to fine-tune processes based on actual user experiences and outcomes.

Proposed Timeline (4/1/2026 Go-live)

September	October	November	December
Communicate to Marketing firm our go-live date	Familiarize with content library	Build landing pages and integrations	Consolidate lists of target audience
Vet marketing materials and planned schedule	Work on bill print explainer/calculator	Work on bill print explainer/calculator	Additional community outreach
Training materials preparation	Internal Staff focus on Stormwater/SWR	Internal Staff focus on Stormwater/SWR	Internal staff training
Finalize bill print work (while Stormwater/Solid Waste begins)	Bill print design	Bill print design	Bill print design
Documenting meter gaps	Addressing remaining communication issues	Addressing remaining communication issues	

Proposed Timeline (4/1/2026 Go-live con't)

January (2026)	February	March	April 1, 2026
Start 90-day campaign; include bill inserts	Start 60-day campaign; include bill inserts	Start 30-day campaign; include bill inserts	Go-live!
Publicize tools	Additional community outreach	Additional community outreach	
Internal staff training	Internal staff training	After-hours call center training	
Bill print testing	Bill print pilot	Final bill print testing	
Install and test communication equip.	Prove all data availability		

Final Preparations and Go-Live Readiness

Conclusion

Customer Education

Educating customers about new time-of-day rates is essential for a successful transition and maximizing benefits.

System Integration

Ensuring seamless integration of systems is critical for implementing new electric rates effectively and efficiently.

Thorough Testing

Conducting thorough testing before launching is vital to identify and resolve any potential issues that may arise.

Networked Geothermal and the Concord Municipal Light Plant

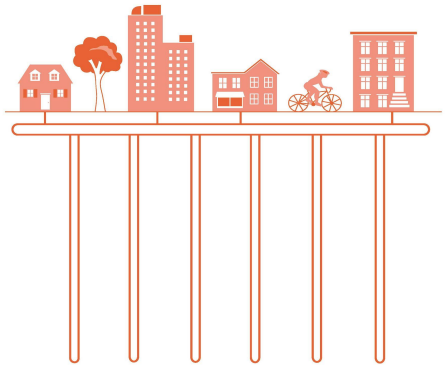
Presentation for the CMLP Light Board
September 10, 2025

———————————————

Brad Hubbard-Nelson
Concord Climate Action Committee

Networked Geothermal (a.k.a. Thermal Energy Networks)

- This concept for district heating and cooling has been pioneered and promoted by the nonprofit organization HEET (see material on their website & also CESA webinar)
- Instead of providing gas to buildings, a utility could provide a thermal network, a pipe from which heat can be extracted or inserted by each building with a geothermal (ground-source) heat pump.
- The network includes a number of wells (300-500’ depth) with the capacity to heat and cool all the buildings at the coldest and hottest temperatures expected.
- Buildings benefit from the very high efficiency of geothermal that is independent of outdoor temperature (unlike ASHP).
- Utility benefits from providing a new service instead of gas.

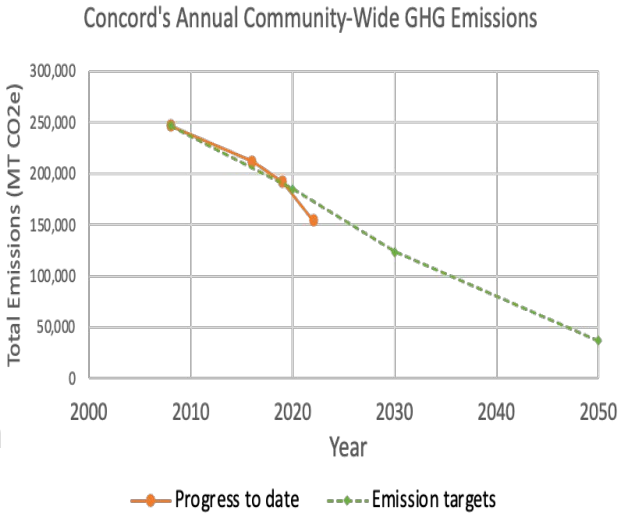


Motivation: Climate Action Perspective

Concord has adopted a GHG emissions reduction goal of 85% by 2050 to address the climate emergency.

- Buildings are the largest sector of Concord's GHG emissions, particularly heating.
- To meet our goals, all buildings will need to be *electrified* with heat pumps in the next 25 years.
- Customer adoption has been slow, as retrofitting individual houses with heat pumps is generally challenging and expensive.
- District heating and cooling with Networked Geothermal can accelerate adoption on a neighborhood basis through:
  - Streamlined procurement,
  - Higher system efficiency (COP) = low operating cost,
  - Economics of scale,
  - Capital costs reduced up-front and spread over time,
  - Longer-term financing

District heating & cooling with Networked Geothermal is a promising and necessary solution to meet our climate goals.



Concord has made good progress! Further reductions will be **more challenging** now that CMLP electricity is emission free.

Motivation: CMLP & Customer Perspective

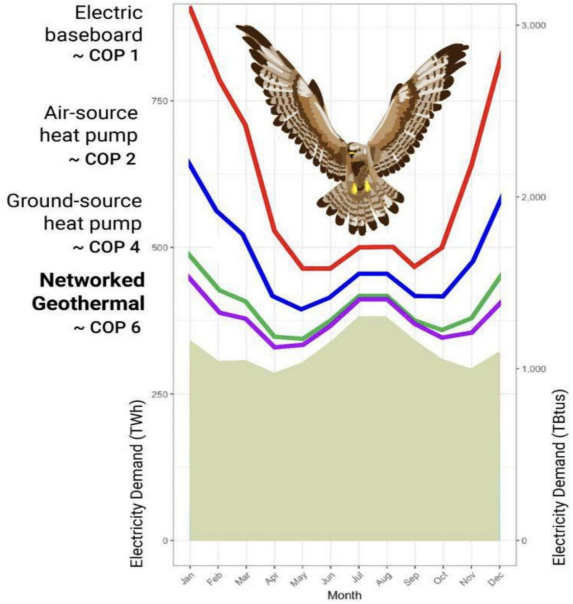
Geothermal networks will help CMLP avoid peak costs and moderate customer rates over time:

- Geothermal networks with ground-source heat pumps will lead to lower peaks, better system load factors and lower electric rates than over-reliance on air-source heat pumps,
- Ground-source heat pumps and networks can adjust better to peak-price periods given higher efficiency,
- Underground pipes and many other components of geothermal networks have very long lifetimes and can be financed over longer terms, with utility debt or credit support (e.g., long-term thermal purchase contracts)
- So, CMLP could avoid future costs and moderate customer rates over time by investing in the early years to support & accelerate geothermal network development

CMLP customers will appreciate benefits:

- Lower rates and lower overall energy costs,
- Support from a professional transition process with neighborhood-scale planning,
- Complete boiler and furnace replacement.

Projected electricity demand by month
(national total, 100% electrification scenarios)



Month: J F M A J J A S O N D

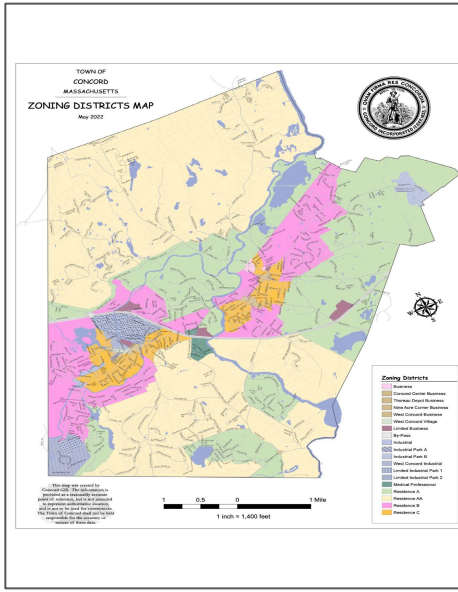
2020 usage in green

Other Networked Geothermal Advantages

- **A new business for gas utilities**: National Grid will lose a key business, a concern for management, and the unions. But, these utilities are capable of installing and maintaining underground networks, which could occupy the under-street right-of-way that the gas lines currently occupy.
- **Solution for aging gas infrastructure and the ‘last-in’ problem**: Maintaining the gas infrastructure will get more difficult with time, as customers transition away from natural gas. The remaining customers, including those who couldn’t afford to switch, would have to shoulder the growing maintenance expense.
- **Conversion of buildings in a neighborhood all-at-once**: Geothermal networks will be planned for economics of scale, and so that all home- and business-owners could install new equipment at the right time, with provisions made for temporary equipment in case heating systems fail beforehand.
- **Combining residential & commercial energy uses improves efficiency** (COP): heat can move from one end use to another on the network.

A vision for Concord's electrification

- 2025-6: Investigate technology and business model for geothermal networks with CMLP in collaboration with National Grid
- 2027-8: Design and implement a pilot project at a suitable site involving retrofits & new construction
- 2027-30: Design and implement a geothermal network for MCI Concord
- 2031-35: Plan and implement several geothermal networks, including multifamily housing and commercial districts
- 2036-40: Implement networks throughout Residence C zones,
- 2041-50: Implement networks throughout Residence B and eventually AA zones. Most of Concord residences covered.



This vision has the scale required to meet our emissions goal. It would reduce electric rates and save residents retrofit and operating costs (compared to ASHPs) with hopefully manageable public investment, and could strengthen CMLP's business in the long term.

Potential Initial Projects 2026-2029 (in addition to MCI)

1. Thoreau Depot (GSEP potential NPA)
    - Includes commercial, multifamily and residential properties - a favorable situation for networked geothermal
    - Could expand over time (e.g., Concord center, CCHS, other large buildings)
2. Crescent St (Residence B zoning) or Pond St (Residence C zoning)
    - Both GSEP potential NPAs, small enough for pilot,
    - Select Board has already approved pipe replacement plans, but National Grid has listed both as potential NPAs
3. Concord Greene
    - Perhaps relatively easy for building retrofits given ductwork and existing A/C
    - Possible without involving street infrastructure
    - Potential to include nearby commercial buildings, River as source
4. Emerson Hospital &/or Newbury Court (subject to Fossil-Free Bylaw)
    - Emerson Hospital planning $100M building upgrades
    - Newbury Court planning new residential development

Roles for NGrid and CMLP working together

Both utilities could be involved, providing the services suiting their capabilities.

For example:

- National Grid could build and run the underground network (geothermal wells and “distribution loop”) and sell energy (flowing either direction) to end customers;
  - If the gas utility is not ready, CMLP could invest &/or partner with an energy service provider.
- CMLP, in addition to selling the electricity, could manage the above-ground procurement & installation of equipment in homes: selecting contractors, negotiating bulk discounts and providing on-bill financing.
- Customers should see lower overall energy bills than fossil or air-source heat pump systems, reliable service and high level of comfort.

Clearly for this to work out, it needs to be financially workable for all parties. Analyzing the economics would be a task for the coming year.

Motivation: Avoid unnecessary spending on gas pipes

The MA governor, legislature and DPU view this as an opportunity for implementing non-emitting alternatives to meet commonwealth climate goals (net zero by 2050)

- Gas companies currently spend ~ $1.5B/year to install new gas pipes in MA.
- GSEP (Gas System Enhancement Program) is financing mechanism for utilities recovering these costs from customers.
- Multi-year GSEP plans filed with communities & DPU each November.
- 2024 Climate Bill allows GSEP to pay for pipe retirement or repair, and directs DPU and gas companies to consider which projects could use "**Non-Pipeline Alternatives" (NPAs)**. See Updated GSEP Fact Sheet from Mothers Out Front.

Concord has 3 potential NPA projects for 2026-2029

Description (street/segment)	NPA Opportunity	LPP Footage
3-46 POND ST, CON	Yes - Potential NPA	425
4-195 THOREAU ST, CON	Yes - Potential NPA	3,590
42-138 CRESCENT RD, CON	Yes - Potential NPA, entire scope	4,055

Framingham/Eversource geothermal network pilot project

Project Overview

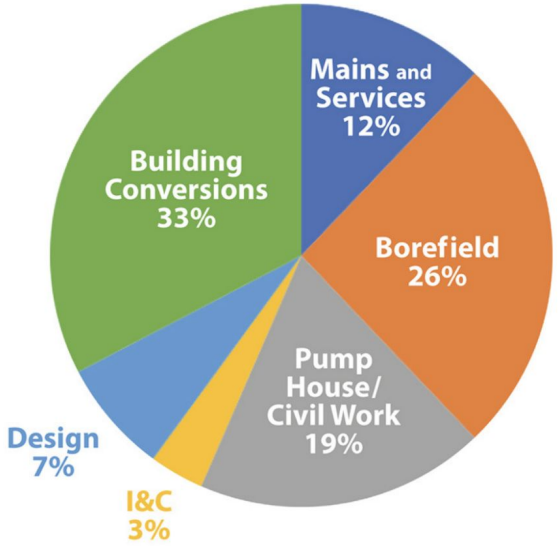
- One main and two recharge borefields
- Primarily Environmental Justice Community
- Mix of loads for system balancing
- 1+ mile of ambient loop piping
- Six outside stakeholders to integrate

Proposed in 2022
Completed in 2024

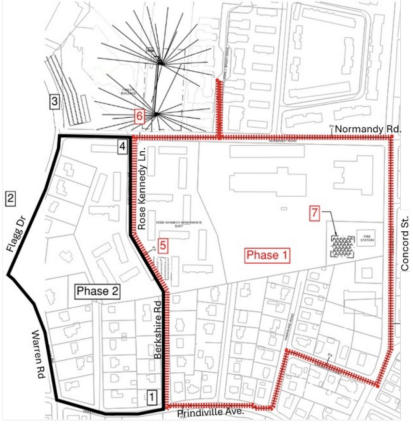
Framingham/Eversource geothermal network

- First-in-nation pilot project, summarized here (3/2025).
- Phase 1 operational since 2024.
- Includes 9 housing authority buildings, 5 commercial and 24 residences.
- 100% participation (Eversource paid full retrofit costs for residences and commercial buildings).
- 375 Tons total heating capacity from 113 boreholes
- Average home retrofit cost ~ $40K.

Current Pilot Cost Breakdown



Phase 2 proposal to extend network, DOE funded



Some potential Concord pilot projects

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    - Possible without involving street infrastructure
    - Potential to include nearby commercial buildings

MCI Concord Redevelopment

Promising large site for a geothermal network:

- Fossil free new construction required.
- Mix of commercial and residential buildings boosts efficiency.
- Waste water treatment plant and/or river are good thermal resources, lowering cost as less wells would be needed.
- Energy consultant Buro Happold experienced in the technology
    - See GeoMicroDistrict Feasibility Study

Concord could propose a geothermal network in the MA Environmental Bond Bill.

Summary

- Networked Geothermal can be a promising climate solution with benefits to CMLP and Concord residents.
  - New concept using mature technology.
- Understanding the technology and business considerations for utilities working together is important in the near future.
  - Can collaborate with other MLPs, assisted by MAPC, HEET and other groups.
- We ask that CMLP and the Light Board support this work:
  - Consider how networked geothermal would most benefit CMLP and residents.
  - Assist with business and technology modeling in the coming year.
  - Work actively with MCI Concord development planning towards a geothermal network.

Thank you for the opportunity to speak today!

Additional slides to follow, if useful for Q&A

Other ongoing or proposed networked geothermal projects

1. Boston Housing Authority + National Grid - under construction
    - Electrify Franklin Fields apartments in Dorchester, serving 129 families.
    - Design in 2024, construction starting 2025.
    - Previous NGrid project in Lowell cancelled earlier this year.
2. Salem MA “Heaven and Earth” proposed project
    - Community owned network proposed by San Pedro Episcopal Church (Reverend Nathan Ives)
    - Heating and cooling for the downtown area, including public housing, shops, and city buildings.
    - ~1 mile loop under streets with ~450 boreholes under Salem Common
    - Draft feasibility study April 2025

Larry Lessard (Achieve Renewable Energy) and Rev. Nathan Ives

The Case for Networked Geothermal in Concord

Brad Hubbard-Nelson, Concord Climate Action Committee
Revised: September 5, 2025

Background

At the 2024 Annual Town Meeting, Concord citizens adopted the climate goal of reducing emissions from energy use by at least 85% by 2050, in recognition of the urgent situation facing society. Since the three largest emission contributions are residential buildings, commercial buildings and vehicle transportation, this means all three of these sectors will need to be electrified almost completely in the next 25 years. Technical solutions exist, specifically electric-powered heat pumps and electric vehicles, that can take care of most of this job using emissions-free electricity. However, for the building sector, economic issues and technical realities may pose insurmountable challenges. Networked geothermal, a model for district heating and cooling, is one promising technology to address many of these challenges as described below.

What is Networked Geothermal?

Geothermal heating[1], a mature technology, can be the most efficient and lowest operating cost heating and cooling option for buildings in this climate. The high cost of installation prevents widespread adoption, though for certain buildings with appropriate ducting, it can be cost effective coupled with local and federal incentives. Networked geothermal is a new concept for neighborhood-level heating/cooling, in which a utility operates a loop network of geothermal wells, to which residential, commercial and municipal buildings can be connected. This year in Framingham, Eversource has built a first-in-the-nation pilot network (phase 1 completed in Summer 2024)[2], and National Grid is building a geothermal network in Dorchester,[3] after cancelling an earlier project in Lowell.

Fig 1: Geothermal network connecting buildings along street.

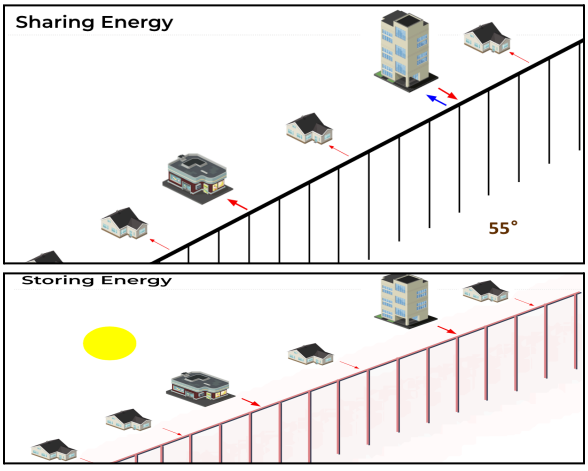
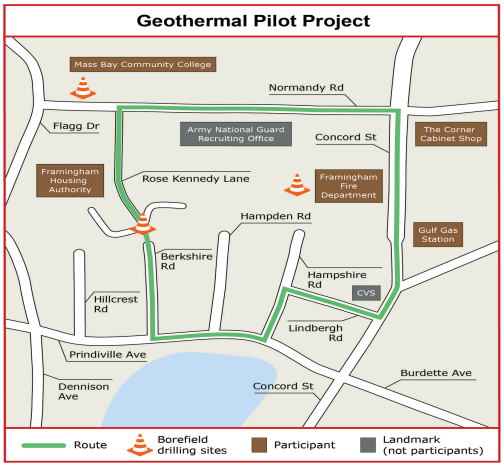


Fig 2: Eversource Framingham pilot project



[1] Not to be confused with Geothermal Energy, used for electricity generation in locations where geology includes magma close to the surface.

[2] Eversource website reference to Framingham pilot project

[3] Boston's first networked geothermal project will electrify 7 public housing buildings

Similar privately-operated geothermal networks are in operation at some college campuses, and also in Europe. In Massachusetts and the US, Networked Geothermal has been promoted by the nonprofit organization HEET[4], pointing out a number of advantages as we transition from fossil fuels to electricity:

- **A new business for utilities to replace natural gas**: National Grid and other gas utilities will lose a key business, which the management, and the unions, would oppose. These utilities are capable of installing and maintaining such underground networks, which could occupy the under-street right-of-way that the gas lines currently occupy.
- **Aging gas infrastructure and the 'last-in' problem**: Maintaining the gas infrastructure will get more difficult with time, as customers change away from natural gas. The remaining customers, including those who couldn't afford to switch, would have to shoulder the growing maintenance expense.
- **Conversion of buildings in a neighborhood all-at-once**: Geothermal networks would be planned so that home- and business-owners could install new equipment at the right time, with provisions made for temporary equipment in case heating systems fail beforehand.
- **Mitigating winter and summer electricity peaks**: Compared with air-source heat pumps, which lose efficiency in very cold or hot weather, geothermal heating maintains high efficiency, reducing the size of the expected winter electricity peak. This can save a capacity and transmission charge costs for all ratepayers if significant fractions of geothermal are installed.

Networked Geothermal Study Group and Collaborations

For networked geothermal to be feasible in Concord, we need to demonstrate a business case where utilities and ratepayers can benefit, with participating residents and businesses reducing operating costs. In this case the separate electric and gas utilities would need to collaborate with defined roles, if both were involved. Last year the Climate Action Committee formed a subcommittee to investigate the technology and business models for installing and operating networks, and advise the Town on whether and how to adopt the technology. Our intention was to obtain grant funding to hire a consultant, but the subcommittee was not continued.

This year, the work has been continued by a study group including Mothers Out Front and other community volunteers. Mothers Out Front has undertaken a statewide campaign to promote neighborhood electrification (networked geothermal or otherwise), in coalition with Gas Transition Allies. This campaign aims to engage communities and residents to advocate for non-pipeline alternatives for GSEP (Gas System Enhancement Program) projects.

Other communities, including several MLP communities, are planning for networked geothermal in early stages. The organizations HEET and MAPC are facilitating a Multi-Town Gas Leaks Initiative, with a focus on networked geothermal. Also the Massachusetts Light Commissioners Association has been discussing networked geothermal projects in quarterly meetings.

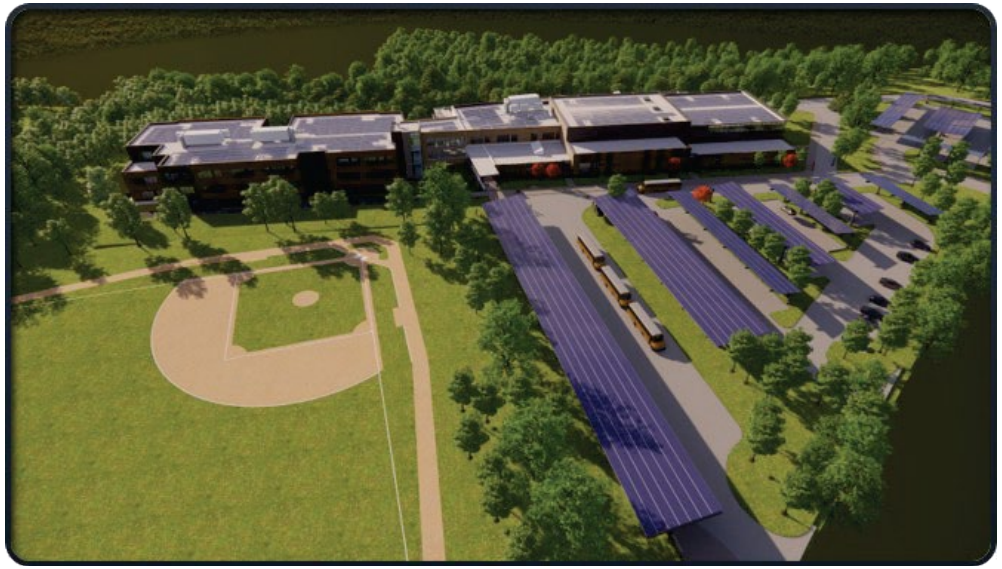
[4] HEET.org (Home Energy Efficiency Team) has good resources about networked geothermal, and has funded some planning efforts through its Kickstart grant program.

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

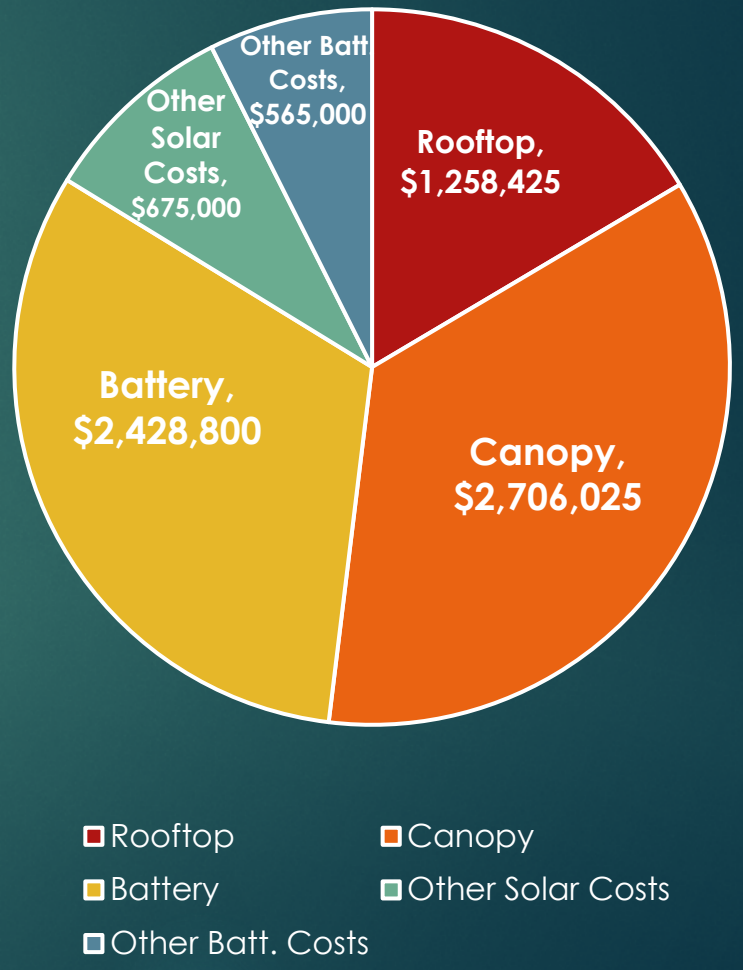
TAX CREDIT UNCERTAINTY

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.



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