CONCORD MUNICIPAL LIGHT PLANT
ELECTRIC | BROADBAND | ENERGY MANAGEMENT

Date: July 11, 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 **Friday, July 18, 2025, at 7:30 A.M.** (link below)

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

7:30 AM 2. **Election of Chair Pro Tempore** 2 Minutes Chair Vote
Light Board Chair Warren Leon will be absent, so the Board must elect a Chair for the meeting.

7:32 AM 3. **Meetings and Minutes** 3 Minutes Chair Vote

- Vote to approve the regular session minutes of July 9, 2025.

Upcoming Meetings:
Aug 13, 2025; Sep 10, 2025; Oct 8, 2025; Oct 22, 2025*; Nov 12, 2025; Nov 24, 2025*; Dec 10, 2025
*Not officially scheduled, but we will need a second meeting in October and November.

7:35 AM *4.* **Energy Storage Financing Methodology** 50 Minutes Director Info./Discussion
Background: The Light Plant's strategic plan calls for grid-scale energy storage for resilience, cost savings, and to allow for more in-town solar to be installed.

Purpose: CMLP staff will ask the Board to weigh in on their preferred method of storage procurement, whether ownership/tolling or a shared savings model.

8:25 AM 5. **Liaison & Public Comments** 5 Minutes Chair Information

8:30 AM 6. **Adjourn**

Distribution:

Kerry Lafleur	Carole Hilton	Joe Repoff	Laura Scott
Nan Okarma	Dale Hartling	Cameron McKennitt	Don Kupka

Join Zoom Meeting
https://us02web.zoom.us/j/81922422844?pwd=CuWDohj2vkuk49M0locvJwLaU4ZmjE.1

Meeting ID: 819 2242 2844
Passcode: 479700

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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
July 9, 2025

Pursuant to a notice duly filed with the Town Clerk, a meeting of the Concord Municipal Light Board was held on Wednesday July 9, 2025, at 7:30 am, via a Zoom meeting. Present were Board Members: John Dalton, Bianca Taylor, Chris Schaffner, and Brian Foulds. Also in attendance were Jason Bulger, CMLP Director; Carole Hilton, Customer Service Manager; Laura Scott, Assistant Director of Power Supply and Energy Management; Nan Okarma, Financial Manager; Donna De Gray, Customer Service Supervisor; Ann Breitenwischer, Meter Supervisor; Karin Farrow, Office Administrator; Finance Committee Liaison to the Light Board; Cameron McKennitt, Select Board liaison to the Light Board; UFS Consultants Mark Beauchamp and Mike Johnson; and residents Karlen Reed, Peter Fandel, Hal Iverson, Andy Puchrik, and Pamela Dritt.

Note definitions for acronyms used in these minutes:

- **CMLP**: Concord Municipal Light Plant
- **COSS**: Cost of Service Study
- **TOD**: Time of Day
- **TOU**: Time of Use

CALL TO ORDER

Mr. Dalton 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]

ELECTION OF CHAIR PRO TEMPORE

Mr. Foulds moved to elect Mr. Dalton as Chair Pro Tempore for the meeting. Mr. Schaffner seconded the motion, and with all members present in favor, the motion carried.

MEETINGS & MINUTES (1:13)

Mr. Foulds moved to approve the June 11, 2025 regular session meeting minutes as distributed. Mr. Schaffner seconded the motion, and with all members present in favor, the motion carried. (Mr. Leon and Ms. Taylor were absent.)

DIRECTOR'S UPDATE (2:08)

- Regarding solar at the new middle school, an invitation for bid was issued, attracting 28 firms so far, with about 25 being legitimate construction companies. A site visit is planned for later today, with CMLP engineering staff, Jason, and school facilities personnel to be present. Bids are due by July 23rd, after which more information on the project's viability and battery implications will be available.
- For the Level 3 Vehicle-to-X charger the school department is receiving for free from Mass CEC, a successful site visit involving all stakeholders (CMLP, school, bus company, charger provider) was coordinated by Mr. Foulds. CMLP expects to quickly complete the prep work, with the charger likely located near the existing one, incurring no additional cost for ratepayers.
- June 24th was an incredibly hot day, which saw ISO-New England's load hit over 26,000 megawatts, the highest since 2013, indicating the real impact of electrification on distribution systems. He noted that

[1] Minuteman Media YouTube Link: https://www.youtube.com/watch?v=UD63lomvHIA

dispatching a battery during the peak hour of 6-7 PM could have resulted in significant savings.

- The Select Board approved Concord's first two small cell installations on Sudbury Road, which will be pole-mounted according to the 2022 policy. These require replacing existing poles with taller ones due to previous undergrounding of power. CMLP's line crew will undergo training for safe operation around these new installations.
- NISC, the vendor for CMLP's ERP and CRM system, will be on-site for a three-day engagement later this month to conduct a process analysis and make improvements to work- and service-order management modules.

COST-OF-SERVICE STUDY UPDATE AND RATE DISCUSSION (11:33)

Utility Financial Solutions (UFS) team, Mark Beauchamp and Mike Johnson presented further analysis. They first reaffirmed CMLP's strong financial stability, indicating no need for rate increases in the next five years. The proposed capital improvement plan in 2028 can be financed using existing cash reserves, which are projected to remain well above the recommended $12 million minimum, reaching nearly $30 million by 2030 if no further capital costs are identified.

Regarding the cost of service results, UFS found that while all customer classes were relatively close to cost, there were some variations.

- **Small commercial rates** are proposed to see a 2% increase, with the customer charge rising from $20 to $24. This means smaller users (250 kWh) would see about a 5.5% increase, while larger users (1600+ kWh) would experience a roughly 1% increase.
- **Medium commercial rates** are proposed for a 2% reduction, though the customer charge would increase from $59 to $100. This adjustment lowers energy charges, with the overall all-in energy rate decreasing from 19 cents to approximately 18 cents, while the demand charge increases by $1. The impact on medium commercial customers depends on their load factor (ratio of peak demand to average demand), where customers with low load factors might see a slight increase, and those above a 36-37% load factor would see a reduction. Mr. Beauchamp explained that the increase in the demand charge aims to recover distribution-related costs, as the infrastructure must be sized to handle a customer's peak demand.

Mr. Foulds emphasized the importance of ensuring that rates accurately reflect expense categories such as distribution, capacity, and energy. He specifically requested that the demand charge be unbundled into capacity and distribution components to ensure fair treatment of solar customers and to keep the light plant financially whole. Mr. Beauchamp agreed to look into unbundling the demand charge, noting that while the total figures would likely remain the same, the breakout would be different. Mr. Schaffner inquired about the number of customers in these classes, learning there are approximately 1,200 small commercial and 200 medium commercial customers. The Board also discussed the balance between rate precision and simplicity, with Mr. Foulds suggesting that while the Board needs more detailed breakdowns for understanding, the billing system can combine these for simplicity.

The primary focus of the discussion then shifted to the residential Time of Use (TOU) rate.

- It was decided that the fixed monthly customer charge would remain unchanged at $20, rather than being increased to the calculated cost-of-service amount of $26. Mr. Beauchamp stressed that moving to a TOU rate was more critical than adjusting the customer charge at this time.
- The proposed TOU rate includes a super off-peak period (1 AM - 5 AM), off-peak hours, and on-peak hours (four-hour periods, excluding weekends and holidays).

- The Board considered a two-phase implementation: Phase I (a smaller change) followed by Phase II (the full target TOU rate). Mr. Beauchamp clarified that the originally proposed three phases had been consolidated into two. Graphically, the proposal shows a transition from the current flat rate to Phase I with slight differentials, and then to Phase II with significantly wider differentials, sending a stronger price signal. For instance, the super off-peak rate would drop by about a third, while on-peak rates could reach over 30 cents during shoulder periods and 46-47 cents during standard periods.
- The customer impacts from current rates to Phase I show that smaller users (0-900 kWh) would experience slight increases ($1.34 to $4 per month), while larger users (over 2,000 kWh) would see significant reductions (around $50 per month). This effect is attributed to the collapsing of the previous inverted block rate structure, which had historically incentivized conservation but potentially overcollected from larger customers.
- Chris expressed concern that the outcome would result in rate cuts for large houses and increases for small houses, which he found unpalatable. Mr. Beauchamp suggested an alternative of tiering the fixed customer charge based on service amperage (e.g., higher for 400 amp service), but acknowledged that CMLP currently lacks this data. Mr. Foulds supported making an effort to gather this data for future adjustments, preferring it over demand or total monthly kWh charges for residential customers, as it ties to infrastructure rather than affecting conservation signals.
- Ms. Scott reminded the board that they had previously committed to moving to a TOU rate, investing in meters and billing systems, knowing that eliminating block rates would lead to these shifts.
- Although the study assumes current usage patterns, Mr. Beauchamp's intuition suggests that Phase II's strong price signals (a 2-to-1 differential) could lead to a 6% reduction in on-peak usage, and even 10-12% in super off-peak usage.
- Mr. Dalton asked and Mr. Beauchamp confirmed that this price change should be thought less of collecting more from customers who have lower usage but correcting for the overcharging of customers who have taken steps to lower their carbon footprint and electrify.

Ms. Scott asked if the Board was ready to approve the proposed rates on slide 11 to facilitate public communication. Mr. Dalton questioned the modest differences between the off-peak and super off-peak rates in Phase I, suggesting they might lack value if not significant. Mr. Schaffner agreed, hoping for slightly larger differentials but acknowledging it serves as preparation for Phase II. Mr. Foulds supported the two-phase approach, preferring a small initial difference to allow customers a year to adjust and learn about their usage habits before the full impact of Phase II.

A resident, Peter Fandel, an Electric Thermal Storage (ETS) user, commented on the potential impact on the remaining 100 ETS customers. He noted that eliminating the special ETS rate would cost these users over $1,000 per year. The Board acknowledged past discussions about a transition period for ETS customers but confirmed it would be a future topic, not decided that day. Ms. Scott clarified that ETS rates would be discussed in September, with a decision expected in October.

Mr. Beauchamp informed the board that the impact of moving directly to Phase II from current rates would not be drastically different from the current-to-Phase I impact, only slightly increasing the reductions for large users. However, Ms. Scott noted that the frequency of increases would be higher for more customers if they went straight to Phase II.

Mr. Schaffner made a formal motion to adopt the two-phase approach for the residential Time of Use rates as outlined on slide 11. With a second from Mr. Foulds, the Board voted to approve the rates 3-1: Chris (yes), Mr.

Foulds (yes), Ms. Taylor (no, as she prefers to move directly to Phase II) and Mr. Dalton (yes).

TOU Rate All-in	TOU Phase I	TOU Phase II
Monthly Charge	$ 20.00	$ 20.00
Energy Charges		
Shoulder Off-Peak	$ 0.19800	$ 0.16300
Shoulder Super Off-Peak	$ 0.19200	$ 0.14600
Shoulder On-Peak	$ 0.24900	$ 0.31800
Standard Off-Peak	$ 0.20000	$ 0.17000
Standard Super Off-Peak	$ 0.19700	$ 0.16000
Standard On-Peak	$ 0.29900	$ 0.46600

Shoulder Months:	Mar/April & October/November
Standard:	All other months

	Super Off	Off	Peak
All Months	1am-5am	5am-3pm; 7pm-1am	3pm-7pm

SOLAR COMPENSATION STRATEGY (1:14:59)

The discussion then moved to the Solar Compensation Strategy, focusing on the Value of Solar (VOS). Mr. Beauchamp explained that historically, solar was credited at a flat average value (e.g., 6.5 cents). The new proposal is for a time-based value, aligning with the Time of Use periods:

- Super off-peak: 3 cents
- Off-peak (shoulder): 5 cents
- On-peak (shoulder): 21 cents
- Standard on-peak: 35 cents

Mr. Beauchamp emphasized that this time-based VOS would incentivize customers to install batteries so that energy could be discharged back to the grid during high-value, on-peak periods, thereby increasing the overall value of their solar installations. He clarified that while utilities often peak in the early evening, solar production peaks around midday, thus the value of solar (primarily energy-driven) is higher when it aligns with the grid's peak demand.

Mr. Beauchamp detailed three common methods for crediting solar customers:

1. **Net Metering:** Customers are billed only for their net consumption after subtracting their solar exports. This method was initially used to incentivize early solar adoption but has become a subsidy as solar penetration increased, failing to fully recover all costs, particularly distribution demands.
2. **Net Billing (Inflow/Outflow):** Customers are billed for all energy taken from the utility at the normal rate, but credited for energy given back based on the time-based Value of Solar. Mr. Beauchamp personally preferred this method as it is more accurate with TOU and time-based VOS, sending appropriate pricing signals, even though it still results in some under-recovery due to current rate structures. Mr. Foulds clarified that under net billing, consumption is charged at the retail rate, and exports are credited at the solar rate (dollars minus dollars).
3. **Buy-All Sell-All:** Customers are billed for their total home consumption, and credited for their total solar array production at the VOS. This method aims for full cost recovery.

An example scenario demonstrated the bill impact differences: for an initial $106 bill, net metering would reduce it to $18, net billing to $34, and buy-all sell-all to $54. Mr. Beauchamp also noted that the annual customer impacts from moving to the time-based VOS under net billing would vary, with some customers seeing bill increases and others reductions, depending on when their energy is given back.

Mr. Foulds confirmed that the buy-all sell all method isn't currently feasible due to CMLP's lack of production meter data. He supported the net billing approach, particularly because it avoids crediting customers for distribution costs associated with their solar exports, focusing instead on crediting pass-through costs like energy, capacity, and transmission. He confirmed that the solar credit values (VOS) specifically reflect only the value of power supply, with the difference between the retail rate and solar credit value representing the distribution collection (around 11 cents). Mr. Foulds expressed satisfaction with the proposed VOS values, believing they align with expectations and will incentivize battery storage for on-peak discharge, which will benefit the light plant by reducing expenses during high-demand times.

Mr. Schaffner acknowledged the time-of-day aspect for solar compensation made perfect sense. He brought up the public perception issue, noting that other utilities often provided better credits, which he experienced when his own low solar tariff incentivized him to buy an electric car. He agreed that rates should also reflect desired behaviors, not just cost collection. The rationale for not crediting distribution costs for solar was reiterated: solar production, while valuable, does not always align with the grid's peak demand times (e.g., residential peaks in the evening) and thus does not necessarily reduce the need for distribution infrastructure sizing. The new rate structure aims to encourage customers to invest in batteries to shift their solar energy delivery to these critical on-peak periods.

Mr. Schaffner made a motion to approve the net billing methodology for solar compensation, where inflow is billed at the rates just approved and outflow is credited based on the time-based Value of Solar values presented in the table. With a second by Mr. Foulds, the Board voted unanimously in support by all members present (Mr. Leon was absent).

Value of Solar	Rate
Shoulder Off-Peak	$ 0.05200
Shoulder Super Off-Peak	$ 0.03441
Shoulder On-Peak	$ 0.20647
Standard Off-Peak	$ 0.05806
Standard Super Off-Peak	$ 0.04860
Standard On-Peak	$ 0.35455

ENERGY STORAGE FINANCING METHODOLOGY (1:46:07)

This topic was deferred to a meeting scheduled for Friday, July 18, 2025 at 7:30am.

LIASION & PUBLIC COMMENTS (1:48:02)

- Karlen Reed questioned how CMLP's rates compare to other municipal light plants, not just investor-owned utilities, to ensure alignment with similar entities. Mr. Dalton noted that CMLP's approach was

patterned after the Sacramento Municipal Utility District (SMUD), which is a municipal utility.

- Pamela Dritt advocated for stronger incentives for solar and battery installations, suggesting moving directly to higher differentials and questioning why solar producers should be charged distribution costs when their generation reduces external power purchases.
- Hal Iverson, another ETS user, reiterated the ETS concerns brought up earlier, stating that adding distribution costs to ETS usage would raise his bill significantly while providing minimal relief to other customers. He thanked the Board and Mr. Foulds in particular for engaging with him and the ETS users over the years. He asked to clarify the status of the R-3 rate, and Ms. Scott let him know that the Board would be taking up this topic at a future meeting.

ADJOURN (1:56:42)

Mr. Foulds moved to adjourn, and with a second from Mr. Schaffner, the remaining members voted unanimously to adjourn the meeting at 9:27AM.

Respectfully submitted,
Mr. Dalton, Clerk

Battery Storage Procurement

Exploring options and weighing risk vs. reward

July 2025

Shared Savings vs. Tolling vs. Ownership

Shared savings: Battery developer pays for the battery installation. They dispatch the battery to shave peaks. We split the capacity and transmission savings at the ratio specified in the agreement.

Tolling: Battery developer pays for the battery installation. They turn over complete control of the battery to CMLP for a fixed cost, usually with an annual escalator.

Ownership: CMLP pays for the battery installation. We achieve 100% of peak shaving savings, but we take on 100% of the liability if we miss peaks.

Shared Savings vs. Ownership Model

	Shared Savings	Ownership
Good	Lose less if no peak	Flexibility (of uses)
	No up-front capital/debt	More money from peak shaving
	Lower impact on CMLP	Better borrowing rate
Bad	Not as flexible	Lose more money
	Less money for peak shaving	Up-front capital/debt
	May have to pay if we cause them to miss a peak	More complicated

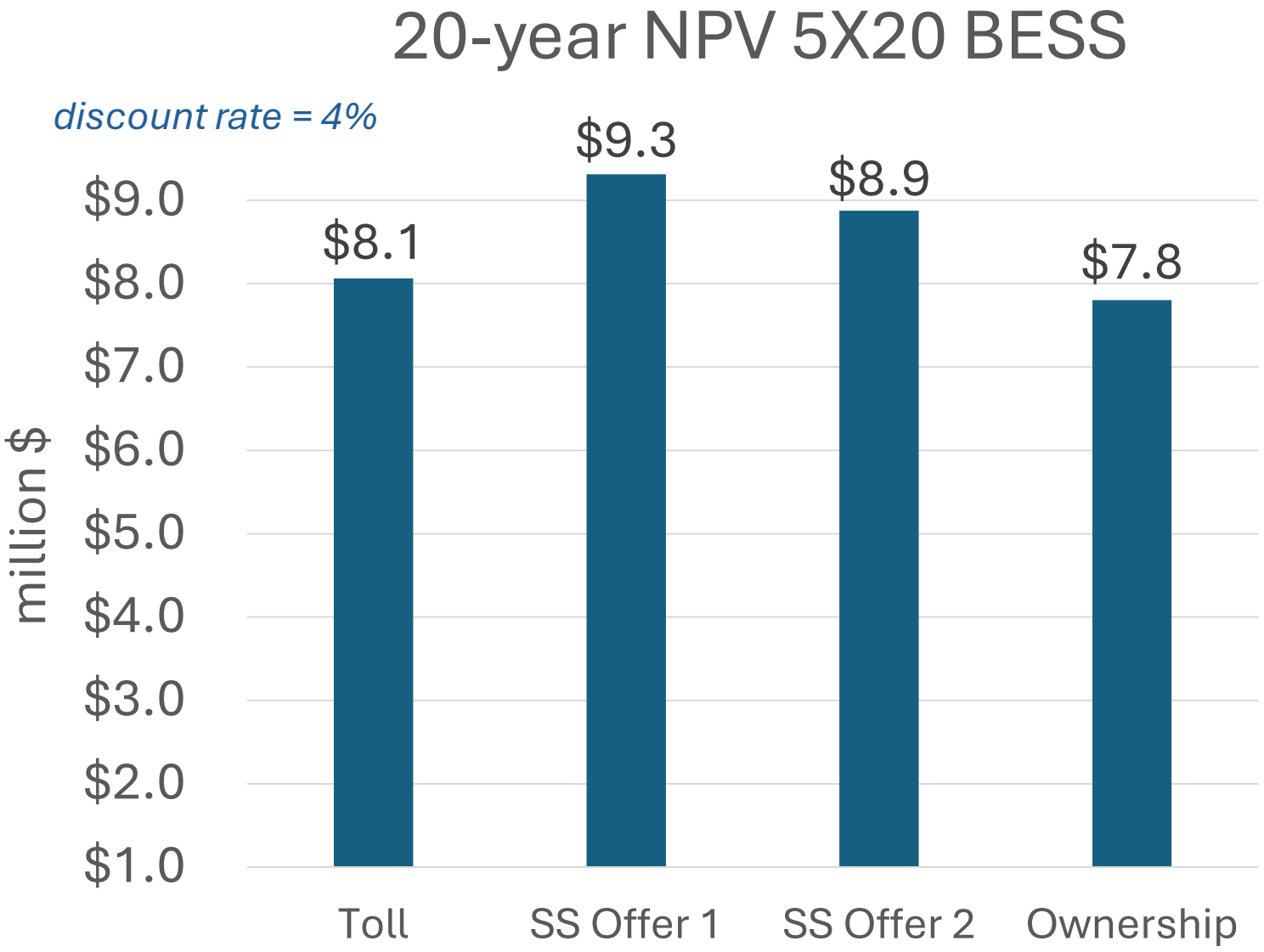
Procurement Options

- Two shared savings proposals:
  1. Up to 1MW of solar curtailment
  2. Peak shaving is the first priority
- One tolling option, where we pay a flat amount per year with an annual escalator
- An outright purchase option

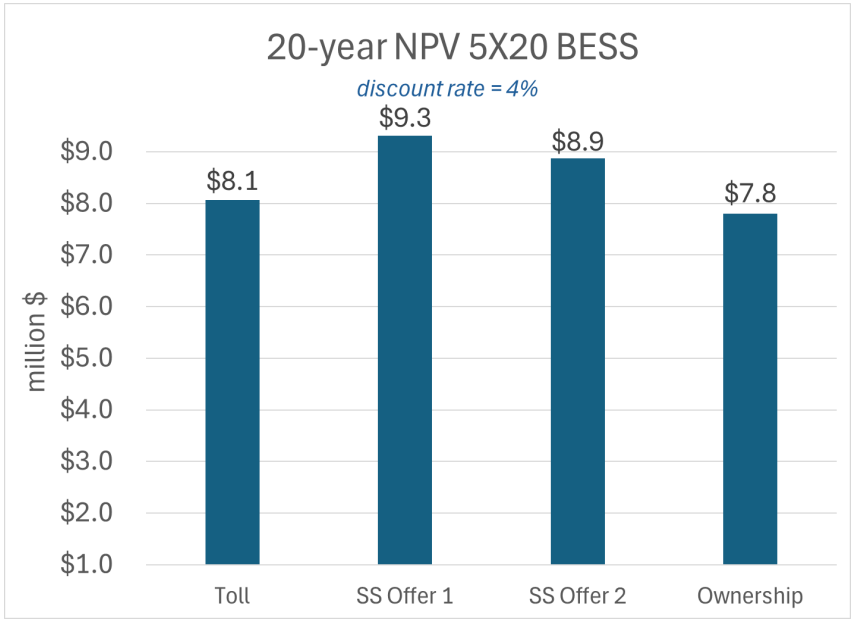
Financial Model Assumptions

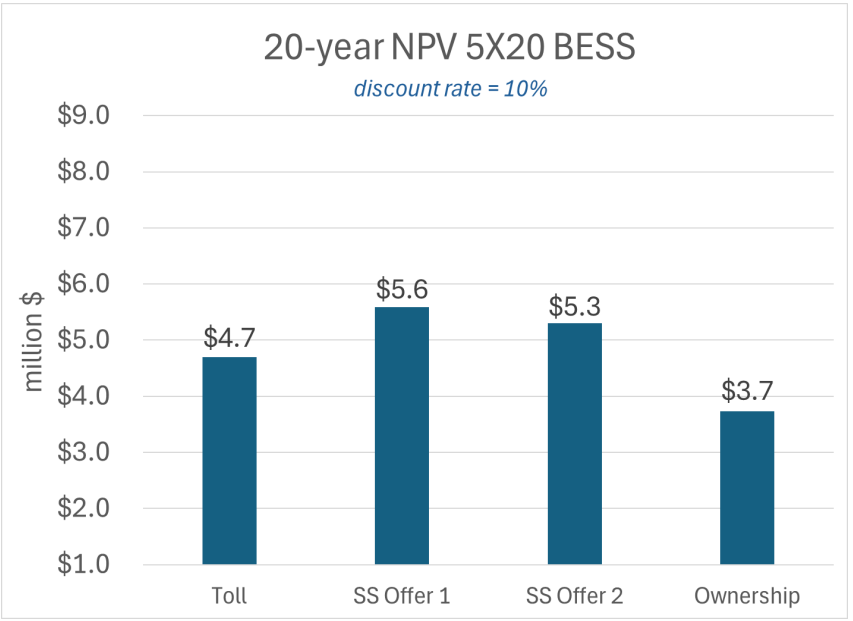
- 20-year financial horizon for all scenarios
- 15-year loan in the case of ownership
- Annual battery performance degradation: .5% (0.005) p.a. with just monthly peak shaving; 1.5% (0.015) p.a. with daily dispatch of the battery for energy arbitrage
- Discount rate: 4%
- Assumed savings derive from
  - RNS ($184/kW-yr year 1 rising 3% p.a. thereafter to $348/kW-yr year 20)
  - LNS ($9/kW-yr year 1 rising 3% p.a. thereafter to $16/kW-yr year 20)
  - ICAP ($3.58/kW-yr in 2027 rising 3% p.a. thereafter to $6.10/kW-yr year 20)
  - Only for the Kearsarge offers, there is an additional value from a lower solar PPA price if paired with their battery
- Transmission peak success rate= 1 out of 12 months (88%)
- Capacity peak success rate= 9 out of 10 years (90%)

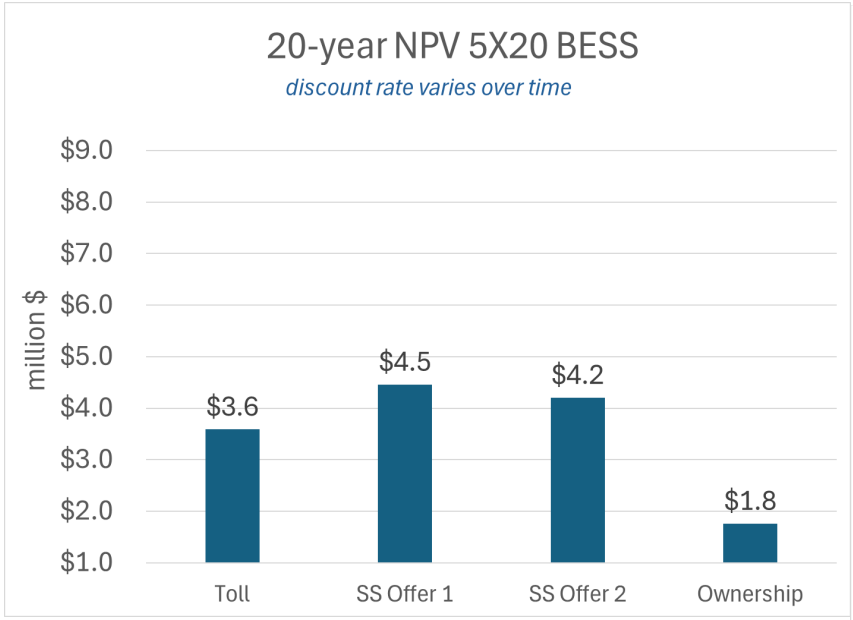
Financials


20-year NPV 5X20 BESS
discount rate = 4%
million $
$9.0
$8.0
$7.0
$6.0
$5.0
$4.0
$3.0
$2.0
$1.0
$8.1
$9.3
$8.9
$7.8
Toll
SS Offer 1
SS Offer 2
Ownership

Financial Scenarios







Other Considerations

- Is the battery developer the same as the solar developer?
- Will the battery absorb solar?
- How much control will we have for alternative uses (like to dispatch for scarcity events)?
- What will peak shaving look like in 5, 10, or 15 years?
- How much work is it to procure and install the battery?