

Light Commission March 1st, 2023 meeting minutes

To: Light Commission: Commissioners
Light Department: J. Kowalik, General Manager, M. Barrett, Business Manager
From: Jean-Jacques Yarmoff, Secretary
Date: March 3, 2023
Re: Commission Meeting March 1, 2022

A quorum being present, Light Commission Chair Mike Hull opened the meeting at 4:03 pm, the meeting being held both in person and with remote access available to the public. A recording of the meeting is made available to the public at the following [link](#).

Participated in meeting:

Commissioners: Hull, Frechette, Smith, Wolf and Yarmoff participated in person.
Light Department: General Manager Joe Kowalik and Business Manager Matt Barrett.
Fire Department: Department Chief Jason Gilliland
Invited: Chris Lund, Consultant, Utility Financial Solutions (UFS)
Justin Connell, MMWEC, Director of Energy Markets

Meeting Guidelines

Commissioner Wolf distributed a document describing proposed guidelines to make the Commission meetings more effective and productive, while providing time for public comments. Such a document could become part of the by-laws of the Commission, when they are established. See page 4.

Vote #2023-09 Motion to approve guidelines, as amended during the discussion, was moved by Commissioner Wolf and seconded by Commissioner Yarmoff. **Unanimous.**

Strategy Working Group Report

Commissioner Yarmoff presented the work of the Strategy Working Group, already explained in more details during the public meeting of February 24. The group has only modeled the Town-wide effect of transportation electrification to date. Other sectors will also have an impact but transportation electrification is likely the most important single factor. Various assumptions were used in the model to cover a range of possible scenarios. The additional load is presented in the slides on pages 6 and 7: by 2030, the existing load will increase by around 60%. The increase corresponds to a 1.7% compound annual growth rate over the period. The observed increase in load from 2020 to 2021 was actually 1.7%: we may already be observing this growth in Marblehead.

The number of electric cars projected in town was also shown (2nd slide page 7). Depending on the penetration speed, one can assume that there will be 2,000 to 3,000 electric cars in town within 5 years. This will have implications for the town, beyond just the electricity supply. Another consequence: car batteries will reach a total of over 100 MWh in Marblehead by 2027. We need to be able to manage these batteries which are 5 times bigger in aggregate than the utility scale battery we are planning to install.

In the next part of its work, the group will explore the temporality of this extra load.

Separately, we are working with the MIT Sloan School of Management to assess solar capabilities / policy in Marblehead.

Update on battery regulations

Fire Chief Gilliland explained the standards and new codes relevant to Battery Energy Storage Systems (BESS). NFPA 855 is the National Fire Protection Association standard which covers the installation and operation of Energy Storage Systems, including Li-Ion batteries. These standards are incorporated in the Massachusetts building code (and stretch code) which was updated at the beginning of the year, and in the Massachusetts [Fire Code](#) 527 CMR 1 under [Chapter 52](#), which applies to the installation of battery storage systems: these BESS can be installed within new or existing buildings. Yet, these systems can present a number of hazards which need to be understood before installation. Precautions mandated by the codes must be followed, such as proper fire-proofing, venting, location (explained in Chapter 52). But now, the building code and the fire code are in place. A resident that wants to install a battery system would have to apply to the building department. In Marblehead, this Commission supports the use of batteries, the Building Inspector will review the installation is made according to code, and the Fire Department will do the same. We are trying to make sure things are safe.

While the codes allow for the batteries to be inside a structure, from the personal perspective of a safety professional, the Fire Chief would prefer that they be installed outside; if they have to be inside, it is better if they are in a detached garage than in a house. The fire department will keep a record of the battery storage systems: in case of incident in a house, firefighters need to know “there is a BESS here”. Some municipalities, like Swampscott, require that houses have a placard outside the house to indicate the presence of a battery. There has been a case, recently in Massachusetts where a residential battery caught fire.

This would be a good moment for MMLD to participate in the MMWEC-facilitated subsidy program for batteries: MMWEC recommends a financial subsidy, as batteries benefit the Light Department overall.

General Manager Update

Financial Updates. The new rate structure has been rolled out in January. We are still waiting for numbers with regards to OPEB and Pension contributions: the new town finance manager starts next week. The Operating Statement for the year-end 2022 shows provisions for these expenses. The actuals at the end of the year came out a little more favorably, with no need to transfer funds from the Rate Stabilization fund.

Village 13 update. Contract negotiations with Virginia Transformer are still on-going. The points discussed are minor and we hope to finalize very soon. Switchgear vendor MCP is back in operations. We have received 4 bids from qualified vendors to work on the right of way (necessary to install the switchgear and transformer). In essence, we have to build a road 6/10th of a mile in length.

Solar PV rate. Commissioners Frechette and Wolf will recuse themselves of voting on solar rates as they are both have solar arrays on their residences.

During the last meeting, the question was asked about capacity and transmission avoidance possible impact on feed-in tariff. Doing this analysis, based on data from 2022, leads us to the value of the excess kWh returned to the distribution system by the owner of the solar array. It is shown in slide 2 page 10. The question was asked whether one should look at an average value over time, or a real time value. The capacity charge chosen of \$2.00 is based on the cleared values for August 2022. They are now higher for 2023 or future years. We are trying to use a certain methodology that is based on existing data and correlates with the value created.

To compare the scale of solar in Marblehead's portfolio, the NREL calculated power production per year from a putative Brown School array (273,000 kWh) is of the same order of magnitude as the power fed into the distribution system by 65-odd residential solar arrays in 2022 (286,000 kWh).

Had this methodology been applied in 2022, these rates would have resulted in about \$2,000 less paid by MMLD to the customers. These are small amounts, and we need to get both the methodology right but also the various aspects of a solar policy right: we have not discussed incentives, implementation hurdles or timing of implementation. It would be beneficial to the Department to receive RECs in exchange for incentives. We also need to consider the timing of solar policy changes in view of the other changes that we want to implement, including time of use. All of these are important for the customers who want to install solar: we need to have this discussed before we vote.

The methodology for feed-in tariff for batteries was presented.

EV charger utilization. If we install new chargers, we would want their utilization to be higher than the current 3% utilization rates. A possible load factor of 20% would give us an energy rate of 36 cents per kWh. Currently, some sites do better than others, but the maintenance fees are more than the revenues. The question for the board is do we want to take responsibility for a meaningful share of electric vehicle charging? That's an open question, but the recommendation is to manage this issue. In view of the large fraction of residents who do not have the possibility to charge at home, we have to work with the town.

A motion to adjourn was proposed, seconded and unanimously adopted at 5:35 pm.

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Documents shown during meeting

Meeting Guidelines as amended during meeting.

Marblehead Municipal Light Commission Meeting Guidelines

In order for the Marblehead Municipal Light Commission to operate efficiently and effectively toward fulfilling its mission to Marblehead residents and ratepayers, every effort will be made to adhere to the following guidelines.

1. Adhering to an agenda:
Posted agenda will state the time at which each item will be discussed. Meeting agenda will follow posted agenda. Commissioners will collectively honor the allotted time per agenda item. Items requiring Board feedback or vote will be noted on the agenda.
2. Timely distribution of agenda materials:
Documents that will be discussed should be circulated to the whole board and are due the Friday before a Tuesday meeting or the Monday before a Wednesday meeting.
3. Public Comment:
After approval of minutes the public will be invited to make comments or statements limited to 2 minutes each at the start of the meeting. Public comment will not exceed 15 minutes; any remaining comments will be invited at the end of the meeting. Public comments may be made during the meeting only at the discretion and invitation of the Chair.
4. Standards of Conduct:
Commissioners will treat each other with courtesy and respect and conduct themselves in a manner which in no way discredits the MMLD staff or fellow commissioners. Behavior that is abusive or hostile is inappropriate.

Strategy Working Group
MMLD Load data and model

Update to Light Commission

March 1, 2023

- Points presented today
- Forecast future Load in Marblehead: discovery path
 - Transportation electrification forecast: model assumptions
 - Load forecast results, transportation only
 - Discussion
 - Next steps

- Discovery path
- • Top Level Load Projection
 - Specific sectors
 - ✓ Transportation Only sector assessed so far
 - Home Heating Likely increase of load, tbd
 - Cooling Likely increase of load, tbd
 - Hot Water tbd
 - Impacts
 - ✓ Overall Demand
 - Impact on Distribution System in Marblehead
 - Capacity
 - Topography

Model assumptions: transportation

- **Miles driven:** US average is 1123 miles per month of which

- One-way commute/trip: 20 miles
20 commutes per month
4 long trips per month, 150 miles

BEV and PHEV charge at home, BEV for whole trips, PHEV for 20 miles of each trip

- **Car efficiency:** BEV: 3 miles per kWh PHEV: 2 miles per kWh

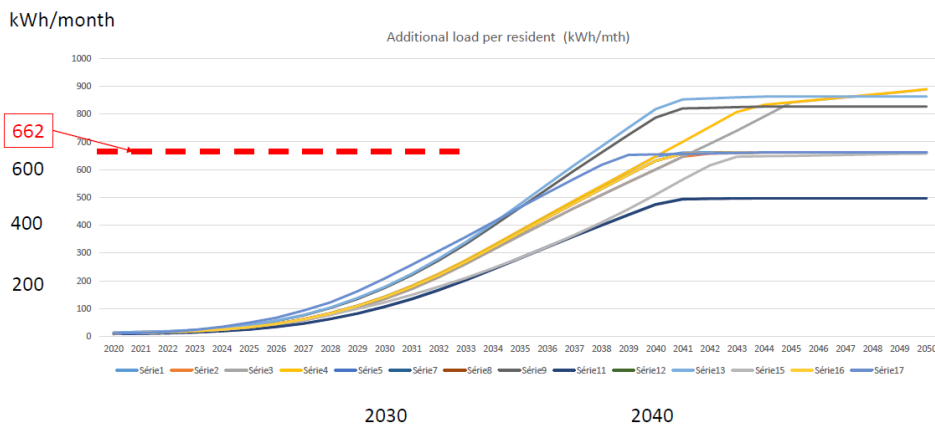
- **Average car consumption:** EV: 374 kWh/month PHEV: 305 kWh/month

Model tested with different assumptions

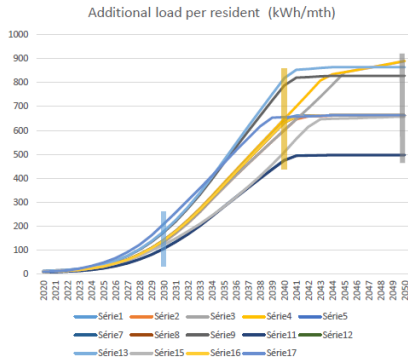
- Effect of

- Different proportions of BEV / PHEV
- Constant number of car in Marblehead, or increasing
- Car efficiency variations
- Miles driven
- Rapidity of transition

Additional load from transportation



Likely Additional Load (transportation only)



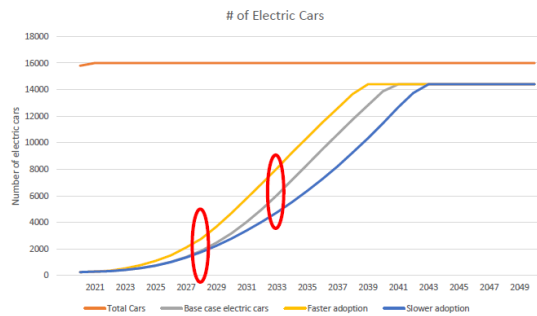
Likely scenario: addition of ...

	Per resident	For Marblehead
By 2030	129 kWh	13,800 MWh/Yr
By 2040	576 kWh	61,620 MWh/Yr
By 2050	603 kWh	64,509 MWh/Yr

... to existing load of
2021 662 kWh **102,374 MWh/Yr**

Calculated annual growth CAGR = 1.7%
Observed growth 2021/2020 = 1.7%

Penetration of Electric Cars Batteries



- In 5 years, 2 to 3,000 cars ...
 - In 10 years, ~ 6,000 cars ...
- will be electric vehicles

Over 100 MWh of battery
installed by 2027
(average battery size taken as 80 kWh)

Next Steps

- Estimate intra-day variation of EV load
 - Model Worst Case
 - Model « Successful behavior management » Case
- Review Marblehead data
 - Public Charger data
 - Private charging patterns
- Estimate other additional load components
 - House electrification load
 - Electric Hot Water heaters
 - Air Conditioning
- Compare to other forecasts
- Review impact on procurement of energy
- Review impact on critical infrastructure and substation / circuit load



Sustainability Initiative

S-Lab Project Descriptions

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General Manager Update Slides



General Manager Topics

- 2022 Financial Update
- Village 13 Updates
- Utility Rates discussion and vote – Solar PV credit & Public EV Charging
- Nexgrid server and software interface upgrades
- Transformer Updates
- Hiring Updates
- Solar on School Updates
- 2nd Feeder from Swampscott



Financial Operations- Feb 2023

- New residential, small commercial and large commercial rates rolled out in January
- Mild December temps – positive impact on Dec net operating income
- Still waiting on final 2022 OPEB (\$300K in budget) and Pension contribution (\$816 in budget) charges...typically provided in Nov
- 2022 results includes the \$330 Pilot Payment
- Our operating cash position remains solid \$5.864 MM



Year-end* 2022 Operating Statement

	Reported January 2023	as of February 2023
	(\$000's)	(\$000's)
Total Projected kwh Revenue	\$19,658	\$19,649
Street Lighting	\$125	\$141
Misc Revenue	\$28	\$28
Total Revenue	\$19,811	\$19,818
Total Projected Expenses*	\$19,629	\$19,331
PILOT Payment to Town	\$330	\$330
Total Expenses	\$19,959	\$19,661
Net Income	-\$148	\$157
Adjustments:		
Rate Stabilization Fund Transfer	\$98	\$0
APPA DEED Grant Proceeds	\$50	\$50
Total Adjustments	\$148	\$50
Adjusted Net Income	\$0	\$207

* Does Not Include final Pension and OPEB expenses



Village 13 update – Feb 2023

- Contract negotiations with Virginia Transformer are nearing completion
- Switchgear vendor MCP – informed us the cyberattack is being managed
- Village 13 tech team is reviewing 4 bids submitted. Range of quotes with varying services included.



Rate-setting: Policy Considerations

- Data driven rates, based on the actual costs of delivering electric service
- Transparent, use available public/objective data sources
- Leverage the expertise and broad US and international perspective of UFS
- Align rates to support adoption of energy efficiency and clean energy best practices



Proposed Solar PV credit rates - updated

Customer class	Current Rate/kwh	PPA	TOTAL Credit /kwh	2023 Proposal Energy Rate/kwh	2023 Capacity Avoidance credit/kwh	2023 Transmission Avoidance Credit/kwh	TOTAL Credit /kwh
Residential	.099	.025	.124	.0785	.0075	.0059	.0918
Commercial	.08438	.025	.10938	.0785	.0075	.0059	.0918

Rate Notes:

- Based on annual prior year averages
- Rate to be updated annually
- No need to apply PPA, built into hourly rate calcs.



Solar PV in the MMLD Portfolio Plans

Solar PV Site	Projected Annual MMLD kwh	Project Levelized Cost of Energy (LCOE/kwh)	Net Energy cost \$/kwh	Mass Class 1 RECS ?	Mass Class 1 REC Price \$/kwh	Clean Peak Credit ?	MA Clean Peak Credit Value \$/kwh
Cotton Memorial Array, Ludlow, MA	1,500,000	0.088	\$0.042	YES	\$0.038	YES	\$0.008
Mhd Brown Elementary School	273,000			YES		NO	\$0.000
Residential Solar - MMLD Customers	286,000		\$0.091	NO		NO	\$0.000



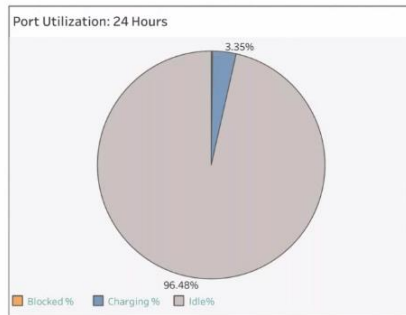
Solar PV and Battery

- Proposed Approach: Address all battery storage peak reduction credits as demand response, based on MMWEC peak forecasts with battery dispatch by MMWEC/Connected Homes program
- MMLD is indifferent to the source of energy from a customer's battery...solar PV-generated or energy provided from the MMLD distribution system.
- Battery charging during a peak, aka the Storm Mode issue- still an issue, until TOU pricing is implemented.

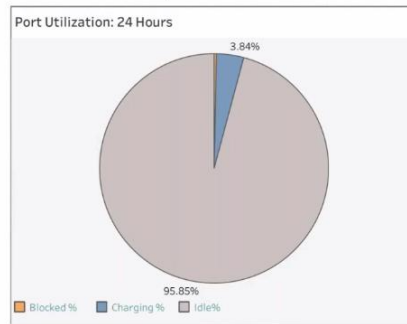


MMLD Public EV Charger Port Utilization

December 2022



Q4 2022



MMLD owned Public EV Chargers

ChargePoint Rate for Utility Owned 7.3 kW, level 2 electric vehicle charger

Monthly kWh	LF	\$ per kWh
160	3%	\$ 1.00
533	10%	\$ 0.47
799	15%	\$ 0.40
1,066	20%	\$ 0.36
1,599	30%	\$ 0.32
2,132	40%	\$ 0.30
2,665	50%	\$ 0.29
3,197	60%	\$ 0.28
3,730	70%	\$ 0.28
4,263	80%	\$ 0.27
4,796	90%	\$ 0.27
5,329	100%	\$ 0.27
Target LF->	20%	\$ 0.36

Rate

- Project current 3% Load Factor to a future target LF of 20%
- \$.036 per kwh all hours, on all three sites
- After 4 hours add \$5.00 parking
- *Annual maintenance fees average \$850 per port or \$8500 total;*
- *2022 revenue was \$5000.*