



CLIMATE ACTION ADVISORY BOARD

May 18, 2022

6:00 PM

MEETING AGENDA

To participate in this meeting you may video conference in to

<https://us02web.zoom.us/j/81743063892?pwd=eUpaRWIsNTdUMEtXbWd3T1hCV0hPQT09>

To call-in by phone dial (877) 853 5257 or (888) 475 4499 and use the Meeting ID 817 4306 3892 and Password 932273. Please note that dial-in participants will be muted and will not be able to make comments.

1. Welcome (Courtney) [6:00]
2. Meetings and minutes (Courtney) [6:05]
 - a. Approval of minutes from April 20th delayed
 - b. Availability for June 15th and 16th at 6:30 to schedule with CSEC
 - c. Summer availability (Jul and Aug) - email Courtney and Amanda
3. Chair's update (Courtney) [6:15]
 - a. Membership – still a work in progress
 - b. Rolling Vice Chair
 - c. Cooler Concord - Reminder and request to help promote/share on social media
 - i. [May 25th, Your Sustainable Home Now, Zoom](#)
 - ii. [June 4th, EV Display and Charging Tips Open House, Harvey Wheeler](#)
4. Director's update (Amanda) [6:30]
 - a. Detailed Director updates on [CAAB's website](#)
5. Workplan Check-Ins [6:45]
 - a. Home Energy Scores (Jake)
 - b. Planning Board Support (Courtney)
 - c. Climate Vulnerability Assessment (Paul and John)
 - d. Financing (Warren) - *Memo attached*
6. Municipal Fleet Study - *Presentation attached* [7:15]
7. New business [7:45]
8. Public comments [7:50]
9. Adjourn [8:00]

Upcoming meeting dates and clerks (Meeting time: 6PM)

- May 18 - Brian
- Jun 15 – Michael
- July 20 – John
- Aug 17 - Paul
- Sept - Warren
- Oct Jake

Distribution

Committee Members: Courtney Eaton (Chair), Brian Crouse, Jake Swenson, John Bolduc, Michael McAteer, Warren Leon, Paul Kirshen

Town: Town Clerk, Matt Johnson (Select Board Liaison), Amanda Kohn (Sustainability Director)

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



Active/Ongoing Projects

- **Municipal Fleet Electrification Study** – Completed. Meeting with the Senior Management Team to discuss next steps and implementation on May 19th.
- **UNH Fellowship** – Applicant has been selected and will start May 31st. Work plan is in development.
- **Tree City USA Recognition** – All standards have been achieved. Will continue to work with Public Works to finalize the application for 2022.
- **2021 Annual Report** –Forthcoming.
- **Concord Middle School (CMS) Building Project and Solar Project**– Waiting final contract from Solar Design Associates (SDA).
- **CSEC's Cooler Concord Sustainability Series**
 - [May 25th, Your Sustainable Home Now, Zoom](#)
 - [June 4th, EV Display and Charging Tips Open House, Harvey Wheeler](#)
- **Hazard Mitigation Plan and Police/Fire Station Retreat Analysis** – In proposal/contracting phase.
- **Exploring Expansion of Compost Pilot Project**
- **USDN Nexus Guidance** – The Town met with the USDN organizer with one of the co-chairs of the DEI Commission. Consensus was reached to revisit this opportunity at a later date.
- **MAPC Technical Assistance on Climate Adaptation** – MAPC provided recommendations on how to incorporate climate adaptation into the Subdivision Rules and Regulations. These will be incorporated into the full overhaul of the Subdivision Rules and Regulations in the next fiscal year. Planning Board is also looking at Site Plan Review updates with recommendations from MAPC.

Grant and Technical Assistance

- **Grants Awarded** –
 - [MassEVIP DC Fast Charger Program](#) – In partnership with CMLP, the Town has received funding for a DC Fast Charger for Rideout Park. **Awaiting contract from state.**
 - [Green Communities Grant](#) – The Town received \$100,000 of grant funding that will be matched with funding from the schools and the CMLP rebate program for air source heat pumps for the pods at the Ripley School and Administration Building. **Awaiting response from National Grid on rebate application.**
- **Submitted - MVP Action Grant** –The Town submitted one MVP Action Grants to create a subbasin watershed model in Concord to assess climate vulnerability and develop actions for integrated water resource management. The project could serve as a pilot for the regional and funds were requested to pursue regional consensus building with OARS. An MVP grant to purchase land along the Assabet for conservation and

affordable housing was not submitted because funds were granted from the Land and Water Conservation Fund in addition to tremendous fundraising efforts of other partners.

- **Waiting to hear back - MAPC Technical Assistance Program** – In partnership with the Engineering and Planning Divisions, the Town submitted a proposal for a sustainable streets planning. The proposal listed several of the implementation steps from Sustainable Concord. MAPC will review and decide if to award assistance of all, a subset, or none of the proposed work.
- **Grants Watch List**
 - **ARPA and IIJA grants – EV charging, electric buses, etc.**
 - MassEVIP for Fleets and Charging – Accepted on a rolling basis.
 - Green Communities – Not eligible for the next funding round since we received a grant from FY22 round two.
 - GAP III Financing
 - Community Compact Efficiency and Regionalization
 - FEMA HMPG and BRIC Grants

Events and Engagement

- **Upcoming Director Speaking Engagements**
 - May 26th – Council on Aging
- **CSEC Cooler Concord Sustainability Series**
 - [May 25th, Your Sustainable Home Now, Zoom](#)
 - [June 4th, EV Display and Charging Tips Open House, Harvey Wheeler](#)
- **CAAB Monthly Meeting** - third Wednesday of the month at 6:00 PM
- **CSEC Monthly Meeting** – third Thursday of the month at 7:00 PM
- **Light Board Monthly Meeting**– second Wednesday of the month at 7:30 AM
- **Have a special interest?** Contact Amanda Kohn (akohn@concordma.gov) for information on how to join groups working together on EV adoption (Concord Drives Electric), expanding the use of air source heat pumps (Concord Heats Electric), and more!

State Legislation to Tracking

New Energy Building Codes: The [Massachusetts Department of Energy Resources \(“DOER”\) is releasing a Straw Proposal](#) containing proposed updates to the existing Stretch Code and a framework for a new Opt-In Specialized Stretch Code. A recording of a webinar held on February 8th and a PDF of the straw proposal slides will be available on the DOER website. DOER is seeking comment on this Straw Proposal and will hold geographically-targeted public hearings in late February/early March to receive verbal public comment.

Back up information for [calculations informing changes have been released online.](#)

MA House and Senate Bills: There are over 140 bills across the House and the Senate that are suggested when you search for [climate](#) in the 192nd session. These are the 27 bills that I have currently added to [my legislative tracker](#). Each committee needed to report on the bills that were under their review by February 3rd. The Telecommunications, Utilities, and Energy Commission (TUE) asked for an extension for the bills highlighted in yellow **until June 2nd**. If you're interested in creating your own dashboard to track your interests at the state policy level visit: <https://malegislature.gov/MyLegislature>.

Updates from last month are indicated in red.

1. [S. 1333 An Act to reduce greenhouse gas emissions by permitting local option all-electric buildings and homes ordinances](#) – Reported favorably by TUE to Ways and Means
 - Statewide act enabling Town to opt into all-electric buildings and homes ordinances rather than appeal as Concord has done through a Home Rule Petition.
 - Accompanied [H.4524 An Act advancing offshore wind and clean energy](#) – **Committee working to reconcile amendments**
2. [S.2136 An Act transitioning Massachusetts to clean electricity, heating, and transportation](#)
3. [S.2139 An Act to promote zero-emission vehicle fleets by 2035](#)
4. [S.2144 An Act promoting local energy investment and infrastructure modernization](#)
5. [H.2145 An Act promoting the adoption of renewable energy for heating, cooling and hot water](#)
6. [S.2148 An Act relative to the future of heat in the Commonwealth](#)
7. [H.2167 An Act to reduce greenhouse gas emissions by permitting local option all-electric buildings and homes ordinances](#)
8. [S.2191 An Act promoting energy storage systems](#)
9. [S.2196 An Act relative to home energy efficiency](#)– **Reported favorably by TUE to Ways and Means**
10. [S.2202 An Act relative to building energy and decarbonization](#)
11. [S.2222 An Act relative to local energy investment and infrastructure modernization](#)
12. [S.2229 An Act creating a 21st Century clean energy economy](#) – **Sent to TUE in study order S2711**
13. [S.2231 An Act relative to green financing](#) - **Sent to TUE in study order S2711**
14. [S.2232 An Act relative to better buildings](#) – Reported favorably by TUE to Ways and Means
 - Large commercial buildings will need to report energy use to DOER annually, establishes an energy performance standard for different building types, cities and towns can establish their own energy disclosure requirements.
15. [H.3261 An Act promoting local energy investment and infrastructure modernization](#)
16. [H.3292 An Act achieving a green future with infrastructure and workforce investments](#)
17. [H.3294 An Act to support innovation and local investment in the green economy](#)
18. [H.3320 An Act establishing the GREEN Initiative](#)
19. [H.3334 An Act relative to home energy efficiency](#)
20. [H.3340 An Act creating a green bank to promote clean energy in Massachusetts](#)
21. [H.3341 An Act relative to green jobs](#)
22. [H.3343 An Act relative to solar power and the green economy](#)
23. [H.3350 An Act relative to building energy and decarbonization](#)
24. [H.3366 An Act relative to better buildings](#)
25. [H.4117 An Act authorizing the town of Concord to adopt and enforce local regulations restricting new fossil fuel infrastructure in certain construction](#)
26. [H.4477 An Act relative to the electrification of new and substantially remodeled or rehabilitated buildings](#)

Residential Decarbonization Financing Options for Concord

May 13, 2022

The availability of convenient financing is important for the acceleration of consumer adoption of building decarbonization measures because it can reduce the up-front costs of implementing those measures. This is especially important for heat pump installations, because of their high cost, but it can also be useful for consumers who want to implement energy efficiency measures, such as insulation and upgraded windows.

An important financing program, MassSave HEAT Loans, is already in place and can serve some of the market, but it is only available to Concord homes that are National Grid natural gas customers. Other options are needed to help finance decarbonization measures at other homes. This memo describes the MassSave HEAT Loan program, assesses other possible programs that could be added by CMLP, and provides information that we have collected about other organizations that could be helpful.

MassSave HEAT Loans

This program “offers interest-free financing opportunities up to \$25,000 for energy-efficient home upgrades like the installation of air source heat pumps (central or ductless mini-split), ground source heat pumps, heat pump water heaters, insulation, and more.”

To qualify, the borrower must be a National Grid customer and first schedule a home energy audit through MassSave. The customer then selects a contractor and obtains a bid on the desired work. The customer (sometimes through the contractor) then secures a HEAT Loan authorization form from MassSAVE. The customer contacts one of the large number of banks and credit unions that are participating in the program. The loan application process is easy and some of the credit unions and banks allow the borrower to do everything online.

Advantages of the Program

- Interest free
- The \$25,000 loan cap should usually be ample
- The application process is straight-forward

Disadvantages of the Program

- Only open to homes with natural gas
- No option to repay the loan through monthly utility bills, so it requires borrowers to make an additional payment each month

Recommendations

This is an excellent option for consumers who qualify. CMLP and the Town should undertake an active campaign to promote it widely and actively to residents.

Other Financing Options to Consider

The Town and CMLP should look for ways to make financing available to consumers who do not qualify for the MassSave program. To maximize consumer uptake, two priorities should be:

1. Option(s) that CMLP will feel able and comfortable to promote actively to its ratepayers. Not only is CMLP a trusted entity but it reaches many more people than any private sector marketing effort can reach.
2. On-bill repayment. In other locations, this has been shown to significantly increase market penetration.

Although it would be ideal for a financing option to offer zero-interest loans, CMLP and the Town should not hold back if that is not currently possible to implement. Especially with high prices for heating oil, heat pumps and energy efficiency measures can be cost-effective for many customers, even if they have to pay interest on a loan. The upfront cost of an installation is a greater barrier than interest.

Here are some options:

Energy New England (ENE)

CMLP is a client and part owner of ENE, which undertakes activities that serve the interests of its public power clients. ENE is seeking to establish a loan program. As one way to do that, ENE is exploring legislation that would establish a \$20 million revolving loan fund. It is also exploring whether funds through the Regional Greenhouse Gas Initiative (RGGI) could be used to establish the revolving loan fund. If it were to have the funding, it would offer loans at an interest rate—perhaps 4.5%—which would cover ENE's costs. In addition, ENE is reaching out to private entities (banks, coops, and other private equity) to potentially secure the needed funding, but that would likely drive up the interest rate for customers. ENE would provide administrative support through reviewing applications, billing, and collections.

Advantages

- CMLP has an existing relationship with ENE and trusts it
- No financial risk to MLPs including the credit and bond rating
- This could be an easy-to-administer loan offering for CMLP to enter into

Disadvantages

- Because ENE does not currently have the needed funding in hand, it could be a long time before the program is ready to launch
- Option to repay the loan through monthly utility bills is unlikely, so it requires borrowers to make an additional payment each month
- It would not be a zero-interest option

Recommendations

CMLP and the Town should monitor this closely and keep in touch with ENE, but not delay action until ENE launches a program. ENE may not be in a position to launch a program until late-2023 or 2024.

CMLP-Administered Program

CMLP could launch its own loan program, using Town funding approved via town meeting. CMLP would need to add a staff member to administer the program. CMLP would issue the loans to borrowers and collect the repayments via on-bill repayment

Advantages

- This approach would give the Town and CMLP maximize control.
- It would be possible to offer zero-interest loans if residents vote to use taxpayer funds for that purpose.
- The number of consumers taking out loans would likely be higher than with other options, especially if the loans are zero interest, because of high trust of CMLP as an institution.

Disadvantages

- It would create a significant administrative burden for CMLP.
- There are some legal questions about CMLP's authority to serve as a lender
- Uncertainty around financial risk as default on this type of loan is low, but not nonexistent
- It would depend on an affirmative decision by Town Meeting, which would be uncertain.

Recommendations

I do not recommend this approach. It would take CMLP beyond its core competence and would require considerable administrative attention to set it up, taking CMLP leaders away from other important tasks. As long as there are other viable options, the advantages do not seem to outweigh the disadvantages.

Massachusetts Municipal Wholesale Electric Company (MMWEC)

Like ENE, MMWEC is an entity that works with and serves Massachusetts MLPs. CMLP is not a member. MMWEC is pursuing using its existing pooled loan agreement to establish a Clean Energy Revolving Fund (currently \$5 million). The current loan program has a 2% interest rate. This fluctuates with inflation and federal reserve policy and could go up to 3% in the near term. Ideally, the state would offer a contribution to offset the interest through legislation or the use of federal American Recovery Plan Act (ARPA) funds and possibly increase the seed funding. If ARPA/legislation is not passed, the interest rate would need to be passed to customers or paid by the MLP. MMWEC would administer the program for the members. The Board of Directors would need to approve nonmember participation. Nonmembers may also need to pay an additional administrative fee. The loan program's infrastructure is in place and may be ready by mid-year, but it could be longer for nonmembers.

The loan program is flexible and can be customized by each MLP. The options for repayment are also flexible and could include fixed repayment with a separate bill sent to the customer, fixed repayment via on-bill repayment, or a variable tariff link to the rate structure in \$/kWh. To provide further security, property liens can be used but would not need to be required. CMLP's credit would be used to establish the loan program. MMWEC believes that given the size of individual loans and the low projected default rate, it is unlikely that defaults would impact a MLP's bond rating.

Advantages

- MMWEC has done considerable work on getting this program started.
- MMWEC has extensive experience working with MLPs and represents the interests of MLPs.
- This program could potentially be up and running sooner than some of the alternatives.

Disadvantages

- CMLP is not an MMWEC member.
- CMLP would need to use its credit to establish the program
- Smaller amount of start-up capital compared to other programs
- It would not be a zero-interest option

Recommendations

This option holds considerable promise. CAAB and CMLP should have further conversations with MMWEC to explore this possibility and consider whether it is worth pursuing.

Slipstream

Slipstream is a national nonprofit organization headquartered in Wisconsin, with more than 150 employees in 21 states, including Massachusetts. They run energy efficiency and renewable energy programs for governments and utilities. They are seeking to expand their financing programs into Massachusetts, but do not yet have a program established with a Massachusetts municipal utility. They could work with a program that relies on unsecured loans or one that uses on-bill financing. They much prefer on-bill financing, because there would be greater program uptake by consumers and administrative costs would be lower.

They especially like the PAYS (pay as you save) tariff model. In that case:

- The utility makes the investment and, in effect, owns the investment
- The utility's investment is capped at 88% of project savings, considering all fuel sources; the consumer can choose to invest more
- A fixed tariff charge is placed on the electric meter for a period of 10-12 years
- If the resident moves, the tariff stays with the meter.

For PAYS-model programs, Slipstream is partnering with EEtility, which has been involved in more PAYS programs than any other organization. Slipstream does not supply the capital, but they have the program infrastructure. They provide the staff for administering the program and doing the data collection. They work with a closed network of vetted contractors. They do the loan servicing.

The start-up costs would be roughly \$150,000-\$200,000. It would be best to have several MLPs involved, so that those costs could be split among the MLPs. Slipstream has had discussions with Ipswich MLP.

CMLP would need to provide the capital or arrange for the capital from some other source. The capital could perhaps be obtained from the Rural Energy Savings Program (RESP) of the US Department of Agriculture, discussed below. Slipstream's program administration could potentially also be combined with a program funded through ENE or MMWEC. Slipstream has had discussions with ENE.

Advantages

- Slipstream has considerable experience administering energy efficiency and fuel-switching programs for utilities.
- Slipstream and EETility have considerable experience administering on-bill financing programs.
- Slipstream is a non-profit organization with a positive reputation.
- PAYS is an attractive model that could even allow households which rent to participate.

Disadvantages

- Although Slipstream has a successful track record, it has not offered a program like this in Massachusetts.
- They would not supply the capital for the loans or investments.
- It would likely require several MLPs to work together to set up a PAYS program.

Recommendations

CAAB and CMLP should keep Slipstream in mind and should have further conversations with them, especially if a program with funding from ENE or MMWEC seems possible.

BlocPower

This is a New York-based company that has been financing efficiency and technology upgrades for commercial buildings and multi-family housing. They pay for the upgrade and lease the equipment to the building owner. This is similar to a solar leasing company or an energy services company (ESCO), with the building owner being able to make monthly repayments that are usually less than the savings in utility bills. The company is not looking to be more active in the Massachusetts market and may also want to do smaller single-family home installations.

Advantages

- The building owner does not need to pay for the initial cost of the installation
- BlocPower is responsible for system maintenance

Disadvantages

- The company does not have a track record in Massachusetts
- Most of their work has focused on large properties in New York; it is unclear how it will translate to smaller properties in a place like Concord

Recommendations

This could ultimately be a useful model for some properties in Concord, especially multi-family properties. However, it would be premature for CMLP to embrace this model and promote it to its customers until there is a solid track record of success in Massachusetts. Even then, it might be a model best left to the private sector marketplace without participation by CMLP.

[Commercial Property-Assessed Clean Energy \(C-PACE\)](#)

According to the Massachusetts Department of Energy Resources website, “Pursuant to G.L. c. 25A, sec. 6(13), MassDevelopment Finance Agency (MDFA), with the technical assistance of DOER, has launched a Property Assessed Clean Energy (PACE) program for commercial and multifamily buildings. PACE Massachusetts allows owners of commercial, industrial, and multifamily (5 or more units) properties to make energy improvements to existing facilities and finance the improvements over a long term (up to 20 years). The loan is repaid via a municipal betterment assessment on the property and attaches to the property so the benefits and payments flow to subsequent purchasers.” This program could be used to offer loans for multifamily housing. Up to now, there have been few loans made through the program and the processes established by MassDevelopment involve considerable administrative complications, but PACE has the potential to play a useful role for Concord. More research needs to be done.

[Resources and Background Information](#)

[Environmental and Energy Study Institute \(EESI\)](#)

EESI manages an [On-Bill Financing Project](#) funded by private foundations that enables EESI to provide assistance to municipalities and utilities that seek to establish an on-bill financing program.

What EESI Can Do for Concord

- Help set appropriate goals for an on-bill financing program
- Provide case studies of other municipal utilities and rural electric coops that established programs
- Make connections for us with other utilities with similar goals and needs to Concord. EESI’s project director, Miguel Yañez-Barnuevo, feels the experiences of the Holland Board of Public Works in Holland, Michigan could be especially relevant to Concord
- Provide CMLP with analysis that CMLP might desire and find useful
- Help with the launch of the program
- Help with an application to the USDA Rural Electric Savings Program, if Concord decides to go that route.

EESI’s Views on Program Design

- The loan should be tied to the utility meter rather than to the individual/household borrowing the money. This allows renters to participate and also reduces the risk of defaults.

- It is generally best to allow for repayment over many years—up to 12 years is a good benchmark
- It is desirable to allow for alternative underwriting criteria

EESI's Views on Loan Defaults

- EESI's experience is that there are usually very few defaults. A key reason is that many utilities focus on energy efficiency measures that will yield immediate savings larger than the monthly payments. That means that the borrower is saving money each month from day one.
- If Concord were to focus on electrification and fuel switching, in addition to cost-effective energy efficiency measures, some borrowers may find their bills going up, at least in the short run. That could influence the number of defaults, but there should still be very few if the borrowing criteria are set up carefully and potential borrowers are given solid information about their costs and savings.

Two Different Roles for CMLP

- With an on-bill financing program, CMLP would take on the task of setting up the administrative structure for the program, issuing the monthly bills, and collecting payments.
- CMLP could also choose to be the lender, either loaning its own money or money it borrows and re-loans.
- But CMLP does not need to play the role of the lender. Another entity could play that role. That entity would loan its own money and would receive the borrower's monthly payments. The contract would be between that lending entity and the Concord ratepayer borrowing the money.
- In terms of the risk of default, the lender takes the risk. If CMLP does not play the role of lender, it does not have any risk if the borrower defaults on payments.

An Option for Obtaining Capital

- If CMLP decides to play the role of lender, it does not need to use its own money. It could obtain the capital from some other source and then lend it out. Miguel especially recommended seeking funding from the Rural Energy Savings Program (RESP) of the US Department of Agriculture. Municipalities (or utilities that serve municipalities) with up to 50,000 people can apply. EESI describes the program here: <https://www.eesi.org/Rural-Energy-Savings-Program>.
 - Advantages of this program
 - RESP offers the funding at 0% interest.
 - CMLP would be able to charge customers an interest rate (up to 5%) to cover its administrative costs and possible defaults.
 - Disadvantages of this program
 - The process of getting approval from RESP would take more than a year
 - The application is long and time-consuming.

Holyoke Gas and Electric (HG&E)

HG&E has an active loan program that offers loans to residential and commercial customers. CAAB Member Michael McAteer collected information from HG&E about their experiences.

Key Points from a Conversation with HG&E

- Roughly five people are engaged to administer the loans
- Annual budget (\$1.0M) is secured from the company's operating plan. Roughly 50 customers elect to participate annually- split evenly between commercial and residential sectors
- Unable to spend the full budget annually
- Scale is small and HG&E has no plan to increase customer participation - strong belief to not increase rates
- 50% of funds go to weatherization / 50% electrification
- Customers like the program
- No concern with defaults / Will initiate a lien on property if necessary
- Process is not burdened with typical loan requirements, although customers must present a copy of their deed to the company
- Billing systems can handle on-bill function
- Engage Diamond Contractors for heat pump systems transitioning from fossil fuels
- Work closely with low-income customers

HG&E's Responses to a Questionnaire

How is the loan program administered within the company, including staffing, budget and resources?

- Managed internally by Energy Efficiency Coordinator, Technical Support Engineer, Customer Service and Accounting Depts. Budget = \$1,000,000

When was the program developed?

- Sometime in the 1990's, maybe earlier

What is the target customer market?

- Residential and commercial buildings with active HG&E accounts

What is the source of the loan funds?

- We do not have a separate account for the funds. Rather, the money is coming out of our operational cash flow and we account for it on an annual basis. The annual budget is based on how much we can take on each year and has historically always been \$1,000,000.

How many loans have been issued?

- 2021 applications approved:
 - Residential Energy Conservation Program: \$363,585
 - Commercial Energy Conservation Program: \$434,776
- 2020 applications approved:
 - Residential Energy Conservation Program: \$286,921
 - Commercial Energy Conservation Program: \$466,706
- 2019 applications approved:
 - Residential Energy Conservation Program: \$293,556

- Commercial Energy Conservation Program: \$167,304
- 2018 applications approved:
 - Residential Energy Conservation Program: \$395,448
 - Commercial Energy Conservation Program: \$356,227
 - Solar: \$20,000
- 2017 applications approved:
 - Residential Energy Conservation Program: \$381,140
 - Commercial Energy Conservation Program: \$340,982
 - Solar: \$10,000

What are the customer eligibility requirements including credit review and liens on property?

- For Residential Energy Conservation Program, see terms and conditions on this webpage: <https://www.hged.com/residential/ee-home/recp/default.aspx>
- For Commercial Energy Conservation Program, see terms and conditions on this webpage: <https://www.hged.com/commercial/ee-business/cecp/default.aspx>
- For both programs, any requests over \$10,000 need to receive Commission approval

What technologies can the loans be used to support?

- For Residential Energy Conservation Program, see list of eligible equipment and equipment-specific requirements on this webpage: <https://www.hged.com/residential/ee-home/recp/default.aspx>
- For Commercial Energy Conservation Program, see list of eligible equipment and equipment-specific requirements on this webpage: <https://www.hged.com/commercial/ee-business/cecp/default.aspx> Note that applications are handled on a case-by-case basis, and exceptions to eligibility requirements may also be made on a case-by-case basis.

How many loan defaults has the company managed?

- Luckily, we have not had any issues with repayment. We have had only one commercial customer default. I think for the most part because we only usually approve customers that pay on time every month, our threat is on the low side. If a customer were to default, we would place a lien on the property.

What is the maximum loan that can be made and over what period of time?

- Residential Energy Conservation Program:
 - The maximum assistance for a project is as follows:
 - Properties with 1 unit: \$10,000
 - Properties with 2 units: \$15,000
 - Properties with 3-4 units: \$20,000
 - Solar - Photovoltaic (PV) \$10,000 per residential dwelling
 - The maximum repayment term for the assistance is 36 months for projects up to \$2,000, 60 months for projects between \$2,001 and \$20,000, and 120 months for Solar PV \$10,000.
- Commercial Energy Conservation Program:

- The maximum assistance amount for non-owner occupied multi-family investment properties is \$20,000 per building. (maximum of \$5,000 per unit).
- The maximum assistance amount for Commercial and Industrial buildings (excluding multifamily buildings) is handled on a case-by-case basis.
- The maximum repayment term for the assistance is 36 months for projects up to \$2,000 and 60 months for projects \$2,001 or more.

What do your customers think about the effectiveness of the loans to drive their goals for mitigating their greenhouse gas footprint?

- No good data on this, imagine customers find it helpful, especially with larger, more expensive projects such as heat pumps, insulation, and high efficiency gas heating systems, which are one of more popular project types

What does the company think about the effectiveness of the program to advance the town's decarbonization goals?

- HG&E believes the programs to be in-line with the town's de-carbonization goals

WL- 5/12/2022

AK-5/13/2022

Project Results & Next Steps








THE TOWN OF
CONCORD
MASSACHUSETTS

Fleet Electrification Roadmap & Charging Infrastructure Needs Assessment

2022

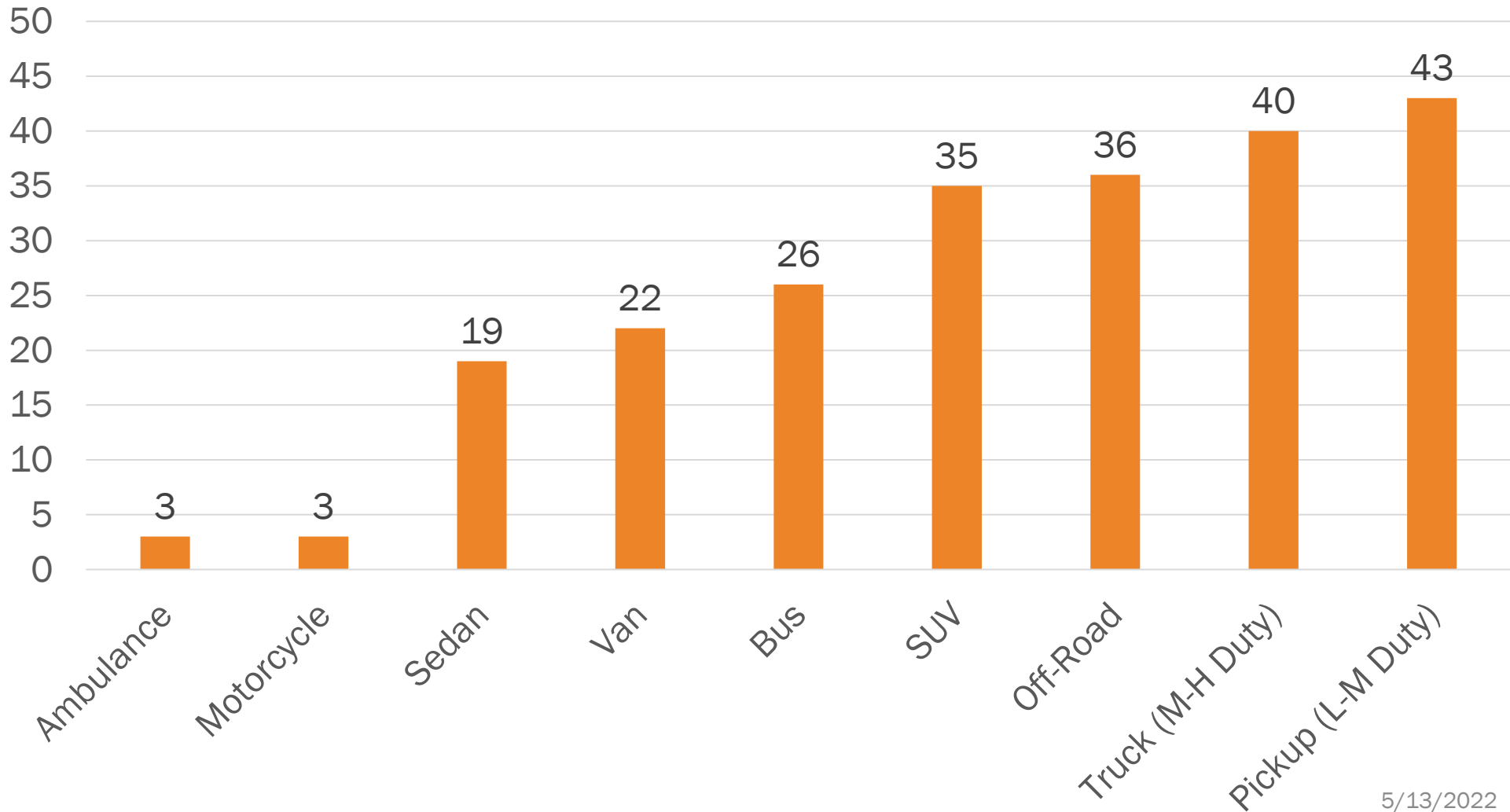
STUDY OVERVIEW

-  VEHICLE ANALYSIS & EV SUITABILITY
-  VEHICLE TOTAL COST OF OWNERSHIP ANALYSIS
-  LOAD FORECASTING & CHARGING INFRASTRUCTURE NEEDS
-  INFRASTRUCTURE COST
-  NEXT STEPS



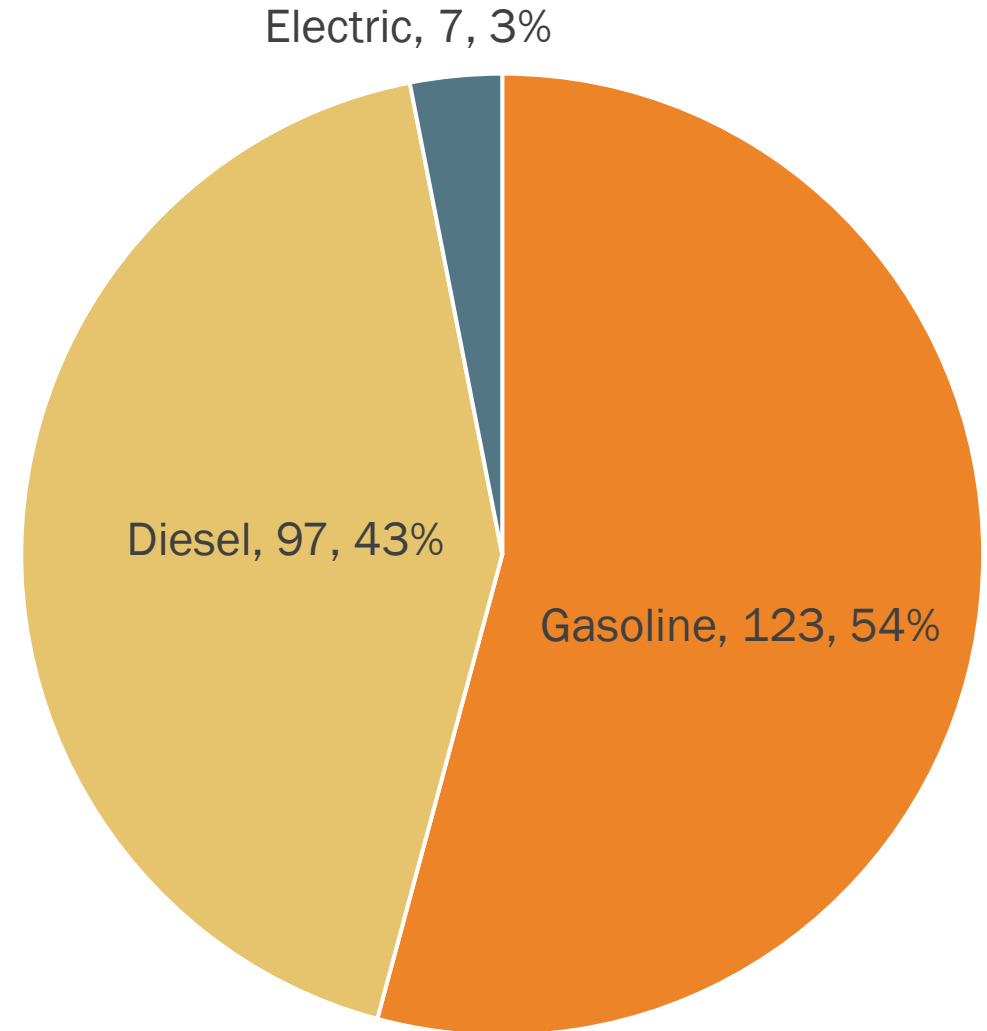
VEHICLE ANALYSIS & EV SUITABILITY

CURRENT FLEET BY VEHICLE TYPE – TOTAL 227

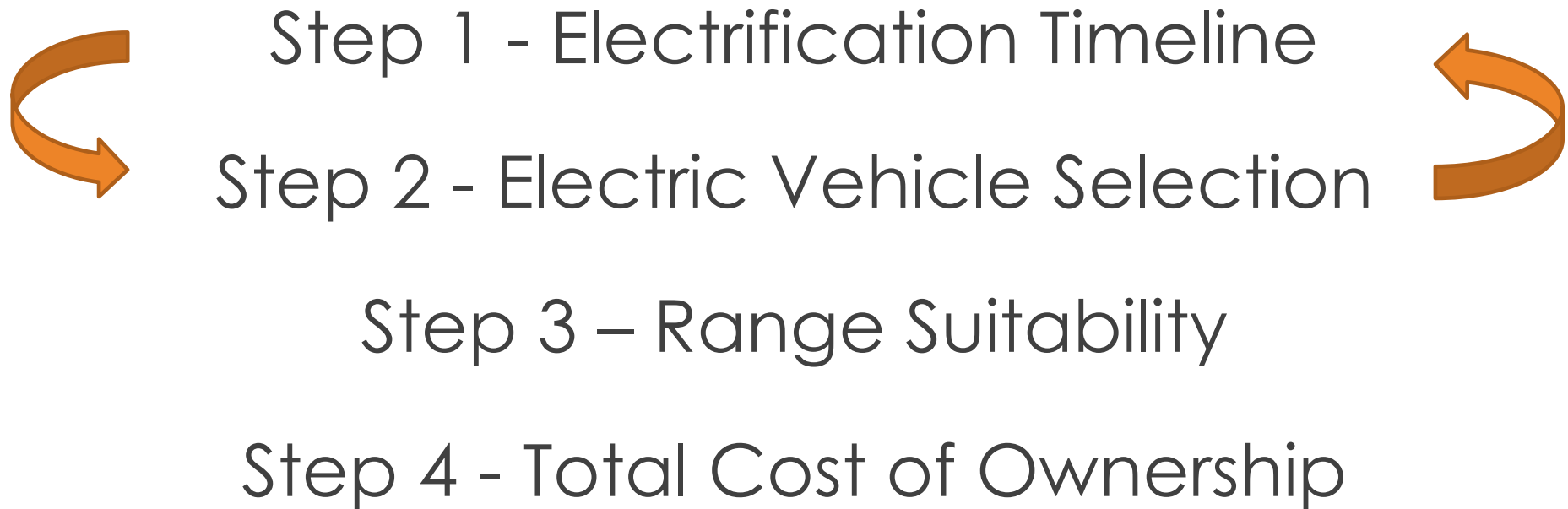


CURRENT FLEET BY FUEL TYPE

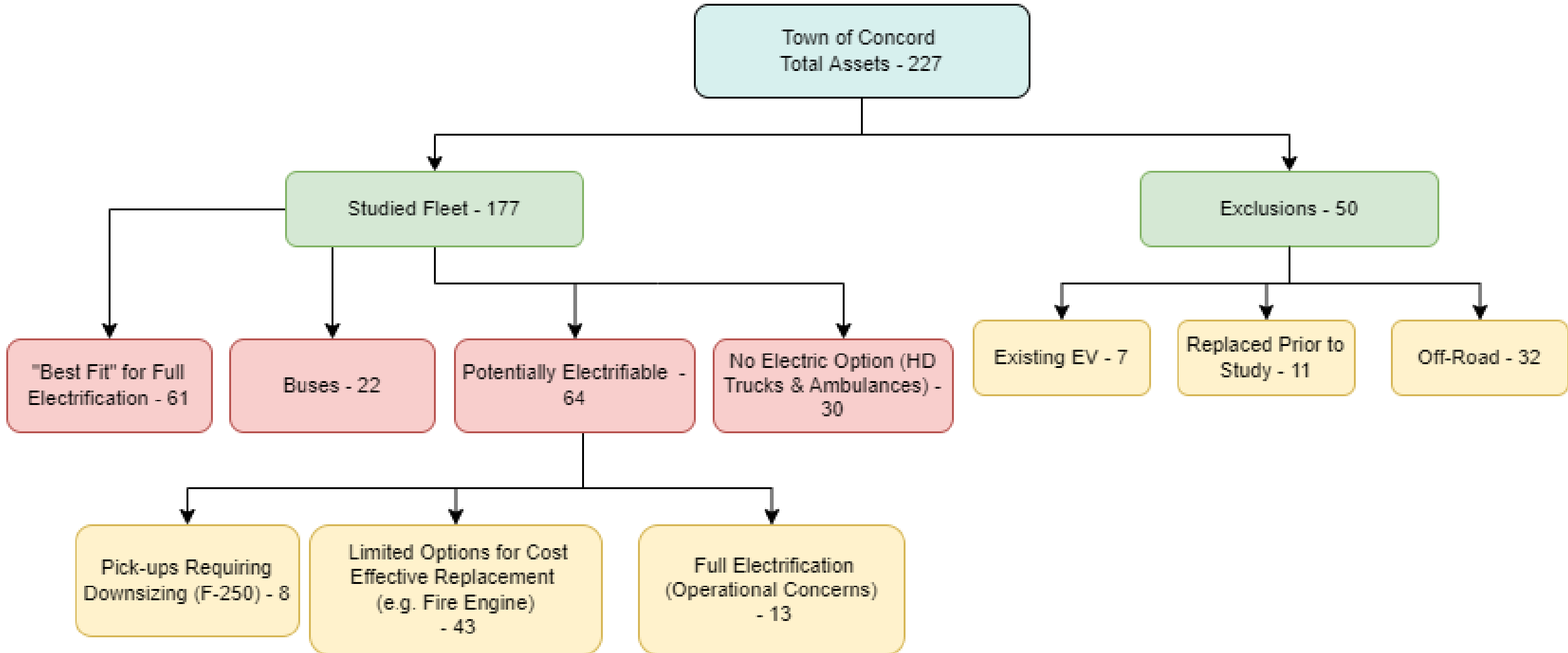
- 91% internal combustion engines (ICE)
- 5% hybrids (gas-powered)
- 3% battery electric vehicles (BEV)
- 1% plug in hybrids (PHEV-gas and electric)



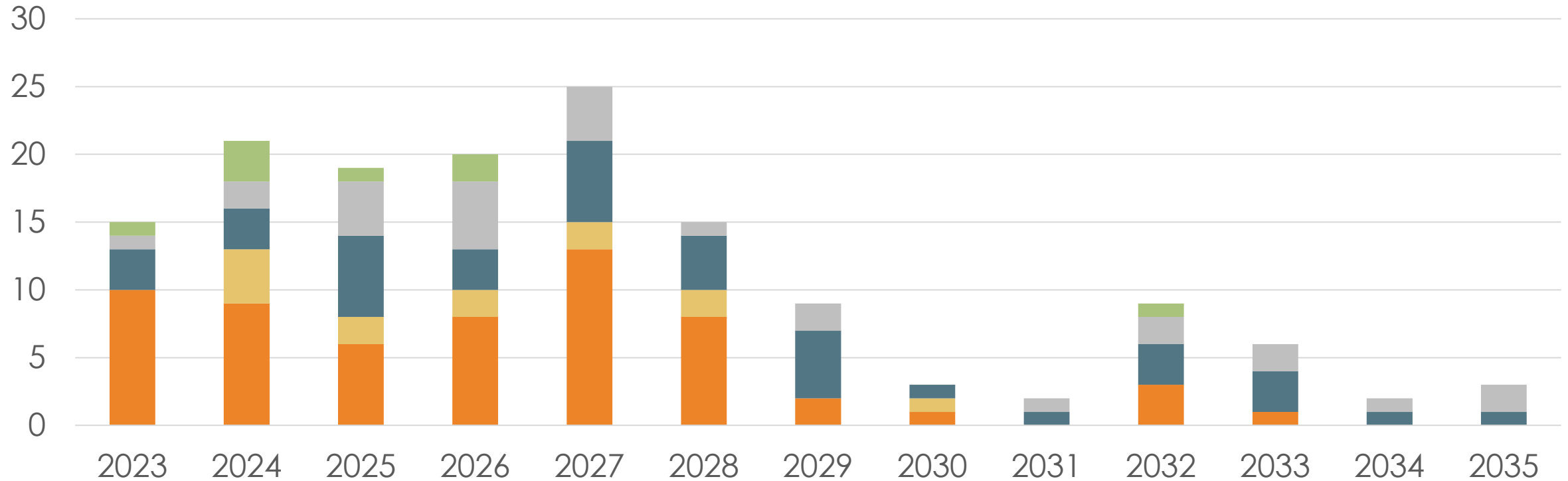
METHODOLOGY



FLEET CATEGORIZATION

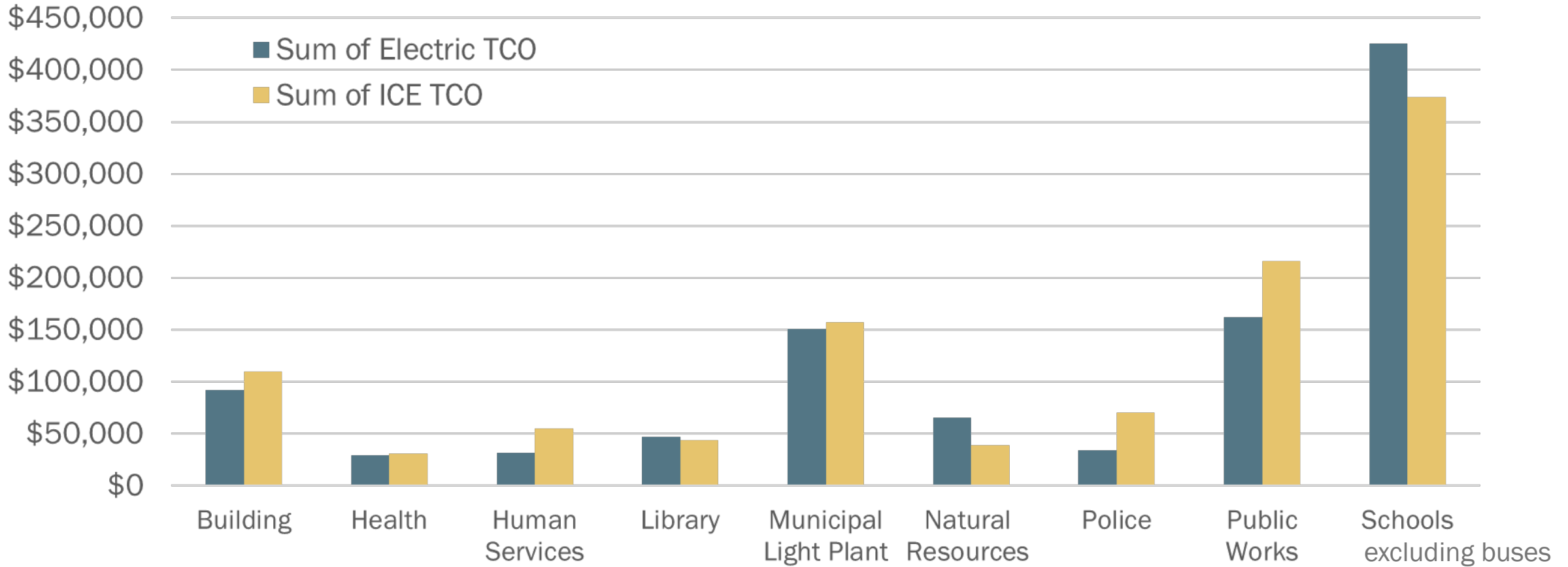


REPLACEMENT TIMELINE BY CATEGORY

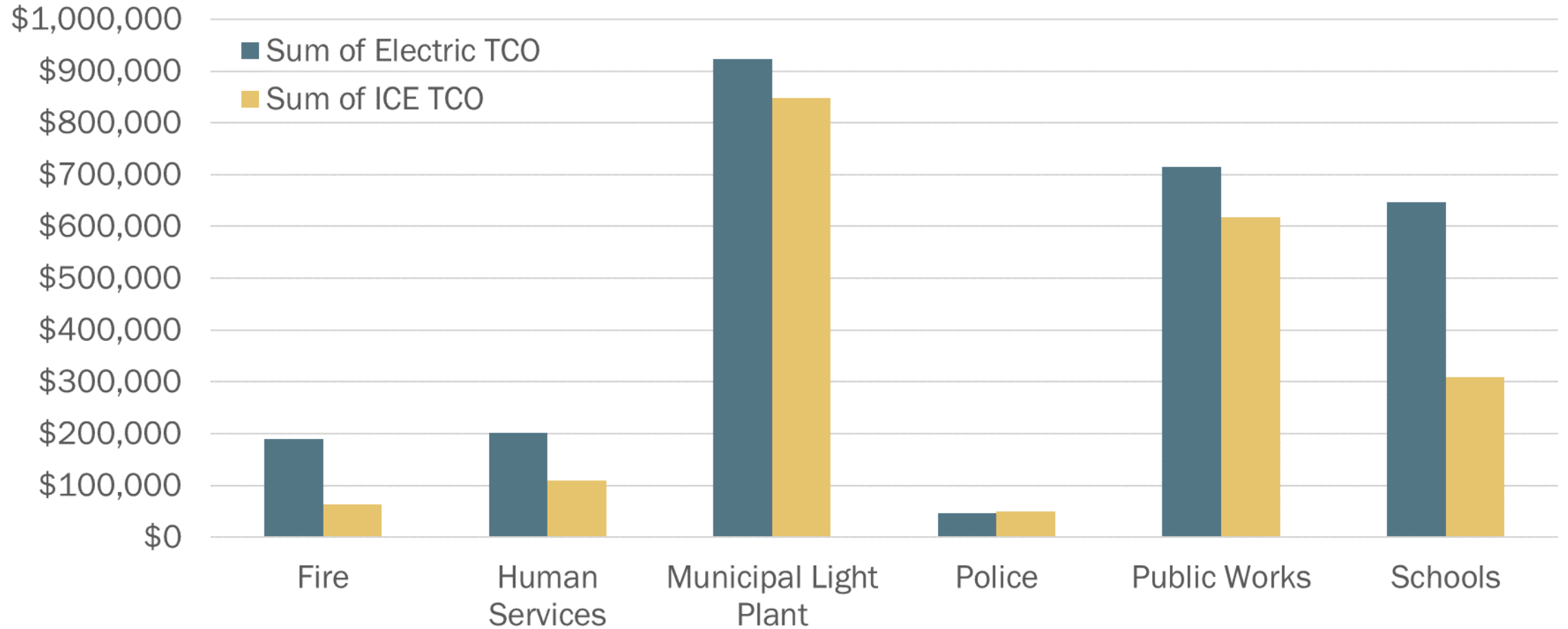


- Pickups Requiring Downsizing
- Limited Options for Cost Effective Replacement
- Full Electrification
- No Electric Alternative
- Full Electrification - Operational Concerns

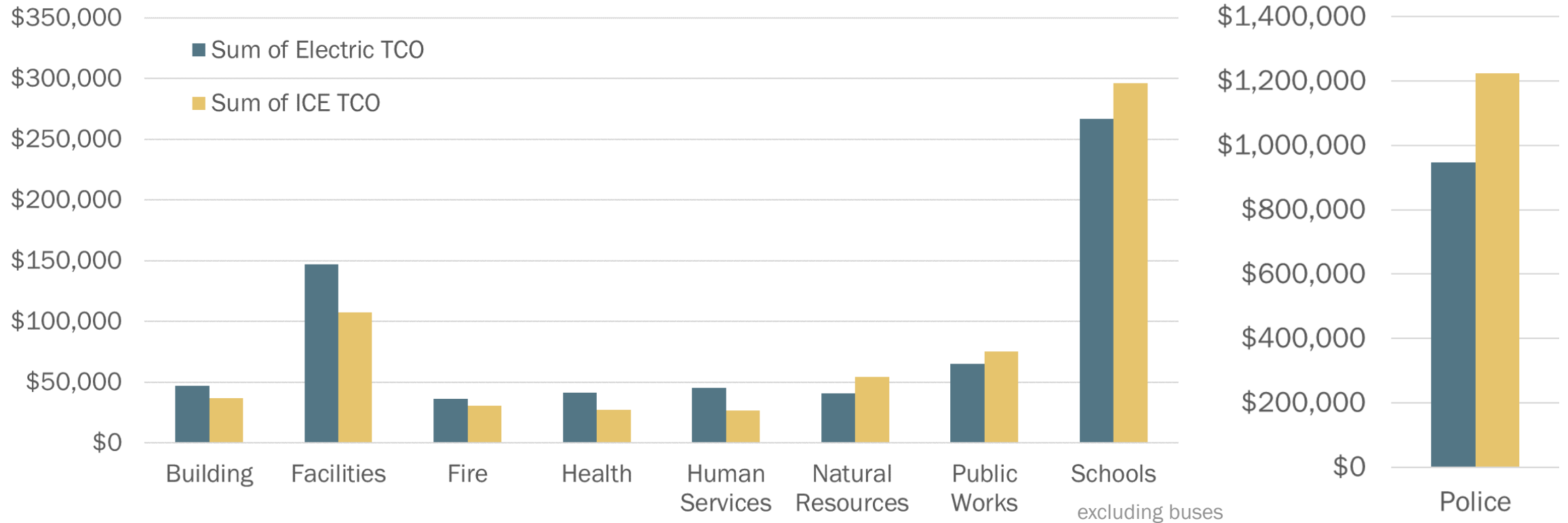
TCO ESTIMATES “BEST FIT” VEHICLES PURCHASES 2023 – 2025



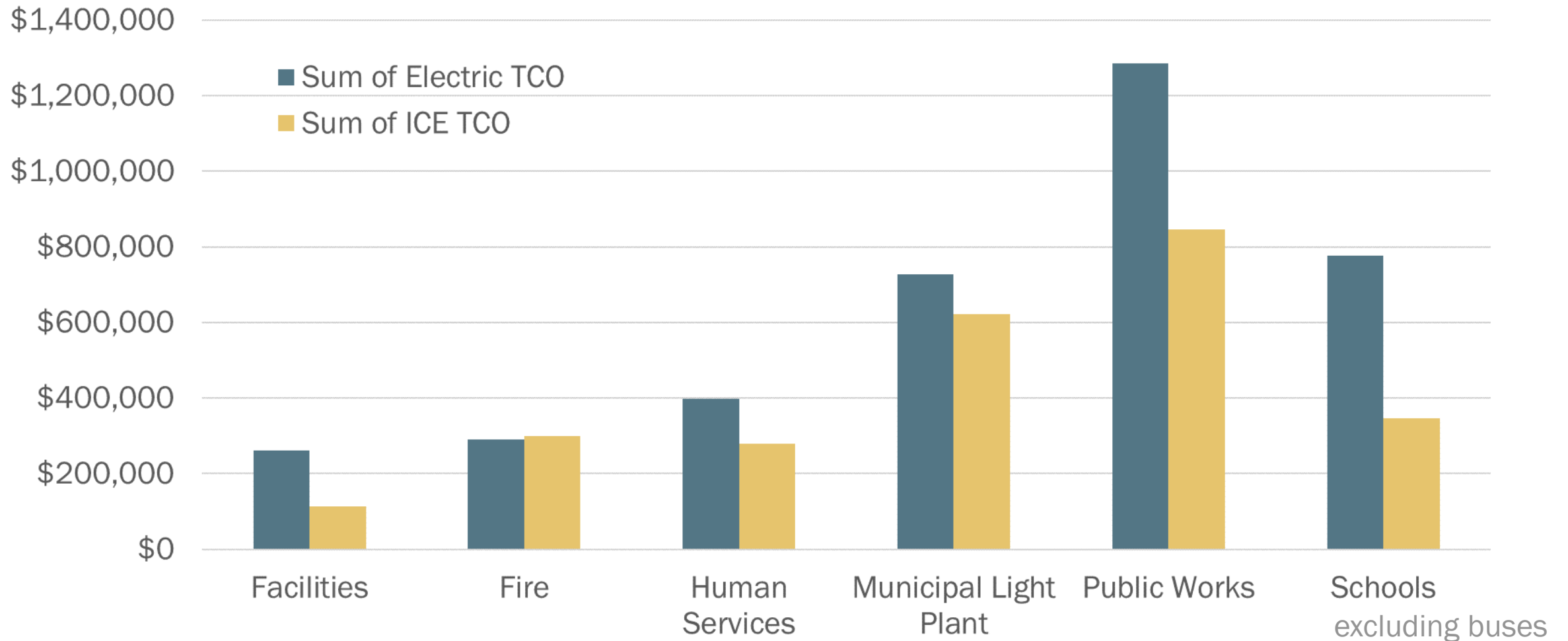
TCO ESTIMATES POTENTIAL ELECTRIFICATION PURCHASES 2023 – 2025



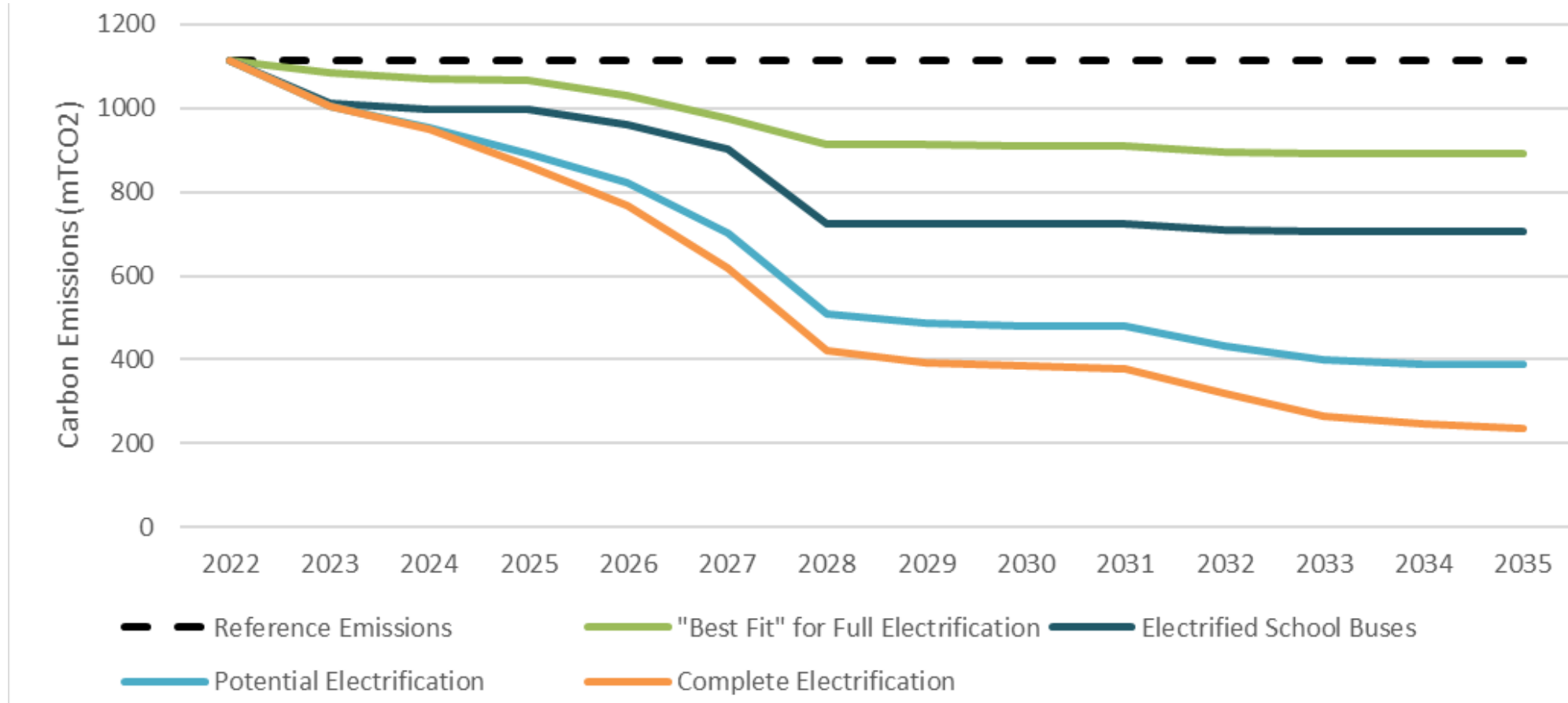
TCO ESTIMATES “BEST FIT” VEHICLES PURCHASES 2026 – 2030



TCO ESTIMATES POTENTIAL ELECTRIFICATION PURCHASES 2026 – 2030



CARBON EMISSIONS REDUCTIONS BY SCENARIO



For this analysis, the regional carbon intensity of 0.255 MTCO2 per MWh was assumed. With CMLP's goal and progress on carbon-free power supply, emissions will be reduced even further and to zero upon complete electrification.

FLEET REPORT – KEY FINDINGS

- **34%** of the studied fleet (61 out 177) can be replaced with an EV currently on the market
- Electrifying “Best Fit” vehicles due for replacement between
 - 2022 – 2025 is expected to **save approximately \$200,000**
 - 2025 – 2030 is expected to **save approximately \$180,000**
 - 2031 – 2035 is estimated to **save approximately \$140,000**
- **Vehicle range is not a barrier - 100%** of the vehicles’ historical driving behavior can be managed with the recommended EV option
- Municipal fleet carbon emissions would be reduced by an **estimated 39% by 2030** with the replacement of the Town’s “Best Fit” vehicles and the buses

CHALLENGES AND NEEDS

- Need centralized fleet management software to track data and transition. Benefits:
 - Streamlined coordination
 - Better understanding of return on investment and total cost of ownership
 - Transition is data driven, easily managed and updated
 - Route optimization, maintenance tickets, additional add-ons
- Need continual analysis to review
 - Availability of medium- and heavy-duty EVs
 - Emergency operations and backup

OTHER COMMENTS

- APP #65 Sustainable Fleet Policy
 - Electric-first - all light-duty passenger vehicles purchases are required to be BEVs
 - Fuel-efficient requirements for standard vehicles
 - Transfers between departments need to meet above requirements
 - Consider downsizing, sharing, multi-modal, carpooling, and leasing
 - Exemptions and waiver process described
- Use of the statewide contract
- Standardization may help with maintenance and charging infrastructure
 - Some discrepancies because some vehicles needed 4-WD



CHARGING INFRASTRUCTURE NEEDS ASSESSMENT



SUMMARY OF METHODOLOGY

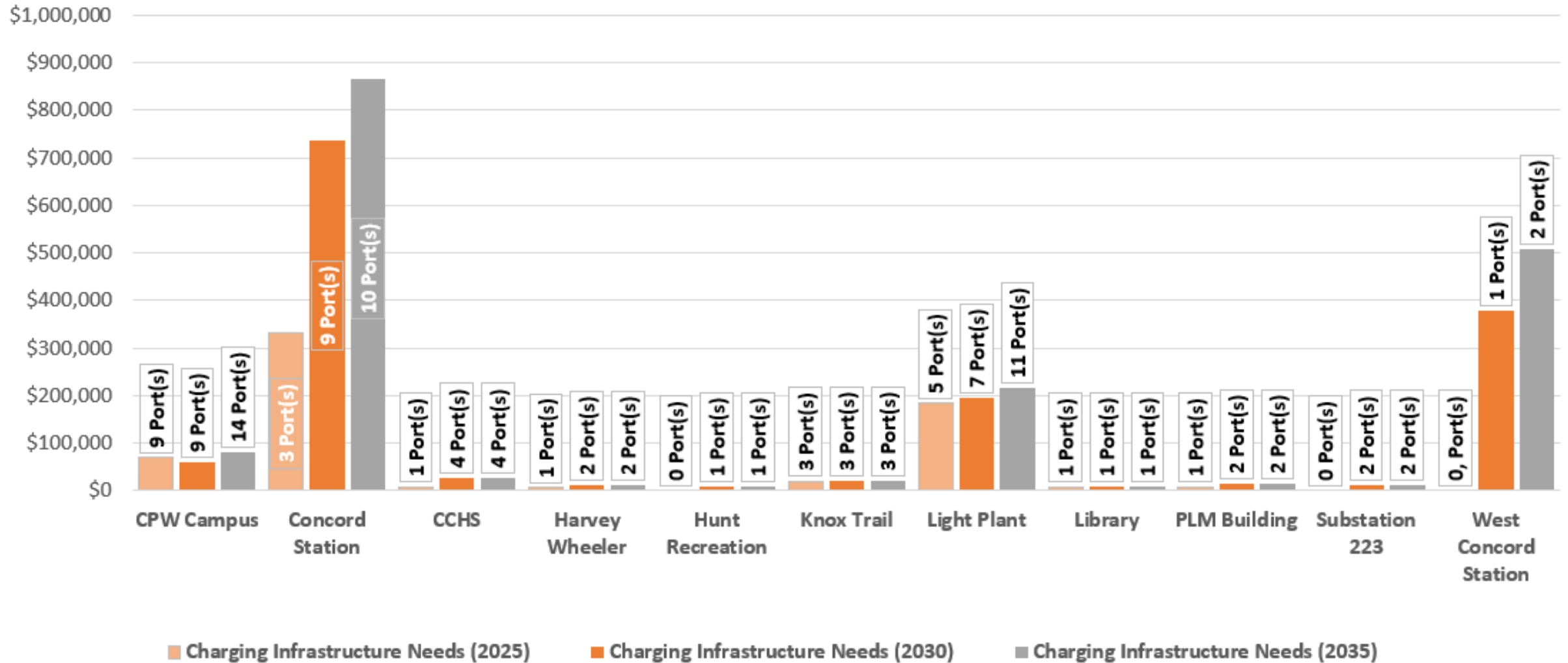
- Solving for two major constraints:
 - Are the port ratings (kW) high enough to provide sufficient energy during vehicle dwell time?
 - Are there enough ports to provide sufficient energy to the entire fleet of EVs?

DWELL TIME SUMMARY

- Concord did not have telematic (GPS) data available to provide a quantitative record of when vehicles were parked
 - Fueling transactions
 - Proxy data
 - Staff interviews
- For most of the Town’s fleet, dwell times are expected to be a minimum of 12 hours (e.g., 6pm – 6am)

Site	Dwell Time
CPW Campus	11-13 hours overnight, periodic emergency responses
Concord Station	Special Unit: Immediate turnaround Patrol: 2 hours or Admin: 11-13 hours
CMLP	11-13 hours overnight, periodic emergency responses
Harvey Wheeler	11-13 hours overnight
Hunt Recreation	
Knox Trail	
Main Library	
PLM Building	
Substation 223	
West Concord	

SUMMARY OF PROJECTED CHARGING INFRASTRUCTURE NEEDS



PROJECTED INFRASTRUCTURE NEEDS - 2025

Site	Electric Vehicles by Scenario			# of Ports & Type	Vehicle to Port Ratio (All Vehicles)	Notes
	"Best Fit"	"Potentially Electrifiable"	"All Vehicles"			
CPW Campus	4 (8%)	12 (24%)	14 (27%)	4 x 11.5 kW 4 x 6.6 kW	1.5	2 existing L2 ports
Concord Station (Total)	2 (6%)	5 (15%)	5 (15%)	2 x 11.5 kW 1 x 6.6 kW	1.66	
Police	5 (3%)	17 (11%)	20 (13%)	1 x 11.5 kW	3	150 kW for Special Unit, 11.5 kW for Patrol 6.6 kW for Admin
Fire	30 (40%)	36 (38%)	38 (51%)	1 x 11.5 kW 1 x 6.6 kW	1	
CCHS	3 (20%)	3 (20%)	3 (20%)	1 x 6.6 kW	3	
Harvey Wheeler	0 (0%)	1 (33%)	1 (33%)	1 x 11.5 kW	1	
Hunt Recreation	0 (0%)			N/A	N/A	
Knox Trail	6 (50%)	10 (83%)	11 (92%)	1 x 11.5 kW 2 x 6.6 kW	3.33	
Light Plant	1 (4%)	13 (52%)	16 (64%)	1 x 11.5 kW 4 x 6.6 kW	2.6	
Library	1 (100%)			1 x 6.6 kW	1	Level I charger would viable
PLM	4 (50%)	4 (50%)	4 (50%)	1 x 6.6 kW	4	
Substation 223	0 (0%)			N/A	N/A	
West Concord Station	0 (0%)				N/A	

PROJECTED INFRASTRUCTURE NEEDS - 2035

Site	# of Electric Vehicles by Scenario (% of Total)			# of Ports (Fully Powered) & Type	Vehicle to Port Ratio ("All Vehicles")	Notes
	"Best Fit"	"Potentially Electrifiable"	"All Vehicles"			
CPW Campus	9 (18%)	34 (67%)	48 (94%)	6 x 11.5 kW 8 x 6.6 kW	2.42	2 existing L2 ports
Concord Station (Total)	19 (58%)	27 (82%)	27 (82%)	4 x 150 kW 5 x 11.5 kW 1 x 6.6 kW	2.7	150 kW for, Engines, SU & redundancy 11.5 kW for Patrol
Police	18 (95%)	19 (100%)	19 (100%)	2 x 150 kW 4 x 11.5 kW	3.16	
Fire	1 (11%)	8 (89%)	8 (89%)	2 x 150 kW 1 x 11.5 kW 1 x 6.6 kW	2	
CCHS	11 (73%)	15 (100%)	15 (100%)	1 x 11.5 kW 3 x 6.6 kW	3.75	
Harvey Wheeler	0 (0%)	3 (100%)	3 (100%)	2 x 11.5 kW	1.5	
Hunt Recreation	Same as 2030					
Knox Trail	Same as 2030					
Light Plant	1 (4%)	17 (65%)	24 (96%)	1 x 150 kW 4 x 11.5 kW 6 x 6.6 kW	1.54	150 kW for Bucket Trucks
Library	Same as 2030					
PLM	Same as 2030					
Substation 223	Same as 2030					
West Concord Station	0 (0%)	2 (67%)	3 (100%)	2 x 150 kW	1	

OPERATIONAL UPDATES

- When vehicle to port ratios exceed 1, operational changes related to vehicle rotation are expected
- Solutions:
 - Not all vehicles will plug in every night
 - Power sharing implemented (e.g., plug count exceeds circuit capacity and chargers share power when multiple vehicles plug in)
 - Staff on hand to rotate vehicles at night
 - Charging software

REMAINING POWER CAPACITY VS. POWER NEEDED

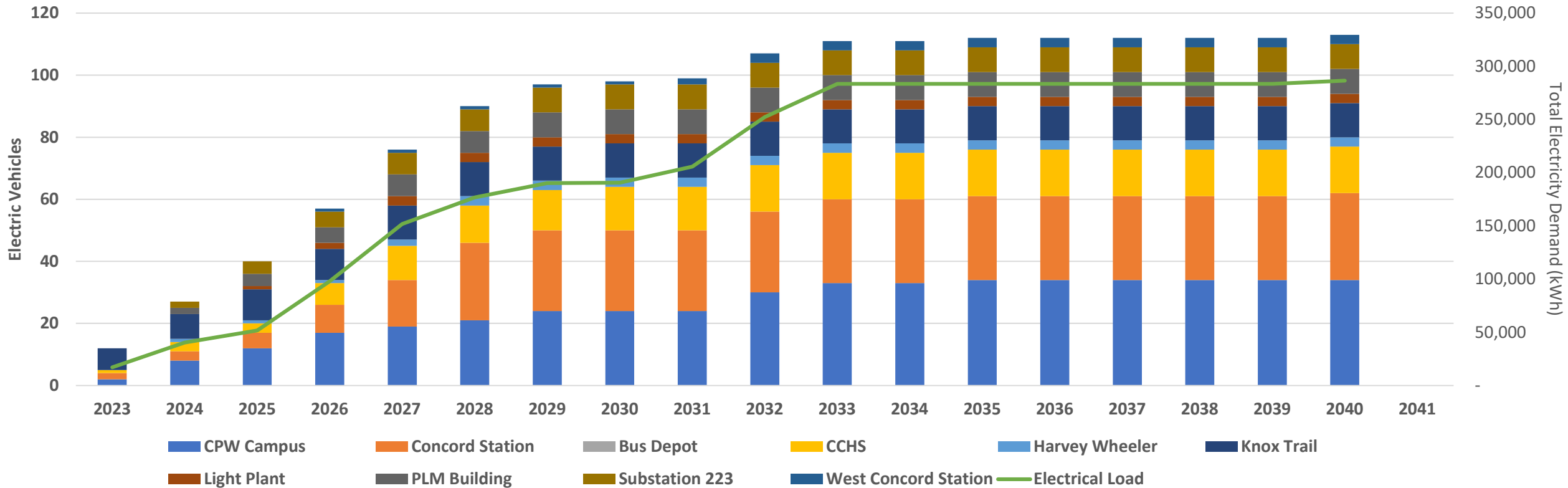
Would need to be updated as more heavy-duty vehicles electric models become available

Site Name	Estimated Capacity Available (kW)	2040 Charging Needs (kW)	Sufficient Capacity?
CPW Campus	519.22	121.8	Yes
Concord Station	230	664.1	No
CCHS	133	31.3	Yes
Harvey Wheeler	356.33	23	Yes
Hunt Recreation	155.30	6.6	Yes
Knox Trail	212.83	24.7	Yes
Light Plant	336.4	235.6	Yes
Library	568.42	6.6	Yes
PLM	65.6	13.2	Yes
Substation 223	33.24	18.1	Yes
West Concord Station	48.43	300	No

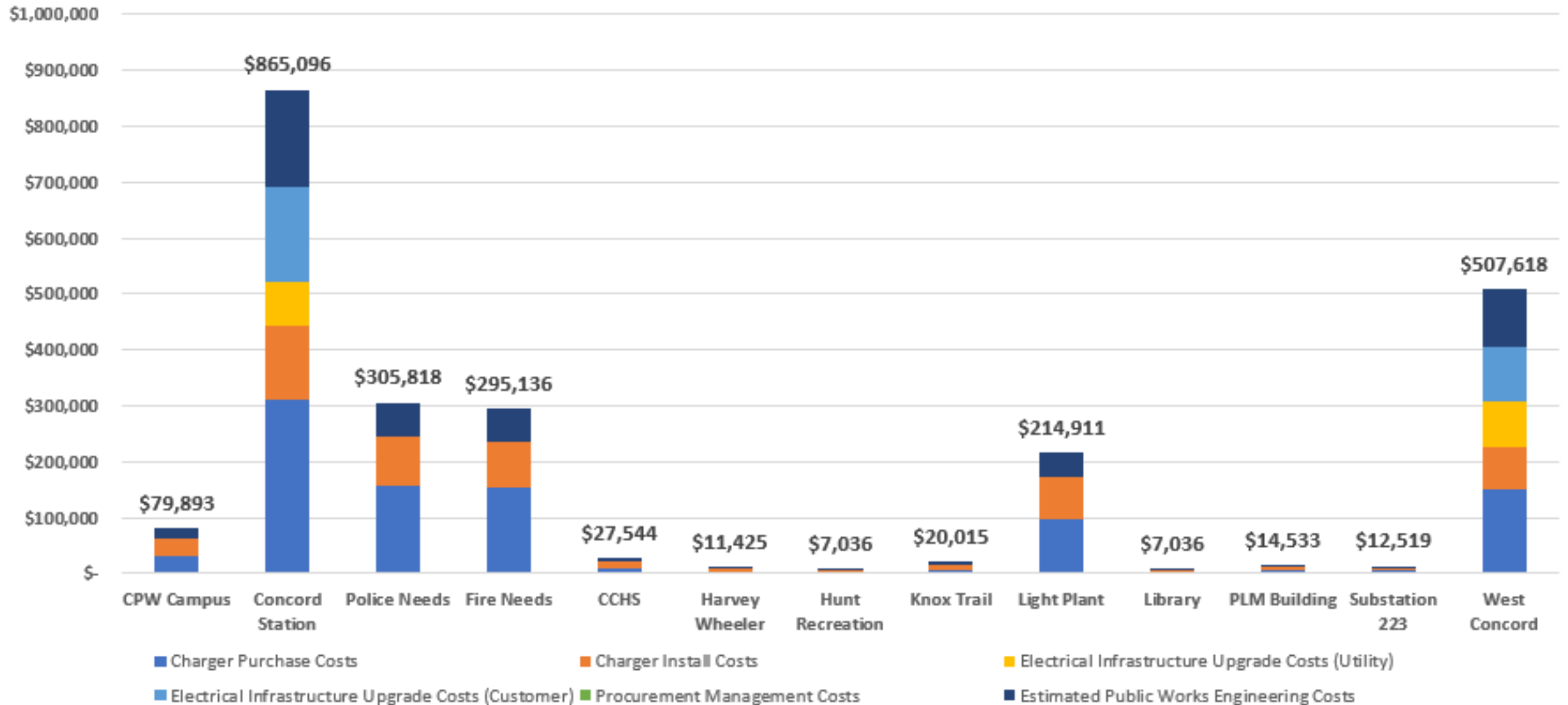
NEXT STEPS

Review of utility capacity (in coordination with CMLP)

Cumulative Vehicle Electrification & Annual Electricity Load



COST ESTIMATES – 2035 (INCLUDING BUILDING UPGRADES)



NEXT STEPS

- Funding strategies
 - Centralized fund
 - contributions by departments based on fleet size
 - annual projection
 - Purchase by department
- Responsibility of scheduling installation
- Determine design and installation process and
 - CMLP, Facilities, and CPW involvement

