

# EVSE Education in New York State Schools

Final Report | Report Number 24-24 | May 2024



**NYSERDA**

## **NYSERDA's Promise to New Yorkers:**

NYSERDA provides resources, expertise, and objective information so New Yorkers can make confident, informed energy decisions.

### **Our Vision:**

New York is a global climate leader building a healthier future with thriving communities; homes and businesses powered by clean energy; and economic opportunities accessible to all New Yorkers.

### **Our Mission:**

Advance clean energy innovation and investments to combat climate change, improving the health, resiliency, and prosperity of New Yorkers and delivering benefits equitably to all.

# EVSE Education in New York State Schools

*Final Report*

Prepared for:

**New York State Energy Research and Development Authority**

Albany, NY

David S. McCabe  
Project Manager

Prepared by

**PlugIn Stations Online**

Valatie, NY

Brandon Mortka  
Program Director

**Energetics**

Clinton, NY

Katherine Bannor  
Program Manager

Victoria McGarril  
Principal Analyst

**Clean Communities of Central New York**

Syracuse, NY

Barry Carr  
Coalition Director

## Notice

---

This report was prepared by PlugIn Stations Online (PISO), in collaboration with project partner Energetics, in the course of performing work contracted for and sponsored by the New York State Energy Research and Development Authority (hereafter “NYSERDA”). The opinions expressed in this report do not necessarily reflect those of NYSEDA or the State of New York, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, NYSEDA, the State of New York, and the contractor make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, or other information contained, described, disclosed, or referred to in this report. NYSEDA, the State of New York, and the contractor make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no liability for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

NYSERDA makes every effort to provide accurate information about copyright owners and related matters in the reports we publish. Contractors are responsible for determining and satisfying copyright or other use restrictions regarding the content of reports that they write, in compliance with NYSEDA’s policies and federal law. If you are the copyright owner and believe a NYSEDA report has not properly attributed your work to you or has used it without permission, please email [print@nysesda.ny.gov](mailto:print@nysesda.ny.gov)

Information contained in this document, such as web page addresses, are current at the time of publication.

## Preferred Citation

---

New York State Energy Research and Development Authority (NYSEDA). 2024. “Electric Vehicle Charging and Education at Schools,” NYSEDA Report Number 24-24. Prepared by PlugIn Stations Online, Valatie, NY. [nysesda.ny.gov/publications](http://nysesda.ny.gov/publications)

# Abstract

---

Providing low-cost plug-in electric vehicle (PEV) charging stations and educational resources to school districts provides an opportunity to engage with teachers, staff, and students. The project expanded the network of PEV charging stations throughout New York State and provided educational resources and opportunities to communities that did not yet have high penetration of the technology. School campuses serve as a unique location for workplace charging, public charging, and educational opportunities for the public and students.

# Keywords

---

Schools, electric vehicle supply equipment (EVSE), electric vehicle charging

# Table of Contents

---

<b>Notice</b> .....	<b>i</b>
<b>Preferred Citation</b> .....	<b>i</b>
<b>Abstract</b> .....	<b>ii</b>
<b>Keywords</b> .....	<b>ii</b>
<b>List of Figures</b> .....	<b>iii</b>
<b>List of Tables</b> .....	<b>iii</b>
<b>Acronyms and Abbreviations</b> .....	<b>iv</b>
<b>Executive Summary</b> .....	<b>ES-1</b>
<b>1 Introduction</b> .....	<b>1</b>
1.1 Project Objectives .....	1
1.2 Project Team .....	1
1.3 Project Scope .....	2
<b>2 Outreach and Installation at Schools</b> .....	<b>3</b>
2.1 Low-Cost Electric Vehicle Supply Equipment Options .....	3
2.2 Securing Teaming Agreements .....	3
2.3 Final Installations .....	5
2.4 EV Charging Station Use Data .....	6
<b>3 Electric Vehicle Education at Schools</b> .....	<b>10</b>
3.1 Outreach to Teachers and Staff .....	10

3.2	Electric Vehicle Education Resources.....	13
3.2.1	Guiding Questions for Instructors.....	13
3.2.2	Educational Resource Repository.....	14
3.2.3	School-led Engagement with Students and Community.....	14
<b>4</b>	<b>Conclusion.....</b>	<b>15</b>
4.1	Best Practices and Lessons Learned.....	15
4.1.0.1	Outreach and Engagement.....	15
4.1.0.2	Timing and Scheduling.....	15
4.1.0.3	Funding and Installation.....	15
4.1.0.4	Implementing EV Education into the Classroom and School Community.....	16
<b>Appendix A.</b>	<b>SWTCH LITE-ON Platinum Station Overview.....</b>	<b>A-1</b>
<b>Appendix B.</b>	<b>Host Site Teaming Agreement.....</b>	<b>B-1</b>
<b>Appendix C.</b>	<b>Electric Vehicle Education in New York State Schools Outreach Flyer.....</b>	<b>C-1</b>
<b>Appendix D.</b>	<b>Summary of Educational Efforts.....</b>	<b>D-1</b>
<b>Appendix E.</b>	<b>Slide Presentations to Teachers and Staff.....</b>	<b>E-1</b>
<b>Appendix F.</b>	<b>Guiding Questions for Instructors.....</b>	<b>F-1</b>
<b>Appendix G.</b>	<b>Educational Resources Repository.....</b>	<b>G-1</b>
<b>Appendix H.</b>	<b>Newsletter Content Samples.....</b>	<b>H-1</b>

## List of Figures

---

Figure 1.	Charging Stations at Schools.....	6
Figure 2.	Charging Events by Day of the Week.....	7
Figure 3.	Average Plug-in and Charging Duration.....	8
Figure 4.	Electricity Cost per Month.....	9
Figure 5.	Sample Content from Plug-in Electric Vehicle Informational Presentation for Teachers and Staff.....	10
Figure 6.	Map of Electric Vehicle Charging Installations.....	13
Figure 7.	Example Promotional Efforts from Participating Schools.....	14

## List of Tables

---

Table 1.	Summary of Charging Station Use.....	7
Table 2.	Charging Start Time by School Location.....	8
Table 3.	Charging Events per Month.....	9

# Acronyms and Abbreviations

---

A	ampere
BEV	battery electric vehicle
CC of CNY	Clean Communities of Central New York
DCFC	direct current fast charger
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EV	electric vehicles
EVSE	electric vehicle supply equipment
GHG	greenhouse gas
ICE	internal combustion engine
kWh	kilowatt-hours
LPG	liquefied petroleum gas
NYS	New York State
NYSERDA	New York State Energy Research and Development Authority
PEV	plug-in electric vehicle
PISO	PlugIn Stations Online
PHEV	plug-in hybrid electric vehicle
SOW	statement of work
V	volt

# Executive Summary

---

The plug-in electric vehicle (PEV) market in New York State (NYS) is still in its infancy with PEV ownership less than 1% of total vehicle registrations.<sup>1</sup> PEV adoption is hindered by limited consumer awareness and inadequate charging infrastructure, among other challenges. PEVs will play a critical role in meeting New York's greenhouse gas (GHG) reduction goals and present an opportunity to deliver significant benefits to residents throughout New York State.

This project leveraged low-cost PEV charging station installations at schools to increase education and awareness about PEV technology. By collaborating with school districts across New York State, the initiative was designed to increase potential PEV owners' exposure to charging stations. Increased visibility and direct experience with PEV technology can help both current and potential drivers build confidence in the technology. Schools provide a valuable opportunity for teachers, staff, students, and parents a chance not only to observe PEV technology, but also to interact with PEV technology firsthand, fostering greater understanding and interest.

PEVs are a technology that students should learn about before they begin driving to generate interest in clean transportation solutions. Schools offer an ideal setting to introduce PEV technology to students and their parents, as well as the teachers, administration, and staff who work at these institutions. The project team, consisting of PlugIn Stations Online (PISO), Energetics, and Clean Communities of Central New York (CC of CNY), collaborated with schools in select New York State communities to install low-cost PEV charging stations. This initiative aimed to expose these communities to PEV technology and encourage teachers and staff to consider purchasing PEVs. The project also provided resources for incorporating PEV and charging information into the school curriculum. Outside of the classroom, the team worked with each school to educate a broader audience by engaging with parents and other community members about PEV technology.

---

<sup>1</sup> Alternative Fuels Data Center, *TransAtlas Data*, Alternative Fuels Data Center, accessed May 15, 2024, <https://afdc.energy.gov/transatlas#/?view=percent&state=NY>



# 1 Introduction

---

In January 2022, project partners PlugIn Stations Online (PISO), Energetics, and Clean Communities of Central New York (CC of CNY), with support from New York State Energy Research and Development Authority (NYSERDA), began engaging schools and their communities with plug-in electric vehicles (PEVs) and PEV charging technology. With support from NYSERDA, the project team was able to provide low-cost PEV charging station installations at schools. The initiative not only facilitated the installation of charging stations, but also created an opportunity to engage with schools about PEV technology and offer additional resources and support to teachers to help integrate PEV-related information into their classroom lessons.

The project ran through April 2024, during which time the team worked with 10 school districts to install PEV charging stations, promote their use, and explore ways to incorporate PEV information into the classroom. This report provides a detailed account of the project's activities and numerous appendices include supplemental reports and materials developed throughout the initiative.

## 1.1 Project Objectives

The objectives of the project were to:

- Generate interest and secure commitment from schools to participate in the PEV project
- Install low-cost charging stations at participating schools to increase PEV technology exposure in these communities
- Introduce PEV technology to teachers and staff to educate them and potentially encourage them to purchase PEVs that could be charged while they work at the school
- Engage with parents and other community members through outreach events and communication channels (newsletters, flyers, email campaigns, etc.)
- Incorporate PEV technology or charging station use data into lessons to help students develop an appreciation for and interest in PEVs, potentially influencing their parents' or their own future vehicle purchase

## 1.2 Project Team

The project team consisted of:

- **PlugIn Stations Online**  
Served as the lead contractor, overseeing deliverables, managing project activities, completing installations at participating schools, and securing teaming agreements in the Capital Region New York area.

- **Energetics**  
Managed project tasks, including progress reporting, meetings, and the final reporting; assisted in securing school participation in the Mohawk Valley; developed outreach materials and lesson plans; and documented educational efforts at participating schools.
- **Clean Communities of Central NY**  
Secured school participation in the Syracuse and Ithaca areas, conducted overviews of electric vehicles (EVs) for participating schools, and facilitated promotional efforts at those schools.

### 1.3 Project Scope

The project comprised five tasks completed over a 28-month period. The following is a summary of each task's objectives and specific activities.

- **Task 0, project management and progress reporting**  
PISO coordinated all project management activities necessary for the performance of this statement of work (SOW), adhering to the project schedule, and budget.
- **Task 1, secure teaming agreements from participating schools**  
The project team conducted outreach in target communities to confirm school participation, which included:
  - Dedicating two parking spaces for PEV charging stations
  - Installing a post for PEV charging station mounting
  - Installing conduit and wiring from the electrical panel to the station location
  - Allowing the project team to present PEV technology to teachers and staff
  - Committing to explore opportunities to incorporate PEV information into lesson plans
- **Task 2, install charging stations at schools**  
PISO installed low-cost EV charging stations at 10 school locations and trained school staff on the operation of the stations and data monitoring work.
- **Task 3, incorporate PEV technology information into classrooms**  
The project team engaged with participating schools to develop educational and promotional materials on PEV technology, which included:
  - Presenting to teachers and staff
  - Assisting with the promotion of the PEV charging stations
  - Providing resources to integrate PEV technology into the classroom lessons
- **Task 4, final report and project completion meeting**  
After completing the project activities, Energetics prepared a final report detailing all aspects of the work performed. This report includes discussions on observations, findings, recommendations, project results, lessons learned, and environmental and economic benefits. It also explores implementation scenarios and opportunities for further improvements.

## 2 Outreach and Installation at Schools

---

### 2.1 Low-Cost Electric Vehicle Supply Equipment Options

The project team set out to provide a low-cost option for schools interested in engaging with PEV technology but hesitant to invest heavily in a charging station installation. When selecting a station for this opportunity, the criteria included level 2 charging capability, a minimal design, low or no-cost networking, and data collection and storage capability. After reviewing several options, the team chose the SWTCH LITE-ON Platinum station as the best choice for schools. This networked station enables schools to collect data (potentially for classroom use) and set pricing if necessary. Appendix A provides an overview of and specifications for the SWTCH LITE-ON Platinum station.

### 2.2 Securing Teaming Agreements

The project team developed a standard agreement to be used between PISO and participating schools. The teaming agreement outlines contact and location details of each participating school, the project term, and the responsibilities of both parties. Those responsibilities include:

- **PISO responsibilities**

Upon acceptance of this agreement and NYSERDA’s approval of the school and installation plan, PISO will:

- Provide a station with two charging outlets
- Install the station, including mounting it to a preexisting structure and connecting it to the electrical supply
- Supply a data monitoring device to record the electrical energy consumed by the station
- Train on operating, using, caring for, and cleaning the station and data monitoring device
- Present information on EVs to teachers and staff
- Supply educational materials on EVs for classroom use
- Assist with a community outreach activity

- **School responsibilities**

To participate in this project, the school will:

- Provide electrical supply connections—two 220 volt (V)/40 Ampere (A) electrical runs on dedicated circuits—at the station’s installation site with associated costs documented and shared with PISO (Appendix B includes a quote for performing this)
- Ensure an adequate structure is available for mounting the station
- Supply electricity for the station’s operation
- Operate and maintain the station to ensure functionality throughout the duration of the agreement

- Share quarterly data downloads from the monitoring device with PlugIn Stations Online
- Facilitate an opportunity for PISO's team to present about EVs to teachers and staff
- Identify at least one interested teacher to conduct a lesson related to EVs or the station, potentially incorporating the station data
- Organize at least one community outreach activity related to EVs or the station, such as a newsletter article, an EV ride-and-drive event, or distributing a flyer or announcement

Appendix B contains a blank Host Site Teaming Agreement for reference.

After finalizing the standard teaming agreement, the project team began outreach. Energetics created an informational flyer (see Appendix C) to support this outreach. This flyer included information on the benefits of program participation, the expectations for participating schools, and contact information for the project team members. It also served as an outreach tool in email communications with potential schools and was easily shareable among school's contacts and across other districts.

The project team began reaching out to schools that expressed interest in participating during the planning phases of the project. However, because a significant amount of time had passed between the initial outreach and the project start date, some of the contacts at schools were no longer working in the district. Familiarity with the project had also decreased, and in some cases, too much time had passed to leverage the initial momentum that might have been possible if outreach started earlier. Along with the short list of schools that had previously shown interest, the team also reached out to school districts that were unaware of the program. Throughout the outreach process, the project team identified some best practices. They found that, for most schools, the best individuals to make decisions on the installation and associated costs were usually staff members at the district offices.

Throughout the initial outreach process, more than 30 schools were engaged in some capacity. Many did not move beyond the initial cold calls and emails. Interest in the program varied. Some schools were hesitant regarding installations due to concerns about increased public access to the school campus, which raised safety concerns for staff and students. Other schools were interested in trying the technology as a first step toward alternative fuel infrastructure, with several noting their interest in electric school buses.

Securing teaming agreement was a lengthy process that lasted for most of the project, with the last teaming agreement finalized in November 2023. Confirming participation from schools was challenging for various reasons, including competing priorities within districts, a lack of interest in the technology, and other administrative issues related to the procurement and installation of the charging stations. The project team ultimately collected 11 teaming agreements, and 10 schools completed installations during the project period.

- Capital Region
  - Galway Central School District
  - Hoosick Falls Central School District
  - Hudson Central School District
  - Inlet Common School District
  - Mizzentop Central School District (decided not to proceed with the project)
  - Schoharie Central School District
- Mohawk Valley
  - Whitesboro Central School District
- Ithaca
  - Dryden Central School District
  - Trumansburg Central School District
- Syracuse
  - Chittenango Central School District
  - Syracuse City School District

## 2.3 Final Installations

As teaming agreements were secured, PISO began scheduling and completing installations. Initially, all agreements were expected to be finalized prior to installation, however, the outreach process revealed that waiting for all agreements could delay installation for schools that were ready. The team adjusted the process to accommodate schools and ensure installations could be completed in a timely manner.

Participating schools were able to combine the NYSERDA-provided charging station with funding from the EV Make-Ready Program, which reduces the upfront costs associated with installing PEV charging stations.<sup>2</sup> The make-ready funding available from utilities offset a large portion of, or in some cases, most the infrastructure costs associated with preparing a site for EV charger installation. The integration of

---

<sup>2</sup> “EV Make-Ready Program,” Joint Utilities of New York, accessed May 10, 2024, <https://jointutilitiesofny.org/ev/make-ready>

these support programs was highly beneficial and PISO's ability to apply for the utility funding on behalf of the schools helped reduce the administrative burden sometimes associated with such funding opportunities like this.

The location of the charging station was customized based on the needs of each school. Some opted to install the station at a facilities garage, while others placed them in areas visible to visitors, and some in areas accessible only to staff. Some schools, such as the Schoharie Central School District, decided to install multiple stations, as shown in Figure 1.

### **Figure 1. Charging Stations at Schools**

Inlet Community School's PEV charging station (left) and Schoharie Central Schools' PEV charging station bank (right).



## **2.4 EV Charging Station Use Data**

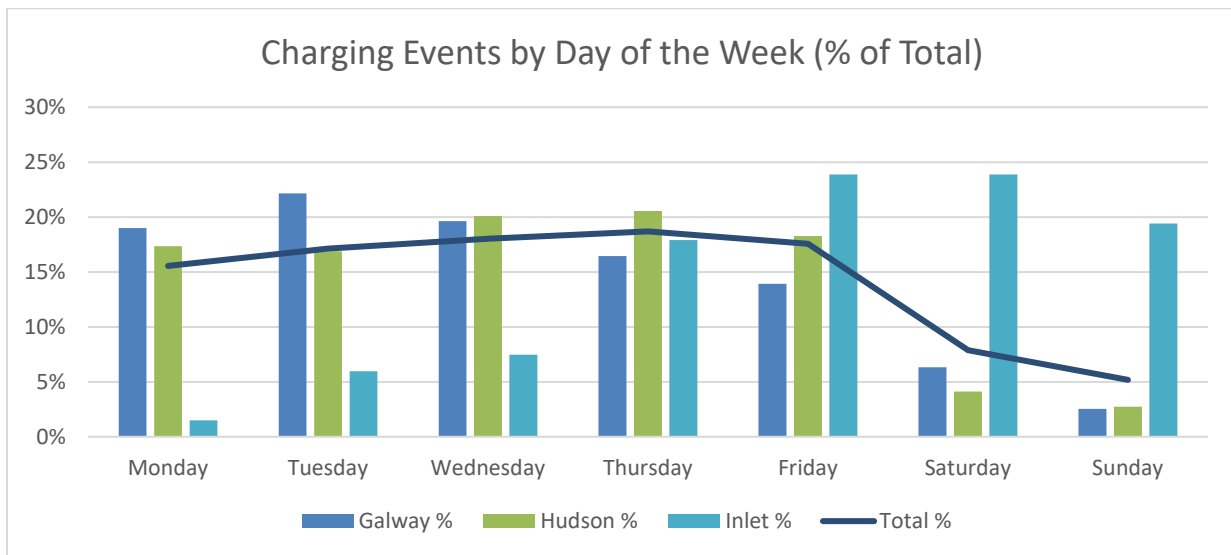
The project team requested data from all of the participating schools. Of the ten school districts, three were able to provide data reports: Galway Central School District (Galway CSD), Hudson Central School District (Hudson CSD), and Inlet Common School. The reports include data from January 1, 2024, to September 30, 2024. The data reported included 441 charging events, accumulating nearly 1,000 hours of charging time 4,000 kg of CO<sub>2</sub> equivalent greenhouse gas emission savings. A summary of the charging events can be found in Table 1.

**Table 1. Summary of Charging Station Use**

School	Total events	Total time Charging (hrs:minutes:seconds)	Total Plug-in Time	GHG Savings (kg CO <sub>2</sub> eq)
Galway CSD	158	312:49:57	430:34:26	1488.391
Hudson CSD	219	481:49:15	1250:43:53	1468.341
Inlet Common School	67	199:54:01	211:56:59	1,041.31
<b>Total</b>	<b>444</b>	<b>994:33:13</b>	<b>1893:15:18</b>	<b>3998.044</b>

The station data provided showed varying usage trends. At Galway and Hudson schools, more than 90% of charging events occurred during the weekdays. In contrast, Inlet Common School had a different pattern, with 85% of its charging events taking place from Thursday to Sunday. It is important to note that Inlet Common School ceased operations as a school since installation, so students, parents, and teachers were not regularly visiting the school like Galway and Hudson school districts.

**Figure 2. Charging Events by Day of the Week**



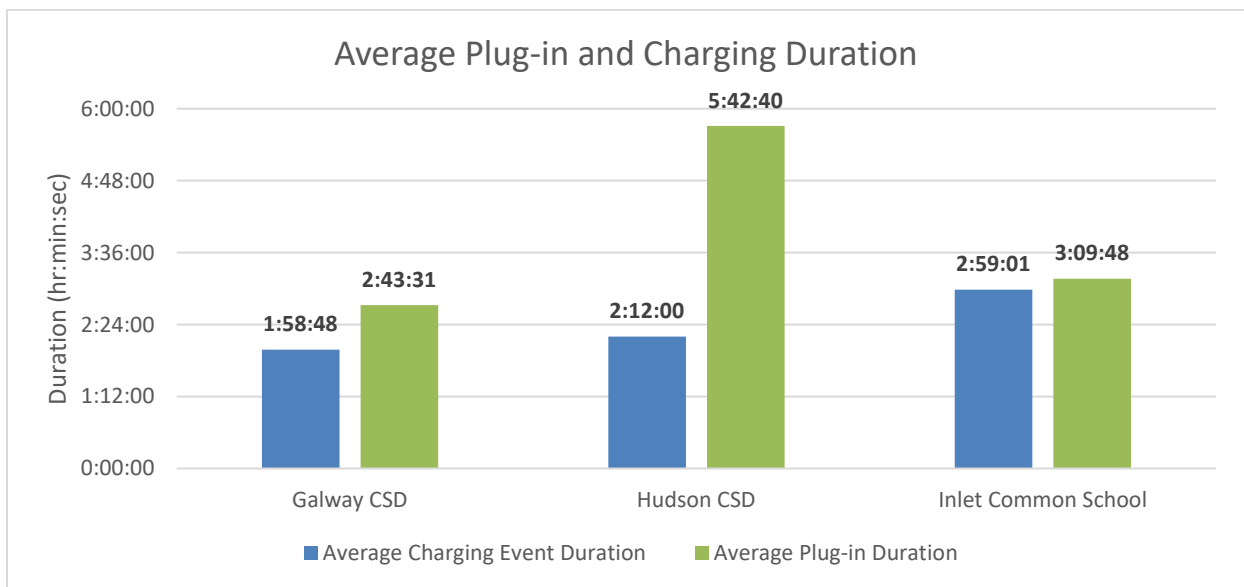
The reports provided also included the start and stop times that charging events occurred, which showed that each location had different time of charging trends. Hudson CSD had nearly 90% of all charging events starting between 5:00 a.m. and 10:00 a.m. Galway CSD also had most charging events begin during the morning and afternoon but was spread more evenly with 47% starting between 5:00 a.m. and 10:00 a.m., and 46% beginning between 10:00 and 3:00 p.m. Inlet Common School had charging event spread even more evenly across the day, with 25-36% of events occurring in the time blocks between 5:00 a.m. and 8:00 p.m. Table 2 includes more detail on charging start times per school location.

**Table 2. Charging Start Time by School Location**

Charging Start Time	Galway CSD (n)	Hudson CSD (n)	Inlet Common School (n)	Galway CSD (%)	Hudson CSD (%)	Inlet Common School (%)
12:00 a.m.–4:59 a.m.	1	0	0	1%	0%	0%
5:00 a.m.–9:59 a.m.	74	196	24	47%	89%	36%
10:00 a.m.–2:59 p.m.	73	18	17	46%	8%	25%
3:00 p.m.–7:59 p.m.	8	4	22	5%	2%	33%
8:00 p.m.–11:59 p.m.	2	1	4	1%	0%	6%

The data reported also shows different use patterns between Galway CSD and Hudson CSD. On average, Hudson CSD had vehicles plugged into the charging station for 3 hours longer than the charging time. The Galway CSD station had vehicles plugged in for about 1 hour longer than the charge time. To encourage drivers to move their vehicles after charging is complete, sites should consider implementing a policy and using signage to help communicate that policy.

**Figure 3. Average Plug-in and Charging Duration**



Along with the data from weekday charging, Inlet Common School differed from Galway and Hudson schools when looking at monthly data. Inlet Common School recorded most of its charging activity during July and August, while Galway and Hudson Schools showed a more consistent spread of charging events throughout the entire reporting period.



**Table 3. Charging Events per Month**

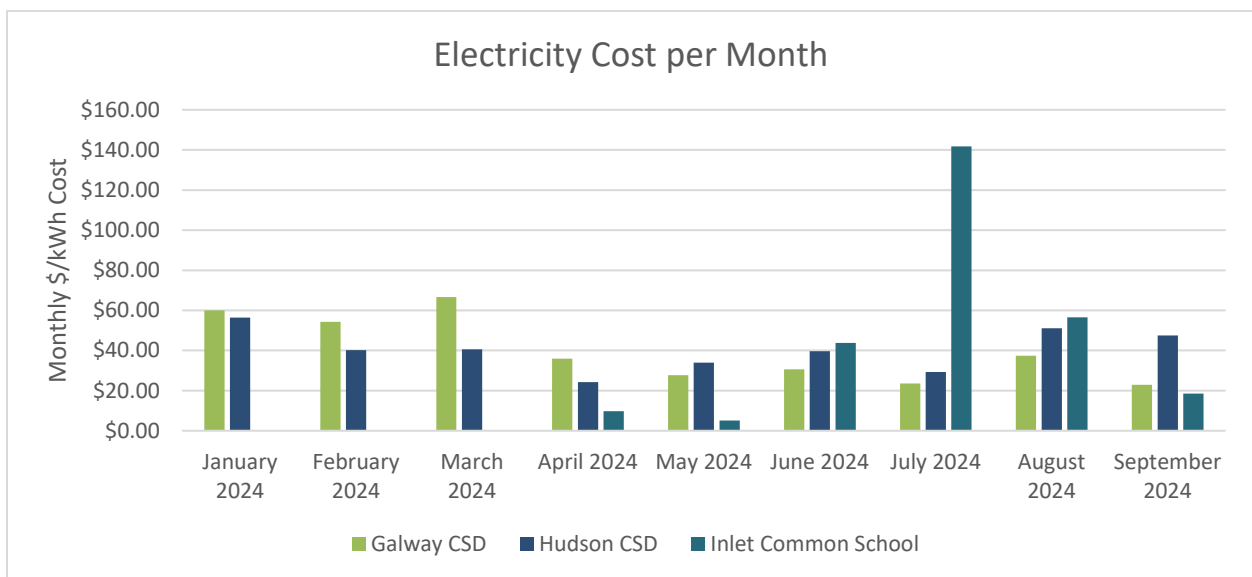
Month	Galway Events per Month	Hudson Events per Month	Inlet Events per Month
January 2024	24	28	0
February 2024	27	20	0
March 2024	27	28	0
April 2024	18	21	3
May 2024	18	27	1
June 2024	15	23	7
July 2024	6	20	34
August 2024	16	24	17
September 2024	7	28	5
<b>Total</b>	<b>158</b>	<b>219</b>	<b>67</b>

There was wide spread of electricity use, with monthly kWh usage ranging from 31 kWh to 717 kWh. This translates to an energy cost between \$5 and \$141, reflecting the differences in demand and charging behavior at each location.

**Figure 4. Electricity Cost per Month**

Electricity costs are based on the NYS statewide commercial electricity rates for 2023. “Monthly Average Retail Price of Electricity—Commercial” NYSERDA, accessed: October 9, 2024.

NYSERDA: <https://www.nyseda.ny.gov/Energy-Prices/Electricity/Monthly-Avg-Electricity-Commercial>



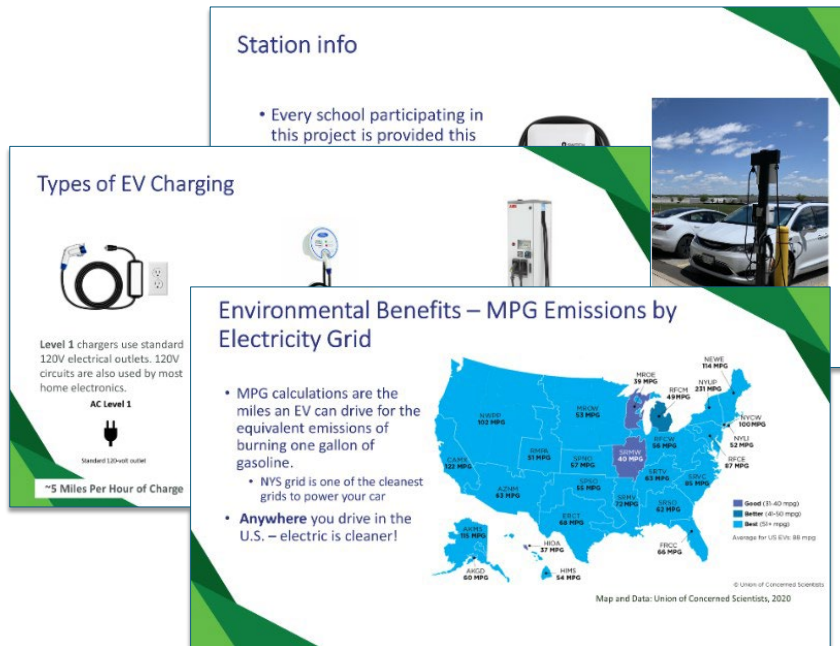
### 3 Electric Vehicle Education at Schools

Developing and providing information to participating schools was an important part of this project. The team developed several resources to support the participating school districts, which are summarized in Appendix D.

#### 3.1 Outreach to Teachers and Staff

As an initial step to increase awareness and provide education about PEV technology, the project team worked with participating schools to increase awareness among teachers and staff. This was important for ensuring that each district received accurate and up-to-date information on the technology, enabling them to disseminate information to their students. To facilitate this outreach, the project team developed a PowerPoint presentation for use at each school (see Appendix E). The presentation reviews the basics on EV and EV charging technology, the costs and benefits of the technology, a high-level overview of the EV market, and next steps for teachers and staff.

Figure 5. Sample Content from Plug-in Electric Vehicle Informational Presentation for Teachers and Staff



The team provided information from the PowerPoint presentation to each school. Attendance and engagement with the presentation varied among schools. Some preferred small meetings for the presentation and others invited a larger staff audience. After each presentation, schools received supplemental educational materials and a draft newsletter article. Following are summaries of each presentation.

- **Inlet Common School District, December 12, 2023**

Following the installation of the new SWTCH station at the Inlet Common School, the school had to suspend operation for the foreseeable future. While the school intends to reopen, no timeline or anticipated reopening date has been set. In the meantime, the lead contact and a teacher at Inlet Common School, arranged for two additional teachers from the Morrisville Central School District to join the presentation led by Energetics. This presentation reviewed the basics of EV and electric vehicle supply equipment (EVSE) technology to better equip teachers to share information about the technology with students.

*Note: In April 2024, Inlet Common School held a follow-up meeting with Energetics to review materials again, this time inviting town of Webb Central School District, a neighboring district with EVSE, but the town of Webb teachers were unable to attend. They did, however, request educational materials to distribute to their teachers and staff.*

- **Trumansburg Central School District, January 4, 2024**

CC of CNY Director Barry Carr met with the School Business Administrator to present information on EVSE and EV. CC of CNY and Trumansburg Central School District remain in contact to schedule an additional virtual or in-person training session for teachers and administrators. Trumansburg has a longstanding commitment for clean transportation, having previously used NYSERDA funding for liquefied petroleum gas (LPG)-powered Bluebird school buses.

- **Dryden Central School District, January 4, 2024**

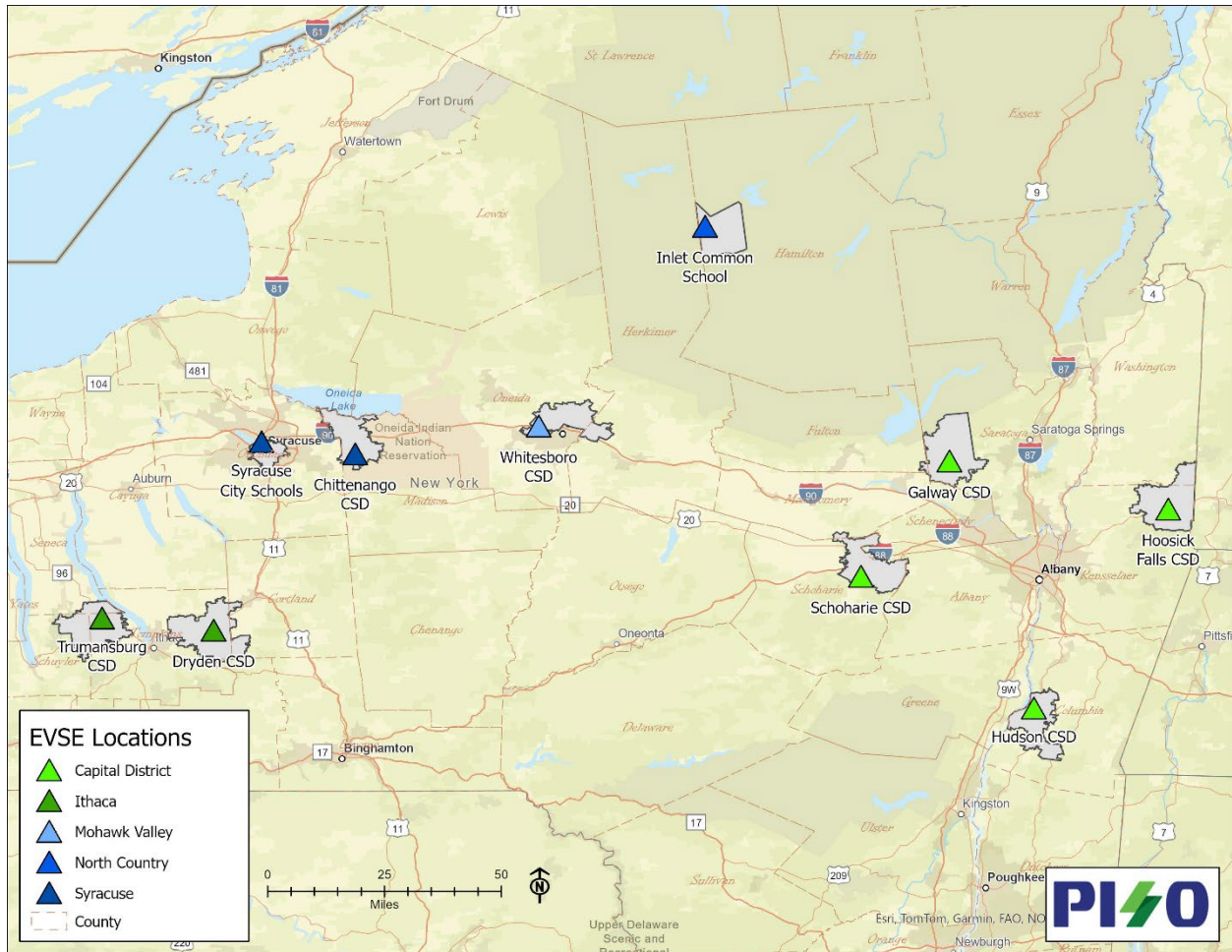
CC of CNY Director Barry Carr and CC of CNY/U.S. Department of Energy (DOE) Intern Skyler Marshall verified installation and provided materials to the Business Manager. CC of CNY has proposed hosting a public ribbon-cutting ceremony and remains in contact with the school district to offer support for the event. The two charging stations are located in the parking area adjacent to the main entrance of the high school.

- **Chittenango Central School District, January 24, 2024**

CC of CNY Director Barry Carr held multiple meetings with the Assistant Superintendent for Business, culminating with a final presentation after the installation was completed. Like other participating schools, Chittenango CSD is considering collaborating with CC of CNY to schedule a public ribbon-cutting ceremony. Additionally, a training session is planned for late 2024, inviting key leaders from all participating schools. The two installed stations are located in the parking lot adjacent to the sports complex behind the high school, which is a highly visible area.

- **Schoharie Central School District, February 1, 2024**  
 Energetics met with the school superintendent to review EV and EVSE technology and walk through the educational resources available to teachers. Due to the district's preference, the project team did not contact teachers directly; instead, information was passed through the superintendent. No follow-up was received from teachers or district staff. Schoharie installed four stations on the campus.
- **Galway Central School District, February 5, 2024**  
 PISO met with the school district, which was eager to join the program and was one of the most involved schools from the start. Five teachers and staff participated in the presentation, which included more than 30 minutes of question and answers to wrap up the meeting.
- **Hoosick Falls Central School District, February 5, 2024**  
 The school district was excited to be a part of this program and to take advantage of the opportunity to receive a free PEV charger. The district team were highly engaged during the presentation and engaged extensively with the PISO team. They invited members of the technology department so they could also listen and learn about using the charger as well as the basics of EV charging. Like many other groups, they were interested in the differences between level 2 and level 3 charging.
- **Whitesboro Central School District, February 5, 2024**  
 The school district allocated time during its quarterly staff meeting for Energetics to present on EV and EVSE technology. The presentation was an abbreviated version of the usual one-hour review, but after the meeting Energetic sent the district the full presentation and the project team's contact information for follow-up questions. Following the presentation, two teachers contacted Energetics to discuss educational resources. Students in technology classes were given an option to present on a technology of their choice and several chose EVs.
- **Hudson Central School District, February 29, 2024**  
 The school district was highly engaged during the PISO presentation, with significant interest in the different levels of EV charging. PISO continues to provide technical support and answer questions from the district, which remains actively engaged. The school is also exploring direct current fast chargers (DCFC) and aims to leverage available funding. PISO conducted an in-depth review of various types and speeds of DCFCs to provide more information to Hudson Schools as they consider future EVSE options and installations.
- **Syracuse City School District, April 25, 2024**  
 CC of CNY Director Barry Carr and CC of CNY/DOE Intern Skyler Marshall presented the EV and EVSE materials to the fleet manager and superintendent at the City District Transportation Offices. The city of Syracuse is appreciative of this program, as is its bus provider, First Student, which has obtained funding from NYSERDA and the U.S. Environmental Protection Agency (EPA) to add electric buses to its fleet.

**Figure 6. Map of Electric Vehicle Charging Installations**



## 3.2 Electric Vehicle Education Resources

### 3.2.1 Guiding Questions for Instructors

With guidance from PISO’s founder, John Doran, who spent decades teaching in New York State public schools, the team developed a resource to assist teachers in selecting classroom materials. This document includes a series of guiding questions to help instructors determine what will engage their students and provides a list of resources to address these questions. The questions are organized by teaching subject and reference additional resources listed in the repository document (details follow).

Appendix F contains the guiding questions document.

### 3.2.2 Educational Resource Repository

The project team researched existing resources available to New York State for supplemental materials related to EVs and EV charging. The list includes nearly 20 resources and tracks details such as grade level, cost to access (most are free), teaching subject, and other information. The resources include short videos, classroom activities, and fully developed lesson plans to meet various classroom needs. Each resource is paired with a “guiding question” that correlates to the guiding questions resource provided to teachers and staff. See Appendix G for the full repository.

### 3.2.3 School-led Engagement with Students and Community

The team worked with schools to raise awareness of the new EV charging station within the broader community. While some chose to not promote the station, others indicated they would do so in the future. To help schools with outreach to their communities, each district received support to promote the EV charging stations. Most districts opted to use their existing newsletters to share information about the stations. To facilitate this, the project developed draft language that could be modified to fit the specific district’s needs. Appendix H includes the draft newsletter language and samples of school newsletters.

#### Figure 7. Example Promotional Efforts from Participating Schools

Column from the monthly Galway Central School Newsletter highlighting new installation (March 2024) (left). Photos from the Inlet Area Community Task Force website (Inlet Common School Host organization) highlighting the EV charging station unveiling (right).

Source: “New Charging Stations,” Galway Central School District Monthly Newsletter (March 2024); Inlet Common School Homepage featuring photo of EV Charging Station unveiling, accessed April 10, 2024, <https://blenny-tiger-c3c9.squarespace.com/>



## 4 Conclusion

---

Working with schools to install charging stations and engage with teachers and staff was an effective way to expand public charging options while also introducing the technology to the communities.

Despite challenges with outreach, engagement, and installation, the participating schools were excited about the technology, and for many, this initiative was the first step in their path to adopting alternative fuel technology. Throughout the project, the team encountered various challenges unique to engaging with schools.

### 4.1 Best Practices and Lessons Learned

Effectively managing school district projects involves careful planning in outreach, timing, and funding. The following lessons learned provide insights into successfully engaging with schools, coordinating schedules, and using funding opportunities to ensure efficient project execution.

#### 4.1.0.1 Outreach and Engagement

- Recognize that connecting with school districts requires more time than initially expected, demanding patience and persistence.
- Initiate initial contact with the district office, which is the most effective approach, often requiring interaction with one or two staff members before reaching a decision-maker for installation.
- Consistent follow-up with multiple emails and phone calls was needed due to the busy nature of school district offices.

#### 4.1.0.2 Timing and Scheduling

- Consider the school calendar to avoid delays caused by holidays, breaks, and state testing periods.
- Adapt to busy schedules and planned breaks, which may slow progress and necessitate additional meetings and debriefing with school officials.

#### 4.1.0.3 Funding and Installation

- Leverage funding opportunities and project timelines to create a sense of urgency, helping schools prioritize their participation decisions.
- Utilize funding sources, such as EV Make-Ready and NYSERDA, to cover installation “soft costs” and provide free stations, significantly reducing overall costs. Additionally, PISO’s application for funding on behalf of the schools helps lessen the administrative burden for schools.

- Address school safety concerns by placing charging stations in less visible areas or labeling them as “private” to mitigate fears about attracting the public during school hours.
- Apply PISO’s expertise in managing funding programs to streamline the installation process, enhancing efficiency for the schools.

#### ***4.1.0.4 Implementing EV Education into the Classroom and School Community***

- Work with the primary contact at the school that will champion efforts to disseminate educational materials. In some cases, this champion will be different than the point of contact that helps coordinate the EV charging installation effort.
- Curriculum that includes review of fossil fuels and other energy sources can be an opportunity to incorporate EVs and EV charging materials into the classroom, and these general topics can be found at varying grade levels.
- Integrating new material into curriculums can be challenging, but teachers were receptive to including EV-specific content in special student-led projects or supplemental educational forums such as summer camps or after-school clubs.
- Incorporating EV technology into existing lessons or curricula where it naturally ties in can be effective. For example, the Whitesboro School District may incorporate the data from their new EVSE station into an existing summer camp activity that uses data from a solar array.
- Engaging students with EV technology, who often have some familiarity with it, can be beneficial, although this varies by student and can be influenced by outside factors such as whether their parents or friends and family drive an EV.



# Appendix A. SWTCH LITE-ON Platinum Station Overview

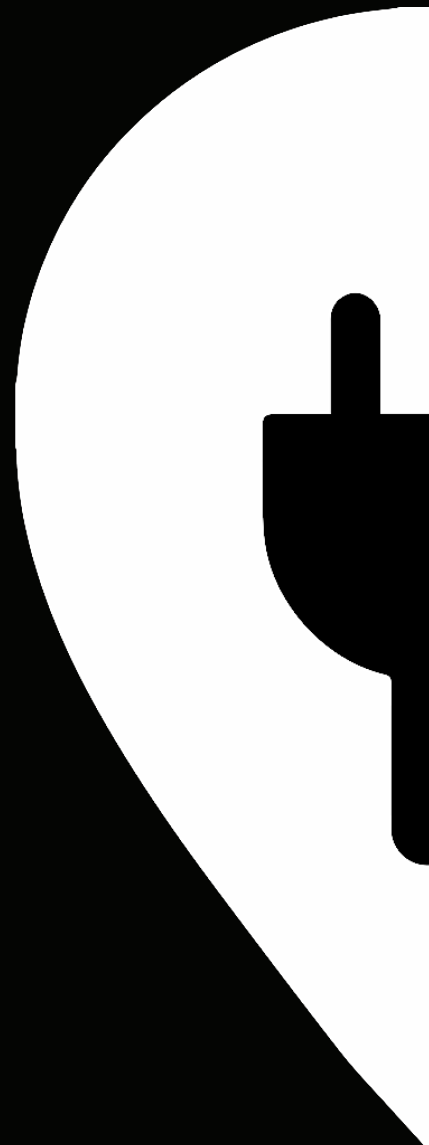
---



FOR COMMERCIAL SETTINGS

# SWTCH Level 2 Charging Solutions

CHARGE EVERYWHERE



# LITE-ON Platinum

## 7.6 kW Level 2 Charger



The LITE-ON Platinum is designed to be the ideal electric vehicle charging solution for commercial and multi-unit residential spaces.

- + Enhanced owner & user experience
- + Slim, compact and stylish design
- + Reduced install cost
- + Low maintenance
- + Access control
- + Revenue generation
- + Remote management
- + Local load management
- + OCPP compliant

### ABOUT LITE-ON PLATINUM

The LITE-ON Platinum is a reliable level 2 electric vehicle charger with an attractive design that is easy to own and operate. Its slim and durable design is outdoor rated with hard-wired installation, and its adjustable power output can match your supply panel, electric vehicle, and driving range.

# LITE-ON Platinum

## 7.6 kW Level 2 Charger

### SPECIFICATIONS

CONNECTORS	Universal SAE J1772
POWER	Adjustable up to 7.6 kW
SUPPLY INPUT	208/240VAC, single phase
CURRENT	32 A
SUPPLY FREQUENCY	60 Hz
LOAD MANAGEMENT	Yes
CABLE LENGTH	18 ft.
METERING ACCURACY	Embedded $\pm$ 3%
REAL-TIME CLOCK	Yes (7 days)
WI-FI	802.11 b/g/n
CELLULAR	LTE Cat. 1
DIMENSIONS	11.14" x 7.56" x 3.11" (H x W x D)
RFID	ISO 14443 A/B, ISO 15693, NFC, NEMA interoperability protocol
DISPLAY	116(L)*8.5(W)*37(H)mm, 5.57mm character height, 5*8 dot matrix, OLED 20x2
DATA PROTOCOL	OCPP 1.6J
IP RATING	NEMA 4
IMPACT RESISTANCE	IK10
OPERATING TEMPERATURE	-30°C/-22°F to 50°C/122°F
STORAGE TEMPERATURE	-40°C/-40°F to 70°C/158°F
WARRANTY	3-year included, 5-year optional
CERTIFICATION	UL 50/991/1449/1998/2231/2594, FCC Part 15B, FCC Part 15.225 (RFID 13.56MHz), FCC Part 15.247 (WLAN 2.4GHz), FCC Part 27 (Gateway), Energy Star
WIRING TYPE	Hard-wired or optional plug-in (NEMA 6-50)



# SWTCH Network Management

## For a Connected Charging Experience

### Easy access for drivers.

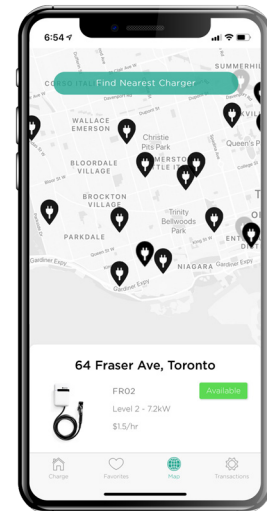
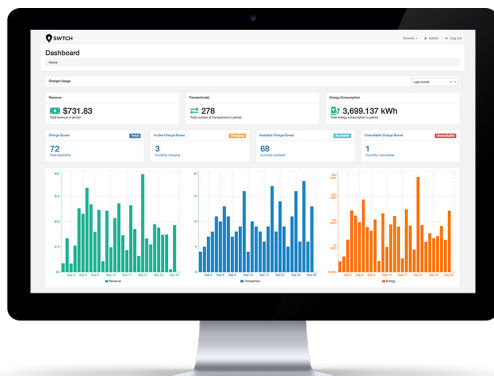
We offer drivers multiple options for access and payment, including credit card tap, plug-in charge, and web browser and mobile app activation. Using our web or mobile app interface, drivers can:

- Locate chargers
- Add payment method
- Track energy use
- Add favorites
- View real-time status
- Activate chargers
- View charging history
- Leave feedback

### Simple management for charger owners.

Our admin dashboard tells you everything you need to know about your chargers, in real-time. With SWTCH's network management services, charger owners get:

- Access control
- Flexible configuration (e.g., first come, first-served or reservation-based)
- Real-time monitoring
- Remote control, including start/stop charge session
- Automatic billing
- Data & analytics: individual & aggregate energy and revenue values
- Optional loitering penalties and automatic license plate recognition (ALPR)



Charger listing page in map view on SWTCH mobile app

### BENEFITS

- Built on the global open communication standard for EV charging, OCPP, to prevent vendor lock-in
- Automated energy management to reduce energy costs and minimize infrastructure upgrades
- Multiple payment methods to streamline driver access
- 24/7 customer and technical support
- Seamless integration with smart building and e-mobility services
- Fast turn-around and quality guaranteed by our team of in-house systems engineers



## **Appendix B. Host Site Teaming Agreement**

---

## ELECTRIC VEHICLE CHARGING STATION PROJECT TEAMING AGREEMENT

This Teaming Agreement ("Agreement"), effective as of this \_\_\_\_ day of March, 2022 (the "Effective Date"), is entered into by and between PlugIn Stations Online, a New York company, having an office and place of business at 7 Cotton Mill Lane, Valatie, NY 12184 and \_\_\_\_ ("School"), owning the property at \_\_\_\_ ("Host Site"). Collectively, PlugIn Stations Online and the School are each a "Party" to this Agreement or collectively the "Parties."

WHEREAS, the School desires to have an electric vehicle charging station installed at the Host Site as part of PlugIn Stations Online's Electric Vehicle Charging Stations and Education at Schools Project ("Project") funded in part by New York State Energy Research and Development Authority ("NYSERDA") Agreement Number 138376.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties agree as follows:

- 1. Term.** The term of this Agreement begins on the Effective Date and ends on April 30, 2023.
- 2. Equipment.** One or more electric vehicle charging units providing a total of two charging outlets ("Station") will be provided under this Project. Station product specifications are provided in Attachment A.
- 3. Installation.** The School is responsible for providing or installing the required electrical power requirements at the location where the Station will be mounted. The School must also prepare the location for the Station with all necessary mounting preparations as outlined by the site plan in Attachment B. Final electrical connection of the Station to power may only be performed by PlugIn Stations Online. Other installation work prior to the final electrical connection of the Station to power can be performed by the School or a contractor hired by the School in collaboration with the PlugIn Stations Online. Some Station protection (bollards, tire stop, curb, or an elevated wall-mount) and signage is strongly encouraged. Responsibilities are as stated in Section 18.
- 4. Access to Host Site and Station.** The School shall provide adequate access of the Host Site and Station to PlugIn Stations Online for the purpose of the Project. PlugIn Stations Online will attempt to give the Site Owner a minimum of 48 hours notice prior to completing any visit to the Host Site; however, factors outside of PlugIn Stations Online's control may not always permit this.
- 5. Network Access.** The Project does not include funding for the Station to be networked. If the School chooses to network the Station, all costs associated with networking must be paid for by the School.
- 6. Access to Information.** The School acknowledges that a data monitoring device will be provided with the Station to collect usage data, including charge event information ("Data"), such as when and how much energy the Station is dispensing. The Data may be used by teachers at the School for lessons or shared with PlugIn Stations Online and NYSERDA for reasonable purposes, including, without limitation, analyzing usage and charging patterns, and the efficacy of the Project. Data monitoring device product specifications are provided in Attachment C.
- 7. Operation and Maintenance.** School shall take all reasonable measures to ensure the Station, and the facility in which it is located, shall be kept operational, clean and in good repair.
- 8. Publicity.** Site Owner shall provide PlugIn Stations Online and NYSERDA unlimited rights to take, use and publish photographs of the Station and the immediate area surrounding the Station, as well as any information related to the Project, which may be included on printed materials or posted on websites. The School shall collaborate with NYSERDA's Communications and Marketing Department to prepare any press release and to plan for any news conference concerning work related to the Project. In addition, the School shall notify NYSERDA's Communications and Marketing Department regarding any media interview in which work related to this Project is referred to or discussed. The School shall not use NYSERDA's corporate name, logo, identity, any affiliation, or any related logo, without NYSERDA's prior written consent.
- 9. Ownership.** Title to the Station shall vest with the School, provided the School complies with all terms of this Agreement. PlugIn Stations Online may reclaim title to the Station in the event (i) the School does not comply with its obligations under this Agreement or (ii) it becomes illegal for the School to hold title to the Station.
- 10. No Right to Remove, Move or Sell the Station.** The Station may not be sold, retired, disposed of, removed or moved from its place of installation, prior to the conclusion of this Agreement, without the prior written consent of PlugIn Stations Online.
- 11. Failure to Comply with Terms of the Program.** In the event that the School fails to comply with any term in this Agreement, PlugIn Stations Online shall provide a notice requesting that the School address the issue to comply with

the Agreement terms. If the School is not in compliance with the Agreement terms within thirty (30) calendar days of receiving a notice from PlugIn Stations Online, PlugIn Stations Online reserves the right to repossess the Station provided under the Project.

- 12. No Amendment or Modification.** No modification, amendment or waiver of this Agreement shall be effective unless in writing and either signed or electronically accepted by PlugIn Stations Online and the School.
- 13. Waiver.** Either Party's failure at any time to require the other Party's performance of any obligation under this Agreement will in no way affect the full right to require such performance at any time thereafter. Either Party's waiver of a breach of any provision of this Agreement will not constitute a waiver of the provision itself. Either Party's failure to exercise any of its rights provided in this Agreement will not constitute a waiver of such rights. No waiver will be effective unless in writing and signed by an authorized representative of PlugIn Stations Online and the School. Any such waiver will be effective only with respect to the specific instance and for the specific purpose given.
- 14. Applicable law.** This Agreement will be construed, and performance will be determined, according to the laws of the State of New York without reference to such state's principles of conflicts of law. Installation of the Station, and its operation, will be conducted in compliance with all local, New York State and federal laws and regulations.
- 15. Assignment.** The School may not assign any of its rights or obligations under this Agreement, whether by operation of law or otherwise, without the prior written consent of PlugIn Stations Online.
- 16. Project Requirements.** The following requirements are imposed upon the School under and pursuant to the terms of the Project:
  - a. NYSERDA must approve the proposed location for the installation of School's Station prior to the installation.
  - b. As part of the Station installation and provisioning, the School must collaborate with PlugIn Stations Online to complete:
    - i. Approval/permission from the Authority Having Jurisdiction, and
    - ii. Confirmation that at least one School employee has been trained in the operation, care and use of the Station and data monitoring device.
  - c. School acknowledges and agrees that NYSERDA shall have no liability to the School relating to the installation and operation of the Station.
  - d. Site Owner shall, at its sole cost and expense, throughout the term of the Agreement, maintain insurance in the following types and amounts: general liability insurance for bodily injury liability, including death and property damage liability, incurred in connection with the performance of the Agreement, with minimum limits of \$1,000,000 in respect of claims arising out of personal injury or sickness or death of any one person, \$1,000,000 in respect of claims arising out of personal injury, sickness or death in any one accident or disaster, and \$1,000,000 in respect of claims arising out of property damage in any one accident or disaster.
  - e. The School hereby acknowledges that NYSERDA and the State of New York are intended third party beneficiaries of the Project.
- 17. Indemnification.** The School and PlugIn Stations Online agree to indemnify and hold each other, and the officers, directors, trustees, employees, agents and affiliates of each other harmless from and against any and all claims, actions, proceedings, costs, liabilities, losses and expenses (including, but not limited to, attorneys' fees) suffered or incurred by the indemnified parties and/or third parties resulting from or arising out of their party's negligent or intentional acts which result in damage to property or injury to person.

The School agrees to indemnify NYSERDA, its officers, directors, trustees, employees, agents and affiliates harmless from and against any and all claims, actions, proceedings, costs, liabilities, losses and expenses (including, but not limited to, attorneys' fees) suffered or incurred by the indemnified parties and/or third parties resulting from or arising out of the Project.

- 18. Responsibilities and Costs.** The Project will provide the following items to the School upon acceptance of this Agreement and NYSERDA approval of the School and installation plan:
  - a. Station providing a total of two charging outlets,
  - b. Installation of the Station including mounting to a pre-existing structure and connection to the electrical supply where the Station is mounted,
  - c. A data monitoring device that will record when and how much electrical energy is being consumed by the Station,
  - d. Training and instructions on how to use the Station and data monitoring device,
  - e. A presentation on electric vehicles to School faculty and staff,
  - f. Electric vehicle educational materials that can be used in classroom lessons, and
  - g. Assistance with a community outreach activity.



To participate in this Project, the School must provide:

- a. Electrical supply connections (two 220V/40A electrical runs on dedicated circuits) at the location where the Station is mounted with any documentation of these costs shared with PlugIn Stations Online (a quote for performing this work is included in Attachment D),
- b. An adequate structure for mounting the station,
- c. Electricity to operate the Station,
- d. Operation and maintenance of the Station to sustain functionality throughout the duration of this Agreement,
- e. Quarterly downloads of the data from the data monitoring device and shared with PlugIn Stations Online,
- f. An opportunity for PlugIn Stations Online's team to provide a presentation on electric vehicles to School faculty and staff,
- g. At least one interested teacher to give a lesson related to electric vehicles or the Station which may incorporate the Station Data, and
- h. At least one community outreach activity related to electric vehicles or the Station, which may include, but is not limited to a newsletter article, electric vehicle ride and drive event, or distribution of a flier or announcement.

**PLUGIN STATIONS ONLINE**

**SCHOOL**

**Signatory:** \_\_\_\_\_  
**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Signatory:** \_\_\_\_\_  
**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Appendix C. Electric Vehicle Education in New York  
State Schools Outreach Flyer**

---

# Electric Vehicle Charging and Education at Schools

PlugIn Stations Online is working with the New York State Energy Research and Development Authority (NYSERDA) to install electric vehicle (EV) charging stations at schools in select locations around New York.

This project will support the expansion of the public EV charging network and education on EV technology in New York public schools in the Capital District, Mohawk Valley, Ithaca, and Syracuse regions. **Participating schools will receive:**



- Free site visit with installation cost estimate
- Free EV charging station
- Educational materials to share with students and staff on EV technology
- Training on EV charging station operation and data collection
- Support to implement EV information into lesson plans

PlugIn Stations Online and the project team will work with each school to identify the best location for EV charging, looking at all site considerations to ensure the lowest cost and high use for each location. **Partnering schools will commit to:**

- Dedicated parking space to EV charging
- Installing conduit and wire from the electrical panel to the station location
- Installing a post for EV charging station mounting (when necessary)
- Allowing project team to present EV technology to faculty

**Interested schools should** contact the following regional outreach coordinators:

Capital District: Brandon Mortka, [bmortka@pisoev.com](mailto:bmortka@pisoev.com)

Mohawk Valley: Victoria McGarril, [vmcgarril@energetics.com](mailto:vmcgarril@energetics.com)

Ithaca and Syracuse area: Barry Carr, [coordinator@ccoofcny.org](mailto:coordinator@ccoofcny.org)



# Appendix D. Summary of Educational Efforts

---



# Summary of EV Educational Efforts with NYS Schools

Electric Vehicle Charging Stations and Education at Schools  
PlugIn Stations Online, Energetics, and Clean Communities of CNY

## 1. Introduction

While adoption of electric vehicles (EVs) steadily grows each year, the total number of EVs registered in New York State (NYS) is below 1% of the total registered vehicles<sup>1</sup>. PISO (PlugIn Stations Online), Energetics, and Clean Communities of Central New York worked with the New York State Energy Research and Development Authority (NYSERDA) to leverage low-cost EV charging station installations to increase education and awareness surrounding plug-in electric vehicle (PEV) technology by engaging with school districts in NYS on PEV technology.

Installation of these stations increases potential EV owners' exposure to charging stations and existing EV drivers are provided more charging opportunities in their community. In addition to increasing awareness through more exposure, it is vital to facilitate meaningful engagement with this technology. Working with schools will allow faculty, staff, students, and parents a chance not only to see PEV technology but also to interact with it.

## 2. Resource Development

The project team collaborated to develop several resources to share with teachers and staff at participating schools. Below is a summary of the resources developed and shared with each participating school district.

1. **Presentation on EV and EV Charging Basics** - Building on the project teams' collective expertise in EVs, EV charging technology, and education and outreach, the team developed a slide deck to use for presentations at each school. The presentation reviews basics on EV and EV charging technology, costs and benefits of the technology, high-level EV market overview, and next steps for teachers/staff.
2. **Draft Newsletter Language** – To serve the school's community at large, each district was provided support to promote the EV charging station with their wider community. Most opted to use their existing newsletter to share information on the station, and the project developed draft language that could be modified to fit district's needs.
3. **Educational Resources Repository** – The project team researched existing resources that NYS teachers could access to use as supplemental materials for lessons related to EV and EV

---

<sup>1</sup> Alternative Fuels Data Center TransAtlas Data, [Alternative Fuels Data Center: TransAtlas \(energy.gov\)](https://www.energy.gov/alternative-fuels-data-center/transatlas)

charging. The list includes nearly 20 resources and tracks information like grade level, cost to access (most are free), teaching subject, and other information. The resources include short videos, classroom activities, and fully developed lesson plans to accommodate many different types of classroom needs. Each resource is also matched with a “guiding question” which correlates with an additional resource provided to teachers and staff (see below).

4. **Guiding Questions for EV Lesson Plans** – With guidance from PISO’s founder, John Doran, who spent decades as a teacher in NYS public schools, the team developed a companion resource for teachers to use when selecting resources to use in the classroom. The document lists a series of guiding questions that instructors determine would interest their student and provides a list of resources that can lead classes to answer the question. The document separates the questions into different teaching subjects and references resources listed in the companion repository document.

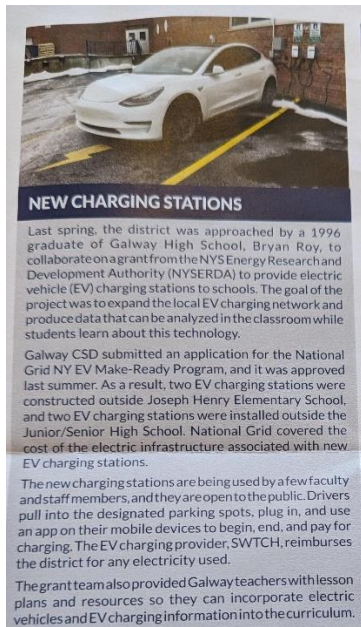


Image 1. Column feature on the new EV charging station in the Galway Schools Newsletter (left)

Image 2. Inlet Community Task Force Website featuring photo of unveiling of new EV charging station (right).

### 3. Sharing Materials

After each EV charging station installation, the team followed up with each district to schedule presentations with teachers and staff. Each district was different, where some preferred small meetings for the presentation and others invited many members of their staff to attend. Following each presentation, the schools were provided supplemental educational materials and the draft newsletter article. A summary of each presentation is below:

- **Inlet Common School – 12/12/2023:** Following the installation of the new SWTCH station at the Inlet Common School, the school had to suspend operation for the foreseeable future. The

school intends to re-open but there isn't a timeline or anticipated re-opening date, so Christine Holt (lead contact and teacher at Inlet Common School) arranged for two additional teachers from the Morrisville Central School District to join the presentation led by Energetics. The presentation reviewed the basics of EV and EVSE technology to better equip teachers to share information on the technology with students.

*Note: Inlet Common School held a follow up meeting with Energetics in April 2024 to review materials again, this time inviting Town of Webb CSD, a neighboring district that has EVSE in town. Town of Webb teachers were not able to attend but requested educational materials to distribute with teachers/staff.*

- **Trumansburg Central Schools – 1/4/2024:** Barry Carr, Director of Clean Communities of CNY met with Jon Koeng, the School Business Administrator to present the EVSE and EV information. Plans are being made to hold either a virtual or in-person training with teachers and administrators this summer. Trumansburg has been a long time user of clean school buses, starting with LPG powered Bluebird buses utilizing funding from NYSERDA.
- **Dryden Central Schools – 1/4/2024:** Clean Communities of CNY, represented by Director Barry Carr and our DOE Intern, Skyler Marshall verified installation and provided materials to Jeff Montesaro, the Business Manager for the Dryden School District. Clean Communities has offered to do a public ribbon cutting this summer, and we hope that they district will host and schedule it in the coming months. The stations (2) are located in the parking area adjacent to the main High School Entrance.
- **Chittenango Central Schools – 1/24/2024:** Barry Carr held multiple meetings with Scott Mahardy, the Assistant Superintendent for Business, with the final presentation after the installation was complete. We have suggested having a public ribbon cutting this summer, with a training meeting with key leaders for all schools late summer/early fall. The stations have been installed in the parking lot adjacent to the sports complex behind the High School and should get a lot of use.
- **Schoharie Central Schools – 2/1/2024:** Energetics met with the Schoharie CSD superintendent to review information on EV and EVSE technology, as well as a walk-through of the educational resources available to teachers. This school district was not comfortable with the project team contacting teachers directly, so information was passed to the district through the superintendent. No follow-up from teachers or others in the district was received.
- **Galway Central Schools – 2/5/2024:** Galway Central School District was eager to join this program and was one of the most involved schools right from day one. Gallway had over 4 reps on the presentation and over 30 minutes of question and answers to wrap up the meeting.
- **Hoosick Falls Central Schools – 2/5/2024:** Hoosick Falls Central School District was excited to be a part of this program and take advantage of the opportunity at a free charger. Pat and his team were highly engaged in the PowerPoint presentation and spent a lot of time engaging with John and the PISO team. Pat is a very smart guy and brought in most of his tech department so they could also listen and learn about using the charger as well as the basic info/background of EV charging. Like most other groups, they were curious to see what the difference between level 2

and level 3 charging. We walked Pat's team through the voltage difference between chargers and the infrastructure difference between both tiers as well.

- **Whitesboro Central Schools – 2/5/2024:** Whitesboro Central Schools gave time in their quarterly staff meeting for Energetics to present on EV and EVSE technology. The presentation was an abbreviated version of the normal 1-hour review, but the district was provided with the full deck of slides and the project team's contact information if there were additional questions. Following the presentation, two teachers at Whitesboro CSD contacted to Energetics discuss educational resources and materials. After these meetings, students in technology classes were given the option to present on a technology of their choice, and several opted to present on EVs (see attached student presentations).
- **Hudson School District – 2/29/2024:** Hudson Central School District was highly engaged in our presentation. We spent a lot of time going back and forth on the different levels of EV charging. We continue to go back and forth with the school answering questions and supporting the school. They are curious to look into DC Fast charging in the future and want to take advantage of existing funding programs before it's too late. We reviewed and took a deep dive into different types and speeds of DC Fast charging
- **Syracuse Central Schools – 4/25/2024:** Barry Carr and Skyler Marshall, representing Clean Communities of CNY presented the EV/EVSE materials to Jeremy Smith; City of Syracuse CSD Fleet Manager, and Robert DiFlorio; Superintendent of Schools at the Fleet Offices. The City of Syracuse is very appreciate of this program, as their bus provider (First Student) has obtained funding NYSERDA and the EPA to add IC Electric buses to their fleet. Clean Communities of CNY, outside of this contract has agreed to host training sessions for the districts to familiarize them with EV charging. The City of Syracuse Sustainability Manager, Owen Kearney has requested a ribbon cutting in June.



Image 3. Example slides from student presentations on EVs.

## 4. Challenges and Lessons Learned

Engaging with school districts presented unique challenges. The team saw a wide range of levels of engagement with the project where some schools were more enthusiastic than others. Like most professions, teachers and staff at schools have busy jobs and engaging with leadership can be



challenging. The team found that most schools requested the team start communication with the district leadership like a superintendent or business administrator, who usually served as the connecting point of contact with others in the district. In some cases, participating schools did not share contact information with others in the district and all communication went through the superintendent or other district leadership. This was challenging at times, given that district leadership was often busy and difficult to connect with. The project team had a difficult time scheduling meetings and follow-up meetings with most districts, and for this reason it was difficult to collect feedback or input on the resources provided. Through the feedback and input on resources that the team was able to collect, there were some helpful lessons from districts:

- At elementary level, some students learn about fossil fuels and other energy sources. EVs and EV charging materials fit well in this subject.
- Implementing new material in curriculum can be challenging. Teachers were receptive to including EV specific material in special student led projects or supplemental educational forums like summer camps or after-school clubs.
- Teachers can look at existing lessons or curricula where EV technology naturally ties in. For example, the Whitesboro school district may incorporate the EVSE data collected from their new station to an existing summer camp activity that uses data from a solar array.
- Students are interested in this technology and have some familiarity with EVs and charging technology. This will vary from student to student and can be influenced by outside factors like if their parents or others drive an EV.

It was also noted early on in outreach that several districts were uncomfortable with promoting charging stations for public use, noting that security at schools is taken very seriously. In those cases, the district felt more comfortable offering charging to the public during after-school hours when students weren't on campus. This could also be the reason that some districts opted to not promote the installation through their social media or other outlets.

In the future, projects and initiatives that seek to engage with school districts may want to consider working with student-led clubs or clubs centered around energy or the environment. Engaging with teachers and staff was difficult given that they are busy and have competing priorities. Providing information/engagement in a forum that is led by students or teachers that can be champions for this work could be a better way to ensure interaction with technology.

charging. The list includes nearly 20 resources and tracks information like grade level, cost to access (most are free), teaching subject, and other information. The resources include short videos, classroom activities, and fully developed lesson plans to accommodate many different types of classroom needs. Each resource is also matched with a “guiding question” which correlates with an additional resource provided to teachers and staff (see below).

4. **Guiding Questions for EV Lesson Plans** – With guidance from PISO’s founder, John Doran, who spent decades as a teacher in NYS public schools, the team developed a companion resource for teachers to use when selecting resources to use in the classroom. The document lists a series of guiding questions that instructors determine would interest their student and provides a list of resources that can lead classes to answer the question. The document separates the questions into different teaching subjects and references resources listed in the companion repository document.

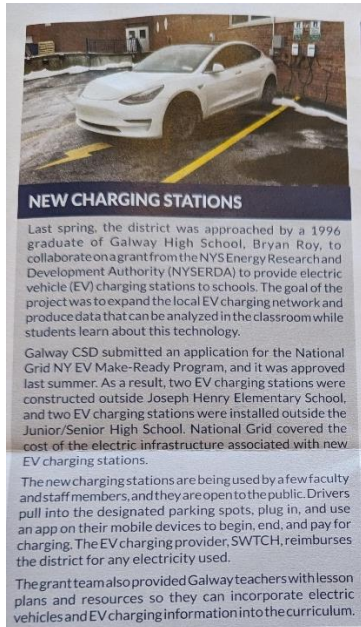


Image 1. Column feature on the new EV charging station in the Galway Schools Newsletter (left)

Image 2. Inlet Community Task Force Website featuring photo of unveiling of new EV charging station (right).

### 3. Sharing Materials

After each EV charging station installation, the team followed up with each district to schedule presentations with teachers and staff. Each district was different, where some preferred small meetings for the presentation and others invited many members of their staff to attend. Following each presentation, the schools were provided supplemental educational materials and the draft newsletter article. A summary of each presentation is below:

- **Inlet Common School – 12/12/2023:** Following the installation of the new SWTCH station at the Inlet Common School, the school had to suspend operation for the foreseeable future. The

school intends to re-open but there isn't a timeline or anticipated re-opening date, so Christine Holt (lead contact and teacher at Inlet Common School) arranged for two additional teachers from the Morrisville Central School District to join the presentation led by Energetics. The presentation reviewed the basics of EV and EVSE technology to better equip teachers to share information on the technology with students.

*Note: Inlet Common School held a follow up meeting with Energetics in April 2024 to review materials again, this time inviting Town of Webb CSD, a neighboring district that has EVSE in town. Town of Webb teachers were not able to attend but requested educational materials to distribute with teachers/staff.*

- **Trumansburg Central Schools – 1/4/2024:** Barry Carr, Director of Clean Communities of CNY met with Jon Koeng, the School Business Administrator to present the EVSE and EV information. Plans are being made to hold either a virtual or in-person training with teachers and administrators this summer. Trumansburg has been a long time user of clean school buses, starting with LPG powered Bluebird buses utilizing funding from NYSERDA.
- **Dryden Central Schools – 1/4/2024:** Clean Communities of CNY, represented by Director Barry Carr and our DOE Intern, Skyler Marshall verified installation and provided materials to Jeff Montesaro, the Business Manager for the Dryden School District. Clean Communities has offered to do a public ribbon cutting this summer, and we hope that they district will host and schedule it in the coming months. The stations (2) are located in the parking area adjacent to the main High School Entrance.
- **Chittenango Central Schools – 1/24/2024:** Barry Carr held multiple meetings with Scott Mahardy, the Assistant Superintendent for Business, with the final presentation after the installation was complete. We have suggested having a public ribbon cutting this summer, with a training meeting with key leaders for all schools late summer/early fall. The stations have been installed in the parking lot adjacent to the sports complex behind the High School and should get a lot of use.
- **Schoharie Central Schools – 2/1/2024:** Energetics met with the Schoharie CSD superintendent to review information on EV and EVSE technology, as well as a walk-through of the educational resources available to teachers. This school district was not comfortable with the project team contacting teachers directly, so information was passed to the district through the superintendent. No follow-up from teachers or others in the district was received.
- **Galway Central Schools – 2/5/2024:** Galway Central School District was eager to join this program and was one of the most involved schools right from day one. Gallway had over 4 reps on the presentation and over 30 minutes of question and answers to wrap up the meeting.
- **Hoosick Falls Central Schools – 2/5/2024:** Hoosick Falls Central School District was excited to be a part of this program and take advantage of the opportunity at a free charger. Pat and his team were highly engaged in the PowerPoint presentation and spent a lot of time engaging with John and the PISO team. Pat is a very smart guy and brought in most of his tech department so they could also listen and learn about using the charger as well as the basic info/background of EV charging. Like most other groups, they were curious to see what the difference between level 2

and level 3 charging. We walked Pat’s team through the voltage difference between chargers and the infrastructure difference between both tiers as well.

- **Whitesboro Central Schools – 2/5/2024:** Whitesboro Central Schools gave time in their quarterly staff meeting for Energetics to present on EV and EVSE technology. The presentation was an abbreviated version of the normal 1-hour review, but the district was provided with the full deck of slides and the project team’s contact information if there were additional questions. Following the presentation, two teachers at Whitesboro CSD contacted to Energetics discuss educational resources and materials. After these meetings, students in technology classes were given the option to present on a technology of their choice, and several opted to present on EVs (see attached student presentations).
- **Hudson School District – 2/29/2024:** Hudson Central School District was highly engaged in our presentation. We spent a lot of time going back and forth on the different levels of EV charging. We continue to go back and forth with the school answering questions and supporting the school. They are curious to look into DC Fast charging in the future and want to take advantage of existing funding programs before it’s too late. We reviewed and took a deep dive into different types and speeds of DC Fast charging
- **Syracuse Central Schools – 4/25/2024:** Barry Carr and Skyler Marshall, representing Clean Communities of CNY presented the EV/EVSE materials to Jeremy Smith; City of Syracuse CSD Fleet Manager, and Robert DiFlorio; Superintendent of Schools at the Fleet Offices. The City of Syracuse is very appreciate of this program, as their bus provider (First Student) has obtained funding NYSERDA and the EPA to add IC Electric buses to their fleet. Clean Communities of CNY, outside of this contract has agreed to host training sessions for the districts to familiarize them with EV charging. The City of Syracuse Sustainability Manager, Owen Kearney has requested a ribbon cutting in June.



Image 3. Example slides from student presentations on EVs.

## 4. Challenges and Lessons Learned

Engaging with school districts presented unique challenges. The team saw a wide range of levels of engagement with the project where some schools were more enthusiastic than others. Like most professions, teachers and staff at schools have busy jobs and engaging with leadership can be

challenging. The team found that most schools requested the team start communication with the district leadership like a superintendent or business administrator, who usually served as the connecting point of contact with others in the district. In some cases, participating schools did not share contact information with others in the district and all communication went through the superintendent or other district leadership. This was challenging at times, given that district leadership was often busy and difficult to connect with. The project team had a difficult time scheduling meetings and follow-up meetings with most districts, and for this reason it was difficult to collect feedback or input on the resources provided. Through the feedback and input on resources that the team was able to collect, there were some helpful lessons from districts:

- At elementary level, some students learn about fossil fuels and other energy sources. EVs and EV charging materials fit well in this subject.
- Implementing new material in curriculum can be challenging. Teachers were receptive to including EV specific material in special student led projects or supplemental educational forums like summer camps or after-school clubs.
- Teachers can look at existing lessons or curricula where EV technology naturally ties in. For example, the Whitesboro school district may incorporate the EVSE data collected from their new station to an existing summer camp activity that uses data from a solar array.
- Students are interested in this technology and have some familiarity with EVs and charging technology. This will vary from student to student and can be influenced by outside factors like if their parents or others drive an EV.

It was also noted early on in outreach that several districts were uncomfortable with promoting charging stations for public use, noting that security at schools is taken very seriously. In those cases, the district felt more comfortable offering charging to the public during after-school hours when students weren't on campus. This could also be the reason that some districts opted to not promote the installation through their social media or other outlets.

In the future, projects and initiatives that seek to engage with school districts may want to consider working with student-led clubs or clubs centered around energy or the environment. Engaging with teachers and staff was difficult given that they are busy and have competing priorities. Providing information/engagement in a forum that is led by students or teachers that can be champions for this work could be a better way to ensure interaction with technology.

**Appendix E. Slide Presentations to Teachers and Staff**

---

# Plug-In Electric Vehicles and EV Charging Overview

*Date*

*Location (School)*



# Agenda

1. EV Charging Station Grant Background
2. Electric Vehicle and Charging Station Basics
3. Available Vehicle Models and Adoption
4. Costs and Incentives
5. EV Benefits



# Acronyms

- EV – Electric Vehicle
- PEV – Plug-in Electric Vehicle
- PISO – PlugIn Stations Online
- EVSE – industry term: “electric vehicle supply equipment”
- NYSERDA - New York State Energy Research and Development Authority

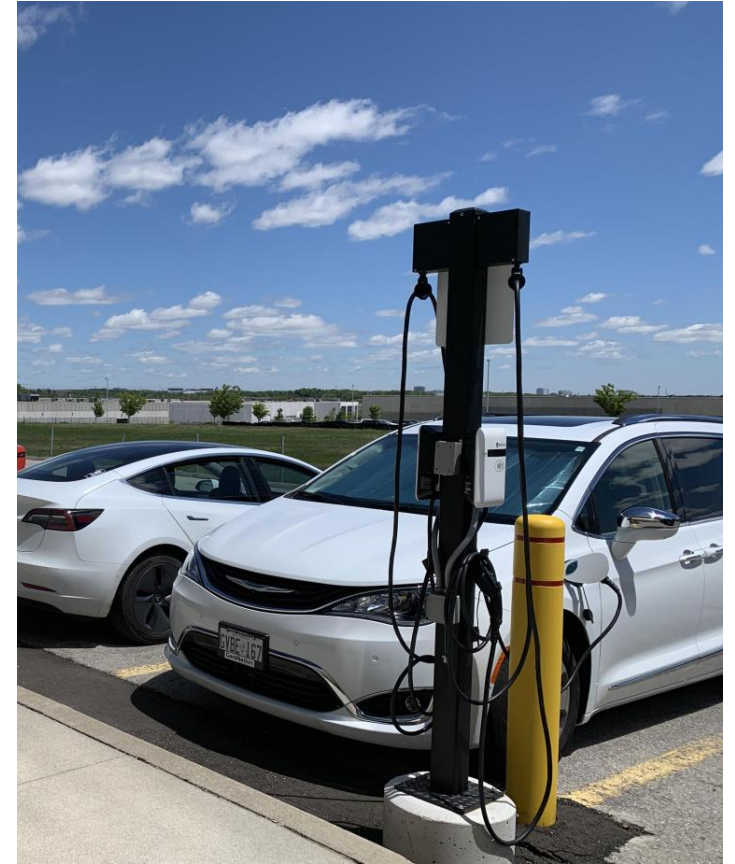
# New EV Charging Station at **SCHOOLS NAME**

- Located at xxx (*describe building, parking lot area, or other descriptions to help staff locate charging station*)

- Placeholder for photo of station
- 

# Station info

- Every school participating in this project is provided this station **for free**
- SWTCH LITE-ON Platinum
  - Level 2 charger
  - 18 ft cable length



# EV Charging Station Grant

- Project supported by New York State Energy Research and Development Authority (NYSERDA)
- Support the expansion of the public electric vehicle charging network
  - Free EV charging station supplied to all participating schools
- Promote education on technology in New York public schools
  - Provide information to teachers and staff
  - Provide lesson plans to teachers



# Types of EV Charging



**Level 1** chargers use standard 120V electrical outlets. 120V circuits are also used by most home electronics.

## AC Level 1



Standard 120-volt outlet



**Level 2** chargers use 240V electrical circuits. 240V circuits are also used by electric dryers & electric stovetops.

## AC Level 2



J1772



NACS

*NACS: North American Charging Standard, also known as the "Tesla Plug".*

**~25 Miles Per Hour of Charge**



**Level 3** direct current fast chargers (DCFCs) use ultra high-power 480V circuits at public charging stations.

## DC Fast Charge



CHAdeMO



CCS

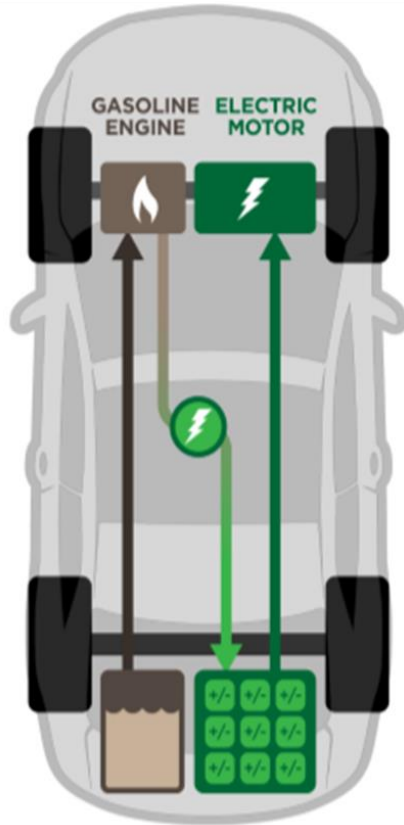


NACS

**40-100 Miles Per 10 Minutes**

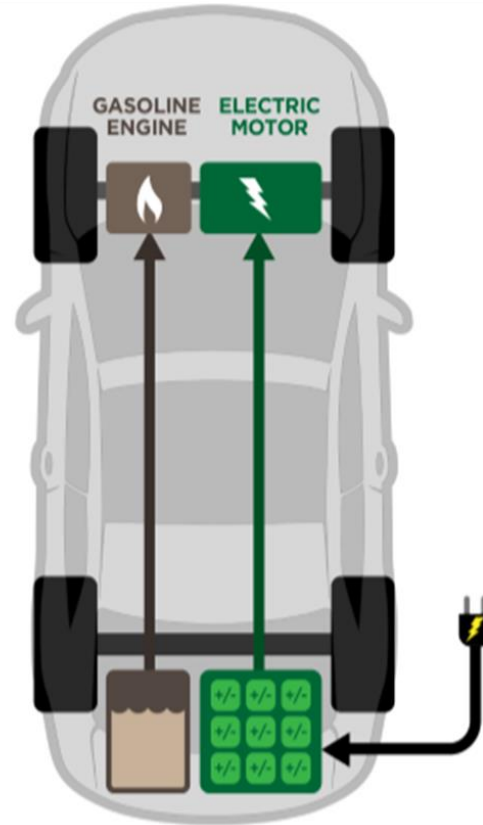
# Types of Electric Vehicles

Hybrid



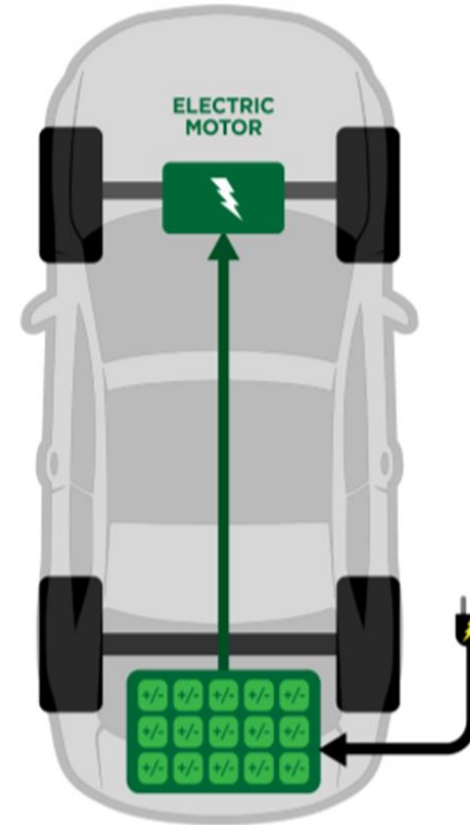
GASOLINE TANK RECHARGEABLE BATTERY PACK

PHEV – Plug-in Hybrid Electric Vehicle



GASOLINE TANK RECHARGEABLE BATTERY PACK

BEV – Battery Electric Vehicle



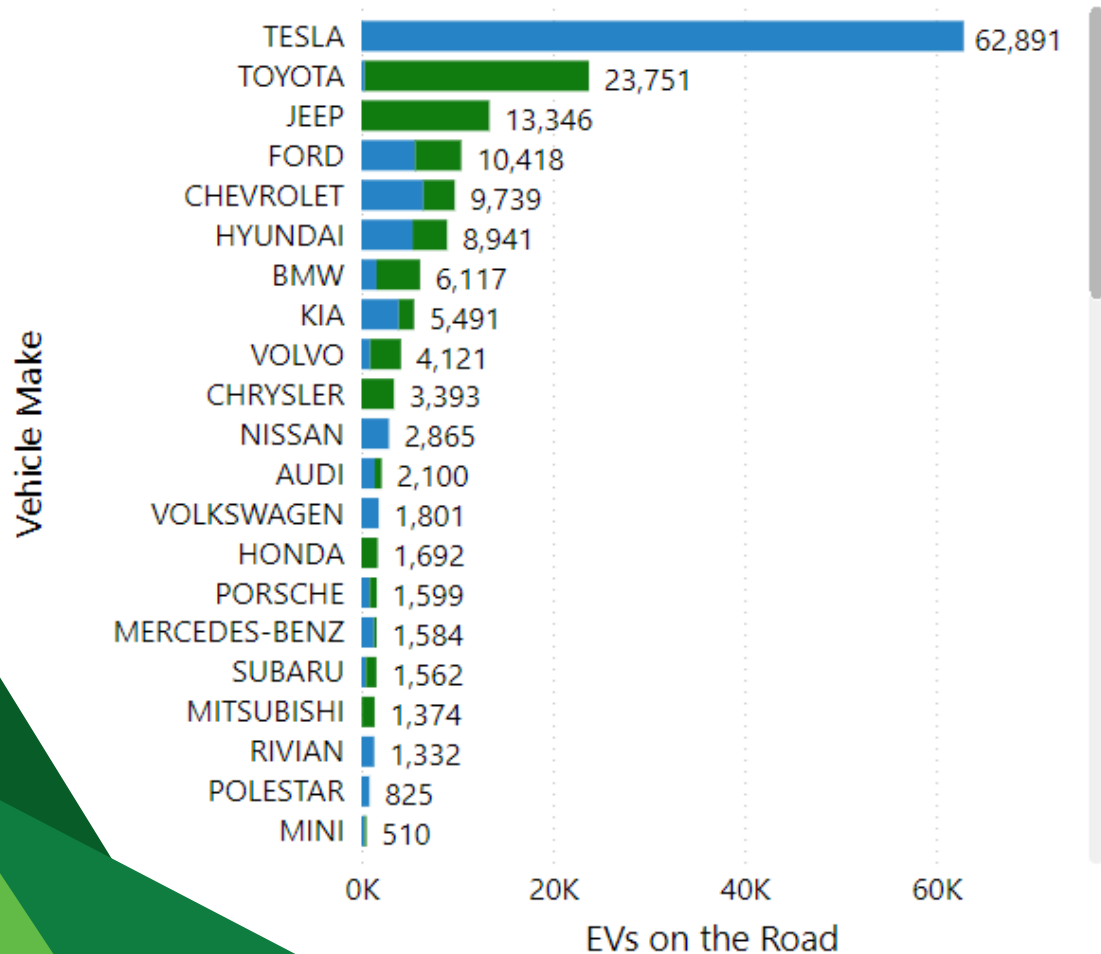
RECHARGEABLE BATTERY PACK

**What about EREV?**  
**Extended Range Electric Vehicles** use a combustion engine purely as a generator and with the sole purpose of charging up batteries when they run low.

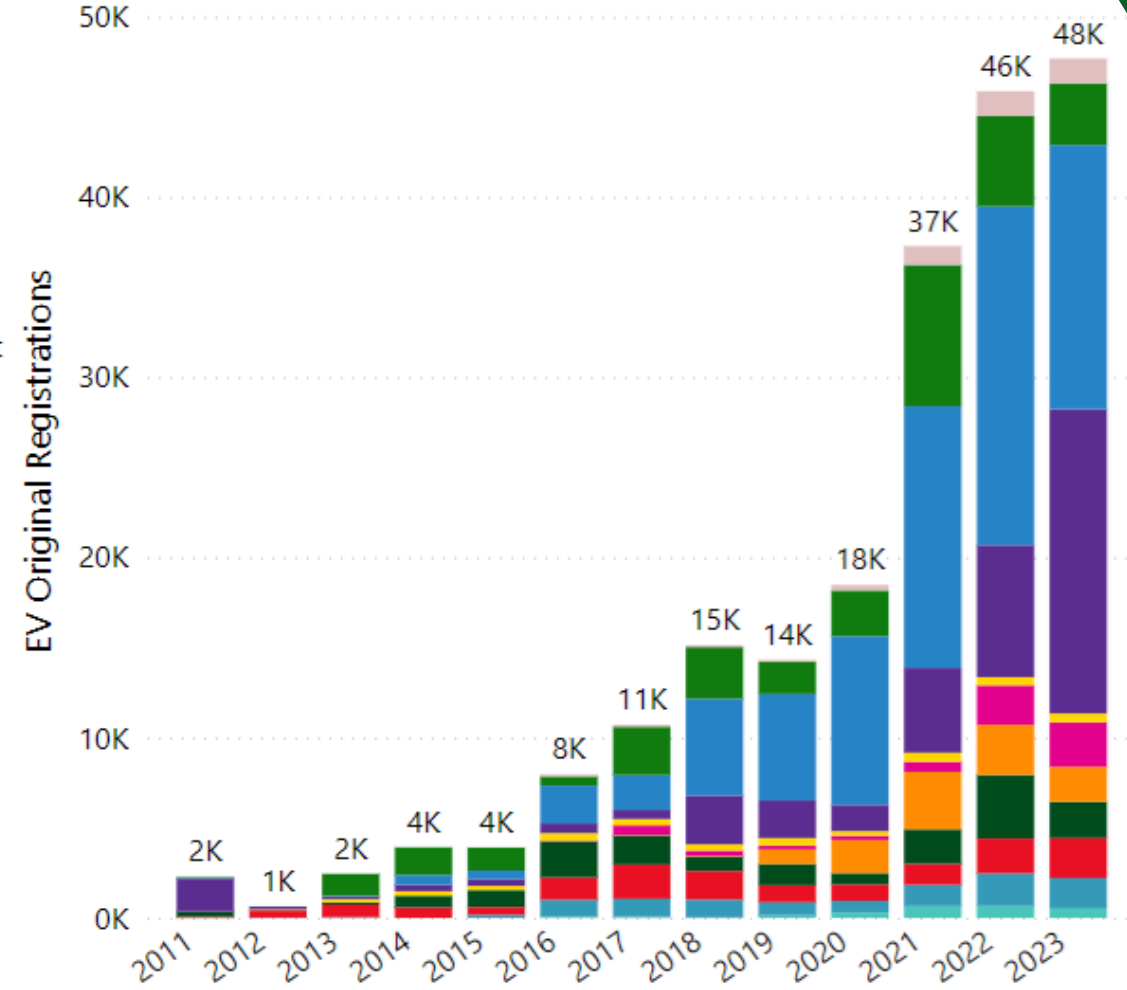
# Available Models and Adoption in NYS, 2023

EVs on the Road by Vehicle Make and Drivetrain

● BEV ● PHEV



Original EV Registrations by Top Makes



Source: Atlas Policy Evaluate NY. Last Updated August 2023

# Popular Model Comparison



Tesla Model 3 Base

- MSRP: \$40,240
- Range: 333 miles

Chevy Bolt EV 1LT

- MSRP: \$27,495
- Range: 259 miles

Battery Electric (BEV)



Jeep Wrangler 4xe Sport

- MSRP: \$49,995
- Electric Range: 22 miles
- Gasoline efficiency: 20 MPG



Toyota Prius Prime Base

- MSRP: \$32,350
- Electric Range: 44 miles
- Gasoline efficiency: 52 MPG

Plug-in Hybrid (PHEV)



# Cost and Incentives

- EVs have higher upfront costs but are eligible for rebates and incentives:
  - New York State incentive of up to \$2000 (Drive Clean Rebate for Electric Cars, NYSERDA)
  - Federal tax credit of up to \$7500 (Inflation Reduction Act, IRS)
  - Additional incentives for installing charging stations from government and utilities

Drivetrain Type	Average Vehicle MSRP
BEV	\$46,765.73
ICE	\$33,992.88
PHEV	\$45,845.72
<b>Total</b>	<b>\$34,486.91</b>

# Economic benefits – Cost of ownership

Average cost/mile across all vehicle types  
(AAA, 2022)

## *Average Ownership Costs Per Mile*

Miles per Year	10k	15k	20k
Average Cost	76¢	72¢	70¢

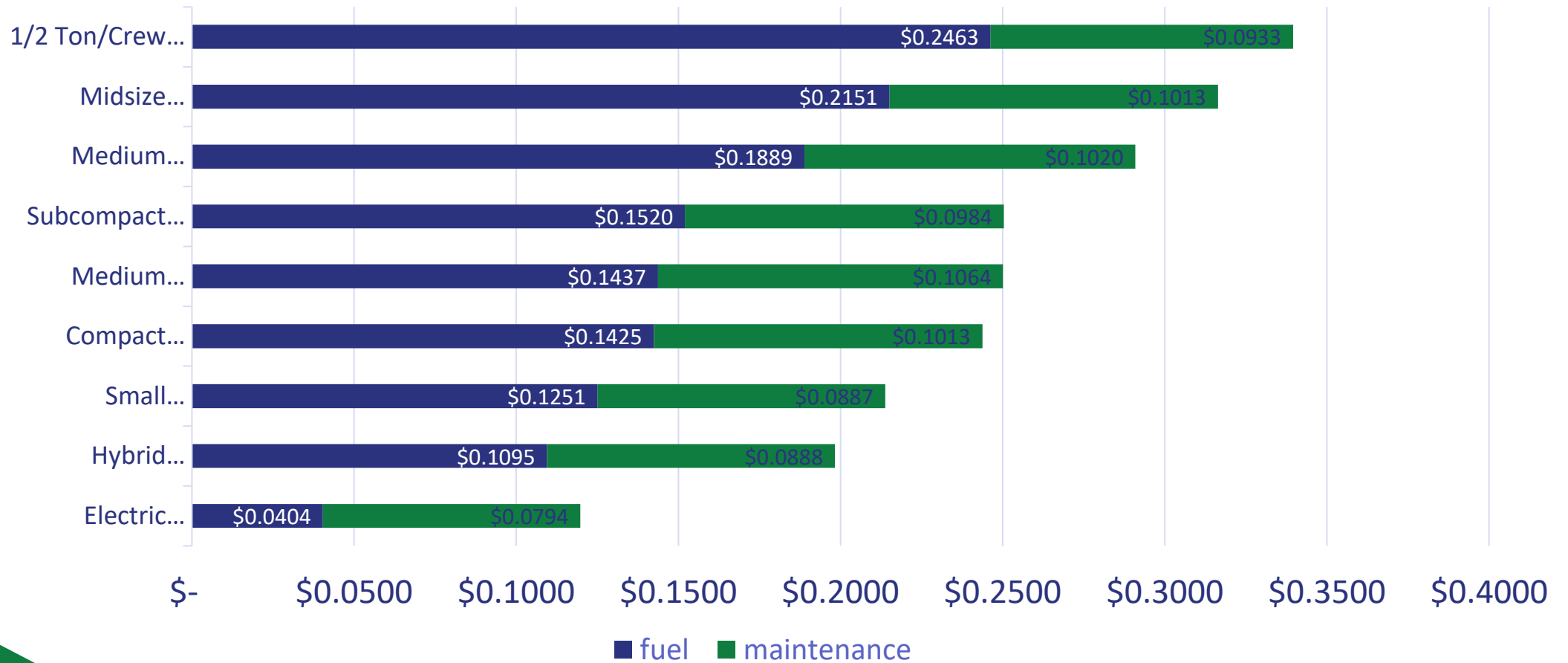
Average cost/mile for PEVs  
(AAA, 2022)

- 60.32¢/mile
- Least expensive for maintenance, repair & tire costs, fuel and licenses, registration & taxes
- Other vehicle types range from 54.56¢/mile to 86.21¢/mile.

Read more about vehicle cost/ mile here: <https://newsroom.aaa.com/wp-content/uploads/2022/08/2022-YourDrivingCosts-FactSheet-7-1.pdf>

# Detailed cost comparison

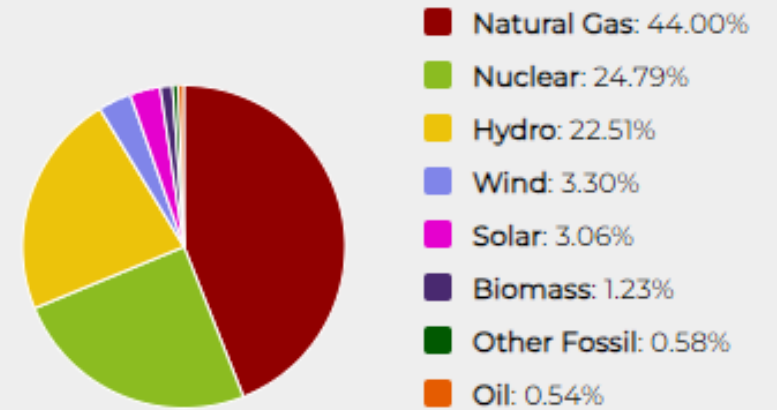
## Operating Costs by Vehicle Type



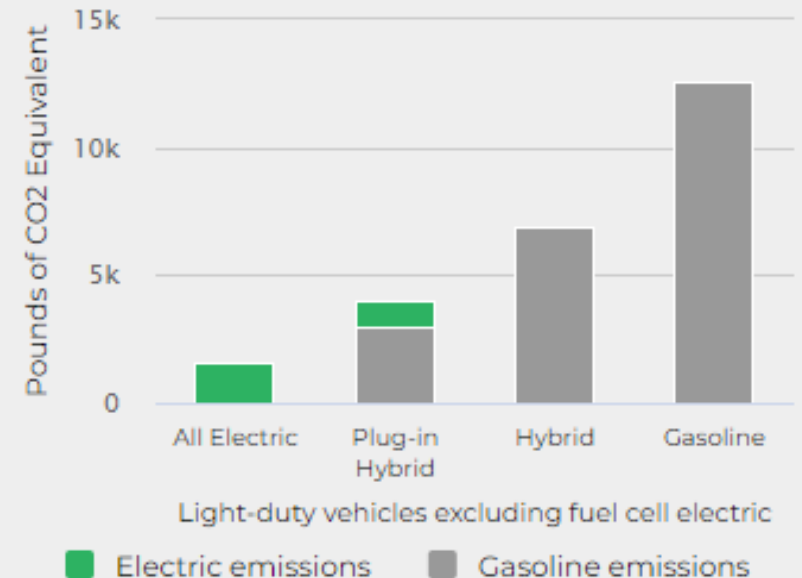
# Environmental Benefits

- Electric powered vehicles produce no tailpipe emissions
- New York State electric grid produces low-emission electricity
- EVs allow independence from foreign energy sources
- New York's electricity generation is getting cleaner – committed to 70% renewable by 2030 and zero-emission by 2040

Electricity Sources

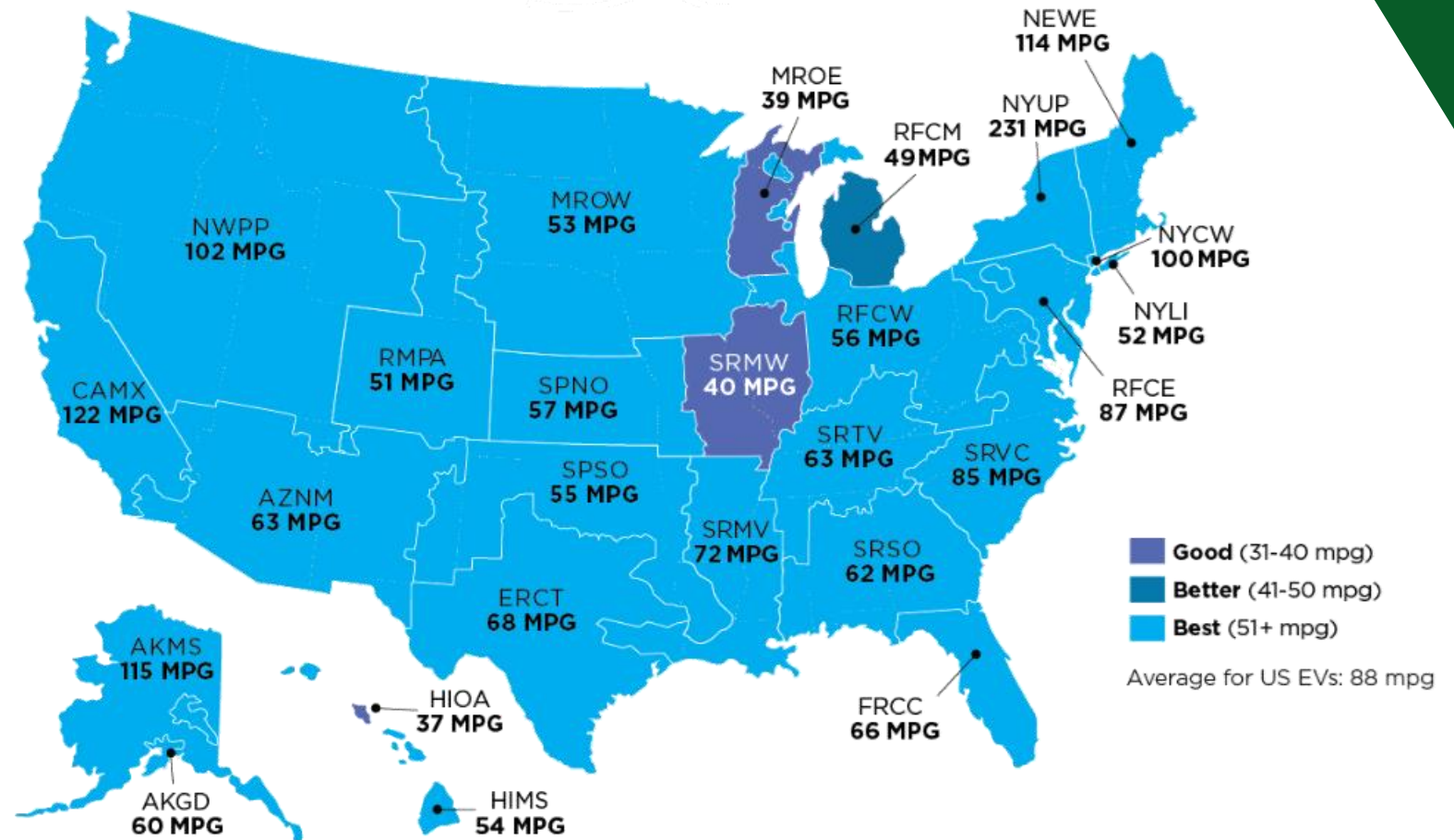


Annual Emissions per Vehicle



# Environmental Benefits – MPG Emissions by Electricity Grid

- MPG calculations are the miles an EV can drive for the equivalent emissions of burning one gallon of gasoline.
  - NYS grid is one of the cleanest grids to power your car
- **Anywhere** you drive in the U.S. – electric is cleaner!



© Union of Concerned Scientists

Map and Data: Union of Concerned Scientists, 2020

# Human Health Benefits

- In addition to greenhouse gases, gasoline and diesel vehicles release harmful pollutants including:
  - Carbon Monoxide (CO)
  - Nitrogen Oxides (NO<sub>x</sub>)
    - Chronic exposure to nitrogen oxides, especially nitrogen dioxide, has been extensively linked to respiratory effects such as inflammation and asthma
  - Volatile Organic Compounds (VOCs)
    - Some VOCs, such as Benzene, are known to cause cancer
    - VOCs play a part in the formation of smog
  - Particulate Matter
    - Fine particulate matter has been widely studied and linked to a variety of health conditions including asthma, lung cancer, and cardiovascular disease
- **Apart from some particulate matter from tires breaking down, EVs do not release any harmful airborne pollutants!**

# Conclusion

- EVs offer environmental, human health, and cost benefits
- EVs are growing portion of the market every year
- EVs are becoming more affordable
- EV and EV charging technology are supported through state and federal legislation

# Next Steps

- Promotional Event at your school district
- Bring EVs and EV charging into the classroom!
  - Provided directory of existing educational materials and resources
  - Select best fit for your class and curriculum
  - Implement information into lesson plan



# Resources

- <https://afdc.energy.gov/fuels/electricity.html>
- <https://www.nyserda.ny.gov/All-Programs/Drive-Clean-Rebate-For-Electric-Cars-Program>
- <https://www.irs.gov/credits-deductions/credits-for-new-clean-vehicles-purchased-in-2023-or-after>
- <https://www.aaa.com/autorepair/drivingcosts>

# Thank you!

Brandon Mortka

Commercial - Leader  
NY/VT/MA/CT

Plugin Stations Online, LLC

[bmortka@pisoev.com](mailto:bmortka@pisoev.com)

855-467-3751

Barry Carr

Director

Clean Communities of  
Central New York

[coordinator@ccocny.com](mailto:coordinator@ccocny.com)

315-278-2061

Victoria McGarril

Transportation Consultant  
Energetics

[vmcgarril@energetics.com](mailto:vmcgarril@energetics.com)

845-399-7186



## **Appendix F. Guiding Questions for Instructors**

---

# Electric Vehicle (EV) and EV Charging Station Classroom Guiding Questions

This resource was developed for classroom instructors to use for providing instruction related to electric vehicles and electric vehicle charging stations. Use the list below to find example lesson plans and activities to use in the classroom. Refer to the last page for a full list of resources and details related.

## English and Social Sciences

1. How do you plan a trip in an EV? Where are charging stations located? Where should they be added?
  - a. Lead activity to encourage students to understand the planning process involved in taking a trip with an electric vehicle and present their logistical plans in a visual format. ([link](#)).
  - b. Understand the benefits of installing charging stations at school or in their community through research. Create a map of their proposed space and present their research findings. ([link](#)).
2. How is your community adapting for EVs? What are the pros and cons of adopting new transportation technology?
  - a. Using a "spark question," students research businesses and organizations that have adapted to the shift to EVs. ([link](#))
  - b. Student teams research and develop a proposal to decrease the carbon footprint of their city's public transportation system through the use of various new technologies and/or alternative fuels. Resource produced in 2008, will need updates by instructor. ([link](#)).
3. How does public policy affect EV technology?
  - a. Use existing lesson plans for social studies, science and language arts that explores how this technology drives policy. Includes lesson plan, handouts, and videos. ([link](#)).

## English as a Second Language

1. What are some words and terms related to EVs?
  - a. For students learning English: Using a sample news article, students move through activity to understand words and meanings related to EVs and transportation. ([link](#)).

## Environmental Studies/Science

1. How do Electric Vehicles work and how do they impact the climate?
  - a. High school level supplementary program (9 day) using EVs to instruct on climate change, technology and engineering, and system design and jobs. ([link](#)).
  - b.
2. How can we persuade car buyers that some cars are more environmentally friendly than others?
  - a. Comparison of vehicle options and the fuel that powers them. Includes readings and activities, lesson could be spread across 10 days. ([link](#)).

## Science, Technology, and Math

1. What makes up an electric vehicle and how do they work? How do EVs work?
  - a. Use existing curriculum for K-6 students on the basics of EV technology. ([link](#)).
  - b. Explore nine topic areas with activities and lessons around how EVs work. ([link](#)).
2. What are the benefits to EVs?
  - a. Use existing lesson plans, games, and online materials to review the benefits of EVs with this STEM-based curriculum. ([link](#)).
3. What would a car of the future look like?
  - a. Students will look at and discuss the evolution of cars over time and consider specific innovations that have been made in cars and what might be done in the future. ([link](#))
4. What are the considerations someone needs to take before buying an EV? What EVs are available to buy?
  - a. Classroom activity to understand the aspects of choosing an EV to purchase (cost, incentives, range, etc.). Existing resource developed in Canada; some adjustments may be necessary. ([link](#)).
  - b. Learn about the history of the make and models of various electric vehicles and investigate current trends. Conduct research to understand the process behind changes in popularity of the Electric Vehicle and gain understanding of their technological changes. Existing resource developed in Canada; some adjustments may be necessary ([link](#)).
5. How do emissions effect human health? What are solutions to improve emissions?
  - a. Introduces students to the concepts of air pollution from transportation and related health effects, plus vehicle solutions to help reduce air pollution and improve air quality. ([link](#)).

Resources Title	Grade level(s)	Cost	Guiding Question	Subject	Link
Car of the Future (Classroom Activity)	5, 6, 7, 8	Free	What are the pros and cons of adopting new transportation technology?	English and Social Sciences	<a href="https://www.pbs.org/wgbh/nova/teachers/activities/3507_car.html">https://www.pbs.org/wgbh/nova/teachers/activities/3507_car.html</a>
"Electric Car: American Industry and Innovation" Social Studies Lesson Plan	7, 8, 9, 10, 11, 12	Free	How does public policy affect EV technology?	English and Social Sciences	<a href="https://mass.pbslearningmedia.org/resource/09ccf389-1afd-428e-9557-ccc207d4a3dd/09ccf389-1afd-428e-9557-ccc207d4a3dd/">https://mass.pbslearningmedia.org/resource/09ccf389-1afd-428e-9557-ccc207d4a3dd/09ccf389-1afd-428e-9557-ccc207d4a3dd/</a>
Exploring Electric Vehicle Charging Stations in Your School or Community	7, 8, 9, 10, 11, 12	Free with signup	Where are charging stations located? Where should they be added?	English and Social Sciences	<a href="https://programs.grelearning.ca/course/take-action-exploring-electric-vehicle-charging-stations-in-your-school-or-community">https://programs.grelearning.ca/course/take-action-exploring-electric-vehicle-charging-stations-in-your-school-or-community</a>
How is your community adapting for EVs?	7, 8, 9, 10, 11, 12	Free with signup	How is your community adapting for EVs?	English and Social Sciences	<a href="https://programs.grelearning.ca/course/how-is-your-community-adapting-for-electric-vehicles">https://programs.grelearning.ca/course/how-is-your-community-adapting-for-electric-vehicles</a>
Planning a Trip in your Electric Vehicle	7, 8, 9, 10, 11, 12	Free with signup	How do you plan a trip in an EV?	English and Social Sciences	<a href="https://programs.grelearning.ca/course/planning-a-trip-in-your-electric-vehicle">https://programs.grelearning.ca/course/planning-a-trip-in-your-electric-vehicle</a>
Breaking English News: Lesson on Electric Cars	Levels 0 - 3	Free	What are some words and terms related to EVs?	English as a Second Language	<a href="https://www.teachingengineering.org/lessons/view/cub-2632-cars-air-quality-">https://www.teachingengineering.org/lessons/view/cub-2632-cars-air-quality-</a>

					<a href="#">connections-k-2-lesson</a>
Environmentally Friendly Cars	4	Free	How can we persuade car buyers that some cars are more environmentally friendly than others?	Environmental Studies/Science	<a href="https://www.learnin-ga-z.com/user_area/content_media/raw/pbl_4_environmentally_friendly_cars_pack_1_esson_plan.pdf">https://www.learnin-ga-z.com/user_area/content_media/raw/pbl_4_environmentally_friendly_cars_pack_1_esson_plan.pdf</a>
Charge into the EV World	9, 10, 11, 12	Yes - sponsorship options available.	How do Electric Vehicles work and how do they impact the climate?	Environmental Studies/Science	<a href="https://www.evworld.support/">https://www.evworld.support/</a>
STEM EV Education for K-6 Classes	K, 1, 2, 3, 4, 5, 6	Free with signup	What are the benefits to EVs?	Science and Math	<a href="https://www.ncsta.org/blog/stem-ev-education-for-k-6-classes/">https://www.ncsta.org/blog/stem-ev-education-for-k-6-classes/</a>
LESSON PLAN: Car of the Future	2, 3	Free	What would a car of the future look like?	Science and Math	<a href="https://thinkplaycreate.org/wp-content/uploads/2017/02/Car-of-the-Future-Lesson-Plan-1.pdf">https://thinkplaycreate.org/wp-content/uploads/2017/02/Car-of-the-Future-Lesson-Plan-1.pdf</a>
EV Challenge Lessons	6, 7, 8	Free	How doe EVs work?	Science and Math	<a href="https://www.gohunterdon.org/sustainable-hunterdon/ev-challenge/teacher-resources">https://www.gohunterdon.org/sustainable-hunterdon/ev-challenge/teacher-resources</a>
Inside an EV	6, 7, 8	Free (sign-up may be required)	What makes up an electric vehicle and how do they work?	Science and Math	<a href="https://schools.bchydro.com/activities/sustainability/inside-an-ev">https://schools.bchydro.com/activities/sustainability/inside-an-ev</a>

What Electric Vehicle Should You Buy?	7, 8, 9, 10, 11, 12	Free with signup	What are the considerations someone needs to take before buying an EV?	Science and Math	<a href="https://programs.grelearning.ca/course/what-ev-should-you-buy">https://programs.grelearning.ca/course/what-ev-should-you-buy</a>
History of the Electric Vehicle	7, 8, 9, 10, 11, 12	Free with signup	What EVs are available to buy?	Science and Math	<a href="https://programs.grelearning.ca/course/history-of-the-electric-vehicle?register=true">https://programs.grelearning.ca/course/history-of-the-electric-vehicle?register=true</a>
EVie Lesson Toolkit	K-12	Free	How do EVs fit in with the transportation sector?	Science and Math	<a href="https://pluginbc.ca/wp/wp-content/uploads/2021/06/CITYHALL-6650781-v9-Fleet-RELT-Lesson-Plan-Kindergarten-to-Grade-7.pdf">https://pluginbc.ca/wp/wp-content/uploads/2021/06/CITYHALL-6650781-v9-Fleet-RELT-Lesson-Plan-Kindergarten-to-Grade-7.pdf</a>
Cars and Air Quality Connections	K, 1, 2	Free	How do emissions effect human health? What are solutions to improve emissions?	Science and Math	<a href="https://www.teachingengineering.org/lessons/view/cub-2632-cars-air-quality-connections-k-2-lesson">https://www.teachingengineering.org/lessons/view/cub-2632-cars-air-quality-connections-k-2-lesson</a>
The Future of EV Batteries	5, 6, 7, 8				<a href="https://www.pbs.org/wgbh/nova/video/the-future-of-ev-batteries/">https://www.pbs.org/wgbh/nova/video/the-future-of-ev-batteries/</a>
Lesson Planet Resources	K-12	Yes - \$84/year for access to entire library	NA		<a href="https://www.lessonplanet.com/search?keywords=electric+cars">https://www.lessonplanet.com/search?keywords=electric+cars</a>





## **Appendix G. Educational Resources Repository**

---

Resources Title	Brief Description	Grade level(s)
Car of the Future (Classroom Activity)	PRODUCED IN 2008 - instructor would need to update reference materials. Student teams research and develop a proposal to decrease the carbon footprint of their city's public transportation system through the use of various new technologies and/or alternative fuels.	5, 6, 7, 8
"Electric Car: American Industry and Innovation" Social Studies Lesson Plan	Lesson plans for social studies, science and language arts that explores how this technology drives policy. Includes lesson plan, handouts, and videos.	7, 8, 9, 10, 11, 12
Exploring Electric Vehicle Charging Stations in Your School or Community	Understand the benefits of installing charging stations at school or in their community through research. Create a map of their proposed space and present their research findings.	7, 8, 9, 10, 11, 12
How is your community adapting for EVs?	Using a "spark question" students research businesses and organizations that have adapted to the shift to EVs.	7, 8, 9, 10, 11, 12
Planning a Trip in your Electric Vehicle	Activity to encourage students to understand the planning process involved in taking a trip with an electric vehicle and present their logistical plans in a visual format.	7, 8, 9, 10, 11, 12
Breaking English News: Lesson on Electric Cars	For students learning English: Using a sample news article, students move through activity to understand words and meanings related to EVs and transportation.	Levels 0 - 3
Environmentally Friendly Cars	Comparison of vehicle options and the fuel that powers them. Includes readings and activities, lesson could be spread across 10 days.	4
Charge into the EV World	High school level supplementary program (9 day) using EVs to instruct on climate change, technology and engineering, and system design and jobs.	9, 10, 11, 12
STEM EV Education for K-6 Classes	National Energy Foundation partnered with Electrify America to deliver curriculum for K-6 teachers.	K, 1, 2, 3, 4, 5, 6
LESSON PLAN: Car of the Future	Students will look at and discuss the evolution of cars over time, and consider specific innovations that have been made in cars and what might be done in the future.	2, 3
EV Challenge Lessons	Nine topic areas related to EV technology with free, downloadable lesson plans.	6, 7, 8
Inside an EV	30 minute overview of electric vehicle components, includes lesson instructions, worksheet, and video.	6, 7, 8
What Electric Vehicle Should You Buy?	Activity to understand the aspects of choosing an EV to purchase (cost, incentives, range, etc.).	7, 8, 9, 10, 11, 12
History of the Electric Vehicle	Learn about the history of the make and models of various electric vehicles and investigate current trends. Conduct research to understand the process behind changes in popularity of the Electric Vehicle and gain understanding of their technological changes	7, 8, 9, 10, 11, 12
EVie Lesson Toolkit	A comprehensive digital teaching package designed for Kindergarten to Grade 12 students. Lesson plans, activities, and curriculum options included. Developed in British Columbia, some reference materials not relevant.	K-12
Cars and Air Quality Connections	Introduces students to the concepts of air pollution from transportation and related health effects, plus vehicle solutions to help reduce air pollution and improve air quality.	K, 1, 2
The Future of EV Batteries	Video on EV batteries, and how new technology could accelerate adoption.	5, 6, 7, 8
Lesson Planet Resources	Collection of existing resources (activities, lesson plans, readings, etc.) for different grade levels.	K-12
Energy for Transportation	Collection of "fast facts," informational videos, and a video lecture from Stanford University that focuses on the impacts of transportation on our energy system and how transportation systems are changing to become cleaner and more efficient.	11, 12

Cost	Guiding Question	Subject	Link
Free	What are the pros and cons of adopting new transportation technology?	English and Social Sciences	<a href="https://www.pbs.org/wgbh/nova/teachers/activities/3507_car.ht">https://www.pbs.org/wgbh/nova/teachers/activities/3507_car.ht</a>
Free	How does public policy affect EV technology?	English and Social Sciences	<a href="https://mass.pbslearningmedia.org/resource/O9ccf389-1afd-428e">https://mass.pbslearningmedia.org/resource/O9ccf389-1afd-428e</a>
Free with signup	Where are charging stations located? Where should they be added?	English and Social Sciences	<a href="https://programs.greenlearning.ca/course/take-action-exploring-">https://programs.greenlearning.ca/course/take-action-exploring-</a>
Free with signup	How is your community adapting for EVs?	English and Social Sciences	<a href="https://programs.greenlearning.ca/course/how-is-your-communi">https://programs.greenlearning.ca/course/how-is-your-communi</a>
Free with signup	How do you plan a trip in an EV?	English and Social Sciences	<a href="https://programs.greenlearning.ca/course/planning-a-trip-in-you">https://programs.greenlearning.ca/course/planning-a-trip-in-you</a>
Free	What are some words and terms related to EVs?	English as a Second Language	<a href="https://www.teachengineering.org/lessons/view/cub-2632-cars-z">https://www.teachengineering.org/lessons/view/cub-2632-cars-z</a>
Free	How can we persuade car buyers that some cars are more environmentally friendly than others?	Environmental Studies/Science	<a href="https://www.learninga-z.com/user_area/content_media/raw/pbl">https://www.learninga-z.com/user_area/content_media/raw/pbl</a>
Yes - sponsorship options available.	How do Electric Vehicles work and how do they impact the climate?	Environmental Studies/Science	<a href="https://www.evworld.support/">https://www.evworld.support/</a>
Free with signup	What are the benefits to EVs?	Science and Math	<a href="https://www.ncsta.org/blog/stem-ev-education-for-k-6-classes/">https://www.ncsta.org/blog/stem-ev-education-for-k-6-classes/</a>
Free	What would a car of the future look like?	Science and Math	<a href="https://thinkplaycreate.org/wp-content/uploads/2017/02/Car-of-">https://thinkplaycreate.org/wp-content/uploads/2017/02/Car-of-</a>
Free	How do EVs work?	Science and Math	<a href="https://www.gohunterdon.org/sustainable-hunterdon/ev-challen">https://www.gohunterdon.org/sustainable-hunterdon/ev-challen</a>
Free (sign-up may be required)	What makes up an electric vehicle and how do they work?	Science and Math	<a href="https://schools.bhydro.com/activities/sustainability/inside-an-ev">https://schools.bhydro.com/activities/sustainability/inside-an-ev</a>
Free with signup	What are the considerations someone needs to take before buying an EV?	Science and Math	<a href="https://programs.greenlearning.ca/course/what-ev-should-you-b">https://programs.greenlearning.ca/course/what-ev-should-you-b</a>
Free with signup	What EVs are available to buy?	Science and Math	<a href="https://programs.greenlearning.ca/course/history-of-the-electric-">https://programs.greenlearning.ca/course/history-of-the-electric-</a>
Free	How do EVs fit in with the transportation sector?	Science and Math	<a href="https://pluginbc.ca/wp/wp-content/uploads/2021/06/CITYHALL-t">https://pluginbc.ca/wp/wp-content/uploads/2021/06/CITYHALL-t</a>
Free	How do emissions effect human health? What are solutions to improve emissions?	Science and Math	<a href="https://www.teachengineering.org/lessons/view/cub-2632-cars-z">https://www.teachengineering.org/lessons/view/cub-2632-cars-z</a>
	What makes up an electric vehicle and how do they work? How doe EVs work?	Science and Math	<a href="https://www.pbs.org/wgbh/nova/video/the-future-of-ev-batterie">https://www.pbs.org/wgbh/nova/video/the-future-of-ev-batterie</a>
Yes - \$84/year for access to entire library	NA	All	<a href="https://www.lessonplanet.com/search?keywords=electric+cars">https://www.lessonplanet.com/search?keywords=electric+cars</a>
Free	How do Electric Vehicles work and how do they impact the climate?	Environmental Studies/Science	<a href="https://understand-energy.stanford.edu/energy-services/energy-">https://understand-energy.stanford.edu/energy-services/energy-</a>

[9557-ccc207d4a3dd/09ccf389-1afd-428e-9557-ccc207d4a3dd/](#)

[electric-vehicle-charging-stations-in-your-school-or-community](#)

[6650781-v9-Fleet - RELT - Lesson Plan - Kindergarten to Grade 7.pdf](#)

# Appendix H. Newsletter Content Samples

---

## Electric car charging station provides learning opportunity for students

**SCHOOL NAME** are excited to announce the installation of a new electric car charging station! The new station can power vehicles for teachers, staff, and community members.

Our new station was installed through a grant funded by the New York State Energy Research and Development Authority (NYSERDA). The station model is the SWTCH Lite-on Platinum Charger, which supplies 240-volt electricity to vehicles (aka Level 2 Charger). Chargers with this power level add about 25 miles of range to a vehicle per hour it is plugged in. For electric car owners, having stations located in places they frequent - like grocery stores, retail, or work locations - can help extend their daily electric miles and get the most out of their electric-powered engine.

Along with providing power to vehicles, this station can provide a learning opportunity to students. The station tracks energy use and stores data on an online cloud service, which can be used by teachers at **SCHOOL NAME** as a supplemental learning tool. Data like this can be used to understand charging patterns, electricity use, and costs. The team assisting the installation have also provided learning materials and resources that can be used in classroom subjects like English, Social Studies, Math, Technology, and Environmental Studies.

**SCHOOL NAME** schools are excited to share this new resource with our students and school community! If you are interested in learning more about EVs and EV charging, we recommend visiting the NYSERDA website here: <https://www.nyserda.ny.gov/All-Programs/ChargeNY/Drive-Electric>







NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975.

To learn more about NYSERDA's programs and funding opportunities, visit [nyserda.ny.gov](http://nyserda.ny.gov) or follow us on X, Facebook, YouTube, or Instagram.

**New York State  
Energy Research and  
Development Authority**

17 Columbia Circle  
Albany, NY 12203-6399

**toll free:** 866-NYSERDA  
**local:** 518-862-1090  
**fax:** 518-862-1091

[info@nyserda.ny.gov](mailto:info@nyserda.ny.gov)  
[nyserda.ny.gov](http://nyserda.ny.gov)



**NYSERDA**

**State of New York**

Kathy Hochul, Governor

**New York State Energy Research and Development Authority**

Richard L. Kauffman, Chair | Doreen M. Harris, President and CEO