

2015 Annual Data Summary:
**New York State Electrical Vehicle (EV)
Charging Station Deployment Program**



NEW YORK
STATE OF
OPPORTUNITY.

ChargeNY

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

Mission Statement:

Advance innovative energy solutions in ways that improve New York's economy and environment.

Vision Statement:

Serve as a catalyst – advancing energy innovation, technology, and investment; transforming New York's economy; and empowering people to choose clean and efficient energy as part of their everyday lives.

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Key Observations to Date

Host organizations with the most frequently used EV charging stations do a lot more than just install the station and wait for EV drivers to charge their vehicles.

When sustainability is a core value within the host organization, EV charging stations installation is accompanied by press releases, EV information for tenants or employees, on-site personnel who are properly educated about the stations, and an embrace of the environmental benefits inherent to this technology. Organizations that have multiple installations on their property or across multiple properties throughout the State have the most commonly used stations, possibly because they have demonstrated a commitment and genuine interest in supporting EVs.

A little **advanced planning can go a long way toward reducing installation costs and successfully locating the station in a convenient spot** to both EV drivers and parking lot maintenance personnel (who clean or plow snow as needed). As more stations are installed throughout the State, electricians are increasing their knowledge on this technology and have insight on the best installation locations. NYSERDA's *Best Practices Guide for Site Owners of Electric Vehicle Charging Stations on Commercial Properties* capture many of those lessons. However, further discussion with your electrician is recommended.

Snow and cold can negatively impact EV charging stations. Cords become stiffer and more challenging to properly coil, while stations or signage between parking spaces may make it more difficult to properly plow. Without adequate **consideration of winter conditions during the planning phase**, the infrastructure could potentially obstruct plowing of the parking space. **Retractable cord systems** can significantly reduce plow damage, and all stations should be cleared of snow regularly so they are visible and convenient to use.

On average, **EVs are only actively charging for half of the time they are plugged into charging stations**. Relatively low demand for charging minimizes negative impact of longer-than-necessary EV dwell times at existing stations. However, as the number of EVs grow, demand for charging will increase. Some locations place a time limit on charging to optimize charging station use. Networked stations can charge a fee or increase the rate after a certain period of time to encourage EVs not to linger. However, this practice often means that EV drivers who are staying longer at that location would need to come back out and move their car. A better solution might be to **reserve or plan for additional parking spaces** where an EV can access the charging station after the other EV is finished charging. The EV community is trying to establish protocols on when it is acceptable to disconnect another vehicle from a charger. Placards could be used to convey an owner's preference.

EV drivers tend to plug-in and **charge at their workplaces**. Figure 1 shows the usage profile for these charging stations. It has a significant peak in use on weekdays at 9:00 am when the majority of EV drivers arrive at their workplace. Only charging stations at university or medical campuses and parking lots or garages outside of New York City are more heavily used. However, that high usage is likely primarily because of EV drivers that work at or near those locations.

Charging stations at multifamily dwellings have a similar occupancy rate as workplaces, but that is due to EVs being plugged into these stations for an extended period of time (average 10.7 hours per charge event). The amount of actual charging time is less than workplaces. Workplace chargers may also be the most successful at increasing EV sales because non-EV drivers see charging stations and EVs plugged in on a regular basis, have colleagues that drive and likely talk about their EVs, and have a known location away from home to charge every day which extends the functionality of EVs. NYSERDA's *Workplace Charging Guide* provides an overview of the potential benefits of installing charging stations at workplaces and information to help employers through the process of planning, installing, and managing EV charging infrastructure.

Outside of New York City, charging stations with a fee dispense less electricity (average 3.6 kWh per week) than free stations (average 10.5 kWh per week). The average revenue generated by stations with fee was \$10 per month. Although the fees offset the cost of electricity (about \$5 per month per port), it was not enough to pay for the network fees (about \$20-30 per month) that enabled the charging station to set a fee for use. Therefore, **in most cases the revenue generated by charging for use alone does not cover monthly networking fees**. Many charging station hosts view the additional electricity cost as a small price to pay for the positive exposure and added value to employees/customers. Networked stations do enable valuable options such as monitoring the station, tracking utilization, managing turnover (through the use of time limits or adjustable fees), and posting the current status (occupied, available, and out of service, etc.). These features may justify the expense of paying the monthly network fees.

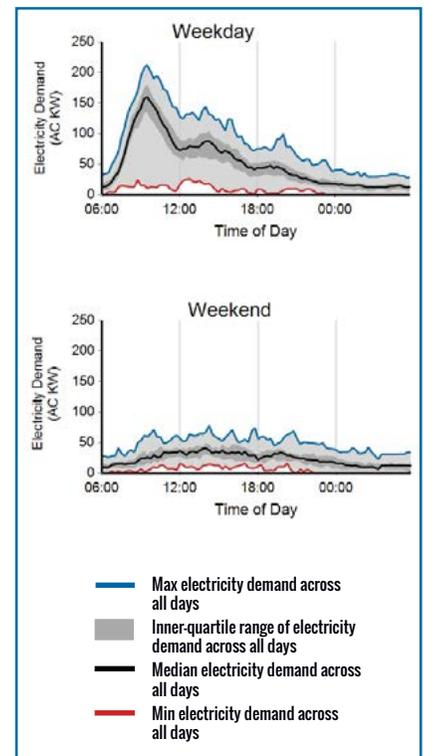
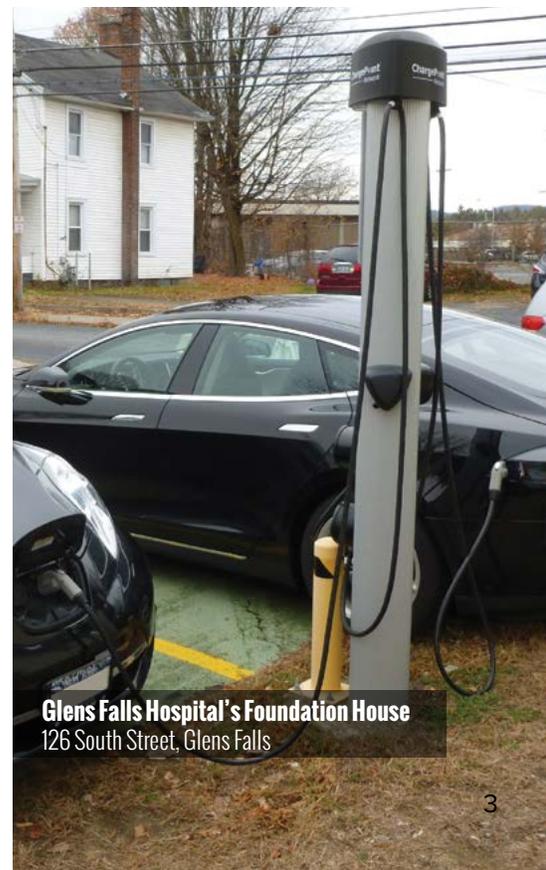


Figure 1. Charging Profile for NYSERDA-funded EV Charging Stations



1,063 Public Level 2 EV charging outlets in New York State

- **177** AC Level 2 EV charging outlets added in 2015 through NYSERDA's Deployment Program
- **628** AC Level 2 EV charging outlets installed through NYSERDA's Deployment Program
- **164** AC Level 2 EV charging outlets added in 2015 by other entities

73 Public direct current (DC) fast charging outlets in New York State

162 Private EV charging outlets in New York State

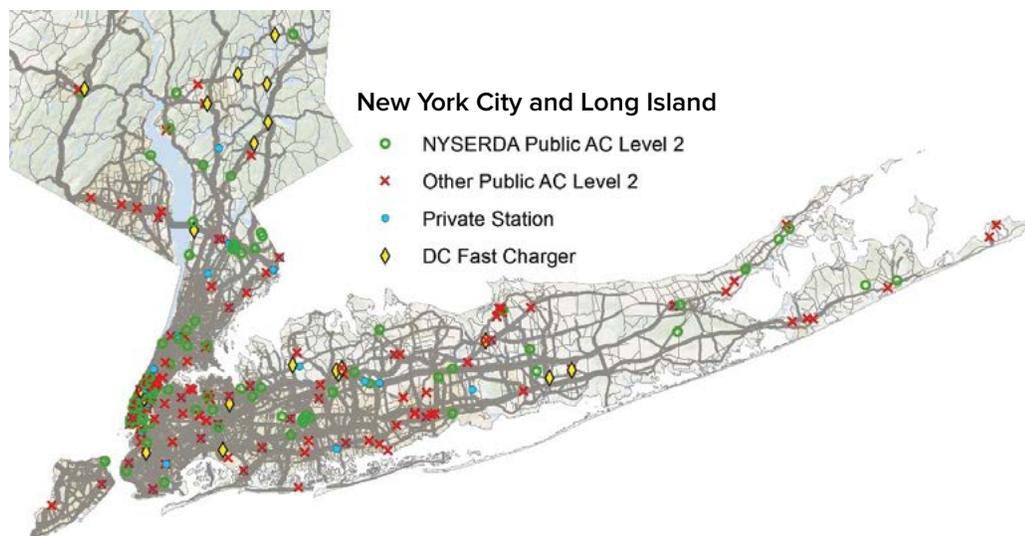
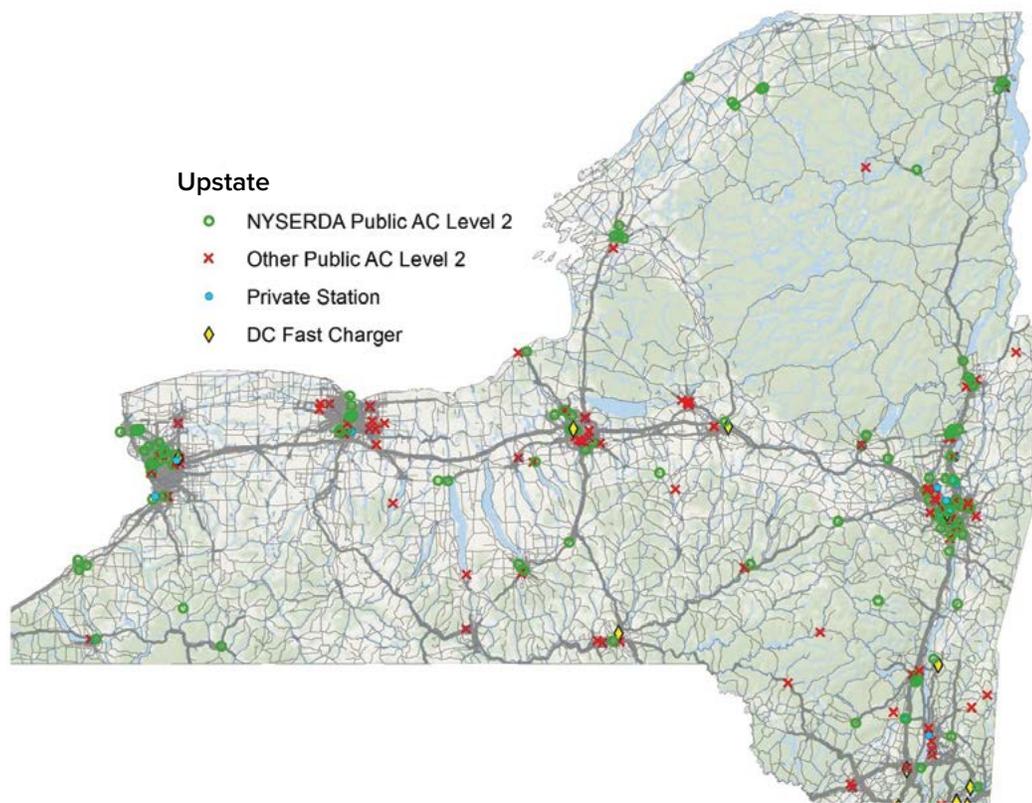


Rochester Institute of Institute of Technology D Lot
Clark Drive, Rochester



Price Chopper Supermarket
290 Saratoga Road, Scotia

New York State EV Charging Stations





Anheuser-Busch Brewery
2885 Belgium Road, Baldwinsville



Ulster County Trudy Resnick Farber Building
50 Center Street, Ellenville



Ulster County Law Enforcement Center
380 Boulevard, Kingston



Ulster County Health Department
239 Golden Hill Drive, Kingston

Installations Supported by the NYSEERDA Deployment Program During 2015

Municipal Facilities (54 new EV outlets)

- Dobbs Ferry
- Jamestown
- Newtown
- New York City Department of Transportation
- Ossining
- Ulster County
- Village of Rouses Point

Multif-Family (16 new EV outlets)

- Bryant Gardens
- Ritz Carlton
- Trump Tower

Transportation Hubs (14 new EV outlets)

- Metro-North Train Stations
 - Beacon North
 - Brewster North
 - Cortlandt
- East Hampton Airport

Universities and /Colleges (30 new EV outlets)

- Hofstra University
- Jamestown Community College
- Rochester Institute of Technology
- Suffolk County Community College
- SUNY Oneonta
- SUNY Purchase
- Hofstra University
- Jamestown Community College
- Rochester Institute of Technology
- Suffolk County Community College
- SUNY Purchase
- SUNY Oneonta

Medical Institutions (14 new EV outlets)

- Northwell Health (NS-LIJ)
 - Bay Shore
 - Huntington
 - Manhasset
- Peconic Bay Medical Center

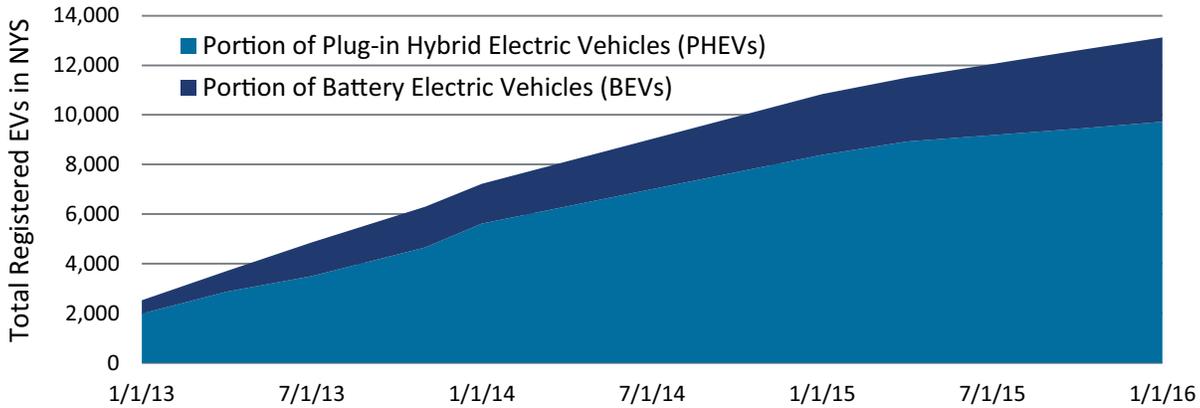
Other Workplaces (2 new EV outlets)

- Anheuser-Busch

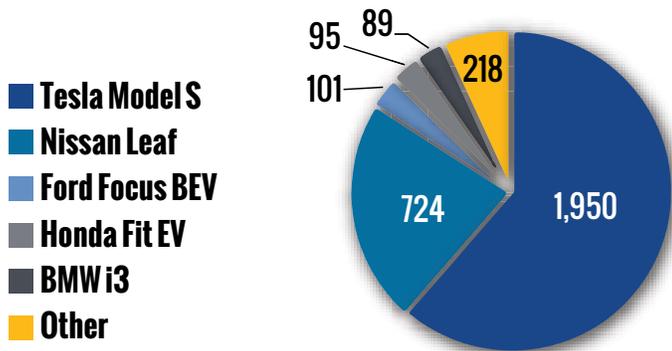
Retail (26 new EV outlets)

- Key Foods
- Price Chopper

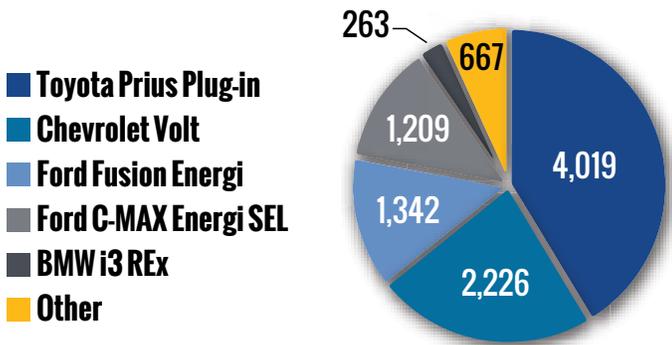
Plug-in Electric Vehicle Ownership in New York State



Current BEVs

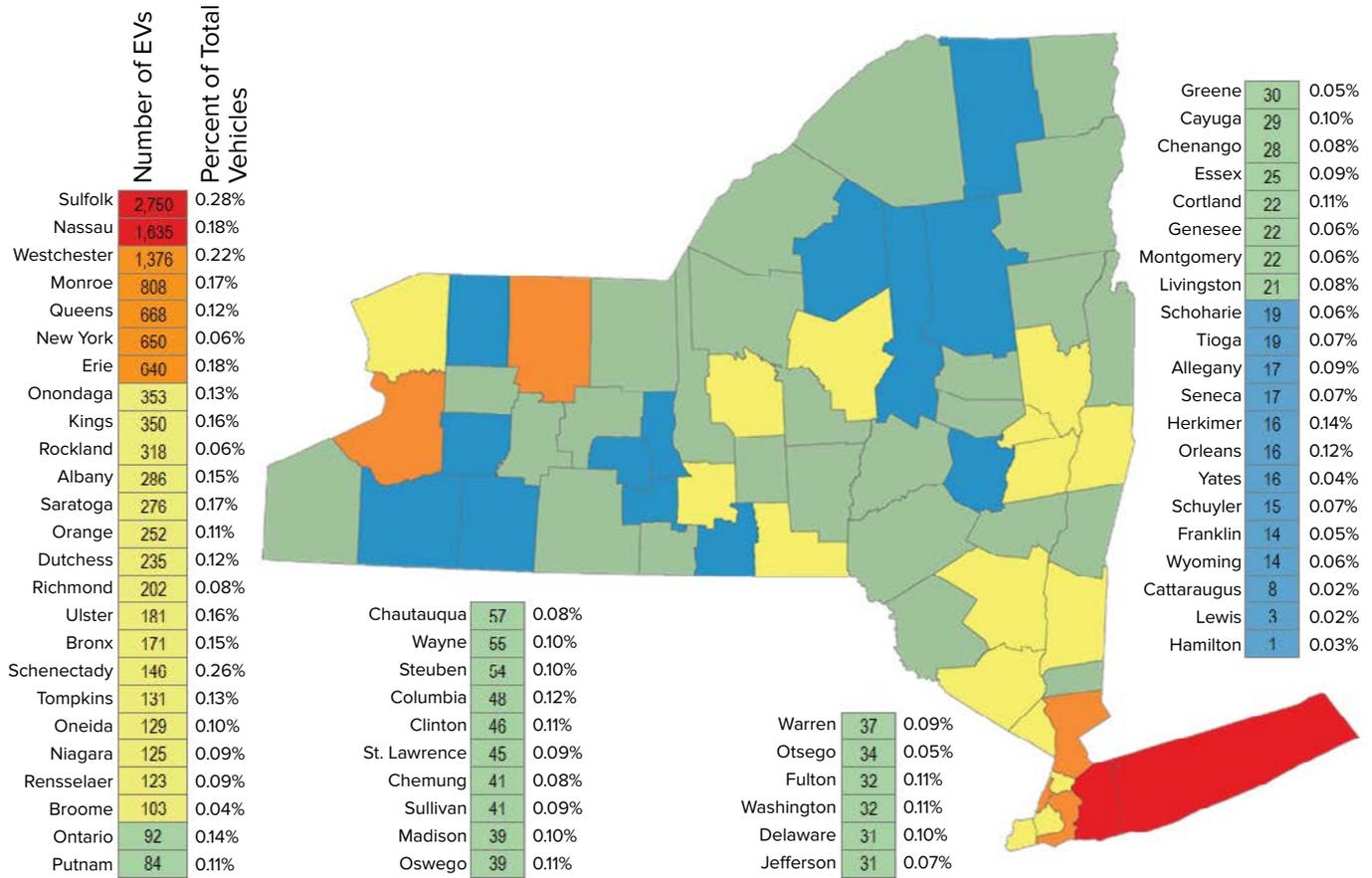


Current PHEVs



BEVs and PHEVs by County

(NYS Department of Motor Vehicle data as of 12/31/2015)



2,750
Electrical Vehicles
in Suffolk County

EV Charging Station Utilization

The 628 EV charging station outlets in the NYSERDA Deployment Program resulted in the following statistics based on their EV charging they facilitated in 2015:

Consumption of
362 MWh
of energy

Displacement of
48,000
gallons
of petroleum

Savings of
647,000 lbs.
of CO₂ emissions

Public Access EV Stations Statistics

31,814 charge events
totaling 213 MWh

3.5% of the time an
EV Outlet was occupied

50% of the occupied time
was spent charging

0.23 charge events per
day per EV outlet

3.6 plug-in hours and
6.7 kWh per charge event

Limited Access EV Stations Statistics

Limited access stations are installed specifically for, but may not necessarily be restricted to, a select group (e.g., employees, apartment building tenants, or hotel guests)

12,399 charge events
totaling 98 MWh

4.3% of the time an
EV outlet was occupied

41% of the occupied time
was spent charging

0.18 charge events per
day per EV outlet

5.7 plug-in hours and
7.9 kWh per charge event



East Hampton Airport
200 Daniels Hole Road

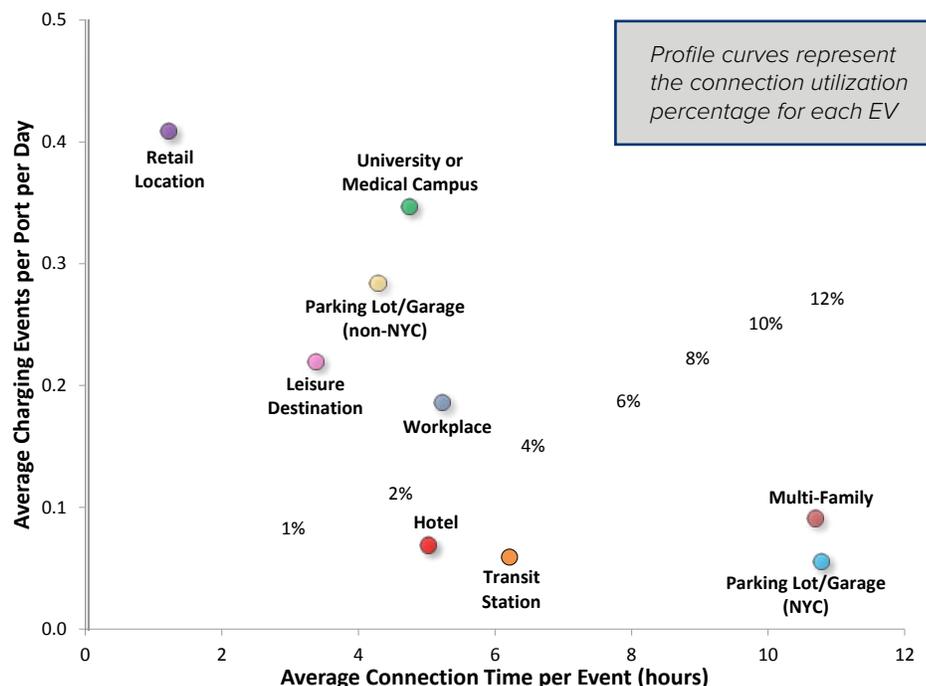


IBM
Route 134, Yorktown

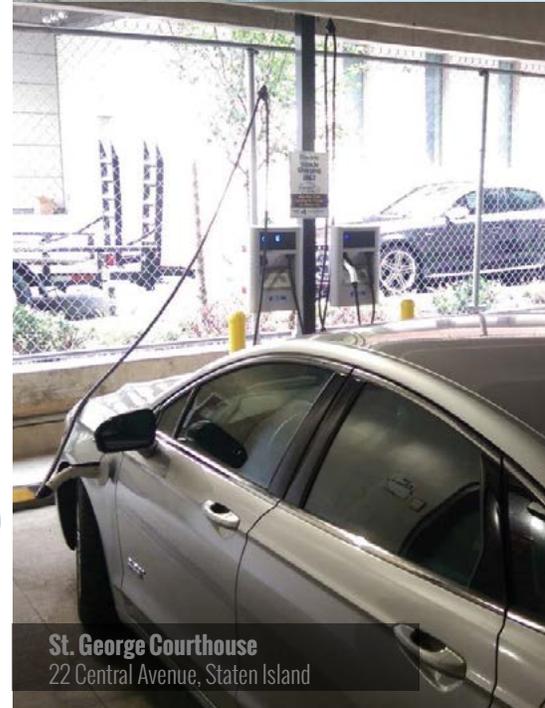
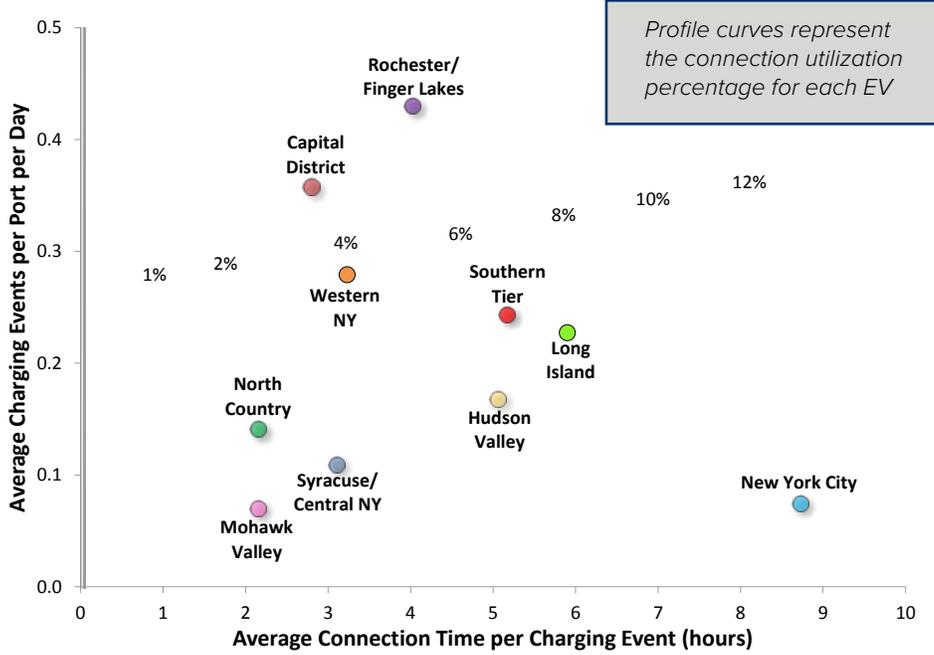
Highlights of the charging station installations in the NYSERDA Deployment Program

- Rochester/Finger Lakes region were occupied the most.** A vehicle was plugged into a port for an average of 7.2% of the time. Long Island followed with 5.6% of the time, and the Capital District was plugged in 4.2% of the time. **Urban-based EV charging stations are also occupied more often (4.6%) than stations in suburban (3.3%) or rural (1.8%) locations.**
- New York City (NYC) parking garages, multifamily dwellings, and hotels averaged few charge events per day, but dispensed the highest amounts of energy per charge event.** EV charging stations that **charged a fee for use** (most are NYC parking garages) followed this same trend: few charge events per day, but high energy dispensed per charge event.
- The **average plug-in time per charge event differed for various location types.** Shortest, by far, were the retail locations (1.2 hours), followed by leisure destinations (3.4 hours), non-NYC parking lot/garages (4.3 hours), university or medical centers (4.7 hours), hotels (5.0 hours), workplaces (5.2 hours), and transit stations (6.2 hours). **NYC parking garages and multifamily dwellings** showed the longest plug-in times per charge event, with an average of 10.8 and 10.7 hours, respectively.

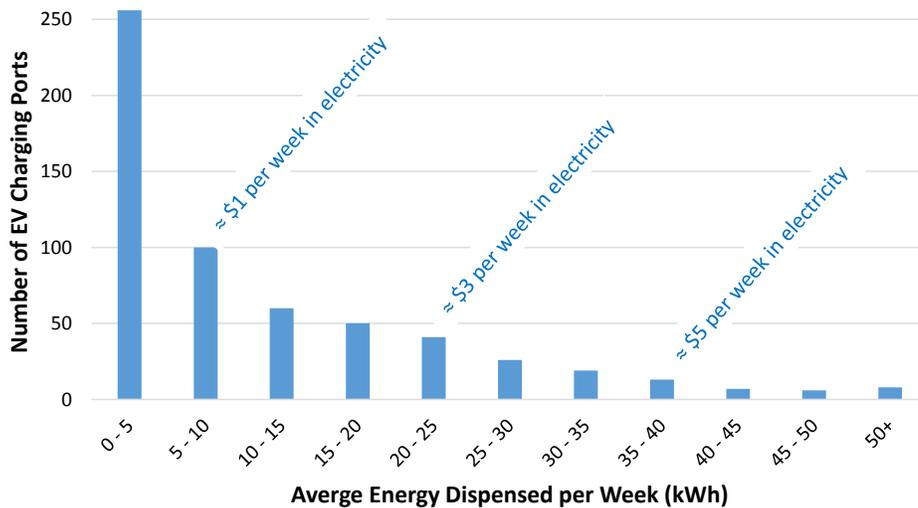
Comparison of Public NYS EV Charging Station Usage



Comparison of Public NYS EV Charging Station Usage



Average EV Charging Station Energy Dispersed per Station in 2015





Chili's Restaurant
382 Route 9W, Glenmont



Washington Square Garage
111 Woodbury Street, Rochester

Media Coverage

1. Aaron Dorman. Electric cars in NY: Is the future is already here? Times Union. November 6, 2015. <http://www.timesunion.com/news/article/Electric-cars-in-NY-Is-the-future-is-already-6615168.php>
2. New York Expands Electric Vehicle Charging Network. NGT News. October 15, 2015. <http://ngtnews.com/new-york-expands-electric-vehicle-charging-network/>
3. NYPA and NYSERDA Team Up on New EV Infrastructure in Hudson Valley. NY Power Authority. October 14, 2015. <http://www.nypa.gov/Press/2015/101415.html>
4. Clarkson University Accepts Challenge to Increase Use of Electric Vehicles. Clarkson University. October 6, 2015. http://www.clarkson.edu/news/2015/news-release_2015-10-06-1.html
5. Beth Young. Southold Pursues Public Electric Car Charging Stations. East End Beacon. October 6, 2015. <http://www.eastendbeacon.com/2015/10/06/southold-pursues-public-electric-car-charging-stations/>
6. Patricia Doxey. Ulster County has installed 9 electric car-charging stations, and they can be used for free. Daily Freeman. August 9, 2015. <http://ulster-county-has-installed-9-electric-car-charging-stations-and-they-can-be-used-for-free>
7. Khurram Saeed. Car charging stations coming to Thruway. Iohud. March 26, 2015. <http://www.lohud.com/story/news/traffic/2015/03/26/thruway-charging-stations-coming/70491338/>
8. Matt Coyne. Want electric car charging stations? Easy, just ask. Iohud. March 11, 2015. <http://www.lohud.com/story/news/local/westchester/2015/03/07/westchester-county-electric-car-charging-stations-clustered-white-plains-bedford/24581953/>
9. New York has second highest number of EV charging stations in US. Ecomento. February 11, 2015. <http://ecomento.com/2015/02/11/new-york-has-second-highest-number-of-ev-charging-stations-in-us/>
10. Allison Dunne. SUNY New Paltz Installs Its First Electric Vehicle Charging Stations. WAMC. February 12, 2015. <http://wamc.org/post/suny-new-paltz-installs-its-first-electric-vehicle-charging-stations#stream/0>
11. Matt Coyne. New York near the top in electric car charging stations. Lohud (USA Today). February 7, 2015. <http://www.lohud.com/story/news/local/westchester/2015/02/07/department-energy-numbers-new-york-fourth-electric-car-charging-stations-nationwide/22886019/>



Metro-North Train Station
2 Independent Way, Brewster

Detailed EV Charging Station Usage Statistics*

Access	Ports	Total Days of Port Availability	Charge Events (CE)	Charge Events per day	Plug-in Time			Charging Time			% of Plug-in time charging	Total Energy (kWh)	Energy per CE
					Hours	Hours per CE	%	Hours	Hours per CE	%			
Public	435	136,316	31,814	0.23	113,023	3.6	3.5%	56,103	1.8	1.7%	50%	212,817	6.7
Limited	200	68,729	12,399	0.18	70,428	5.7	4.3%	28,839	2.3	1.7%	41%	98,236	7.9

Region	Ports	Total Days of Port Availability	Charge Events (CE)	Charge Events per day	Plug-in Time			Charging Time			% of Plug-in time charging	Total Energy (kWh)	Energy per CE
					Hours	Hours per CE	%	Hours	Hours per CE	%			
New York City	174	50,502	3,770	0.07	32,887	8.7	2.7%	12,007	3.2	1.0%	37%	59,480	15.8
Capital District	128	43,244	15,476	0.36	43,295	2.8	4.2%	23,007	1.5	2.2%	53%	80,315	5.2
Hudson Valley	105	28,228	4,741	0.17	24,004	5.1	3.5%	11,394	2.4	1.7%	47%	40,053	8.4
Long Island	70	22,957	5,220	0.23	30,783	5.9	5.6%	11,228	2.2	2.0%	36%	41,262	7.9
Western NY	52	19,955	5,572	0.28	17,993	3.2	3.8%	10,613	1.9	2.2%	59%	34,780	6.2
Rochester/ Finger Lakes	34	14,195	6,106	0.43	24,575	4.0	7.2%	11,057	1.8	3.2%	45%	34,365	5.6
North Country	30	10,240	1,444	0.14	3,109	2.2	1.3%	2,064	1.4	0.8%	66%	7,279	5.0
Syracuse/ Central NY	26	8,944	981	0.11	3,045	3.1	1.4%	1,686	1.7	0.8%	55%	5,928	6.0
Mohawk Valley & Southern Tier	16	6,780	903	0.13	3,759	4.2	2.3%	1,888	2.1	1.2%	50%	7,592	8.4

*Includes data from all stations reporting usage, which may be less than all stations installed by the end of 2015.



County Community College
Riverhead, NY

Detailed EV Charging Station Usage Statistics (continued)

Land Use Type	Ports	Total Days of Port Availability	Charge Events (CE)	Charge Events per day	Plug-in Time			Charging Time			% of Plug-in time charging	Total Energy (kWh)	Energy per CE
					Hours	Hours per CE	%	Hours	Hours per CE	%			
Suburban	325	104,627	26,178	0.25	83,836	3.2	3.3%	42,192	1.6	1.7%	50%	142,242	5.4
Urban	269	83,201	16,328	0.20	92,218	5.6	4.6%	38,846	2.4	1.9%	42%	154,623	9.5
Rural	41	17,217	1,707	0.10	7,397	4.3	1.8%	3,904	2.3	0.9%	53%	14,189	8.3

Location Type/Venue	Ports	Total Days of Port Availability	Charge Events (CE)	Charge Events per day	Plug-in Time			Charging Time			% of Plug-in time charging	Total Energy (kWh)	Energy per CE
					Hours	Hours per CE	%	Hours	Hours per CE	%			
Parking Lot/ Garage (NYC)	149	42,502	2,357	0.06	25,414	10.8	2.5%	8,872	3.8	0.9%	35%	49,790	21.1
University or Medical Campus	114	37,918	13,173	0.35	62,510	4.7	6.9%	28,191	2.1	3.1%	45%	95,899	7.3
Retail Location	95	29,048	11,877	0.41	14,500	1.2	2.1%	12,078	1.0	1.7%	83%	44,889	3.8
Parking Lot/ Garage (non-NYC)	79	27,536	7,837	0.28	33,560	4.3	5.1%	14,190	1.8	2.1%	42%	48,107	6.1
Workplace	57	26,035	4,840	0.19	25,309	5.2	4.1%	12,268	2.5	2.0%	48%	33,353	6.9
Transit Station	64	14,943	886	0.06	5,504	6.2	1.5%	1,659	1.9	0.5%	30%	6,463	7.3
Hotel	36	12,508	867	0.07	4,357	5.0	1.5%	2,178	2.5	0.7%	50%	9,666	11.1
Multifamily	20	6,418	585	0.09	6,255	10.7	4.1%	2,154	3.7	1.4%	34%	11,534	19.7
Leisure Destination	21	8,137	1,791	0.22	6,042	3.4	3.1%	3,353	1.9	1.7%	55%	11,353	6.3

Payment Required	Ports	Total Days of Port Availability	Charge Events (CE)	Charge Events per day	Plug-in Time			Charging Time			% of Plug-in time	Total Energy (kWh)	Energy per CE
					Hours	Hours per CE	%	Hours	Hours per CE	%			
No	527	169,392	41,688	0.25	167,367	4.0	4.1%	77,376	1.9	1.9%	46%	272,798	6.5
Yes	108	35,653	2,525	0.07	16,084	6.4	1.9%	7,566	3.0	0.9%	47%	38,256	15.2

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