Penn Sustainability

Low-Emissions Vehicle Purchasing Guidance

August 2025

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OVERVIEW

How to Use this Guide:

This guide is intended to be an easy-to-use document that provides purchasers considering electric vehicles with:

- A general understanding of the concepts and benefits of purchasing low- or zero-emission vehicles
- Resources for funding
- Recommended vehicle options (including alternatives for vehicle classes whose needs are not currently met by the available low- or zero-emissions vehicles available)
- An overview of the purchasing process at Penn
- Information on infrastructure and other support

Penn's *Climate and Sustainability Action Plan (CSAP)* represents a vision for the University's sustainable future. This guide was authored in summer 2025 following the launch of *CSAP 4.0* in November 2024. Included in *CSAP 4.0* is a goal to optimize Penn's fleet towards zero-emission vehicles.

These vehicles can not only help reduce Penn's carbon footprint, but they also reduce the negative impact air pollution has on human health, which can lead to conditions like asthma and lung cancer. The American Lung Association gave Philadelphia a "failing" grade for its annual particle pollution levels, showing that there is a lot of room for improvement when it comes to our air pollution. One of the main contributors to Philadelphia's polluted air is local emissions, which Penn's vehicles contribute to.

Recognizing the social and environmental impacts of University vehicles is particularly important given the environmental inequity that exists in the communities surrounding Penn's main campus. Philadelphia's poor air quality also impacts the University, both in maintenance costs and impacts on the health of faculty and staff.

The two main vehicle types emphasized in this guide are battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). When possible, preference should be given to BEVs due to their greater ability to contribute to Penn's goal of carbon neutrality by 2042.

In the AASHE (Association of Advancement of Sustainability in Higher Education) 2021 Sustainable Campus Index, Penn ranked 7th as a top performer in transportation. In FY22, Penn Transportation purchased four Ford electric passenger vans for the first time. A year later, in FY23, two more electric passenger vans were added to the fleet. Each van will eliminate at least 13 MTCDE (metric tons of carbon dioxide equivalents) per year, reducing 78 MTCDE or more annually. Building off that, more Penn departments purchased electric vehicles in FY23, including electric carts and passenger vehicles. In FY25, the University expanded its electric fleet further by adding eight more electric vehicles. These are great achievements in addressing the carbon footprint of our campus fleets, but Penn hopes this guide will help further those efforts. For any questions about the information within this document, please contact the Penn Sustainability Office at sustainability@upenn.edu.

INTRODUCTION

The 2025 Low-Emissions Vehicle Purchasing Guidance is a tool to help Penn fleet managers integrate low-emission vehicles into their fleets. This initiative aligns with the University's *CSAP 4.0* commitment to optimize the campus fleet towards zero-emission vehicles. By curbing the environmental impact of Penn's fleet, we further our pursuit of a sustainable campus environment.

The 2025 update of the Low-Emissions Vehicle Purchasing Guidance features these three important sections:

1. **Updated Funding Resources:** Recognizing that funding is often a pivotal obstacle in the path toward low-emission vehicle acquisition, we have updated the funding resources section. This section provides pertinent details such as available amounts of funds, eligible vehicles, and application deadlines.

The 2025 Low-Emissions Vehicle Purchasing Guidance continues to catalyze the low-emission vehicle transition at Penn. Guided by the principles of *CSAP 4.0*, this document embodies the University's commitment to a greener, more sustainable future.

For detailed information and resources, please refer to the following guidance.

VEHICLE TYPES AND IMPACTS

Electric vehicles generally fall under the following four categories:

- **Battery Electric Vehicles** (BEVs) – powered by electric motors and are offered in a wide range of vehicle types for both short- and long-distance travel
- **Low Speed Vehicles** (LSVs) – lightweight vehicles powered by an electric motor with a maximum speed of 25 mph
- **Plug-In Hybrid Vehicles** (PHEVs) – have both an electric motor and a gasoline motor to benefit from both fuel types; these are ideal when charging availability is limited or uncertain
- **Fuel Cell Electric Vehicle** (FCEV) – powered by hydrogen and emits only water vapor and warm air

Nissan LEAF, Battery Electric Model (BEV)	Columbia Electric Utilitruck (LSV)	Chrysler Pacifica, Plugin Hybrid Model (PHEV)	Hydrogen Powered Street Sweeper (FCEV)

Internal combustion engine vehicles (ICEVs) cover all vehicles that are powered by combustion, most commonly by burning gasoline or diesel. Alternative fuel vehicles (AFVs) are a subset of ICEVs that are powered by fuel sources like compressed natural gas.

In some cases, the utility of a vehicle may not be able to be fulfilled by the current selection of EVs available. However, lower emissions options may be available and should be considered.

Achieving Penn's *CSAP* Goals

CSAP 4.0 expands upon previous *CSAPs* to reduce Penn's emissions. The main goals outlined in *CSAP 4.0* regarding Penn's campus fleets are as follows:

- Continue progress toward carbon neutrality by 2042.
- Facilitate an increase in commuter trips to Penn made by non-single occupancy vehicles
- Make data-informed recommendations to continue to optimize sustainable options in Penn's parking infrastructure
- Facilitate an optimization of Penn's fleet towards zero-emission vehicles

This guide aims to address these goals by providing a comprehensive set of resources and recommendations for purchasing and funding vehicles.

When possible, **preference should be given to battery electric vehicles** (BEVs) because of their greater ability to contribute to Penn's carbon neutrality goal. Research shows that the emissions associated with the lifecycle of BEVs are significantly less than those of their gas or diesel ICEV counterparts. This is especially true considering the energy makeup of Philadelphia's electrical grid, combined with increases in renewable energy sources from the electrical grid and through Penn's Power Purchase Agreement.

For more information on the global warming potential (GWP) of EVs, see **Appendix I: Global Warming Potential (GWP) of EVs**.

Lifecycle Cost

In addition to reduced emissions, one of the major benefits of incorporating EVs into Penn's fleets is the **lowered cost of maintenance over time**. EVs cost less on average to keep running than ICEVs because they don't need regular oil changes and have fewer moving parts that need to be maintained or replaced. According to a 2025 study published in Nature Energy, citing Argonne National Laboratory, the average maintenance cost per mile for battery electric vehicles (BEVs) is $0.06, compared to $0.10 per mile for internal combustion engine vehicles (ICEVs), reflecting significant cost savings over time.

The cost to power EVs is also lower than it is for ICEVs. According to the National Resources Defense Council, EV drivers spend 60% less each year on fuel costs than those driving gas-powered vehicles. Contributing to these savings, electric vehicles can charge overnight when electricity rates are lower, which can lead to savings of 30% on that charge. For more information, see **Additional Resources: FAQ**.

Additional rebates/incentives for fleet replacement and EV charger installation can be found in the table under **Funding Resources**. Purchasing via the Climate Mayors EV Purchasing Collaborative provides further financial and infrastructure resources. For more information on the Collaborative, see the **Purchasing Process** section of this guide.

FUNDING RESOURCES

The following information provides various funding options for hybrid and electric vehicles and charging stations. For further assistance in searching for government rebates, grants, and other funding opportunities, please contact the Sustainability Office at sustainability@upenn.edu.

Funding Quick Guide

The following table provides a quick overview of the available funding options. See below or follow the links for more details.

FUNDING QUICK GUIDE					
Federal Programs					
Name	**Source**	**Amount**	**Vehicle Type**	**Notes**	**Contact**
FTA Grants for Buses and Bus Facilities Competitive Program	Federal	Up to 80% of project costs (Awards in past years have ranged from hundreds of thousands to tens of millions of dollars per project. Applicants should propose amounts justified by their project needs.)	Buses / Bus facilities	FY25 application cycle closed. Competitive grant for bus and facility capital projects. Check FTA site for future funding rounds and most recent information.	
EPA Clean Heavy-Duty Vehicle Program	Federal	Varies by project scope	Replace class 6 & 7 heavy-duty vehicles with zero-emissions alternatives	Funding available through 2031 in the form of grants and rebates; 2024 application cycle closed, no new 2025 NOFO currently open. View website for latest information on how to claim this credit	
State Programs					
Name	**Source**	**Amount**	**Vehicle Type**	**Notes**	**Contact**
Alternative Fuels Incentive	State	Applicants will be eligible for a maximum grant	Covers projects that retrofit old vehicles,	An applicant may submit more than one application;	Josh Dziubek , Energy

Grant Program (AFIG)		award across all applications of $500,000. Individual application awards are still capped at $300,000, FY25 reopened with ~$5M total funding	purchase new vehicles, purchase charging equipment, and conduct research	however, no business or business with ownership in common will be awarded more than the maximum applicant award amount ($500,000) from the program during the fiscal year. The AFIG program will reopen for 2025 in the spring. AFIG has approximately $5 million in funding available	Programs Office jdziubek@pa.gov
Driving PA Forward: Onroad Rebate Program for Trucks and Buses	State	Diesel and Alternative Fuel Reimbursement Amounts Electric Vehicle Reimbursement Amounts Electric Vehicle with Infrastructure Reimbursement Amounts	Fund rebates for projects that replace or repower single or fleets of 5 or fewer vehicles, which are GVWR-Class 4-8 trucks, port drayage trucks, school buses, shuttle buses, and/or transit buses	As of March 1, 2025, approximately $1.0 million in uncommitted funds remain available	RA-EPVWMITIGATION@pa.gov
Driving PA Forward: Clean Diesel Grant Program	State	Reimbursement Chart	Emission reduction technologies include but are not limited to exhaust controls, engine upgrades, engine and vehicle replacement, idle reduction technologies, aerodynamic	The federal fiscal years 2023–2024 Clean Diesel Grant Program has been rebranded as the Pennsylvania Freight Innovations in Transportation (PA-FIT) Grant Program. The application period is expected to	RA-EPVWMITIGATION@pa.gov / (717) 787-9495

			technologies. Vehicles or engines must be scrapped per Program Guidelines.	open to the public in Q3 2025, with approximately $4.0 million in total funding available. This grant is jointly funded by Volkswagen settlement funds and the Diesel Emission Reduction Act (DERA), which is disbursed by the U.S. EPA. All approved projects must be completed by August 31, 2026.	
Private Programs					
Name	**Source**	**Amount**	**Vehicle Type**	**Notes**	**Contact**
PECO Public Benefit Charging Program Rebate	Private	Incentives are capped at 50% of the cost of equipment, installation, and make ready work for the project. $60,000/year/customer maximum	EV charging infrastructure; Level 2 chargers and Direct Current Fast Chargers (DCFCs) are eligible for rebates.	To receive a rebate, an applicant must be a commercial, industrial, or governmental PECO customer that receives electric service to the project site under PECO Rate GS (General Service), Rate HT (High Tension Power), or Rate PD (Primary Distribution Power), regardless of the retail electric supplier.	
PECO Level 2 Commercial Electric	Private	The base rebate amount is calculated as the lesser of $2,000 per Charging	Provides rebates for make-ready costs associated with the installation of	To receive a rebate, an applicant must be a commercial, industrial, or	

[Charging Program]		Port or 50% of eligible makeready costs. For projects located in EJAs, we offer an enhanced rebate calculated as the lesser of $3,000 per Charging Port; max $60,000/year	new qualifying Level 2 EV chargers at sites with non-residential PECO electric service	governmental PECO customer that receives electric service to the project site under PECO Rate GS (General Service), Rate HT (High Tension Power), or Rate PD (Primary Distribution Power), regardless of the retail electric supplier. Must apply before project starts; provide 2 years of charger usage data; ends May 31, 2029.	

Federal Funding

Federal funding is available through the Grants for Buses and Bus Facilities Competitive Program and the Clean Heavy-Duty Vehicle Program.

Pennsylvania Commonwealth Funding

The **Alternative Fuels Incentive Grant Program** (AFIG) is provided through the Pennsylvania Department of Environmental Protection. This competitive grant program provides up to $5 million in funding to school districts, municipalities, nonprofit organizations, and businesses in Pennsylvania that want to transition to cleaner fuel transportation. Grant application periods run each year, and more information can be found here.

Driving PA Forward is another state-funded opportunity that focuses on promoting better air quality. One incentive offered through this program is the Onroad Trucks & Buses Rebate Program. This program allocated approximately $30 million over a 5-year period to fund rebates for projects that replace or repower single or fleets of 5 or fewer vehicles, which are GVWR-Class 4-8 trucks, port drayage trucks, school buses, shuttle buses, and/or transit buses. Follow this link to find other grant and rebate opportunities that focus on reducing emissions from diesel engines.

Additional Sources

The **Climate Mayors Electric Vehicle Purchasing Collaborative's leasing options** allow savings to be passed along to your department. For more information regarding purchasing through the Climate Mayors EV Purchasing Collaborative, please refer to the **Purchasing Process** section of this guide or this webpage.

The U.S. Department of Energy has a database of all federal and State Laws and Incentives. This can be used to look for both federal and Pennsylvania-specific incentives by fuel type. The example shown below shows federal incentives for EVs. This tool is useful for seeing the most up-to-date information for both funding and laws/regulations regarding alternative fuel vehicles.

Category Search

Jurisdiction	Technology/Fuel	Incentive/Regulation	User
☐ All	☐ All	☐ All	☐ All
☑ Federal	☐ Biodiesel	☐ Grants	☐ Commercial
☐ Alabama	☐ Ethanol	☐ Tax Incentives	☐ Government Entity
☐ Alaska	☐ Natural Gas	☐ Loans and Leases	☐ Tribal Government
☐ Arizona	☐ Propane (LPG)	☐ Rebates	☐ Personal Vehicle Owner or Driver
☐ Arkansas	☐ Hydrogen Fuel Cells	☐ Exemptions	☐ Alternative Fuel
☐ California	☑ EVs	☐ Time-of-Use Rate	

SEARCH CLEAR

54 results for:
Jurisdiction: US
Technology/Fuel: EVs

Search Results | 54 laws and incentives

VIEW ALL DOWNLOAD CSV

Jurisdiction	Title	Type
Federal	Congestion Mitigation and Air Quality (CMAQ) Improvement Program	Incentives
Federal	State Energy Program (SEP) Funding	Incentives
Federal	Clean School Bus	Incentives
Federal	Electric Vehicle (EV) and Fuel Cell Electric Vehicle (FCEV) Manufacturing Loans	Incentives

RECOMMENDED VEHICLES

Below are recommendations for vehicles that are sustainable alternatives by type/utility. Because this market is constantly expanding, referring to the U.S. Department of Energy's database of hybrids and federally recognized alternative fuel vehicles is recommended.

Please note that the **prices listed are estimates** – actual prices may vary depending on the vehicle's specifications/availability. Penn Procurement Services recommends working directly with a dealership to obtain the best prices.

Sourcewell/the Climate Mayors EV Purchasing Collaborative updates its offerings frequently, so it is best to check the Offerings page of their website for the most up-to-date information.

In addition to these recommendations, please view Appendix I for a checklist of questions to consider and a framework for cost analysis between gas and electric-powered vehicles.

Terminology:

- E-Assist Bike – Bicycles with built-in electric motors
- BEV – Battery Electric Vehicle
- PHEV – Plug-in Hybrid Electric Vehicle
- FCEV – Fuel Cell Electric Vehicle (hydrogen cell)
- ICEV – Internal Combustion Engine Vehicle

Vehicle	Image	Fuel Type	Est. Price	Notes
Fuji E-Crosstown		E-Assist Bike	$1,499	Battery: Fuji Power Pack 468Wh w/ 2A charger
Fuji E-Traverse 2.1 ST		E-Assist Bike	$1,499	Battery: Fuji Power Pack 417Wh w/ 2A charger

Aventon Level 2 Commuter E-bike		E-Assist Bike	$1,399	Battery: 48 V 14 Ah (672 Wh)
RadWagon 5 Electric Cargo Bike		E-Assist Bike	$2,399	Battery: 15Ah 720 Wh Safe Shield Advanced External Battery
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
Columbia Utilitruck		BEV	$15,389	Product details
Deere TE 4x2 Electric Gator		BEV	$15,499	Product details
GEM eL XD		BEV	$18,741	Product details
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
2025 Chevrolet Equinox EV LT		BEV	$33.600	
2025 Chevrolet Bolt EV		BEV	TBD	
2024/2025 Nissan Leaf		BEV	$28,140	Product details
2024-2026 Chevrolet Blazer EV		BEV	$53,200	Product details;

2024/2025 Ford Escape Plug-In Hybrid		PHEV	$40,500	Product details
2024/2025 Honda Prologue		BEV	$47,400	Product details
2024/2025 Jeep Grand Cherokee 4xe		PHEV	$60,490	Product details
2024/2025 Rivian R1S Dual Standard		BEV	$79,400	Product details
2024/2025 Tesla Model 3		BEV	$42,490	Product details
2023-2025 Volkswagen ID.4 Pro		BEV	$45,095	Product details;
2023-2025 Volkswagen ID.4 Electric SUV		BEV	$39,735	Product details
2024 Acura ZDX		BEV	$68,500	Product details
2024/2025 Kia Sportage Plug-In Hybrid		PHEV	$39,890	Product details
2024/2025 Hyundai Kona Electric SUV		BEV	$32,975	Product details

2024/2025 Cadillac LYRIQ		BEV	$58,595	Product details
2024/2025 Toyota Highlander Hybrid		PHEV	$46,820	Product details
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
2022-2025 Chrysler Pacifica Hybrid		PHEV	$51,250	Product details
2023 Mercedes-Benz Metris Passenger Van		ICEV	$43,600	Product details
2024-2025 Mercedes-Benz e-Sprinter		BEV	$71,886	Product details
Ford Forest River E-Transit Van (2025)		BEV	Contact for pricing options	Product details
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
2022-2025 Ford E-Transit		BEV	$45,700	Available through Sourcewell; Product details
2025 Dodge Ram ProMaster		ICEV	$44,405	Product details

2024 BrightDrop Zevo 600 Electric Van		BEV	$62,725	Product details
2024/2025 Ford Transit		ICEV	$47,400	Product details
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
2022-2025 Ford F-150 Lightning		BEV	$63,345	Product details;
2024/2025 Ford F-150 XL		PHEV	$38,810	Product details
2024/2025 Ford Maverick		PHEV	$28,145	Product details
2025 Rivian R1T Dual Standard		BEV	$70,990	Product details
2023-2025 Rivian R1T Dual Large		BEV	$75,500	Product details
2025 GMC EV Hummer Pickup		BEV	$98,845	Product details
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**

BYD Electric Transit Bus		BEV	Contact BYD for pricing	Product details
Gillig Zero Emissions Electric Bus		BEV	Contact sales@gillig.com for pricing	Product details
GreenPower EV Bus		BEV	Contact GreenPower for pricing	Product details
New Flyer Xcelsior CHARGE NG		BEV	Contact the local rep for pricing	Product details
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
Kenworth K270E/K370E		BEV	Contact brett.duarte@paccar.com for pricing	Available through Sourcewell; Product details; medium-duty vehicles
Kenworth T680E		BEV	Contact brett.duarte@paccar.com for pricing	Available through Sourcewell; Product details; for regional haul and drayage
Lion Electric Lion8		BEV	Contact Lion Electric for pricing	Available through Sourcewell; a class 8 truck that can be customized based on use
Peterbilt 220EV		BEV	Contact Peterbilt.Info@paccar.com for pricing General website contact page	Available through Sourcewell; for pickup & delivery; see their operating costs calculator to compare power consumption & fuel costs

Peterbilt 579EV		BEV	Contact Peterbilt.Info@paccar.com for pricing General website contact page	Available through Sourcewell; for regional haul & drayage; see their operating costs calculator to compare power consumption & fuel costs
Global Environmental Sweepers M4 Electric Sweeper		BEV OR FCEV	Contact cbormann@globalsweeper.com for pricing General website contact page	Available through Sourcewell; 11 hours of operational time
Madvac LR50e Compact Sweeper		BEV	Contact gbally@exprolink.com for pricing General website contact page	Available through Sourcewell
Vehicle	**Image**	**Fuel type**	**Est. Price**	**Notes**
2024 Chevy Blazer EV Police Pursuit Vehicle		BEV	Contact GM Evolve for a quote	Product details; 190kW, DC Fast-Charging capable; Specialization Guide
Ford Police Interceptor Utility		HEV	Contact your local rep for pricing	Product details

For additional options, see the following resources:

- Sourcewell’s complete list of light-duty vehicles
- Sourcewell’s list of medium and heavy-duty vehicles
- Creative Bus Sales’ Ford Transit Passenger Van information
- U.S. Department of Energy’s Alternative Fuel and Advanced Vehicles search
- Contact your preferred local dealer for options for electric or alternative fuel vehicles with competitive quotes
- Popular brands for electric mowers, leaf-blowers, and other equipment: EGO, Greenworks, and Ryobi

To get connected with municipalities that purchase EV and hybrid police vehicles, please contact Sean Greene, Manager, Office of Freight and Clean Transportation at the Delaware Valley Regional Planning Commission at sgreene@dvrpc.org.

For further assistance in finding more environmentally friendly vehicle options or if you have questions about the information within this document, please contact the Penn Sustainability Office at sustainability@upenn.edu.

PURCHASING PROCESS

When purchasing a University vehicle, make sure to follow these Procurement Services guidelines:

- Obtain at least three bids (online quotes are discouraged as better prices can be obtained by contacting dealers directly)
- Have the paperwork signed by Procurement Services
- Register the vehicle with Risk Management

When purchasing through Holman, a fleet management service that handles leasing and purchasing, at least three bids are required. When purchasing via Sourcewell, multiple bids are encouraged to secure the best price, but are not required. Regardless of the vehicle's source, if your department would like to choose a higher bid, a justification should be provided.

When purchasing a vehicle, we recommend buyers **utilize the information and resources provided in this guide** to obtain the best vehicle options to help Penn reach zero emissions. Questions regarding the content of this guide can be directed to the Penn Sustainability Office at sustainability@upenn.edu.

For questions about the purchasing process, please contact Procurement Services at sourcing@upenn.edu.

Sourcing Options

When **purchasing from a dealership**, mention that your department is associated with the University of Pennsylvania and is **eligible for COSTARS** pricing. COSTARS is the Commonwealth of Pennsylvania's Cooperative Purchasing Program and offers discounts on items purchased through the cooperative.

If your department does not want to purchase directly through a vehicle dealership, **Holman** may be helpful.

For electric vehicles (EVs), the **Climate Mayors Electric Vehicle Purchasing Collaborative** is the best option. The Collaborative is a partnership between Second Nature, Climate Mayors, and Sourcewell, and has recently opened memberships to universities. The Collaborative's main objective is to decrease the upfront costs for EV procurement.

They also give members access to:

- Leasing options
- Competitively solicited EVs
- Charging infrastructure
- Technical analysis support
- Information for best practices with EV fleets

Vehicles that are currently available through the Collaborative can be found on their website. Sourcewell also provides access to numerous other products.

Penn's point of contact at Sourcewell is Abby Meinke, who can be reached via email. Please contact Penn Procurement for Penn's member number.

Vehicle Registration

When your department purchases a new vehicle, it is critical that you **notify Risk Management** so that they can properly insure the vehicle.

When purchasing and registering a new vehicle, please use the following name and address on all vehicle documents:

> The Trustees of the University of Pennsylvania
> 2929 Walnut Street
> Suite 460
> Philadelphia, PA 19104-5099

The following information should be emailed to the Office of Risk Management and Insurance at dofriskmgmt@pobox.upenn.edu:

- Bill of Sale
- MV-1
- Registration (temporary or permanent if the initial registration service is provided by the vendor)
- Name, mailing address, email, and phone number of the person who will be managing and/or responsible for the vehicle
- 26-digit account code for allocation of annual registration expenses

Risk Management can be reached at dofriskmgmt@pobox.upenn.edu, and additional questions can be emailed to Dana D'Amore. Additional information can be found on Risk Management's website.

When your department purchases an electric vehicle, there is an additional step that must be taken. After completing all of the steps detailed above, it is important that you also contact the Office, notifying them of the EV purchase. This is necessary for documentation purposes.

Vehicle Decommission

Departments seeking to decommission a University-owned vehicle have to notify the Office of Risk Management and Insurance and follow the proper procedures outlined below.

1. Notify the Office of Risk Management and Insurance with an email including the following information:
- Vehicle being disposed of (VIN, License Plate, Year, Make, Model)
- Name and address of the entity the vehicle is being sold to
- Sale price
- Odometer reading
2. The Office of Risk Management and Insurance will prepare the title for transfer and provide it to the individual completing the transaction.
- Upon completing the transaction, please retire the asset as per Financial Policy 1106.3.
3. Risk Management will:
- Confirm University ownership of the vehicle
- Prepare and execute the vehicle title transfer paperwork (if the vehicle is being sold or donated)
- Update Penn's liability and insurance records accordingly

Note :

- If the vehicle is transferred internally (i.e., from one Penn department to another), no formal title change occurs, but asset ownership must be reflected in Penn's internal property tracking systems. Departments can post the vehicle on Ben's Attic, Penn's internal reuse platform for surplus property. This allows other departments to express interest and facilitates transparent reuse within the University. For additional information, contact *Endo Mayuko* (215-898-4327) in the Office of Risk Management.

- If no internal transfer is feasible, surplus vehicles can be sold externally through GovDeals, an auction platform for government and University assets. For more information, contact: *Mark Moritz* (215-359-7296). For higher-value or fleet-style vehicle disposal, departments may coordinate with Manheim Auto Auctions to reach external dealer networks. For more information, contact: *Rich Mullen* (609-385-8998).

POLICIES & FORMS

Risk Management's website summarizes existing vehicle registration, disposition, and driver safety information.

ADDITIONAL RESOURCES

Charging Stations & Resources

ChargeHub provides information on the types and number of EV charging stations in Philadelphia. They also provide a map of charging locations, including ones on Penn's campus, which can be viewed here (type Philadelphia, PA into the "Search for a location" bar).

PennDOT also provides a map of charging stations, which is particularly useful for planning longer trips in Pennsylvania, as it shows designated Alternative Fuel Corridors (AFCs). AFCs are populated with EV charging stations to provide accessible roadways for traveling in an EV.

Currently, all 16 EV charging stations on campus are provided by Blink Charging Co. Campus chargers can be found at the following locations:

- 34th & Chestnut: 4 standalone Level 2 chargers, each with a single charging port and an exclusively reserved parking space.
- 38th & Walnut: 4 standalone Level 2 chargers, each with a single charging port and an exclusively reserved parking space.
- Penn Museum: 4 standalone Level 2 chargers, each with a single charging port and an exclusively reserved parking space.
- Pennovation: 2 dual-port Level 2 chargers, a total of 4 charge heads.

If your department would like to purchase and install its own charging stations (Level 1 or Level 2), please reach out to Penn Transportation and Parking. The cost of the project will vary, but funding assistance may be available through the state of Pennsylvania and/or PECO. Please refer to the Funding Quick Guide under **Funding Resources** for more information.

Fleet Certification

CALSTART Sustainable Fleet Accreditation recognizes sustainable fleets by setting objective, meaningful standards and guidelines. This accreditation stems from a partnership between CALSTART and NAFA and performs a rigorous assessment of your fleet's sustainable inventory and practices. There is a focus on the collection and organization of data, so documentation is important for fleets interested in this accreditation.

FAQ

Are electric vehicles able to travel as long as or as far as we need them to before running out of battery?

> Though the range varies with each vehicle make and model, the average EV has a range of around 250 miles. Select parking lots at Penn host Level 2 electric chargers that reach full charge in four to six hours. Fast Chargers (Level 3 chargers) reach full charge in around an hour. There are 108 Fast Chargers in the Philadelphia area, and a map of their locations can be viewed on ChargeHub. In the rare case that a Penn vehicle needs to travel long distances, PennDOT provides a map of charging stations along designated Alternative Fuel Corridors (AFCs). This allows for easier travel planning along EV accessible roadways.
>
> It should be noted that overusing Fast Chargers may reduce the lifespan of the vehicle's battery.

Are electric vehicle alternatives as powerful as gasoline or diesel-powered models?

> Electric motors generate 100% of their available torque instantly, enabling them to accelerate faster than gasoline-powered vehicles. Although most EVs are able to deliver equivalent power, they do typically have added weight from their fuel cells, which can cut into their total hauling capacity. For some models, such as the Rivian R1T, this issue has been fixed; it has a hauling capacity of up to 11,000 lbs. This shows that attention to detail is important when purchasing specialized utility vehicles to ensure the vehicle will be able to meet the desired use.
>
> Though EVs aren't currently able to cover every corner of the market, the number and variety of EVs have been expanding, and equivalent electric options are expected to emerge steadily.

What if electric models are more expensive?

> The cost of most EVs is higher than that of internal combustion vehicles because of the cost of manufacturing their batteries. Market trends show that battery prices are decreasing, which will lead to a lower cost of EVs. Given the Federal government's goal to achieve a 50-52% reduction in emissions by 2030 (the U.S. remains in the Paris Agreement at the time of this report's publication), the market also

expects to see more incentives to reduce the cost of EVs. Additionally, there are opportunities for grants, rebates, and tax credits associated with purchasing electric or hybrid vehicles, as shown in the **Funding Resources section of this guide.**

Do electric vehicle batteries present a safety risk?

A 2017 report by NHTSA on the safety of lithium-ion batteries, which power battery electric vehicles, states that fires and explosions from lithium-ion batteries are estimated to be comparable to or less than those for gasoline or diesel vehicles. In fact, the National Renewable Energy Laboratory stated that, though they are sensitive to overheating and overcharging, more than 99% of lithium-ion batteries used for EV energy storage will never have safety issues.

According to the U.S. Department of Energy, electric vehicles are manufactured with insulated high-voltage lines as an extra layer of protection. Additionally, light-duty EVs are required to have safety features that deactivate or isolate the electrical system when a collision or short-circuit is detected, eliminating any sort of electrical malfunction that may lead to a fire or explosion.

Are electric vehicles more costly to maintain and repair than vehicles with internal combustion engines?

While EVs can have a higher upfront cost for each maintenance event, they cost less on average to keep running than internal combustion engine vehicles (ICEVs) since they don't need regular oil changes. Additionally, EVs don't have spark plugs, valves, and catalytic converters that tend to fail in ICEVs and need replacement.

The cost of fueling EVs is also lower than that of ICEVs. As of June 2025, the average Philadelphia commercial electricity rate is $ 0.09382/kWh. For the most up-to-date rates, click this link. The average battery electric sedan reaches a full charge of 60kWh and is able to run for about 250 miles per charge, costing about $5.63 in total. Comparatively, according to the Federal Bureau of Transportation, the average 2022 ICEV light-duty passenger vehicle in the United States had a fuel economy of 22.8 mpg. In June 2025, gas in Philadelphia cost $3.3/gallon on average, costing roughly $36.18 to travel 250 miles (AAA). This indicates the large cost gap between using an EV and an ICEV in the Philadelphia area.

Are the emissions from charging an electric vehicle as bad as internal combustion engine vehicle emissions?

No, the overall carbon footprint for electric vehicles has been shown to be lower than that of internal combustion engines.

Philadelphia's electric grid draws its power from four main categories: nuclear power, coal, natural gas, and "other" sources. Our region's energy sources have been trending towards an increase in renewable energy sources, especially in wind and solar. This has resulted in an overall decrease in emissions associated with electricity production in Pennsylvania.

In December 2023, Penn's solar Power Purchase Agreement came online. The PPA provides approximately 70% of the electricity demand of the University of Pennsylvania and the University of Pennsylvania Health System in Greater Philadelphia. The University will purchase solar electricity from AES, the solar power system developer.

Additionally, Penn's emissions have also been decreasing due to shifts toward renewable energy grid sources. Penn's PPA, combined with our region's general trends toward more sustainable energy sources, will result in Penn's energy being sourced from predominantly renewable sources, decreasing the carbon footprint of campus operations, including vehicle charging.

More information can be found in the Achieving Penn's *CSAP 3.0 and 4.0* Goals under the **Vehicle Types & Impacts** section.

Can we support the infrastructure needed to use electric vehicles?

While Penn has 16 charging stations across campus, the capacity is currently larger than the demand. Additionally, as batteries become cheaper and more EVs populate the roads, the cost of charging stations is estimated to go down. There are also multiple grant and rebate programs for funding EV charging stations, such as the Alternative Fuels Incentive Grant program (AFIG). Due to these factors and rising demand, an increase in charging stations is expected to be seen not just at Penn but across the region, expanding the number of stations available in general.

How long does it take to charge an electric car at a charging station?

The 16 chargers on Penn's campus are all Level 2 chargers that plug into a regular outlet and can take three to five hours to get up to 80% charged.

Among the chargers Penn already has, do they use the NACS or CCS charging ports?

All charging stations utilized by Penn use a J1772 charging port, which is the smaller top half of the larger CCS plug. Also, because all the Penn chargers are from the Blink Charging Station and they have a plan to provide Dual-Port CCS and NACS Connectors, Penn chargers may have the chance to provide dual-port service in the future as we expand our charging infrastructure.

How does the manufacturing process for EV batteries impact their overall carbon emissions?

The manufacturing of EVs is more energy-intensive and produces more emissions than manufacturing a conventional car because of the electric vehicles' complex batteries. Lithium-ion battery production requires extracting and refining rare earth metals and is energy-intensive because of the high heat and sterile conditions needed. However, increasing the percentage of renewable energy used in plants that produce EV batteries would significantly reduce these emissions. Increased demand for EVs has led to the development of larger, more efficient factories that produce a lower carbon footprint per battery. Even without these improvements in manufacturing, EVs still have a lower lifetime carbon footprint than ICVs. Based on recent European studies of life-cycle emissions of EVs, an average EV produces 50% less life-cycle greenhouse gases over the first 150,000 kilometers (about 93,200 miles) of driving than an internal combustion engine vehicle.

What happens to the batteries of EVs at the end of their useful life?

Currently, it is difficult to recycle most EV batteries. There is no standardized design for EV batteries, and most are not designed with recycling in mind. Some governments are beginning to promote the recycling of EV batteries. China imposed new laws in 2018 that made EV manufacturers responsible for ensuring batteries are recycled, and as a result, it recycles more lithium-ion batteries than the rest of the world combined. Similarly, the European Union is requiring that at least 50%

of an EV battery's weight be recycled, with that percentage set to increase in the coming years.

In the US, the federal government has yet to tackle EV battery recycling laws, but the Department of Energy is actively supporting EV battery recycling through research grants and major investment programs, such as two-billion-dollar and multi-hundred-million-dollar loans to firms like Redwood Materials and Li-Cycle to build domestic battery processing capacity. On the state level, California—the nation's largest car market—is exploring setting its own rules. Pennsylvania currently does not have state battery regulations in place. In the US, most EV manufacturers can recycle parts of used batteries, but what cannot be recycled goes into the landfill. Tesla claims that "none of our scrapped lithium-ion batteries go to landfills and 100% are recycled," referring to the fact that all batteries returned to them are sent to recycling partners for material recovery.

References

- Information on the Health Effects of Ozone Pollution by the EPA
- Calculator from the Union of Concerned Scientists showing comparisons of emissions from EVs versus internal combustion engines
- EV Battery Degradation Comparison Tool by Geotab
- Case Studies on Fleet Electrification by the Climate Mayors Electrification Coalition
- Electrifying Transportation in Municipalities guide by the Electrification Coalition
- Plug-In Hybrid & Electric Vehicle Research Center at UC Davis
- Electric Vehicle Resource Kit provided by the Delaware Valley Regional Planning Commission

APPENDIX I

Global Warming Potential (GWP) of EVs

In a report published by the European Commission in 2020, a comprehensive look into the overall environmental impact using life cycle assessment (LCA) was conducted. This study covers fuel and electricity production, vehicle production, use and operation, and end-of-life.

The results of this study are measured by global warming impact (GWP) based on emissions. Lower medium vehicles, shown in *Figure 1*, include the following passenger vehicles: class C vehicles (e.g., Ford Taurus) and medium SUVs (e.g., Ford Escape). Urban buses, shown in *Figure 2*, include models that have a single deck and are 12 meters long.

In *Figure 1* and *Figure 2*, the following fuel types are represented:

- ICEV-G – gasoline-fueled internal combustion engine
- ICEV-D – diesel-fueled internal combustion engine
- ICEV-CNG – compressed natural gas-fueled internal combustion engine
- HEV-G – gasoline and battery hybrid electric vehicle
- HEV-D – diesel and battery hybrid electric vehicle
- PHEV-G – gasoline and battery plug-in hybrid electric vehicle
- PHEV-D – diesel and battery plug-in hybrid electric vehicle
- FCEV – hydrogen fuel cell electric vehicle
- BEV – battery electric vehicle

The calculated GWP for 2020, 2030, and 2050 for each fuel type is shown in *Figures 1* and *2*. For 2050, the "TECH1.5" scenario reflects projected adjustments in infrastructure, policy, etc., to align with the Paris Agreement and keep global temperature increase to a 1.5°C maximum. The GWP for 2020 and 2030 are in accordance with 2020 baseline conditions.

The results of this study indicate that for both classes of vehicles, **battery electric vehicles (BEVs) have the lowest overall global warming potential** projected over the next several decades.

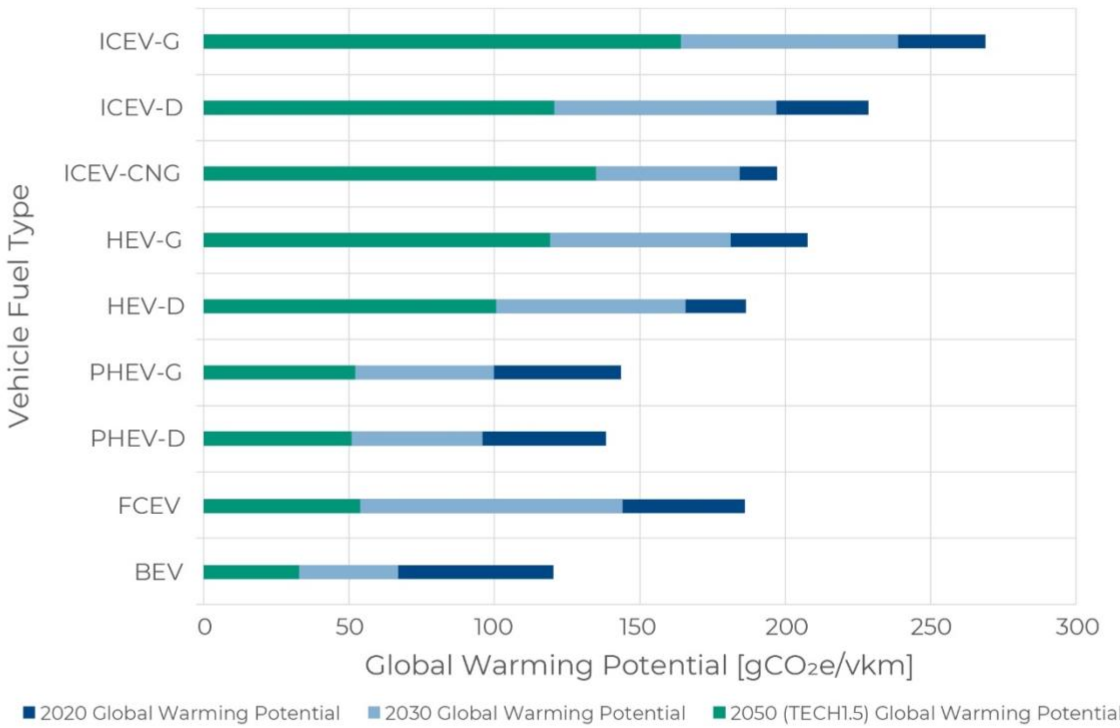


Figure 1. Summary of overall lifecycle GWP impacts for Lower Medium Cars by fuel type (*Determining the environmental impacts of conventional and alternatively fueled vehicles through LCA*, Figure 5.58).

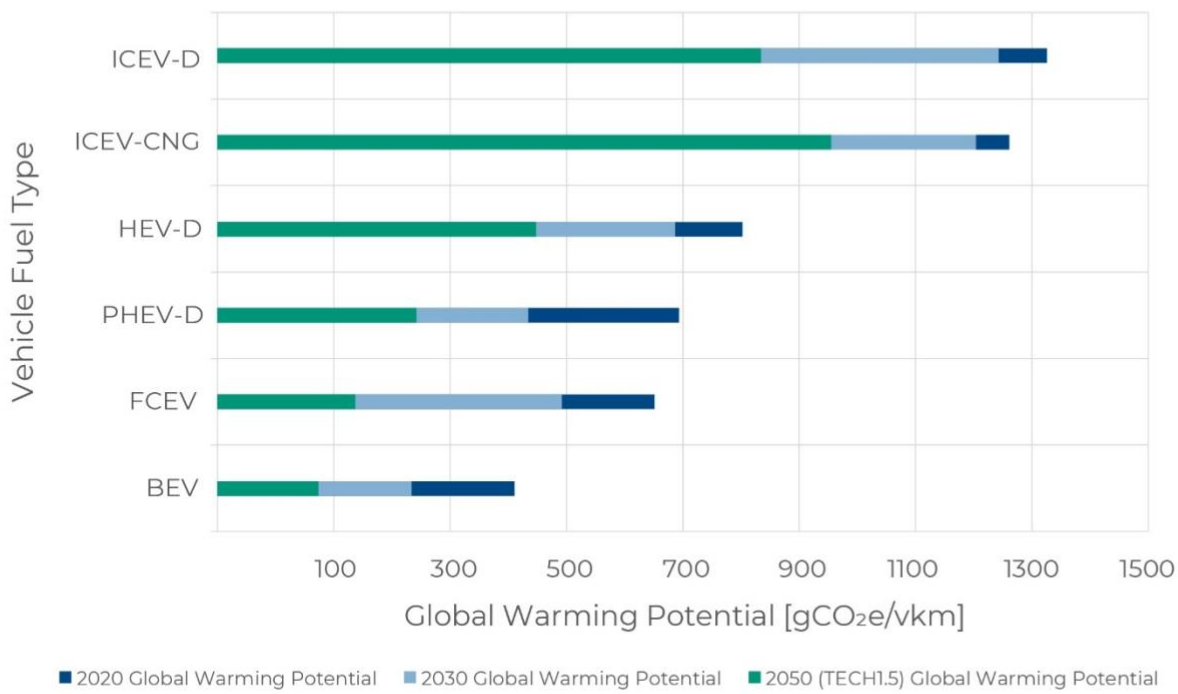


Figure 2. Summary of overall lifecycle GWP impacts for Urban Buses by fuel type (*Determining the environmental impacts of conventional and alternatively fueled vehicles through LCA*, Figure 5.72).

As shown in *Figures 1* and *2*, adjustments in infrastructure and sources of energy over time will result in a significant decrease in the lifecycle emissions of battery electric vehicles and plug-in hybrid electric vehicles compared to internal combustion engine vehicles.

The primary sources of electricity in the state of Pennsylvania are coal, natural gas, and nuclear power. As shown in *Figure 3.1*, the percentage of coal-sourced electricity decreased while gas-sourced electricity increased between 2002 and 2024. *Figure 3.2* shows a decrease in oil-sourced electricity and an increase in renewable power between 2002 and 2024.

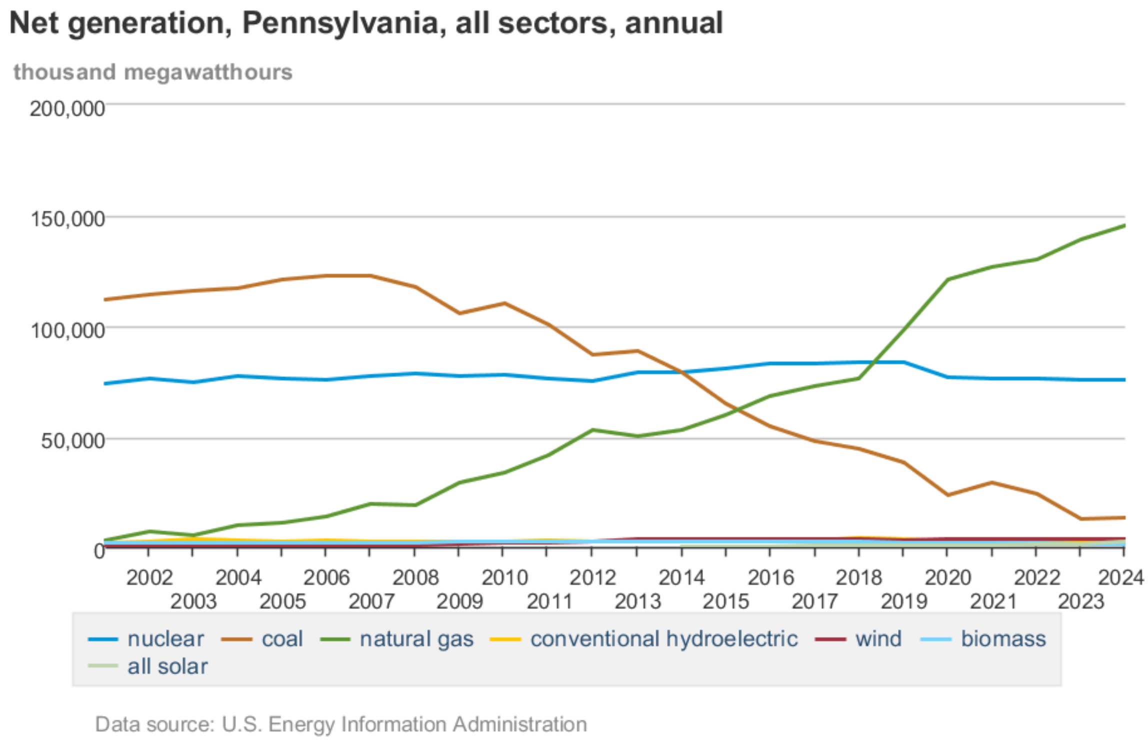


Figure 3.1. Net electricity generation by fuel source in Pennsylvania across all sectors, 2002–2024 *(Data source: U.S. Energy Information Administration)*

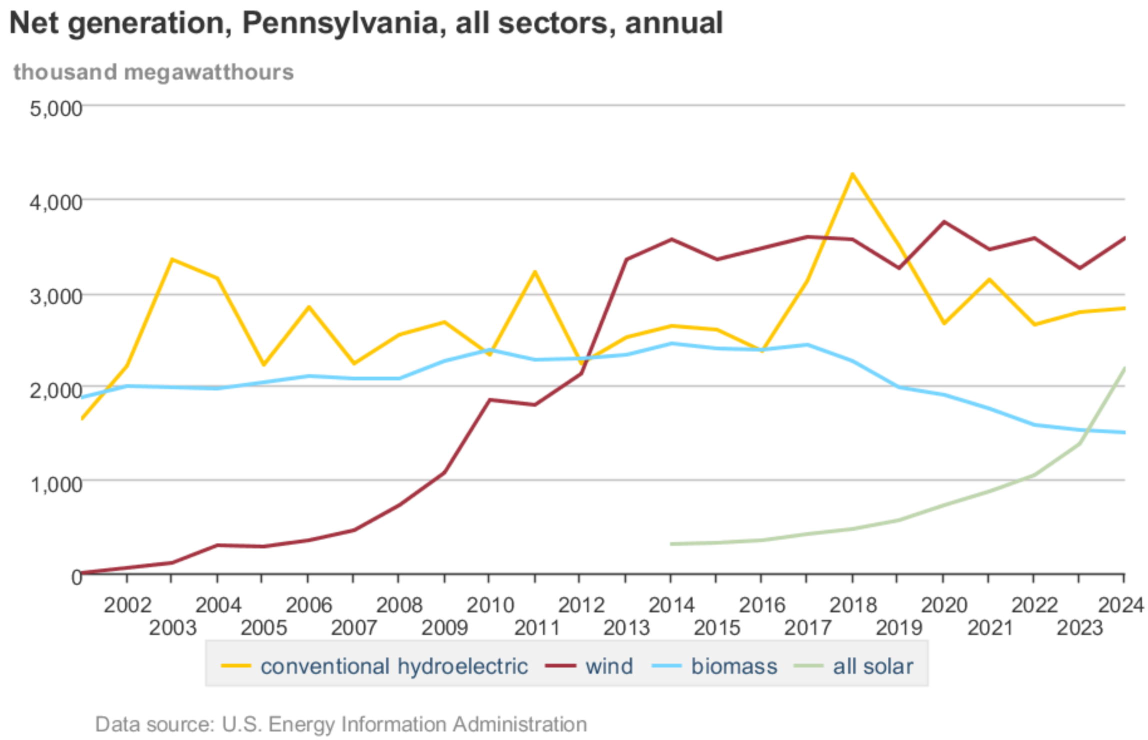


Figure 3.2. Net electricity generation from renewable and low-emission sources in Pennsylvania, 2002–2024 *(Data source: U.S. Energy Information Administration)*

According to data from the EPA, Pennsylvania's carbon dioxide equivalent emissions (CO_2e) have generally decreased between 2002 and 2024 and are projected to continue to drop due to the increase in lower-emission electricity sources (*Figures 3.1* and *3.2*).

Figure 4 shows the three main electricity sources used in the Pennsylvania, New Jersey, Delaware, and Maryland region: nuclear power, coal, and natural gas. While making up a small percentage of the total amount, the region has been increasing its use of renewable energy, predominantly in wind and solar.

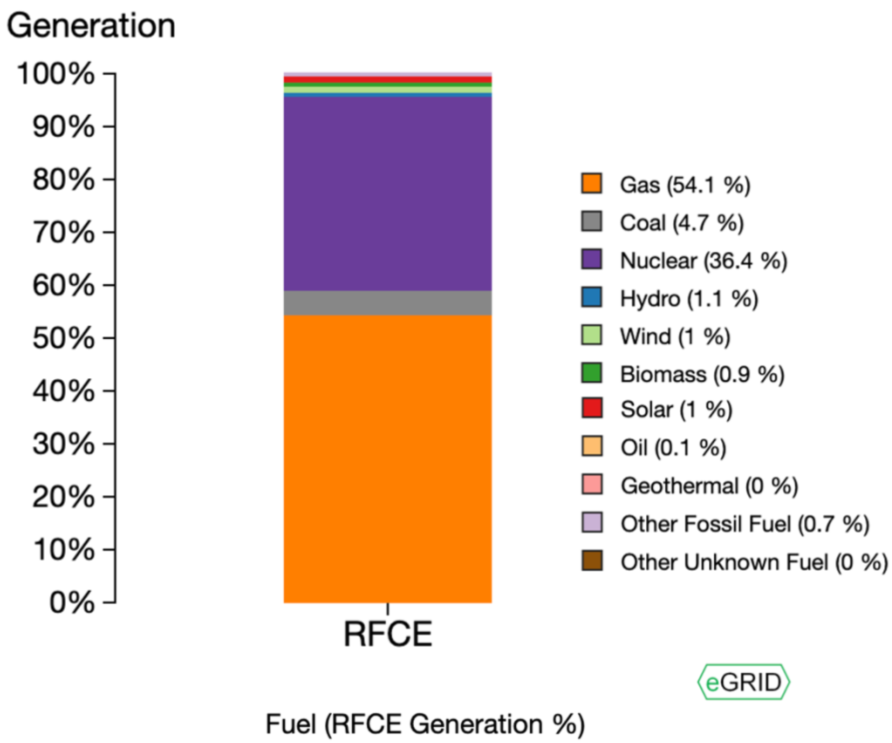


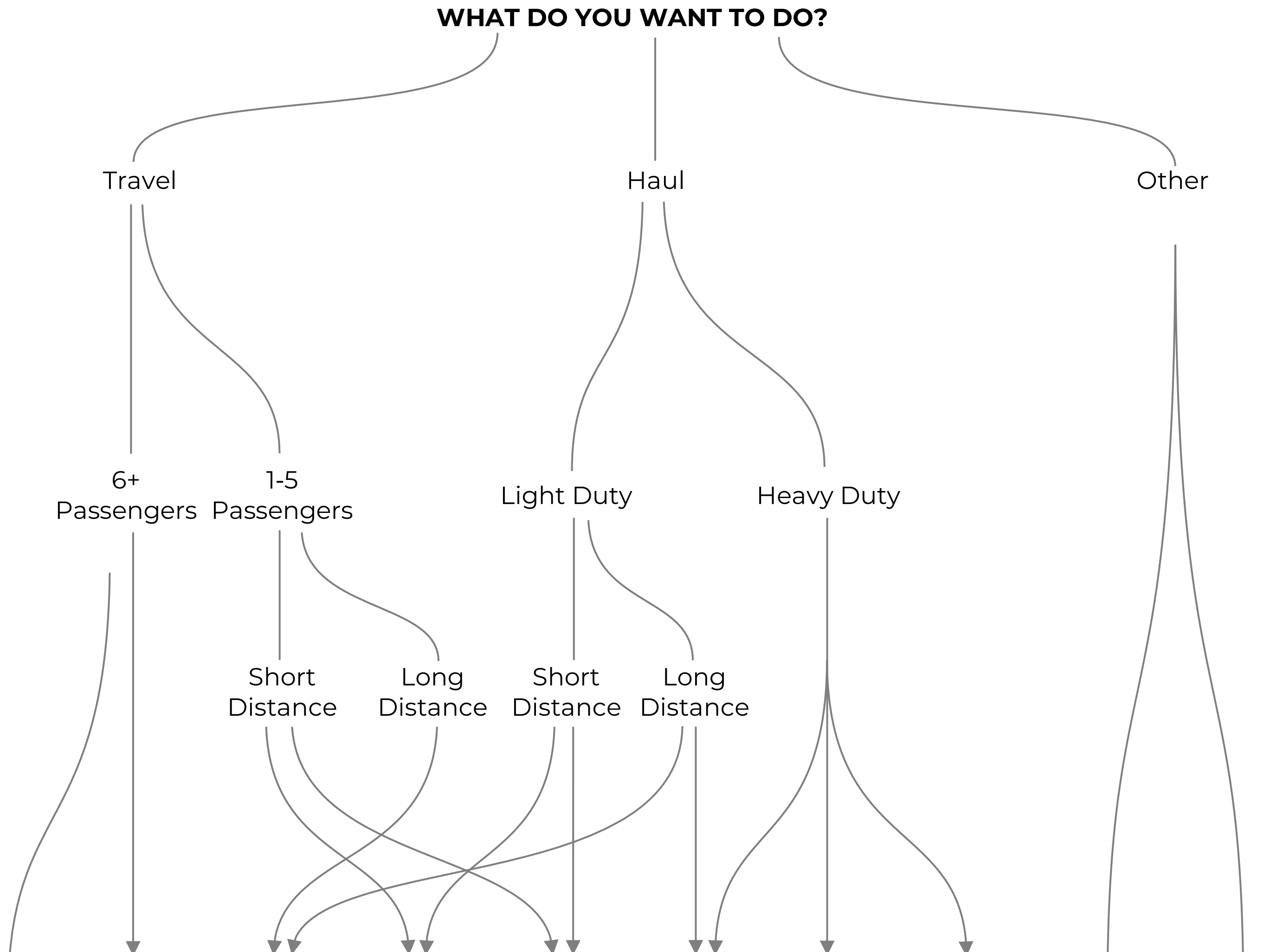
Figure 4. Electricity generation fuel mix in the RFCE eGRID subregion (includes Pennsylvania, New Jersey, Delaware, and Maryland) as of 2023 (EPA's Power Profiler, Fuel Mix for RFCE Region).

As mentioned earlier, Penn signed a solar Power Purchase Agreement that provides approximately 70% of the electricity demand of the University of Pennsylvania and the University of Pennsylvania Health System in Greater Philadelphia. This PPA shifts Penn's electricity to be predominantly sourced from renewable sources. Additionally, as the United States moves toward carbon neutrality, it is expected that clean electricity sources will become more accessible, further lowering the emissions associated with the electricity used to power EVs (as demonstrated in *Figures 1* and *2's* 2050 TECH 1.5 scenarios).

Overall, the current and projected electricity sources for our area and their associated emissions make EVs highly beneficial for reducing Penn's fleet emissions.

APPENDIX II

EV Selection Quick Guide: For more info, click on the name of each category.



Bus	Passenger Van	Light-Duty /Passenger Vehicle	E-Assist Bike	Low Speed Vehicle	Cargo Van	Pickup Truck	Chassis	Public Safety Vehicle	Equipment
Consult Vendor for Price Range	Est. Price Range: $31,860 and up	Est. Price Range: $28,040 and up	Est. Price Range: $1,999 and up	Consult Vendor for Price Range	Est. Price Range: $34,100 and up	Est. Price Range: $22,195 and up	Consult Vendor for Price Range	Consult Vendor for Price Range	Consult Vendor for Price Range