

CHOOSING AN ELECTRIC VEHICLE

GSA Fleet Electric Vehicle Training Series

2016



AGENDA

- Federal Mandates
- Types of Electric Vehicles (EV)
- FY16 Electric Vehicle Offerings
- Choosing the Right Vehicle
- Vehicle Economy
- Electric Vehicle Features
- What to Expect from Your EV
- Resources



ACRONYMS AND DEFINITIONS

- BEV – Battery Electric Vehicle
 - » All-electric vehicle powered exclusively by a battery. Qualifies as a zero emission vehicle.
- PHEV – Plug-in Hybrid Electric Vehicle
 - » A vehicle propelled by both an internal combustion engine (ICE) and an electric motor. Does count towards federal zero emissions mandates.
- HEV – Hybrid Electric Vehicle
 - » A vehicle powered by the engine and fuel of a conventional vehicle with the batteries of an electric motor. Hybrid vehicles do not need to be plugged in to utilize electric power.
 - » Does **not** count towards federal zero emissions mandates.

FEDERAL MANDATES

Law/Mandate	Requirements
Executive Order 13693: Planning for Sustainability in the Next Decade	<ul style="list-style-type: none">• By 2020, 20% of new fleet acquisitions must comprise of zero emission and plug-in hybrid electric vehicles<ul style="list-style-type: none">○ Increase to 50% by 2025• Reduce federal fleet per-mile greenhouse gas (GHG) emissions by 30% by 2025 from a 2014 baseline• Procure charging stations and infrastructure that will allow for vehicle-level data reporting capabilities• Determine optimum fleet inventory, with an emphasis on eliminating unnecessary or non-essential vehicles
Energy Policy Act 1992/2005 (EPAAct)	<ul style="list-style-type: none">• 75% of light duty vehicle acquisitions must be alternative fuel vehicles in metropolitan areas
Energy Independence and Security Act of 2007 (EISA) Guidance on Section 141 (2010)	<ul style="list-style-type: none">• Acquire only low-GHG emitting vehicles.<ul style="list-style-type: none">○ MY16 Passenger Cars: 300 g/mile max CO2 emission○ MY16 Light-Duty Trucks: 375 g/mile max CO2 emission

EV FEATURES

	HEV	PHEV	BEV
Motor/Engine Type	Electric motor and internal combustion engine	Electric motor and internal combustion engine	Electric motor
Fuel Source	Gas, diesel, or E85	Electricity AND Gas, diesel, or E85	Electricity
Battery type	Nickel-metal hydride*	Lithium ion	Lithium ion
Range	500+ miles	19-53 all-electric 420+ combined miles	70+ miles
Meets EO 13693 Zero Emission Requirements	X	✓	✓

*Some manufacturers have started making HEVs with Lithium-Ion batteries.

FY 2016 EV OFFERINGS



8E Ford Focus BEV

Lease Rate: \$180 / \$0.06

Incremental: \$12,039

FRR: \$461 / \$0.06

Purchase: \$26,684



8P Chevy Volt

Lease Rate: \$180 / \$0.083

Incremental: \$15,655

FRR: \$444 / \$0.08

Purchase: \$30,300



8P Ford C-MAX Energi

Lease Rate: \$180 / \$0.083

Incremental: \$14,519

FRR: \$444 / \$0.08

Purchase: \$29,164



9P Ford Fusion Energi

\$181 / \$0.099

Incremental \$12,362

FRR: \$460 / \$0.10

Purchase: \$30,234

AVERAGE RANGE AND CHARGING TIME

BEV and PHEVs Available in FY16				
	Ford Fusion PHEV	Ford CMAX Energi PHEV	Chevy Volt PHEV	Ford Focus BEV
Electric Range	19 miles	19 miles	53 miles	76 miles
Total Range	550 miles	550 miles	420 miles	76 miles
Charge Time (Level 2)	2.5 hrs	2.5 hrs	4.5 hrs	3.6 hrs
Passengers	5	5	5	5

CHOOSING THE RIGHT VEHICLE

Rocky/Rough Terrain

- 4X4 SUV
- E85 or CNG pickup (pending availability of fuel and maintenance facilities)



City Driving

- BEV, PHEV, HEV
- Low-GHG sedan



Highway Driving

- Low-GHG sedan
- Diesel sedan



CHOOSING ELECTRIC

- Take into consideration unique agency needs.
- EVs are well suited for agencies when:
 - » Average distance traveled per day is between 0 and 60 miles
 - » Vehicles operate primarily on paved roadways
 - » Vehicles do a lot of start-stop driving or have long idle times
 - » Vehicles do not need to carry large loads
 - » Charging station infrastructure exists along route, plugs are available at parking location, or the agency has the money to obtain charging stations
 - » Local dealerships are authorized to service/repair EVs
 - » Vehicles need to carry 5 people or less

EV ATTRIBUTES AND COST CONSIDERATIONS

	Ford Focus (8C)		Ford CMAX HEV (8H)	Ford CMAX PHEV (8P)	Ford Focus BEV (8E)
	Gas	E85			
MPGe	N/A		N/A	88	105
MPG	31	23	40	38	N/A
CO2 grams/mile	285	266	225	129	0
Estimated Average Fuel Savings*	N/A		58 gallons/year	167 gallons/year	182 gallons/year
50 State Certified	Gas only		✓	✓	✓
Incremental Cost	N/A		\$6,060.00	\$14,518.75	\$12,039.20
Lease Rate	\$160/\$0.13		\$160/\$0.11	\$181/\$0.083	\$181/\$0.064
Estimated Average Annual Lease Cost*	\$2,960		\$2,800	\$2,836	\$2,684

*Calculated based on 8,000 miles driven per year

ELECTRIC VEHICLE FEATURES

- Regenerative Braking
 - » Energy is recovered when drivers brake slowly, extending the vehicle's electric range and the life of the vehicle's braking system.
- “EV Later” Option (PHEVs only)
 - » Vehicle operator can chose whether to use gas or the vehicle's electric charge at any point.
- Level 1 charging station cord comes standard with every vehicle

WHAT TO EXPECT

EV MAINTENANCE AND REPAIR

- EV maintenance must be handled by the original equipment manufacturer (OEM).
- Only dealerships authorized to work on plug-in electric vehicles can complete work on the vehicle.
 - » GM: <http://www.chevrolet.com/tools/dealer-locator.html>
 - » Ford: <http://www.ford.com/dealerships/locate?gnav=header-finddealer>
 - » Nissan:
http://www.nissanusa.com/nissanddealers/?_vipreq=1650499919
- For BEVs, preventative maintenance is every 10,000 miles or 12 months.
- For PHEVs, preventative maintenance is every 15,000 miles or 24 months.

WHAT TO EXPECT

GSA FLEET MINIMUM VEHICLE REPLACEMENT STANDARDS

- EV batteries typically have an 8-year, 100,000-mile warranty.
 - » Most EV batteries meet or exceed this
 - » In some states, the warranty period is longer (CA, NY)
- GSA Vehicle Replacement Standards for Hybrid and Electric Vehicles
 - » 5 years and 60,000 miles, OR
 - » 7 years and any miles, OR
 - » Any year and 85,000 miles

RESOURCES

- GSA Alternative Fuel Vehicle Team:
 - » GSAFleetAFVTeam@gsa.gov
- Useful Resources for Fleet Managers
 - » [DOE Plug-In Electric Vehicle Handbook for Fleet Managers](#)
 - » [GSA Fleet Drive-thru and Training](#)
 - » [Alternative Fuel Vehicle Guide](#)
 - » [New EO 13693](#)
 - » [DOE Station Locator](#) / [Wex Connect](#)
 - » [Short Term Rental Program](#)
 - » [Dispatch Reservation Module](#)
 - » [Car Sharing](#)
 - » [Telematics](#)