Plug-in Hybrid Electric Vehicles (PHEVs)

Electricity is a scalable, domestic source of energy that is low and stable in price and produced from both non-renewable (coal, natural gas) and renewable sources (solar, wind). Plug-in hybrid electric vehicles PHEVs) use batteries to power an electric motor and another fuel, such as gasoline, to power an internal combustion engine. When driven in EV mode, they produce zero emissions, and when the battery becomes depleted, the vehicle automatically switches over to the traditional gas-powered engine to allow for continued driving. Overall, PHEV's can help increase energy security, improve fuel economy, lower fuel costs, and reduce emissions.

Sample Plug-In Hybrid Electric Vehicle (PHEV) Models

2018 Ford Fusion Energi

2018 Toyota Prius Prime

2018 Honda Clarity

Plug-in Hybrid Electric Vehicle Comparison			
Model	2018 Ford Fusion Energi	2018 Toyota Prius Prime	2018 Honda Clarity
Electric range on a full charge	21 miles (610 miles combined total driving range)	25 miles (640 miles combined total driving range)	48 miles (340 miles combine total driving range)
Battery size	7.6 kWh lithium-ion	8.8 kWh lithium-ion	17 kWh lithium-ion
Charge Time for full charge (Level 2/240V AC)	2.5 hours	2 hours	2.2 hours
EPA-estimated regular gas MPG combined city/highway	42 mpg	54 mpg	42 mpg
EPA-estimated elec + gas MPGe combined city/highway	97 MPGe	133 MPGe	110 MPGe
Starting MSRP	$31,400	$27,300	$33,400

The Ford Fusion Energi, Toyota Prius Prime, and Honda Clarity are all plug-in hybrid electric vehicles. There are several other light-duty PHEVs commercially available. Contact your local dealer for more info on deals and pricing and your local Clean Cities Coalition for available PHEV discounts/credits. Although PHEVs are generally more expensive than similar conventional vehicles, cost can be recovered through fuel savings, a federal tax credit, or state incentives.

Business Case/ROI Scenario for Plug-in Hybrid Electric Vehicle (PHEV)

Light-Duty Gasoline Vehicle vs. Light-Duty PHEV Fuel Cost Comparison				
Gasoline		**PHEV**	**Electricity**	**Gasoline**
Base Cost	$25,000	**Incremental Cost**	$5,000	
Annual Fuel Use	485 gallons	**Annual Fuel Use**	2,275 kWh/68 gallons	165 gallons
Daily miles traveled	40 miles	**Daily miles traveled**	20 miles	20 miles
Annual Mileage	15,000	**Annual Mileage**	7,500	7,500

Price Levels	**Low Oil Price**			**Median Oil Price**			**High Oil Price**		
Fuel Type	**Gas ($2.54)**	**Electricity ($1.06)**	**Gas ($2.54)**	**Gas ($2.77)**	**Electricity ($1.06)**	**Gas ($2.77)**	**Gas ($3.57)**	**Electricity ($1.08)**	**Gas ($3.57)**
Avg. Annual Fuel Costs	$1,232	$72	$419	$1,343	$72	$457	$1,731	$73	$589
Avg. Annual Fuel Cost Savings	$741			$814			$1,069		
Payback Period	**6.7 years**			**6.1 years**			**4.7 years**		

EV Charging Station Locator

Hundreds of EV charging stations are available in the United States. Visit the U.S. Department of Energy Alternative Fuels Data Center to find public charging stations in the United States and Canada: **https://afdc.energy.gov/fuels/electricity_stations.html**

Scenario 2: Cumulative Cost of Ownership Comparison for Three PHEV models

*The table below displays the vehicle data that is used to compare the ownership costs among the plug-in hybrid electric vehicle models. For this example, all three vehicles travel 15,000 miles annually and the gas fuel price is $2.87/gallon.

Vehicle	Annual Vehicle Miles Traveled	Annual Gasoline Use	Annual Electricity Use	Annual Fuel Costs	Annual Operating Cost	Cost Per Mile
2018 Ford Fusion Energi PHEV	15,000	217 gallons	2,053 kWh	$883	$3,3306	$0.22
2018 Ford Fusion Hybrid	15,000	358 gallons	0 kWh	$1,028	$3,451	$0.23
2018 Ford Fusion	15,000	589 gallons	0 kWh	$1,691	$4,114	$0.27

Cumulative Cost of PHEV Ownership without (Table 1) and with credit/incentive/discount (Table 2)

*These graphs show the cumulative cost of ownership by year of each vehicle. Table 2 displays CCO for the plug-in hybrid EV model after a $4,000 federal tax credit. These tables were generated from the Alternative Fuels Data Center Vehicle Cost Calculator.

Table 1.

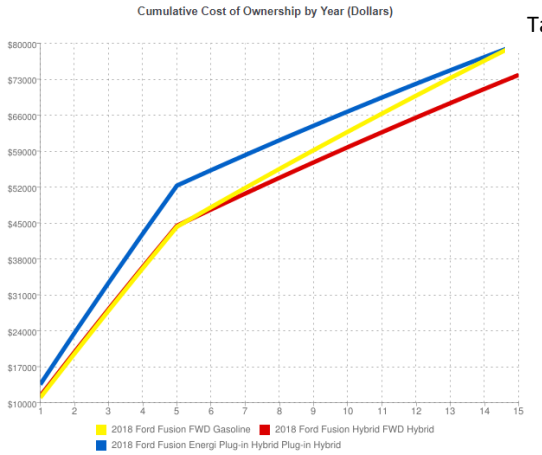
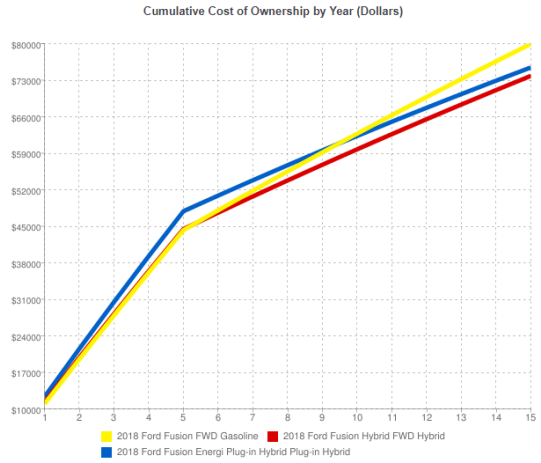


Table 2.



Scenario 3: Cost per mile for various PHEV driver scenarios over 5 years

Fuel	Year 1 (2019)	Year 2 (2020)	Year 3 (2021)	Year 4 (2022)	Year 5 (2023)
Gasoline	$2.77/gallon	$2.85/gallon	$2.87/gallon	$2.88/gallon	$2.92/gallon
Electricity	$1.06/GGE	$1.13/GGE	$1.18/GGE	$1.20/GGE	$1.20/GGE

Driver Scenario	Year 1 (2019) Fuel Costs			Year 2 (2020) Fuel Costs			Year 3 (2021) Fuel Costs			Year 4 (2022) Fuel Costs			Year 5 (2023) Fuel Costs		
Fuel Type	**Gas**	**Elec**	**Total**	**Gas**	**Elec**	**Total**	**Gas**	**Elec**	**Total**	**Gas**	**Elec**	**Total**	**Gas**	**Elec**	**Total**
Sporadic Driver	~$81	~$44	**$125**	~$85	~$46	**$131**	~$88	~$48	**$136**	~$92	~$49	**$141**	~$93	~$51	**$144**
Commuter	~$242	~$73	**$315**	~$254	~$76	**$330**	~$265	~$79	**$344**	~$276	~$81	**$357**	~$280	~$85	**$365**
Lyft/Uber Driver	~$2,406	~$146	**$2,552**	~$2,527	~$153	**$2,680**	~$2,639	~$158	**$2,797**	~$2,751	~$163	**$2,914**	~$2,781	~$171	**$2,952**

Driver Scenario	Daily Vehicle Miles Traveled	Annual Vehicle Miles Traveled	Gas Used Per Day	Elec Used Per Day	Gasoline Use/year	Electricity Use/year	Fuel Cost Per Mile
Sporadic Driver	20 mi (15 elec, 5 gas)	7,300 mi	0.093 gal	3.75 kWh	34 gal	1,369 kWh	$0.02/mi
Commuter	40 mi (25 elec, 15 gas)	14,600 mi	0.28 gal	6.25 kWh	102 gal	2,281 kWh	$0.02/mi
Lyft/Uber Driver	200 mi (50 elec, 150 gas)	73,000 mi	2.78 gal	12.5 kWh	1,015 gal	4,563 kWh	$0.04/mi

*The vehicle data used in these driver scenarios is a 2018 Toyota Prius Prime (PHEV). The data looks at fuel cost savings comparisons of each driver scenario along with fuel price projections for gasoline and electricity over the next 5 years from the Energy Information Administration (EIA).