PEVs: The First Three Years
(of the post-modern electric-vehicle era)

U.S. Plug-in Electric Vehicle Sales Trends & Analysis
Dec 2010 — Nov 2013

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Outline: the First Three Years

• Where are we with plug-in electric vehicles (PEVs)?
  – cumulative sales

• How is the rate of sales changing?
  – monthly sales
  – yearly totals

• How does PEV commercialization compare to gasoline hybrids?

• What do we mean by electric vehicle?: typology and acronyms

• How many of each type are on the market (in Nov. and in total)?

• Appendix: Further detail
Where are we with plug-in electric vehicles (PEVs)?

Cumulative U.S. sales
The first three years: Cumulative plug-in electric vehicles sold

- Panamera S E-Hybrid
- 500 Elettrica
- Chevy Spark
- Fusion Energi
- Accord Plug-in
- C-Max Energi
- RAV4EV
- Fit EV
- Model S
- Prius Plug-In
- Active E
- Focus Electric
- i
- smart electric drive
- Chevy Volt
- LEAF

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by Individual model

The first three years: Cumulative plug-in electric vehicles sold

- LEAF
- Chevy Volt
- smart electric drive
- i
- Focus Electric
- Active E
- Prius Plug-In
- Model S
- Fit EV
- RAV4EV
- C-Max Energi
- Accord Plug-in
- Fusion Energi
- Chevy Spark
- 500 Elettrica
- Panamera S E-Hybrid

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Model market share

The first three years: Share of cumulative plug-in vehicle sales

- Panamera S E-Hybrid
- 500 Elettra
- Chevy Spark
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Dec-10 May-11 Oct-11 Mar-12 Aug-12 Jan-13 Jun-13 Nov-13

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by PEV type

The first three years: Cumulative plug-in electric vehicles sold

- BEV
- PHEV

0 20,000 40,000 60,000 80,000 100,000 120,000 140,000 160,000 180,000

Dec-10 May-11 Oct-11 Mar-12 Aug-12 Jan-13 Jun-13 Nov-13
Market share by type

The first three years: Percent of cumulative plug-in vehicle sales

- BEV
- PHEV

Dec-10  May-11  Oct-11  Mar-12  Aug-12  Jan-13  Jun-13  Nov-13
How is the rate changing over time?

Monthly U.S. PEV sales
by PEV type

The first three years: Plug-in electric vehicles sold per month

Dec-10 May-11 Oct-11 Mar-12 Aug-12 Jan-13 Jun-13 Nov-13

BEV
PHEV

0 2,000 4,000 6,000 8,000 10,000 12,000
Monthly market share by type

The first three years: Percent of monthly plug-in vehicle sales

- **BEV**
- **PHEV**

Dec-10  May-11  Oct-11  Mar-12  Aug-12  Jan-13  Jun-13  Nov-13

0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
by Model

The first three years: Plug-in electric vehicles sold per month

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Monthly model market share

The first three years: Percent of monthly plug-in electric vehicle sales

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By Individual model

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Cumulative changes

Yearly U.S. PEV sales totals
Yearly U.S. sales

Cumulative plug-in electric vehicle sales by model

Panamera S E-Hybrid
500 Elettrica
Chevy Spark
Fusion Energi
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Yearly U.S. sales by PEV type

![Bar chart showing yearly sales of BEVs and PHEVs from 2010 to 2013. The chart indicates a significant increase in sales from 2012 to 2013.]

BEVs
PHEVs

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How do PEVs compare to gasoline-only hybrids?

U.S. sales from introduction of vehicle type
U.S. sales by calendar year from introduction of EV type

- **BEVs ('10 thru '13)**
- **PHEVs ('10 thru '13)**
- **Conventional hybrids ('99 thru '02)**

Number of vehicles vs. 
# of calendar years from introduct. of vehicle type (conventional hybrid or PEV)
What kinds of “electric vehicles” are on the market?

EV typology and acronym soup
"Electric vehicles" (Williams 2013)

Electric-drive vehicles (EVs)

Hybrid electric vehicles (HEVs)

Electric-fuel vehicles or plug-in-electric vehicles (PEVs)

Plug-in hybrids (PHEVs)

Range-extended electric vehicles (EREVs)

Fuel-cell electric vehicles (FCEVs)

All-gasoline hybrids

All-battery electric vehicles (BEVs)
EV light-duty examples

Evolution of Electric Vehicles (EVs) includes various types such as HEVs (Hybrid Electric Vehicles), PEVs (Plug-In Electric Vehicles), and FCVs (Fuel Cell Vehicles). Key examples include:

- FCX-Clarity, B-Class
- Prius Plug-in, Fusion Energi
- Volt (sort of)
- Prius, Fusion Hybrid
- LEAF, Model S

(Williams 2013)
# of models on the market in Nov ‘13 (Williams 2013)

- EVs: 59
  - HEVs: 50
  - PEVs: 15
    - PHEVs: 6
    - EREVs: 1 (sort of)
  - Gasoline hybrids: 42
  - BEVs: 9
    - FCEVs: 2

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# of U.S. vehicles sold thru Nov. 2013 (Williams 2013)

- PEVs: ~158,546
- PHEVs: ~90,569
- BEVs: ~67,977
- EREV: ~52,160 (sort of)
# of U.S. vehicles sold in Nov. 2013

(Williams 2013)

- **PEVs**: 8,833 (0.71%)
  - **PHEVs**: 6,367
  - **EREVs**: 2,022 (sort of)
- **BEVs**: 3,733
- **Gasoline hybrids**: 36,085 (2.91%)
Notes about these slides

• EV = electric-drive vehicle = HEVs + PEVs + FCEVs
  — HEVs = hybrid EVs (aka “hybrids”)
  — FCEVs = fuel-cell EVs
  — PEVs = plug-in electric vehicles (aka “plug-ins”) = BEVs + PHEVs
    • BEVs = all-battery EVs (aka “all-electric”)
    • PHEVs = plug-in hybrid EVs (aka “plug-in hybrids”)

• Figure legend order reflects sequence of vehicle introduction.

• No single source used contained a complete and/or accurate list of sales data, so multiple sources were compiled by the National Renewable Energy Laboratory (gasoline-only hybrid data) and UCLA Luskin Center (PEV data, most of which were compiled from monthly reports at hybridcars.com).

• Data for the Tesla Roadster, Cooper MINI-E, Th!nk City, Azure Transit Connect Electric, Fisker Karma, and Coda Sedan are not included.

• Tesla Model S sales are estimates and increasingly overestimate U.S. sales as the vehicle is marketed globally. Further, for simplification, it is assumed that all 2012 sales are the 85kWh model and 2013 sales are the 60kWh model.
Further detail
by Type

The first three years: Cumulative plug-in electric vehicles sold

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BEV PHEV

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by Individual PEV type

The first three years: Cumulative plug-in electric vehicles sold

Dec-10  May-11  Oct-11  Mar-12  Aug-12  Jan-13  Jun-13  Nov-13

BEV  PHEV
by PEV model

The first three years: Plug-in electric vehicles sold per month

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