Does maximizing the national total of electric miles driven in the U.S. call for the deployment of more plug-in electric vehicles with short all-electric ranges? It is a scenario that the U.S. Department of Energy should consider in the framing document of its *EV Everywhere Grand Challenge*, which aims to enable U.S. producers to lead in the development of affordable and convenient plug-in electric vehicles within the next decade. The document presents three scenarios that could achieve the *Challenge*'s goals:

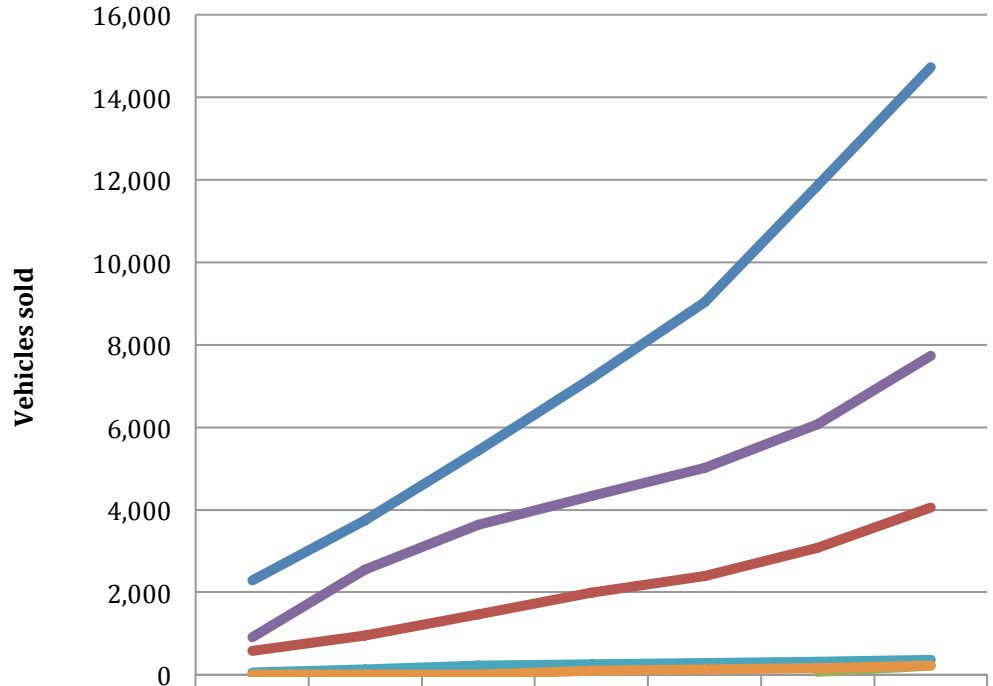
"1. A plug-in hybrid electric vehicle with a 40-mile all-electric range (PHEV-40) with limited fast-charge infrastructure;
2. An all-electric vehicle with a 100-mile range (AEV-100) with significant intra-city and inter-city fast charge infrastructure; and
3. An all-electric vehicle with a 300-mile range (AEV-300) with significant inter-city fast charge infrastructure."

These scenarios reflect a scope limited to "PEVs in which the majority of miles driven are electric", implying larger batteries. EV market developments thus far point to a fourth scenario:
4. A plug-in hybrid vehicle with a 15-mile all-electric range (PHEV-15) with limited charging infrastructure.

Plug-in hybrid electric vehicles offer the most convenience and are independent of new infrastructure, with a scale of affordability that is inversely related to the size of their batteries. Given that consumers have not yet shifted to a total-cost-of-ownership mentality when purchasing a new vehicle, a small-range PHEV has the advantage of offering electric driving at the lowest price premium. Assuming that batteries are likely to remain the most expensive EV component for the next few years, the affordability of, and market for 300-mile range vehicles will be limited. While a 100-mile range would suffice for most drivers in theory, range anxiety remains a roadblock to the adoption of vehicles in this category at their current price point.

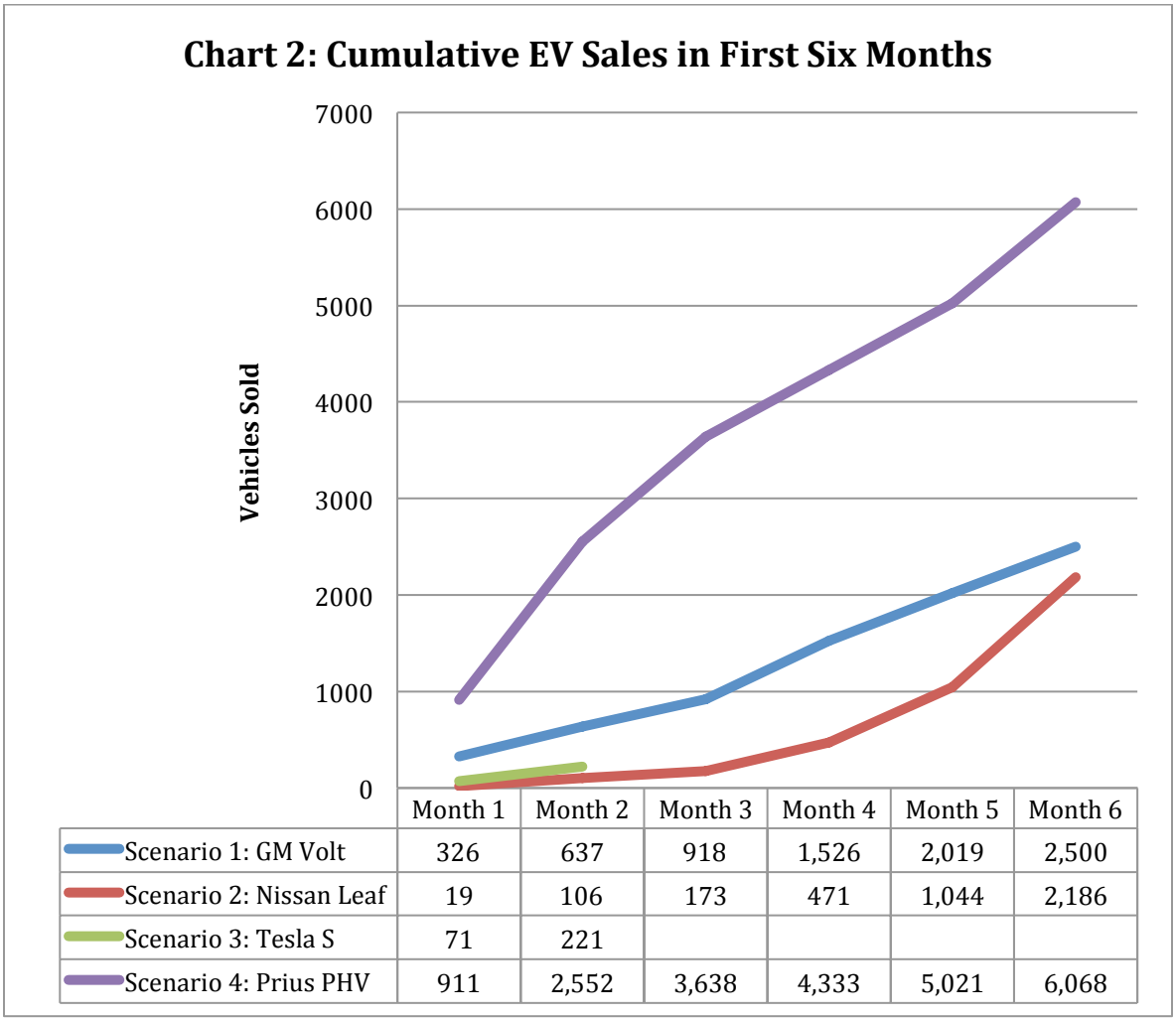
Sales of existing EV models can already shed light on which scenarios are most fitting. The following models are respectively illustrative of the four scenarios: GM's Volt, Nissan's Leaf, Tesla's Model S, and Toyota's Prius PHV. Since the latter was introduced it has been one of the top two best-selling EVs, along with GM's Volt (See Chart 1). The two PHEVs have each outsold the all-electric Leaf, Mitsubishi i, Ford Focus Electric, and Tesla Model S combined every month in the past seven months.

Chart 1: Cumulative EV Sales March-September 2012



	Mar. 2012	Apr. 2012	May. 2012	Jun. 2012	Jul. 2012	Aug. 2012	Sept. 2012
GM Volt	2,289	3,751	5,431	7,191	9,040	11,851	14,722
Nissan Leaf	579	949	1,459	1,994	2,389	3,074	4,058
Tesla Model S						71	221
Prius PHV	911	2,552	3,638	4,333	5,021	6,068	7,734
Mitsubishi i	56	135	220	253	286	323	359
Ford Focus Electric	0	0	6	95	133	167	226

In terms of speed of adoption, Chart 2 shows that the Prius PHV's sales grew more than twice as fast in its first semester on the market than the Volt, Leaf and Model S in their first months on the market.



	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Scenario 1: GM Volt	326	637	918	1,526	2,019	2,500
Scenario 2: Nissan Leaf	19	106	173	471	1,044	2,186
Scenario 3: Tesla S	71	221				
Scenario 4: Prius PHV	911	2,552	3,638	4,333	5,021	6,068

These market trends clearly suggest the DOE should include a PHEV-15 scenario in its analysis. Since the average driver travels fewer than 30 miles a day and almost half of daily trips consist of running errands and shopping, a good share of PHEV-15 drivers could still conceivably drive a majority of electric miles. More importantly though, the widespread adoption of small-range PHEVs could help bring down the cost of batteries, allow for charging infrastructure to gradually ramp up, and initiate consumers to electric driving and its lower operating costs, thereby paving the way for greater adoption of all-electric vehicles in the long term. It may seem counterintuitive, but shorter-range EVs might be the key to maximizing the country's total of electric miles driven.