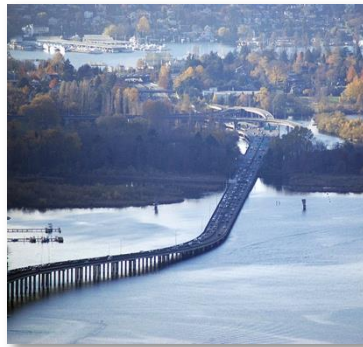


The Hybrid Vehicle and Alternative Fuel Report

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Washington State Transportation Commission
May 20, 2015

The Hybrid Vehicle and Alternative Fuel Report

May 15, 2015

- Why *The Hybrid Report*?
- Evolution of *The Report*
- Who reads *The Report*
- Observations from 10 years of following hybrid vehicles

Why The Hybrid Report?

The Impact of Hybrid Cars on Washington Gas Tax

In early 2005, the question was asked:

- What will the impact of hybrid cars be on Washington gas tax revenue?
 - What do we know about hybrid car registrations in Washington?
 - What do the experts think about sales potential?
 - Does our gas tax revenue forecast take hybrid cars into account?
 - Yes, through the forecasts we get from Global Insight and EIA
- These questions initiated looking for information that would grow into the report
 - Lack of technical and academic studies required looking at popular press

Why *The Hybrid Report*?

- Began Researching
 - Technical reports
 - Academic studies
 - Mass media
- Circulating Findings
 - Emailed articles to coworkers
 - Emailed links to coworkers
 - Provide summary of articles to coworkers
- We do not perform independent research for the report
- We do not endorse the articles that appear in the report

This report is a summary of articles and reports appearing in the media that refer to the impact of fuel costs and fuel efficiency on vehicle technology, development and markets. This issue covers articles appearing during the month of March. At the end of the report is a bibliography listing all articles summarized. Future issues will include hyperlinks to the articles. For further information contact Thomas L. Smith, WSDOT Financial Planning & Economic Analysis, 360-705-7941, smithtm@wsdot.wa.gov

On March 2, the Washington Post reports that the State of Virginia may end HOV privileges for hybrid vehicles. Currently, Virginia is the only state that allows hybrid vehicles into HOV lanes, as an incentive to promote fuel-efficient vehicles. Apparently the program was so successful that hybrids have clogged the HOV lane. The policy, in addition to clogging HOV lanes, is credited as a key element in boosting hybrid sales in Virginia. Virginia has the second highest number of hybrid vehicles in the nation.

Also on March 2, the Associated Press reported that automotive engineers believe that the hybrid automobile is a short-term phenomenon that has about ten years to run. This report quoted a Honda design engineer at the Geneva Autoshow. The engineer also said that the purpose of the hybrid is to test and refine the technology that will be used in the next generation of fuel-efficient vehicles, the fuel cell vehicle. Many automakers, particularly those who haven't produced hybrids of their own, are still not convinced that hybrids are the wave of the future. Most of these believe that until the vehicle can be built as cheaply as a conventional automobile, the vehicle is just a passing fancy. Most buyers are not willing to pay the \$3 to \$4,000 premium for hybrid technology.

By March 15, Reuters and MSNBC began reporting that rising fuel costs are finally having an impact on sales of large Sport Utility Vehicles (SUVs) and trucks. Edmunds.com, the report says, shows that sales of the largest SUVs have dropped 1.2% and large trucks dropped 2% in the last two months. On the other hand, fuel-efficient vehicles have gained 2.2% in the same sales period. This report also quoted from a number of industry analysts who seem to be leaning toward the opinion that fuel prices are now at a level that will create structural changes in the car and truck market.

Reuters reported on March 16 that British engineers have introduced a zero-emission motorcycle fueled by a hydrogen fuel cell. The motorcycle has a 100-mile range and reaches a top speed of 50 mph. One drawback of the vehicle is that it doesn't make any noise. This is a problem for two reasons: 1) safety--pedestrians and other motorists aren't aware the vehicle is around, and 2) aesthetics--motorcyclists want to hear the roar of the engine. Designers are considering adding artificial engine noise.

Transport Topics ran a Reuters report on March 21st that DaimlerChrysler plans to offer its first hydrogen fuel cell vehicle to the market in 2012. Some of the problems that still must be overcome are reliability and durability of the fuel cell, developing an engine that will start in sub-zero temperatures, and developing a fuel cell that can store enough fuel to be workable. Cost is still a problem as well.

Evolution of *The Report*

- Title
 - *The Hybrid, Fuel, and Vehicle Report*
 - *The Hybrid Vehicle and Alternative Fuel Report*
- Sections
 - 2nd edition grouped by topics
 - Hybrids, Alternative Fuel, Electric, Other Tech, New Charging Stations
 - Length of *The Report*
 - From 3 to 7 pages
 - From 1 edition per month to 2
 - Shifted publication date

Evolution of *The Report*

- Content
 - Early editions covered general national vehicle registration trends
 - Now in *Fuel and Vehicle Trends Report*
- Format
 - Word document
 - PDF
 - Home on the Web



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This report is a summary of articles appearing in popular, business, and technical media referring to the impact of fuel costs and fuel efficiency on vehicle technology, development, and markets.

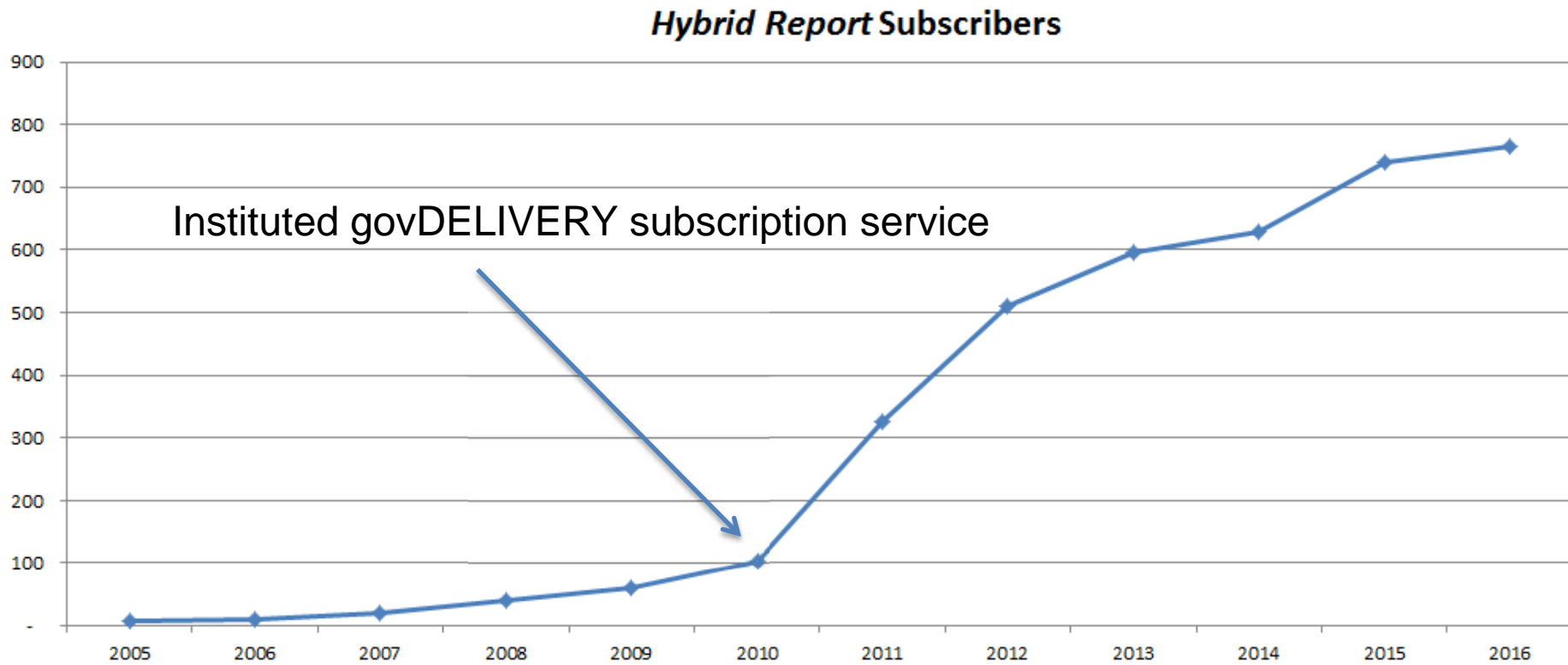
The Hybrid Vehicle and Alternative Fuel Report (ISSN: 1946-1011) is compiled by Thomas L. R. Smith, Ph. D., Economic Analysis Branch, Budget and Financial Analysis Division, Washington State Department of Transportation. Contact the editor by email at smithtm@wsdot.wa.gov or by telephone at 360-705-7941. Contributions of articles and positive comments about **The Report** are welcome.

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Who reads *The Report*?

- Originally 8 co-workers
- Currently, 769 subscribers



Who reads *The Report*?

- Private - 59.1%
 - Government – 26.9%
 - WSDOT – 11.1%
 - Other WA Gov – 7.8%
 - Local Gov – 4.8%
 - Other States – 2.0%
 - US Gov – 1.2%
 - Business – 11.5%
 - Education – 1.4%
 - Associations -1%
- Public Sector
- House, Senate, & Joint Transportation Committees
 - Caucus Staff
 - DOL, COM, Agriculture, OFM, DES & Ecology
 - Nevada, Oregon, Connecticut, New York, Ohio, Wisconsin, Alaska
- Private Sector
- Four automakers
 - Auto parts manufacturers
 - Transportation Companies
 - Engineering Consultants
 - Planning Consultants
 - Environmental Organizations
 - Four news Organizations
 - AASHTO

Observations

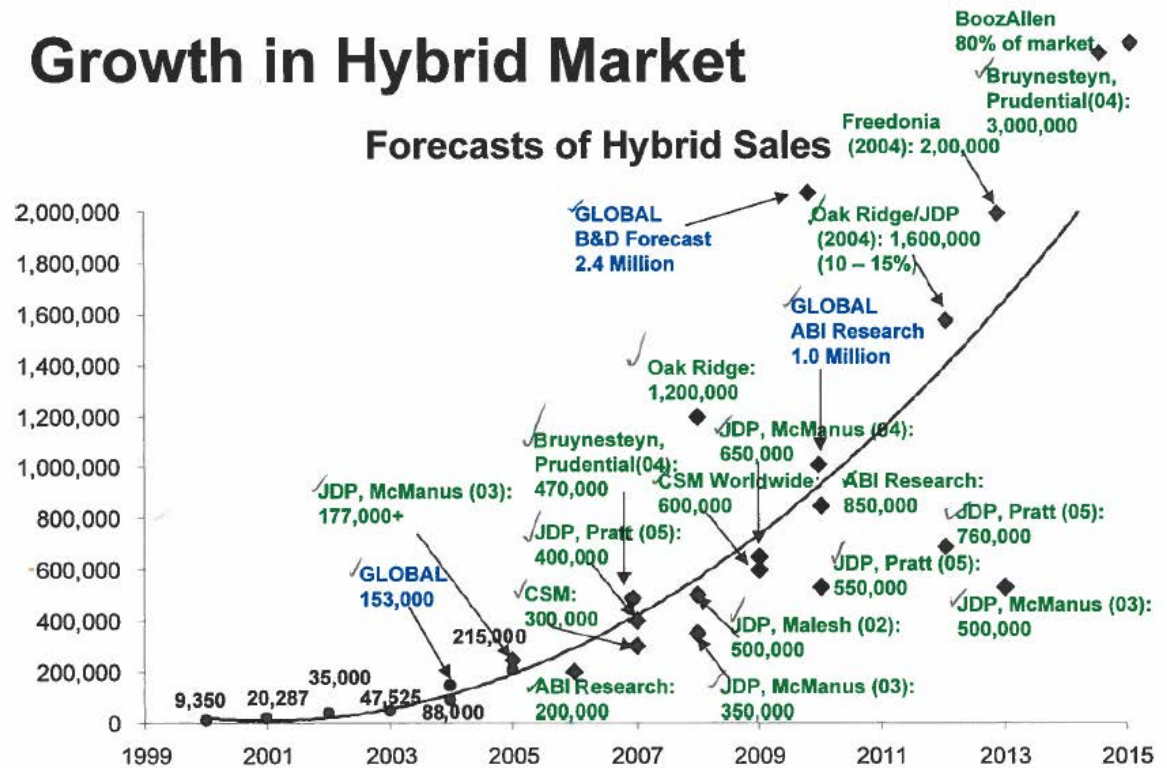
Ten years of publication reveals some interesting trends, but some are relearned again and again

- Early projections of hybrid car sales and penetration were optimistic
- Current projections of electric car sales and penetration still assume growth, but are less optimistic than earlier forecasts
 - Press spends more time on electric vehicles
- Recurring Themes
 - Chicken or Egg
 - Gas prices and impact on hybrid and electric car sales
 - The demise of the market
 - The hybrid premium

Observations (continued)

Early projections of hybrid car sales and penetration were optimistic

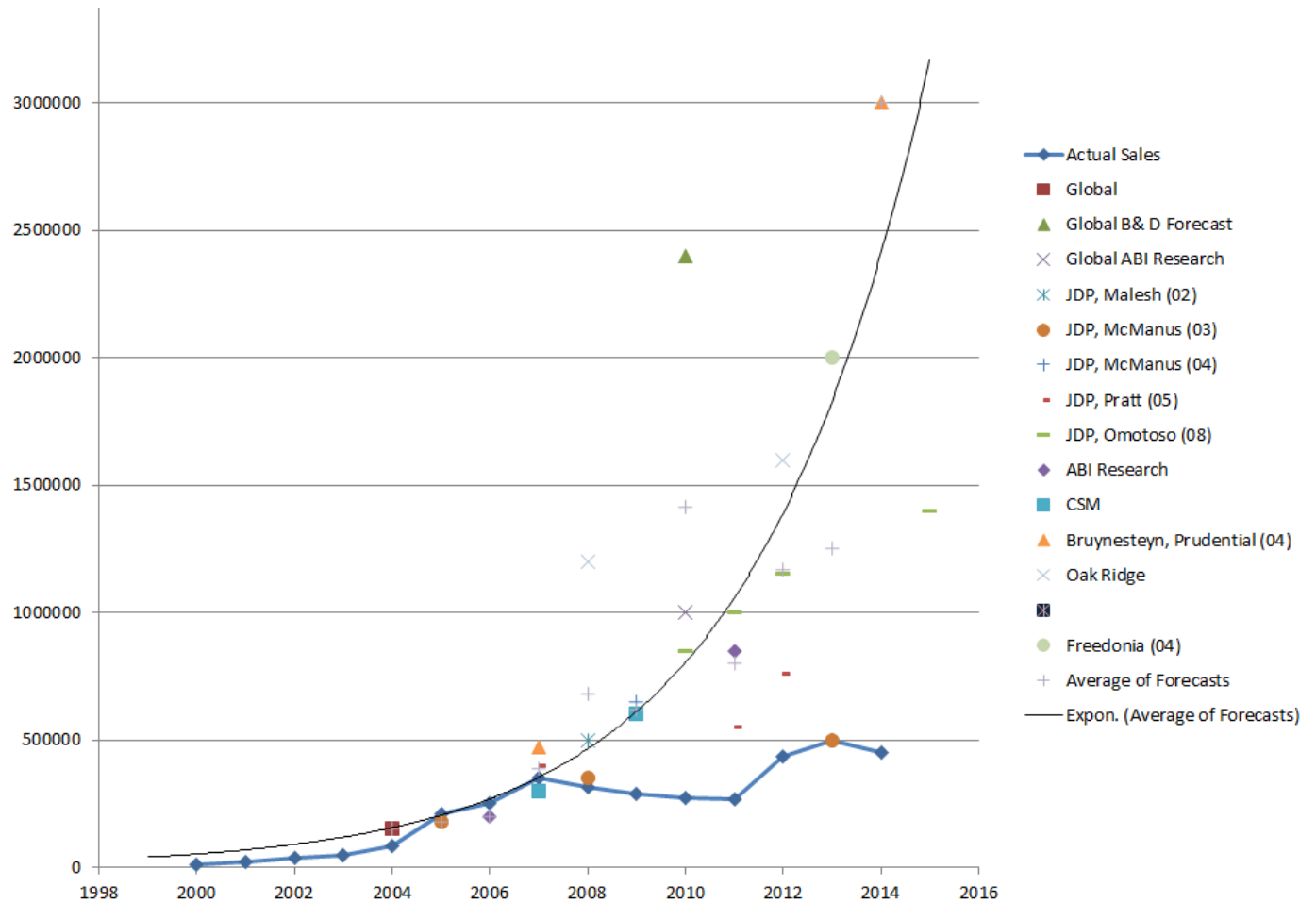
Growth in Hybrid Market



hybridCARS.com

Observations (continued)

Early projections of hybrid car sales and penetration were optimistic



April 2015 Hybrid Car Sales Numbers

Hybrids sold in the U.S. (April 2015): 32,378

Hybrid Take-Rate: 2.24%

April 2015 Plug-in Hybrid Car Sales Numbers

Plug-in Hybrids sold in the U.S. (April 2015): 2,962

Plug-in Hybrid Take-Rate: 0.20

April 2015 Battery Electric Car Sales Numbers

Battery Electrics sold in the U.S. (April 2015): 6,037

Battery Electric Take-Rate: 0.42%

Observations (continued)

Recurring Themes

- Chicken or Egg
 - Infrastructure needed to encourage vehicles
 - Vehicles needed to justify infrastructure
 - Tax subsidies and rebates
 - Charging station
 - Vehicle taxes and fees

Observations (continued)

Recurring Themes

- Gas prices and impact on hybrid and electric car sales
- Every gas price drop brings out speculation that the market is dead
- Gas prices are not the driving force in the first 5 years of hybrid sales
 - Early tech adopters
 - Environmentalists
- From 2005 to 2007, gas prices and sales were positively correlated
- Current behavior appears connected, but not enough data is available
- Gas prices are not the primary factor in electric vehicle sales

Observations (continued)

Recurring Themes

- The myth of the hybrid premium and payback period
- Hybrids cost \$3,000 more than their conventional counterpart
- Originated from first generation Prius
 - Built on Corolla chassis
 - Cost \$3,000 more than Corolla
 - Buyers of Corollas were not in the market for a Prius
 - Early Prius buyers traded BMWs, Mercedes, SUVs, and Camrys
- There may be a premium if a gas model exists
 - Otherwise should compare to buyers options

Questions?

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