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ORNL/TM-2014/99

Vehicle Technologies' Fact of the Week 2013

March 2014

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UT-BATTELLE
ORNL-27 (4-00)

ORNL/TM-2014/XXX

FACT OF THE WEEK 2013

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Prepared for the
Vehicle Technologies Office
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Prepared by the
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831-6073
Managed by
UT-BATTELLE, LLC
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC05-00OR22725

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ACKNOWLEDGEMENTS

The authors would like to thank the project sponsor, Jake Ward, for his continued support and review of each weekly Fact. In addition, we thank Vicki Skonicki at Argonne National Laboratory for her invaluable role in reviewing and posting the Facts on the Department of Energy’s Vehicle Technologies Office website each week.

INTRODUCTION

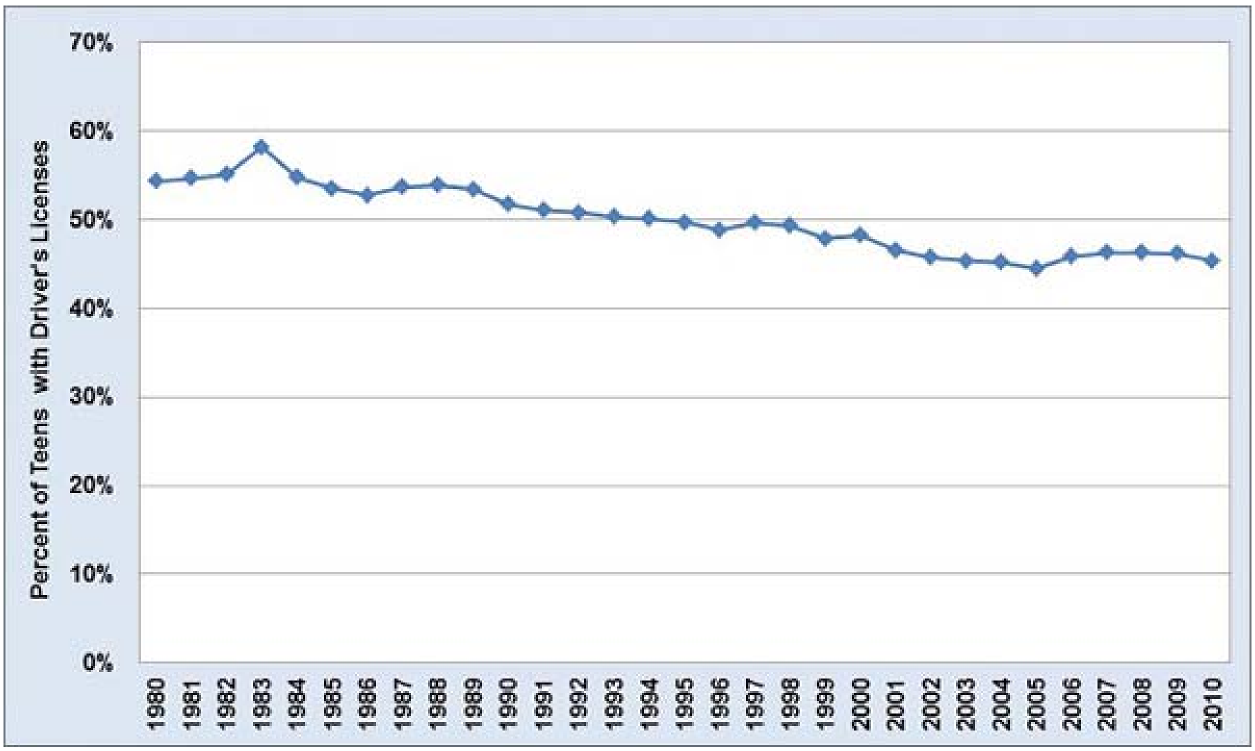
Each week the U.S. Department of Energy's Vehicle Technology Office (VTO) posts a *Fact of the Week* on their website: http://www1.eere.energy.gov/vehiclesandfuels/ . These Facts provide statistical information, usually in the form of charts and tables, on vehicle sales, fuel economy, gasoline prices, and other transportation-related trends. Each Fact is a stand-alone page that includes a graph, text explaining the significance of the data, the supporting information on which the graph was based, and the source of the data. A link to the current week's Fact is available on the VTO homepage, but older Facts are archived and still available at: http://www1.eere.energy.gov/vehiclesandfuels/facts/.

This report is a compilation of the Facts that were posted during calendar year 2013. The Facts were written and prepared by staff in Oak Ridge National Laboratory's Center for Transportation Analysis.

Fact #761: January 7, 2013
Smaller Share of Teenagers Have a Driver's License in 2010

In the 1980's, more than half of all teenagers 15 to 19 years old had a driver's license. But that has changed. Since 1995, less than half of that age group has a driver's license. In 2010, the latest year for which data are available, only 45.3% of 15 to 19 year-olds had a license. There are many different reasons that this has happened. Some states have placed more stringent requirements on those applying for a license. For example, the State of Tennessee requires anyone less than 18 years of age to provide proof that they are currently attending school in order to obtain a driver's license. Among other reasons, the connectivity of the Internet may give teens less of an incentive to pursue a license, or the high costs of operating a vehicle may be prohibitive, thus obtaining a license is delayed.

Share of 15 to 19 Year-Olds with Driver's Licenses, 1980-2010



Supporting Information

Number of Licensed Drivers, 15-19 Year Olds			
Year	Number of Licensed Drivers 19 Years Old and Under	U.S. Population of 15-19 Year-Olds	Drivers as a Percent of Age Group
1980	11,496,000	21,168,000	54.3%
1981	11,215,000	20,541,000	54.6%
1982	10,993,000	19,962,000	55.1%
1983	11,280,000	19,388,000	58.2%
1984	10,366,000	18,931,000	54.8%
1985	10,011,000	18,727,000	53.5%
1986	9,920,751	18,813,000	52.7%
1987	10,034,302	18,698,000	53.7%
1988	9,964,531	18,496,000	53.9%
1989	9,674,286	18,133,000	53.4%
1990	9,249,046	17,893,000	51.7%
1991	8,813,928	17,270,000	51.0%
1992	8,749,553	17,246,000	50.7%
1993	8,781,080	17,474,000	50.3%
1994	8,948,793	17,876,000	50.1%
1995	9,124,125	18,374,000	49.7%
1996	9,234,000	18,920,000	48.8%
1997	9,626,945	19,398,000	49.6%
1998	9,782,763	19,840,000	49.3%
1999	9,610,142	20,085,000	47.8%
2000	9,743,519	20,219,000	48.2%
2001	9,420,642	20,262,000	46.5%
2002	9,298,258	20,348,000	45.7%
2003	9,263,217	20,446,000	45.3%
2004	9,333,086	20,677,000	45.1%
2005	9,337,290	20,994,000	44.5%
2006	9,727,516	21,246,000	45.8%
2007	9,920,174	21,446,000	46.3%

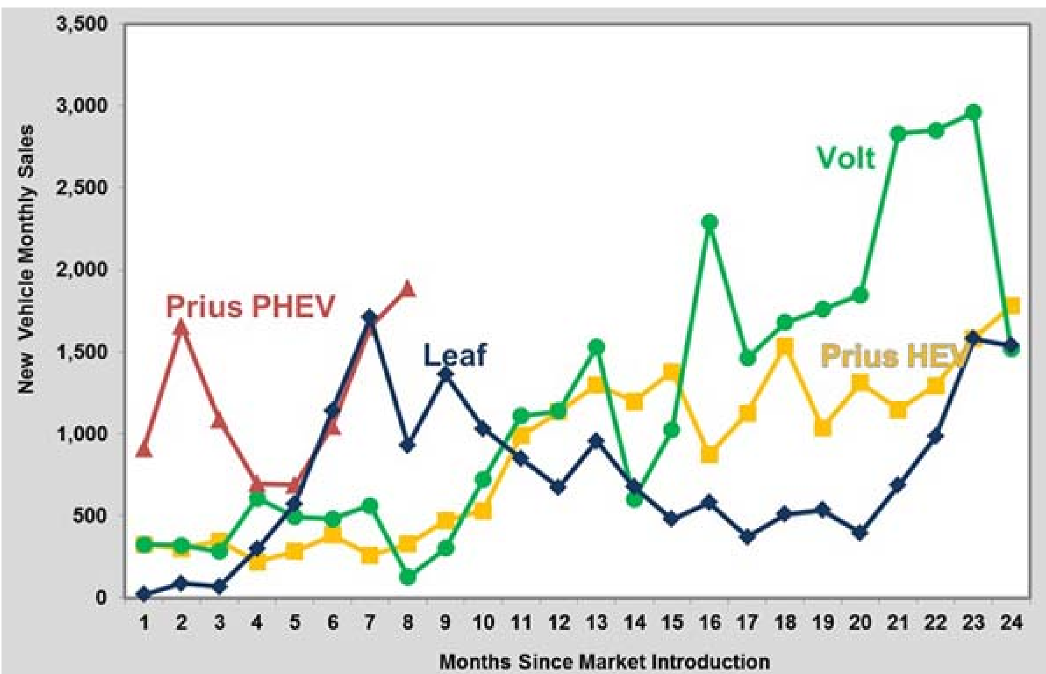
2008	9,953,935	21,514,000	46.3%
2009	9,932,441	21,538,000	46.1%
2010	9,556,240	21,086,000	45.3%

Sources: Licensed Drivers - U.S. Department of Transportation, *Federal Highway Administration, Highway Statistics 2010*, Washington, D.C., September 2011, Table DL-20 and annual. Population - Bureau of the Census, Statistical Abstract of the United States.

Fact #762: January 14, 2013
Sales from Introduction: Hybrid Vehicles versus Plug-In Vehicles

The Toyota Prius hybrid-electric vehicle (HEV) was first released in the U.S. market in January 2000 and 324 were sold in the first month. The Chevrolet Volt, a hybrid-electric plug-in, and the Nissan Leaf, an all-electric plug-in vehicle, were first released in December 2010. The Prius plug-in hybrid electric (PHEV) began sales in April 2012. The chart below shows a comparison of the sales of the Prius HEV from when it was first introduced, to the sales of the Volt, the Leaf, and the Prius PHEV when they were first introduced. The first month sales for the Volt were 326—two more than the Prius HEV's first month. Sales for the Leaf started out slower than the other vehicles, but rose dramatically from month 3 to month 7. Over the first 24 months from introduction, the Prius HEV achieved monthly sales of over 1,700 in month 18, the Leaf achieved about 1,700 units in month 7, the Prius PHEV achieved nearly 1,900 sales in month 8, and the Volt achieved more than 2,900 sales in month 23.

Monthly Sales since Market Introduction



Notes:
Month 1 for the Prius HEV = January 2000.
Month 1 for the Volt and Leaf = December 2010.
Month 1 for the Prius PHEV = April 2012.

Supporting Information

Monthly Sales since Market Introduction

Months Since Market Introduction	Prius HEV	Volt	Leaf	Prius PHEV
1	324	326	19	911
2	299	321	87	1,654
3	344	281	67	1,086
4	218	608	298	695
5	281	493	573	688
6	383	481	1,142	1,047
7	259	561	1,708	1,652
8	327	125	931	1,889
9	472	302	1,362	
10	532	723	1,031	
11	989	1,108	849	
12	1,134	1,139	672	
13	1,298	1,529	954	
14	1,198	603	676	
15	1,378	1,023	478	
16	872	2,289	579	
17	1,126	1,462	370	
18	1,534	1,680	510	
19	1,037	1,760	535	
20	1,311	1,849	395	
21	1,148	2,831	685	
22	1,294	2,851	984	
23	1,580	2,961	1,579	
24	1,780	1,519	1,539	
Total as of 24 months	21,118	28,825	18,023	9,622

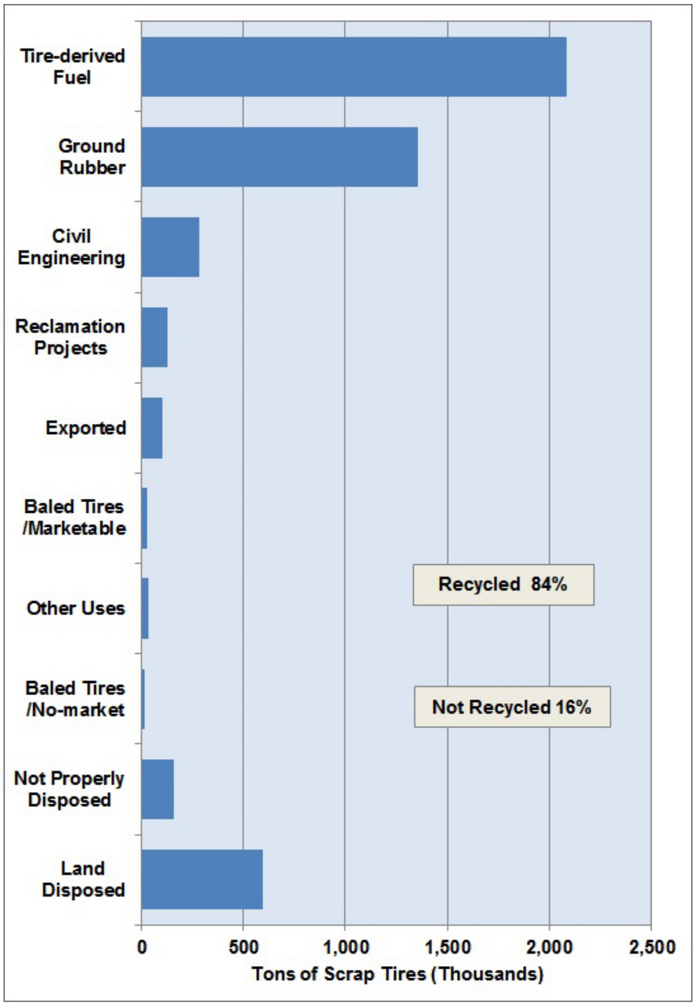
Note: Total for Prius PHEV is for the eight months it has been on sale.

Source: Data compiled by Argonne National Laboratory, Argonne, Illinois, December 2012.

Fact #763: January 21, 2013
Eighty-Four Percent of Scrapped Tires Are Recycled

There were 263 million tires scrapped in 2009 (latest available data) which amounts to more than 4.7 million tons of waste. Fortunately, 84% of that waste was recycled. Most of the recycled tires were used to make fuel for industries such as pulp and paper mills, cement kilns, and electric utilities. Ground rubber, which is used for sports surfacing, asphalt, playgrounds, and other molded products, is the second largest use of recycled tires.

U.S. Scrap Tire Uses, 2009



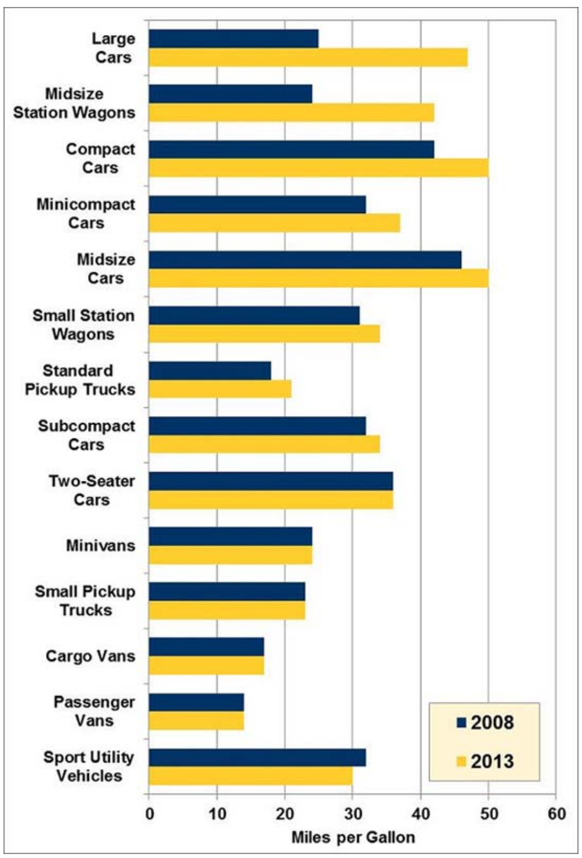
Supporting Information

U.S. Scrap Tire Uses, 2009	
Market	**Tons (Thousands)**
Tire-derived Fuel	2,084.8
Ground Rubber	1,354.2
Civil Engineering	284.9
Reclamation Projects	130.0
Exported	102.1
Baled Tires/Marketable	27.8
Other Uses	36.1
Total Recycled	4,019.9
Baled Tires/No-market	15.6
Not Properly Disposed	162.0
Land Disposed	594.0
Total Not Recycled	771.6
Total Scrap Tires	4,791.5
Note: Other Uses include electric arc furnace, agricultural, and punched/stamped. Source: Rubber Manufacturers Association.	

Fact #764: January 28, 2013
Model Year 2013 Brings More Fuel Efficient Choices for Consumers

Over the last six years, manufacturers have made more fuel efficient choices available to consumers in several size classes. For a consumer purchasing a new large car in 2008, the highest combined city/highway fuel economy available was 25 miles per gallon (mpg); for 2013, the top fuel economy of the large car class is 47 mpg. The top fuel economy for midsize station wagons and compact cars also rose by more than 5 mpg in the six-year time period. Standard pickups were the only light truck class to improve top fuel economy. All the other light truck classes had the same top fuel economy in both years, except for sport utility vehicles.

Top Fuel Economy in Class, Model Year 2008 and 2013



Notes: EPA combined city and highway fuel economy estimates are used. Compressed natural gas vehicles, electric vehicles, and plug-in hybrids are not included in these data.

Supporting Information

Top Fuel Economy in Class, Model Year 2008 and 2013 (Miles per Gallon, EPA Combined Rating)			
Size of Class	**Model Year 2008**	**Model Year 2013**	**Difference in mpg between 2008 and 2013**
Large Cars	25	47	22
Midsize Station Wagons	24	42	18
Compact Cars	42	50	8
Minicompact Cars	32	37	5
Midsize Cars	46	50	4
Standard Pickup Trucks	18	21	3
Small Station Wagons	31	34	3
Subcompact Cars	32	34	2
Passenger Vans	14	14	0
Cargo Vans	17	17	0
Small Pickup Trucks	23	23	0
Minivans	24	24	0
Two-Seater Cars	36	36	0
Sport Utility Vehicles	32	30	-2

Sources: U.S. Department of Energy and U.S. Environmental Protection Agency, *Model Year 2008 Fuel Economy Guide*.
U.S. Department of Energy and U.S. Environmental Protection Agency, *Model Year 2013 Fuel Economy Guide*.

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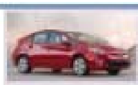
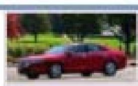
Fact #765: February 4, 2013
EPA's Top Ten Conventionally-Fueled Vehicles for Model Year 2013

For the 2013 model year, the Toyota Prius and smaller Prius c took the top spot with a combined average of 50 mpg. All vehicles making this list are hybrid vehicles, and six of the ten cars making the list are classified as midsize or large sedans and wagons.

Fueleconomy.gov's Top Ten EPA-Rated Fuel Sippers, 2013*

1.		2013 Toyota Prius Hybrid, 4 cyl, 1.8 L, Auto (AV), Regular	Combined 50	City 51/Highway 48
		2013 Toyota Prius c Hybrid, 4 cyl, 1.5 L, Auto (AV), Regular	Combined 50	City 53/Highway 46
2.		2013 Ford C-Max Hybrid Hybrid, 4 cyl, 2.0 L, Auto (AV), Regular	Combined 47	City 47/Highway 47
		2013 Ford Fusion Hybrid Hybrid, 4 cyl, 2.0 L, Auto (AV), Regular	Combined 47	City 47/Highway 47
3.		2013 Lincoln MKZ Hybrid Hybrid, 4 cyl, 2.0 L, Auto (AV), Regular	Combined 45	City 45/Highway 45
		2013 Volkswagen Jetta Hybrid Hybrid, 4 cyl, 1.4 L, Auto (AM-S7), Premium	Combined 45	City 42/Highway 48
4.		2013 Honda Insight Hybrid, 4 cyl, 1.3 L, Auto (AV) , Regular	Combined 42	City 41/Highway 44
		2013 Lexus CT 200h Hybrid, 4 cyl, 1.8 L, Auto (AV), Regular	Combined 42	City 43/Highway 40
		2013 Toyota Prius V Hybrid, 4 cyl, 1.8 L, Auto (AV), Regular	Combined 42	City 44/Highway 40
5.		2013 Lexus ES 300h Hybrid, 4 cyl, 2.5 L, Auto (AV-S6), Regular	Combined 40	City 40/Highway 39

*Excludes electric and plug-in hybrid electric vehicles.

Note: Vehicles are ranked by their combined rating (weighted by 55% city and 45% highway). In the event of a tie, multiple vehicles may share the same ranking.

Supporting Information

Fueleconomy.gov's Top Ten EPA-Rated Fuel Sippers, 2013*			
	Make and Model	**Miles per Gallon**	
1.	2013 Toyota Prius Hybrid, 4 cyl, 1.8 L, Auto (AV), Regular	Combined 50	City 51/Highway 48
	2013 Toyota Prius c Hybrid, 4 cyl, 1.5 L, Auto (AV), Regular	Combined 50	City 53/Highway 46
2.	2013 Ford C-Max Hybrid Hybrid, 4 cyl, 2.0 L, Auto (AV), Regular	Combined 47	City 47/Highway 47
	2013 Ford Fusion Hybrid Hybrid, 4 cyl, 2.0 L, Auto (AV), Regular	Combined 47	City 47/Highway 47
3.	2013 Lincoln MKZ Hybrid Hybrid, 4 cyl, 2.0 L, Auto (AV), Regular	Combined 45	City 45/Highway 45
	2013 Volkswagen Jetta Hybrid Hybrid, 4 cyl, 1.4 L, Auto (AM-S7), Premium	Combined 45	City 42/Highway 48
4.	2013 Honda Insight Hybrid, 4 cyl, 1.3 L, Auto (AV) and (AV-S7), Regular	Combined 42	City 41/Highway 44
	2013 Lexus CT 200h Hybrid, 4 cyl, 1.8 L, Auto (AV), Regular	Combined 42	City 43/Highway 40
	2013 Toyota Prius V Hybrid, 4 cyl, 1.8 L, Auto (AV), Regular	Combined 42	City 44/Highway 40
5.	2013 Lexus ES 300h Hybrid, 4 cyl, 2.5 L, Auto (AV-S6), Regular	Combined 40	City 40/Highway 39

*Excludes electric and plug-in hybrid electric vehicles.

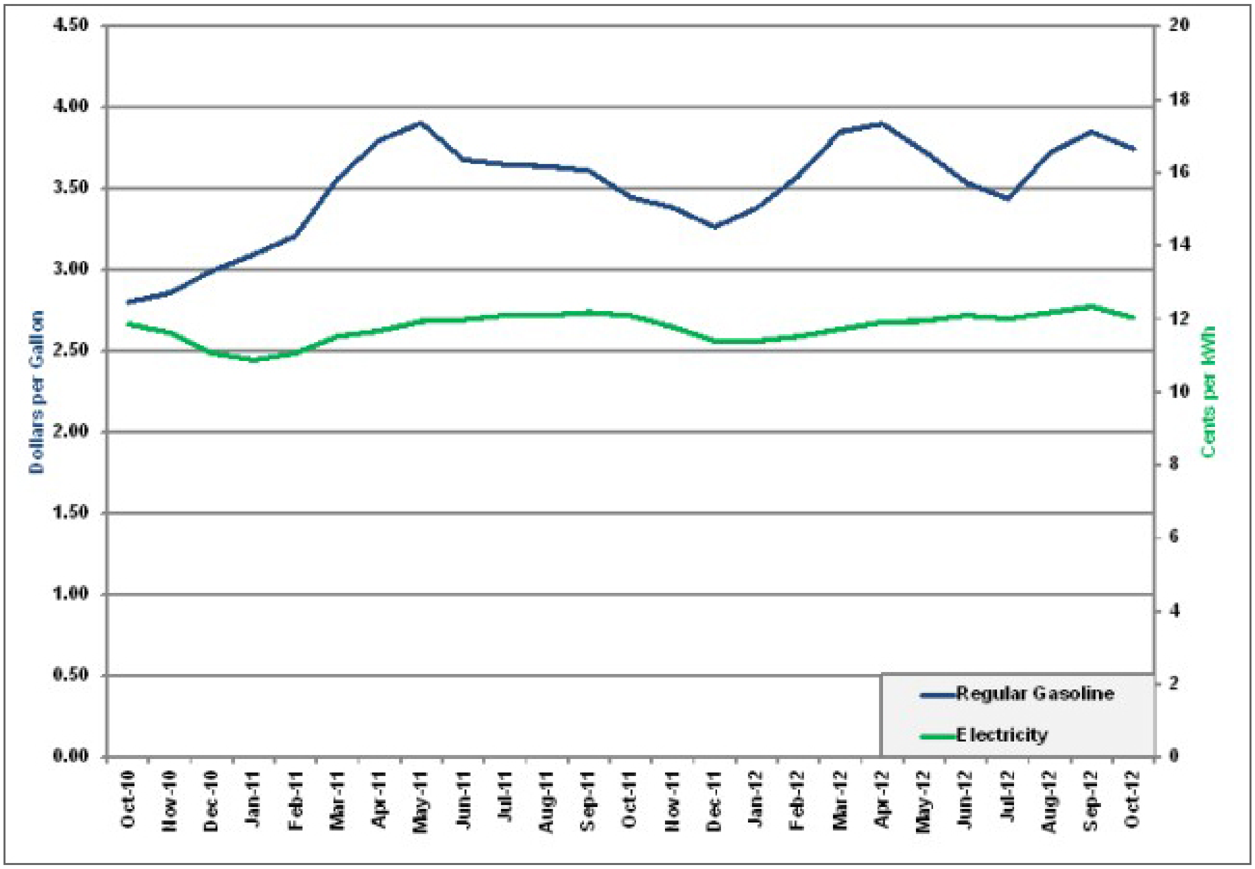
Note: Vehicles are ranked by their combined rating (weighted by 55% city and 45% highway). In the event of a tie, multiple vehicles may share the same ranking.

Source: U.S. Department of Energy and U.S. Environmental Protection Agency's Fuel Economy Website. Website accessed January 17, 2013.

Fact #766: February 11, 2013
Electricity Prices are More Stable than Gasoline Prices

All energy prices vary from month to month and year to year. However, when comparing the national average retail price for a gallon of regular gasoline and a kilowatt-hour (kWh) for residential electricity, the pricing for gasoline is far more volatile. In the two year period shown in the figure below, electricity prices varied by approximately 11% from 11.06 cents to 12.33 cents per kWh. For the same period, gasoline prices varied by approximately 40% from $2.80 to $3.91 dollars per gallon.

National Average Retail Price for Regular Gasoline and Residential Electricity, October 2010–October 2012



Supporting Information

National Average Retail Price for a Gallon of Regular Gasoline and a kWh of Residential Electricity		
Date	Gasoline (Dollars per gallon)	Electricity (Cents per kWh)
Oct-10	2.80	11.86
Nov-10	2.86	11.62
Dec-10	2.99	11.06
Jan-11	3.10	10.87
Feb-11	3.21	11.06
Mar-11	3.56	11.52
Apr-11	3.80	11.67
May-11	3.91	11.93
Jun-11	3.68	11.97
Jul-11	3.65	12.09
Aug-11	3.64	12.09
Sep-11	3.61	12.17
Oct-11	3.45	12.08
Nov-11	3.38	11.78
Dec-11	3.27	11.40
Jan-12	3.38	11.39
Feb-12	3.58	11.52
Mar-12	3.85	11.72
Apr-12	3.90	11.91
May-12	3.73	11.94
Jun-12	3.54	12.09
Jul-12	3.44	12.00
Aug-12	3.72	12.17
Sep-12	3.85	12.33
Oct-12	3.75	12.03
Source: U.S. Energy Information Administration, Average Retail Price of Electricity to Ultimate Customers, U.S. Monthly Retail Gasoline Prices		

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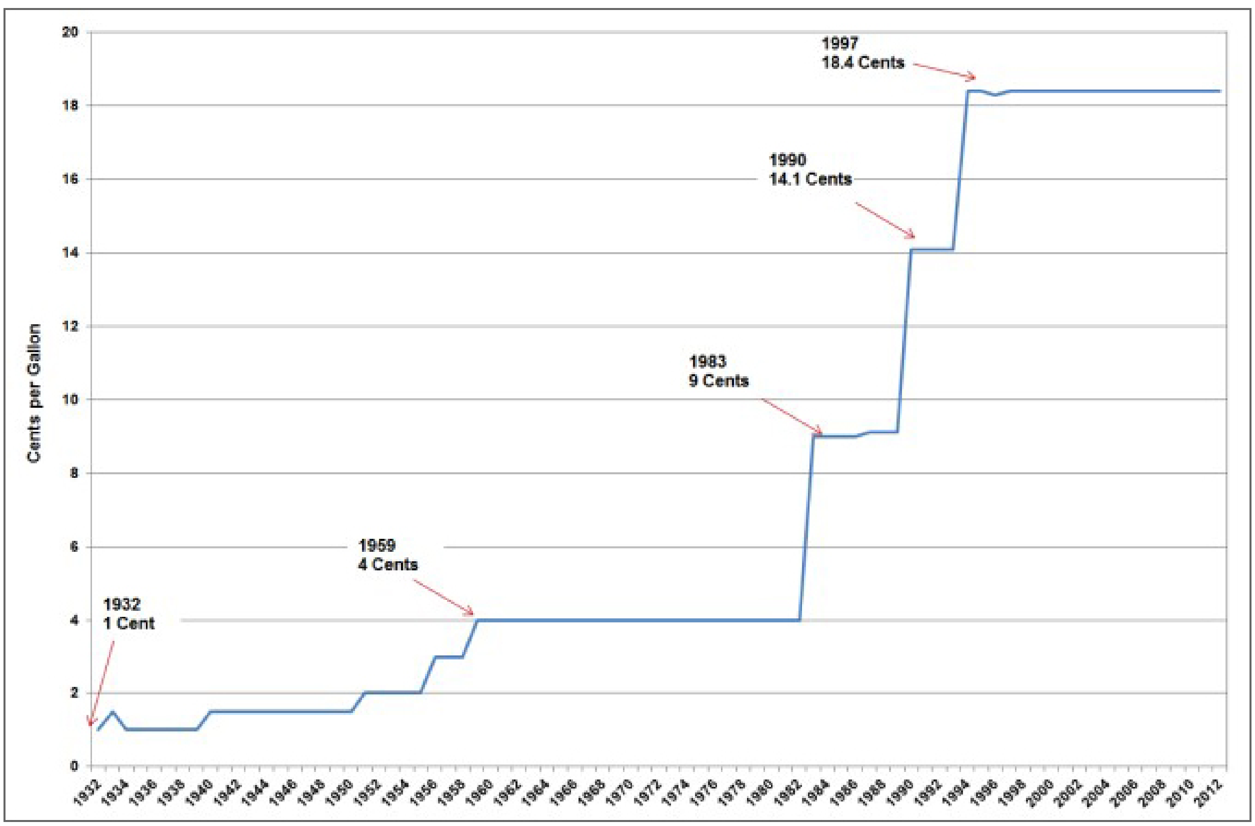
Fact #767: February 18, 2013
Federal Excise Tax on Gasoline, 1932-2012

The Federal excise tax on gasoline began in 1932 and has generally been used to fund transportation related projects like highway construction and repair. This tax began at 1 cent per gallon in 1932 and has been adjusted over the years. However, the increases have been sporadic with half cent or 1 cent increases some years and larger increases of 4 or 5 cents per gallon in other years. The number of years between increases has also varied. The longest period without an increase in this tax was 24 years from 1959 to 1983. The last increase in the Federal excise tax on gasoline was in 1997 when it was raised to 18.4 cents per gallon.

Federal Excise Tax on Gasoline, 1932-2012



Supporting Information

Federal Gasoline Excise Tax 1932 to Present			
Year	Cents per Gallon	Year	Cents per Gallon
1932	1	1973	4
1933	1.5	1974	4
1934	1	1975	4
1935	1	1976	4
1936	1	1977	4
1937	1	1978	4
1938	1	1979	4
1939	1	1980	4
1940	1.5	1981	4
1941	1.5	1982	4
1942	1.5	1983	9
1943	1.5	1984	9
1944	1.5	1985	9
1945	1.5	1986	9
1946	1.5	1987	9.1
1947	1.5	1988	9.1
1948	1.5	1989	9.1
1949	1.5	1990	14.1
1950	1.5	1991	14.1
1951	2	1992	14.1
1952	2	1993	14.1
1953	2	1994	18.4
1954	2	1995	18.4
1955	2	1996	18.3
1956	3	1997	18.4
1957	3	1998	18.4
1958	3	1999	18.4
1959	4	2000	18.4

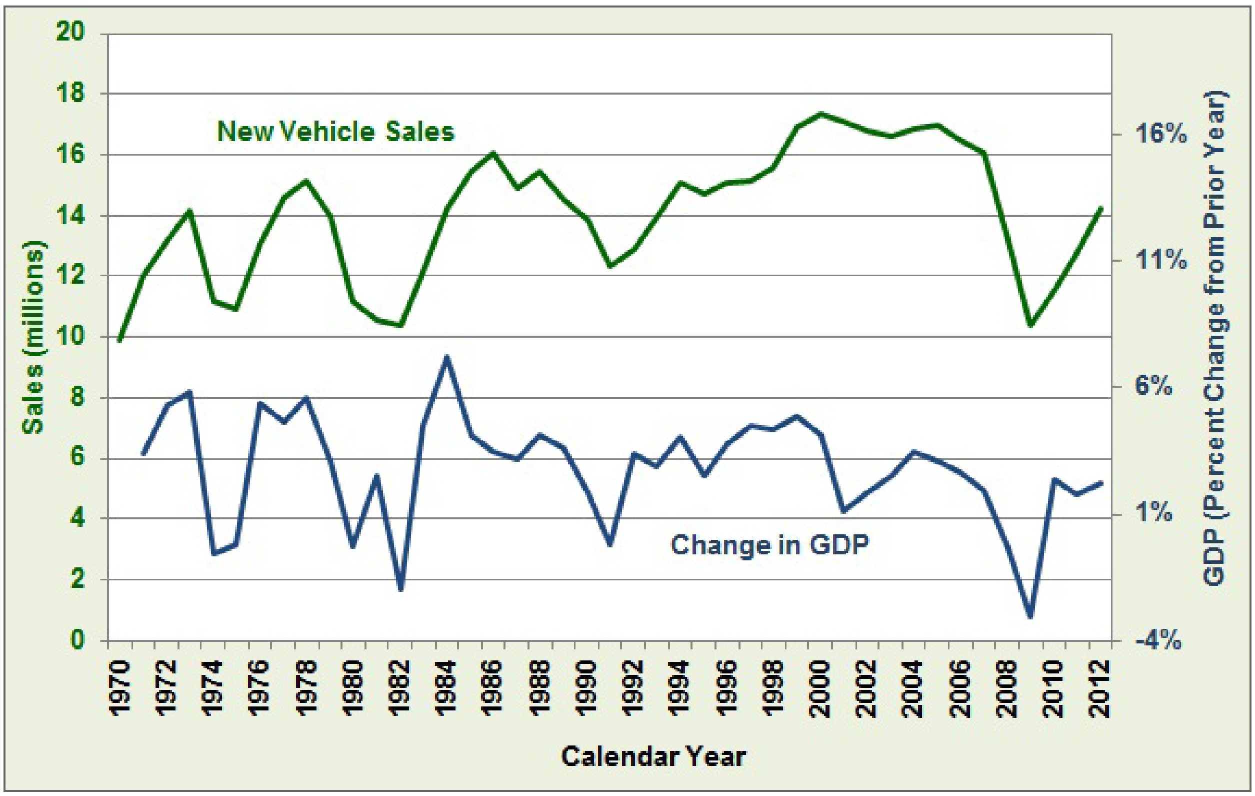
1960	4	2001	18.4
1961	4	2002	18.4
1962	4	2003	18.4
1963	4	2004	18.4
1964	4	2005	18.4
1965	4	2006	18.4
1966	4	2007	18.4
1967	4	2008	18.4
1968	4	2009	18.4
1969	4	2010	18.4
1970	4	2011	18.4
1971	4	2012	18.4
1972	4		

Source: Tax Foundation website, Federal Gasoline Excise Tax Rate, 1932-2008

Fact #768: February 25, 2013
New Light Vehicle Sales and Gross Domestic Product

Over the last four decades, new light vehicle sales have gone from a low of 9.9 million vehicles in 1970 to a high of 17.1 million vehicles sold in 2001, but along the way, there have been significant ups and downs. Those ups and downs are also reflected in the change in Gross Domestic Product (GDP) over time which shows a trend similar to the vehicle sales trend. Vehicle sales have been climbing since the recent low point in 2009.

Light Vehicle Sales, 1970-2012



Note: New vehicle sales include cars and light trucks up to 14,000 lbs. gross vehicle weight rating.

Supporting Information

Light Vehicle Sales, 1970-2012		
Year	**Light Vehicle Sales**	**Percent Change in Gross Domestic Product From Prior Year**
1970	9.9	
1971	12.0	3.4%
1972	13.2	5.3%
1973	14.2	5.8%
1974	11.2	-0.6%
1975	10.9	-0.2%
1976	13.1	5.4%
1977	14.6	4.6%
1978	15.1	5.6%
1979	14.0	3.1%
1980	11.2	-0.3%
1981	10.5	2.5%
1982	10.4	-1.9%
1983	12.1	4.5%
1984	14.2	7.2%
1985	15.4	4.1%
1986	16.1	3.5%
1987	14.9	3.2%
1988	15.5	4.1%
1989	14.5	3.6%
1990	13.9	1.9%
1991	12.3	-0.2%
1992	12.9	3.4%
1993	13.9	2.9%
1994	15.1	4.1%
1995	14.7	2.5%
1996	15.1	3.7%
1997	15.1	4.5%

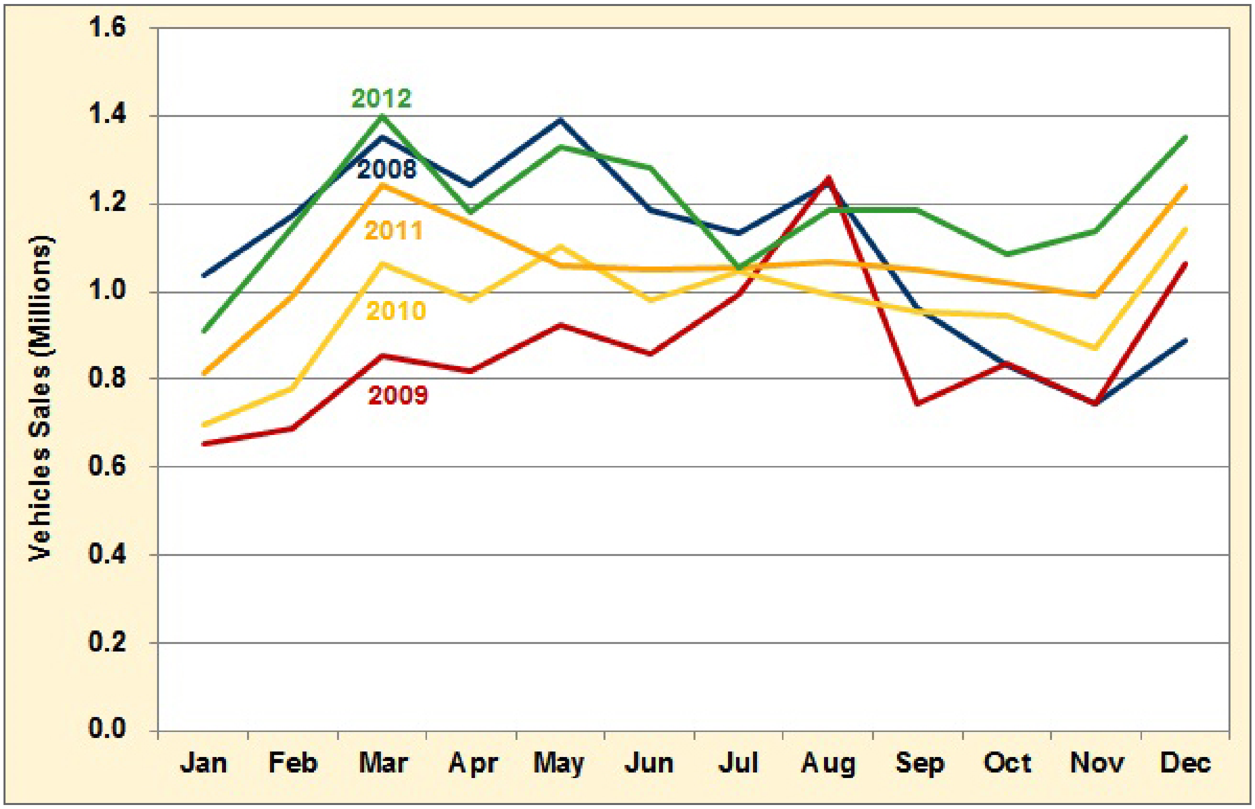
1998	15.5	4.4%
1999	16.9	4.8%
2000	17.4	4.1%
2001	17.1	1.1%
2002	16.8	1.8%
2003	16.6	2.5%
2004	16.9	3.5%
2005	16.9	3.1%
2006	16.5	2.7%
2007	16.1	1.9%
2008	13.2	-0.3%
2009	10.4	-3.1%
2010	11.6	2.4%
2011	12.7	1.8%
2012	14.3	2.2%

Source: Light Vehicle Sales: Oak Ridge National Laboratory, Transportation Energy Data Book: Edition 31.
Gross Domestic Product: Bureau of Economic Analysis, National Product and Income Accounts, Table 1.1.6. Real Gross Domestic Product, Chained Dollars.

Fact #769: March 4, 2013
Monthly Trend in Light Vehicle Sales, 2008-2012

Over the last five years, there have been peaks in light vehicle sales in the months of March, May, and December. There are two notable exceptions: in 2009, the Cash for Clunkers program caused a spike in sales in August; and in 2011 the tsunami/earthquake in Japan was likely responsible for nearly flat sales from the month of May through November, due to supply constraints. Sales in the beginning of 2012 were near the same level as in early 2008 before the economic recession.

Monthly Light Vehicle Sales, 2008-2012



Supporting Information

U.S. Light Vehicle Sales by Month, 2008-2012 (Millions)					
Month	**2008**	**2009**	**2010**	**2011**	**2012**
January	1.0	0.7	0.7	0.8	0.9
February	1.2	0.7	0.8	1.0	1.1
March	1.4	0.9	1.1	1.2	1.4
April	1.2	0.8	1.0	1.2	1.2
May	1.4	0.9	1.1	1.1	1.3
June	1.2	0.9	1.0	1.0	1.3
July	1.1	1.0	1.0	1.1	1.1
August	1.2	1.3	1.0	1.1	1.2
September	1.0	0.7	1.0	1.1	1.2
October	0.8	0.8	0.9	1.0	1.1
November	0.7	0.7	0.9	1.0	1.1
December	0.9	1.1	1.1	1.2	1.4
Total	13.2	10.4	11.6	12.7	14.3
Source: Ward's Automotive.					

Fact #770: March 11, 2013
Changes to the Top Ten Vehicles Sold over the Last Five Years

When reviewing the top ten vehicles sold in calendar years 2008 through 2012, the year 2011 stands out. Likely due to Japan's tsunami/earthquake and Thailand's flood, both of which disrupted the automotive supply chain for many manufacturers in 2011, the top ten vehicles sold in that year were different than previous years. In 2011, the Honda Civic and CR-V were not even on the top ten list for the first time in many years, and the Toyota Corolla and Honda Accord were near the bottom of the list. The Ford Escape and the Chevy Cruze made the top ten in 2011 for the first time in the five-year period. The top three vehicles have been nearly identical in each year, with the exception of 2009, where the Toyota Camry outsold the Chevy Silverado. The U.S. economy was in a recession that year, and the 2009 Cash for Clunkers Program which favored fuel-efficient vehicles also had an effect on sales in that model year. For 2012, the top ten vehicles sold resembles those of 2008, 2009 and 2010. The fuel economy in miles per gallon (MPG) is shown to the right of each vehicle name.

Top Ten Light Vehicles Sold by Calendar Year, 2008-2012

	2008	MPG		2009	MPG		2010	MPG		2011	MPG		2012	MPG
1	Ford F Series	16	1	Ford F Series	17	1	Ford F Series	17	1	Ford F Series	18	1	Ford F Series	18
2	Chevy Silverado	17	2	Toyota Camry	25	2	Chevy Silverado	17	2	Chevy Silverado	17	2	Chevy Silverado	17
3	Toyota Camry	25	3	Chevy Silverado	17	3	Toyota Camry	26	3	Toyota Camry	26	3	Toyota Camry	28
4	Honda Accord	25	4	Toyota Corolla	30	4	Honda Accord	25	4	Nissan Altima	27	4	Honda Accord	27
5	Toyota Corolla	31	5	Honda Accord	25	5	Toyota Corolla	30	5	Ford Escape	25	5	Honda Civic	32
6	Honda Civic	29	6	Honda Civic	29	6	Honda Civic	29	6	Ford Fusion	26	6	Nissan Altima	27
7	Nissan Altima	26	7	Nissan Altima	26	7	Nissan Altima	27	7	Ram	16	7	Ram	16
8	Chevy Impala	22	8	Honda CR-V	23	8	Ford Fusion	25	8	Toyota Corolla	31	8	Toyota Corolla	30
9	Ram	17	9	Ford Fusion	23	9	Honda CR-V	24	9	Honda Accord	27	9	Honda CR-V	26
10	Honda CR-V	23	10	Ram	16	10	Ram	16	10	Chevy Cruze	30	10	Ford Escape	25

Notes: The Toyota Corolla sales also include sales of the Matrix.
For each model, the engine configuration with the highest EPA combined fuel economy was chosen.

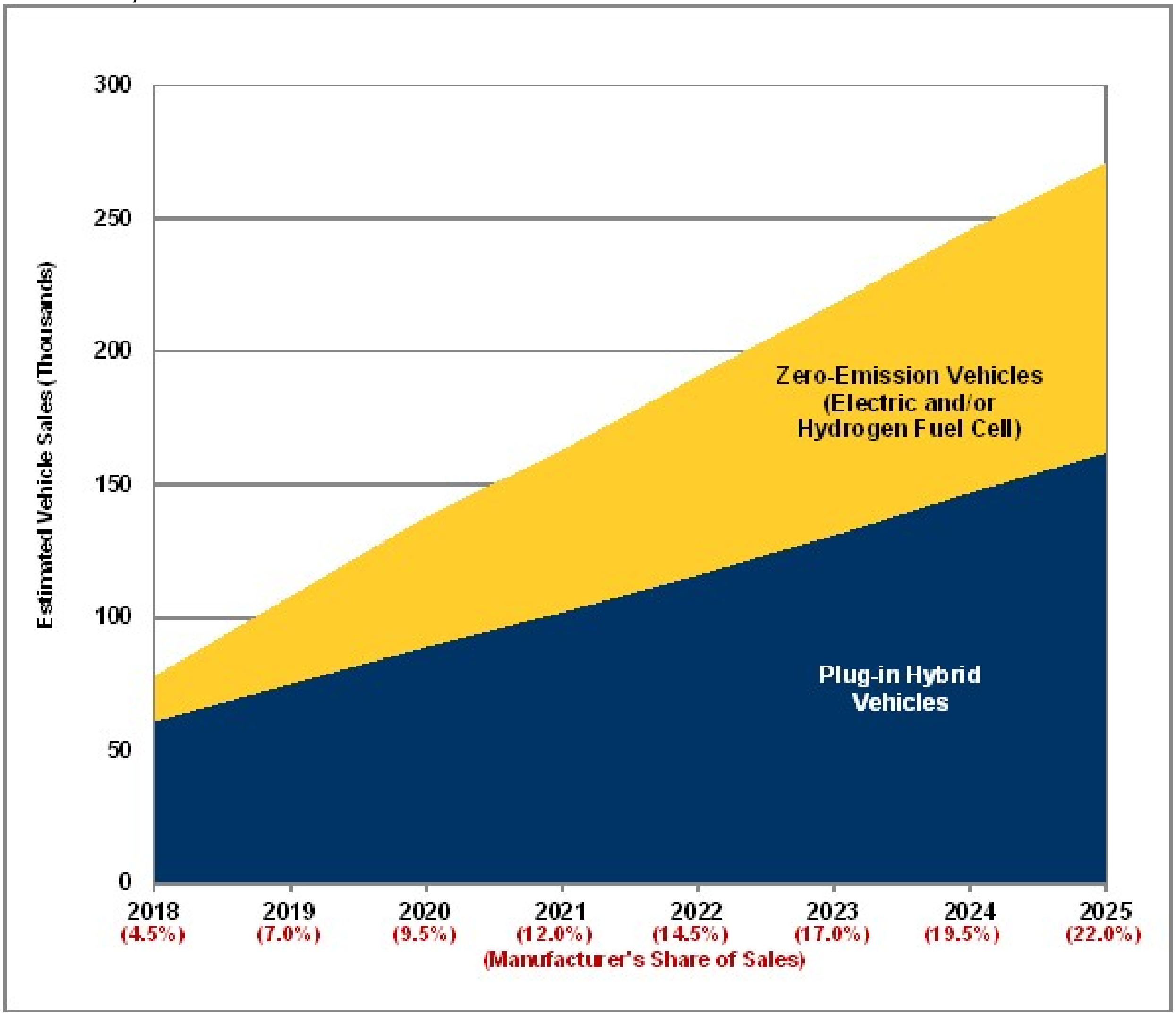
Source: Ward's Automotive and Fuel Economy Guide.

Fact #771: March 18, 2013
California Zero-Emission Vehicle Mandate is now in Effect

A waiver granted by the Environmental Protection Agency (EPA) on December 27, 2012, allowed the Amendments to the California Zero Emission Vehicle (ZEV) Regulation to become effective immediately. California had passed the law in early 2012, but it could not become effective without the EPA waiver. Other states which currently adhere to California emissions rules may choose to adopt the same mandate as well; those states include Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, and Vermont. The mandate requires automakers to sell zero emission vehicles, such as electric and hydrogen fuel cell vehicles along with plug-in hybrid vehicles in increasing quantities beginning in 2018. Electric and fuel cell vehicle sales get full ZEV credit, but plug-in hybrids only get partial credits based on their all-electric range. There is a cap on the share of plug-in hybrid sales that can be used to meet the mandate. In 2018, 4.5% of the manufacturer's sales must be ZEVs or a mixture of ZEVs and plug-in hybrids; by 2025, it rises to 22%.

For additional details concerning this mandate, see the California Air Resources Board Zero Emission Vehicle Program website.

Estimated Sales of Zero-Emission Vehicles under the 2012 Amended Mandate in California, 2018–2025



Supporting Information

California Zero-Emission Vehicle (ZEV) Sales, as Mandated by the 2012 Amendments to the California Zero-Emission Vehicle Regulation

Model Year	Transitional ZEVs (Plug-In Hybrids)	ZEVs (Electric and/or Hydrogen Fuel Cell)	Total ZEV Sales Requirements
2018	61,000	17,000	4.5%
2019	75,000	33,000	7.0%
2020	89,000	49,000	9.5%
2021	102,000	61,000	12.0%
2022	116,000	75,000	14.5%
2023	131,000	87,000	17.0%
2024	147,000	99,000	19.5%
2025	162,000	109,000	22.0%

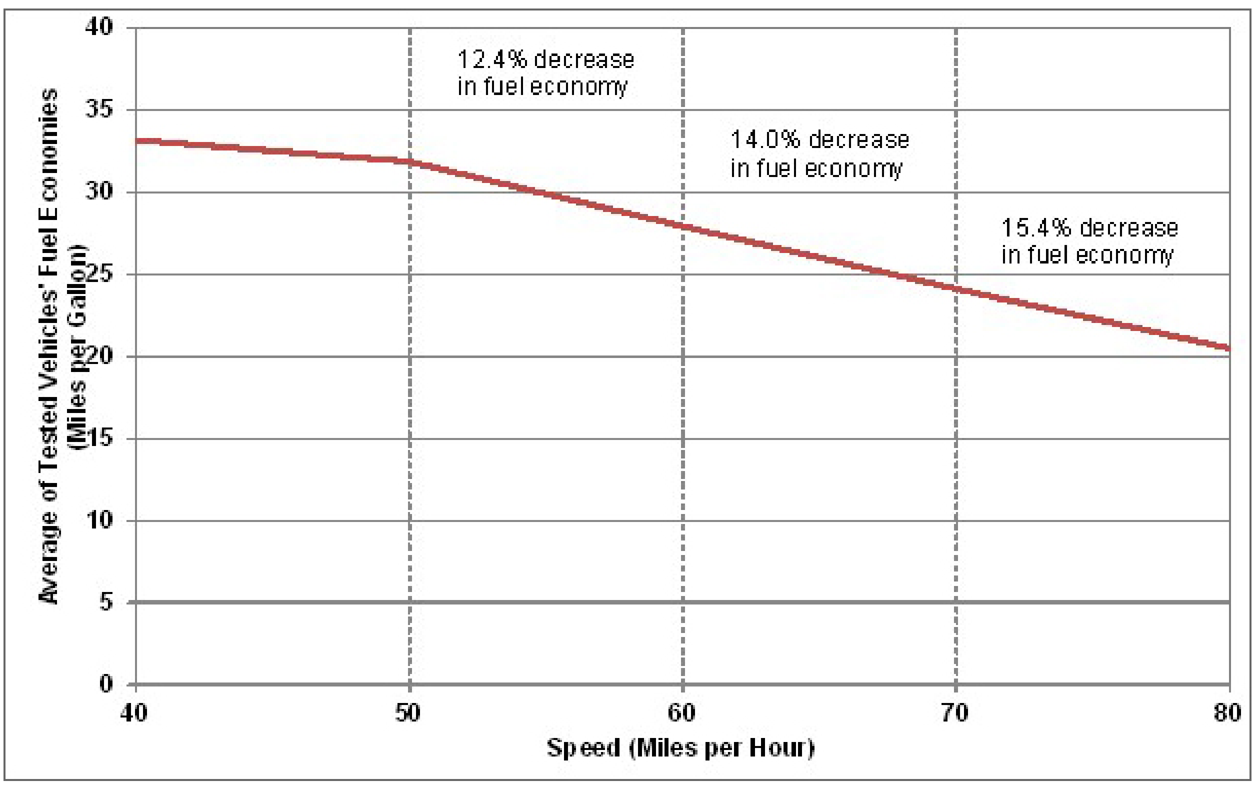
Note: Only the largest automakers are subject to the mandate: BMW, Chrysler Daimler, Ford, General Motors, Honda, Hyundai, Kia, Mazda, Nissan, Toyota, and Volkswagen.

Sources: Crain Communications, *Automotive News*, "ZEV 'straitjacket'?," January 7, 2013. (Original source of estimated sales: California Air Resources Board.) California Air Resources Board, Final Regulation Order: §1962.2 Zero Emission Vehicle Standards for 2018 and subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

Fact #772: March 25, 2013
Fuel Economy by Speed: Slow Down to Save Fuel

A recent study by Oak Ridge National Laboratory shows that the fuel economy of cars and light trucks in the study decreases rapidly at speeds above 50 miles per hour (mph). The study of 74 light vehicles included two-seaters, sedans, station wagons, sport utility vehicles, pickup trucks, and minivans for model years (MY) ranging from 2003 to 2012 with a wide variety of powertrains. Performed on dynamometers simulating highway cruising speeds on flat roads and moderate temperatures, the study results indicate that for the tested vehicles, 40-50 mph is the optimum cruising speed for high fuel economy. The average fuel economy decrease for 50 to 60 mph was 12.4%; from 60 to 70 mph the average decrease was 14%; and from 70 to 80 mph the average decrease was 15.4%. According to engineers at Oak Ridge National Laboratory, the lowest speed in the vehicle's highest gear is where the best fuel economy is typically obtained.

Average Fuel Economy by Speed, 2012 Study of 74 Vehicles



Supporting Information

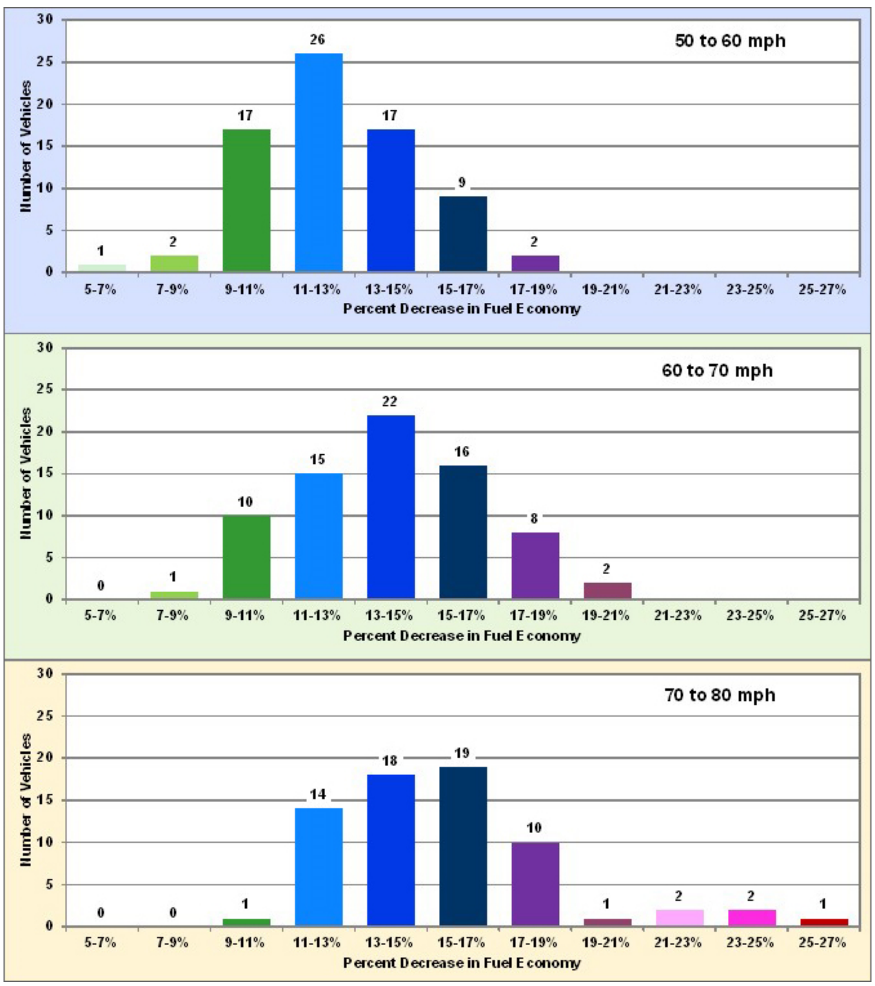
Average Fuel Economy by Speed, 2012 Study of 74 Vehicles	
Vehicle Speed (Miles per Hour)	**Average of Tested Vehicles' Fuel Economies (Miles per Gallon)**
40	33.17
50	31.86
60	27.93
70	24.12
80	20.49

Sources: U.S. Department of Energy and U.S. Environmental Protection Agency, Fuel Economy Guide.
Green Car Congress, "ORNL researchers quantify the effect of increasing highway speed on fuel economy." February 8, 2013.

Fact #773: April 1, 2013
Fuel Economy Penalty at Higher Speeds

Each vehicle reaches an optimal fuel economy at a different speed or range of speeds. A recent study by Oak Ridge National Laboratory illustrates that point with a wide range of data collected on 74 light vehicles. The figure below shows that from 50 to 60 miles per hour (mph) 26 of the vehicles experienced an 11-13% decrease in fuel economy, but one vehicle only experienced a 5-7% decrease, and two experienced a 17 to 19% decrease. From 60 to 70 mph, a fuel economy decrease of 13-15% was most common, and from 70 to 80 mph, a fuel economy decrease of 15-17% was most common.

Fuel Economy Penalty in Ten-Mile-per-Hour Increments



Notes:

- There were only 68 vehicles used for the 70 to 80 mph analysis; six vehicles were tested only to 70 mph.
- The study included two-seaters, sedans, station wagons, sport utility vehicles, pickup trucks, and minivans of model years (MY) 2003 to 2012 with a wide variety of powertrains.
- Dynamometers were used simulating highway cruising speeds on flat roads with moderate temperatures.
- From 70 to 80 mph, there are several vehicles that show more than a 21% decrease in fuel economy; these values mainly come from vehicles with cylinder deactivation. Cylinder deactivation is a fuel saving technology that allows engines to deactivate cylinders under normal cruising conditions. The switch from using 4 cylinders at cruising speed to 8 cylinders at cruising speed causes a large change in fuel economy.

Supporting Information

Fuel Economy Penalty in Ten-Mile-Per-Hour Increments

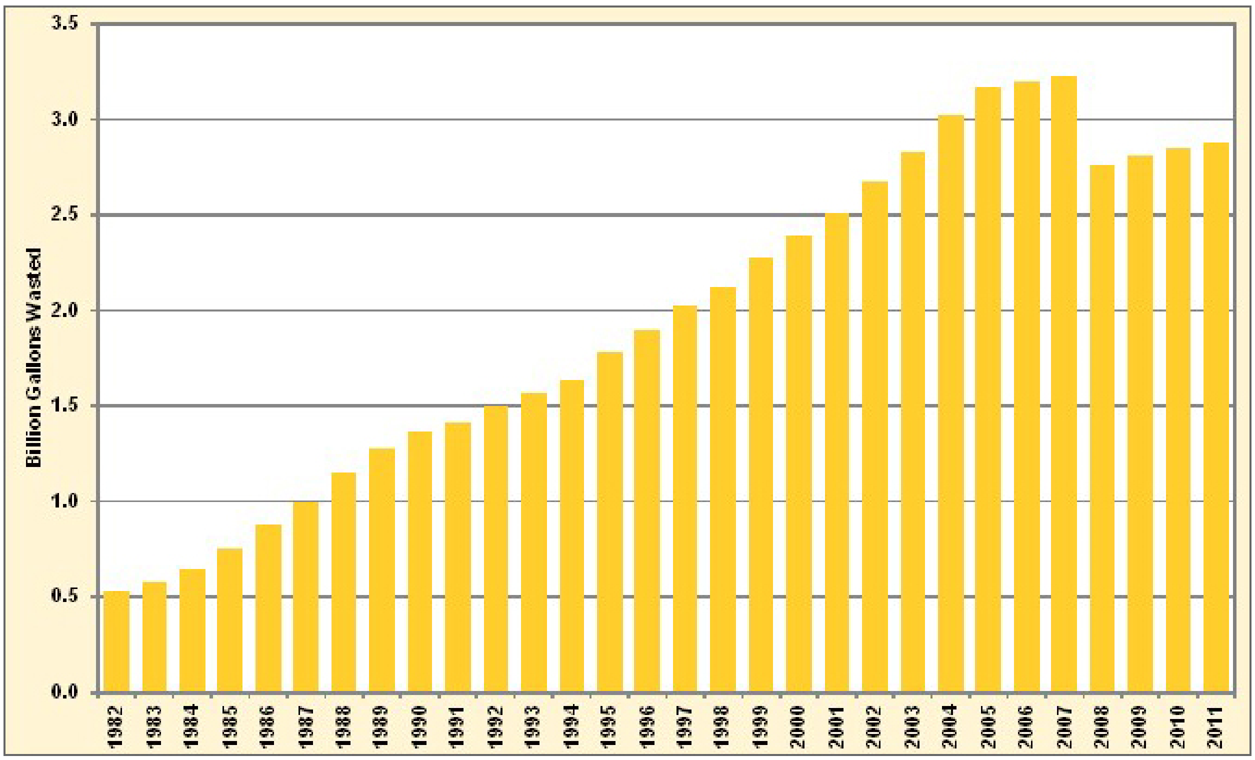
	Speed Increments		
	50 to 60 mph	60 to 70 mph	70 to 80 mph
Percent Decrease	Number of Vehicles		
5-7%	1	0	0
7-9%	2	1	0
9-11%	17	10	1
11-13%	26	15	14
13-15%	17	22	18
15-17%	9	16	19
17-19%	2	8	10
19-21%	0	2	1
21-23%	0	0	2
23-25%	0	0	2
25-27%	0	0	1
Total	74	74	68

Source: Green Car Congress, "ORNL researchers quantify the effect of increasing highway speed on fuel economy," February 8, 2013.

Fact #774: April 8, 2013
Fuel Wasted in Traffic Congestion

The researchers at the Texas Transportation Institute have recently published new estimates of the effects of traffic congestion. The trend toward increased congestion eased in 2008 at the beginning of the recession with the downturn in the economy but began to rise again in each year since. In 2011, 2.88 billion gallons of fuel were wasted due to traffic congestion. This equates to approximately 19 gallons per commuter in 2011.

Total Fuel Wasted Due to Congestion, 1982-2011



Note: The methodology for the gallons of fuel wasted was changed for the 2012 report. The historical values back to 1982 were revised to the new methodology in order to be compatible.

Supporting Information

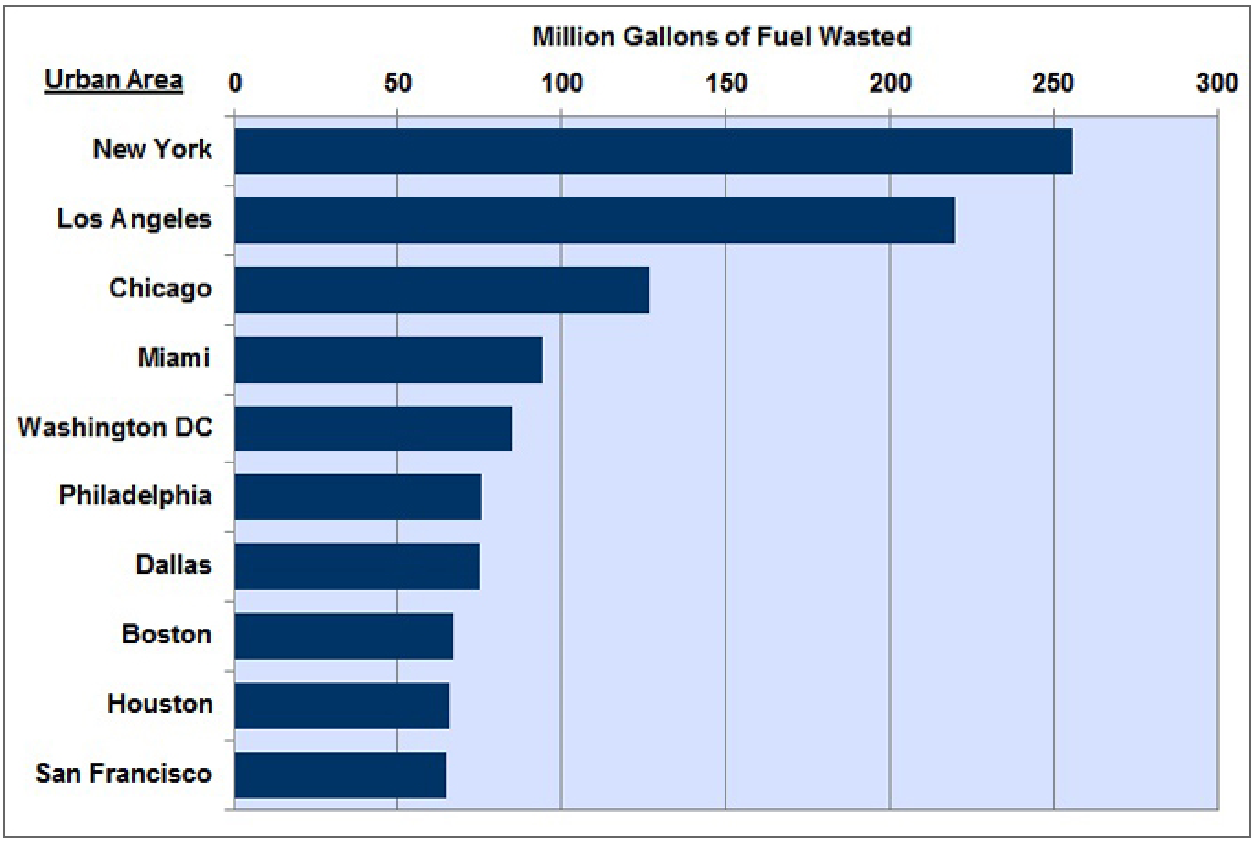
Total Fuel Wasted Due To Congestion	
Year	Fuel Wasted (Billion gallons)
1982	0.53
1983	0.58
1984	0.65
1985	0.75
1986	0.88
1987	1.00
1988	1.15
1989	1.28
1990	1.36
1991	1.41
1992	1.50
1993	1.57
1994	1.64
1995	1.78
1996	1.90
1997	2.02
1998	2.12
1999	2.28
2000	2.39
2001	2.51
2002	2.67
2003	2.83
2004	3.02
2005	3.17
2006	3.20
2007	3.23
2008	2.76
2009	2.81

2010	2.85
2011	2.88
Source: Texas Transportation Institute, *2011 Urban Mobility Report*, December 2012.	

Fact #775: April 15, 2013
Top Ten Urban Areas for Fuel Wasted Due to Traffic Congestion, 2011

The top ten urban areas across the U.S. accounted for nearly 40% of the total fuel wasted due to traffic congestion in 2011. Highway congestion caused vehicles in the combined urban areas of New York, Los Angeles and Chicago to waste about 600 million gallons of fuel in 2011, more than the other seven areas combined. Vehicles in the remaining top ten areas wasted between 50 and 100 million gallons each.

Top Ten Urban Areas for Fuel Wasted Due to Traffic Congestion, 2011



Note: Wasted fuel is extra fuel that is consumed during congested travel that would not have otherwise been consumed in free-flow traffic.

Supporting Information

Top Ten Urban Areas for Fuel Wasted due to Traffic Congestion, 2011		
Rank	**Urban Area**	**Fuel Wasted due to Congestion (Million Gallons)**
1	New York-Newark NY-NJ-CT	256
2	Los Angeles-Long Beach-Santa Ana CA	220
3	Chicago IL-IN	127
4	Miami FL	94
5	Washington DC-VA-MD	85
6	Philadelphia PA-NH-DE-MD	76
7	Dallas-Fort Worth-Arlington TX	75
8	Boston MA-NH-RI	67
9	Houston TX	66
10	San Francisco-Oakland CA	65
	Total for the Top Ten	1,129
	Total for the Nation*	2,884
	Top Ten Share of Total Fuel Wasted	39%

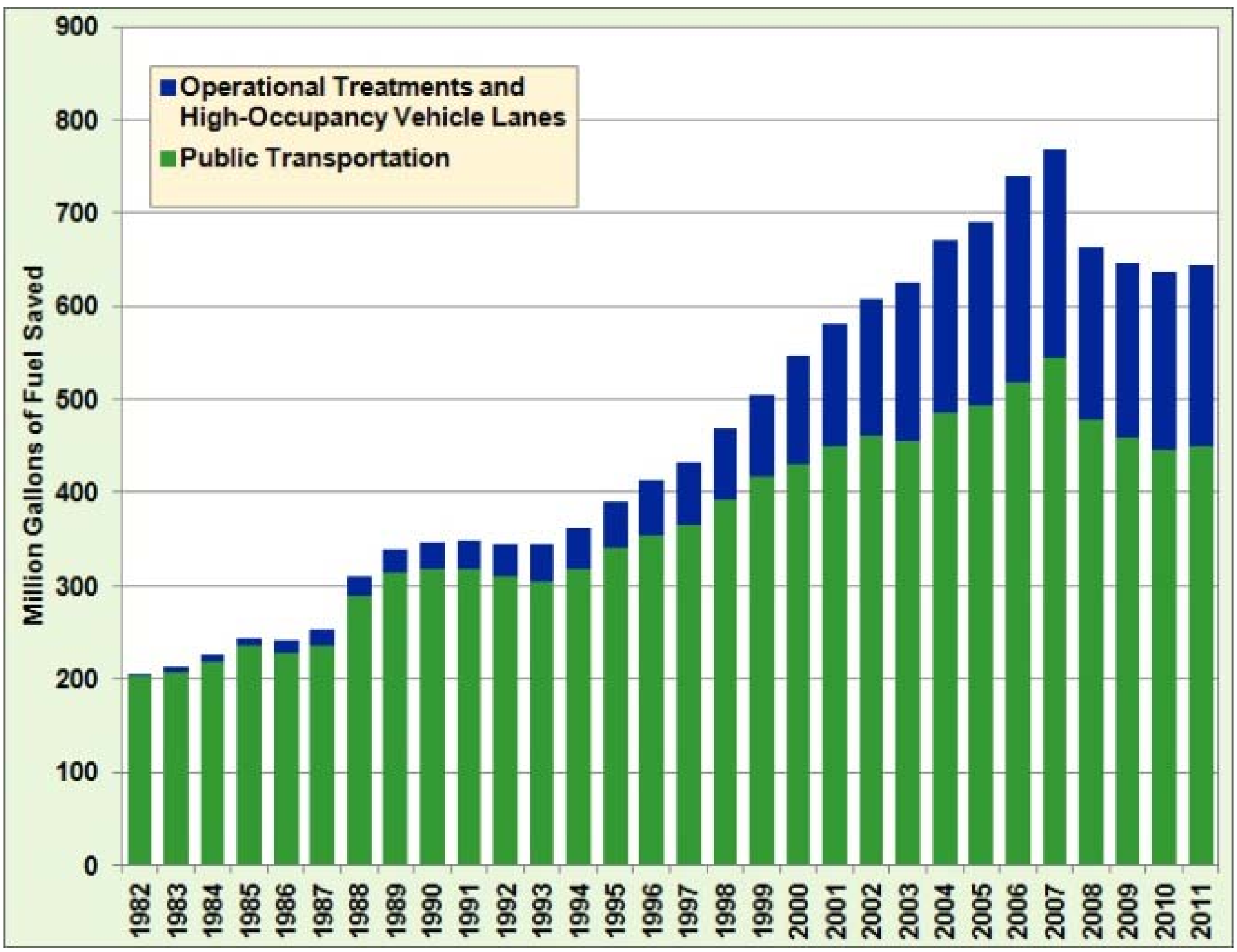
* 498 urban areas across the U.S.

Source: Texas Transportation Institute, *2012 Urban Mobility Report*, December 2012.

Fact #776: April 22, 2013
Fuel Savings from Attempts to Alleviate Traffic Congestion

Despite the news that traffic congestion wasted nearly 2.9 billion gallons of fuel in 2011, fuel savings were achieved due to efforts to combat congestion. According to the Texas Transportation Institute, public transportation was responsible for a savings of 450 million gallons of fuel in 2011. High-occupancy vehicle lanes, combined with other operational treatments, contributed another 194 million gallons to fuel savings. Operational treatments include the coordination of traffic signals, freeway ramp metering, freeway incident management, and arterial street access management.

Fuel Saved Due to Methods of Alleviating Congestion



Supporting Information

Fuel Saved Due to Methods of Alleviating Congestion		
Year	Operational Treatments and High-Occupancy Vehicle Lanes	Public Transportation
1982	1	204
1983	4	208
1984	7	219
1985	9	235
1986	12	229
1987	16	236
1988	21	289
1989	25	314
1990	29	317
1991	31	317
1992	35	310
1993	40	305
1994	44	318
1995	51	340
1996	59	354
1997	67	365
1998	76	392
1999	87	418
2000	116	431
2001	131	450
2002	148	461
2003	169	456
2004	186	486
2005	198	493
2006	220	519
2007	223	546
2008	185	478
2009	188	459

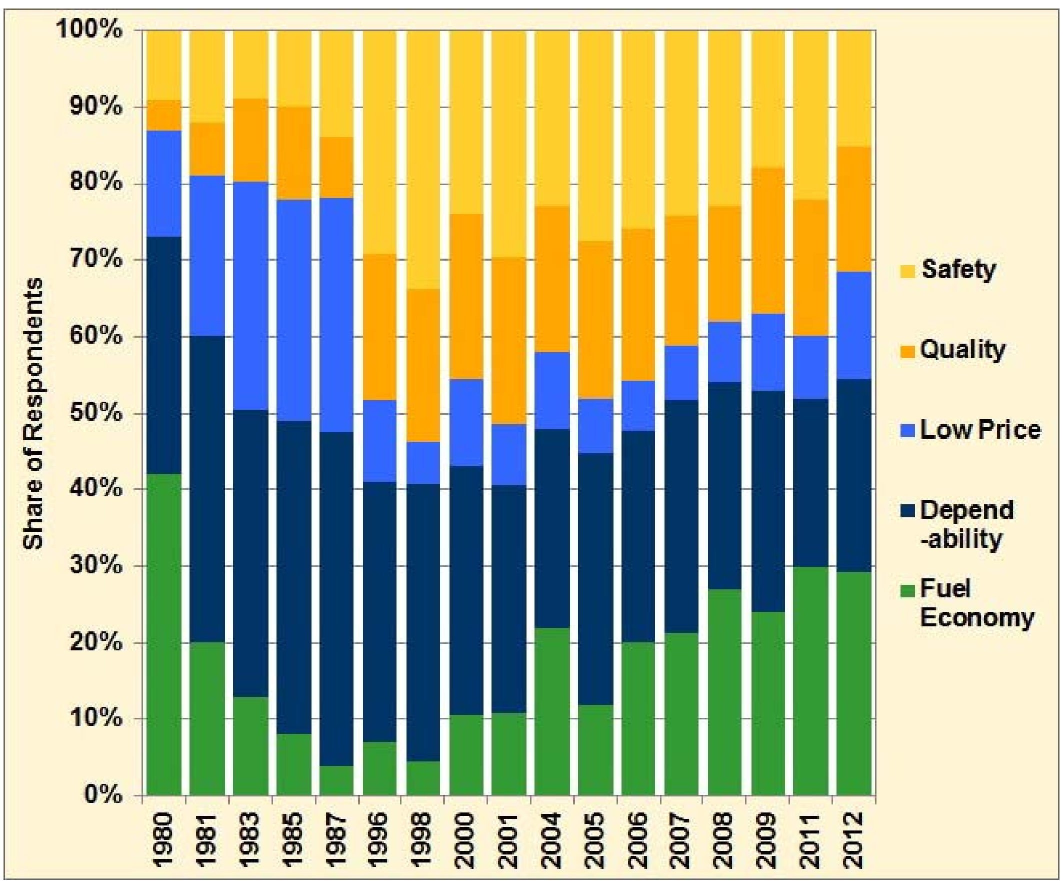
2010	192	445
2011	194	450

Note: Operational treatments include Freeway incident management, freeway ramp metering, arterial street signal coordination, arterial street access management.
Public Transportation—Regular route service from all public transportation providers in an urban area.
Texas Transportation Institute, *2012 Urban Mobility Report*, December 2012.

Fact #777: April 29, 2013
For the Second Year in a Row, Survey Respondents Consider Fuel Economy Most Important When Purchasing a Vehicle

A 2012 survey asked the question "Which one of the following attributes would be MOST important to you in your choice of your next vehicle?" The choices were fuel economy, dependability, low price, quality, and safety. This same question was asked in previous surveys and the results are compared in the graph below. Dependability was chosen most often in nearly every survey, but fuel economy surpassed it in 2011 and 2012. Twenty-nine percent of the survey respondents indicated that fuel economy would be the most important vehicle attribute, while only 25% of respondents chose dependability.

Most Important Vehicle Attribute, 1980-2012



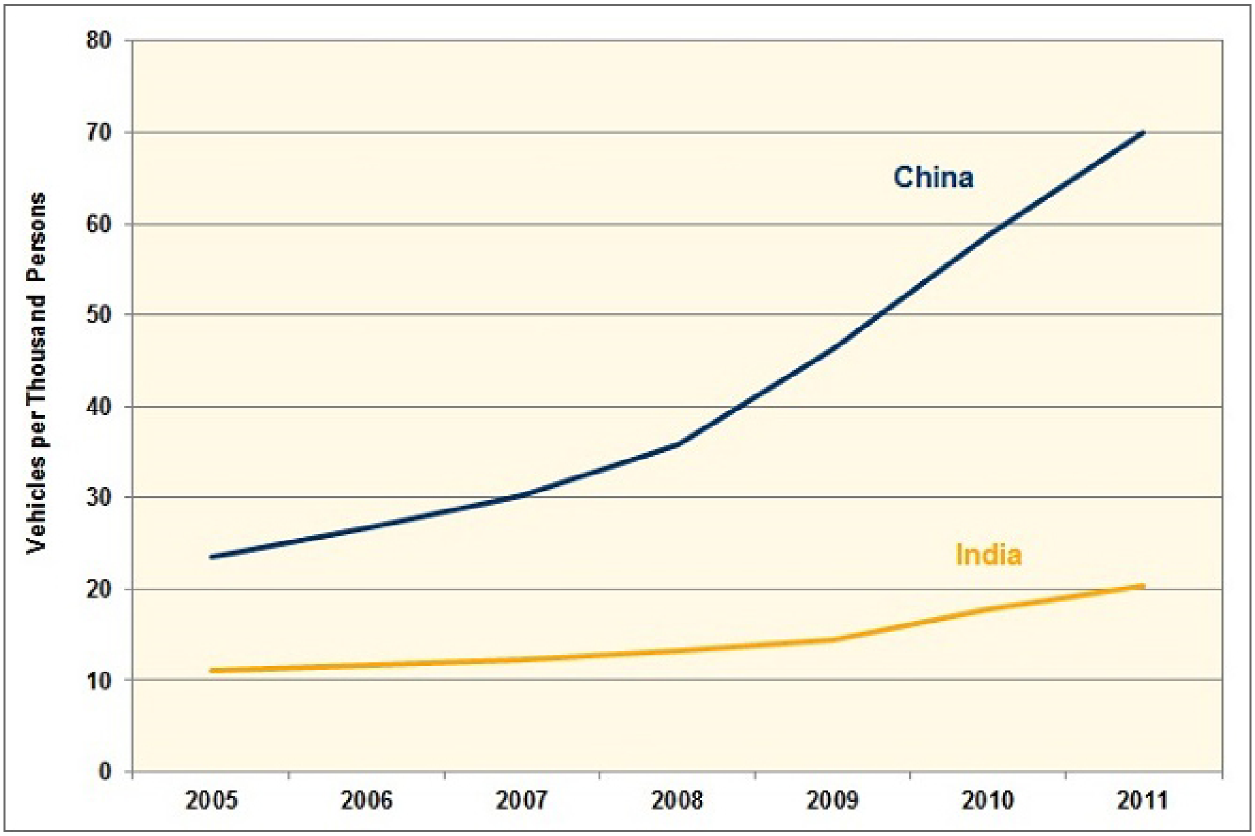
Supporting Information

Q: Which one of the following attributes would be most important in your choice of your next vehicle?						
Year	**Fuel Economy**	**Dependability**	**Low Price**	**Quality**	**Safety**	
1980	42%	31%	14%	4%	9%	100%
1981	20%	40%	21%	7%	12%	100%
1983	13%	38%	30%	11%	9%	101%
1985	8%	41%	29%	12%	10%	100%
1987	4%	44%	31%	8%	14%	100%
1996	7%	34%	11%	19%	29%	100%
1998	4%	36%	5%	20%	34%	100%
2000	11%	33%	11%	22%	24%	100%
2001	11%	30%	8%	22%	30%	100%
2004	22%	26%	10%	19%	23%	100%
2005	12%	33%	7%	21%	28%	100%
2006	20%	28%	7%	20%	26%	100%
2007	21%	30%	7%	17%	24%	100%
2008	27%	27%	8%	15%	23%	100%
2009	24%	29%	10%	19%	18%	100%
2011	30%	22%	8%	18%	22%	100%
2012	29%	25%	14%	16%	15%	100%
Source: Oak Ridge National Laboratory, *2012 Vehicle Technologies Market Report* Figure 17.						

Fact #778: May 6, 2013
Vehicles per Thousand Persons Rising Quickly in China and India

The number of vehicles per thousand persons in China grew by nearly 200% from 2005 to 2011, from 23.46 in 2005 to 69.95 in 2011. India's vehicle per thousand persons grew by 84% in the same time frame, from 11.04 in 2005 to 20.28 in 2011. For comparison, the U.S. in 2011 had about 800 vehicles per thousand people which was a 5% decrease from 2005.

Vehicles per Thousand Persons in China and India, 2005-2011



Note: The term "vehicles" applies to passenger cars and commercial vehicles, such as trucks and buses.

Supporting Information

Vehicles per Thousand Persons in China and India, 2005-2011		
Year	**China**	**India**
2005	23.46	11.04
2006	26.64	11.65
2007	30.33	12.32
2008	35.70	13.16
2009	46.22	14.39
2010	58.66	17.71
2011	69.95	20.28
Growth from 2005 to 2011	198%	84%
Sources: Population – U.S. Census Bureau, International Data Base. Vehicles - Ward's Communications, *Ward's Motor Vehicle Data 2011*.		

Fact #779: May 13, 2013
EPA's Top Ten Rated Vehicles List for Model Year 2013 is All Electric

The 2013 model year marks the first time when the Environmental Protection Agency's (EPA's) top ten most fuel efficient vehicles list is comprised entirely of electric vehicles. Electric vehicles are highly efficient so it is not surprising to see them topping the list. The fact that the list is now made up entirely of electric vehicles is a reflection of the growing number of electric models available to consumers.

The Scion iQ takes the top spot with a combined fuel economy of 121 MPGe (Miles Per Gallon equivalent) while the midsize Nissan Leaf comes in at number four. The Tesla Model S is a large sedan and comes with two battery pack options (60 kW-hr and 85 kW-hr) which achieved an EPA combined average of 95 and 89 MPGe respectively.

EPA Top Ten Rated Vehicles for Model Year 2013

1.	2013 Scion iQ EV Electric Vehicle, Auto (AV)	Combined 121	City 138/Highway 105
2.	2013 Honda Fit EV Electric Vehicle, Auto (A1)	Combined 118	City 132/Highway 105
3.	2013 Fiat 500e Electric Vehicle, Auto (A1)	Combined 116	City 122/Highway 108
4.	2013 Nissan Leaf Electric Vehicle, Auto (A1)	Combined 115	City 129/Highway 102
5.	2013 Mitsubishi i-MiEV Electric Vehicle, Auto (A1)	Combined 112	City 126/Highway 99
6.	2013 smart fortwo EV cabriolet Electric Vehicle, Auto (A1)	Combined 107	City 122/Highway 93
	2013 smart fortwo EV coupe Electric Vehicle, Auto (A1)	Combined 107	City 122/Highway 93
7.	2013 Ford Focus Electric Electric Vehicle, Auto (AV)	Combined 105	City 110/Highway 99
8.	2013 Tesla Model S (60 kW-hr) Electric Vehicle, Auto (A1)	Combined 95	City 94/Highway 97
9.	2013 Tesla Model S (85 kW-hr) Electric Vehicle, Auto (A1)	Combined 89	City 88/Highway 90

Note: The EPA tests all-electric vehicles at their testing facility in Ann Arbor Michigan (Fuel Economy Tests). Vehicles are fully charged and left overnight before testing. The vehicles are run through successive test cycles until they are unable to perform. The vehicles are then fully recharged and the electricity used to recharge the vehicle is measured at the wall outlet in kW-hrs. To determine the MPGe value, the EPA uses a conversion factor of 33.705 kW-hrs = 1 gallon of gasoline.

Source: U.S. EPA and DOE Fuel Economy Website. Accessed May 8, 2013.

Supporting Information

EPA Top Ten Rated Vehicles for Model Year 2013

	Make and Model	Miles per Gallon	
1.	2013 Scion iQ EV Electric Vehicle, Auto (AV)	Combined 121	City 138/Highway 105
2.	2013 Honda Fit EV Electric Vehicle, Auto (A1)	Combined 118	City 132/Highway 105
3.	2013 Fiat 500e Electric Vehicle, Auto (A1)	Combined 116	City 122/Highway 108
4.	2013 Nissan Leaf Electric Vehicle, Auto (A1)	Combined 115	City 129/Highway 102
5.	2013 Mitsubishi i-MiEV Electric Vehicle, Auto (A1)	Combined 112	City 126/Highway 99
6.	2013 smart fortwo EV cabriolet Electric Vehicle, Auto (A1)	Combined 107	City 122/Highway 93
	2013 smart fortwo EV coupe Electric Vehicle, Auto (A1)	Combined 107	City 122/Highway 93
7.	2013 Ford Focus Electric Electric Vehicle, Auto (AV)	Combined 105	City 110/Highway 99
8.	2013 Tesla Model S (60 kW-hr battery pack) Electric Vehicle, Auto (A1)	Combined 95	City 94/Highway 97
9.	2013 Tesla Model S (85 kW-hr battery pack) Electric Vehicle, Auto (A1)	Combined 89	City 88/Highway 90

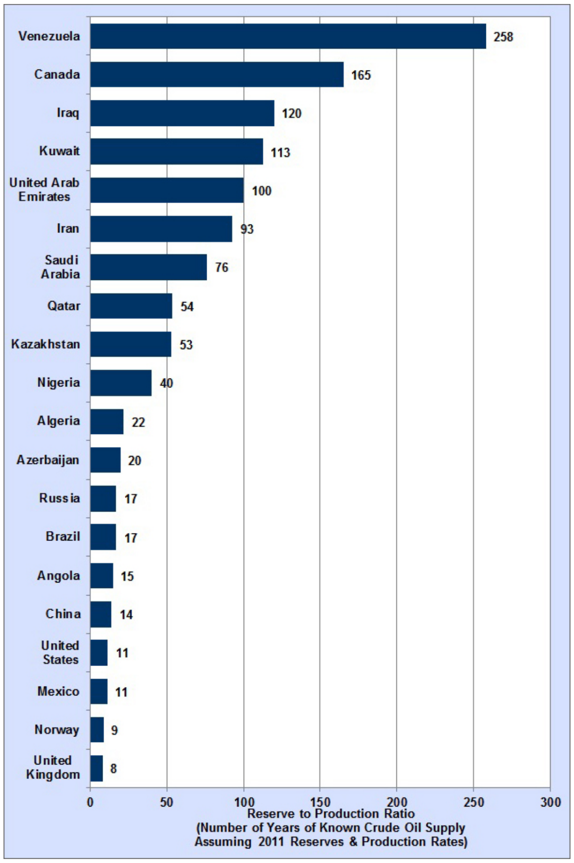
Note: The EPA tests all-electric vehicles at their testing facility in Ann Arbor Michigan (Fuel Economy Tests). Vehicles are fully charged and left overnight before testing. The vehicles are run through successive test cycles until they are unable to perform. The vehicles are then fully recharged and the electricity used to recharge the vehicle is measured at the wall outlet in kW-hrs. To determine the MPGe value, the EPA uses a conversion factor of 33.705 kW-hrs = 1 gallon of gasoline.

Source: U.S. EPA and DOE Fuel Economy Website. Accessed May 8, 2013.

Fact #780: May 20, 2013
Crude Oil Reserve to Production Ratio

The ratio of reserves to production gives a relative measure of the resources available in different oil producing countries. Assuming 2011 crude oil production rates and holding reserves constant, the reserves in Venezuela would last another 258 years, while Canada's reserves would last 165 years and the United States reserves would last 11 years. Saudi Arabia, which held the largest reserves, also produced a significant amount of crude oil in 2011, thus the reserve to production ratio was 76 years. Please note that these ratios do not take into account undiscovered oil or unconventional resources, which may extend the timeframes; nor do they take into account future increased demand for crude oil, which may shorten the timeframes.

Crude Oil Reserve to Production Ratio in the Top 20 Oil Producing Countries



Note: Reserve to Production Ratio assumes 2011 production rates and holds reserves constant.

Supporting Information

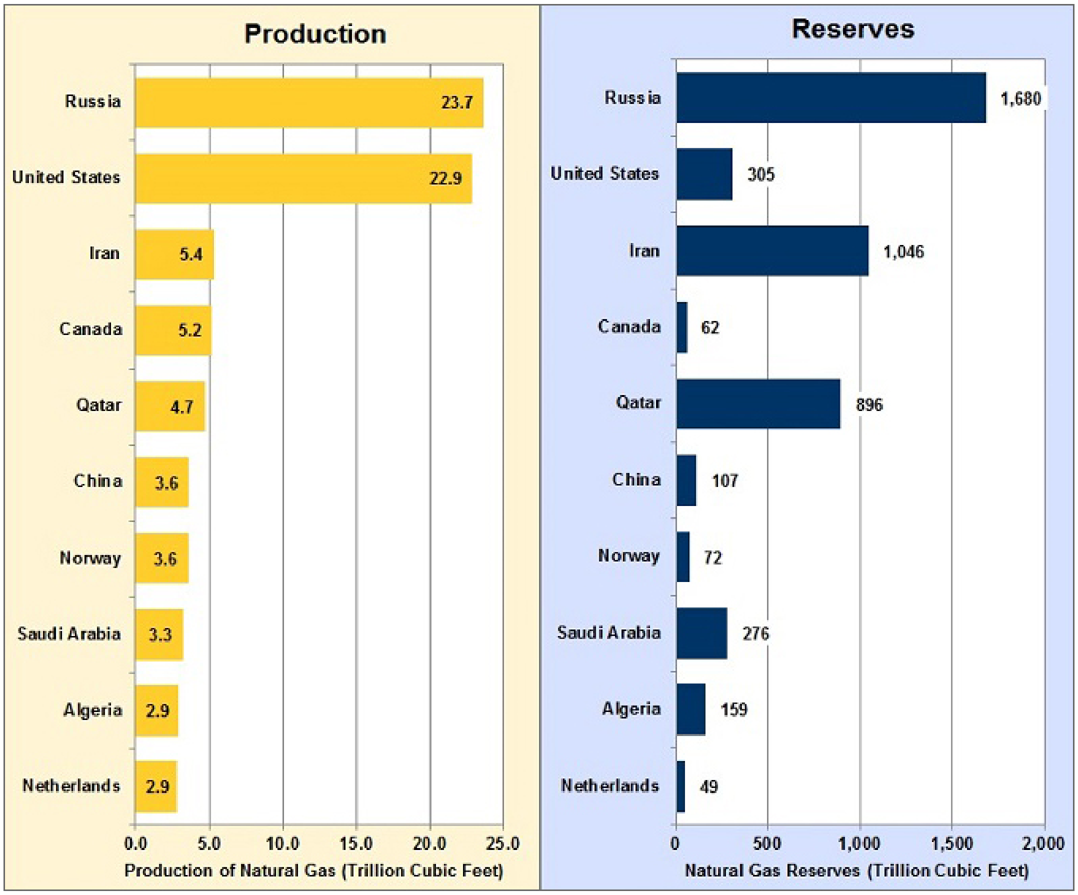
Crude Oil Reserve to Production Ratio in the Top 20 Oil Producing Countries	
Country	**Reserve to Production Ratio (Number of Years of Known Crude Oil Supply Assuming 2011 Reserves and Production Rates)**
Venezuela	258
Canada	165
Iraq	120
Kuwait	113
United Arab Emirates	100
Iran	93
Saudi Arabia	76
Qatar	54
Kazakhstan	53
Nigeria	40
Algeria	22
Azerbaijan	20
Brazil	17
Russia	17
Angola	15
China	14
Mexico	11
United States	11
Norway	9
United Kingdom	8

Source: Energy Information Administration, International Energy Statistics, 2011 reserves and 2011 production queried on March 28, 2013.

Fact #781: May 27, 2013
Top Ten Natural Gas Producing Countries

In 2011, Russia and the United States were by far the top natural gas producing countries, with more than four times that of Iran, the third largest producer of natural gas. Although Russia and the United States produced nearly the same amount of natural gas, Russia has far greater conventional natural gas reserves than the United States based on 2011 estimates. Iran and Qatar have large reserves of natural gas but are not producing natural gas as aggressively as the United States or Russia.

Natural Gas Production and Reserves for the Top Ten Natural Gas Producing Countries, 2011



Note: Reserves include only known conventional reserves, which may increase in the future with the discovery of new deposits or improved techniques for extraction.

Supporting Information

Natural Gas Production and Reserves for the Top Ten Countries which Produce Natural Gas, 2011 (Trillion Cubic Feet)

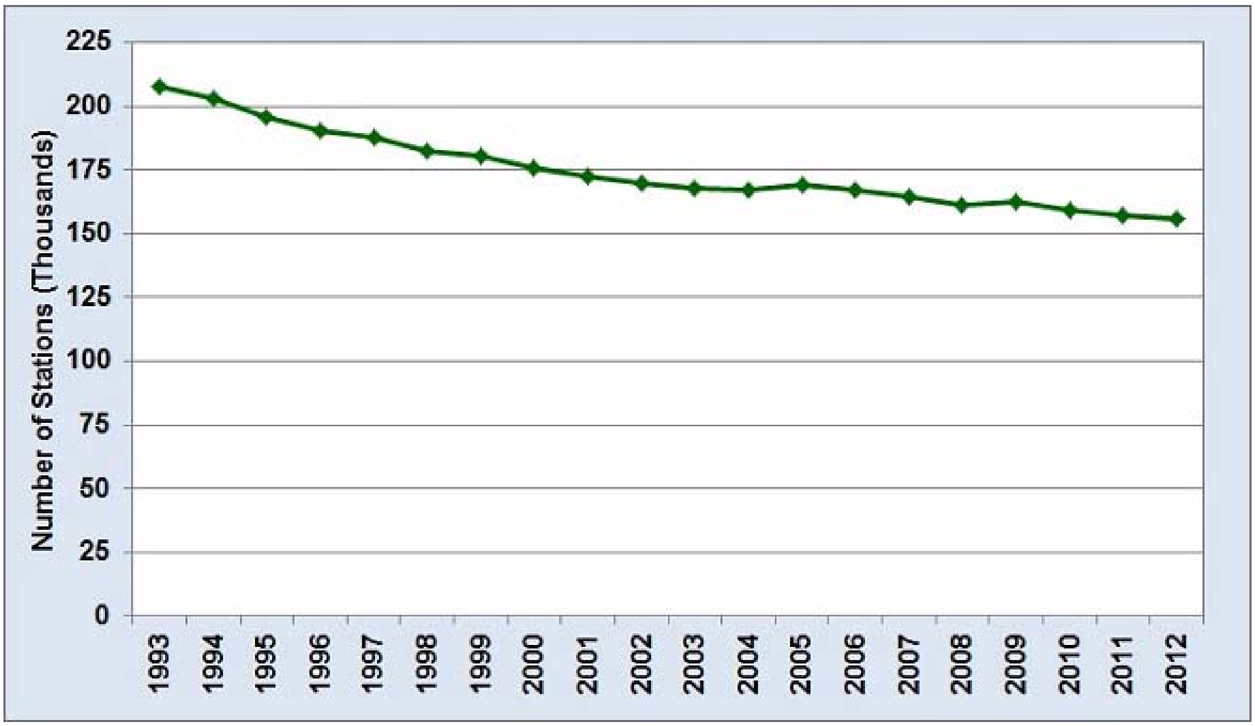
	Country	Production	Known Conventional Reserves
1	Russia	23.7	1,680
2	United States	22.9	305
3	Iran	5.4	1,046
4	Canada	5.2	62
5	Qatar	4.7	896
6	China	3.6	107
7	Norway	3.6	72
8	Saudi Arabia	3.3	276
9	Algeria	2.9	159
10	Netherlands	2.9	49

Source: Energy Information Administration, International Energy Statistics, 2011 reserves and 2011 production queried on March 28, 2013.

Fact #782: June 3, 2013
Number of Refueling Stations Continues to Shrink

In 1993 there were more than 200,000 refueling stations on our nation's roadways. The number of stations has been decreasing almost every year since then. By 2012, there were just over 150,000 stations; this translates to about one station per 1,600 vehicles.

Number of Refueling Stations, 1993-2012



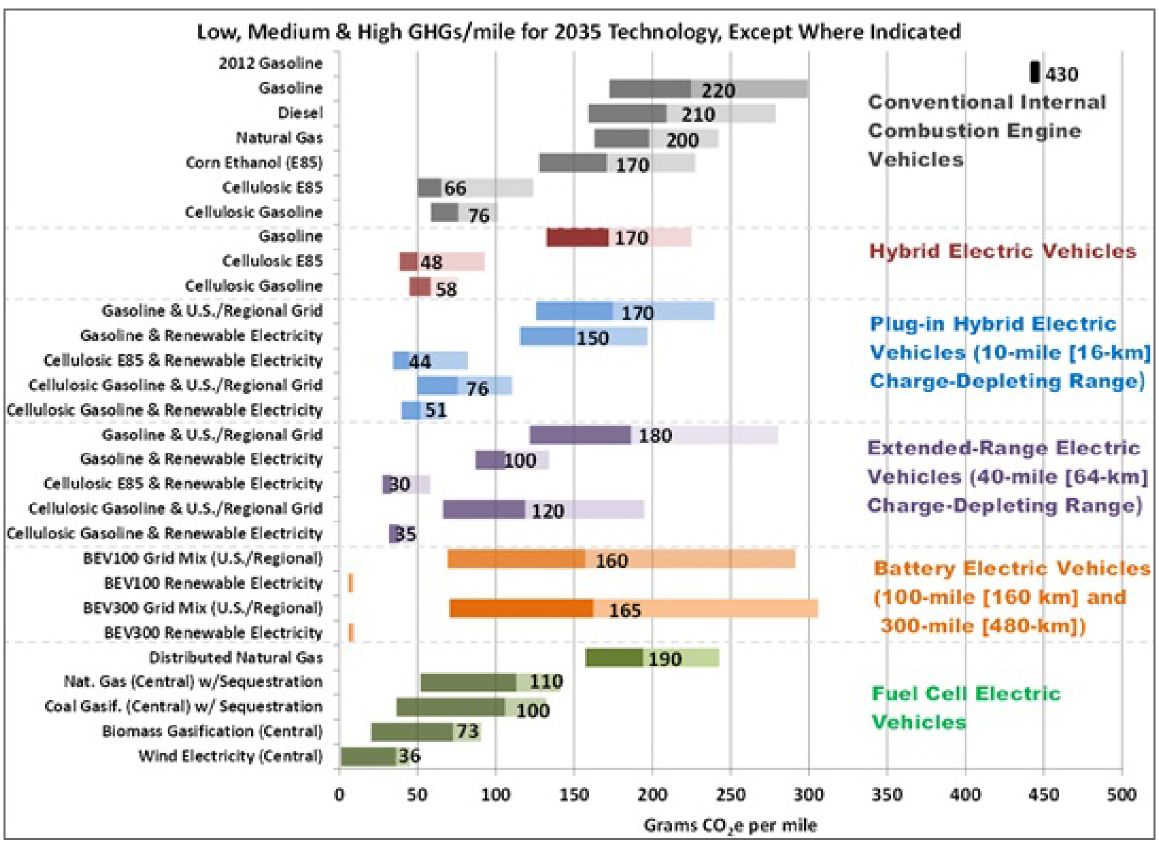
Supporting Information

Number of Refueling Stations, 1993-2012	
Year	**Number of Refueling Stations (Thousands)**
1993	207.4
1994	202.9
1995	195.5
1996	190.2
1997	187.9
1998	182.6
1999	180.6
2000	175.9
2001	172.2
2002	170.0
2003	167.6
2004	167.3
2005	169.0
2006	167.5
2007	164.3
2008	161.1
2009	162.4
2010	159.0
2011	157.4
2012	156.1
Source: National Petroleum News Survey, 2013.	

Fact #783: June 10, 2013
Emissions and Energy Use Model—GREET

The Greenhouse Gases, Regulated Emission, and Energy Use in Transportation (GREET) Model is a full life-cycle model for evaluating the energy and emission impacts of various vehicle and fuel combinations. The first version of the GREET model was released in 1996. Since then, the model has been updated and expanded to include additional vehicle types and fuels. The results below are from GREET Model 2012 v.2. Greenhouse gas (GHG) emissions (in carbon dioxide (CO_2) equivalent) are compared for 2035 vehicles, including conventional, hybrid electric, plug-in hybrid electric, extended-range electric, battery electric and fuel cell electric vehicles. Different fuels and/or grid mixes are shown.

Well-to-Wheels Greenhouse Gas Emissions for a 2035 Mid-Size Car



Notes: At the top of the figure, a 2012 mid-size car is shown for comparison. Renewable electricity includes biomass, hydro, wind, solar, and geothermal.

Supporting Information

Well-to-Wheels Greenhouse Gas Emissions for a 2035 Mid-Size Car		
Fuels	**GHG emissions per Mile**	**Vehicle Technology**
2012 Gasoline	430	Conventional Internal Combustion Engine Vehicles
Gasoline	220	
Diesel	210	
Natural Gas	200	
Corn Ethanol (E85)	170	
Cellulosic E85	66	
Cellulosic Gasoline	76	
Gasoline	170	Hybrid Electric Vehicles
Cellulosic E85	48	
Cellulosic Gasoline	58	
Gasoline & U.S./Regional Grid	170	Plug-in Hybrid Electric Vehicles (10-mile Charge Depleting Range)
Gasoline & Renewable Electricity	150	
Cellulosic E85 & Renewable Electricity	44	
Cellulosic Gasoline & U.S. Regional Grid	76	
Cellulosic Gasoline & Renewable Electricity	51	
Gasoline & U.S./Regional Grid	180	Extended-Range Electric Vehicles (40-mile Charge Depleting Range)
Gasoline & Renewable Electricity	100	
Cellulosic E85 & Renewable Electricity	30	
Cellulosic Gasoline & U.S. Regional Grid	120	
Cellulosic Gasoline & Renewable Electricity	35	
BEV100 Grid Mix (U.S./Regional)	160	Battery Electric Vehicles (100-mile and 300-mile)
BEV100 Grid Mix Renewable Electricity	7	
BEV300 Grid Mix (U.S./Regional)	165	
BEV300 Grid Mix Renewable Electricity	8	

Distributed Natural Gas	190	Fuel Cell Electric Vehicles
Nat. Gas (Central) w/ Sequestration	110	
Coal Gasification (Central) w/ Sequestration	100	
Biomass Gasification (Central)	73	
Wind Electricity (Central)	36	
Source: U.S. Department of Energy, Program Record (Offices of Bioenergy Technologies, Fuel Cell Technologies and Vehicle Technologies), "Well-to-Wheels Greenhouse Gas Emissions and Petroleum Use for Mid-Size Light-Duty Vehicles," Record #13005, April 25, 2013.		

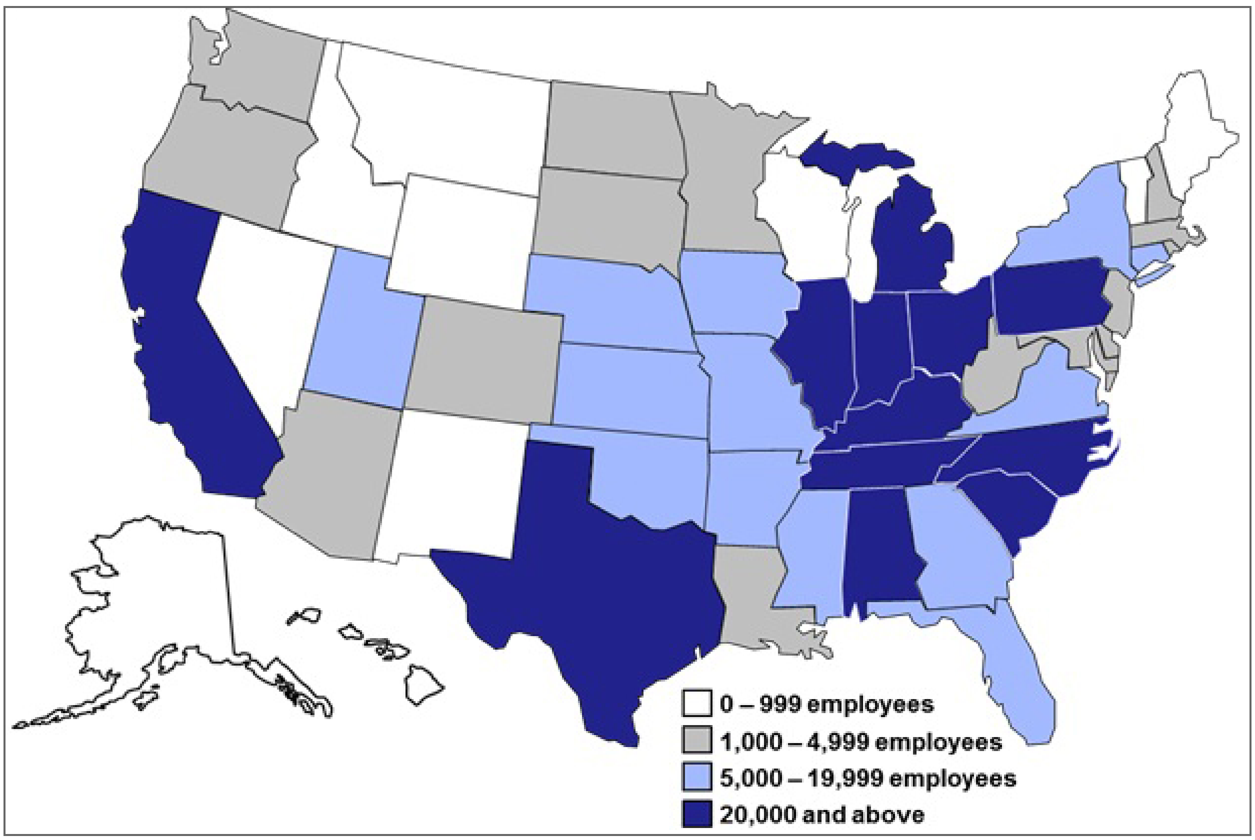
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Vehicle Technologies Office

Fact #784: June 17, 2013
Direct Employment of Motor Vehicle Parts Manufacturing by State

The manufacture of motor vehicle parts accounts for a substantial amount of employment, particularly in the Midwest and in the South. Motor vehicle parts manufacturing directly employed more than 734,000 people in 2012; and all 50 states had some level of employment supported by this industry. The top five states including Michigan, Ohio, Indiana, Tennessee, and Kentucky accounted for nearly half of the employment directly related to motor vehicle parts manufacturing. The table below shows that Michigan had by far the greatest number employed in this sector with more than six times that of Georgia which ranked fifteenth.

Direct Employment of Motor Vehicle Parts Manufacturing by State, 2012



Supporting Information

Top Fifteen States for Motor Vehicle Parts Manufacturing Employment, 2012	
State	**Employment**
Michigan	102,624
Ohio	89,423
Indiana	79,651
Tennessee	48,284
Kentucky	41,097
Illinois	37,087
Alabama	30,566
Texas	29,422
North Carolina	25,843
South Carolina	24,569
California	22,736
Pennsylvania	21,130
New York	19,005
Missouri	16,648
Georgia	16,287
Source: Motor & Equipment Manufacturers Association (MEMA), "Moving America Forward." Accessed May 6, 2013	

Supporting Information for Map

Direct Employment of Motor Vehicle Parts Manufacturing by State, 2012	
State	**Number of Employees**
Alaska	0 - 999 employees
Hawaii	0 - 999 employees
Idaho	0 - 999 employees
Maine	0 - 999 employees
Montana	0 - 999 employees
Nevada	0 - 999 employees
New Mexico	0 - 999 employees
Vermont	0 - 999 employees
Wisconsin	0 - 999 employees
Wyoming	0 - 999 employees
Arizona	1,000 - 4,999 employees
Colorado	1,000 - 4,999 employees
Delaware	1,000 - 4,999 employees
Louisiana	1,000 - 4,999 employees
Maryland	1,000 - 4,999 employees
Massachusetts	1,000 - 4,999 employees
Minnesota	1,000 - 4,999 employees
New Hampshire	1,000 - 4,999 employees
New Jersey	1,000 - 4,999 employees
North Dakota	1,000 - 4,999 employees
Oregon	1,000 - 4,999 employees
Rhode Island	1,000 - 4,999 employees
South Dakota	1,000 - 4,999 employees
Washington	1,000 - 4,999 employees
West Virginia	1,000 - 4,999 employees
Arkansas	5,000 - 19,999 employees
Connecticut	5,000 - 19,999 employees
Florida	5,000 - 19,999 employees

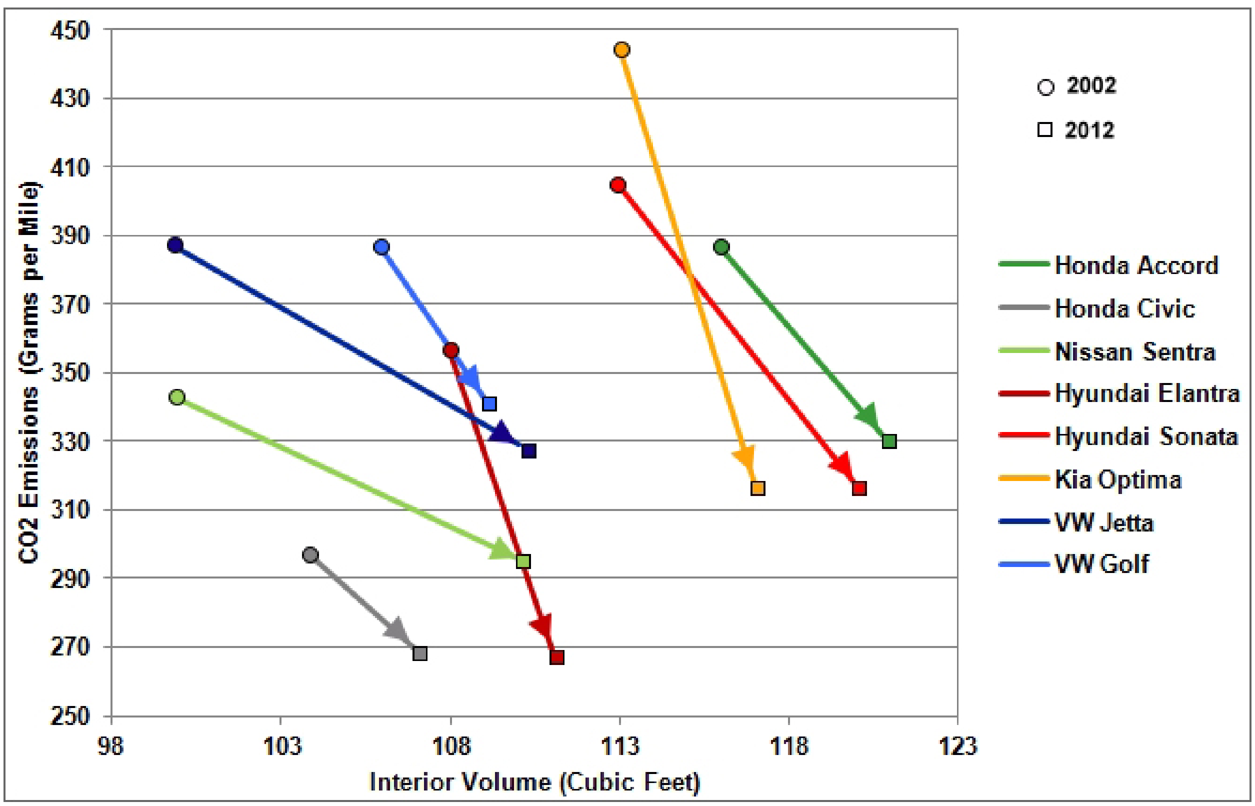
Georgia	5,000 - 19,999 employees
Iowa	5,000 - 19,999 employees
Kansas	5,000 - 19,999 employees
Mississippi	5,000 - 19,999 employees
Missouri	5,000 - 19,999 employees
Nebraska	5,000 - 19,999 employees
New York	5,000 - 19,999 employees
Oklahoma	5,000 - 19,999 employees
Utah	5,000 - 19,999 employees
Virginia	5,000 - 19,999 employees
Alabama	20,000 and above employees
California	20,000 and above employees
Illinois	20,000 and above employees
Indiana	20,000 and above employees
Kentucky	20,000 and above employees
Michigan	20,000 and above employees
North Carolina	20,000 and above employees
Ohio	20,000 and above employees
Pennsylvania	20,000 and above employees
South Carolina	20,000 and above employees
Tennessee	20,000 and above employees
Texas	20,000 and above employees

Source: Motor & Equipment Manufacturers Association (MEMA), "Moving America Forward." Accessed May 6, 2013

Fact #785: June 24, 2013
Many Cars Pollute Less Despite Increases in Size

As new vehicles become more efficient, the amount of carbon dioxide (CO_2) they produce decreases. Shown below are several examples of model year (MY) 2012 cars that have decreased the amount of CO_2 they produce (in grams per mile) despite the fact that they are larger (in interior volume) than they were ten years ago. Of the examples, the Kia Optima had the largest decline in CO_2 emissions in the ten-year period, and the Nissan Sentra and VW Jetta had the greatest increase in interior volume while still reducing CO_2 emissions.

Carbon Dioxide Emissions versus Interior Volume for Selected Model Year 2012 Cars



Supporting Information

Carbon Dioxide Emissions versus Interior Volume for Selected MY 2012 Cars

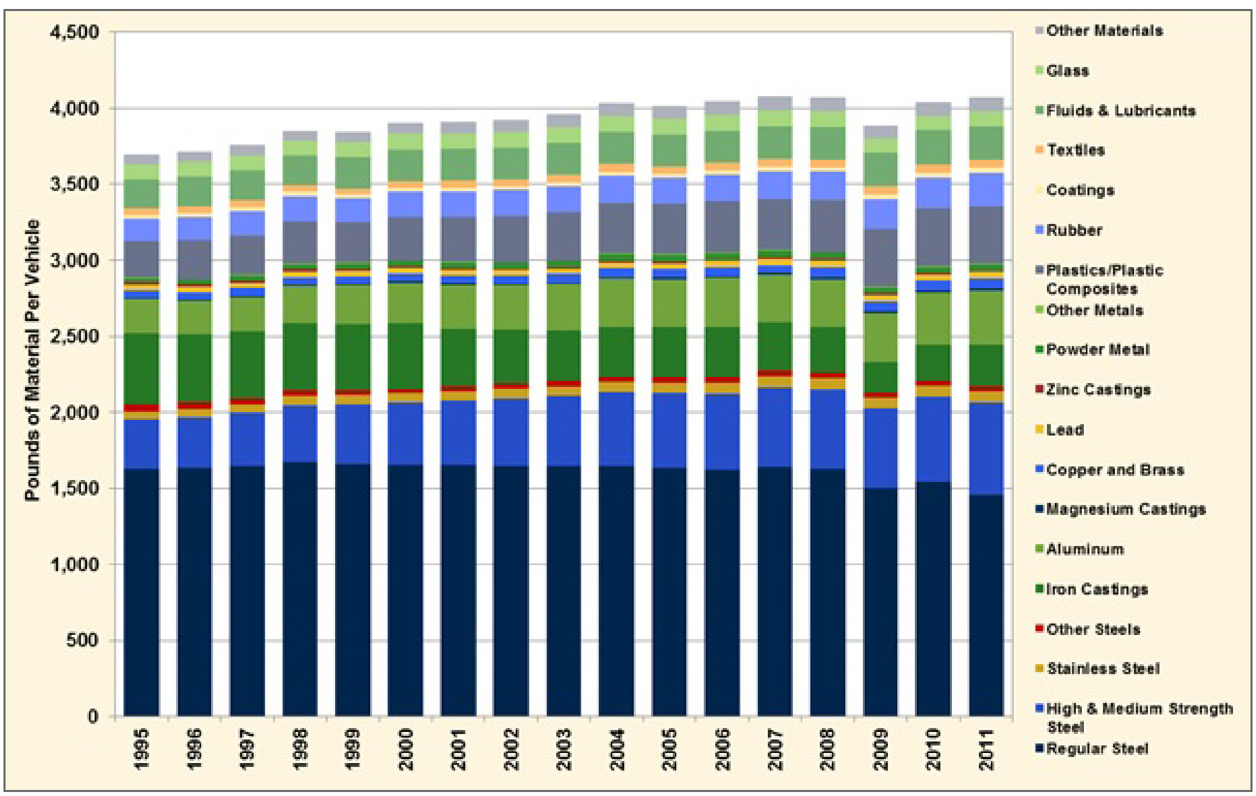
Year	Make	Model	Total Interior Volume	CO_2 Emissions Grams per mile
2002	Honda	Accord	116	386
2012	Honda	Accord	121	329
2002	Honda	Civic	104	296
2012	Honda	Civic	107	269
2002	Nissan	Sentra	100	342
2012	Nissan	Sentra	110	296
2002	Hyundai	Elantra	108	355
2012	Hyundai	Elantra	111	269
2002	Hyundai	Sonata	113	404
2012	Hyundai	Sonata	120	317
2002	Kia	Optima	113	444
2012	Kia	Optima	117	317
2002	VW	Golf	106	386
2012	VW	Golf	109	342
2002	VW	Jetta Sedan	100	386
2012	VW	Jetta Sedan	110	329

Source: Oak Ridge National Laboratory, *2012 Vehicle Technologies Market Report*, February 2013, accessed May 30, 2013.

Fact #786: July 1, 2013
Use of Lightweight Materials is on the Rise

As automakers strive to improve fuel economy, they have turned increasingly to lightweight materials to reduce overall vehicle weight. For example, most light vehicle engine blocks are now made of aluminum rather than cast iron, and in many cases, aluminum wheels have replaced heavier steel wheels as standard equipment. Use of regular steel has declined by an average of 172 pounds per vehicle from 1995 to 2011 while the use of high and medium strength steels has increased by 284 lbs. per vehicle. The increased use of high and medium strength steel is significant because it allows manufacturers to improve the structural integrity of vehicles while keeping the overall vehicle weight to a minimum. The use of plastics and composites has also increased by 57% and lightweight magnesium castings have seen greater use in dashboards and other interior applications such as seat components, replacing the heavier steel components that were previously used.

Average Material Content of Light Vehicles, 1995-2011



Supporting Information

Average Material Content of Light Vehicles, 1995-2011 (Pounds of material per vehicle)																	
Material	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Regular Steel	1,630	1,636	1,649	1,669	1,662	1,655	1,652	1,649	1,646	1,650	1,634	1,622	1,644	1,629	1,501	1,542	1,458
High & Medium Strength Steel	324	333	346	378	390	408	424	443	460	479	491	500	518	523	524	559	608
Stainless Steel	51	53	55	59	60	62	63	64	65	70	71	73	75	75	69	73	73
Other Steels	46	44	42	40	30	26	28	30	32	34	35	35	34	34	31	33	32
Iron Castings	466	444	438	438	436	432	384	355	336	331	328	331	322	301	206	237	275
Aluminum	231	224	227	245	257	268	286	294	303	315	316	323	313	315	324	344	355
Magnesium Castings	4	6	6	7	7	8	10	9	10	10	10	10	10	11	12	13	12
Copper and Brass	50	51	53	53	52	52	53	55	57	59	59	61	53	64	63	65	67
Lead	33	34	35	35	35	36	37	35	35	37	37	39	42	45	42	40	41
Zinc Castings	19	19	18	17	14	13	11	10	10	10	10	10	9	10	9	9	9
Powder Metal	29	28	31	33	35	36	38	39	41	43	42	42	43	43	41	41	41
Other Metals	4	4	4	4	4	4	4	4	4	5	4	5	5	5	5	6	5
Plastics/Plastic Composites	240	257	260	278	265	286	298	307	319	337	332	338	331	343	376	378	377
Rubber	149	154	158	166	159	166	163	167	171	173	173	174	189	185	198	200	222
Coatings	23	25	24	26	24	25	26	26	25	28	27	29	29	28	34	34	34
Textiles	42	41	47	43	42	44	45	45	46	51	48	48	46	48	52	54	48
Fluids & Lubricants	192	198	199	201	204	207	208	209	210	210	210	211	215	214	219	226	223
Glass	97	99	100	99	101	103	104	104	105	105	104	105	106	106	93	94	98
Other Materials	64	65	65	58	66	71	75	79	83	87	86	88	92	91	90	92	94
Total	3,694	3,715	3,757	3,849	3,843	3,902	3,909	3,924	3,958	4,034	4,017	4,044	4,076	4,070	3,889	4,040	4,072

Source: Oak Ridge National Laboratory, *2012 Vehicle Technologies Market Report*, February 2013, accessed May 30, 2013 and Wards Communications.

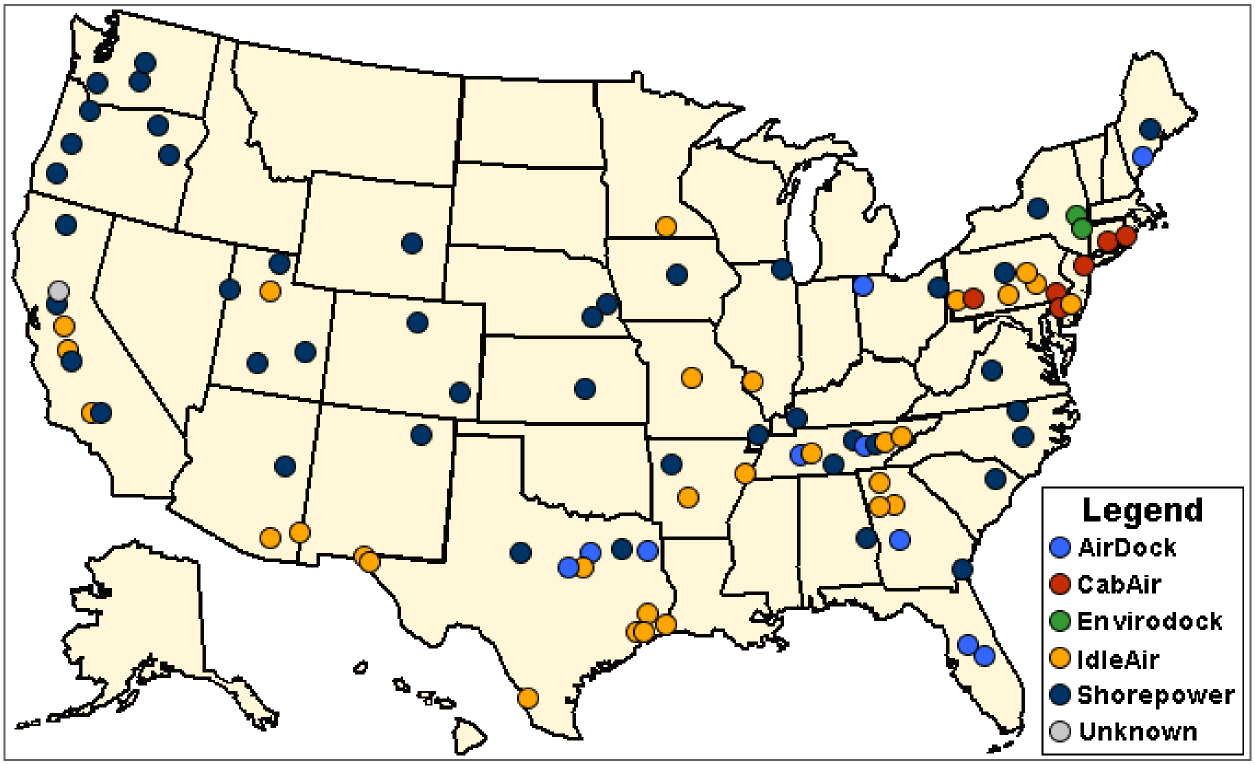
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Vehicle Technologies Office

Fact #787: July 8, 2013
Truck Stop Electrification Reduces Idle Fuel Consumption

The U.S. Department of Transportation mandates that truckers rest for 10 hours after driving for 11 hours, during which time they often park at truck stops idling the engines to provide heating, cooling and use of electrical appliances. Electrification at truck stops allows truckers to "plug-in" vehicles to operate the necessary systems without idling the engine. In 2012, there were 93 publicly-accessible electrification sites across the nation. Some of these sites require special equipment to be installed on the truck and others do not. Presently, five companies equip electrification sites: Shorepower, CabAire, EnvironDock, AireDock, and IdleAir.

Map of Truck Stop Electrification Sites, 2012



Supporting Information

Number of Truck Stop Electrification Sites by State, 2012	
State	**Number of Truck Stops**
Alabama	1
Alaska	0
Arizona	3
Arkansas	3
California	8
Colorado	2
Connecticut	2
Delaware	2
District of Columbia	0
Florida	2
Georgia	5
Hawaii	0
Idaho	0
Illinois	2
Indiana	0
Iowa	1
Kansas	1
Kentucky	1
Louisiana	0
Maine	2
Maryland	0
Massachusetts	0
Michigan	0
Minnesota	1
Mississippi	0
Missouri	2
Montana	0
Nebraska	2

Nevada	0
New Hampshire	0
New Jersey	2
New Mexico	1
New York	3
North Carolina	2
North Dakota	0
Ohio	2
Oklahoma	0
Oregon	5
Pennsylvania	6
Rhode Island	0
South Carolina	1
South Dakota	0
Tennessee	8
Texas	13
Utah	5
Vermont	0
Virginia	1
Washington	3
West Virginia	0
Wisconsin	0
Wyoming	1
Total	93
Source: Oak Ridge National Laboratory, *2012 Vehicle Technologies Market Report*, February 2013, accessed May 30, 2013.	

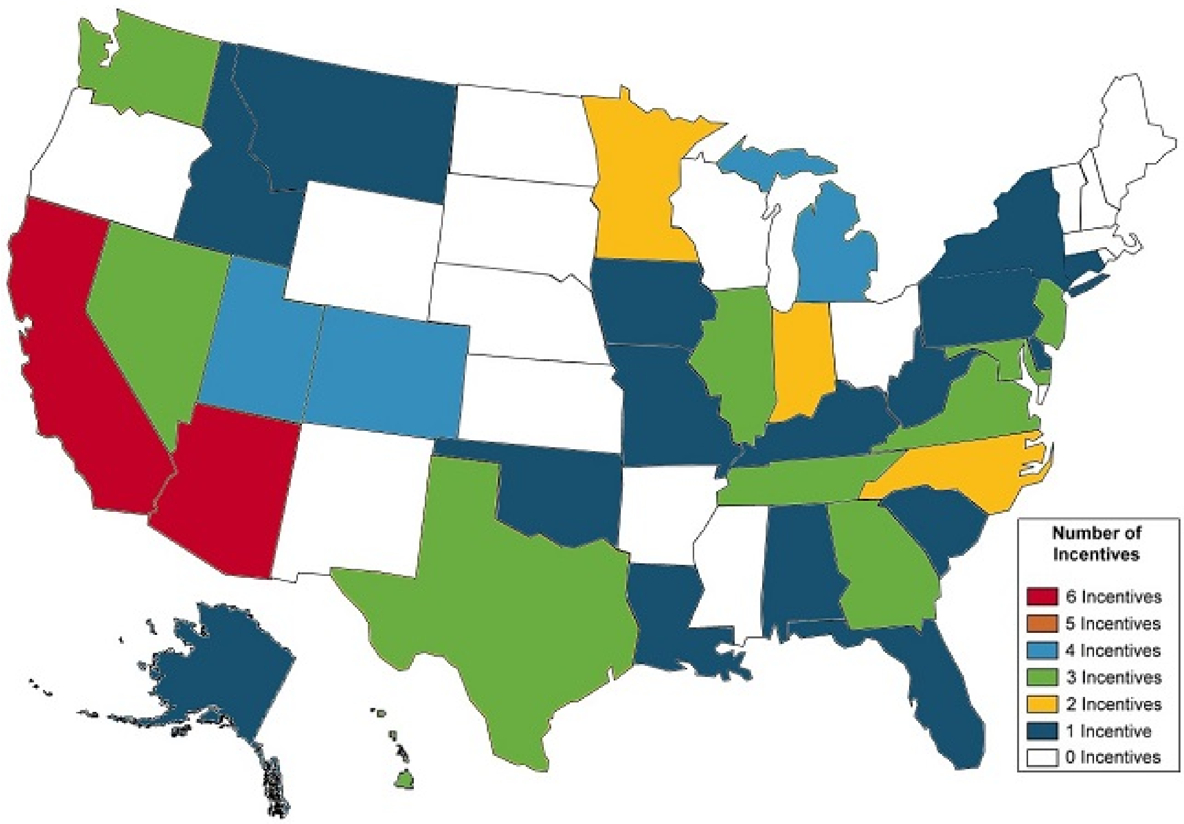
Fact #788: July 15, 2013
State and Private Consumer Incentives for Plug-In Vehicles

Many states offer their own consumer incentives for plug-in vehicles, such as HOV lane exemptions and tax credits/rebates, as shown in the table below. In some states there are also private incentives offered, typically by utility companies that offer lower electric rates for vehicle charging through the installation of a secondary meter.

State and Private Consumer Incentives for Plug-In Vehicles	
Incentive	**State**
High Occupancy Vehicle (HOV) Lane Exemption	AZ, CA, CO, FL, GA, HI, MD, NJ, NY, NC, TN, UT, VA
PEV Purchase Incentives: Tax Credits and Rebates	CA, GA, IL, LA, MD, MI, OK, PA, SC, TN, TX, UT, WV
Electric Rates for Residents with a Separate Meter for PEV Charging	AK, AL, AZ, CA, GA, HI, IN, KY, MI, MN, NV, TX, VA
Charging Equipment/Installation Incentive	AZ, CA, CO, IL, IN, MD, MI, TN, TX
Vehicle Inspection/Emissions Testing Exemption	CA, ID, MD, MI, MO, NV, NC, VA, WA
Parking Incentives	AZ, CA, CT, HI, NV, UT
Sales and/or Use Tax Exemption	AZ, NJ, WA
Fuel Tax Exemption	WI, UT
Reduced License Tax	AZ
Reduced Registration Fee	IL, IA
Conversion Tax Credit	MT
Vehicle-to-Grid Energy Credit	DE
Idle Reduction Technology Tax Credit	CO
Weight Limit Exemption	CO
Title Tax Exemption	DC
Reduced Toll Road Rates	NJ

While the states that offer incentives are scattered throughout the U.S., those states along the West Coast and in the Southern and Eastern portions of the U.S. tend to offer incentives while the Western Plain states and New England do not, as shown in the map below.

Map of State and Private Incentives for Plug-In Vehicles



Supporting Information

Number of State and Private Consumer Incentives for Plug-In Vehicles, 2013	
State	**Number of Incentives**
Alabama	1
Alaska	1
Arizona	6
Arkansas	0
California	6
Colorado	4
Connecticut	1
Delaware	1
District of Columbia	1
Florida	1
Georgia	3
Hawaii	3
Idaho	1
Illinois	3
Indiana	2
Iowa	1
Kansas	0
Kentucky	1
Louisiana	1
Maine	0
Maryland	3
Massachusetts	0
Michigan	4
Minnesota	2
Mississippi	0
Missouri	1
Montana	1
Nebraska	0

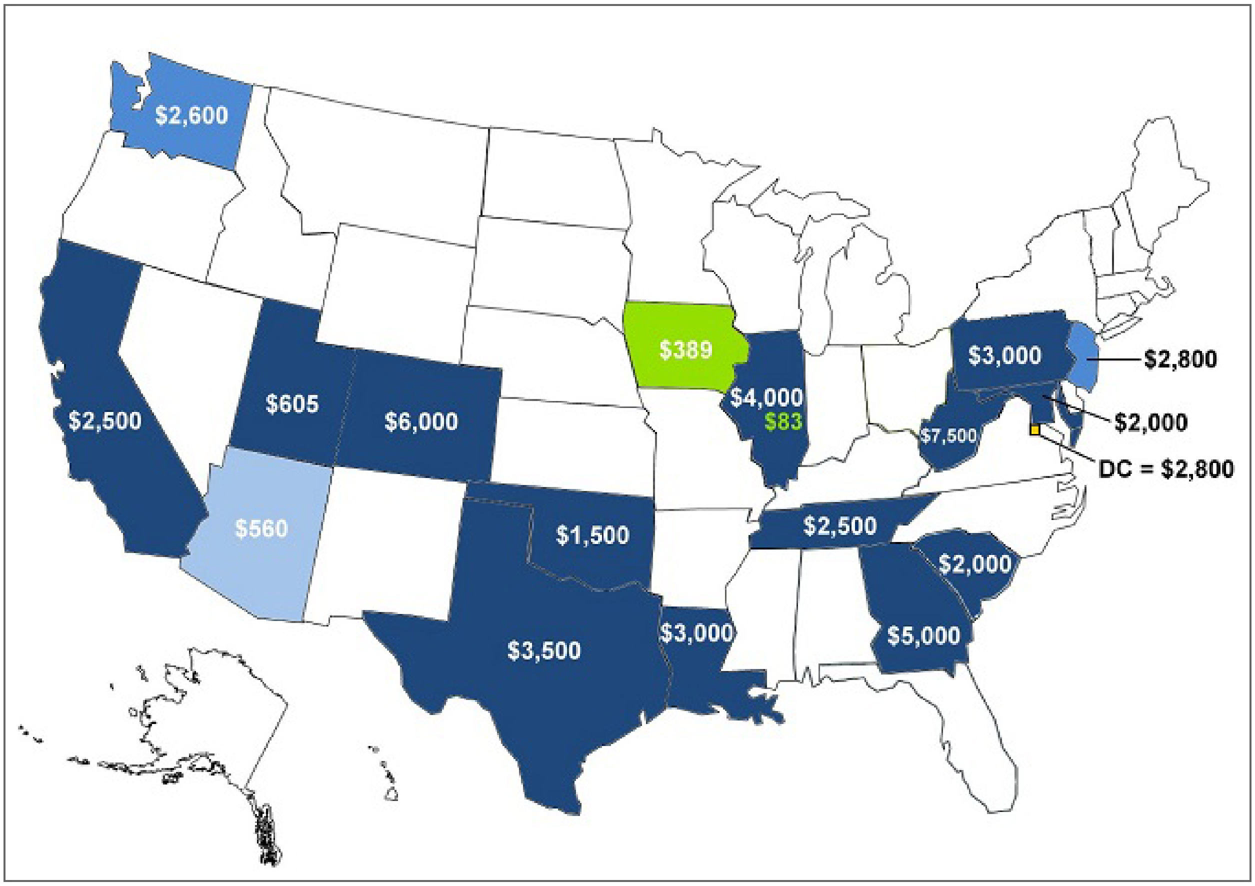
Nevada	3
New Hampshire	0
New Jersey	3
New Mexico	0
New York	1
North Carolina	2
North Dakota	0
Ohio	0
Oklahoma	1
Oregon	0
Pennsylvania	1
Rhode Island	0
South Carolina	1
South Dakota	0
Tennessee	3
Texas	3
Utah	4
Vermont	0
Virginia	3
Washington	3
West Virginia	1
Wisconsin	0
Wyoming	0

Sources:
Alternative Fuels Data Center website. Accessed June 28, 2013.
Northeast Group, LLC, United States Smart Grid: Utility Electric Vehicle Tariffs, July 2013.
Tesla Motors, Inc. Electric Vehicle Incentives Around the World.

Fact #789: July 22, 2013
Comparison of State Incentives for Plug-In Electric Vehicle Purchases

In addition to a Federal government tax credit up to $7,500, consumers who purchase plug-in electric vehicles (PEVs) may also receive state government incentives which are different for each state. Shown below are state incentives that can be quantified, such as tax credits and rebates, sales and use tax exemptions, reduced license taxes, title tax exemptions, and reduced registration fees. West Virginia and Colorado have the highest incentive amounts, both of which are tax credits.

Selected State PEV Incentives Totals by State, July 2013



Supporting Information

Selected State Incentives for Plug-in Vehicles, July 2013 (Dollars)

State	Tax Credits & Rebates	Sales and Use Tax Exemption	Reduced License Tax	Title Tax Exemption	Reduced Registration Fee	Total
AZ			$560			$560
CA	$2,500					$2,500
CO	$6,000					$6,000
DC				$2,800		$2,800
GA	$5,000					$5,000
IA					$389	$389
IL	$4,000				$83	$4,083
LA	$3,000					$3,000
MD	$2,000					$2,000
NJ		$2,800				$2,800
OK	$1,500					$1,500
PA	$3,000					$3,000
SC	$2,000					$2,000
TN	$2,500					$2,500
TX	$3,500					$3,500
UT	$605					$605
WA		$2,600				$2,600
WV	$7,500					$7,500

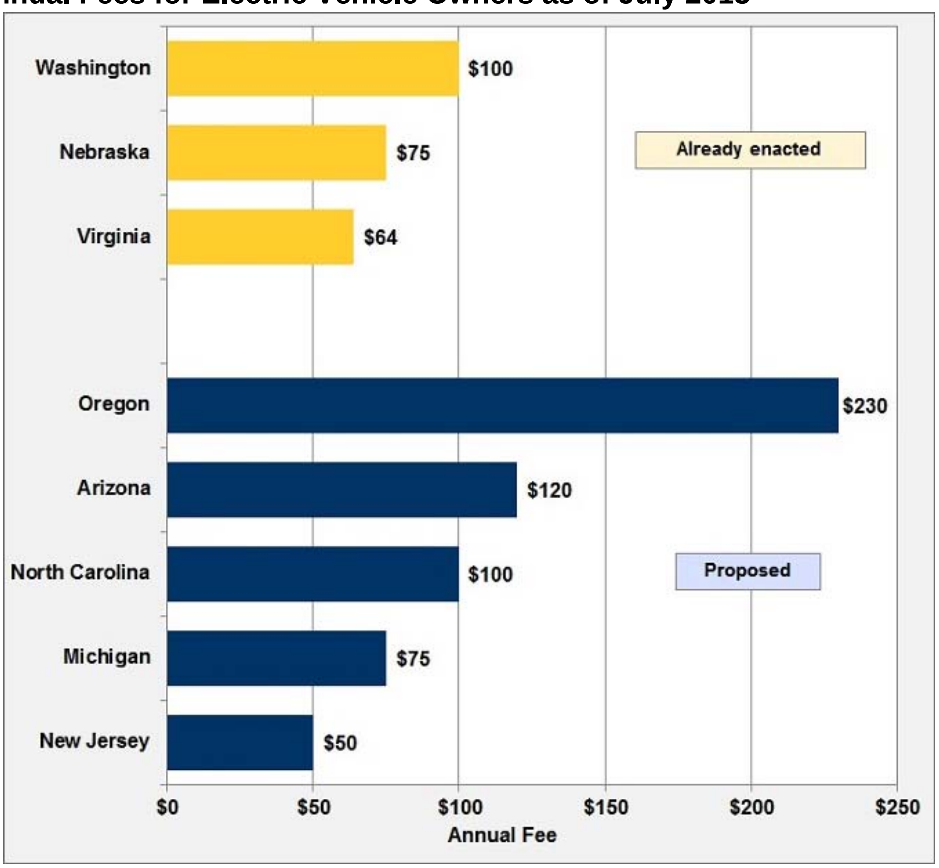
Notes:
- When applicable, in calculation purposes for, e.g., sales tax exemptions, etc., the vehicle was assumed to have a value of $40,000 and a weight of 3,500 lbs.
- Only the incentives listed in the columns above were considered. Other state incentives, such as high-occupancy vehicle lane exemptions and reduced toll rates are not reflected here. Also, incentives on the charging equipment, electricity discounts, etc., were not considered.

Sources: Alternative Fuels Data Center accessed July 2, 2013.
Value of incentives also obtained from: Arizona DOT, Title and Registration, Center for Sustainable Energy California, CVRP Eligible Vehicles, District of Columbia, Department of Motor Vehicles, Iowa TaxandTags.gov, Registration Fees by Vehicle Type, CyberDriveIllinois.com, Vehicle Services, New Jersey Motor Vehicle Commission, Instructions for NJ Residents to Title & Register a Vehicle, CarsDirect, How to Calculate Washington Car Tax

Fact #790: July 29, 2013
States Beginning to Tax Electric Vehicles for Road Use

The maintenance of our highways has traditionally been funded from a combination or Federal and state taxes collected at the pump from the sale of motor fuels. Because electric vehicles (EVs) do not refuel at pumps that collect state and Federal highway taxes, they do not contribute to the upkeep of the highways. This has caused many states to rethink how taxes are assessed. Some proposals call for changes on how all vehicles are taxed while others are focused specifically on taxing EVs through increased annual registration fees or per-mile charges. As shown in the figure below, Washington, Nebraska, and Virginia have already enacted legislation to begin collecting taxes from EVs while other states have proposed legislation. States not shown in the figure that are considering annual fees include Indiana, South Carolina, Texas, and Vermont.

Annual Fees for Electric Vehicle Owners as of July 2013



- Nebraska and Virginia fees also apply to hybrid-electric vehicles.
- Arizona fees are based on the vehicle's annual mileage, with fee not to exceed $120/year.
- North Carolina fees for hybrid-electric vehicles are $50/year.
- Oregon fees apply to any vehicle with fuel economy above 55 miles per gallon and are based on the vehicle's annual mileage. Above estimate calculated for 15,000 miles/year.

Supporting Information

Annual Fees for Electric Vehicle Owners as of July 2013	
State	**Annual Fee**
Already enacted	
Washington	$100
Nebraska	$75
Virginia	$64
Proposed	
Oregon	$230
Arizona	$120
North Carolina	$100
Michigan	$75
New Jersey	$50

Sources:
Crain Communications, Automotive News, "The EV taxation debate comes to Michigan"
Crain Communications, Automotive News, "States debate taxing green cars to recover lost gas taxes" June 9, 2013.
National Conference for State Legislators, Transportation Funding and Finance Legislation Database, accessed July 2, 2013.
Autobloggreen, "Oregon proposes 1.5-cent-per-mile mileage tax for EVs, would also target 55+ mpg cars" March 3, 2013.

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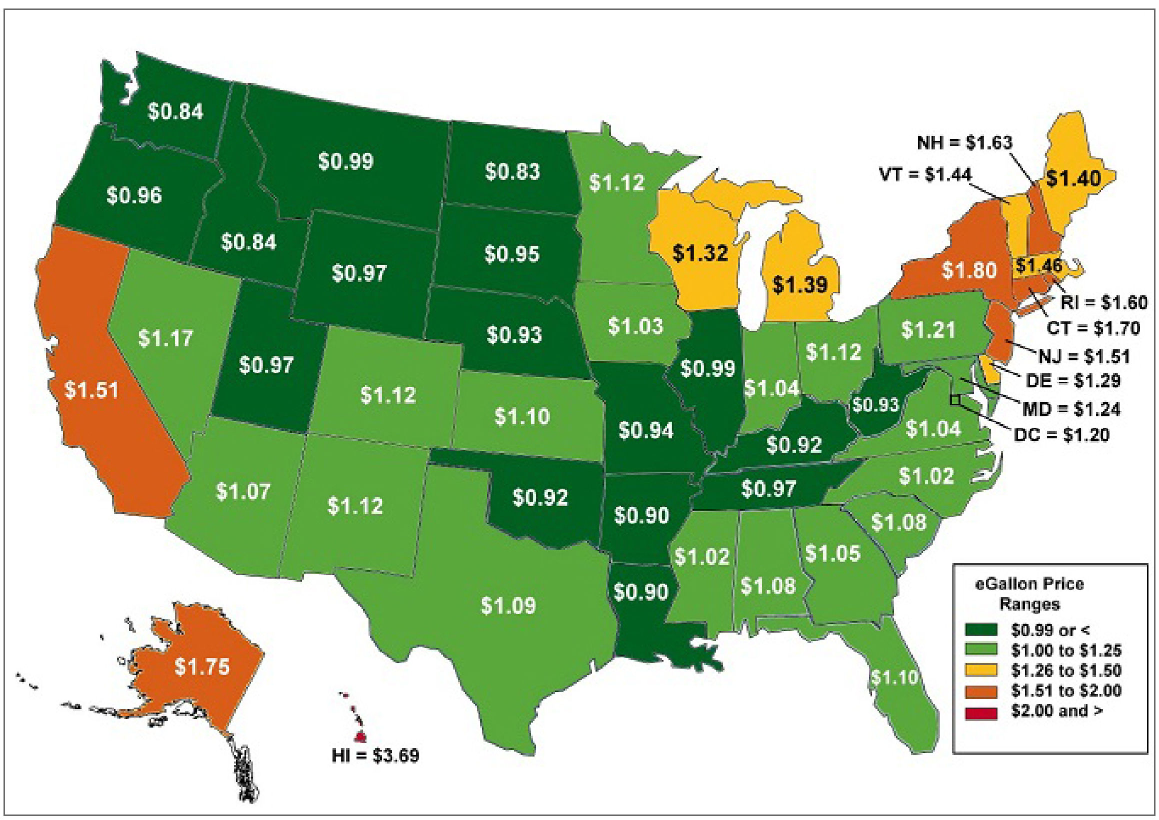
Fact #791: August 5, 2013
Comparative Costs to Drive an Electric Vehicle

On average, it costs about three times less to drive an electric vehicle than a conventional gasoline-powered vehicle. The Department of Energy has created a new term, called the eGallon, to allow for a more direct comparison of the fueling costs from conventional vehicles to electric vehicles. Many consumers know the price for a gallon of gasoline. With the eGallon website, they can see the price of the electricity that would take them the same number of miles as a gallon of gasoline. For instance, the national average of a gallon for gasoline is $3.65; to go the same number of miles on electricity, the national average price for an eGallon is $1.14. The map below shows the difference in prices among the different states, using residential electricity rates by state as the basis.

eGallon Prices by State, July 2013 – The Price of Electricity to Drive an Electric Vehicle the Same Distance as One Gallon of Gasoline in a Conventional Vehicle



Supporting Information

eGallon Prices by State, July 2013 – The Price of Electricity to Drive an Electric Vehicle the Same Distance as One Gallon of Gasoline in a Conventional Vehicle			
State	**Electric eGallon Price (dollars)**	**State**	**Electric eGallon Price (dollars)**
AL	1.08	MT	0.99
AK	1.75	NE	0.93
AZ	1.07	NV	1.17
AR	0.90	NH	1.63
CA	1.51	NJ	1.51
CO	1.12	NM	1.12
CT	1.70	NY	1.80
DE	1.29	NC	1.02
DC	1.20	ND	0.83
FL	1.10	OH	1.12
GA	1.05	OK	0.92
HI	3.69	OR	0.96
ID	0.84	PA	1.21
IL	0.99	RI	1.60
IN	1.04	SC	1.08
IA	1.03	SD	0.95
KS	1.10	TN	0.97
KY	0.92	TX	1.09
LA	0.90	UT	0.97
ME	1.40	VT	1.44
MD	1.24	VA	1.04
MA	1.46	WA	0.84
MI	1.39	WV	0.93
MN	1.12	WI	1.32
MS	1.02	WY	0.97
MO	0.94		

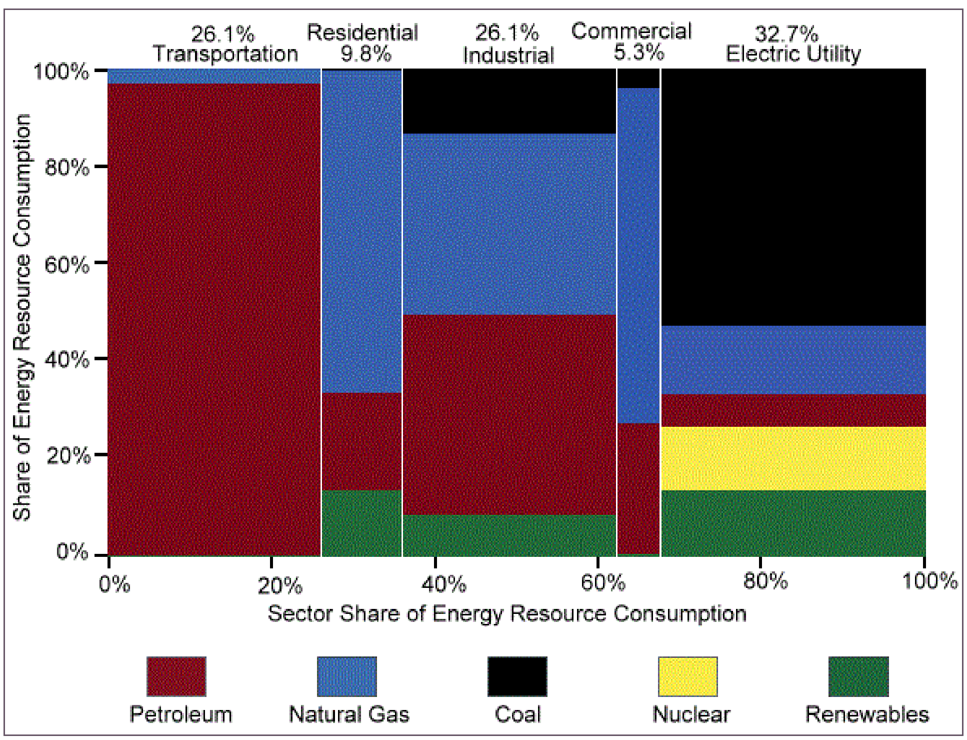
Source: U.S. Department of Energy, eGallon: Compare the costs of driving with electricity. Website accessed July 10, 2013.

Fact #792: August 12, 2013
Energy Consumption by Sector and Energy Source, 1982 and 2012

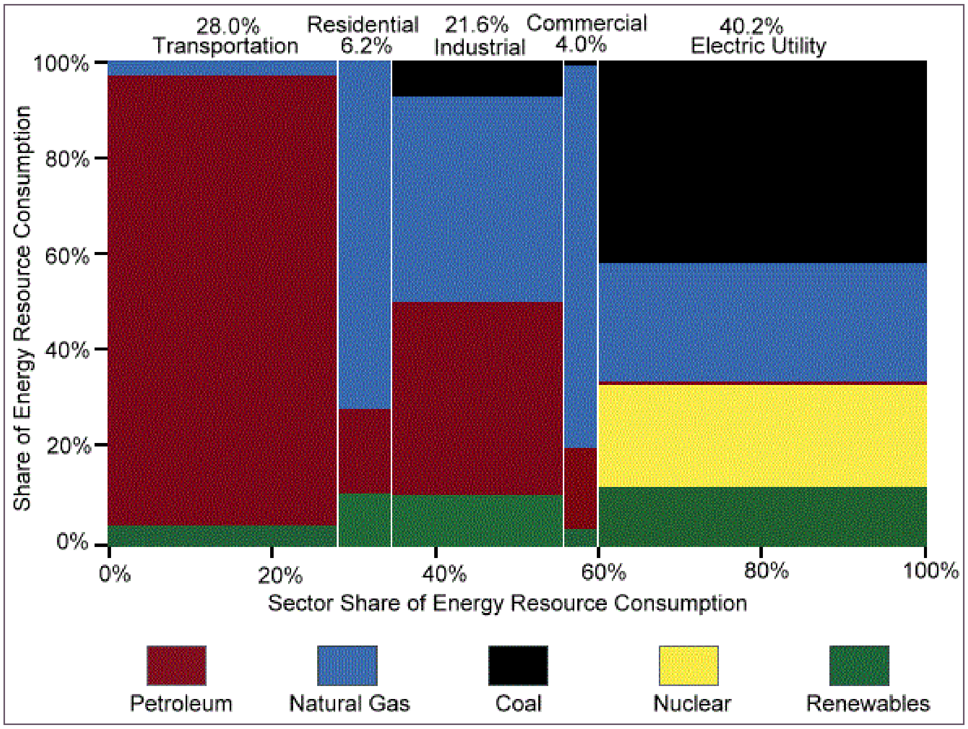
In the last 30 years, overall energy consumption has grown by about 22 quadrillion Btu. The share of energy consumption by the transportation sector has seen modest growth in that time – from about 26% to 28% of the energy consumed. The electric utility sector saw the greatest increase from less than 33% to over 40% of overall energy consumption while the share of residential, industrial and commercial sectors all decreased.

Changes in the energy sources consumed are also noteworthy. In 1982, renewables made up just 0.1 percent of the transportation sector and by 2012, renewables grew to 4.4%. The use of coal, shown in black, declined as a share of energy consumption in all sectors in which it is used, while natural gas (blue) showed significant gains in all sectors except for transportation.

Energy Consumption by Sector and Energy Source, 1982
[Total Consumption for 1982 = 73.1 quadrillion Btu]



Energy Consumption by Sector and Energy Source, 2012
[Total Consumption for 2012 = 95.1 quadrillion Btu]



Supporting Information

Sector Share of Energy Resource Consumption by Energy Source, 1982					
Sector share:	**26.1%**	**9.8%**	**26.1%**	**5.3%**	**32.7%**
	Transportation	**Residential**	**Industrial**	**Commercial**	**Electric Utility**
Coal	0.0%	0.4%	13.4%	4.0%	52.5%
Natural Gas	3.2%	65.9%	37.1%	68.6%	13.8%
Petroleum	96.7%	20.1%	40.8%	26.8%	6.5%
Renewables	0.1%	13.6%	8.8%	0.6%	13.7%
Nuclear	0.0%	0.0%	0.0%	0.0%	13.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

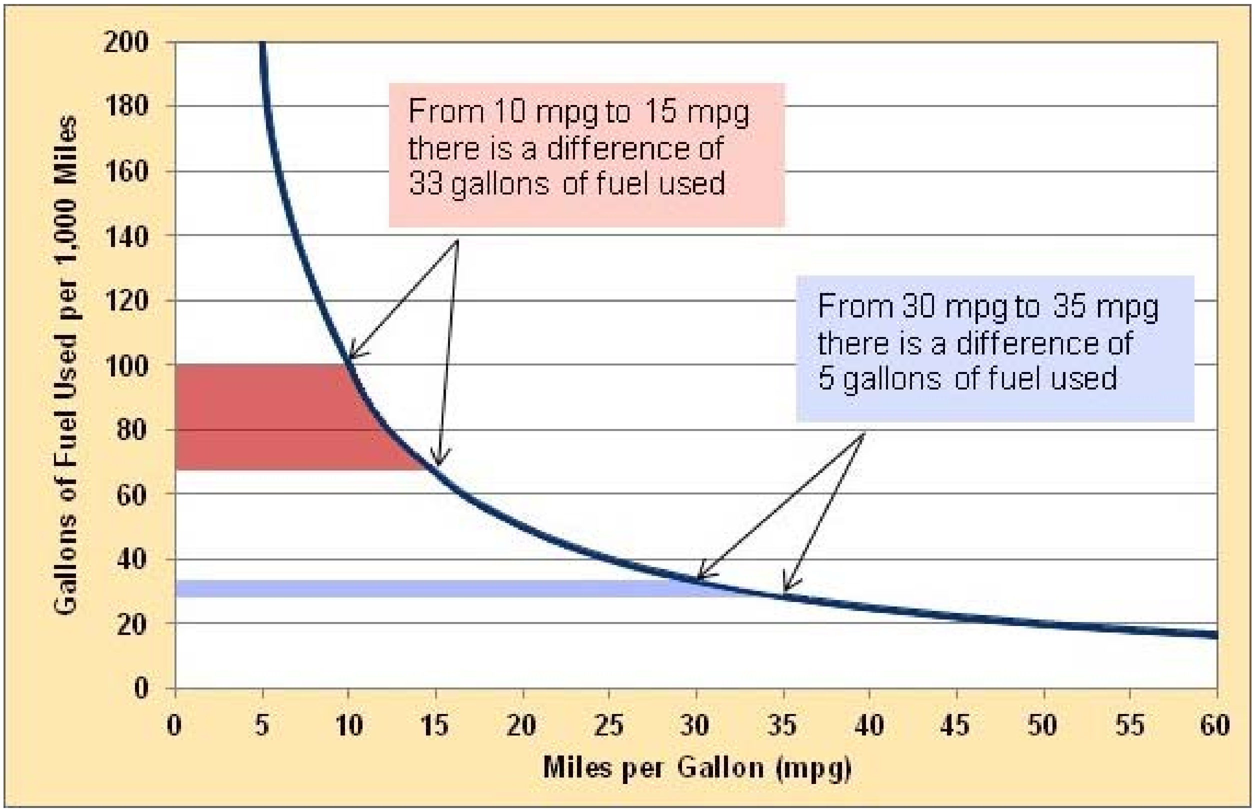
Sector Share of Energy Resource Consumption by Energy Source, 2012					
Sector share:	**28.0%**	**6.2%**	**21.6%**	**4.0%**	**40.2%**
	Transportation	**Residential**	**Industrial**	**Commercial**	**Electric Utility**
Coal	0.0%	0.0%	7.2%	1.1%	41.4%
Natural Gas	2.9%	71.8%	42.4%	78.6%	24.3%
Petroleum	92.8%	17.2%	39.6%	16.8%	0.6%
Renewables	4.4%	11.0%	10.8%	3.5%	12.2%
Nuclear	0.0%	0.0%	0.0%	0.0%	21.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: U.S. Department of Energy, Energy Information Administration, Monthly Energy Review, Tables 2.2, 2.3, 2.4, 2.5, 2.6.

Fact #793: August 19, 2013
Improvements in Fuel Economy for Low-MPG Vehicles Yield the Greatest Fuel Savings

The relationship between gallons used over a given distance and miles per gallon (mpg) is not linear. Thus, an increase in fuel economy by 5 mpg does not translate to a constant fuel savings amount. Trading a low-mpg car or truck for one with just slightly better mpg will save more fuel than trading a high-mpg car or truck for one that is even higher. For example, trading a truck that gets 10 mpg for a new one that gets 15 mpg will save 33 gallons of fuel for every 1,000 miles driven. In contrast, trading a 30 mpg car for a new car that gets 35 mpg will save 5 gallons of fuel for every 1,000 miles driven.

Fuel Use versus Fuel Economy



Note: Each category on the horizontal axis shows a five-mile per gallon improvement in fuel economy.

Source: U.S. Department of Energy and Environmental Protection Agency, *Fuel Economy Guide*.

Supporting Information

Fuel Use Versus Fuel Economy		
Fuel Economy (miles per gallon)	**Gallons Per 1,000 Miles**	**Difference in Gallons Used from One MPG Category to the Next**
5	200.0	
10	100.0	100.0
15	66.7	33.3
20	50.0	16.7
25	40.0	10.0
30	33.3	6.7
35	28.6	4.7
40	25.0	3.6
45	22.2	2.8
50	20.0	2.2
55	18.2	1.8
60	16.7	1.5

Source: U.S. Department of Energy and Environmental Protection Agency, *Fuel Economy Guide*.

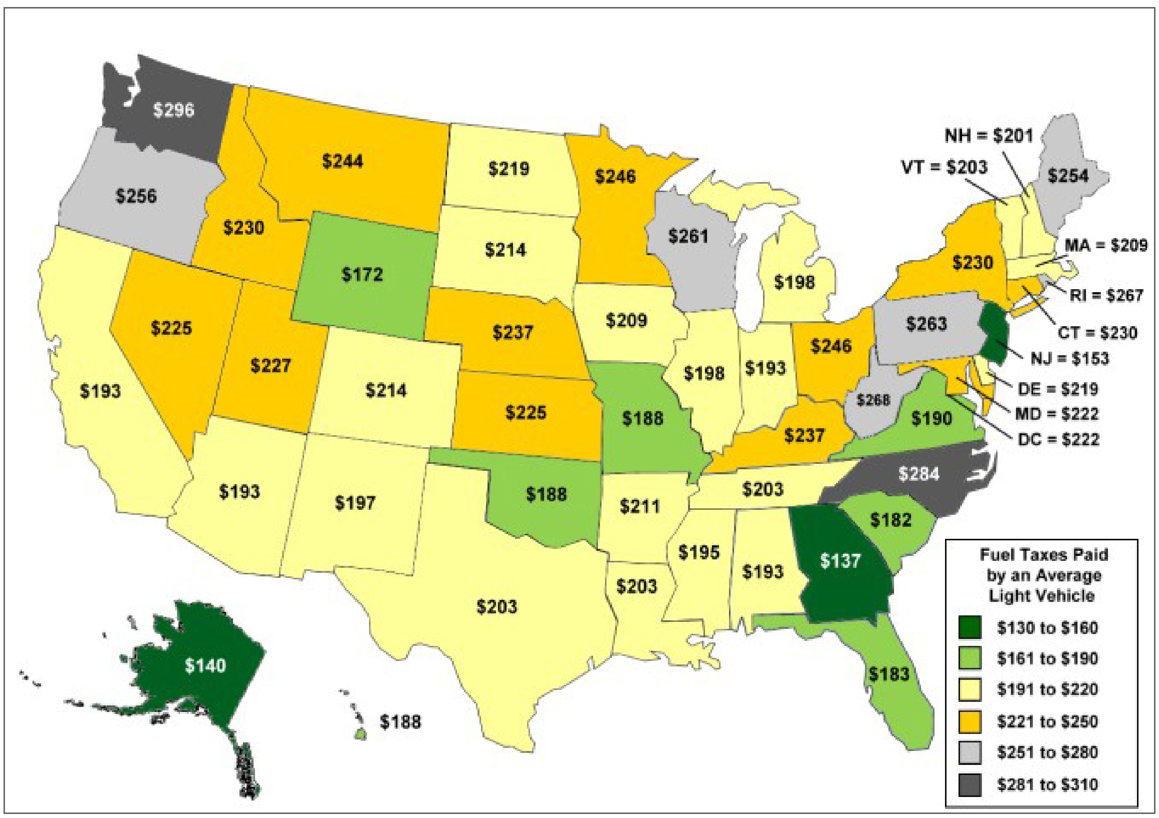
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Vehicle Technologies Office

Fact #794: August 26, 2013
How Much Does an Average Vehicle Owner Pay in Fuel Taxes Each Year?

According to the Federal Highway Administration, the average fuel economy for all light vehicles on the road today is 21.4 miles per gallon (mpg). A person owning a gasoline vehicle with that fuel efficiency pays between $137 and $296 in fuel taxes each year, depending upon the state in which the fuel is purchased. The Federal tax on gasoline is 18.4 cents per gallon, and each state has a gasoline tax ranging from 7.5 cents in Georgia to 37.5 cents in the state of Washington. Since taxes are based on a per-gallon rate, someone with a more efficient vehicle will pay less in taxes over the course of a year and someone with a less efficient vehicle will pay more.

Average Annual Gasoline Tax Paid per Vehicle



Notes:
Includes Federal and State taxes on gasoline.
Assumptions: 11,318 annual miles of travel and 21.4 miles per gallon.

Supporting Information

Average Annual Gasoline Tax Paid per Vehicle	
State	Average Annual Gasoline Tax Paid (Dollars)
Georgia	$137
Alaska	$140
New Jersey	$153
Wyoming	$172
South Carolina	$182
Florida	$183
Hawaii	$188
Missouri	$188
Oklahoma	$188
Virginia	$190
Alabama	$193
Arizona	$193
California	$193
Indiana	$193
Mississippi	$195
New Mexico	$197
Illinois	$198
Michigan	$198
New Hampshire	$201
Louisiana	$203
Tennessee	$203
Texas	$203
Vermont	$203
Iowa	$209
Massachusetts	$209
Arkansas	$211
Colorado	$214
South Dakota	$214

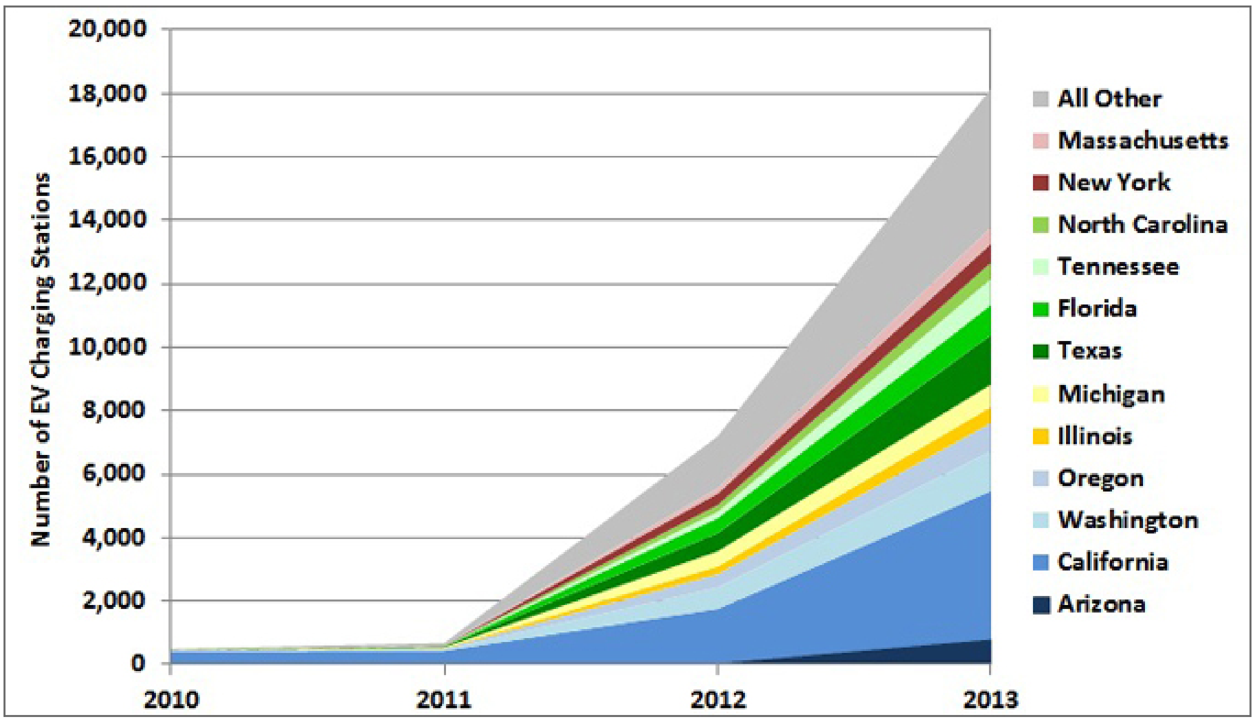
Delaware	$219
North Dakota	$219
D.C.	$222
Maryland	$222
Kansas	$225
Nevada	$225
Utah	$227
Connecticut	$230
Idaho	$230
New York	$230
Nebraska	$237
Kentucky	$237
Montana	$244
Minnesota	$246
Ohio	$246
Maine	$254
Oregon	$256
Wisconsin	$261
Pennsylvania	$263
Rhode Island	$267
West Virginia	$268
North Carolina	$284
Washington	$296

Source: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2011*, Tables MF-121T, VM-1, and FE-21B.

Fact #795: September 2, 2013
Electric Vehicle Charging Stations by State

The number of charging stations for plug-in vehicles has increased sharply in the last two years from less than a thousand nationwide in 2011 to over 18 thousand by June of 2013. This includes public and private charging stations, but does not include residential chargers. California has by far the most chargers of any state, accounting for just over a quarter of all the chargers nationwide. Charger installations have risen in nearly all states, but a dozen states, shown in the graph below, account for a majority of all installations.

Electric Vehicle Charging Stations by State, 2010-2013



Note: Electric vehicle charging stations are counted once for each outlet available.

Supporting Information

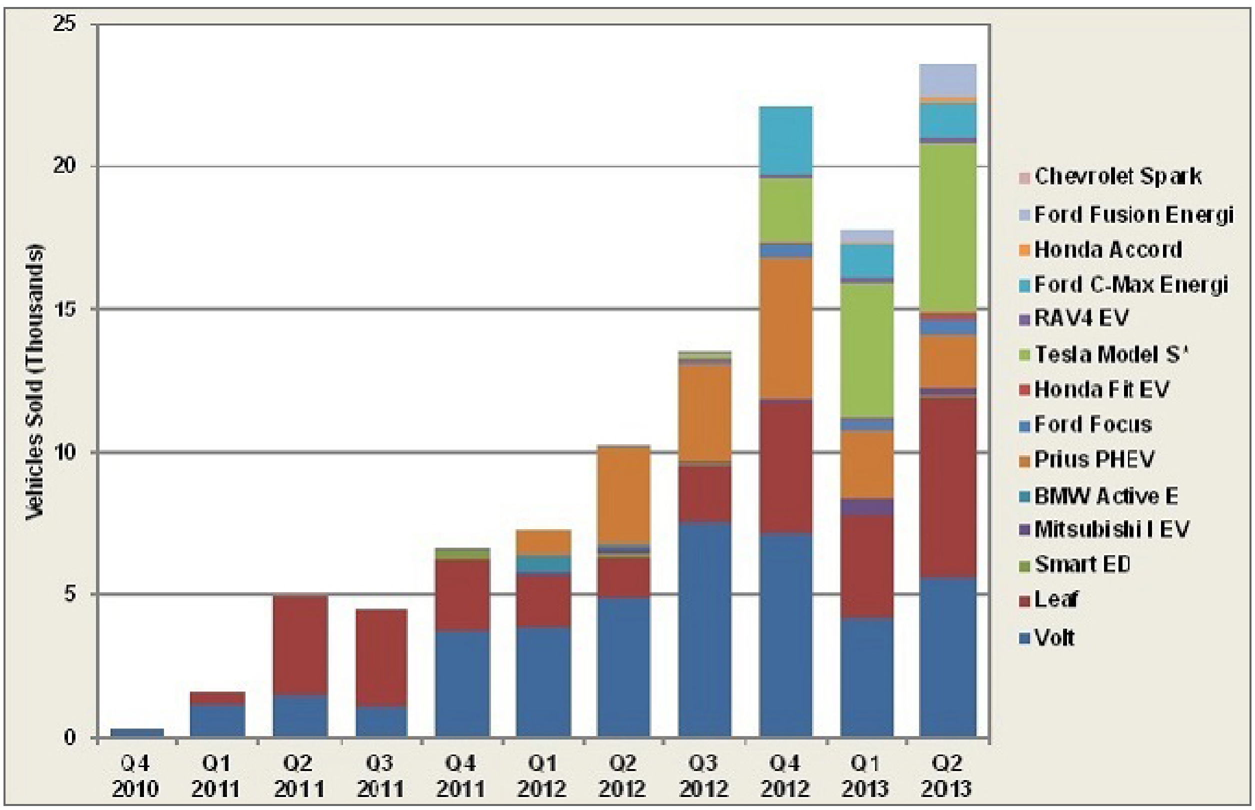
Electric Vehicle Charging Stations by State, 2010-2013				
State	**2010**	**2011**	**2012**	**2013**
Arizona	6	4	43	799
California	413	433	1,718	4,672
Washington	4	35	674	1,247
Oregon	23	38	415	895
Illinois	7	20	245	504
Michigan	0	19	480	710
Texas	6	31	570	1,552
Florida	5	8	475	949
Tennessee	2	1	195	819
North Carolina	3	6	211	509
New York	2	10	367	599
Massachusetts	3	3	163	507
All Other	32	79	1,641	4,383
Total	**506**	**687**	**7,197**	**18,145**

Sources: 2010 – 2012: Oak Ridge National Laboratory, *Transportation Energy Data Book: Editions 31, 30, and 29*. Data as of February each year.
2013: U.S. Department of Energy, Alternative Fuel Data Center, Total Alternative Fuel Station Counts. Data last updated June 30, 2013; website accessed July 23, 2013.

Fact #796: September 9, 2013
Electric Vehicle and Plug-In Hybrid Electric Vehicle Sales History

Electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) have been available in the U.S. in limited numbers for many years. The introduction of the Nissan Leaf and Chevrolet Volt at the end of 2010 mark the beginning of mainstream plug-in vehicle sales in the U.S. market. The Chevrolet Volt and Nissan Leaf have continued to account for a large share of the plug-in vehicle sales through the second quarter of 2013. However, newer models introduced in 2012 have begun to capture a sizeable share of the plug-in market. Though still a tiny fraction of overall vehicle sales, the growth in plug-in vehicle sales tripled from 2011 to 2012 and the first two quarters of 2013 plug-in vehicle sales were just below total sales for all of 2012.

Plug-In and Electric Vehicle Sales by Quarters (In Order of Market Introduction)



Supporting Information

Plug-In and Electric Vehicle Sales (In Order of Market Introduction)

Quarter & Year	Volt	Leaf	Smart ED	Mitsubishi I EV	BMW Active E	Prius PHEV	Ford Focus	Honda Fit EV	Tesla Model S*	RAV4 EV	Ford C-Max Energi	Honda Accord	Ford Fusion Energi	Chevrolet Spark	Total	Cumulative
Q42010	326	19													345	345
Q12011	1,210	452	32												1,694	2,039
Q22011	1,535	3,423	8												4,966	7,005
Q32011	1,150	3,324	2												4,476	11,481
Q42011	3,776	2,475	300	76											6,627	18,108
Q12012	3,915	1,733	2	136	553	911									7,250	25,358
Q22012	4,902	1,415	127	197	120	3,435	95								10,291	35,649
Q32012	7,531	2,064	7	106	0	3,387	131	32	250	61					13,569	49,218
Q42012	7,113	4,607	3	149	-2	5,016	457	61	2,150	131	2,374				22,059	71,277
Q12013	4,244	3,539	2	625	0	2,353	419	46	4,750	210	1,166	45	414		17,813	89,090
Q22013	5,611	6,300	113	257	0	1,861	481	245	5,900	198	1,316	155	1,170	27	23,634	112,724
Total	41,313	29,351	596	1,546	671	16,963	1,583	384	13,050	600	4,856	200	1,584	27	112,724	

*Tesla Model S numbers are estimated.

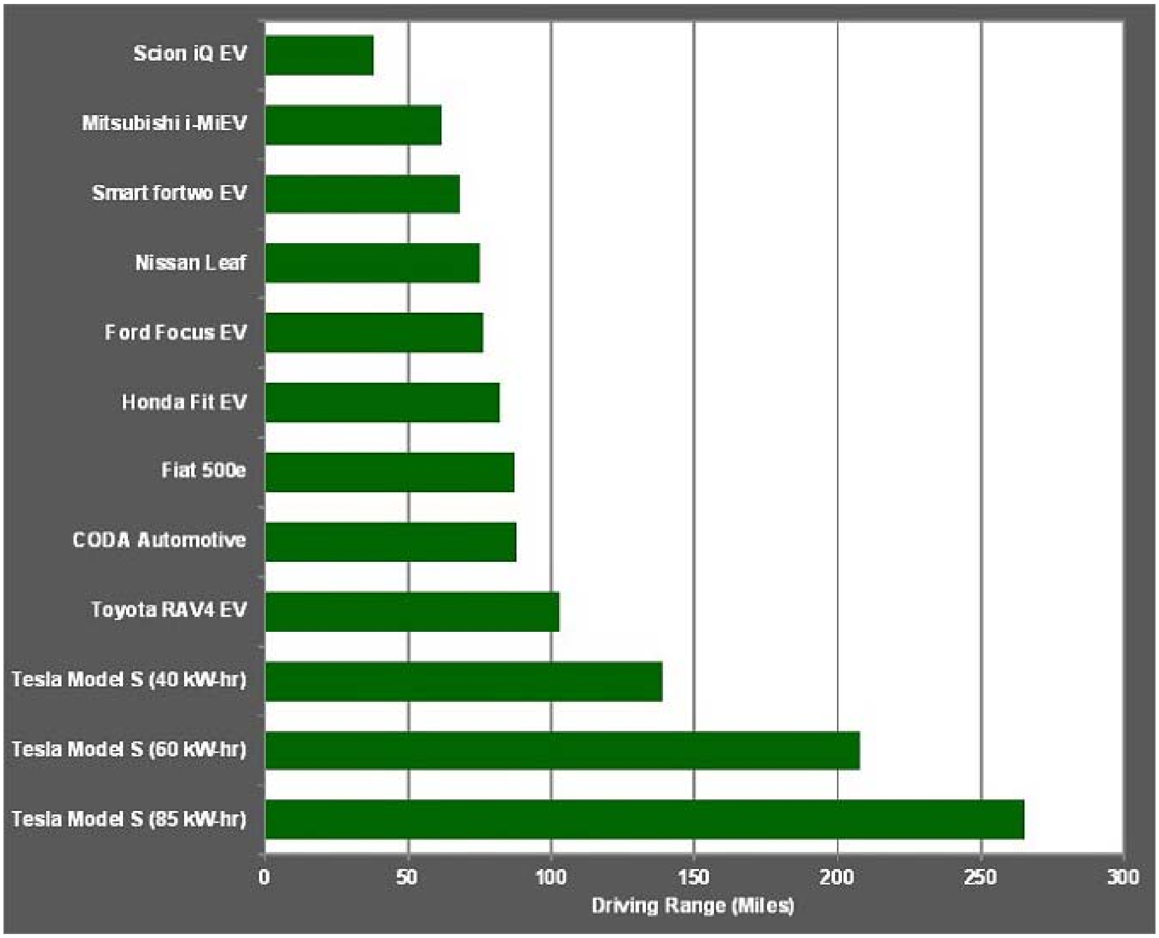
Source: U.S. Department of Energy, Visualizing Electric Vehicle Sales, accessed August 9, 2013.

Fact #797: September 16, 2013
Driving Ranges for Electric Vehicles

The figure below shows the Environmental Protection Agency (EPA) driving ranges for electric vehicles (EVs) offered for the 2013 model year (MY). The Tesla Model S has the longest range of any EV offered, ranging from 139 miles for the 40 kilowatt-hour (kW-hr) battery pack model to 265 miles for the 85 kW-hr battery pack model. Battery capacity is important because greater capacity generally means greater range. However, the relationship between battery capacity and range is a complicated one. In order to protect the battery, EVs do not allow for the full use of the battery pack. Therefore, the usable amount of the battery capacity can be significantly less than the full battery capacity. This varies by manufacturer and the battery management system of the vehicle.

Range calculations based on manufacturer-stated battery capacities will not directly match EPA-stated ranges that were obtained through actual vehicle testing. Because there is no standard for measuring battery capacities that is observed by all manufacturers, and vehicles manage their batteries differently, the EPA tests all EVs at their National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan to determine vehicle range and efficiency values.

Driving Ranges for MY 2013 Electric Vehicles



Notes: Electric driving range based on Environmental Protection Agency laboratory testing. These data may not directly match the vehicle manufacturer's stated range.
The Tesla Model S with a 40 kW-hr battery capacity has been discontinued.

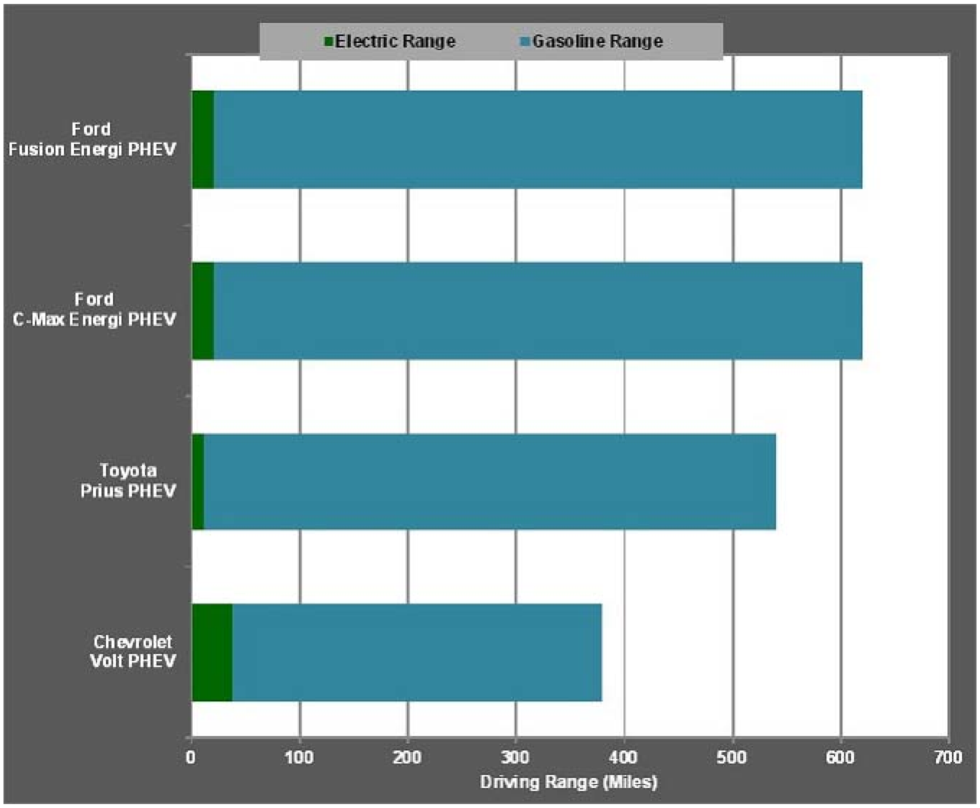
Supporting Information

Driving Ranges for EVs	
Model Year 2013 Vehicle Make/ Model	**Estimated Driving Range (Miles)**
Tesla Model S (85 kW-hr)	265
Tesla Model S (60 kW-hr)	208
Tesla Model S (40 kW-hr)	139
Toyota RAV4 EV	103
CODA Automotive	88
Fiat 500e	87
Honda Fit EV	82
Ford Focus EV	76
Nissan Leaf EV	75
Smart fortwo EV	68
Mitsubishi i-MiEV	62
Scion iQ EV	38
Source: U.S. Department of Energy and U.S. Environmental Protection Agency, Fuel Economy Website. Website accessed August 7, 2013.	

Fact #798: September 23, 2013
Plug-in Hybrid Vehicle Driving Range

For the 2013 model year (MY) there are four plug-in hybrid electric vehicles (PHEVs) available to consumers. PHEVs offer a limited amount of all-electric driving range that is drawn from a plug and uses a gasoline engine to provide additional range when the battery is depleted. The automakers have taken different approaches to employing this technology. The Chevrolet Volt offers the longest all-electric range at 38 miles, but has the shortest overall range at 380 miles (electric 38 miles + gasoline 342 miles). The two PHEVs from Ford offer the greatest overall range at 620 miles but just 21 of those miles are all electric. The Toyota Prius PHEV provides the shortest electric driving range at 11 miles but has an overall range of 540 miles.

Driving Range for MY 2013 PHEVs



Note: Driving range based on Environmental Protection Agency laboratory testing. These may not directly match the vehicle manufacturer's stated range.

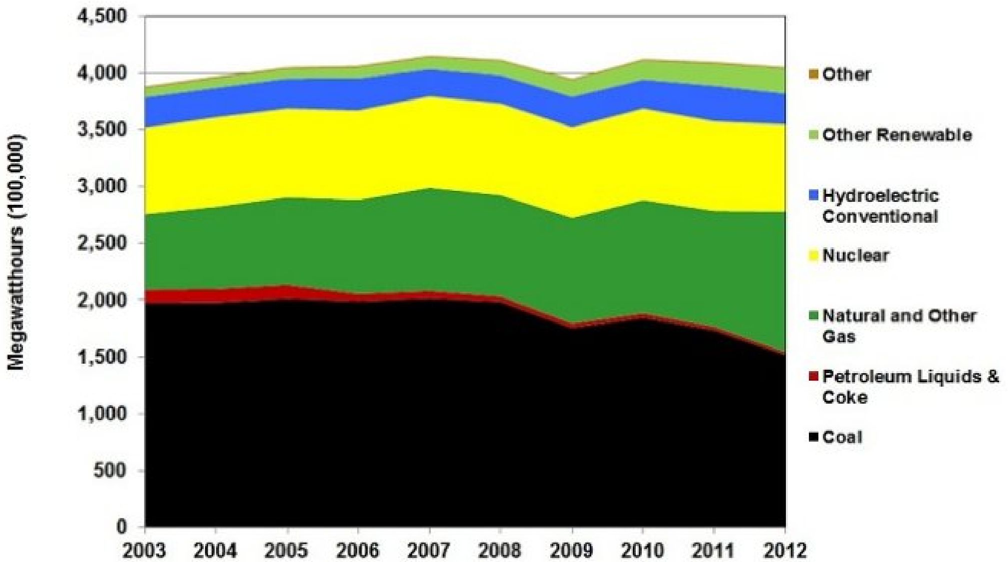
Supporting Information

Driving Range for MY 2013 PHEVs			
2013 Model Year Vehicle Make/Model	**Electric Range (Miles)**	**Gasoline Range (Miles)**	**Total Vehicle Range (Miles)**
Chevrolet Volt PHEV	38	342	380
Toyota Prius PHEV	11	529	540
Ford C-Max Energi PHEV	21	599	620
Ford Fusion Energi PHEV	21	599	620
Source: U.S. Department of Energy and U.S. Environmental Protection Agency, Fuel Economy Website. Website accessed August 7, 2013.			

Fact #799: September 30, 2013
Electricity Generation by Source, 2003-2012

With the increase in market penetration for electric vehicles, the upstream emissions from electricity generation become important. Those emissions are dependent upon the source of electricity generation. Although the generation of electricity varies greatly by region, the overall use of coal declined by about 24% from 2008 to 2012. The decrease in coal use has largely been supplanted by natural gas which has seen an increase of nearly 87% from 2003 to 2012. The use of nuclear and hydroelectric power has remained fairly constant over this time period. Though still a relatively small percentage of overall electricity generation, the use of renewable sources (other than hydroelectric) such as solar, wind, and biomass have increased nearly three-fold while the use of petroleum liquids and coke have dwindled to just 0.6%. The drop in overall electricity generation in 2009 reflects the effects of the economic recession that began at the end of 2007.

Electricity Generation by Source, 2003-2012



Notes:

- Other Renewable sources include wood, black liquor, other wood waste, biogenic municipal solid waste, landfill gas, sludge waste, agriculture byproducts, other biomass, geothermal, solar thermal, photovoltaic energy, and wind.
- Other includes non-biogenic municipal solid waste, batteries, hydrogen, purchased steam, sulfur, tire-derived fuel, and other miscellaneous energy sources.

Supporting Information

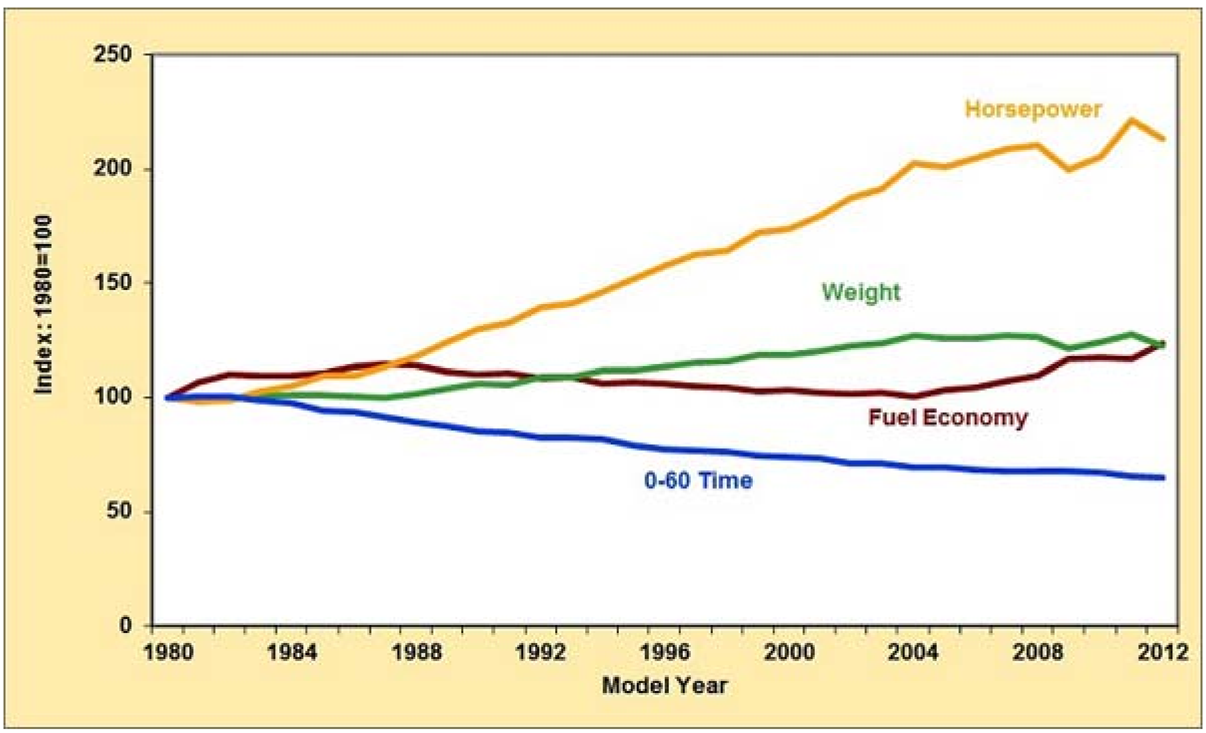
Electricity Generation by Source, 2003-2012							
Year	**Coal**	**Petroleum Liquids & Coke**	**Natural & Other Gas**	**Nuclear**	**Hydroelectric Conventional**	**Other Renewable**	**Other**
2003	1,974	119	666	764	267	79	14
2004	1,978	121	725	789	260	83	14
2005	2,013	122	774	781	264	87	13
2006	1,991	64	831	787	283	97	13
2007	2,016	66	910	806	241	105	12
2008	1,986	46	895	806	249	126	12
2009	1,756	39	932	799	269	144	12
2010	1,847	37	999	807	255	167	13
2011	1,733	30	1,025	790	313	194	14
2012	1,517	23	1,242	769	272	219	12

Source: Energy Information Administration, Electric Power Monthly -- June 2013, Table 1.1.

Fact #800: October 21, 2013
Characteristics of New Light Vehicles over Time

From model years 1980 to 2012, there have been significant gains in automotive technology. For new light vehicles, horsepower has more than doubled and "0-to-60" acceleration times have dropped from 14.3 to 9.3 seconds. The average weight grew to a high of 4,111 pounds in 2004 and has dropped slightly since then (3,950 pounds in 2012). The average fuel economy of new light vehicles has fluctuated over the years, but has been trending higher since 2004 with a new high of 23.8 miles per gallon reached in model year 2012.

Characteristics of New Light Vehicles Sold, Model Years 1980-2012



Supporting Information

Characteristics of New Light Vehicles Sold, Model Years 1980-2012								
	Native Units				Indexed to 1980			
Model Year	Miles per gallon	Weight (lbs)	0-60 Time (sec)	Horsepower	Miles per gallon	Weight (lbs)	0-60 Time (sec)	Horsepower
1980	19.2	3,228	14.3	104	100	100	100	100
1981	20.5	3,202	14.4	102	107	99	101	98
1982	21.1	3,202	14.4	103	110	99	101	99
1983	21.0	3,257	14.1	107	109	101	99	103
1984	21.0	3,262	14.0	109	109	101	98	105
1985	21.3	3,271	13.5	114	111	101	94	110
1986	21.8	3,238	13.4	114	114	100	94	110
1987	22.0	3,221	13.1	118	115	100	92	113
1988	21.9	3,283	12.8	123	114	102	90	118
1989	21.4	3,351	12.5	129	111	104	87	124
1990	21.2	3,426	12.2	135	110	106	85	130
1991	21.3	3,410	12.1	138	111	106	85	133
1992	20.8	3,512	11.8	145	108	109	83	139
1993	20.9	3,519	11.8	147	109	109	83	141
1994	20.4	3,603	11.7	152	106	112	82	146
1995	20.5	3,613	11.3	158	107	112	79	152
1996	20.4	3,659	11.1	164	106	113	78	158
1997	20.2	3,727	11.0	169	105	115	77	163
1998	20.1	3,744	10.9	171	105	116	76	164
1999	19.7	3,835	10.7	179	103	119	75	172
2000	19.8	3,821	10.6	181	103	118	74	174
2001	19.6	3,879	10.5	187	102	120	73	180
2002	19.5	3,951	10.2	195	102	122	71	188
2003	19.6	3,999	10.2	199	102	124	71	191
2004	19.3	4,111	9.9	211	101	127	69	203
2005	19.9	4,059	9.9	209	104	126	69	201
2006	20.1	4,067	9.8	213	105	126	69	205

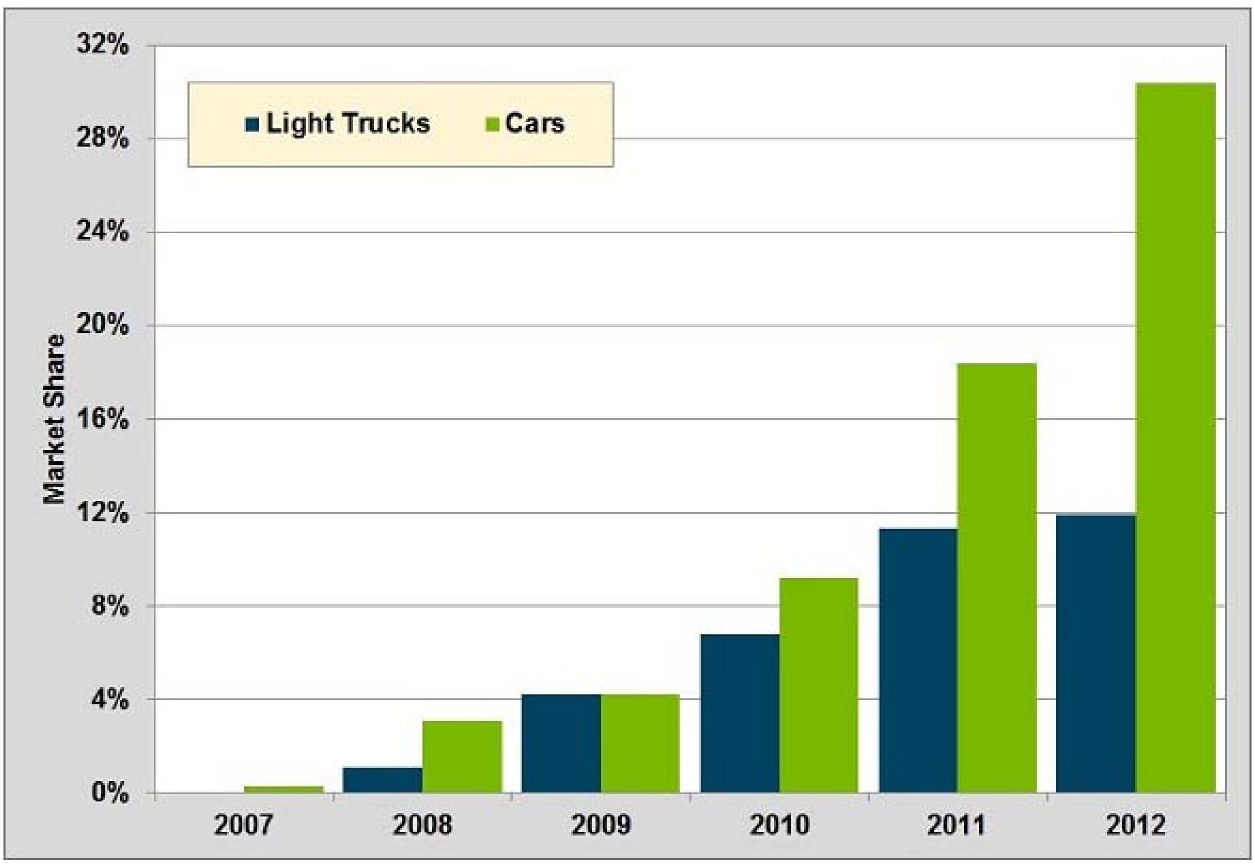
2007	20.6	4,093	9.7	217	107	127	68	209
2008	21.0	4,085	9.7	219	109	127	68	211
2009	22.4	3,914	9.7	208	117	121	68	200
2010	22.6	4,002	9.6	214	118	124	67	206
2011	22.4	4,127	9.4	230	117	128	66	221
2012	23.8	3,950	9.3	222	124	122	65	213

Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, March 2013.

Fact #801: October 28, 2013
Gasoline Direct Injection Continues to Grow

Gasoline Direct Injection (GDI) is an engine technology that improves fuel economy and engine performance by injecting fuel directly into the combustion chamber, allowing for a more complete and efficient use of fuel compared to standard fuel injection. Both cars and light trucks have seen increased use of GDI in recent years as manufacturers strive to increase fuel economy while meeting consumer expectations for performance. Cars have seen the greatest increase in the use of GDI from just 0.3% market share in 2007 to 30.4% of all new cars sold in 2012.

GDI Market Share for New Cars and Light Trucks, Model Years 2007-2012



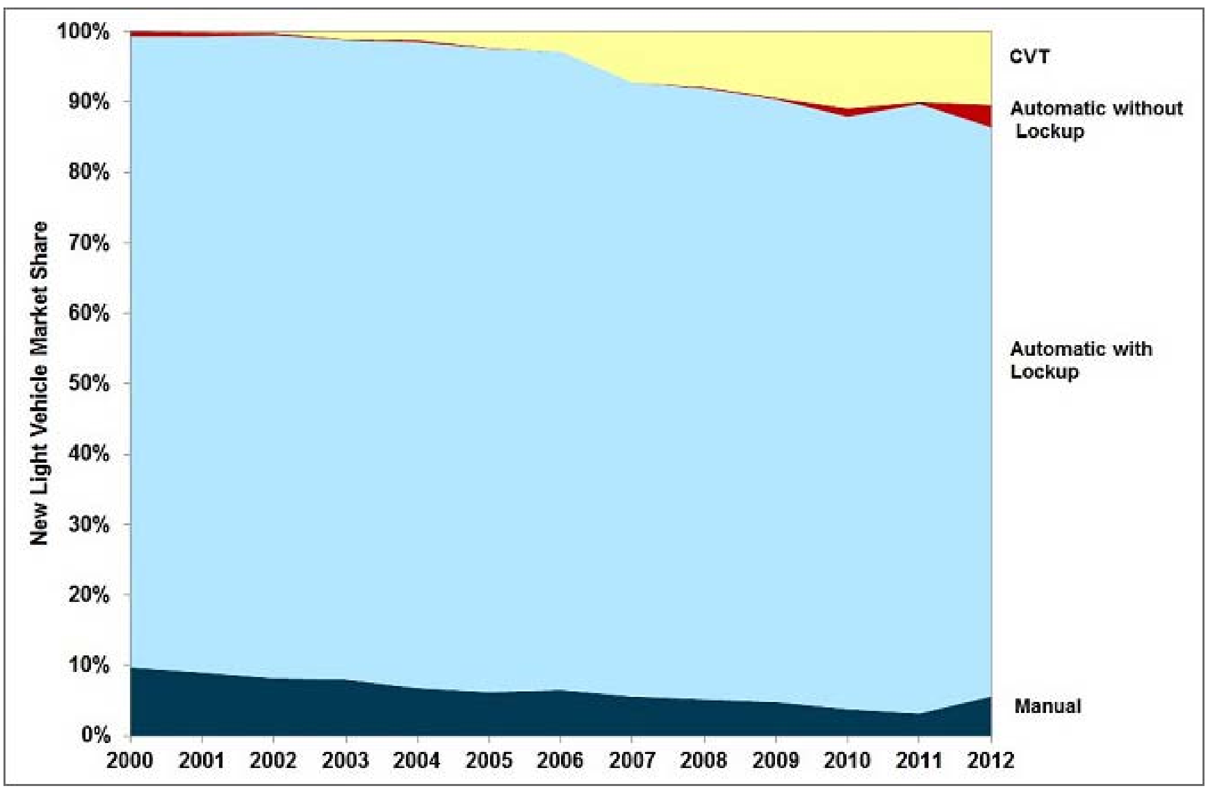
Supporting Information

GDI Market Share for New Cars and Light Trucks, Model Years 2007-2012		
Model Year	**Cars**	**Light Trucks**
2007	0.3%	0.0%
2008	3.1%	1.1%
2009	4.2%	4.2%
2010	9.2%	6.8%
2011	18.4%	11.3%
2012	30.4%	11.9%
Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, March 2013.		

Fact #802: November 4, 2013
Market Share by Transmission Type

The variety of transmission technologies has increased as manufacturers seek more efficient ways of transferring power from the engine to the wheels of the vehicles. Automatic transmissions with lockup remain the dominant transmission type but Continuously Variable Transmissions (CVT) have seen greater use in recent years, accounting for about 10 percent of all transmissions between 2010 and 2012. The number of automatic transmissions without lockup (shown in red in the figure below) dropped to zero by 2006. Beginning in 2008, however, new technology was employed which raised the share of automatic without lockup transmissions to 3.2% percent by 2012. The dual clutch automatic transmissions, which are mechanically similar to manual transmissions but they shift automatically, are not equipped with a lock-up torque converter. Standard manual transmissions have declined from nearly 10% in 2000 to a low of 3.2% in 2011 but rebounded somewhat in 2012.

Market Share by Transmission Type, Model Years 2000-2012



Supporting Information

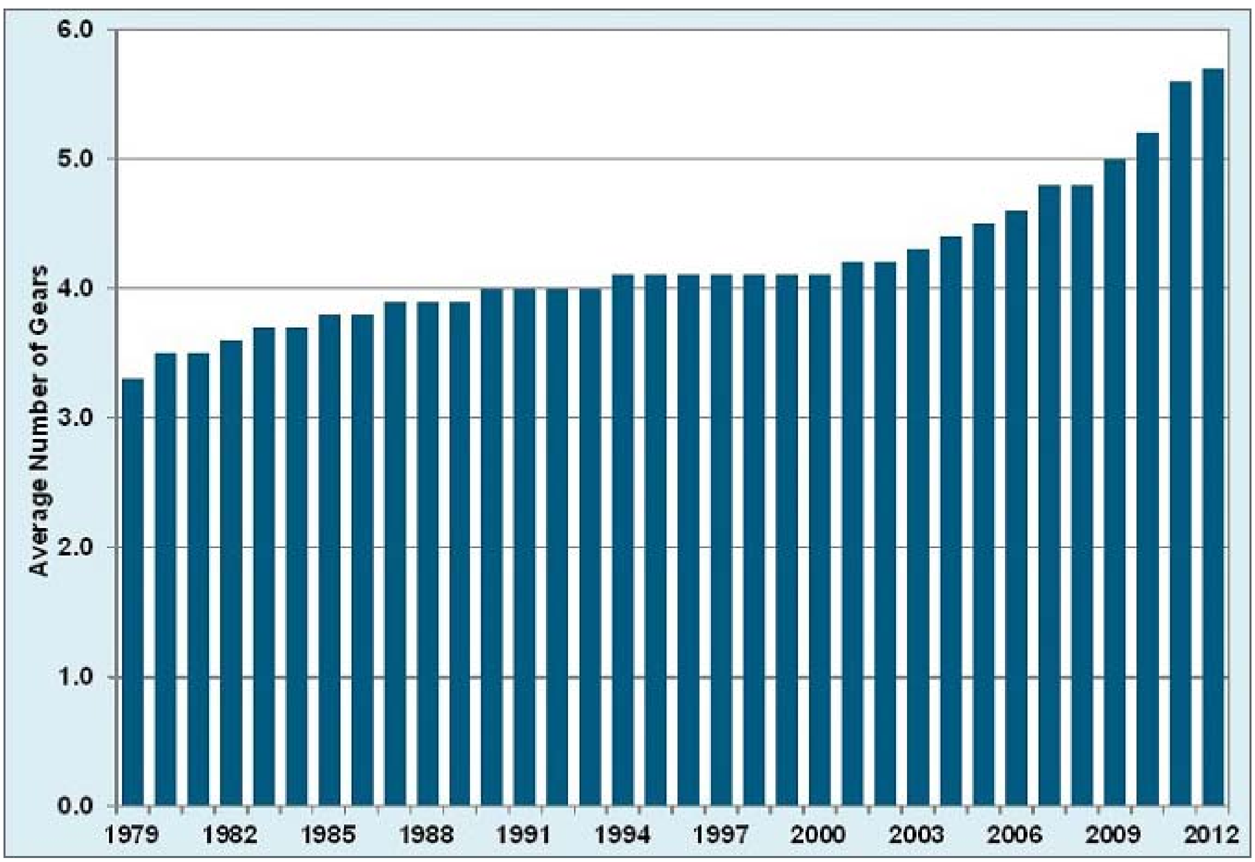
Market Share by Transmission Type, Model Years 2000-2012				
Model Year	**Manual**	**Automatic with Lockup**	**Automatic without Lockup**	**CVT**
2000	9.7%	89.5%	0.7%	0.0%
2001	9.0%	90.3%	0.6%	0.1%
2002	8.2%	91.4%	0.3%	0.2%
2003	8.0%	90.8%	0.1%	1.1%
2004	6.8%	91.8%	0.3%	1.2%
2005	6.2%	91.5%	0.1%	2.3%
2006	6.5%	90.6%	0.0%	2.8%
2007	5.6%	87.1%	0.0%	7.2%
2008	5.2%	86.8%	0.2%	7.9%
2009	4.8%	85.5%	0.2%	9.4%
2010	3.8%	84.1%	1.2%	10.9%
2011	3.2%	86.6%	0.3%	10.0%
2012	5.6%	80.8%	3.2%	10.4%

Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, March 2013.

Fact #803: November 11, 2013
Average Number of Transmission Gears is on the Rise

The number of gears a transmission has affects a vehicle's fuel economy and performance. The more gears a vehicle has, the more time the engine spends within an optimal operating range while the vehicle speeds up and slows down. To achieve a better match between engine speed and wheel speed, manufacturers have been increasing the number of gears in the vehicles offered. In model year 1979, the average number of gears in new light vehicles sold was just over 3, and that average rose only to about 4 gears for the next two decades. But beginning in 2001, the number climbed from about 4 gears to nearly 6 gears in model year 2012.

Average Number of Gears for New Light Vehicles, Model Years 1979-2012



Supporting Information

Average Number of Gears for New Light Vehicles, Model Years 1979-2012	
Model Year	**Average Number of Gears**
1979	3.3
1980	3.5
1981	3.5
1982	3.6
1983	3.7
1984	3.7
1985	3.8
1986	3.8
1987	3.9
1988	3.9
1989	3.9
1990	4.0
1991	4.0
1992	4.0
1993	4.0
1994	4.1
1995	4.1
1996	4.1
1997	4.1
1998	4.1
1999	4.1
2000	4.1
2001	4.2
2002	4.2
2003	4.3
2004	4.4
2005	4.5
2006	4.6

2007	4.8
2008	4.8
2009	5.0
2010	5.2
2011	5.6
2012	5.7

Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, March 2013.

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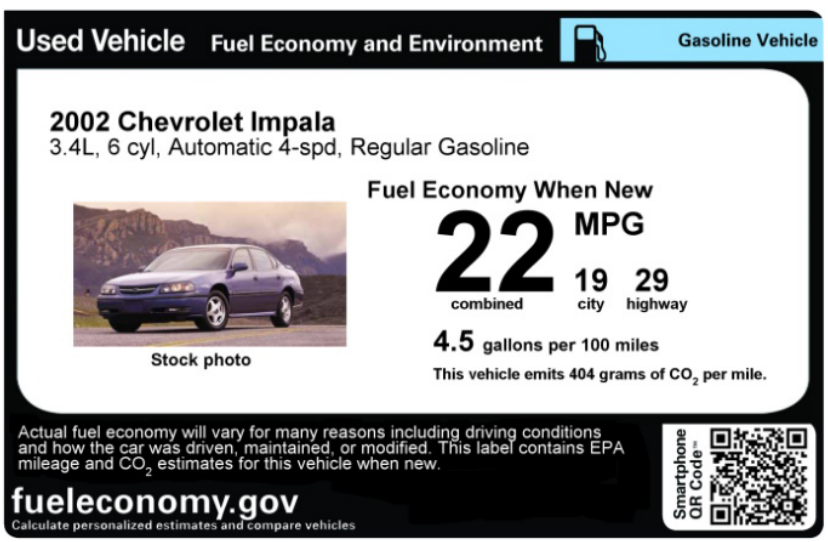
Vehicle Technologies Office

Fact #804: November 18, 2013
Tool Available to Print Used Vehicle Fuel Economy Window Stickers

Because used vehicle sales outnumber new vehicle sales by about three to one, a new tool has been developed that allows those selling used vehicles to produce a fuel economy label for the vehicle. The labels are optional and can be printed and affixed directly on a vehicle or downloaded in electronic format for online advertising. All labels come with a QR code that allows consumers to scan the label with a smart phone for additional vehicle information directly from the Fuel Economy Website. It is noted on the label that the mileage and CO_2 estimates are for the vehicle when new, and that factors such as vehicle modifications and maintenance can affect fuel economy. However, if a vehicle has not been modified and has been properly maintained, its fuel economy should not vary significantly from when it was new.

Example of a Used Vehicle Label from the Fuel Economy Website



Supporting Information

U.S. Department of Energy and U.S. Environmental Protection Agency's Fuel Economy Website.

Crain Communications. Automotive News, "Feds develop optional used-car mpg window stickers." September 12, 2013.

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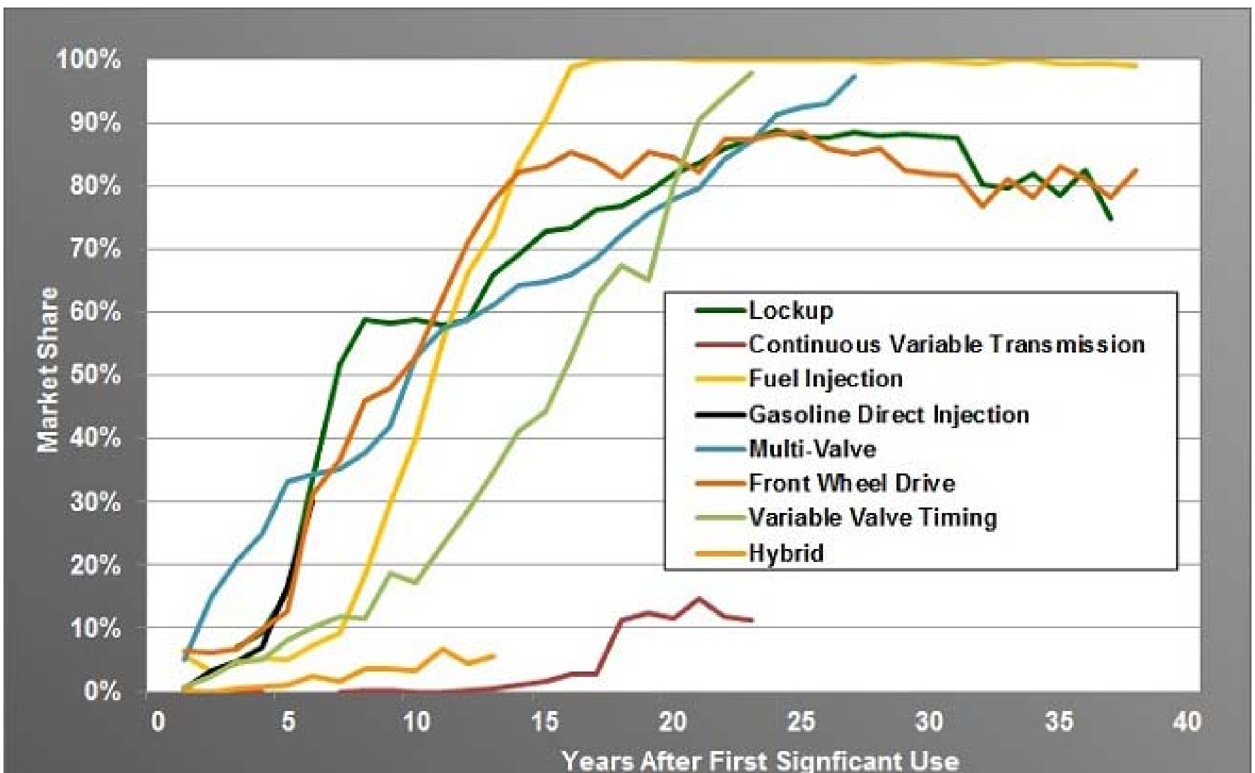
Vehicle Technologies Office

Fact #805: November 25, 2013
Vehicle Technology Penetration

As new vehicle technologies are introduced into the market their initial and overall adoption rate can vary widely. The figure below shows select technologies and their production share over time since first significant use. Fuel injection was adopted fairly quickly after its introduction nearly 40 years ago and reached 100% of the market share, completely replacing the older carburetion technology. A variation on standard port fuel injection, gasoline direct injection has grown to 30% market share in just five years as automakers strive for greater engine efficiency.

Other engine technologies, like multi-valve and variable valve timing, have also seen rapid and widespread adoption, while technologies like continuously variable transmissions and hybrid drivetrains have experienced a slower adoption rate. The recent decline in the use of lockup for automatic transmissions can be attributed to the increased use of automated manual transmissions that do not require lockup.

Vehicle Technology Penetration since First Significant Use



Supporting Information

Vehicle Technology Penetration since First Significant Use (Market Share)								
Year	Lockup	Continuous Variable Transmission	Fuel Injection	Gasoline Direct Injection	Multi-Valve	Front Wheel Drive	Variable Valve Timing	Hybrid
1		0%	6%	0%	5%	7%	1%	0%
2		0%	3%	3%	15%	6%	3%	0%
3	7%	0%	4%	5%	21%	7%	5%	0%
4	9%	0%	5%	7%	25%	10%	5%	1%
5	16%		5%	17%	33%	13%	8%	1%
6	34%		7%	30%	34%	31%	10%	2%
7	52%	0%	9%		35%	37%	12%	2%
8	59%	0%	18%		38%	46%	12%	4%
9	58%	0%	30%		42%	48%	19%	4%
10	59%	0%	40%		53%	53%	17%	3%
11	58%	0%	55%		57%	62%	23%	7%
12	59%	0%	66%		59%	71%	29%	4%
13	66%	0%	73%		61%	78%	35%	6%
14	69%	1%	83%		64%	82%	41%	
15	73%	2%	90%		65%	83%	44%	
16	73%	3%	99%		66%	85%	53%	
17	76%	3%	100%		69%	84%	62%	
18	77%	11%	100%		72%	81%	67%	
19	79%	13%	100%		76%	85%	65%	
20	82%	12%	100%		78%	84%	80%	
21	84%	15%	100%		80%	82%	90%	
22	86%	12%	100%		84%	87%	94%	
23	87%	11%	100%		87%	87%	98%	
24	89%		100%		91%	88%		
25	88%		100%		92%	88%		
26	88%		100%		93%	86%		
27	88%		100%		97%	85%		
28	88%		100%			86%		

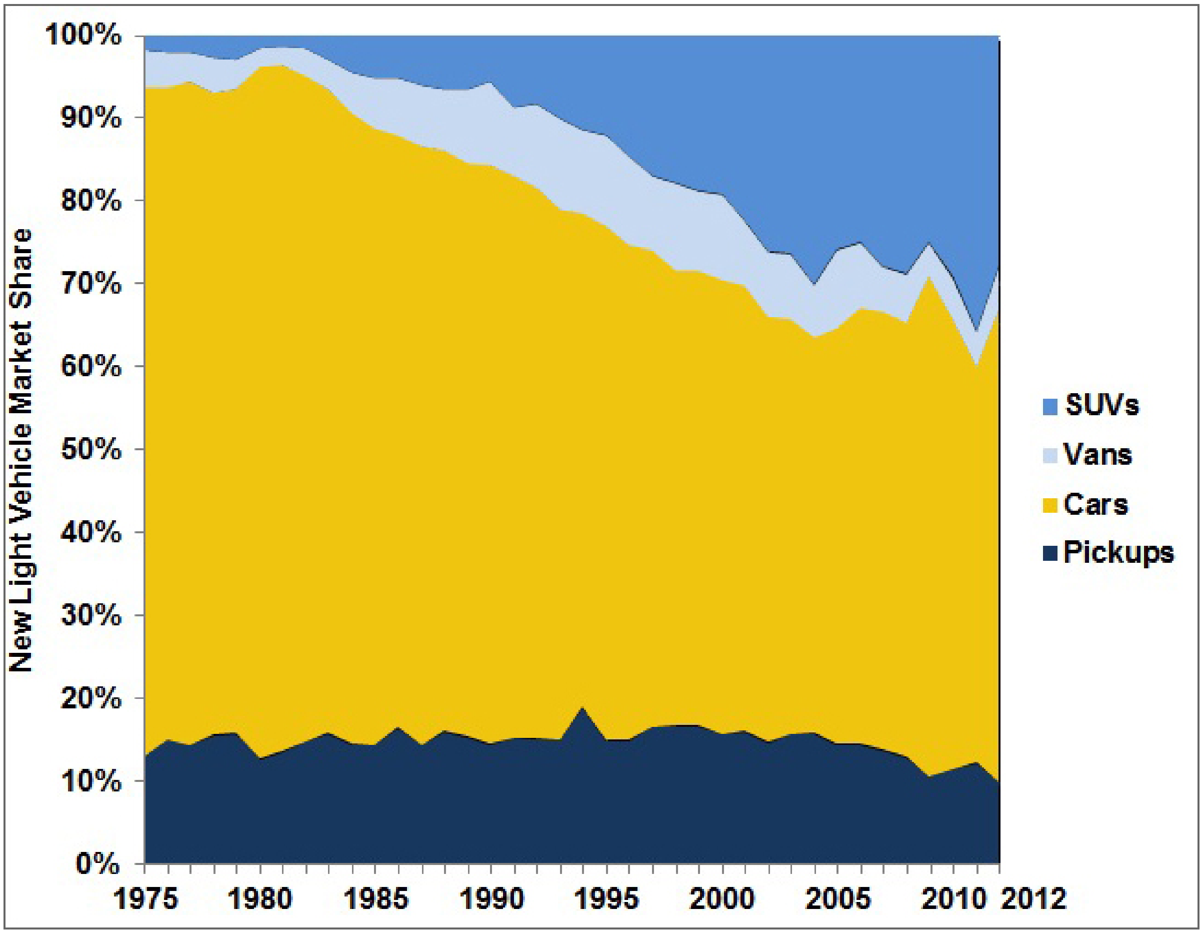
29	88%		100%			83%		
30	88%		100%			82%		
31	88%		100%			82%		
32	80%		99%			77%		
33	80%		100%			81%		
34	82%		100%			78%		
35	79%		99%			83%		
36	83%		99%			81%		
37	75%		99%			78%		
38			99%			83%		

Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, March 2013.

Fact #806: December 2, 2013
Light Vehicle Market Shares, Model Years 1975–2012

In 1975, cars were by far the dominant vehicle style among new light vehicle sales, with a few vans and pickup trucks. Sport Utility Vehicles (SUVs) accounted for less than 2% of the market at that time. As SUVs increased in popularity, the share of cars decreased proportionally. The increase in vans beginning in the mid 1980s and through 2000 reflects new popular minivan models that were brought to market, but sales of vans have been declining in recent years. The sharp drop in car sales in 2011 was likely a result of the tsunami that occurred in Japan which constrained supplies of popular car models from Japanese manufacturers.

Light Vehicle Market Shares, Model Years 1975–2012



Supporting Information

New Light Vehicle Market Shares, Model Years 1975–2012				
Model Year	**Light Trucks**	**Cars**	**Vans**	**SUVs**
1975	13.1%	80.6%	4.5%	1.8%
1976	15.1%	78.9%	4.1%	2.0%
1977	14.4%	79.9%	3.6%	1.9%
1978	15.6%	77.3%	4.3%	2.6%
1979	15.9%	77.8%	3.5%	2.9%
1980	12.7%	83.5%	2.1%	1.6%
1981	13.6%	82.8%	2.3%	1.3%
1982	14.8%	80.3%	3.2%	1.6%
1983	15.8%	77.6%	3.7%	2.8%
1984	14.5%	76.2%	4.8%	4.4%
1985	14.4%	74.7%	5.9%	5.1%
1986	16.5%	71.6%	6.8%	5.1%
1987	14.4%	72.2%	7.5%	5.9%
1988	16.1%	70.2%	7.4%	6.4%
1989	15.4%	69.4%	8.8%	6.4%
1990	14.5%	69.8%	10.0%	5.6%
1991	15.3%	67.8%	8.2%	8.7%
1992	15.2%	66.6%	10.0%	8.2%
1993	15.1%	64.0%	10.9%	10.0%
1994	18.9%	59.6%	10.0%	11.4%
1995	15.0%	62.1%	11.0%	12.0%
1996	14.9%	60.0%	10.7%	14.4%
1997	16.7%	57.7%	8.8%	17.0%
1998	16.7%	55.1%	10.3%	17.8%
1999	16.7%	55.1%	9.6%	18.6%
2000	15.7%	55.0%	10.2%	19.0%
2001	16.1%	53.9%	7.9%	22.2%
2002	14.8%	51.5%	7.7%	26.0%
2003	15.7%	50.2%	7.8%	26.2%

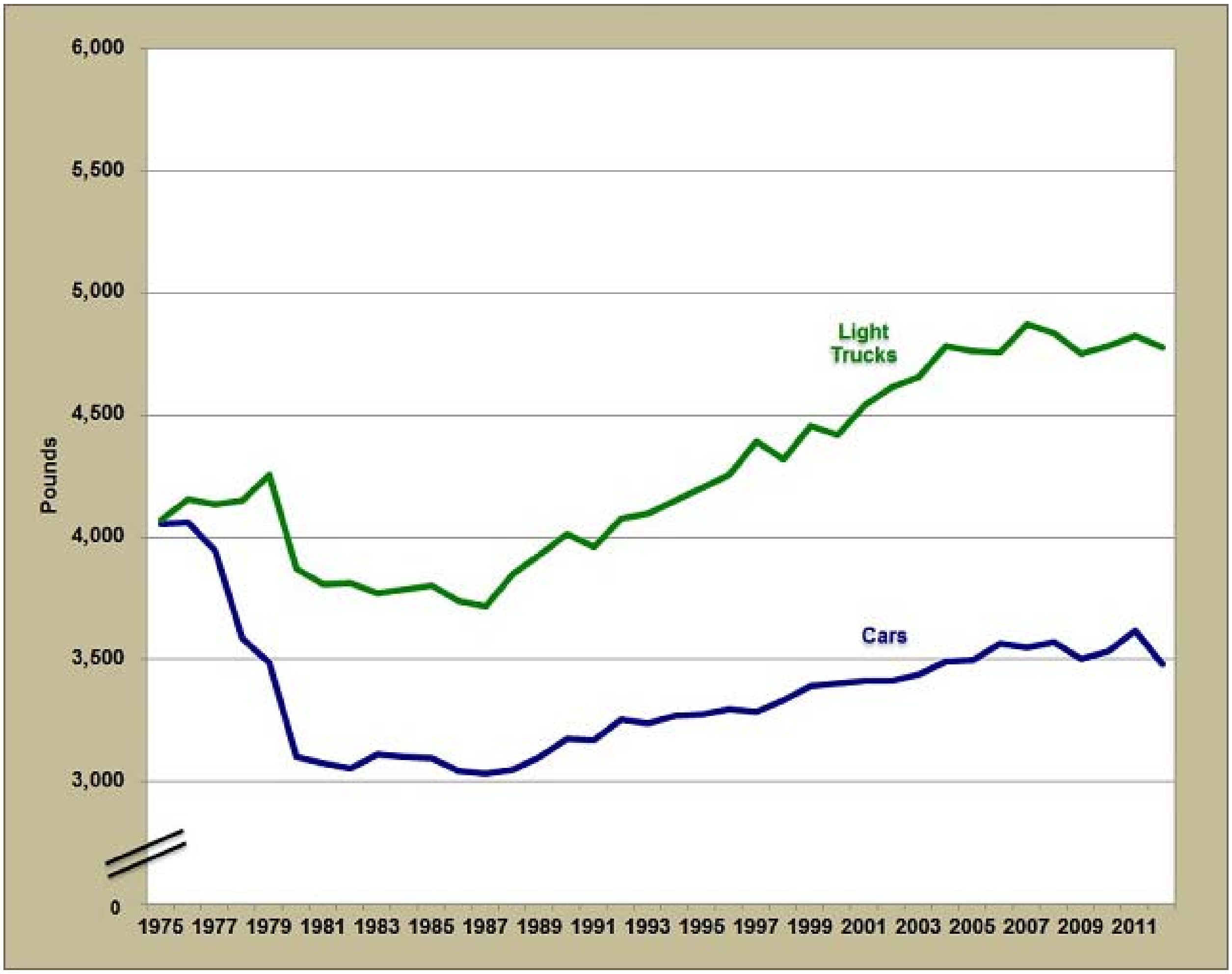
2004	15.9%	48.0%	6.1%	30.1%
2005	14.5%	50.5%	9.3%	25.8%
2006	14.5%	52.9%	7.7%	24.9%
2007	13.8%	53.0%	5.5%	27.7%
2008	12.9%	52.7%	5.7%	28.7%
2009	10.6%	60.5%	4.0%	24.9%
2010	11.5%	54.5%	5.0%	29.0%
2011	12.3%	47.8%	4.3%	35.6%
2012	10.0%	57.0%	5.1%	27.8%

Source: Oak Ridge National Laboratory, *Transportation Energy Data Book, Ed. 32*, Table 4.11, July 2013.
Original data source: Environmental Protection Agency.

Fact #807: December 9, 2013
Light Vehicle Weights Leveling Off

The effect of the oil crisis in the mid-1970s and subsequent rise of smaller import vehicles is evident in the graph below, showing a dramatic fall in average vehicle weight from model years 1975 to the mid-1980s. Since that time, the average weight of both cars and light trucks has increased. In the last few years, the average weight seems to be leveling – in 2012, both cars and light trucks have a similar weight as in 2004. Interestingly, the average weight for cars remains well below 1975 levels while the average weight for light trucks remains well above 1975 levels.

Average Weight of New Cars and Light Trucks, Model Years 1975-2012



Supporting Information

Average Weight of New Cars and Light Trucks, 1975-2012 (Pounds)		
Model Year	**Cars**	**Light Trucks**
1975	4,057	4,073
1976	4,059	4,155
1977	3,944	4,136
1978	3,588	4,152
1979	3,485	4,257
1980	3,101	3,869
1981	3,076	3,806
1982	3,053	3,813
1983	3,112	3,773
1984	3,101	3,787
1985	3,096	3,803
1986	3,043	3,741
1987	3,035	3,718
1988	3,051	3,850
1989	3,104	3,932
1990	3,178	4,014
1991	3,168	3,961
1992	3,254	4,078
1993	3,241	4,098
1994	3,268	4,149
1995	3,274	4,201
1996	3,297	4,255
1997	3,285	4,394
1998	3,334	4,317
1999	3,390	4,457
2000	3,401	4,421
2001	3,411	4,543
2002	3,415	4,612

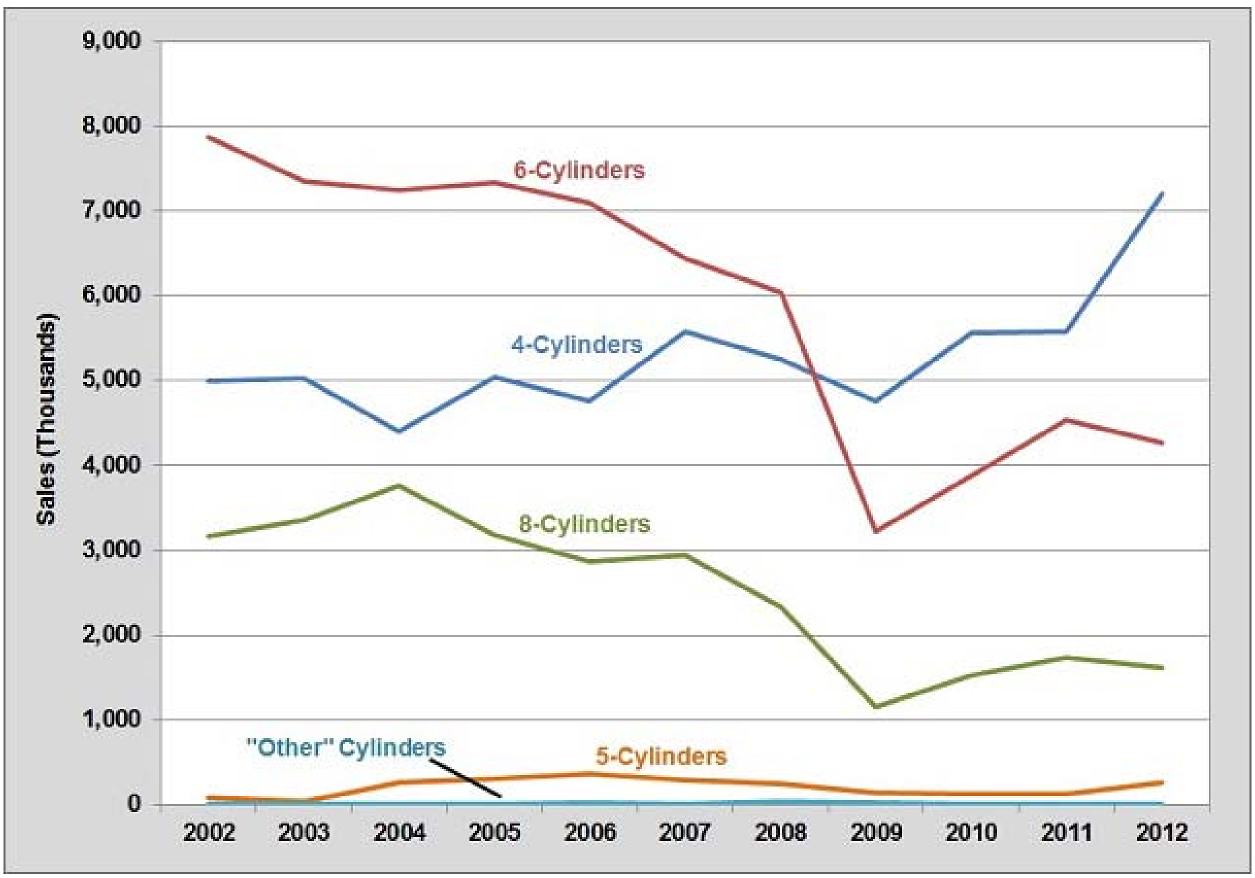
2003	3,437	4,655
2004	3,492	4,783
2005	3,498	4,763
2006	3,563	4,758
2007	3,551	4,871
2008	3,569	4,837
2009	3,502	4,753
2010	3,536	4,784
2011	3,617	4,824
2012	3,482	4,779

Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, March 2013.

Fact #808: December 16, 2013
Declining Use of Six- and Eight-Cylinder Engines

Since 2002, there has been a shift away from eight- and six-cylinder engines and increased use of four-cylinder engines in new light vehicles. From 2002 to 2012, eight- and six-cylinder engines declined by nearly 50% (49% and 46%, respectively) while the use of four-cylinder engines increased by 44%. This shift toward smaller engines is attributable to advances in engineering that allow greater output from smaller engines. These advances are helping manufacturers to meet both Corporate Average Fuel Economy standards and consumer expectations. Other cylinder configurations like the three- and five-cylinder engines have never been widely used.

Sales of New Light Vehicles by Number of Cylinders, 2002–2012



Supporting Information

Sales of New Light Vehicles by Number of Cylinders, 2002–2012 (Thousands)

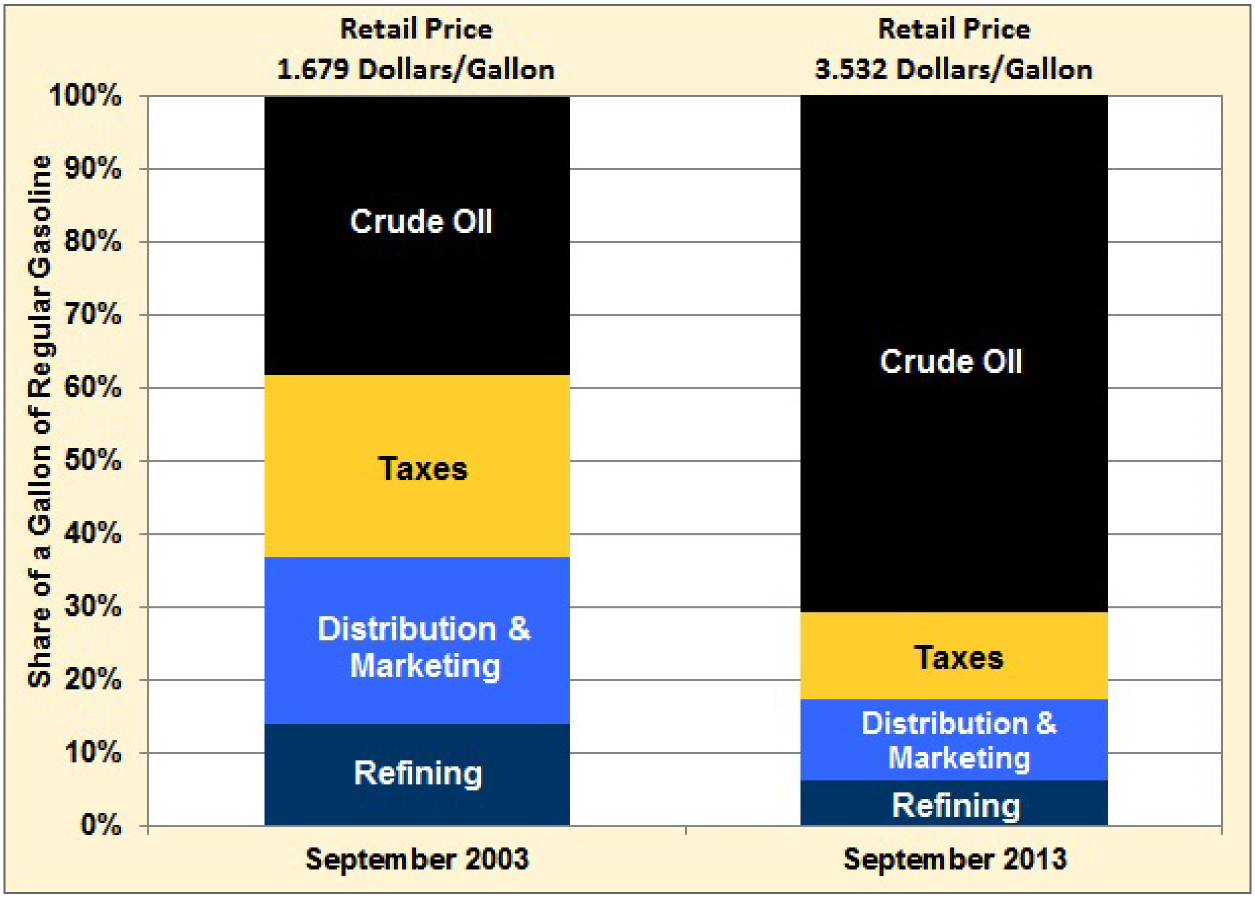
Model Year	Number of Cylinders					Total
	4	5	6	8	Other	
2002	5,003	77	7,866	3,164	4	16,115
2003	5,021	40	7,346	3,359	6	15,773
2004	4,400	260	7,245	3,757	12	15,674
2005	5,034	305	7,340	3,180	16	15,875
2006	4,758	366	7,095	2,860	19	15,098
2007	5,576	297	6,434	2,946	17	15,270
2008	5,245	251	6,036	2,328	36	13,896
2009	4,762	149	3,232	1,150	19	9,312
2010	5,556	125	3,887	1,532	9	11,109
2011	5,582	130	4,542	1,740	8	12,002
2012	7,199	256	4,260	1,617	11	13,343

Source: Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2012*, EPA-420-S-13-001, Appendix J, March 2013.

Fact #809: December 23, 2013
What Do We Pay for in a Gallon of Gasoline?

The figure below shows how the shares of component costs have changed for a gallon of regular gasoline over the ten-year period from September 2003 to September 2013. In 2003, crude oil accounted for 38.3% of the retail price of a gallon of regular gasoline. By 2013, the share for crude oil nearly doubled to 70.8% of the price. While the share for crude oil grew, the shares for taxes, distribution and marketing, and refining decreased proportionally. In 2003, taxes accounted for 25% of the price of regular gasoline but by 2013, taxes accounted for just 11.9% of the price.

Price Components of a Gallon of Gasoline, September 2003 versus September 2013



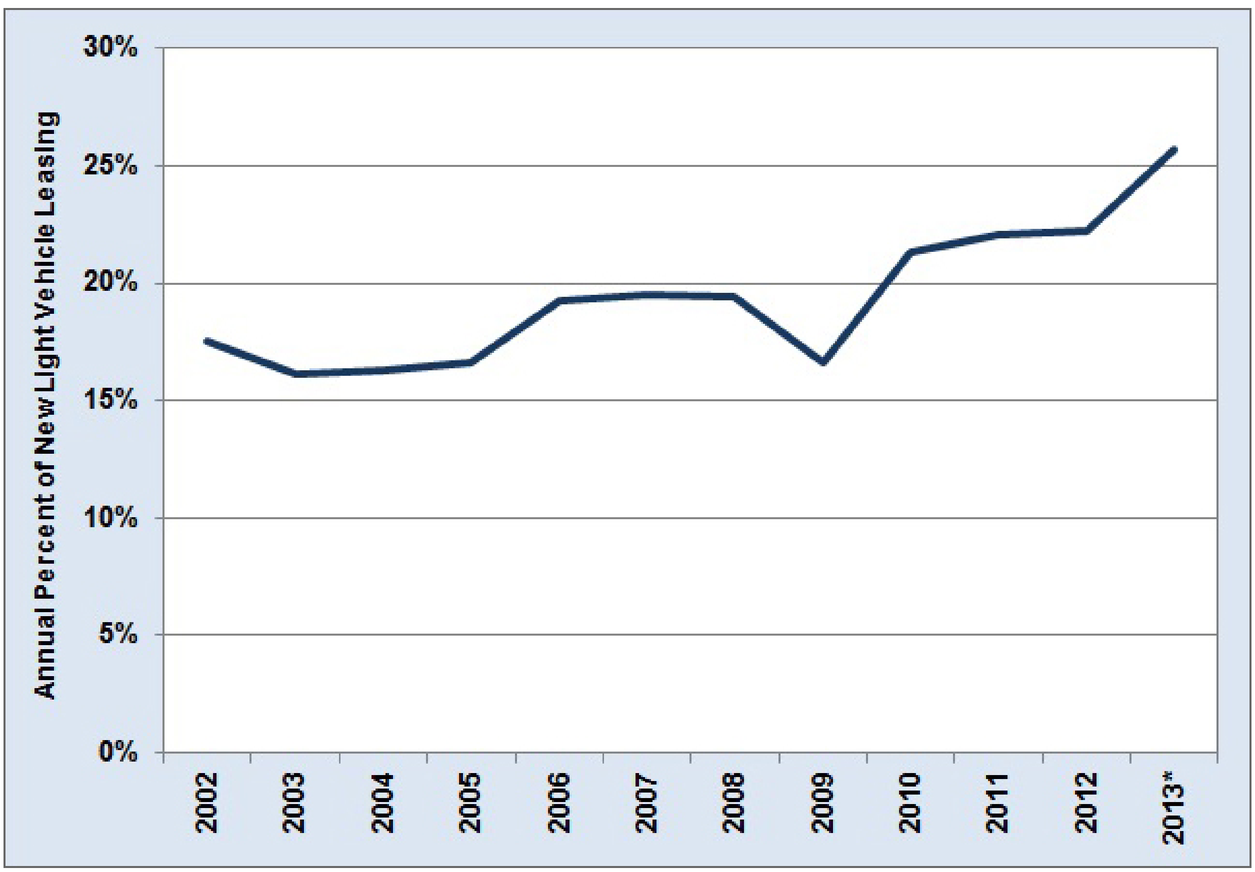
Supporting Information

Price Components of a Gallon of Gasoline, September 2003 vs. September 2013						
	Refining	**Distribution & Marketing**	**Taxes**	**Crude Oil**		**Retail Price**
Month/Year	**Share of a Gallon of Regular Gasoline**					**Dollars per Gallon**
September 2003	13.9%	22.7%	25.0%	38.3%		1.679
September 2013	6.2%	11.1%	11.9%	70.8%		3.532
Source: Energy Information Administration, Gasoline Pump Components History, November 2013.						

Fact #810: December 30, 2013
Leasing on the Rise

Leasing has been on the rise since 2009 and rose sharply from 2012 through the first half of 2013, with leases accounting for about 26% of all new light vehicle transactions. The pronounced dip in 2009 during the recession reflects the loss of several high volume leasing programs. Many leasing programs were eliminated due to heavy financial losses resulting from the sudden drop in residual values for the vehicles leased just prior to the recession. The Cash for Clunkers program also contributed to the lower leasing rates for 2009. Although leasing was permitted under that program, only long-term five-year leases qualified, while the more popular shorter term leases were ineligible for the program.

Annual Percentage of New Light Vehicle Leasing, 2002–2013*



Supporting Information

Annual Percentage of New Light Vehicle Leasing, 2002 - 2013	
Year	**Percent Leased**
2002	17.5%
2003	16.1%
2004	16.3%
2005	16.6%
2006	19.3%
2007	19.5%
2008	19.4%
2009	16.6%
2010	21.3%
2011	22.1%
2012	22.2%
2013*	25.7%

* Leasing for January-June 2013.

Source: Automotive News, "Leases buoy market, add factory risk," September 23, 2013. Original source: Edmunds.