ORNL/TM-2015/129

Vehicle Technologies' Fact of the Week 2014

Stacy C. Davis
Susan W. Diegel
Sheila A. Moore
Oak Ridge National Laboratory

Robert G. Boundy
Roltek, Inc.

April 2015

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE US DEPARTMENT OF ENERGY

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Prepared for the
Vehicle Technologies Office
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The authors would like to thank the project sponsor, Jacob 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. We are indebted to Debbie Bain for the manuscript of this report.

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 (back to 2009) 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 2014. The Facts were written and prepared by staff in Oak Ridge National Laboratory's Center for Transportation Analysis.

In 2014 there were not as many Facts posted as in a typical year. From February 17 to April 20, 2014, the VTO website was undergoing a reprogramming and the site content could not be changed in any way. ORNL has no control over the VTO website, but sends content to the website programmers in the appropriate file formats. No Facts could be posted during the reprogramming period, but ORNL made sure that the programmers had new Facts on hand as soon as the site was able to accept new content.

Beginning on July 21, 2014, each Fact of the Week website page includes a link to an Excel file. That file contains the data from the Supporting Information section of the page so that researchers can easily use data from the Fact of the Week in their work.

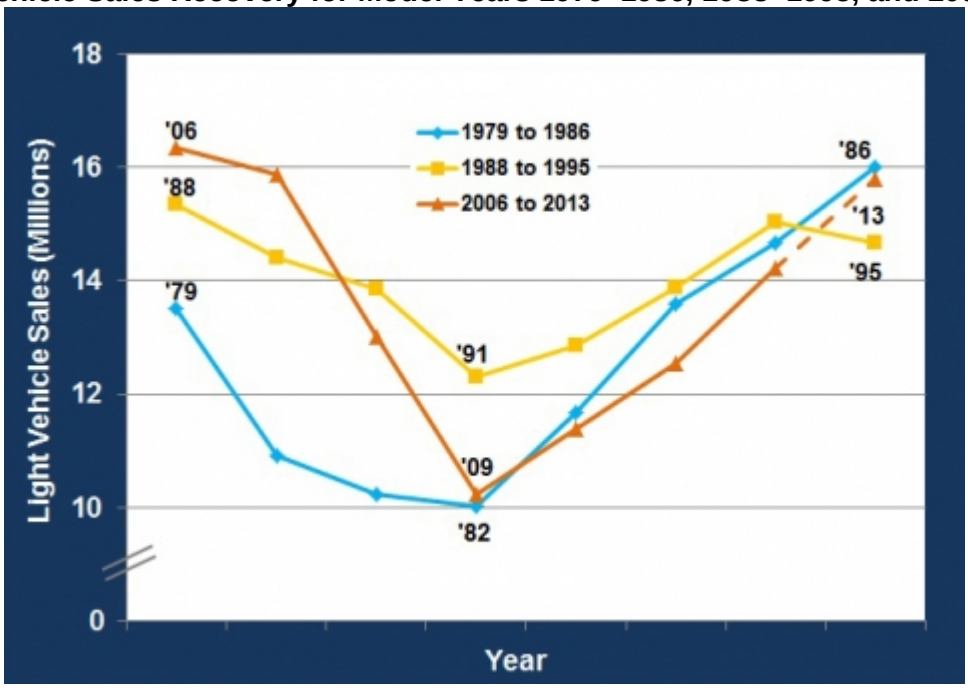
Vehicle Technologies Office

Fact #811: January 6, 2014

Light Vehicle Sales Recoveries

The figure below shows the effect of the past three recessions on light vehicle sales. Of the last three recessions, the recent one had the most profound effect on light vehicle sales with a decline of 37.4% over a three-year period. In 2006, vehicle sales began to decline and then plummeted from about 16 million sales in 2007 to about 10 million in 2009, roughly equivalent to the low in 1982. The subsequent recovery in light vehicle sales from the low in 2009 was similar to that of the other two with projected sales expected to reach 15.8 million by the end of 2013.

Light Vehicle Sales Recovery for Model Years 1979–1986, 1988–1995, and 2006–2013



Supporting Information

Light Vehicle Sales Recovery for Model Years 1979–1986, 1988–1995, and 2006–2013

Model Year	Sales (Millions)	Model Year	Sales (Millions)	Model Year	Sales (Millions)
1979	13.5	1988	15.3	2006	16.3
1980	10.9	1989	14.4	2007	15.9
1981	10.2	1990	13.9	2008	13.0
1982	10.0	1991	12.3	2009	10.2
1983	11.7	1992	12.8	2010	11.4
1984	13.6	1993	13.9	2011	12.5
1985	14.7	1994	15.0	2012	14.2
1986	16.0	1995	14.7	2013*	15.8

* Sales estimation for January–December 2013

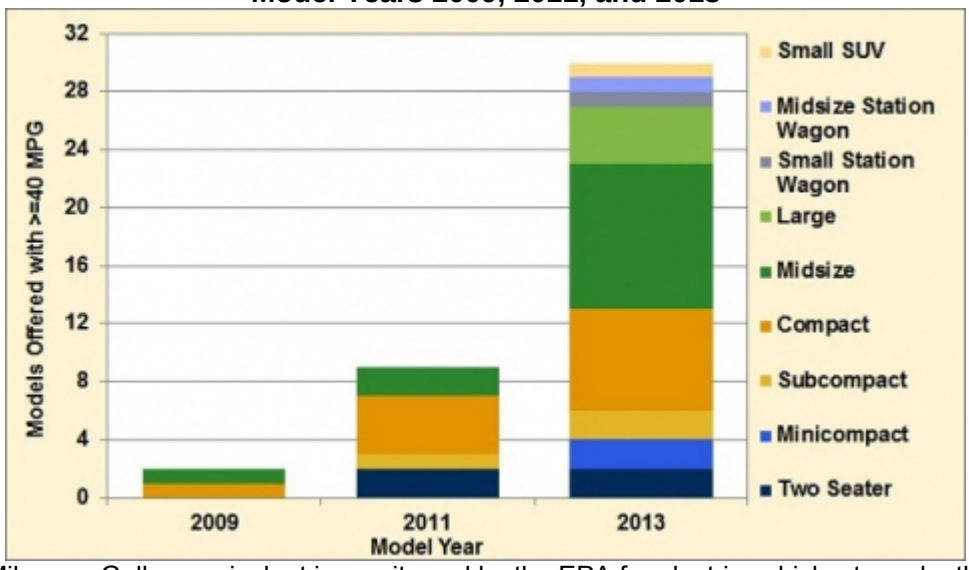
Sources:
1979-2012: Oak Ridge National Laboratory, *Transportation Energy Data Book, Ed. 32*, Table 3.11, July 2013.
2013: Crain Communications, "Automotive News," September 9, 2013, p. 62.

Fact #812: January 13, 2014

The Number of Models Achieving 40 MPG or More is Increasing Rapidly

For the 2009 model year, there were only two models that achieved a combined EPA rating of 40 MPG or higher. By the 2013 model year, that number rose to 30 models. In 2009, the only two models with a combined rating of 40 MPG or higher were conventional hybrids with a top fuel economy of 46 MPG. In 2013, the models that met or exceeded 40 MPG include conventional hybrids, plug-in hybrids, and all electric vehicles, seven of which exceed 100 MPGe*. It is also noteworthy that by the 2013 model year, the vehicles that achieved a combined average of 40 MPG or more represent a wide variety of size classes including midsize and large sedans as well as station wagons and an SUV.

Models Offered with EPA Combined Rating of 40 MPG or More for Model Years 2009, 2011, and 2013



* MPGe – Miles per Gallon equivalent is a unit used by the EPA for electric vehicles to make their efficiency ratings directly comparable to gasoline-powered vehicles. The conversion rate used by the EPA is 33.705 kW-hrs of electricity equals the energy contained in one gallon of gasoline.

Supporting Information

Models Offered with EPA Combined Rating of 40 MPG or More for Model Years 2009, 2011, and 2013

Make/Model	2009		2011		2013	
	Combined MPG or MPG(e)	Class	Combined MPG or MPG(e)	Class	Combined MPG or MPG(e)	Class
BMW Active E			102	Subcompact		
Toyota Prius	46	Midsize	50	Midsize	50	Midsize
Honda Civic Hybrid	42	Compact	41	Compact	44	Compact
Nissan Leaf			99	Midsize	115	Midsize
Chevrolet Volt			60**	Compact	62**	Compact
smart fortwo electric drive coupe			87	Two-seater	107	Two-seater
smart fortwo electric drive convertible			87	Two-seater	107	Two-seater
Lexus CT 200h			42	Compact	42	Compact
Honda Insight			41	Compact	42	Compact
Scion iQ EV					121	Minicompact
Honda Fit EV					118	Small Station Wagon
Fiat 500e					116	Minicompact
Mitsubishi i-MiEV					112	Subcompact
Ford Focus					105	Compact
Tesla Model S (40 kW-hr battery pack					94	Large
Tesla Model S (60 kW-hr battery pack)					95	Large
Tesla Model S (85 kW-hr battery pack)					89	Large
Toyota RAV4 EV					76	Small SUV
CODA					73	Subcompact
Toyota Prius c					80	Compact
Toyota Prius v					42	Midsize Station Wagon
Toyota Prius Plug-in Hybrid					58**	Midsize
Ford Fusion Hybrid					44	Midsize
Ford Fusion Energi					58**	Midsize
Lincoln MKZ Hybrid					45	Midsize

Volkswagen Jetta Hybrid					45	Compact
Ford C-MAX Hybrid					43	Large
Ford C-MAX Energi					58**	Midsize
Toyota Camry Hybrid					40	Midsize
Lexus ES 300h					40	Midsize
Toyota Avalon Hybrid					40	Midsize
MODELS OFFERED	2		9		30	

**For plug-in hybrid electric vehicles, the EPA's blended gasoline and electric combined average is used.

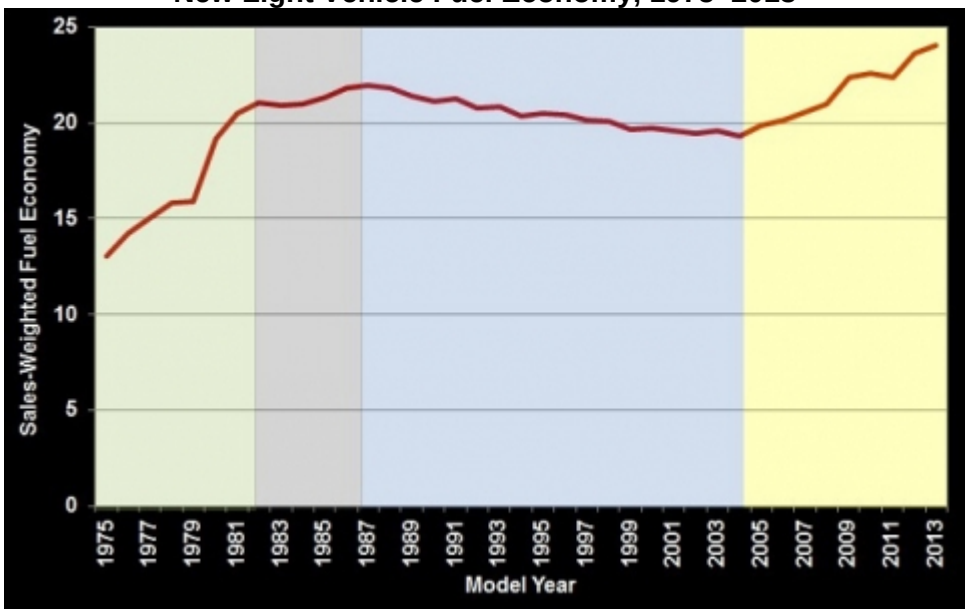
Source:
U.S. Department of Energy and U.S. Environmental Protection Agency, Fueleconomy.gov website accessed on November 13, 2013.

Fact #813: January 20, 2014

New Light Vehicle Fuel Economy Continues to Rise

The sales-weighted fuel economy average of all light vehicles sold in model year (MY) 2013 was 1.6 miles per gallon (mpg) higher than MY 2011. This increase brings the new light vehicle fuel economy average to 24 mpg for the first time since the Environmental Protection Agency (EPA) began recording new vehicle fuel economy data in 1975. According to the EPA, fuel economy has moved through four phases over the years.

New Light Vehicle Fuel Economy, 1975–2013



Supporting Information

New Light Vehicle Fuel Economy, 1975–2013

Model Year	Miles per Gallon
1975	13.1
1976	14.2
1977	15.1
1978	15.8
1979	15.9
1980	19.2
1981	20.5
1982	21.1
1983	21.0
1984	21.0
1985	21.3
1986	21.8
1987	22.0
1988	21.9
1989	21.4
1990	21.2
1991	21.2
1992	20.8
1993	20.9
1994	20.4
1995	20.5
1996	20.4
1997	20.1
1998	20.1
1999	19.7
2000	19.8
2001	19.6
2002	19.4
2003	19.6
2004	19.3
2005	19.9

2006	20.1
2007	20.6
2008	21.0
2009	22.4
2010	22.6
2011	22.4
2012	23.6
2013	24.0

Note: Fuel economy data are sales-weighted EPA adjusted values.

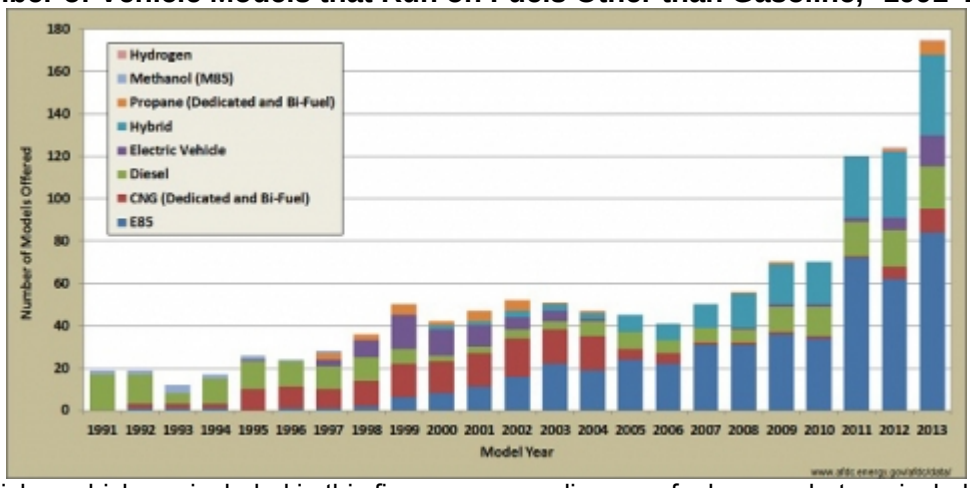
Source:
U.S. EPA, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2013*.

Fact #814: January 27, 2014

More Choices when Buying Vehicles that Use Advanced Technology and Alternative Fuels

The number of models and types of alternative fuel vehicles produced by manufacturers has varied considerably over the last 22 years. In 1991, there were a total of 19 models available that did not run on gasoline, 17 of which were diesel. In 2011 the number of models began to surge, rising to 175 models by 2013 and representing seven different fuel types. It is interesting to note that there were a number of both electric and compressed natural gas (CNG) models in the late 1990s to early 2000s and they all but disappeared by 2007. Both have been making a comeback. Many of the early electric and CNG models were only available to fleets and not for sale to the general public. Hybrids and E85 (85% ethanol, 15% gasoline) flex-fuel vehicles accounted for the majority of new models available since 2010, although diesel and propane models contributed as well.

Number of Vehicle Models that Run on Fuels Other than Gasoline,* 1991–2013



*Hybrid vehicles, which are included in this figure, use gasoline as a fuel source but are included as a type of advanced technology vehicle.

Note: Electric vehicles include plug-in hybrid-electric vehicles, but do not include Neighborhood Electric Vehicles, Low Speed Electric Vehicles, or two-wheeled electric vehicles. Only full-sized vehicles sold in the U.S. and capable of 60 mph are counted.

Supporting Information

Number of Vehicle Models that Run on Fuels Other than Gasoline,* 1991–2013

Model Year	E85	CNG (Dedicated and Bi-Fuel)	Diesel	Electric Vehicle	Hybrid	Propane (Dedicated and Bi-Fuel)	Hydrogen	Methanol (M85)	Total
1991	0	0	17	0	0	0	-	2	19
1992	1	2	14	0	0	0	-	2	19
1993	1	2	5	0	0	0	-	4	12
1994	1	2	12	0	0	0	-	2	17
1995	0	10	13	1	0	0	-	2	26
1996	1	10	12	0	0	0	-	1	24
1997	1	9	11	3	0	3	-	1	28
1998	2	12	11	8	0	3	-	-	36
1999	6	16	7	16	0	5	-	-	50
2000	8	15	3	12	2	2	-	-	42
2001	11	16	3	10	2	5	-	-	47
2002	16	18	4	6	3	5	-	-	52
2003	22	16	4	5	3	1	-	-	51
2004	19	16	7	1	3	1	-	-	47
2005	24	5	8	0	8	0	-	-	45
2006	22	5	6	0	8	0	-	-	41
2007	31	1	7	0	11	0	-	-	50
2008	31	1	6	1	16	1	-	-	56
2009	36	1	12	1	19	1	-	-	70
2010	34	1	14	1	20	0	0	-	70
2011	72	1	16	2	29	0	0	-	120
2012	62	6	17	6	31	1	1	-	124
2013	84	11	20	15	38	6	1	-	175

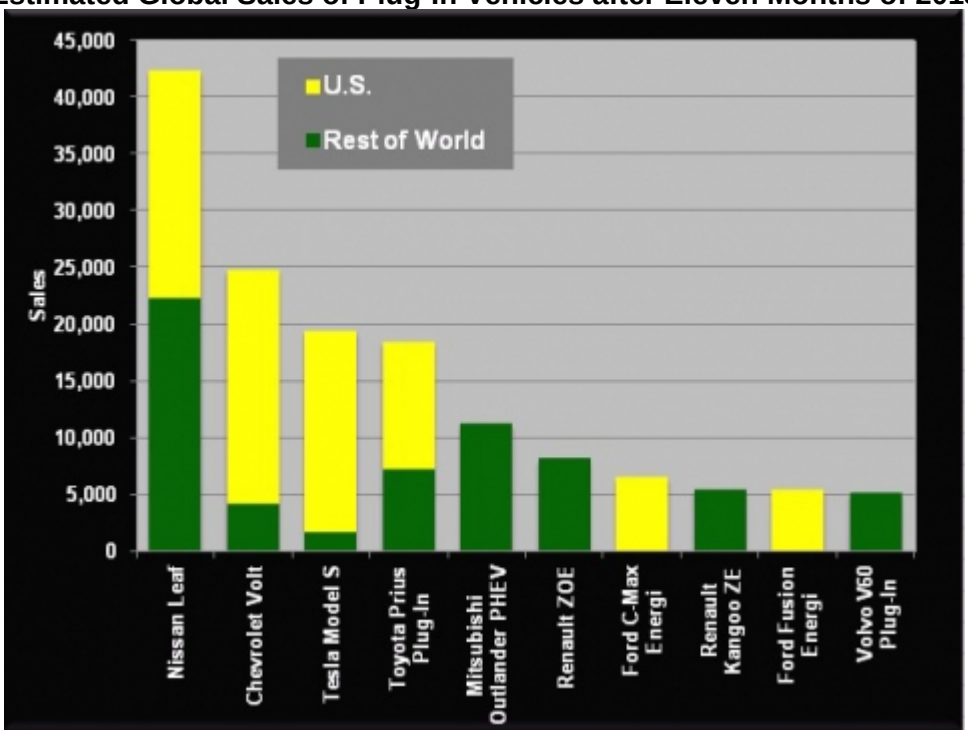
Source:
U.S. Department of Energy, Alternative Fuels Data Center.

Fact #815: February 3, 2014

Global Sales of Top 10 Plug-In Vehicles

Global sales are important in the context of new automotive technologies because each vehicle sold, regardless of the market, provides the automakers with data and experience necessary for adapting their vehicle technologies to a wide range of real-world conditions. In the first 11 months of 2013, the Nissan Leaf had by far the highest sales of all plug-In vehicles, topping 40,000. The Chevrolet Volt had the second highest sales overall and led among plug-in hybrid vehicles with sales of about 25,000. As a proportion of sales, the Nissan Leaf and Toyota Prius Plug-in hybrid had the most even distribution of sales inside and outside of the United States. Four of the plug-in vehicles shown are not sold in the United States, and two are sold only in the United States.

Estimated Global Sales of Plug-In Vehicles after Eleven Months of 2013



Supporting Information

Estimated Global and U.S. Sales after Eleven Months of 2013

Plug-In Electric Vehicle Model	U.S.	Rest of World	Total
Nissan Leaf	20,081	22,285	42,366
Chevrolet Volt	20,702	4,083	24,785
Tesla Model S	17,700	1,683	19,383
Toyota Prius Plug-In	11,169	7,197	18,366
Mitsubishi Outlander PHEV	0	11,216	11,216
Renault ZOE	0	8,148	8,148
Ford C-Max Energi	6,470	0	6,470
Renault Kangoo ZE	0	5,419	5,419
Ford Fusion Energi	5,369	0	5,369
Volvo V60 Plug-In	0	5,066	5,066

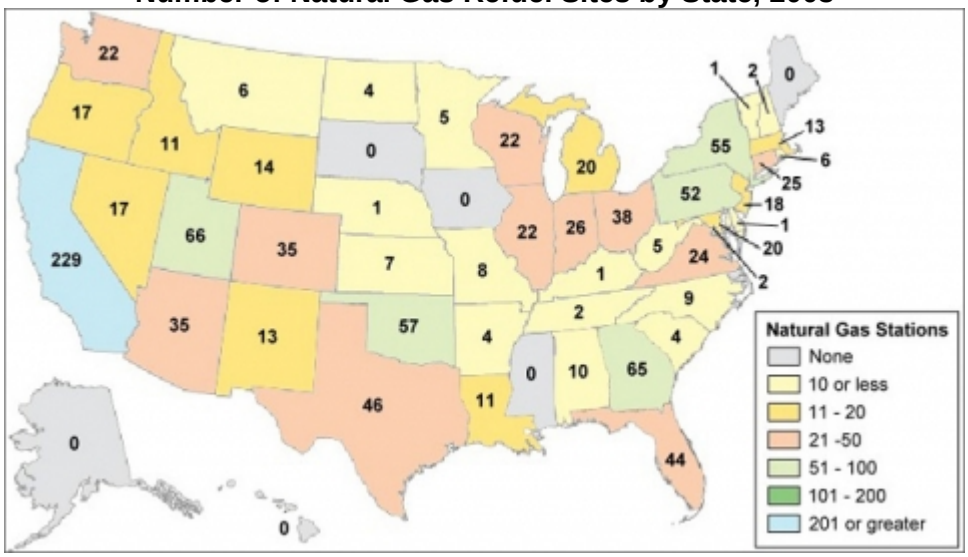
Sources:
Global Sales: *Inside EVs* "Global Sales of Top 10 Plug-Ins Already Above 20,000 Units a Month," accessed January 15, 2014.
U.S. Sales: U.S. Department of Energy, *Visualizing Electric Vehicle Sales*, accessed January 29, 2014.

Fact #816: February 10, 2014

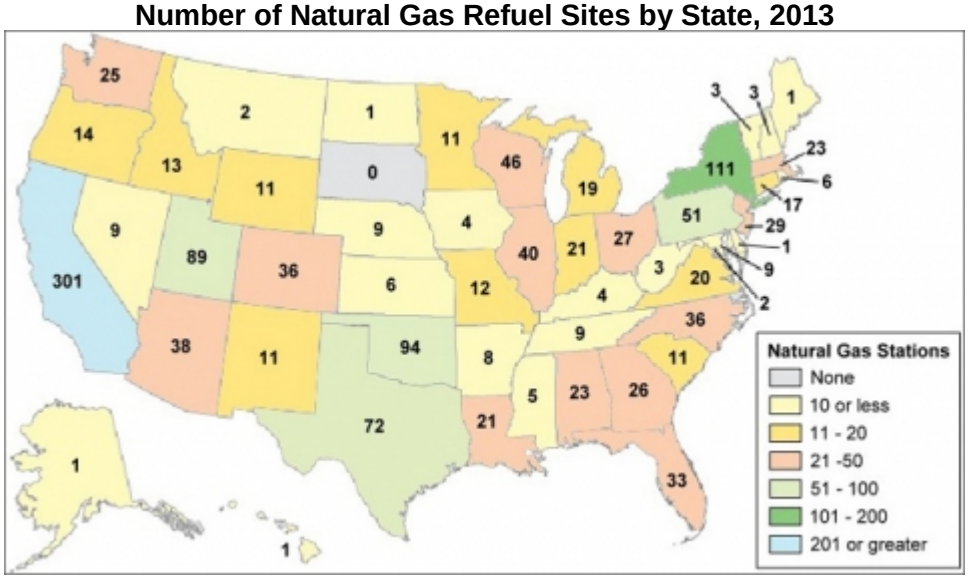
Natural Gas Refueling Stations Grow Over the Last Ten Years

In 2003 there were 1,097 natural gas refueling stations nationwide. By 2013, that number increased by about 25% to a total of 1,374 natural gas refueling stations. In 2003, there were six states without any natural gas refueling stations. By 2013, South Dakota was the only state without a natural gas refueling station. In 2013 California had by far the most natural gas stations with 301, followed by New York with 111 stations.

Number of Natural Gas Refuel Sites by State, 2003



Number of Natural Gas Refuel Sites by State, 2013



Supporting Information

Number of Natural Gas Refuel Sites by State, 2003 and 2013

State	2003	2013
Alabama	10	23
Alaska	0	1
Arizona	35	38
Arkansas	4	8
California	229	301
Colorado	35	36
Connecticut	25	17
Delaware	3	1
District of Columbia	2	2
Florida	44	33
Georgia	65	26
Hawaii	0	1
Idaho	11	13
Illinois	22	40

Indiana	26	21
Iowa	0	4
Kansas	7	6
Kentucky	1	4
Louisiana	11	21
Maine	0	1
Maryland	20	9
Massachusetts	13	23
Michigan	20	19
Minnesota	5	11
Mississippi	0	5
Missouri	8	12
Montana	6	2
Nebraska	1	9
Nevada	17	9
New Hampshire	2	3
New Jersey	18	29
New Mexico	13	11
New York	55	111
North Carolina	9	36
North Dakota	4	1
Ohio	38	27
Oklahoma	57	94
Oregon	17	14
Pennsylvania	52	51
Rhode Island	6	6
South Carolina	4	11

South Dakota	0	0
Tennessee	2	9
Texas	46	72
Utah	66	95
Vermont	1	3
Virginia	24	20
Washington	22	25
West Virginia	5	3
Wisconsin	22	46
Wyoming	14	11
TOTAL	1,097	1,374

Sources:
U.S. Department of Energy, Alternative Fuels Data Center website, accessed Jan. 15, 2014.
Transportation Energy Data Book, Edition 24, Oak Ridge National Laboratory, 2004, Table 6.4.

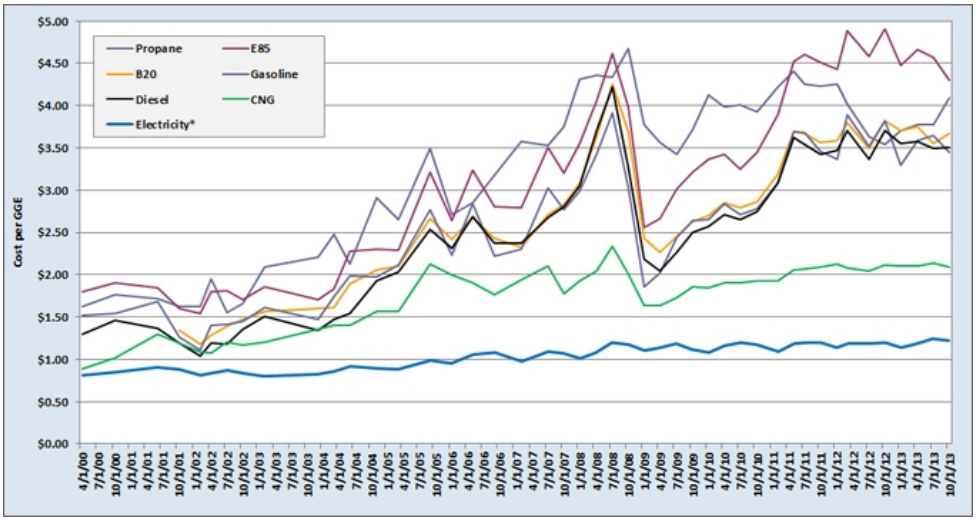
Fact #817: February 17, 2014

Conventional and Alternative Fuel Price Trends from 2000 to 2013

Retail prices for most transportation fuels have been highly volatile over the past 13 years. The figure below shows quarterly price fluctuations for select fuel types from 2000 to 2013. Gasoline, diesel, propane, E85 (85% ethanol and 15% gasoline), and B20 (20% biodiesel and 80% petroleum diesel) all experienced significant fluctuations in price during the entire 13-year period. Compressed natural gas (CNG) and electricity were the notable exceptions. Though CNG experienced large price fluctuations between 2005 and 2009 it was generally more stable than the other fuel types. Residential electricity prices were by far the most stable. The overall price for residential electricity increased by 51% during the 13-year period while the price for gasoline and diesel rose by 127% and 172% respectively.

The prices are displayed in gasoline-gallon equivalents (GGE) which equate the energy content of any motor fuel to that of a gallon of gasoline. The prices are collected in gallons (except for CNG) and are translated to GGE's using conversion factors.

Quarterly Retail Fuel Price Trends, 2000 to 2013



*According to the U.S. Department of Energy's Alternative Fuels Data Center, electricity prices are reduced by a factor of 3.4 because electric motors are approximately 3.4 times as efficient as internal combustion engines. Efficiency adjustments were not made for other fuels because they are much smaller and inconsistent.

Supporting Information

Quarterly Retail Fuel Price Trends, 2000 to 2013
(All prices in gasoline-gallon equivalents, or GGE)

Survey Start Date	Gasoline	E85	CNG	Propane	Diesel	B20	Electricity*
4/10/2000	$1.52	$1.80	$0.89	$1.62	$1.29	Not available	$0.81
10/9/2000	$1.54	$1.90	$1.02	$1.76	$1.46	Not available	$0.84
6/4/2001	$1.68	$1.85	$1.30	$1.72	$1.37	Not available	$0.90
10/22/2001	$1.27	$1.60	$1.19	$1.62	$1.19	$1.35	$0.88
2/11/2002	$1.11	$1.54	$1.09	$1.62	$1.04	$1.18	$0.81
4/15/2002	$1.40	$1.80	$1.07	$1.95	$1.19	$1.28	$0.83
7/22/2002	$1.41	$1.81	$1.20	$1.55	$1.18	$1.39	$0.87
10/28/2002	$1.44	$1.71	$1.17	$1.66	$1.35	$1.47	$0.84
2/10/2003	$1.61	$1.86	$1.20	$2.09	$1.50	$1.57	$0.79
12/8/2003	$1.48	$1.70	$1.35	$2.21	$1.34	$1.60	$0.82
3/8/2004	$1.74	$1.84	$1.40	$2.48	$1.47	$1.61	$0.85
6/14/2004	$1.99	$2.28	$1.40	$2.13	$1.55	$1.89	$0.92
11/15/2004	$1.97	$2.30	$1.56	$2.91	$1.93	$2.05	$0.89
3/21/2005	$2.11	$2.29	$1.56	$2.65	$2.03	$2.11	$0.88
9/1/2005	$2.77	$3.21	$2.12	$3.50	$2.54	$2.67	$0.98
1/1/2006	$2.23	$2.65	$1.99	$2.71	$2.32	$2.42	$0.95
5/24/2006	$2.84	$3.24	$1.90	$2.85	$2.69	$2.68	$1.05
9/4/2006	$2.22	$2.81	$1.77	$3.18	$2.37	$2.43	$1.08
2/21/2007	$2.30	$2.79	$1.94	$3.58	$2.37	$2.32	$0.98
7/3/2007	$3.03	$3.50	$2.10	$3.53	$2.67	$2.71	$1.10

10/2/2007	$2.76	$3.20	$1.77	$3.75	$2.81	$2.82	$1.07
1/1/2008	$2.99	$3.55	$1.93	$4.31	$3.05	$3.08	$1.01
4/1/2008	$3.43	$4.06	$2.04	$4.36	$3.71	$3.63	$1.08
7/1/2008	$3.91	$4.62	$2.34	$4.34	$4.22	$4.25	$1.19
10/1/2008	$3.04	$3.99	$2.01	$4.67	$3.27	$3.69	$1.17
1/30/2009	$1.86	$2.56	$1.63	$3.77	$2.19	$2.43	$1.11
4/15/2009	$2.02	$2.66	$1.64	$3.56	$2.04	$2.27	$1.14
7/31/2009	$2.44	$3.01	$1.73	$3.43	$2.27	$2.45	$1.19
10/26/2009	$2.64	$3.21	$1.86	$3.72	$2.50	$2.63	$1.12
1/29/2010	$2.65	$3.36	$1.85	$4.13	$2.57	$2.70	$1.08
4/12/2010	$2.84	$3.42	$1.90	$3.99	$2.71	$2.85	$1.16
7/23/2010	$2.71	$3.25	$1.91	$4.01	$2.65	$2.79	$1.19
10/14/2010	$2.78	$3.45	$1.93	$3.93	$2.75	$2.86	$1.18
2/7/2011	$3.08	$3.89	$1.93	$4.22	$3.09	$3.19	$1.10
5/15/2011	$3.69	$4.52	$2.06	$4.41	$3.62	$3.69	$1.18
7/14/2011	$3.68	$4.60	$2.07	$4.26	$3.54	$3.67	$1.20
10/14/2011	$3.46	$4.51	$2.09	$4.23	$3.42	$3.57	$1.20
1/27/2012	$3.37	$4.43	$2.13	$4.25	$3.47	$3.59	$1.14
3/30/2012	$3.89	$4.89	$2.08	$4.02	$3.71	$3.80	$1.18
7/13/2012	$3.52	$4.58	$2.05	$3.64	$3.36	$3.50	$1.19
10/12/2012	$3.82	$4.91	$2.12	$3.54	$3.70	$3.82	$1.19
1/15/2013	$3.29	$4.48	$2.10	$3.70	$3.55	$3.70	$1.14
4/12/2013	$3.59	$4.66	$2.10	$3.77	$3.58	$3.75	$1.18

7/13/2013	$3.65	$4.57	$2.14	$3.77	$3.50	$3.55	$1.25
10/4/2013	$3.45	$4.30	$2.09	$4.09	$3.51	$3.67	$1.22

* According to the U.S. Department of Energy's Alternative Fuels Data Center, electricity prices are reduced by a factor of 3.4 because electric motors are approximately 3.4 times as efficient as internal combustion engines. Efficiency adjustments were not made for other fuels because they are much smaller and inconsistent.

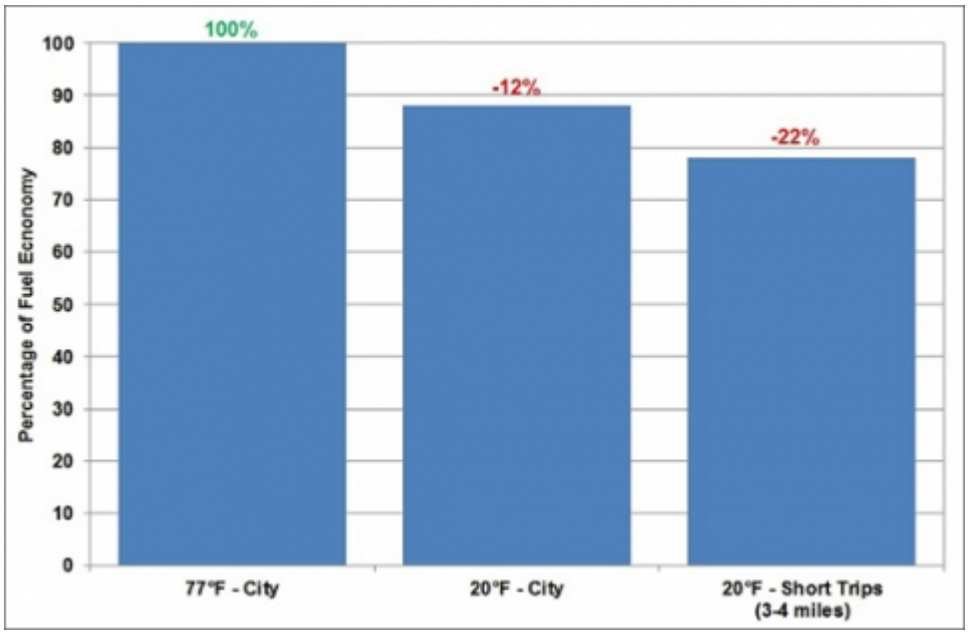
Source:
U.S. Department of Energy, Alternative Fuels Data Center.

Fact #818: April 21, 2014

The Effect of Winter Weather on Fuel Economy

Winter driving conditions and cold temperatures can have a significant effect on a vehicle's fuel economy. For a conventional gasoline-powered vehicle, fuel economy at 20°F is about 12% lower than at 77°F for short-trip city driving. For very short trips of just 3 to 4 miles, fuel economy can drop by as much as 22%. For more information on the effects of winter conditions on fuel economy, visit www.fueleconomy.gov/feg/coldweather.shtml.

Fuel Economy at 77°F and 20°F in City Driving for a Conventional Gasoline Vehicle



Supporting Information

Fuel Economy of a Conventional Vehicle at 77°F and 20°F in City Driving

77°F - City	20°F - City	20°F - Short Trips (3-4 miles)
100%	88%	78%

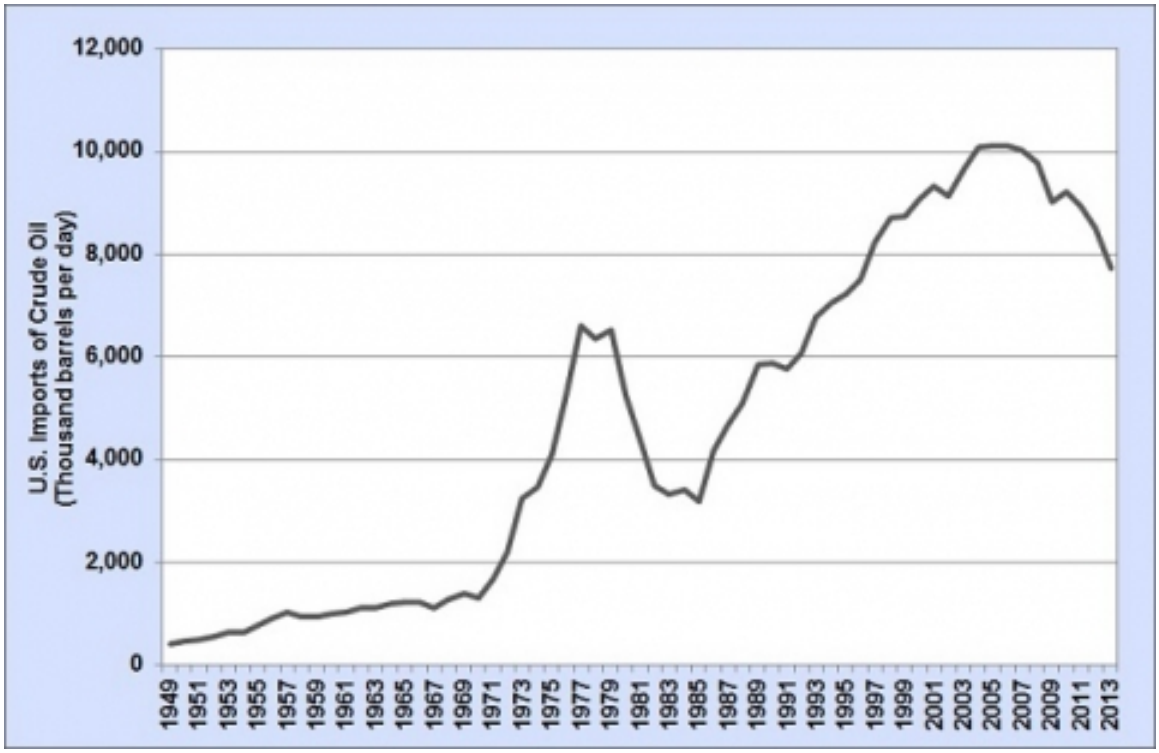
Source:
The U.S. Department of Energy and U.S. Environmental Protection Agency's Fuel Economy Website

Fact #819: April 28, 2014

Imports of Crude Oil Declining

Imports of crude oil to the U.S. were on an upward trend for about 20 years. During this period, imports increased from 3.2 million barrels per day in 1986 to 10.1 million barrels per day in 2006. Since 2006, this trend has reversed, with imports of crude oil declining to 7.7 million barrels per day by 2013.

U.S. Imports of Crude Oil, 1980-2013



Supporting Information

U.S. Imports of Crude Oil, 1980–2013

YEAR	MILLION BARRELS PER DAY
1980	5.3
1981	4.4
1982	3.5
1983	3.3
1984	3.4
1985	3.2
1986	4.2
1987	4.7
1988	5.1
1989	5.8
1990	5.9
1991	5.8
1992	6.1
1993	6.8
1994	7.1
1995	7.2
1996	7.5
1997	8.2
1998	8.7
1999	8.7
2000	9.1
2001	9.3
2002	9.1

YEAR	MILLION BARRELS PER DAY
2003	9.7
2004	10.1
2005	10.1
2006	10.1
2007	10.0
2008	9.8
2009	9.0
2010	9.2
2011	8.9
2012	8.5
2013	7.7

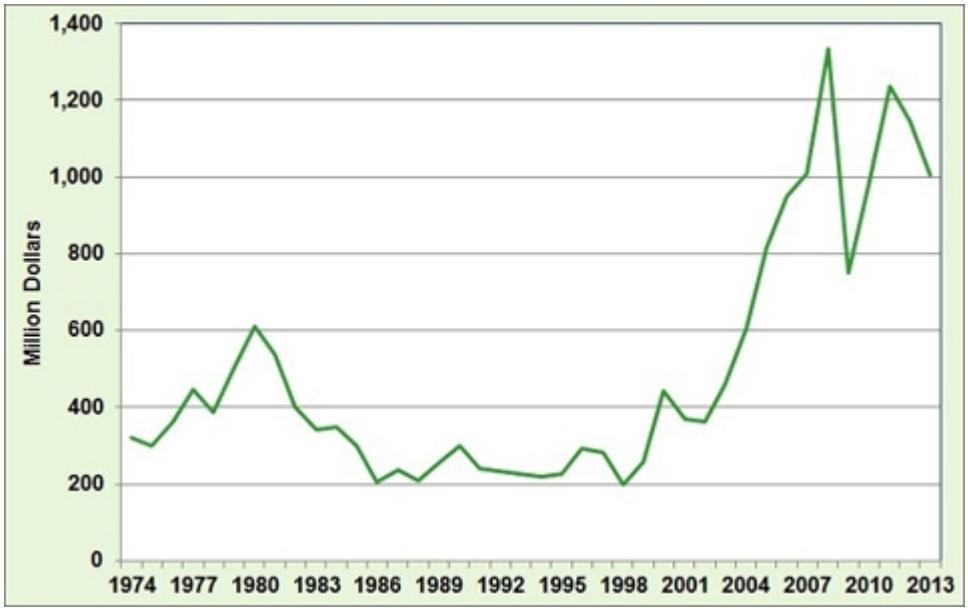
Source:
U.S. Energy Information Administration, *Monthly Energy Review*, January 2014, Table 3.3b. Website accessed Feb 12, 2014.

Fact #820: May 5, 2014

Dollars Spent on Imported Petroleum

Over the last three decades, the amount of money the U.S. spent on imported petroleum varied widely. In 1988 and 1998, about $200 million per day was spent on imported petroleum, but in 2008 it was more than $1,300 million per day. In 2009 lower demand and a collapse in oil prices caused the expenditures to fall to about $750 million per day. Since that time the spending has been closer to $1,000 million per day or more.

Dollars per Day Spent on U.S. Petroleum Imports



Supporting Information

Dollars per Day Spent on U.S. Petroleum Imports

YEAR	2013 CONSTANT DOLLARS (MILLIONS)
1980	609
1981	538
1982	400
1983	341
1984	350
1985	299
1986	205
1987	238
1988	209
1989	256
1990	301
1991	241
1992	233
1993	225
1994	219
1995	228
1996	293
1997	283
1998	197
1999	257
2000	442
2001	370
2002	364

YEAR	2013 CONSTANT DOLLARS (MILLIONS)
2003	459
2004	606
2005	817
2006	949
2007	1,008
2008	1,334
2009	749
2010	976
2011	1,238
2012	1,144
2013	1,005

Note: Expenditures were adjusted to 2013 constant dollars using the Consumer Price Index.

Source:
U.S. Energy Information Administration, *Monthly Energy Review*, January 2014, Table 1.5.

Fact #821: May 19, 2014

Best Selling Vehicle by State, 2013

2013 Best Selling Vehicle by State

The map above shows the best-selling models by state for 2013. The Ford F-Series pickup truck, shown in blue, dominates the map. An F-150 has a combined city/highway Environmental Protection Agency (EPA) fuel economy rating of 13 to 19 miles per

gallon (mpg) depending on the model selected. Of the 15 states that did not have the F-Series as their top selling model, four states did have a pickup truck as the top model. Nine states had a sedan as the top selling model; of those, California's top seller, the Honda Civic, had the highest combined fuel economy range (25 to 32 mpg). Two states, Connecticut and Massachusetts, had a sport utility vehicle as the top selling model with a combined fuel economy range of 25 to 26 mpg. Overall, the Eastern third of the United States had the greatest variation for the top selling model in 2013.

Supporting Information

2013 Best Selling Vehicle by State

State	2013 Top Selling Vehicle	2013 EPA Combined Fuel Economy
Alabama	Ford F-Series	13-19 mpg
Alaska	Ford F-Series	13-19 mpg
Arizona	Ford F-Series	13-19 mpg
Arkansas	Ford F-Series	13-19 mpg
California	Honda Civic	25-32 mpg
Colorado	Ford F-Series	13-19 mpg
Connecticut	Honda CR-V	25-26 mpg
Delaware	Ford F-Series	13-19 mpg
District of Columbia	Toyota Corolla	29-30 mpg
Florida	Toyota Camry	25-28 mpg
Georgia	Ford F-Series	13-19 mpg
Hawaii	Toyota Tacoma	17-23 mpg
Idaho	Ford F-Series	13-19 mpg
Illinois	Ford F-Series	13-19 mpg
Indiana	Chevy Silverado	14-18 mpg
Iowa	Ford F-Series	13-19 mpg

Kansas	Ford F-Series	13-19 mpg
Kentucky	Ford F-Series	13-19 mpg
Louisiana	Ford F-Series	13-19 mpg
Maine	Chevy Silverado	14-18 mpg
Maryland	Toyota Camry	25-28 mpg
Massachusetts	Honda CR-V	25-26 mpg
Michigan	Ford Fusion	25-29 mpg
Minnesota	Ford F-Series	13-19 mpg
Mississippi	Ford F-Series	13-19 mpg
Missouri	Ford F-Series	13-19 mpg
Montana	Ford F-Series	13-19 mpg
Nebraska	Ford F-Series	13-19 mpg
Nevada	Ford F-Series	13-19 mpg
New Hampshire	Ford F-Series	13-19 mpg
New Jersey	Honda Accord	22-30 mpg
New Mexico	Ford F-Series	13-19 mpg
New York	Honda Accord	22-30 mpg
North Carolina	Ford F-Series	13-19 mpg
North Dakota	Ford F-Series	13-19 mpg
Ohio	Ford F-Series	13-19 mpg
Oklahoma	Nissan Altima	25-31 mpg
Oregon	Ford F-Series	13-19 mpg
Pennsylvania	Ford F-Series	13-19 mpg
Rhode Island	Honda Accord	22-30 mpg
South Carolina	Ford F-Series	13-19 mpg
South Dakota	Ford F-Series	13-19 mpg

Tennessee	Ford F-Series	13-19 mpg
Texas	Ford F-Series	13-19 mpg
Utah	Ford F-Series	13-19 mpg
Vermont	GMC Sierra	14-18 mpg
Virginia	Honda Accord	22-30 mpg
Washington	Ford F-Series	13-19 mpg
West Virginia	Ford F-Series	13-19 mpg
Wisconsin	Ford F-Series	13-19 mpg
Wyoming	Ford F-Series	13-19 mpg

Note: Combined fuel economy range shown is the lowest and highest combined mpg for each gasoline-only model configuration.

Source:

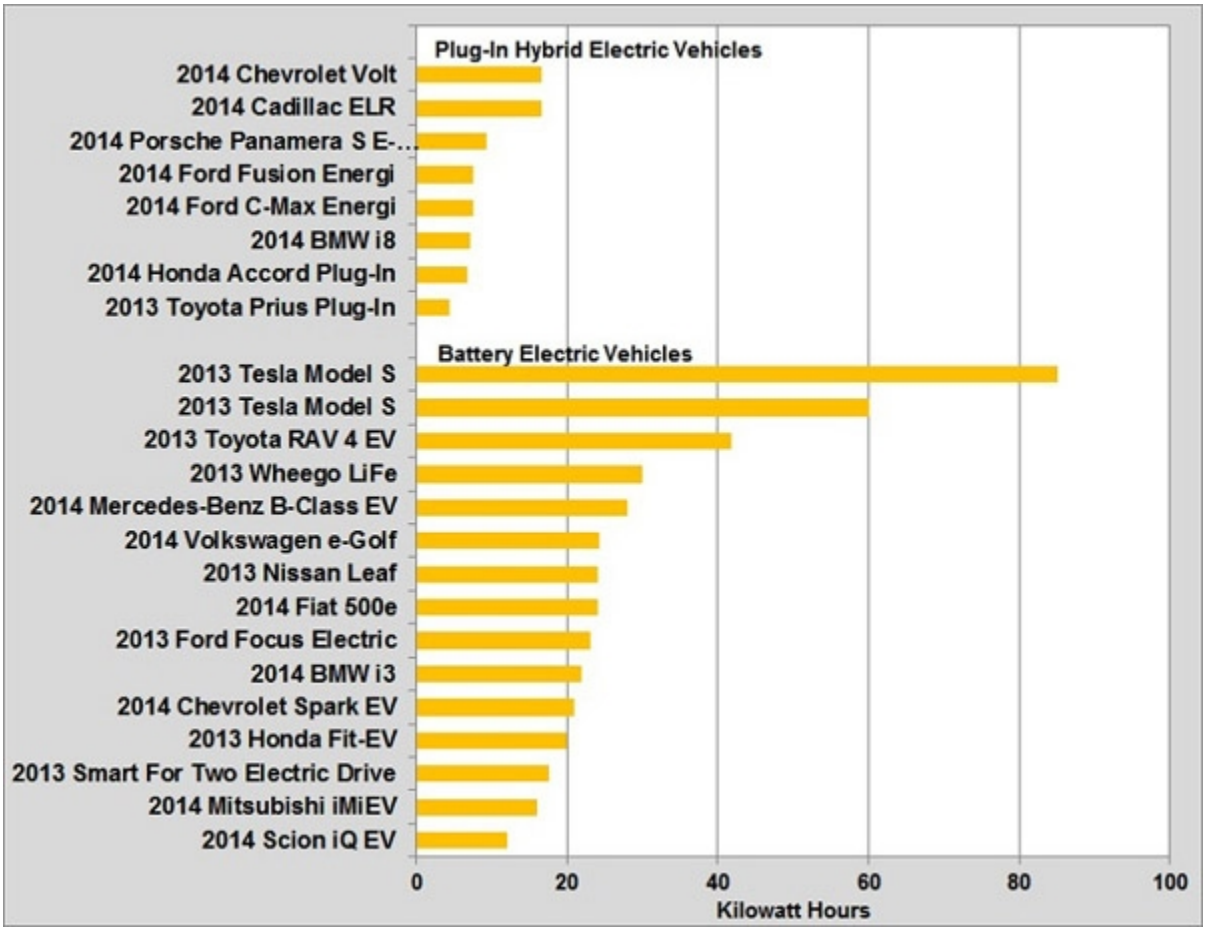
A. Davies and M. Nudelman, **Business Insider**, "The Best-Selling Car In Every State" published November 20, 2013, accessed on February 20, 2014.

Fact #822: May 26, 2014

Battery Capacity Varies Widely for Plug-In Vehicles

Battery-electric vehicles have capacities ranging from 12 kilowatt-hours (kWh) in the Scion iQ EV to 85 kWh in the Tesla Model S. Plug-in hybrid-electric vehicles typically have smaller battery capacities than battery-electric vehicles because their range is extended with a gasoline engine. All of these plug-in vehicles currently have lithium-ion batteries.

Battery Capacities for Selected Plug-in Vehicles, Model Years 2013–2014



Supporting Information

Battery Capacities for Selected Plug-in Vehicles, Model Years 2013–2014

Make and Model Year	Battery Capacity (kWh)
Plug-In Hybrid Electric Vehicles	
2014 Chevrolet Volt	16.5
2014 Cadillac ELR	16.5
2014 Porsche Panamera S E-Hybrid	9.4
2014 Ford C-Max Energi	7.6
2014 Ford Fusion Energi	7.6
2014 BMW i8	7.1
2014 Honda Accord Plug-In	6.7
2013 Toyota Prius Plug-In	4.4
Battery Electric Vehicles	
2013 Tesla Model S	85
2013 Tesla Model S	60
2013 Toyota RAV 4 EV	41.8
2013 Wheego LiFe	30
2014 Mercedes-Benz B-Class EV	28
2014 Volkswagen e-Golf	24.2
2014 Fiat 500e	24
2013 Nissan Leaf	24
2013 Ford Focus Electric	23
2014 BMW i3	22
2014 Chevrolet Spark EV	21
2013 Honda Fit-EV	20
2013 Smart For Two Electric Drive	17.6

2014 Mitsubishi iMiEV	16
2014 Scion iQ EV	12

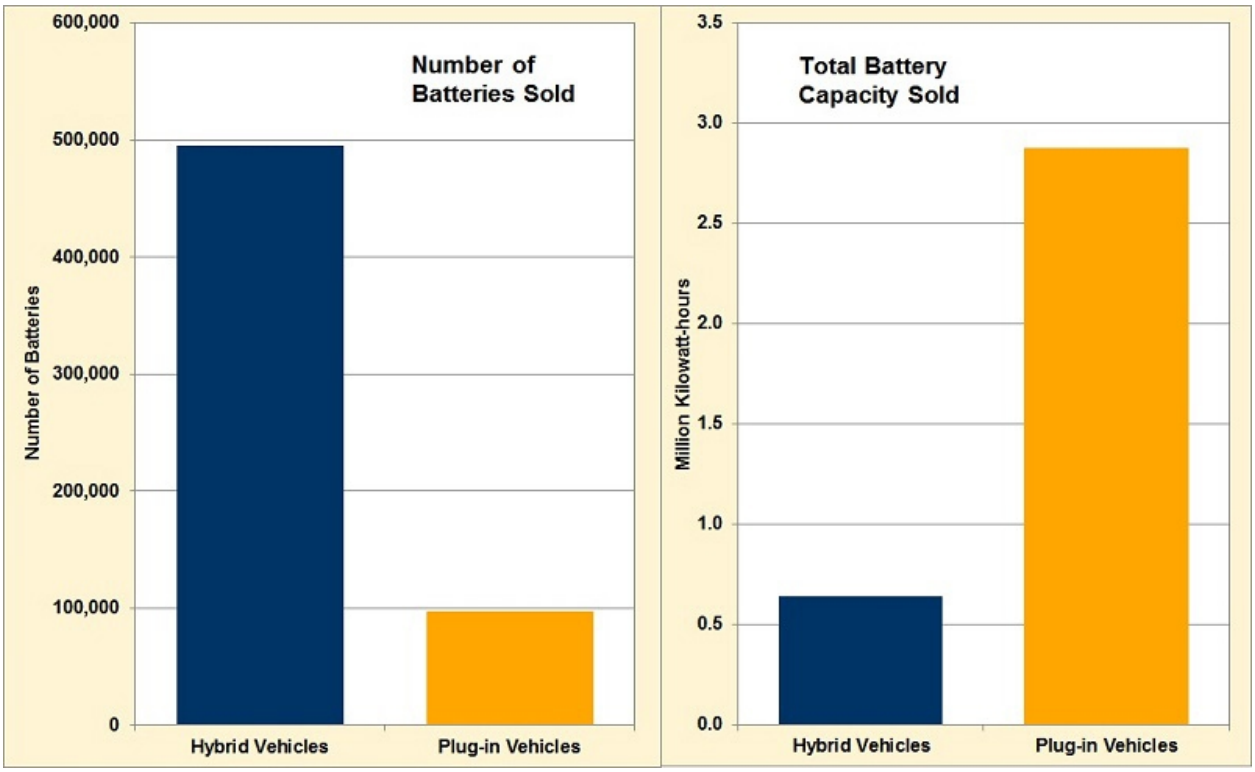
Source:
Oak Ridge National Laboratory, *2013 Vehicle Technologies Market Report*, ORNL/TM-2014/58, March 2014.

Fact #823: June 2, 2014

Hybrid Vehicles Use More Battery Packs but Plug-in Vehicles Use More Battery Capacity

Of the battery packs used for electrified vehicle powertrains in model year 2013, the greatest number went into conventional hybrid vehicles which use battery packs that average about 1.3 kilowatt-hours (kWh). However, far greater battery capacity was installed in plug-in vehicles. Although plug-in vehicles sell in much lower volume, their battery packs are much larger with capacities as high as 85 kWh – a battery offering for the Tesla Model S.

Number of Batteries Sold and Battery Capacity Sold for Model Year 2013



Sources:
Estimated using hybrid and plug-in sales data along with information on battery suppliers. Vehicle Sales Data – Provided by Yan (Joann) Zhou, Argonne National Laboratory.

Supporting Information

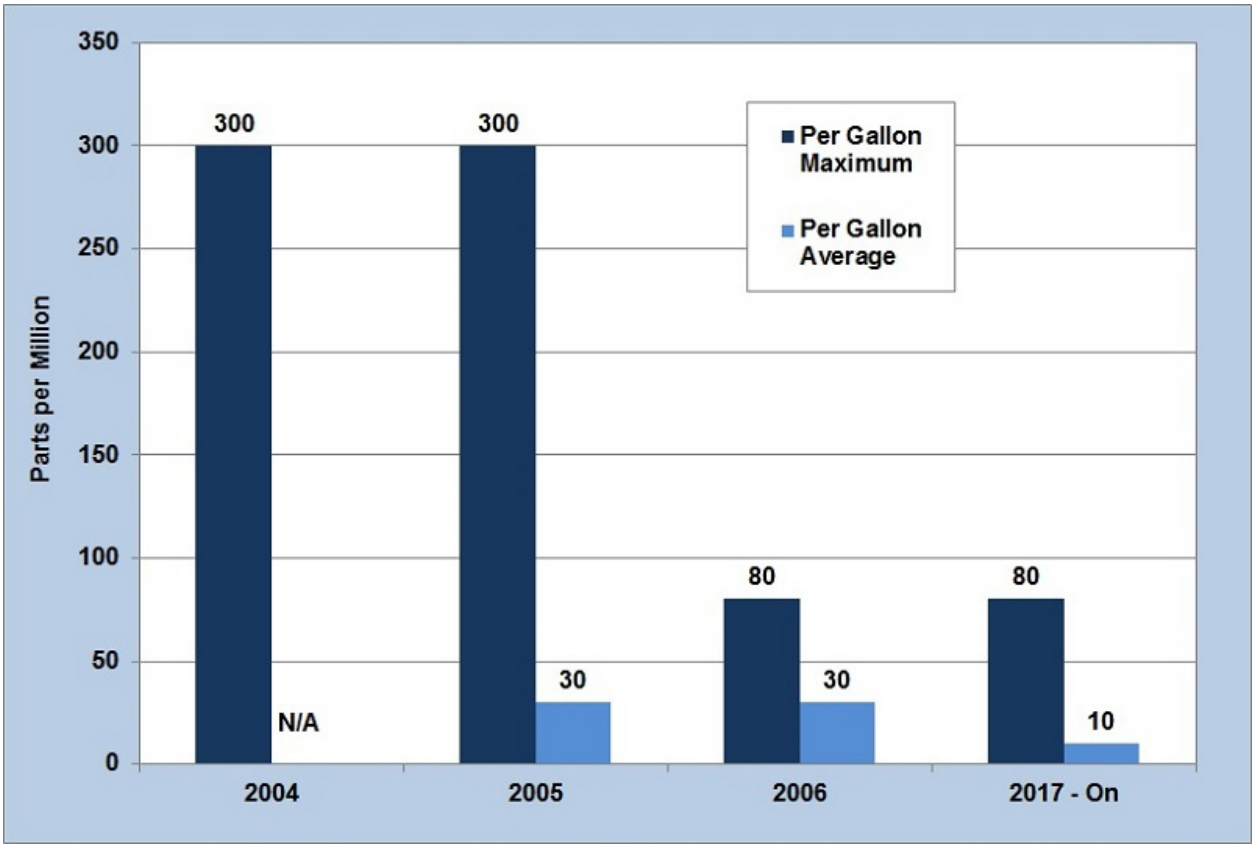
Number of Batteries Sold	
Hybrid Vehicles	Plug-in Vehicles
495,502	97,102
Total Battery Capacity Sold (Million Kilowatt-hours)	
Hybrid Vehicles	Plug-in Vehicles
0.640	2.875

Fact #824: June 9, 2014

EPA Sulfur Standards for Gasoline

Sulfur naturally occurs in gasoline and diesel fuel, contributing to pollution when the fuel is burned. Beginning in 2004, standards were set on the amount of sulfur in gasoline (Tier 2 standards). Separate standards were set for different entities, such as large refiners, small refiners, importers, downstream wholesalers, etc. In March 2014, Tier 3 standards were finalized by the Environmental Protection Agency (EPA). Tier 3 standards take effect in 2017. Large refinery standards are shown below, both the maximum and average per gallon. See the Environmental Protection Agency website for additional details on sulfur standards.

EPA Gasoline Sulfur Standards, 2004–On



Note: N/A = not applicable.

Supporting Information

EPA Gasoline Sulfur Standards, 2004–On

	Sulfur Standards (Parts per Million)			
	2004	**2005**	**2006**	**2017-on**
Per Gallon Maximum	300	300	80	80
Per Gallon Average	N/A	30	30	10

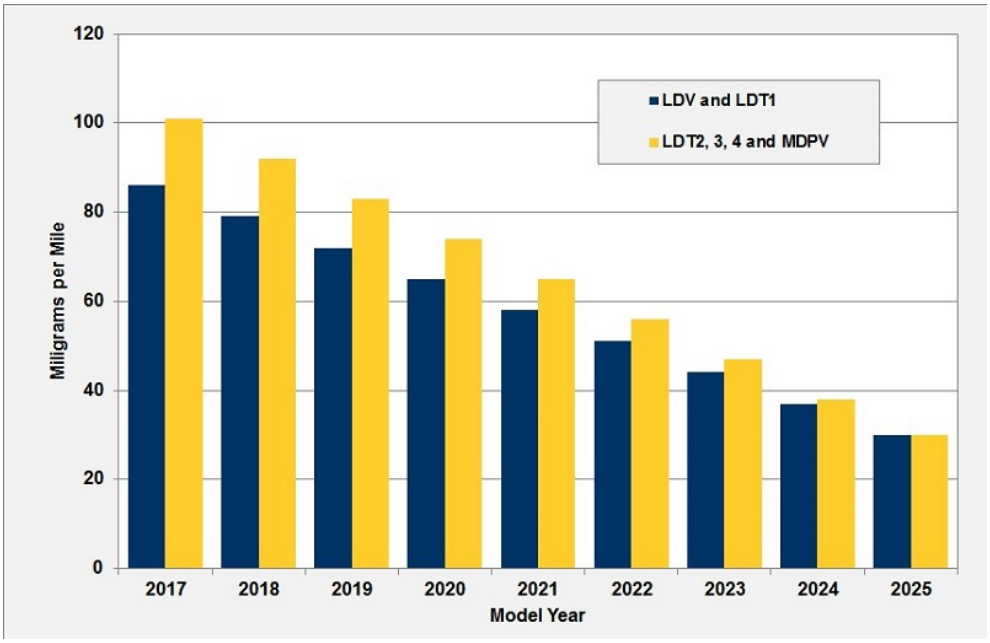
Sources:
U.S. Environmental Protection Agency Tier 2 Vehicle and Gasoline Sulfur Program and Tier 3 Vehicle Emission and Fuel Standards Program

Fact #825: June 16, 2014

Tier 3 Non-Methane Organic Gases plus Nitrogen Oxide Emission Standards, Model Years 2017-2025

The Environmental Protection Agency finalized Tier 3 emission standards in a rule issued in March 2014. One effect of the rule is a decrease in the combined amount of non-methane organic gases (NMOG) and nitrogen oxides (NOx) that new light vehicles with gasoline engines are allowed to produce for model years 2017 to 2025. These standards apply to a corporate average, meaning that some vehicles produced in those model years will emit more than the standard, while others will emit less, so long as the average for each Original Equipment Manufacturer (OEM) product offerings meets the standard.

Tier 3 NMOG+NOx Emission Standards, Model Years 2017–2025



Notes: Standards shown are for the Federal Test Procedure. Different standards apply to the Supplemental Federal Test Procedure. For vehicles over 6,000 lbs. gross vehicle weight rating (GVWR), the standards apply beginning in MY 2018.
LDV = Light-duty vehicles.
LDT1 = Light trucks less than 6,000 lbs. GVWR and less than 3,750 lbs. loaded vehicle weight (LVW).
LDT2, 3, 4 = Light trucks less than 8,500 lbs. GVWR and more than 3, 750 lbs. LVW.
MDPV = Medium-duty passenger vehicles.

Supporting Information

Tier 3 NMOG+NOx Emission Standards, MY 2017–2025
(Milligrams per Mile)

Year	LDV and LDT1	LDT2,3,4 and MDPV
2017	86	101
2018	79	92
2019	72	83
2020	65	74
2021	58	65
2022	51	56
2023	44	47
2024	37	38
2025	30	30

Note: Standards are for the Federal Test Procedure. Different standards apply for the Supplemental Federal Test Procedure.

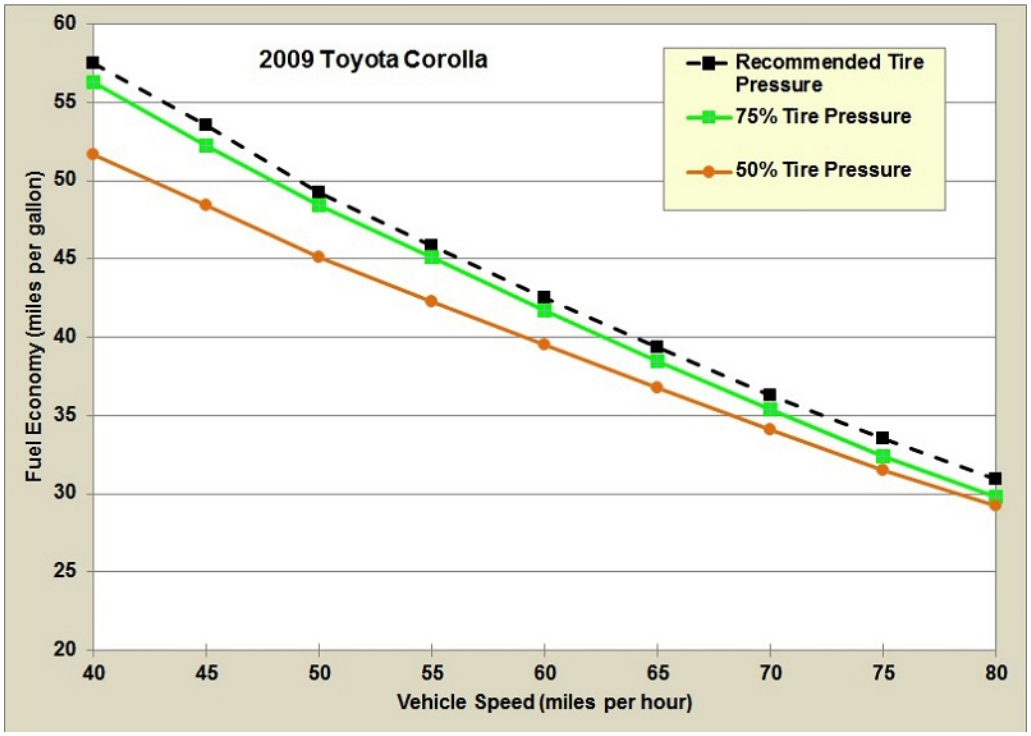
Source:
U.S. Environmental Protection Agency, Tier 3 Vehicle Emission and Fuel Standards Program.

Fact #826: June 23, 2014

The Effect of Tire Pressure on Fuel Economy

Researchers at Oak Ridge National Laboratory recently conducted a study that measured the effect of tire pressure on fuel economy at speeds ranging from 40 to 80 miles per hour. The figure below shows the results of a 2009 Toyota Corolla tested with all four tires at the recommended pressure (Black line), then at 75% of the recommended pressure (green line), and again at 50% of the recommended pressure (orange line). With all four tires at 75% of the recommended pressure, the fuel economy penalty remained fairly consistent at about 2-3% over the range of speeds. The fuel economy penalty for all four tires at 50% of the recommended pressure is more severe but the effect on fuel economy is greater at lower speeds. At 40 miles per hour, fuel economy with all four tires at 50% of their recommended pressure is about 10% lower but at 80 miles per hours it is only about 5% lower. It should be noted that underinflated tires not only waste fuel but also pose serious safety risks.

Fuel Economy by Speed for a Toyota Corolla under Various Tire Pressure Conditions



Supporting Information

Fuel Economy by Speed for a Toyota Corolla under Various Tire Pressure Conditions

Speed (miles per hour)	Recommended Tire Pressure	75% Tire Pressure	50% Tire Pressure
	Fuel Economy (miles per gallon)		
40	57.5	56.3	51.7
45	53.5	52.2	48.4
50	49.2	48.4	45.1
55	45.8	45.1	42.3
60	42.5	41.7	39.5
65	39.4	38.5	36.8
70	36.3	35.4	34.1
75	33.5	32.4	31.5
80	30.9	29.8	29.2

Note: The vehicle tests consisted of a warm-up phase to a target oil temperature, followed by a 50 mph cruise for five minutes and then operating the vehicle at steady speeds from 40 mph to 80 mph in 5 mph increments, with each speed held for at least 5.5 minutes. For additional detail on the individual tests, see the source listed below.

Source:

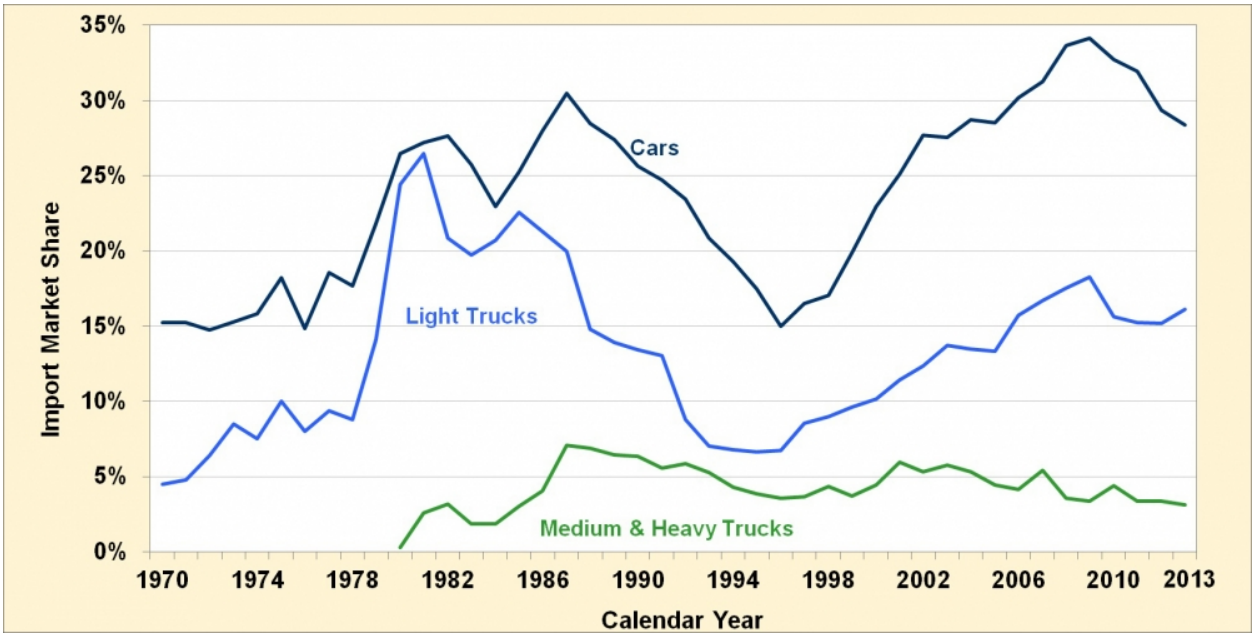
J., Huff, S., and West, B., "Fuel Economy and Emissions Effects of Low Tire Pressure, Open Windows, Roof Top and Hitch-Mounted Cargo, and Trailer," SAE International Journal of Passenger Cars -Mech. Syst. 7(2):2014, doi:10.4271/2014-01-1614.

Fact #827: June 30, 2014

Share of Import Cars Declines to Less than 30% of Car Sales in 2013

In 1970, about 15% of all cars sold were imported (built outside of North America) and about 5% of all light trucks sold were imported. These import shares grew during the 1970's and the early 1980's. Following sharp declines in the late 1980s through the mid-1990s, import shares of both cars and light trucks rebounded, with import cars reaching a peak of just over 34% in 2009. Import light trucks reached their peak share in 1981 at almost 27% but accounted for just 16% in 2013. Import medium and heavy trucks have always represented a small percentage of the medium and heavy truck market totaling just 3.1% in 2013.

Import Market Share of Cars, Light Trucks, and Medium and Heavy Trucks, 1970–2013



Note: Imported vehicles include any vehicle built outside of North America regardless of manufacturer. Data for Medium and Heavy Trucks before 1980 are not available.

Supporting Information

Import Vehicle Market Share by Vehicle Type, 1970–2013

Calendar Year	Cars	Light Trucks	Medium & Heavy Trucks
1970	15.2%	4.5%	Not available
1971	15.2%	4.8%	Not available
1972	14.8%	6.4%	Not available
1973	15.3%	8.5%	Not available
1974	15.8%	7.5%	Not available
1975	18.2%	10.0%	Not available
1976	14.8%	8.0%	Not available
1977	18.5%	9.4%	Not available
1978	17.7%	8.8%	Not available
1979	21.8%	14.1%	Not available
1980	26.5%	24.4%	0.3%
1981	27.2%	26.5%	2.6%
1982	27.6%	20.9%	3.2%
1983	25.7%	19.7%	1.8%
1984	23.0%	20.7%	1.8%
1985	25.3%	22.6%	3.0%
1986	28.0%	21.3%	4.1%
1987	30.5%	20.0%	7.1%
1988	28.5%	14.8%	6.9%
1989	27.4%	13.9%	6.4%
1990	25.6%	13.5%	6.3%
1991	24.7%	13.1%	5.6%
1992	23.5%	8.8%	5.8%

1993	20.9%	7.1%	5.3%
1994	19.3%	6.8%	4.3%
1995	17.5%	6.6%	3.9%
1996	15.0%	6.7%	3.6%
1997	16.5%	8.5%	3.7%
1998	17.1%	9.0%	4.4%
1999	19.9%	9.6%	3.7%
2000	23.0%	10.2%	4.5%
2001	25.1%	11.4%	6.0%
2002	27.7%	12.4%	5.3%
2003	27.6%	13.7%	5.7%
2004	28.7%	13.5%	5.3%
2005	28.5%	13.3%	4.4%
2006	30.2%	15.7%	4.2%
2007	31.3%	16.7%	5.4%
2008	33.7%	17.6%	3.6%
2009	34.1%	18.3%	3.4%
2010	32.7%	15.6%	4.4%
2011	32.0%	15.2%	3.4%
2012	29.3%	15.2%	3.4%
2013	28.4%	16.1%	3.1%

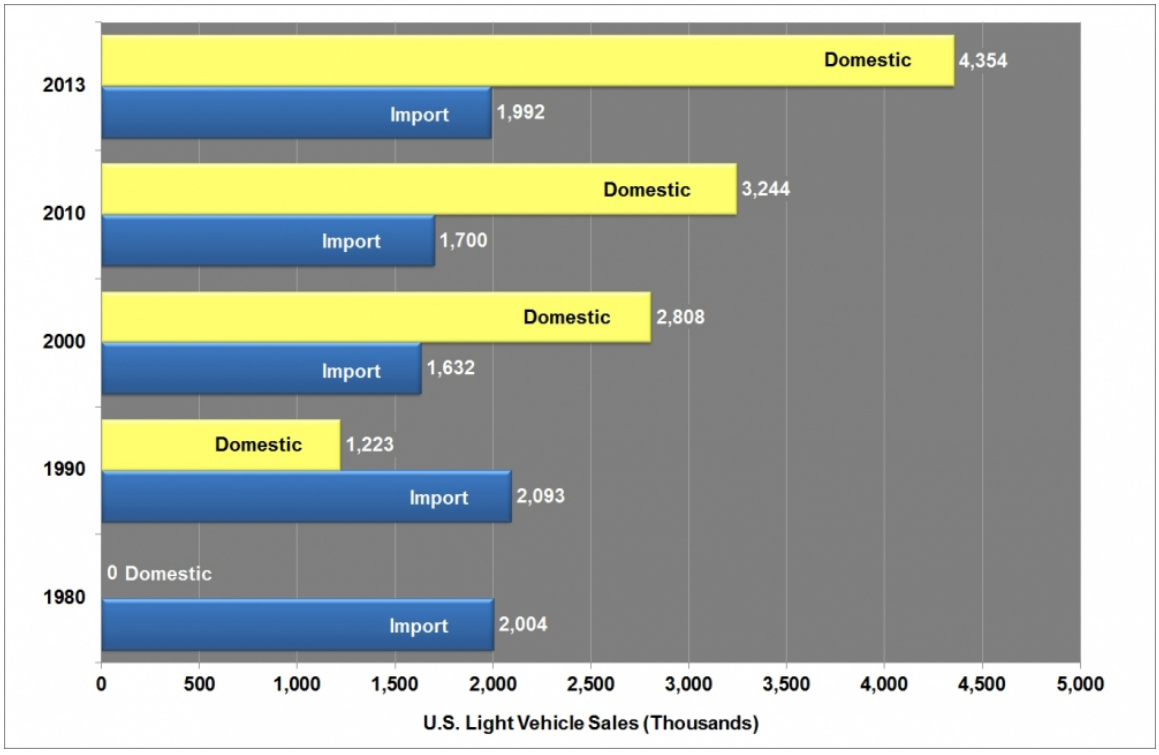
Source:
Ward's Automotive, 2014.

Fact #828: July 7, 2014

Japanese Auto Manufacturers Increase Domestic Production for U.S. Sales

In 1980, all Japanese-brand vehicles sold in the U.S. were imported. By 1990, just over one-third of Japanese-brand vehicles sold in the U.S. were produced domestically in North America which includes the U.S., Canada, and Mexico. By 2013, about 70 percent of all Japanese-brand vehicles sold in the U.S. were produced domestically. While sales of domestic Japanese-brand vehicles have grown markedly over the 33 year period shown in the figure below, import sales by Japanese manufacturers in 1980 and 2013 are about the same.

Domestic and Import U.S. Light Vehicle Sales from Japanese Manufacturers, 1980–2013



Note: Japanese manufacturers' data include Acura, Honda, Infiniti, Isuzu, Lexus, Mazda, Mitsubishi, Datsun/Nissan, Subaru, Suzuki, and Toyota.

Supporting Information

Domestic and Import U.S. Light Vehicle Sales by Japanese Manufacturers, 1980–2013

Calendar Year	Import	Domestic
	(Thousands)	
1980	2,004	0
1990	2,093	1,223
2000	1,632	2,808
2010	1,700	3,244
2013	1,992	4,354

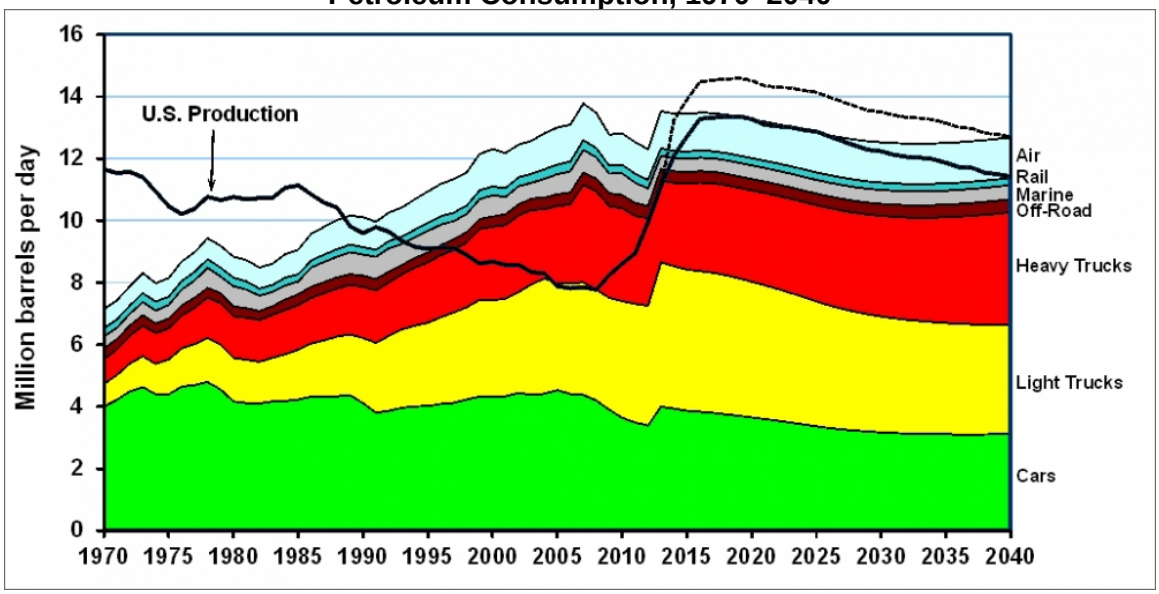
Source:
Ward's Automotive.

Fact #829: July 14, 2014

The Transportation Petroleum Gap

In 1989 petroleum consumption in the transportation sector surpassed U.S. petroleum production for the first time, creating a gap that must be met with imports of petroleum. In 2009, however, the U.S. production of petroleum began to increase. The Energy Information Administration expects petroleum production to be nearly equal to transportation consumption by about 2020. When including non-petroleum sources, the production will exceed transportation demand (see note below for details on the non-petroleum sources).

United States Petroleum Production and Transportation Petroleum Consumption, 1970–2040



Notes: The U.S. Production has two lines after 2011. The solid line is conventional sources of petroleum, including crude oil, natural gas plant liquids, and refinery gains. The dashed line adds in other non-petroleum sources, including ethanol, biomass, liquids from coal, other blending components, other hydrocarbons, and ethers.

The sharp increase in values between 2012 and 2013 are caused by the data change from historical to projected values. The sharp increase in the value for heavy trucks between 2006 and 2007 is the result of the FHWA's methodology change.

Supporting Information

U.S. Petroleum Production and Transportation Petroleum Consumption, 1970–2040 (Million barrels per day)

Year	Autos	Light Trucks	Medium & Heavy Trucks	Air	Water	Off-Highway	Rail	Pipeline	Total Transportation	U.S. Petroleum Production with Other Inputs 2013-on (dotted line)	U.S. Petroleum Production without Other Inputs (solid line)
1970	4.01	0.73	0.79	0.62	0.40	0.35	0.26	0.47	7.62	11.66	11.66
1971	4.22	0.80	0.83	0.62	0.37	0.34	0.26	0.48	7.90	11.54	11.54
1972	4.50	0.89	0.90	0.62	0.37	0.33	0.27	0.49	8.38	11.57	11.57
1973	4.64	0.99	0.99	0.65	0.42	0.34	0.28	0.47	8.78	11.40	11.40
1974	4.40	0.98	0.99	0.59	0.42	0.31	0.29	0.44	8.43	10.94	10.94
1975	4.40	1.13	1.01	0.60	0.44	0.32	0.26	0.40	8.55	10.47	10.47
1976	4.65	1.23	1.06	0.63	0.51	0.33	0.27	0.38	9.06	10.21	10.21
1977	4.70	1.32	1.17	0.64	0.56	0.32	0.28	0.37	9.36	10.39	10.39
1978	4.80	1.43	1.30	0.67	0.65	0.31	0.28	0.37	9.80	10.77	10.77
1979	4.56	1.44	1.34	0.70	0.54	0.32	0.29	0.41	9.60	10.66	10.66
1980	4.17	1.41	1.34	0.68	0.66	0.32	0.28	0.42	9.26	10.77	10.77
1981	4.12	1.40	1.36	0.69	0.60	0.31	0.27	0.43	9.16	10.69	10.69
1982	4.11	1.34	1.35	0.68	0.50	0.28	0.23	0.40	8.90	10.73	10.73
1983	4.17	1.41	1.38	0.68	0.46	0.28	0.23	0.35	8.95	10.73	10.73
1984	4.19	1.51	1.43	0.76	0.46	0.34	0.25	0.37	9.29	11.06	11.06
1985	4.23	1.61	1.43	0.79	0.41	0.35	0.24	0.36	9.42	11.14	11.14
1986	4.33	1.71	1.47	0.86	0.63	0.35	0.23	0.35	9.93	10.85	10.85
1987	4.34	1.80	1.52	0.90	0.65	0.36	0.24	0.37	10.17	10.58	10.58
1988	4.34	1.93	1.55	0.93	0.67	0.36	0.24	0.41	10.43	10.42	10.42
1989	4.37	1.96	1.59	0.94	0.72	0.34	0.24	0.42	10.59	9.82	9.82
1990	4.12	2.10	1.65	0.97	0.68	0.36	0.24	0.44	10.55	9.60	9.60
1991	3.80	2.26	1.69	0.91	0.72	0.37	0.23	0.41	10.37	9.79	9.79
1992	3.87	2.42	1.73	0.92	0.76	0.35	0.23	0.40	10.66	9.64	9.64
1993	3.96	2.53	1.78	0.94	0.68	0.30	0.24	0.42	10.84	9.35	9.35
1994	4.01	2.61	1.87	0.98	0.66	0.31	0.25	0.45	11.14	9.16	9.16
1995	4.02	2.69	1.95	1.01	0.69	0.32	0.26	0.46	11.40	9.10	9.10
1996	4.09	2.80	2.00	1.04	0.67	0.32	0.27	0.46	11.65	9.13	9.13
1997	4.13	2.91	2.02	1.09	0.59	0.34	0.27	0.48	11.83	9.12	9.12

1998	4.23	2.98	2.09	1.08	0.58	0.34	0.27	0.42	11.99	8.90	8.90
1999	4.33	3.12	2.29	1.17	0.65	0.32	0.28	0.43	12.58	8.62	8.62
2000	4.31	3.12	2.38	1.21	0.69	0.33	0.28	0.43	12.74	8.68	8.68
2001	4.34	3.15	2.37	1.13	0.56	0.35	0.29	0.42	12.60	8.57	8.57
2002	4.45	3.25	2.47	1.05	0.59	0.36	0.29	0.44	12.89	8.58	8.58
2003	4.38	3.57	2.40	1.07	0.51	0.36	0.29	0.40	12.98	8.34	8.34
2004	4.42	3.71	2.23	1.16	0.61	0.37	0.31	0.39	13.21	8.30	8.30
2005	4.54	3.45	2.50	1.20	0.65	0.38	0.31	0.40	13.41	7.89	7.89
2006	4.41	3.57	2.55	1.19	0.69	0.38	0.32	0.40	13.49	7.82	7.82
2007	4.38	3.63	3.14	1.19	0.74	0.39	0.31	0.42	14.20	7.86	7.86
2008	4.20	3.58	3.18	1.13	0.69	0.40	0.30	0.43	13.91	7.78	7.78
2009	3.91	3.61	2.96	1.01	0.63	0.42	0.26	0.44	13.22	8.24	8.24
2010	3.64	3.77	3.00	1.02	0.70	0.42	0.27	0.44	13.26	8.61	8.61
2011	3.49	3.83	2.83	1.02	0.66	0.42	0.29	0.45	12.98	8.95	8.95
2012	3.39	3.86	2.82	0.99	0.56	0.39	0.28	0.47	12.78	9.95	9.95
2013	4.00	4.65	2.64	1.20	0.42	0.37	0.25	0.46	14.00	11.10	11.10
2014	3.94	4.60	2.69	1.20	0.42	0.38	0.23	0.46	13.92	13.25	12.09
2015	3.87	4.55	2.77	1.21	0.43	0.37	0.24	0.45	13.89	13.90	12.71
2016	3.84	4.54	2.85	1.22	0.44	0.37	0.24	0.44	13.93	14.48	13.28
2017	3.80	4.52	2.89	1.23	0.44	0.37	0.23	0.45	13.92	14.54	13.33
2018	3.75	4.49	2.91	1.24	0.44	0.36	0.23	0.45	13.88	14.57	13.35
2019	3.71	4.44	2.93	1.25	0.44	0.36	0.24	0.46	13.81	14.60	13.37
2020	3.66	4.38	2.95	1.25	0.44	0.36	0.24	0.47	13.74	14.52	13.28
2021	3.60	4.32	2.98	1.26	0.44	0.36	0.24	0.48	13.67	14.35	13.10
2022	3.55	4.25	3.01	1.26	0.44	0.36	0.24	0.48	13.59	14.31	13.05
2023	3.49	4.18	3.04	1.27	0.44	0.36	0.24	0.48	13.51	14.28	13.02
2024	3.43	4.11	3.07	1.27	0.44	0.37	0.24	0.48	13.41	14.20	12.93
2025	3.37	4.03	3.11	1.28	0.44	0.37	0.24	0.49	13.32	14.14	12.87
2026	3.31	3.96	3.14	1.28	0.45	0.37	0.24	0.49	13.25	13.99	12.72
2027	3.27	3.89	3.17	1.29	0.45	0.38	0.24	0.50	13.18	13.84	12.57
2028	3.23	3.83	3.19	1.29	0.45	0.38	0.24	0.51	13.12	13.69	12.42
2029	3.20	3.78	3.22	1.30	0.45	0.38	0.24	0.52	13.08	13.56	12.29
2030	3.17	3.74	3.25	1.30	0.45	0.39	0.24	0.52	13.05	13.51	12.24
2031	3.15	3.70	3.28	1.30	0.45	0.39	0.24	0.52	13.03	13.40	12.12
2032	3.14	3.67	3.30	1.30	0.45	0.39	0.24	0.53	13.01	13.33	12.06
2033	3.13	3.64	3.33	1.30	0.45	0.40	0.24	0.53	13.01	13.31	12.03

2034	3.12	3.61	3.37	1.30	0.45	0.40	0.24	0.53	13.02	13.26	11.98
2035	3.11	3.59	3.41	1.30	0.45	0.41	0.23	0.53	13.04	13.14	11.87
2036	3.11	3.57	3.46	1.30	0.46	0.41	0.23	0.53	13.06	13.00	11.73
2037	3.11	3.55	3.50	1.30	0.46	0.41	0.23	0.53	13.09	12.98	11.71
2038	3.11	3.54	3.54	1.31	0.46	0.42	0.23	0.53	13.13	12.82	11.55
2039	3.12	3.53	3.58	1.31	0.46	0.42	0.23	0.54	13.18	12.78	11.50
2040	3.12	3.52	3.62	1.31	0.46	0.43	0.23	0.54	13.22	12.70	11.42

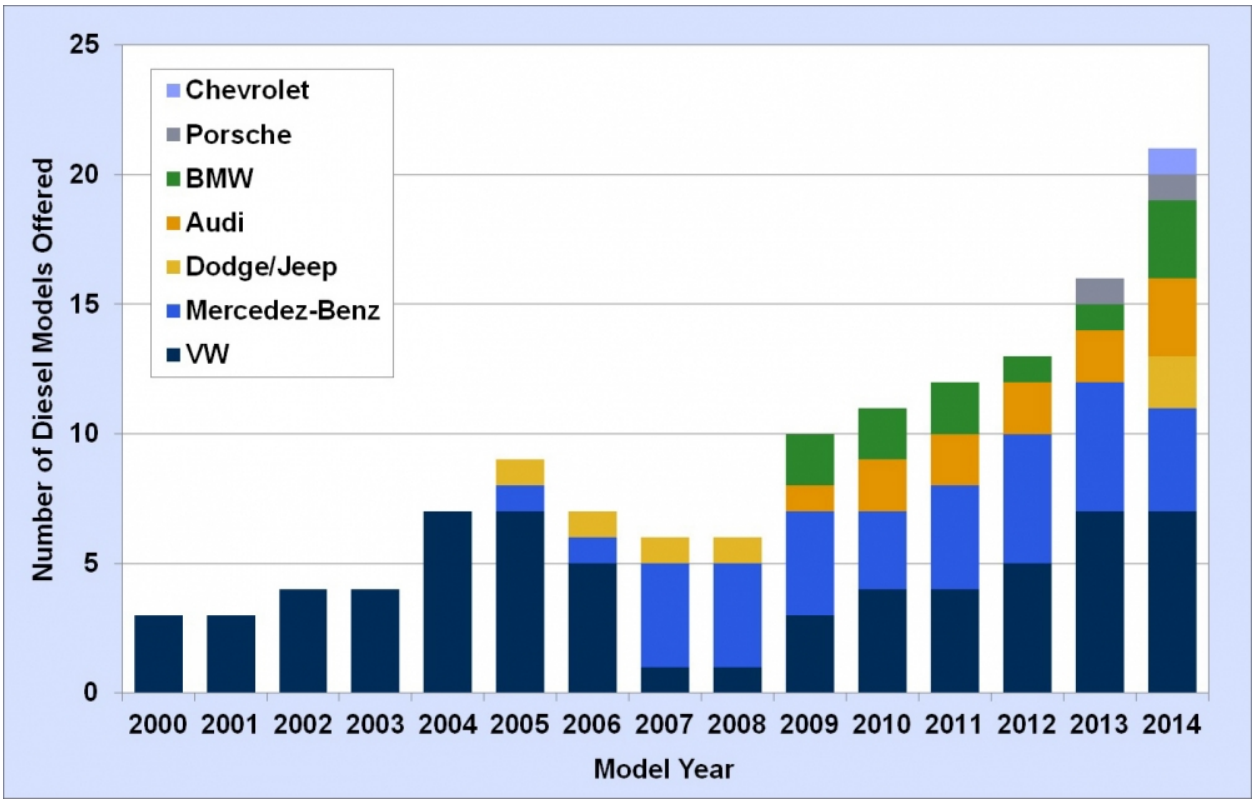
Sources:
Historical: Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 33*, July 2014.
Projections: Energy Information Administration, Annual Energy Outlook 2014, May 2014.

Fact #830: July 21, 2014

Diesel Light Vehicle Offerings Expand

The number of diesel light vehicles offered for sale by manufacturers has grown since 2000. In model year (MY) 2000 there were only 3 diesel models offered by one manufacturer (VW), but by MY 2014 there were 21 models from seven different manufacturers. The diesel vehicles offered in 2014 are cleaner, quieter, and more efficient than the diesel light vehicles introduced in the late 1970's.

Number of Diesel Light Vehicle Models Offered by Manufacturer, MY 2000–2014



Note: Data include only those vehicles below 8,500 lbs. gross vehicle weight rating.

Supporting Information

Number of Diesel Light Vehicle Models Offered, MY 2000–2014

Model Year	VW	Mercedes-Benz	Dodge/Jeep	Audi	BMW	Porsche	Chevrolet	Total
2000	3							3
2001	3							3
2002	4							4
2003	4							4
2004	7							7
2005	7	1	1					9
2006	5	1	1					7
2007	1	4	1					6
2008	1	4	1					6
2009	3	4		1	2			10
2010	4	3		2	2			11
2011	4	4		2	2			12
2012	5	5		2	1			13
2013	7	5		2	1	1		16
2014	7	4	2	3	3	1	1	21

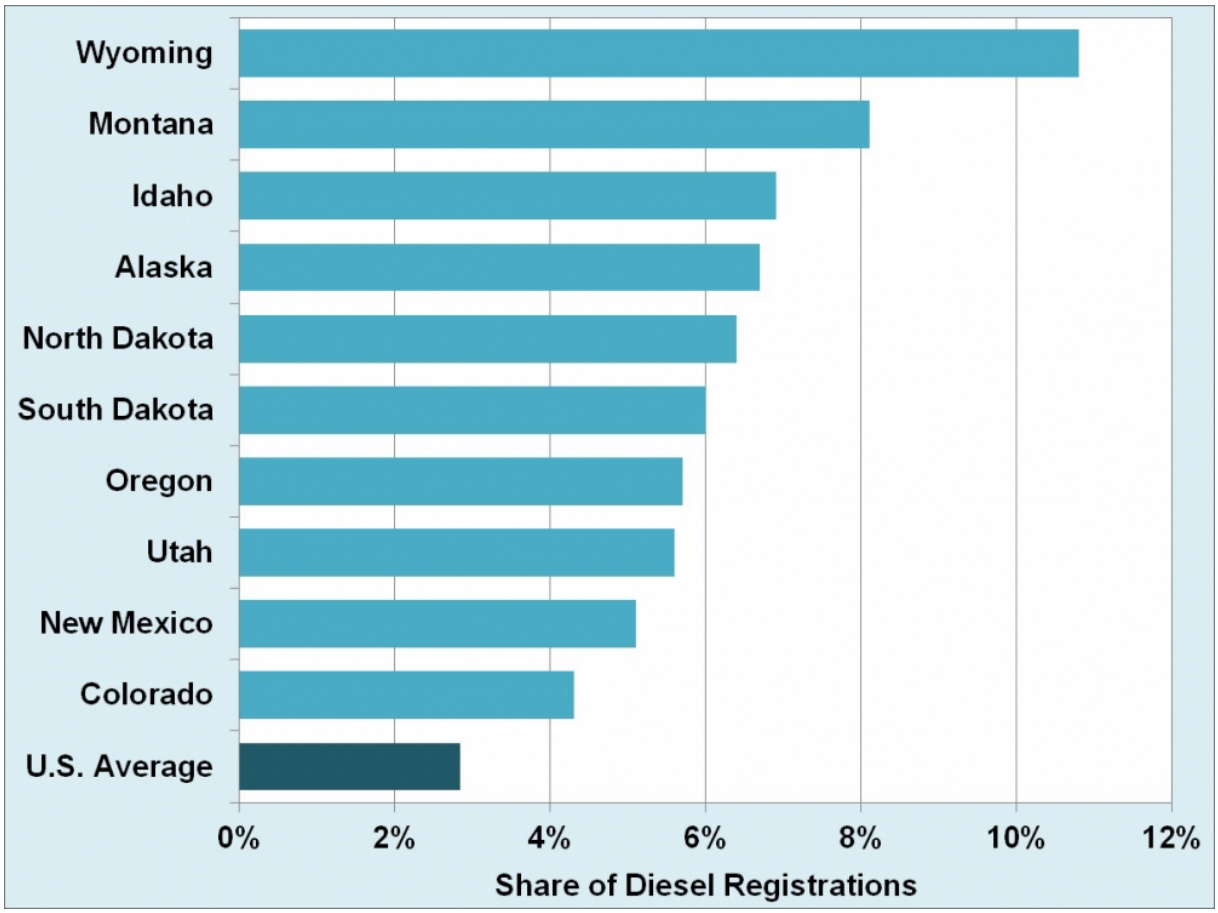
Source:
U.S. Department of Energy and U.S. Environmental Protection Agency, Fuel Economy Website, accessed June 10, 2014.

Fact #831: July 28, 2014

Top Ten States with Diesel Light Vehicles

In Wyoming, more than 10% of registered light vehicles are fueled by diesel making their State number one in terms of diesel share. All other States on the top ten list are also western States. The average of all light diesels registered in the U.S. is 2.8%. The data include diesel cars, sport-utility vehicles, vans, and pickups (includes heavy-duty pickups as well).

Top Ten States Ranked by Share of Diesel Registrations and U.S. Average, 2013



Note: Data include only those vehicles below 8,500 lbs. gross vehicle weight rating.

Supporting Information

Top Ten States Ranked by Share of Diesel Registrations and U.S. Average, 2013

State	Share of Diesel Registrations
Wyoming	10.8%
Montana	8.1%
Idaho	6.9%
Alaska	6.7%
North Dakota	6.4%
South Dakota	6.0%
Oregon	5.7%
Utah	5.6%
New Mexico	5.1%
Colorado	4.3%
U.S. Average	2.8%

Note: U.S. Average was calculated using an estimated total of 246 million light vehicle registrations.

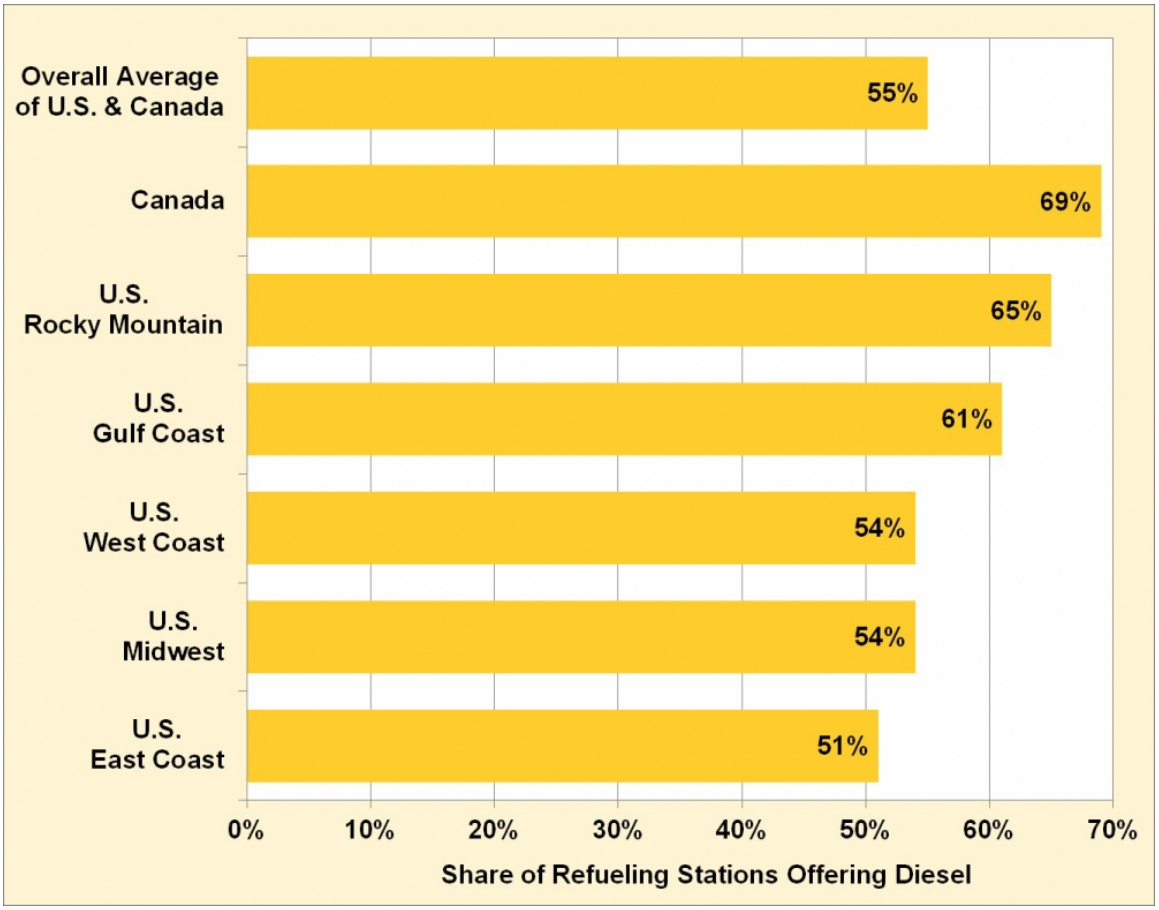
Source:
Diesel Technology Forum, "A Clean Diesel State of Mind," June 2014.
Original source: R.L. Polk and Company.

Fact #832: August 4, 2014

Over Half of the Refueling Stations in the United States and Canada Sell Diesel Fuel

A 2014 survey of over 110,000 refueling stations in the U.S. and Canada shows that over half of all refueling stations sell diesel fuel. The survey results are shown for five different regions of the U.S., with the Rocky Mountain region having the highest share of stations offering diesel (65%), and the East Coast region having the lowest (51%). In Canada, the share of refueling stations offering diesel is even higher than in the U.S.

Share of Refueling Stations Offering Diesel Fuel by Region, 2014



Supporting Information

Share of Refueling Stations Offering Diesel Fuel by Region, 2014

Country/Region	Percent
U.S. East Coast	51%
U.S. Midwest	54%
U.S. West Coast	54%
U.S. Gulf Coast	61%
U.S. Rocky Mountain	65%
Canada	69%
Overall Average of U.S. & Canada	55%

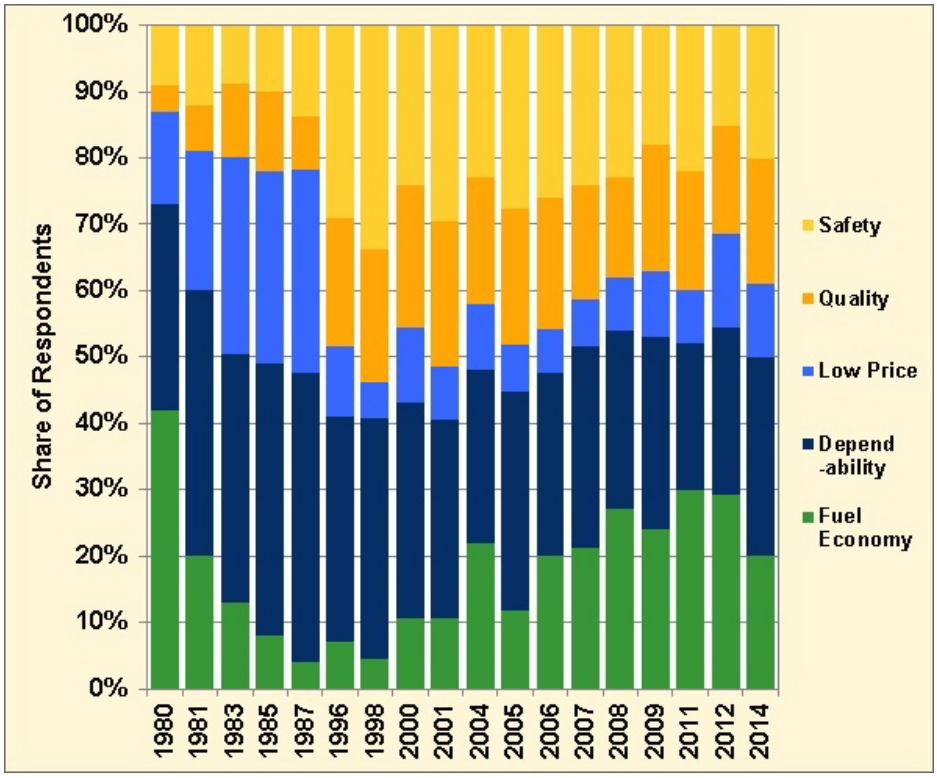
Source:
Diesel Technology Forum, "A Clean Diesel State of Mind," June 2014. Original source: Integer-Research, unpublished study, May 2014.

Fact #833: August 11, 2014

Fuel Economy Rated Second Most Important Vehicle Attribute

A 2014 survey asked a sample of the U.S. population 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 after 1980, but fuel economy surpassed it in 2011 and 2012. In 2014, 30% of the survey respondents indicated that dependability would be the most important vehicle attribute while 20% of the survey respondents chose fuel economy and another 20% chose safety.

Most Important Vehicle Attributes, 2014



Supporting Information

Question: 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%
1981	20%	40%	21%	7%	12%
1983	13%	38%	30%	11%	9%
1985	8%	41%	29%	12%	10%
1987	4%	44%	31%	8%	14%
1996	7%	34%	11%	19%	29%
1998	4%	36%	5%	20%	34%
2000	11%	33%	11%	22%	24%
2001	11%	30%	8%	22%	30%
2004	22%	26%	10%	19%	23%
2005	12%	33%	7%	21%	28%
2006	20%	28%	7%	20%	26%
2007	21%	30%	7%	17%	24%
2008	27%	27%	8%	15%	23%
2009	24%	29%	10%	19%	18%
2011	30%	22%	8%	18%	22%
2012	29%	25%	14%	16%	15%
2014	20%	30%	11%	19%	20%

Sources:
For 1980-87: J. D. Power (data based on new car buyers).
For 1998: Opinion Research Corporation International for NREL, Study #707089, February 19 – 22, 1998, N = 1,019.
For 2000: Opinion Research Corporation International for NREL, Study #709318, August 3 – 6, 2000, N = 1,013.
For 2001: Opinion Research Corporation International for NREL, Study #710288, July 12, 2001, N = 1,004.
For 2004: Opinion Research Corporation International for NREL, Study #713228, May 27, 2004, N=949.

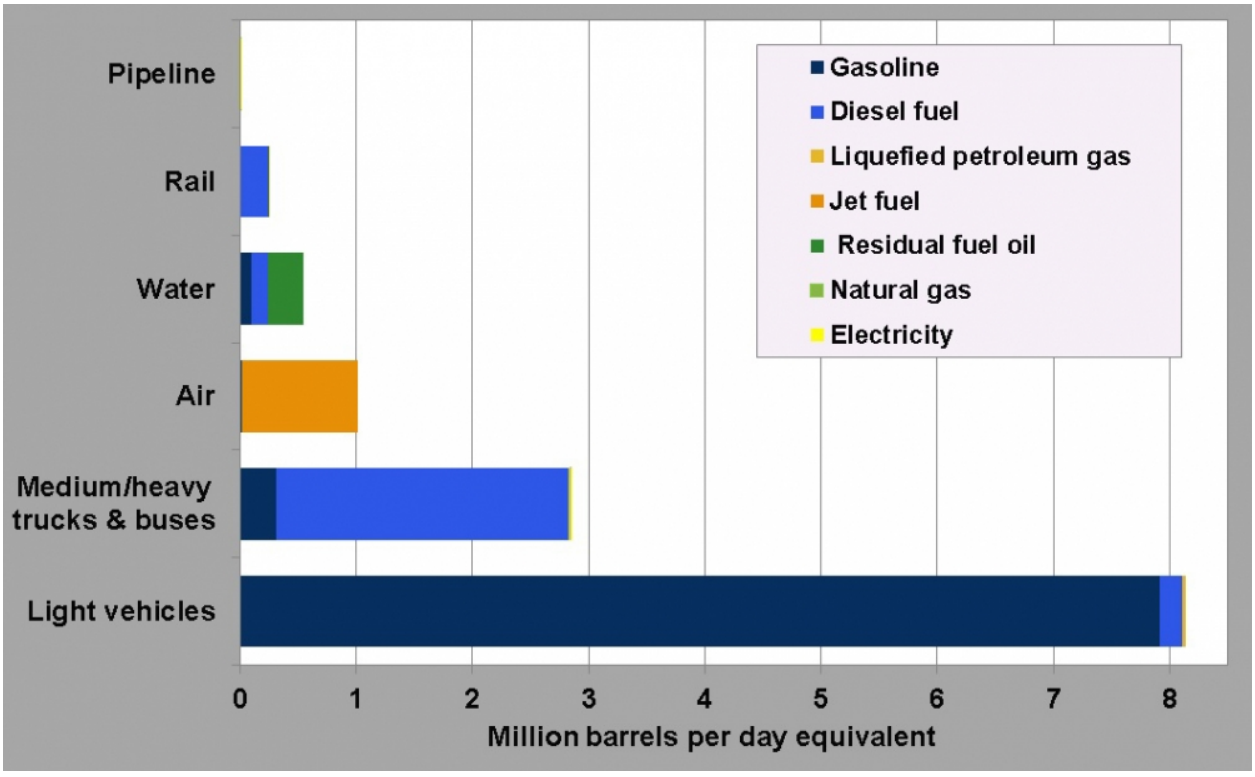
For 2005: Opinion Research Corporation International for NREL, Study #714209, May 20, 2005, N=1012.
For 2006: Opinion Research Corporation International for NREL, Study #715238, June 8, 2006, N=1,007.
For 2007: Opinion Research Corporation International for NREL, Study #716328, August 9, 2007, N=1010.
For 2008: Opinion Research Corporation International for NREL, Study #717318, August 3, 2008, N=1,005.
For 2009: Opinion Research Corporation International for NREL, Study #718339, August 14-17, 2009, N=1003.
For 2011: Opinion Research Corporation International for NREL, Study #720229, June 3 - 6, 2011, N=1011
For 2012: Opinion Research Corporation International for NREL, Study #721488, November 29 - December 2, 2012, N=1,007
For 2014: Opinion Research Corporation International for NREL, Study #723238, June 5-8, 2014, N=1,014

Fact #834: August 18, 2014

About Two-Thirds of Transportation Energy Use is Gasoline for Light Vehicles

Highway vehicles are responsible for the majority of the energy consumed by the transportation sector. Most of the fuel used in light vehicles is gasoline, while most of the fuel used in medium and heavy trucks and buses is diesel.

Transportation Energy Use by Mode and Fuel Type, 2013



Notes: Rail includes transit, intercity passenger, and freight.
Water includes waterborne commerce and recreational boating.
Air includes all domestic operations and one-half of international operations.
Civilian consumption only. Totals may not include all possible uses of fuels for transportation (e.g., snowmobiles).

Supporting Information

Transportation Energy Use by Mode and Fuel Type, 2013
(Million barrels per day equivalent)

Mode	Gasoline	Diesel fuel	Liquefied petroleum gas	Jet fuel	Residual fuel oil	Natural gas	Electricity	Total
Light vehicles	7.9	0.2	0.0	0.0	0.0	0.0	*	8.1
Medium/heavy trucks & buses	0.3	2.5	0.0	0.0	0.0	0.0	*	2.8
Air	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0
Water	0.1	0.1	0.0	0.0	0.3	0.0	0.0	0.5
Rail	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2
Pipeline	0.0	0.0	0.0	0.0	0.0	0.008	0.002	0.0
Total highway & nonhighway	8.3	3.1	0.0	1.0	0.3	0.0	0.0	12.8

* Data on electricity use of highway vehicles is not available.

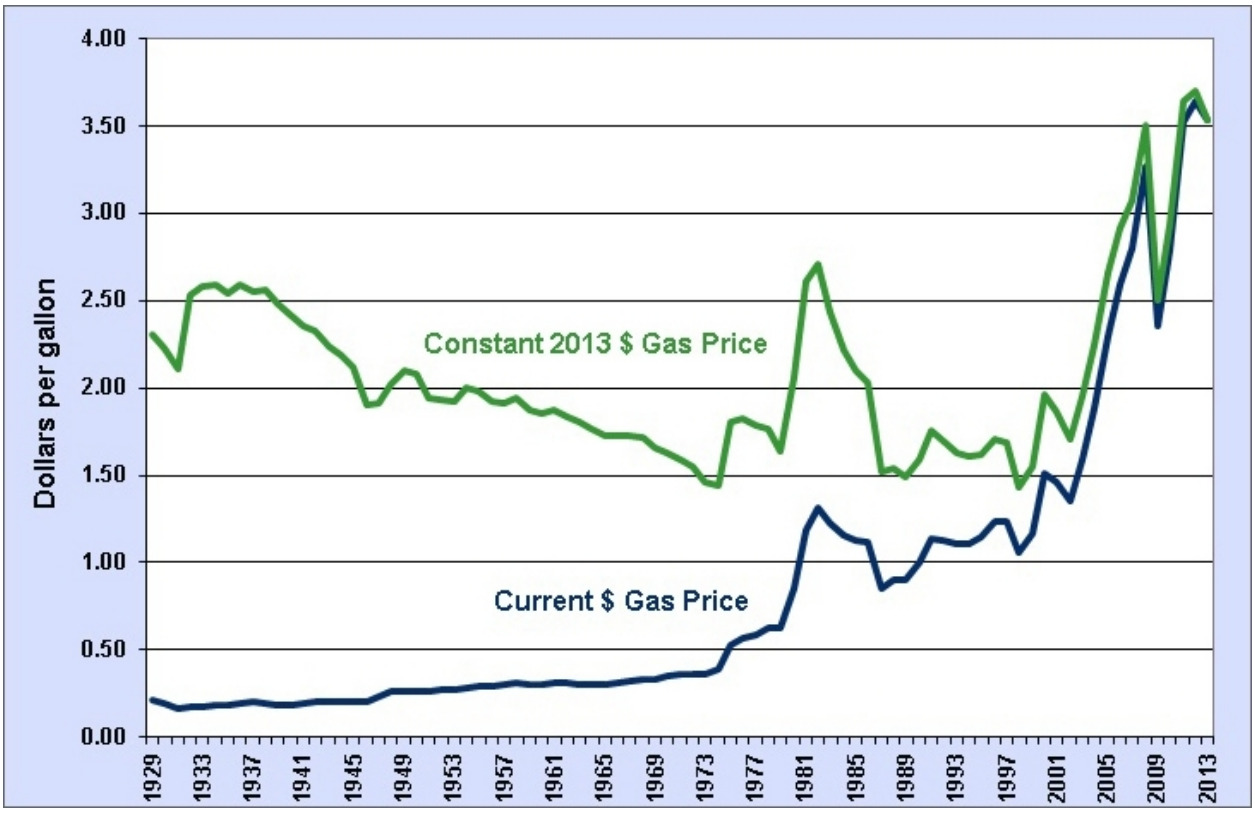
Source:
Oak Ridge National Laboratory, *Transportation Energy Data Book, Edition 32*, Oak Ridge, TN, July 2013.

Fact #835: August 25, 2014

Average Historical Annual Gasoline Pump Price, 1929–2013

When adjusted for inflation, the average historical annual price of gasoline (gas) has fluctuated greatly, and, by 2013, had risen by more than 50% since the data series began in 1929. The effect of the U.S. embargo of oil from Iran can be seen in the early 1980's with the price of gasoline peaking in 1982. From 2002 to 2008 the price of gasoline rose substantially, but then fell in 2009 during the economic recession. In 2012, prices reached the highest level in the eighty-year series in both current and constant dollars, but declined slightly in 2013.

Average Retail Price of Gasoline, 1929–2013



Supporting Information

Average Retail Price of Gasoline, 1929–2013

Year	Retail Gasoline Price (Current dollars/gallon)	Retail Gasoline Price (Constant 2013 dollars/gallon)	Year	Retail Gasoline Price (Current dollars/gallon)	Retail Gasoline Price (Constant 2013 dollars/gallon)
1929	0.21	2.31	1972	0.36	1.55
1930	0.20	2.23	1973	0.36	1.46
1931	0.17	2.11	1974	0.39	1.44
1932	0.18	2.53	1975	0.53	1.81
1933	0.18	2.58	1976	0.57	1.82
1934	0.19	2.59	1977	0.59	1.79
1935	0.19	2.54	1978	0.62	1.76
1936	0.19	2.59	1979	0.63	1.64
1937	0.20	2.55	1980	0.86	2.06
1938	0.20	2.56	1981	1.19	2.61
1939	0.19	2.49	1982	1.31	2.71
1940	0.18	2.41	1983	1.22	2.43
1941	0.19	2.36	1984	1.16	2.22
1942	0.20	2.32	1985	1.13	2.10
1943	0.21	2.23	1986	1.12	2.03
1944	0.21	2.19	1987	0.86	1.52
1945	0.21	2.12	1988	0.90	1.54
1946	0.21	1.90	1989	0.90	1.49
1947	0.23	1.91	1990	1.00	1.59
1948	0.26	2.03	1991	1.14	1.76

1949	0.27	2.10	1992	1.13	1.70
1950	0.27	2.08	1993	1.11	1.63
1951	0.27	1.94	1994	1.11	1.60
1952	0.27	1.93	1995	1.15	1.62
1953	0.27	1.93	1996	1.23	1.71
1954	0.29	2.00	1997	1.23	1.68
1955	0.29	1.98	1998	1.06	1.43
1956	0.29	1.93	1999	1.17	1.55
1957	0.30	1.92	2000	1.51	1.97
1958	0.31	1.94	2001	1.46	1.86
1959	0.30	1.88	2002	1.36	1.70
1960	0.31	1.86	2003	1.59	1.95
1961	0.31	1.87	2004	1.88	2.25
1962	0.31	1.83	2005	2.30	2.66
1963	0.31	1.80	2006	2.59	2.91
1964	0.30	1.76	2007	2.80	3.07
1965	0.30	1.73	2008	3.27	3.51
1966	0.31	1.73	2009	2.35	2.50
1967	0.32	1.73	2010	2.79	2.94
1968	0.33	1.71	2011	3.53	3.64
1969	0.34	1.66	2012	3.64	3.69
1970	0.35	1.63	2013	3.53	3.53
1971	0.36	1.59			

Notes: Retail price includes Federal and State Taxes.
Price is for Regular Leaded Gasoline until 1990 and for Regular Unleaded Gasoline thereafter.
Constant dollars calculated using the Gross Domestic Product Inflation Index.

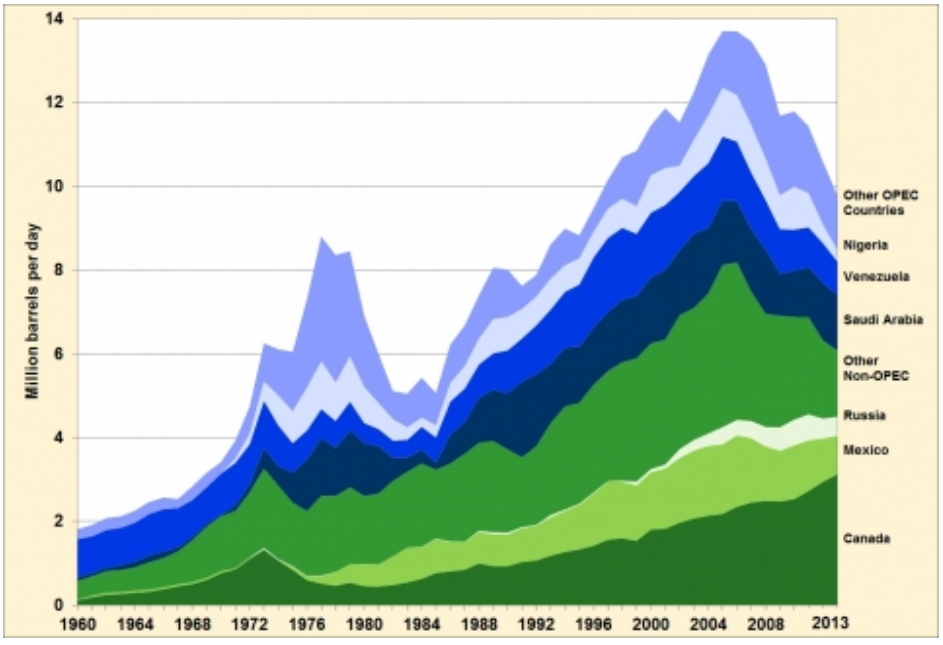
Source:
Energy Information Administration, *Monthly Energy Review*, Table 9.4.

Fact #836: September 1, 2014

Non-OPEC Countries Supply Nearly Two-Thirds of U.S. Petroleum Imports

The figure below shows the volume and source of imported petroleum to the United States from 1960 to 2013. The countries which are members of OPEC (Organization of the Petroleum Exporting Countries) are shown in shades of blue while non-OPEC countries are shown in shades of green. Petroleum imports rose sharply from the mid-1960s to 1977 when OPEC countries supplied 70% of all imported petroleum. Petroleum imports then plummeted from the late 1970s through the early 1980s. While petroleum imports rebounded to a peak of nearly 14 million barrels per day in 2005, the share of imports from non-OPEC countries has grown and now accounts for a majority of imported petroleum. In 2013, non-OPEC countries supplied nearly two-thirds of all petroleum imported to the United States. Between 2005 and 2013, overall petroleum imports have declined 28.5%.

U.S. Petroleum Imports by Country, 1960–2013



Supporting Information

U.S. Petroleum Imports by Country, 1960–2013 (Million barrels per day)

Year	Non-OPEC Countries				OPEC Countries				Total	Percent OPEC
	Canada	Mexico	Russia	Other Non-OPEC	Nigeria	Saudi Arabia	Venezuela	Other OPEC Countries		
1960	0.12	0.02	0.00	0.45	0.00	0.08	0.91	0.24	1.81	68%
1961	0.19	0.04	0.00	0.46	0.00	0.07	0.88	0.27	1.92	64%
1962	0.25	0.05	0.00	0.52	0.00	0.07	0.91	0.29	2.08	61%
1963	0.27	0.05	0.00	0.53	0.00	0.11	0.90	0.27	2.12	60%
1964	0.30	0.05	0.00	0.56	0.00	0.13	0.93	0.29	2.26	60%
1965	0.32	0.05	0.00	0.66	0.00	0.16	0.99	0.29	2.47	58%
1966	0.38	0.05	0.00	0.70	0.00	0.15	1.02	0.28	2.57	56%
1967	0.45	0.05	0.00	0.79	0.00	0.09	0.94	0.22	2.54	49%
1968	0.51	0.05	0.00	1.00	0.00	0.07	0.89	0.33	2.84	45%
1969	0.61	0.04	0.00	1.23	0.00	0.07	0.87	0.35	3.17	41%
1970	0.77	0.04	0.00	1.31	0.00	0.03	0.99	0.27	3.42	38%
1971	0.86	0.03	0.00	1.37	0.10	0.13	1.02	0.42	3.93	43%
1972	1.11	0.02	0.01	1.56	0.25	0.19	0.96	0.65	4.74	43%
1973	1.32	0.02	0.03	1.90	0.46	0.49	1.13	0.91	6.26	48%
1974	1.07	0.01	0.02	1.76	0.71	0.46	0.98	1.10	6.11	53%
1975	0.85	0.07	0.01	1.52	0.76	0.71	0.70	1.42	6.06	59%
1976	0.60	0.09	0.01	1.55	1.02	1.23	0.70	2.11	7.31	69%
1977	0.52	0.18	0.01	1.91	1.14	1.38	0.69	2.98	8.81	70%
1978	0.47	0.32	0.01	1.82	0.92	1.14	0.65	3.04	8.36	69%
1979	0.54	0.44	0.00	1.84	1.08	1.36	0.69	2.51	8.46	67%
1980	0.45	0.53	0.00	1.62	0.86	1.26	0.48	1.70	6.91	62%

1981	0.45	0.52	0.00	1.70	0.62	1.13	0.41	1.17	6.00	55%
1982	0.48	0.68	0.00	1.80	0.51	0.55	0.41	0.67	5.11	42%
1983	0.55	0.83	0.00	1.81	0.30	0.34	0.42	0.80	5.05	37%
1984	0.63	0.75	0.01	2.00	0.22	0.32	0.55	0.96	5.44	38%
1985	0.77	0.82	0.01	1.64	0.29	0.17	0.60	0.76	5.07	36%
1986	0.81	0.70	0.02	1.86	0.44	0.68	0.79	0.92	6.22	46%
1987	0.85	0.65	0.01	2.10	0.53	0.75	0.80	0.97	6.68	46%
1988	1.00	0.75	0.03	2.11	0.62	1.07	0.79	1.03	7.40	48%
1989	0.93	0.77	0.05	2.17	0.82	1.22	0.87	1.23	8.06	51%
1990	0.93	0.76	0.04	1.99	0.80	1.34	1.02	1.13	8.02	54%
1991	1.03	0.81	0.03	1.67	0.70	1.80	1.03	0.55	7.63	54%
1992	1.07	0.83	0.02	1.88	0.68	1.72	1.17	0.52	7.89	52%
1993	1.18	0.92	0.05	2.19	0.74	1.41	1.30	0.82	8.62	50%
1994	1.27	0.98	0.03	2.46	0.64	1.40	1.33	0.87	9.00	47%
1995	1.33	1.07	0.02	2.41	0.63	1.34	1.48	0.55	8.83	45%
1996	1.42	1.24	0.03	2.57	0.62	1.36	1.68	0.56	9.48	44%
1997	1.56	1.39	0.01	2.63	0.70	1.41	1.77	0.69	10.16	45%
1998	1.60	1.35	0.02	2.83	0.70	1.49	1.72	1.00	10.71	46%
1999	1.54	1.32	0.09	2.95	0.66	1.48	1.49	1.33	10.85	46%
2000	1.81	1.37	0.07	3.00	0.90	1.57	1.55	1.19	11.46	45%
2001	1.83	1.44	0.09	2.98	0.89	1.66	1.55	1.43	11.87	47%
2002	1.97	1.55	0.21	3.20	0.62	1.55	1.40	1.03	11.53	40%
2003	2.07	1.62	0.25	3.15	0.87	1.77	1.38	1.14	12.26	42%
2004	2.14	1.66	0.30	3.34	1.14	1.56	1.55	1.45	13.15	43%
2005	2.18	1.66	0.41	3.87	1.17	1.54	1.53	1.36	13.71	41%
2006	2.35	1.71	0.37	3.76	1.11	1.46	1.42	1.52	13.71	40%
2007	2.45	1.53	0.41	3.09	1.13	1.48	1.36	2.00	13.47	44%

2008	2.49	1.30	0.47	2.70	0.99	1.53	1.19	2.25	12.92	46%
2009	2.48	1.21	0.56	2.66	0.81	1.00	1.06	1.90	11.69	41%
2010	2.54	1.28	0.61	2.46	1.02	1.10	0.99	1.80	11.79	42%
2011	2.73	1.21	0.62	2.32	0.82	1.19	0.95	1.59	11.44	40%
2012	2.95	1.03	0.48	1.87	0.44	1.37	0.96	1.51	10.60	40%
2013	3.13	0.92	0.46	1.58	0.28	1.33	0.80	1.30	9.79	38%

Notes:

- Petroleum imports include crude oil and petroleum products.
- Other OPEC Countries include Algeria, Angola, Ecuador, Iraq, Kuwait, Libya, Gabon, Indonesia, Iran, Qatar, and the United Arab Emirates.
- Other Non-OPEC Countries include Brazil, Columbia, Netherlands, Norway, United Kingdom, U.S. Virgin Islands and other non-OPEC countries.

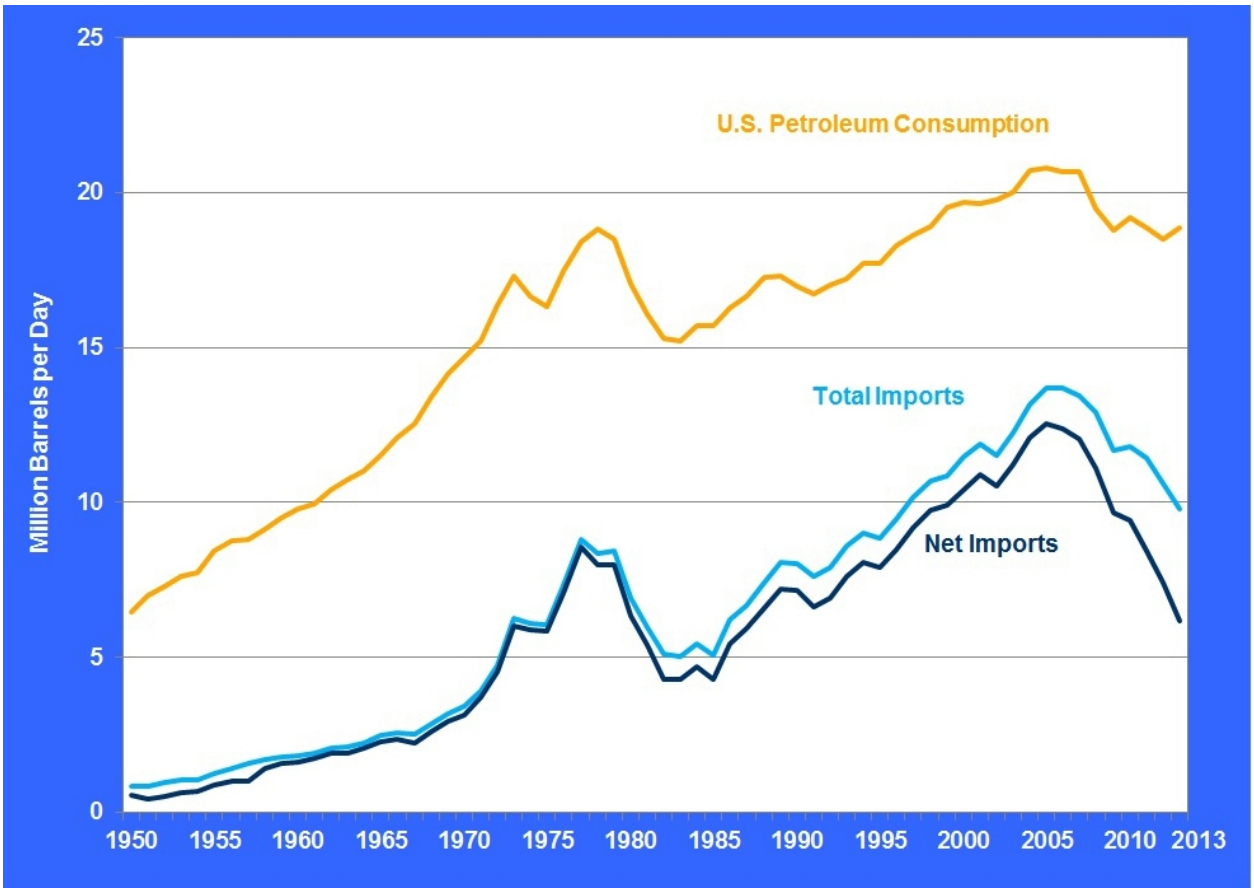
Source:
U.S. Energy Information Administration, *International Energy Statistics*, accessed August 2014.

Fact #837: September 8, 2014

Gap between Net Imports and Total Imports of Petroleum is Widening

Net imports of petroleum (total imports minus exports) were 6.2 million barrels per day in 2013 – the lowest since the 1980's (dark blue line). The widening gap between total imports (light blue line) and net imports (dark blue line) is due to an increase in exports of petroleum and petroleum products in recent years. Total imports, net imports, and U.S. petroleum consumption all peaked in 2005 and have generally declined since then.

U.S. Petroleum Consumption, Total Imports, and Net Imports, 1950–2013



Note: Net imports are equal to total imports minus exports.

Supporting Information

U.S. Petroleum Total Imports, Net Imports, and Consumption, 1950–2013

Year	Total Imports of Petroleum	Net Imports of Petroleum	U.S. Consumption of Petroleum
	(Million barrels per day)		
1950	0.85	0.55	6.46
1951	0.84	0.42	7.02
1952	0.95	0.52	7.27
1953	1.03	0.63	7.60
1954	1.05	0.70	7.76
1955	1.25	0.88	8.46
1956	1.44	1.01	8.78
1957	1.57	1.01	8.81
1958	1.70	1.42	9.12
1959	1.78	1.57	9.53
1960	1.81	1.61	9.80
1961	1.92	1.74	9.98
1962	2.08	1.91	10.40
1963	2.12	1.91	10.74
1964	2.26	2.06	11.02
1965	2.47	2.28	11.51
1966	2.57	2.37	12.08
1967	2.54	2.23	12.56
1968	2.84	2.61	13.39
1969	3.17	2.93	14.14
1970	3.42	3.16	14.70

1971	3.93	3.70	15.21
1972	4.74	4.52	16.37
1973	6.26	6.02	17.31
1974	6.11	5.89	16.65
1975	6.06	5.85	16.32
1976	7.31	7.09	17.46
1977	8.81	8.56	18.43
1978	8.36	8.00	18.85
1979	8.46	7.99	18.51
1980	6.91	6.36	17.06
1981	6.00	5.40	16.06
1982	5.11	4.30	15.30
1983	5.05	4.31	15.23
1984	5.44	4.72	15.73
1985	5.07	4.29	15.73
1986	6.22	5.44	16.28
1987	6.68	5.91	16.67
1988	7.40	6.59	17.28
1989	8.06	7.20	17.33
1990	8.02	7.16	16.99
1991	7.63	6.63	16.71
1992	7.89	6.94	17.03
1993	8.62	7.62	17.24
1994	9.00	8.05	17.72
1995	8.83	7.89	17.72
1996	9.48	8.50	18.31
1997	10.16	9.16	18.62

1998	10.71	9.76	18.92
1999	10.85	9.91	19.52
2000	11.46	10.42	19.70
2001	11.87	10.90	19.65
2002	11.53	10.55	19.76
2003	12.26	11.24	20.03
2004	13.15	12.10	20.73
2005	13.71	12.55	20.80
2006	13.71	12.39	20.69
2007	13.47	12.04	20.68
2008	12.92	11.11	19.50
2009	11.69	9.67	18.77
2010	11.79	9.44	19.18
2011	11.44	8.45	18.88
2012	10.60	7.39	18.49
2013	9.79	6.20	18.89

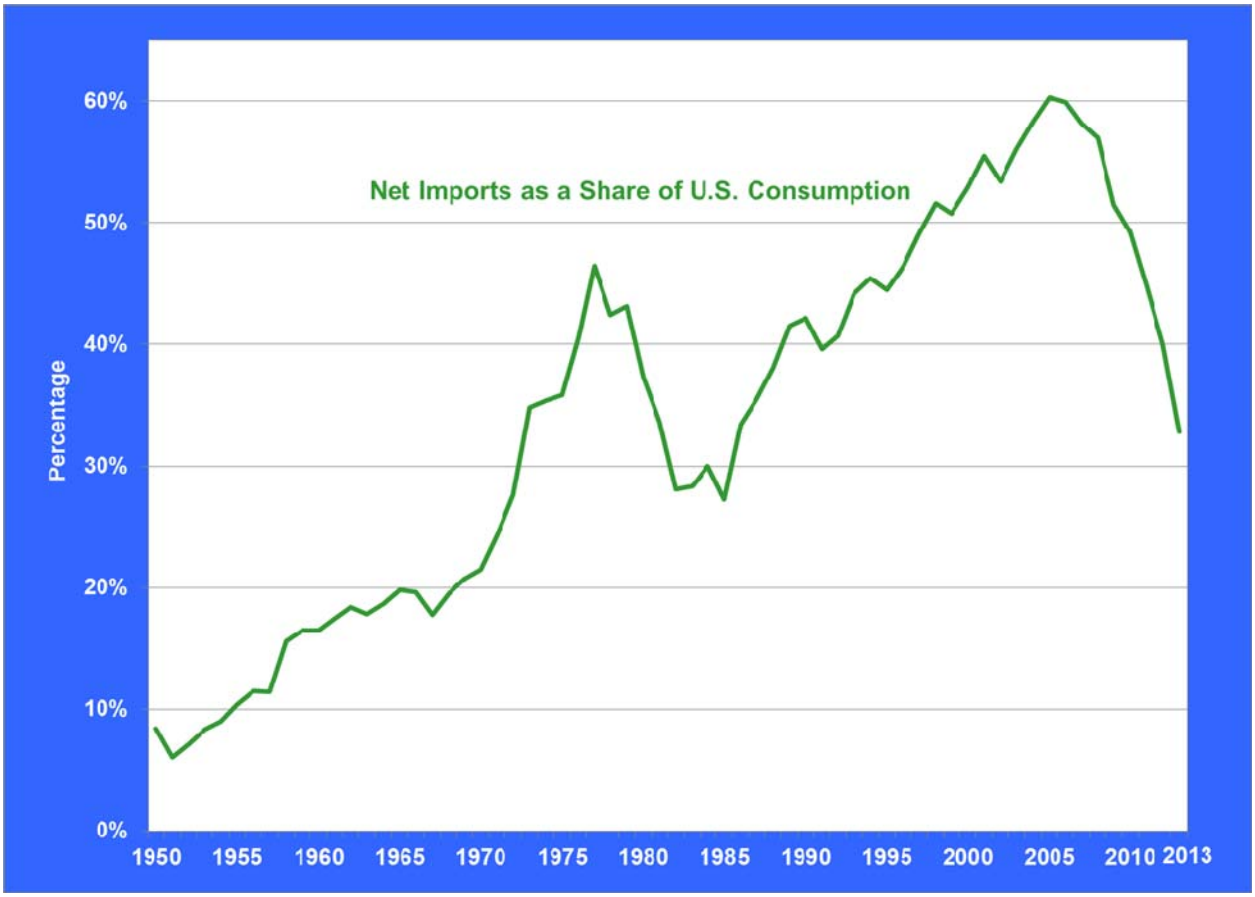
Source:
U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, August 2014, Table 3.3a.

Fact #838: September 15, 2014

Net Imports of Petroleum were only 33% of U.S. Consumption in 2013

When compared to total U.S. consumption of petroleum, net imports were only 33% in 2013. The share of imported petroleum reached a peak of 60% in 2005, from a low of 27% in 1985. Since 2005, the share has declined each year.

Net Imports of Petroleum as a Share of U.S. Petroleum Consumption, 1950–2013



Note: Net imports are equal to total imports minus exports.

Supporting Information

Net Imports of Petroleum as a Share of U.S. Petroleum Consumption, 1950–2013

Year	Net Imports of Petroleum	U.S. Consumption of Petroleum	Net Imports as a Share of U.S. Consumption
	(Million barrels per day)		Percentage
1950	0.55	6.46	8.4%
1951	0.42	7.02	6.0%
1952	0.52	7.27	7.2%
1953	0.63	7.60	8.3%
1954	0.70	7.76	9.0%
1955	0.88	8.46	10.4%
1956	1.01	8.78	11.5%
1957	1.01	8.81	11.4%
1958	1.42	9.12	15.6%
1959	1.57	9.53	16.5%
1960	1.61	9.80	16.5%
1961	1.74	9.98	17.5%
1962	1.91	10.40	18.4%
1963	1.91	10.74	17.8%
1964	2.06	11.02	18.7%
1965	2.28	11.51	19.8%
1966	2.37	12.08	19.7%
1967	2.23	12.56	17.8%
1968	2.61	13.39	19.5%
1969	2.93	14.14	20.7%
1970	3.16	14.70	21.5%

1971	3.70	15.21	24.3%
1972	4.52	16.37	27.6%
1973	6.02	17.31	34.8%
1974	5.89	16.65	35.4%
1975	5.85	16.32	35.8%
1976	7.09	17.46	40.6%
1977	8.56	18.43	46.5%
1978	8.00	18.85	42.5%
1979	7.99	18.51	43.1%
1980	6.36	17.06	37.3%
1981	5.40	16.06	33.6%
1982	4.30	15.30	28.1%
1983	4.31	15.23	28.3%
1984	4.72	15.73	30.0%
1985	4.29	15.73	27.3%
1986	5.44	16.28	33.4%
1987	5.91	16.67	35.5%
1988	6.59	17.28	38.1%
1989	7.20	17.33	41.6%
1990	7.16	16.99	42.2%
1991	6.63	16.71	39.6%
1992	6.94	17.03	40.7%
1993	7.62	17.24	44.2%
1994	8.05	17.72	45.5%
1995	7.89	17.72	44.5%
1996	8.50	18.31	46.4%
1997	9.16	18.62	49.2%

1998	9.76	18.92	51.6%
1999	9.91	19.52	50.8%
2000	10.42	19.70	52.9%
2001	10.90	19.65	55.5%
2002	10.55	19.76	53.4%
2003	11.24	20.03	56.1%
2004	12.10	20.73	58.4%
2005	12.55	20.80	60.3%
2006	12.39	20.69	59.9%
2007	12.04	20.68	58.2%
2008	11.11	19.50	57.0%
2009	9.67	18.77	51.5%
2010	9.44	19.18	49.2%
2011	8.45	18.88	44.8%
2012	7.39	18.49	40.0%
2013	6.20	18.89	32.8%

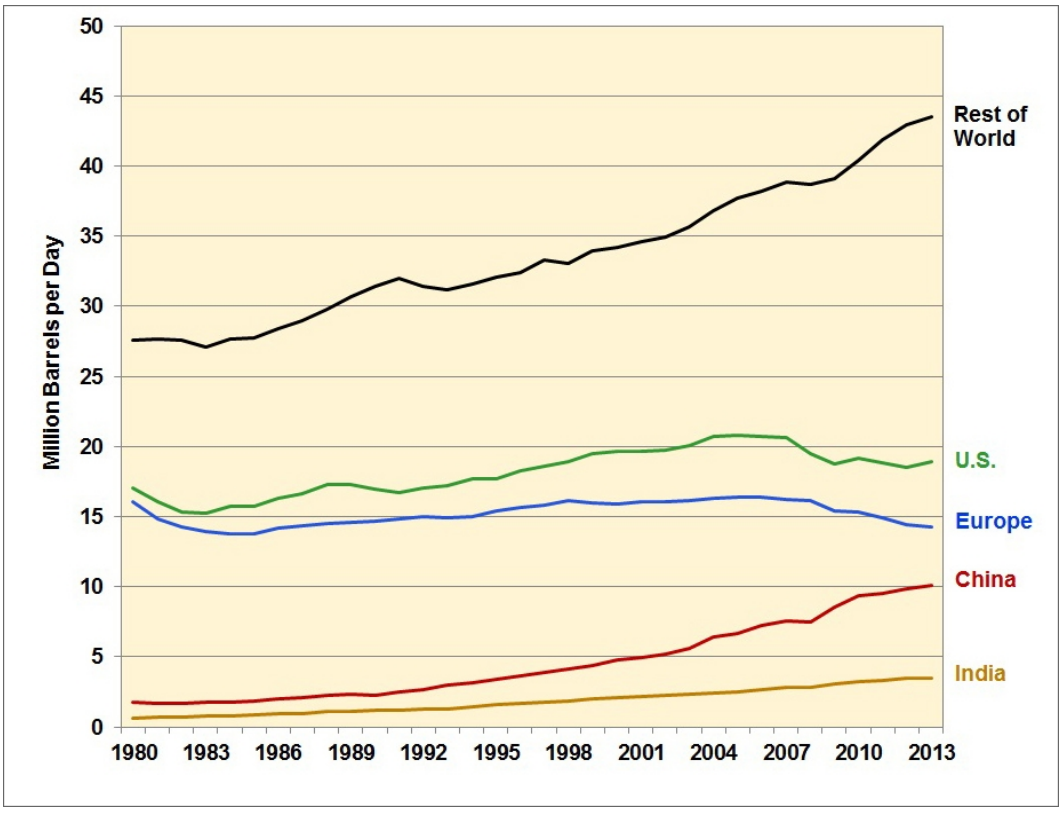
Source:
U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, August 2014, Table 3.3a.

Fact #839: September 22, 2014

World Petroleum Consumption Continues to Rise despite Declines from the United States and Europe

From 1980 to 2013, overall world petroleum consumption has increased from 63 to 90 million barrels per day. Overall consumption is the total of the individual countries/regions shown below. Although petroleum consumption in the U.S. and Europe has declined since 2007, this is offset by increasing consumption from the rest of the world. China has seen a rapid increase in petroleum consumption over the last decade while India has experienced a gradual rise in petroleum consumption. Not including the U.S., Europe, China, and India, petroleum consumption by the rest of the world has increased by 12.4% from 2008 to 2013.

Petroleum Consumption for Selected Countries/Regions, 1980–2013



Supporting Information

Petroleum Consumption for Selected Countries/Regions, 1980–2013

Year	(Million barrels per day)					
	United States	Europe	China	India	Rest of World	World Total
1980	17.06	16.06	1.77	0.64	27.60	63.12
1981	16.06	14.80	1.71	0.73	27.66	60.95
1982	15.30	14.29	1.66	0.74	27.57	59.55
1983	15.23	13.93	1.73	0.77	27.12	58.78
1984	15.73	13.82	1.74	0.82	27.69	59.80
1985	15.73	13.79	1.89	0.89	27.79	60.08
1986	16.28	14.19	2.00	0.95	28.40	61.82
1987	16.67	14.33	2.12	0.99	29.00	63.11
1988	17.28	14.52	2.27	1.08	29.82	64.98
1989	17.33	14.56	2.38	1.15	30.68	66.09
1990	16.99	14.69	2.30	1.17	31.40	66.55
1991	16.71	14.80	2.50	1.19	32.01	67.21
1992	17.03	14.97	2.66	1.27	31.45	67.38
1993	17.24	14.93	2.96	1.31	31.15	67.59
1994	17.72	15.04	3.16	1.41	31.59	68.93
1995	17.72	15.39	3.36	1.57	32.08	70.13
1996	18.31	15.69	3.61	1.68	32.42	71.71
1997	18.62	15.85	3.92	1.77	33.31	73.46
1998	18.92	16.15	4.11	1.84	33.10	74.12
1999	19.52	16.02	4.36	2.03	33.94	75.88
2000	19.70	15.92	4.80	2.13	34.24	76.79
2001	19.65	16.10	4.92	2.18	34.63	77.48

2002	19.76	16.06	5.16	2.26	34.97	78.22
2003	20.03	16.16	5.58	2.35	35.70	79.81
2004	20.73	16.28	6.44	2.43	36.79	82.67
2005	20.80	16.40	6.70	2.51	37.74	84.15
2006	20.69	16.42	7.26	2.69	38.21	85.27
2007	20.68	16.24	7.53	2.80	38.83	86.09
2008	19.50	16.15	7.47	2.86	38.72	84.70
2009	18.77	15.38	8.54	3.11	39.12	84.92
2010	19.18	15.34	9.33	3.26	40.42	87.53
2011	18.88	14.93	9.50	3.28	41.89	88.49
2012	18.49	14.42	9.87	3.45	42.93	89.16
2013	18.89	14.30	10.12	3.51	43.52	90.33

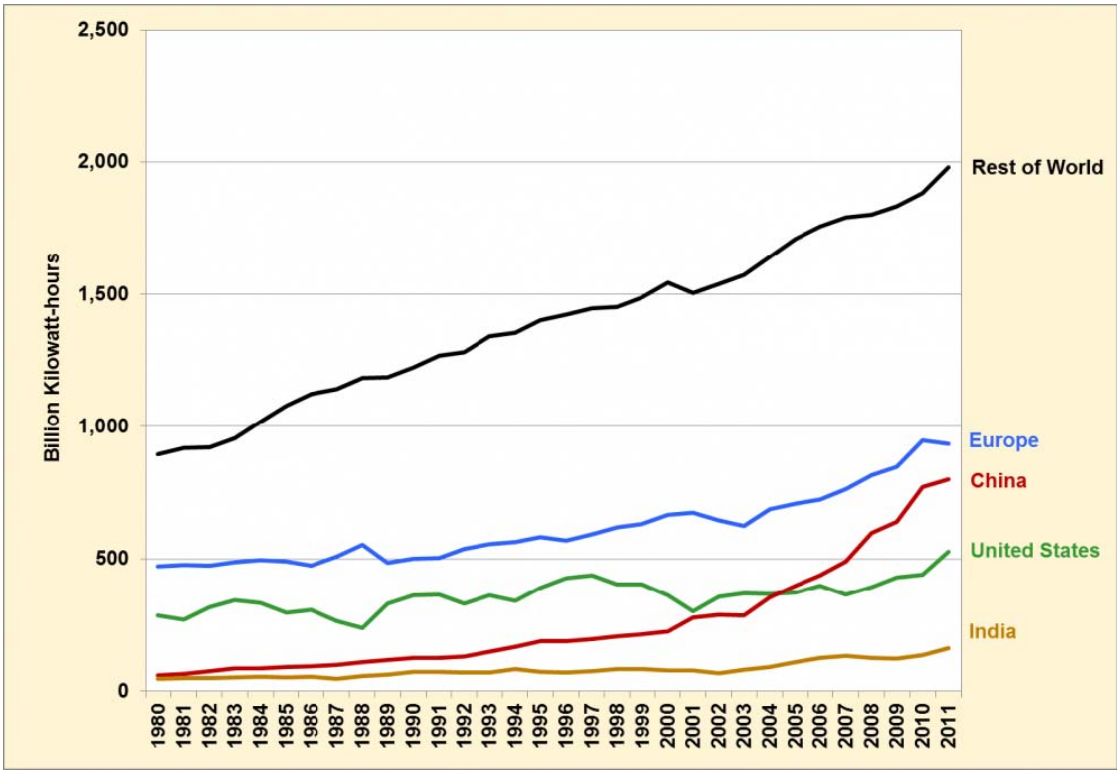
Source:
Energy Information Administration, International Energy Statistics, accessed August 2014.

Fact #840: September 29, 2014

World Renewable Electricity Consumption is Growing

Electricity generated from sources that are renewable – hydroelectric power, bio-fuels, geothermal, solar, wind, wood, waste – have grown 150% from 1980 to 2011 (latest year available). Of the selected countries/regions shown, Europe has consistently had the highest consumption of renewable electricity. However, China has shown dramatic growth in the consumption of renewable electricity, overtaking the United States in 2005 and approaching levels that are closer to those of Europe by 2011. Although the growth in renewable electricity consumption in the U.S. appears modest compared to China and Europe, the U.S. has seen an increase of about 85% from 1980 to 2011.

Renewable Electricity Net Consumption for Selected Countries/Regions, 1980–2011



Note: Renewable electricity is generated from hydroelectric power, bio-fuels, geothermal, solar, wind, wood, and waste.

Supporting Information

Renewable Electricity Net Consumption for Selected Countries/Regions

Year	(Billion Kilowatt-hours)					
	United States	Europe	China	India	Rest of World	World Total
1980	284.69	471.88	57.62	46.54	893.17	1,753.89
1980	284.69	471.88	57.62	46.54	893.17	1,753.89
1981	269.90	477.69	64.85	49.56	917.39	1,779.38
1982	317.54	473.44	73.66	48.31	920.23	1,833.17
1983	341.75	486.57	85.54	49.87	954.37	1,918.09
1984	332.95	495.14	85.93	53.41	1,018.07	1,985.49
1985	295.04	490.97	91.48	50.51	1,078.20	2,006.19
1986	305.51	474.92	93.56	53.31	1,123.88	2,051.17
1987	265.12	508.66	99.20	47.00	1,141.37	2,061.35
1988	238.09	552.43	108.01	57.30	1,184.81	2,140.63
1989	329.16	484.14	117.22	61.52	1,185.25	2,177.28
1990	360.85	499.65	125.14	70.97	1,222.42	2,279.03
1991	362.51	502.87	123.86	72.09	1,267.16	2,328.49
1992	330.58	535.96	130.20	69.28	1,279.78	2,345.79
1993	360.19	556.04	149.22	69.87	1,341.20	2,476.52
1994	340.33	564.59	165.74	82.10	1,354.72	2,507.48
1995	388.90	580.85	187.87	72.40	1,402.48	2,632.50
1996	426.53	569.64	186.58	69.17	1,423.23	2,675.15
1997	437.25	591.59	195.45	74.96	1,446.32	2,745.56
1998	404.00	619.59	205.01	83.31	1,450.92	2,762.81
1999	402.98	630.98	213.72	82.39	1,489.60	2,819.67
2000	361.27	666.16	223.25	76.76	1,544.27	2,871.71

2001	299.64	673.99	277.87	77.03	1,503.92	2,832.45
2002	356.96	643.73	288.44	68.00	1,539.52	2,896.66
2003	369.34	623.91	284.37	80.06	1,571.60	2,929.27
2004	365.72	687.18	353.82	90.28	1,639.63	3,136.63
2005	370.47	707.54	397.67	109.26	1,709.86	3,294.79
2006	398.75	724.56	437.90	123.24	1,757.20	3,441.65
2007	364.98	763.82	488.73	133.17	1,790.22	3,540.93
2008	392.74	816.66	596.79	124.87	1,800.88	3,731.93
2009	429.65	847.55	639.28	123.03	1,831.92	3,871.43
2010	440.23	946.92	770.92	135.27	1,883.72	4,177.06
2011	527.49	933.35	800.97	160.36	1,980.26	4,402.43

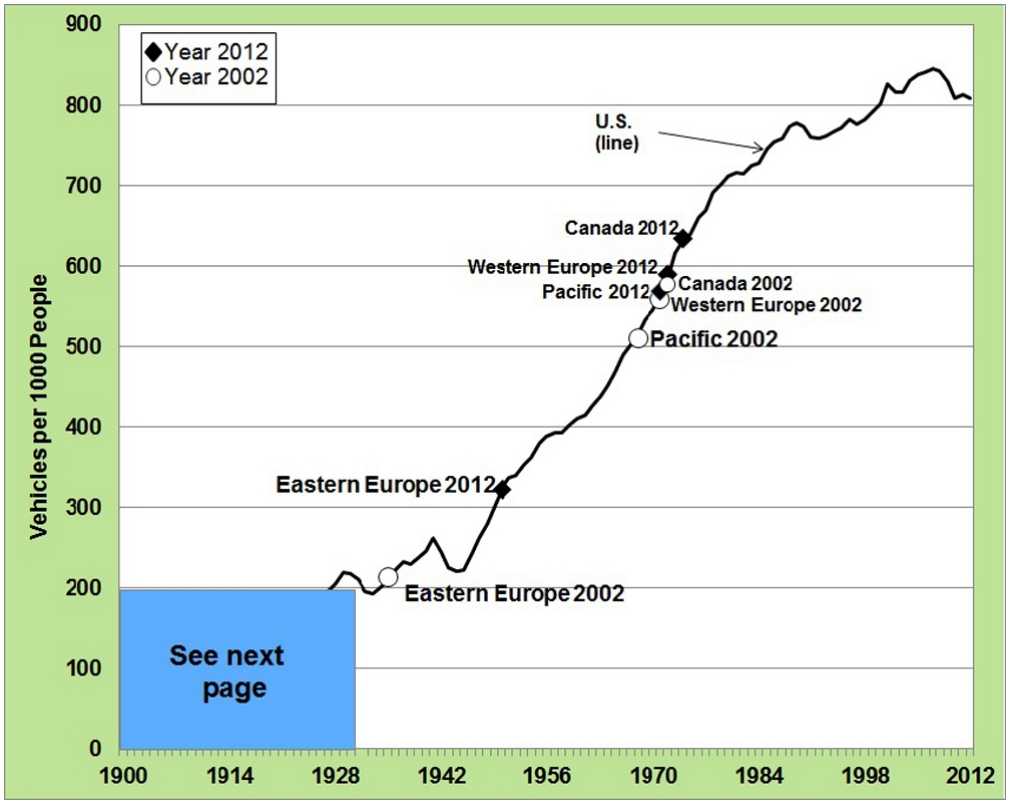
Source:
Energy Information Administration, International Energy Statistics, accessed August 2014.

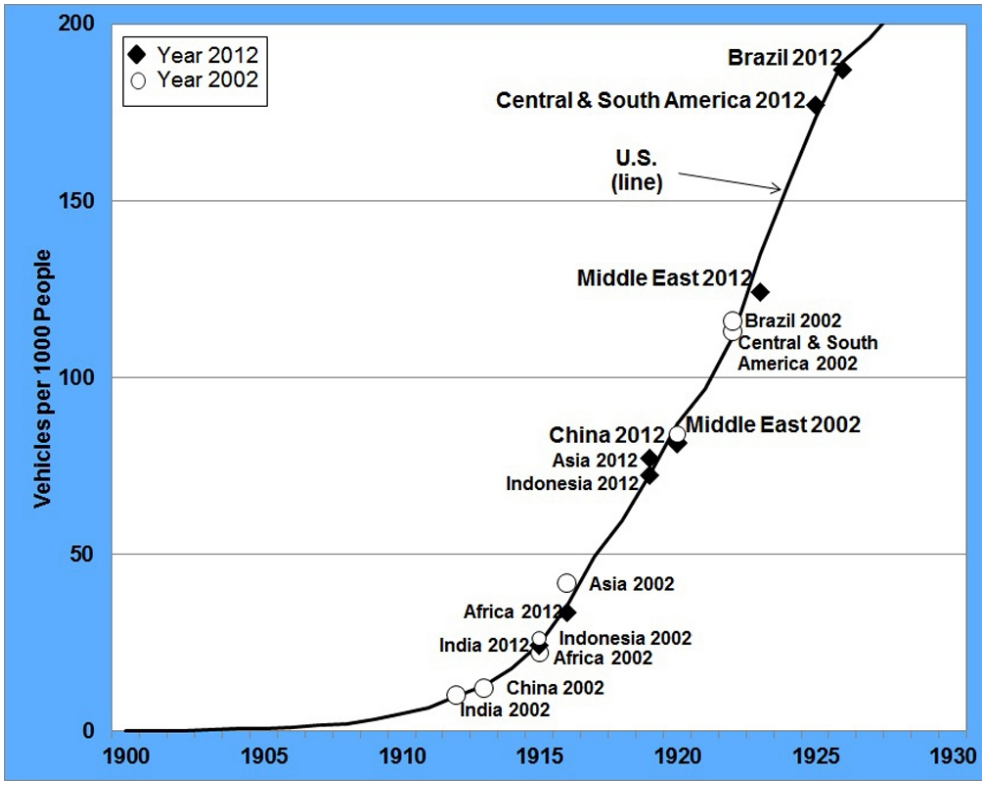
Fact #841: October 6, 2014

Vehicles per Thousand People: United States versus Other World Regions

The graphs below show the number of motor vehicles per thousand people for select countries and regions. The data for the United States are displayed in the line which goes from 1900 to 2012. The points labeled on that line show data for the other countries/regions and how their number of vehicles per thousand people compared to the United States at two different points in time, 2002 and 2012. For instance, the graph shows that in 2002, Eastern Europe's vehicles per thousand people was about equal to the United States in 1935, but by 2012 it was about where the United States was in 1950. The lower part of the graph (1900-1930) is shown enlarged below the first graph.

Vehicles per Thousand People: United States (Over Time) Compared to Other Countries (in 2002 and 2012)





Supporting Information

Vehicles per Thousand People in Other Countries, 2002 and 2012

	Vehicles per 1,000 people	
Country/Region	**2002**	**2012**
Africa	22.5	33.6
Asia, Far East	42.0	77.2
Asia, Middle East	84.0	124.2
Brazil	115.9	187.0
Canada	577.3	634.0
Central & South America	112.9	177.0
China	12.1	81.5
Europe, East	213.9	321.6
Europe, West	558.7	589.4
India	10.1	24.4
Indonesia	26.1	72.4
Pacific	510.2	568.5

Note: Though some countries are listed separately in this table, those countries are also included in the regional total. For instance, China is listed separately, but is also included in the Asia, Far East region.

Vehicles per Thousand People in the United States, 1990–2012

Year	U.S. vehicles per 1,000 people	Year	U.S. vehicles per 1,000 people	Year	U.S. vehicles per 1,000 people	Year	U.S. vehicles per 1,000 people	Year	U.S. vehicles per 1,000 people
1900	0.11	1923	134.90	1946	243.11	1969	533.37	1992	757.96
1901	0.19	1924	154.35	1947	262.56	1970	545.35	1993	761.94
1902	0.29	1925	173.26	1948	280.20	1971	562.45	1994	766.94

1903	0.41	1926	189.10	1949	299.56	1972	585.60	1995	770.99
1904	0.67	1927	195.77	1950	323.71	1973	615.19	1996	781.16
1905	0.94	1928	204.87	1951	337.14	1974	632.32	1997	776.02
1906	1.27	1929	219.31	1952	340.57	1975	640.07	1998	781.20
1907	1.65	1930	217.34	1953	353.67	1976	659.47	1999	790.07
1908	2.24	1931	210.37	1954	361.40	1977	669.03	2000	800.32
1909	3.45	1932	195.38	1955	379.77	1978	690.17	2001	825.81
1910	5.07	1933	192.38	1956	387.58	1979	700.42	2002	815.73
1911	6.81	1934	199.90	1957	392.11	1980	710.71	2003	816.11
1912	9.90	1935	208.61	1958	392.17	1981	715.22	2004	829.94
1913	12.94	1936	222.62	1959	402.83	1982	713.95	2005	837.25
1914	17.79	1937	233.33	1960	410.37	1983	724.30	2006	840.69
1915	24.77	1938	229.65	1961	415.11	1984	728.20	2007	844.54
1916	35.48	1939	236.93	1962	426.06	1985	744.50	2008	841.57
1917	49.57	1940	245.63	1963	438.75	1986	753.33	2009	828.67
1918	59.69	1941	261.57	1964	451.57	1987	758.58	2010	808.43
1919	72.50	1942	244.73	1965	466.90	1988	772.92	2011	812.66
1920	86.78	1943	225.89	1966	489.34	1989	776.99	2012	807.99
1921	96.68	1944	220.23	1967	500.66	1990	773.40		
1922	111.53	1945	221.80	1968	516.49	1991	760.19		

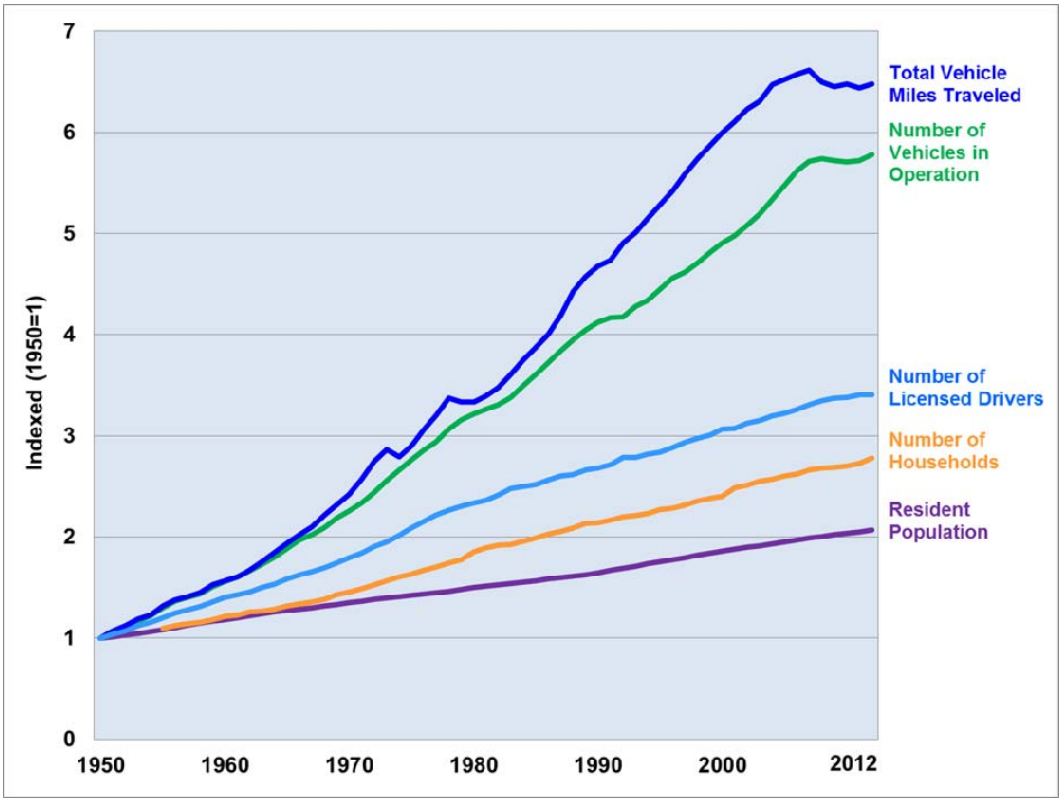
Source (both tables):
Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 33*, ORNL-6990, Oak Ridge, TN, July 2014, Tables 3.5 and 3.6.

Fact #842: October 13, 2014

Vehicles and Vehicle Travel Trends have Changed Since 2008

As the U.S. population has doubled from 1950 to 2012, the number of vehicles has grown nearly 6-fold and vehicle travel even more than that. The number of vehicles and vehicle travel peaked in 2007 and 2008, respectively, and remained at similar levels in 2012. The growth in licensed drivers has not kept the pace with the growth of vehicle miles traveled reflecting that the average driver is driving more miles in 2012 than in 1950. However, the trends have changed for vehicle miles traveled and number of vehicles in operation. Since 2008 the amount of travel and number of vehicles has increased far less quickly than in the previous 50 years.

Population and Vehicle Growth Comparison, 1950–2012



Supporting Information

Population and Vehicle Growth Comparison, 1950–2012

Year	Resident Population	Number of Households	Number of Vehicles in Operation	Total Vehicle Miles Traveled	Number of Licensed Drivers
1950	1.00	1.00	1.00	1.00	1.00
1951	1.01	Not available	1.07	1.07	1.04
1952	1.03	Not available	1.11	1.12	1.07
1953	1.05	Not available	1.17	1.19	1.12
1954	1.07	Not available	1.22	1.23	1.16
1955	1.09	1.10	1.30	1.32	1.20
1956	1.11	1.12	1.36	1.38	1.25
1957	1.13	1.14	1.41	1.41	1.28
1958	1.15	1.16	1.44	1.45	1.31
1959	1.17	1.18	1.51	1.53	1.36
1960	1.19	1.21	1.56	1.57	1.40
1961	1.20	1.23	1.61	1.61	1.43
1962	1.22	1.26	1.66	1.67	1.46
1963	1.24	1.27	1.73	1.76	1.50
1964	1.26	1.29	1.80	1.85	1.54
1965	1.27	1.32	1.89	1.94	1.58
1966	1.29	1.34	1.97	2.02	1.62
1967	1.30	1.36	2.02	2.10	1.66
1968	1.32	1.38	2.09	2.22	1.69
1969	1.33	1.43	2.19	2.32	1.74
1970	1.35	1.46	2.26	2.42	1.79
1971	1.37	1.49	2.34	2.57	1.84

1972	1.38	1.53	2.44	2.75	1.90
1973	1.40	1.57	2.56	2.87	1.95
1974	1.41	1.60	2.66	2.79	2.02
1975	1.42	1.63	2.76	2.90	2.09
1976	1.44	1.67	2.86	3.06	2.16
1977	1.45	1.70	2.95	3.20	2.22
1978	1.47	1.75	3.07	3.37	2.26
1979	1.48	1.78	3.16	3.34	2.30
1980	1.50	1.85	3.21	3.33	2.34
1981	1.51	1.89	3.26	3.39	2.36
1982	1.53	1.92	3.31	3.48	2.42
1983	1.54	1.93	3.38	3.61	2.48
1984	1.56	1.96	3.50	3.75	2.50
1985	1.57	1.99	3.61	3.87	2.52
1986	1.58	2.03	3.73	4.00	2.56
1987	1.60	2.05	3.84	4.19	2.60
1988	1.61	2.09	3.95	4.42	2.62
1989	1.63	2.13	4.04	4.58	2.66
1990	1.65	2.14	4.12	4.68	2.69
1991	1.67	2.17	4.17	4.74	2.72
1992	1.69	2.20	4.17	4.90	2.78
1993	1.71	2.21	4.28	5.01	2.78
1994	1.73	2.23	4.34	5.14	2.82
1995	1.76	2.27	4.45	5.29	2.84
1996	1.78	2.29	4.56	5.42	2.89
1997	1.80	2.32	4.62	5.59	2.94
1998	1.82	2.35	4.71	5.74	2.97

1999	1.84	2.38	4.82	5.87	3.01
2000	1.86	2.40	4.90	5.99	3.07
2001	1.88	2.48	4.98	6.10	3.08
2002	1.90	2.51	5.08	6.23	3.12
2003	1.91	2.55	5.19	6.31	3.15
2004	1.93	2.57	5.34	6.47	3.20
2005	1.95	2.60	5.48	6.52	3.22
2006	1.97	2.63	5.62	6.58	3.26
2007	1.99	2.66	5.72	6.61	3.31
2008	2.01	2.68	5.74	6.50	3.35
2009	2.02	2.69	5.72	6.45	3.37
2010	2.04	2.70	5.71	6.48	3.38
2011	2.05	2.72	5.72	6.44	3.41
2012	2.07	2.78	5.78	6.48	3.41

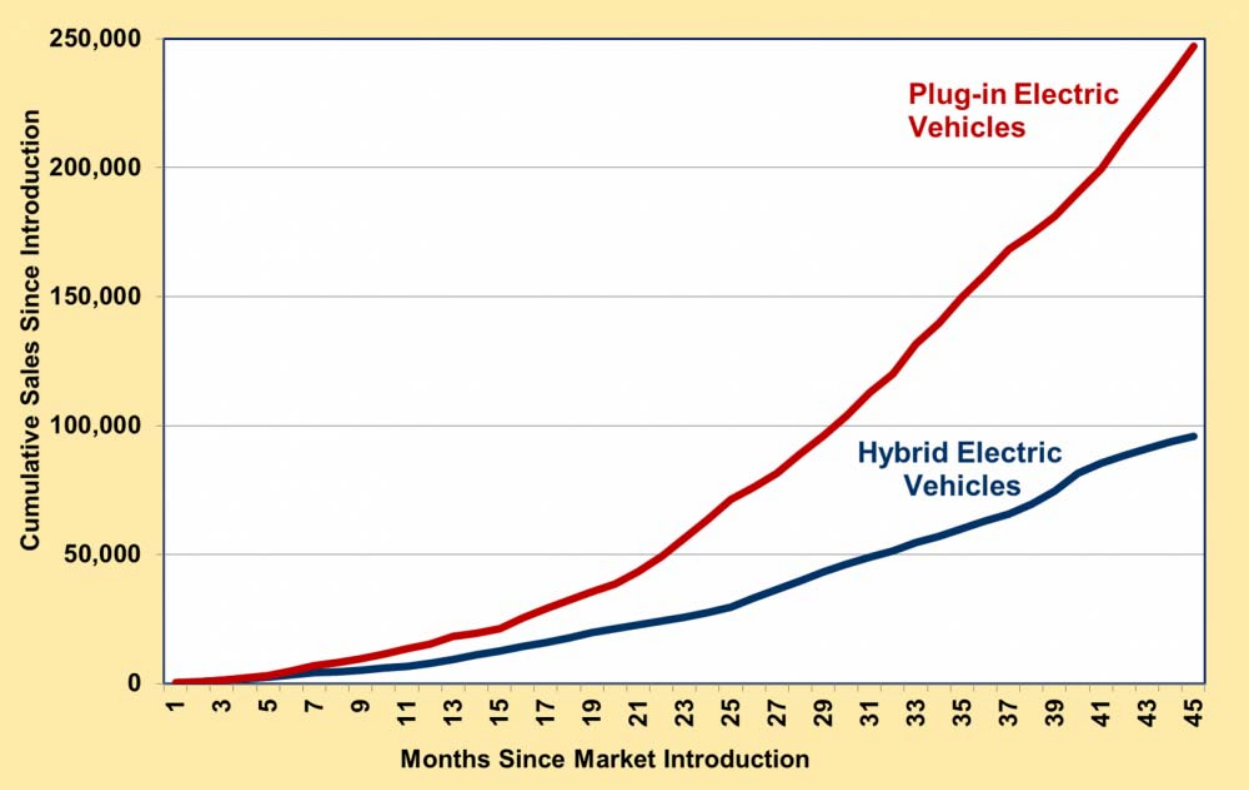
Source:
Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 33*, July 2014, ORNL-6990, Table 8.1.

Fact #843: October 20, 2014

Cumulative Plug-in Electric Vehicle Sales are Two and a Half Times Higher than Hybrid Electric Vehicle Sales in the First 45 Months since Market Introduction

The first hybrid electric vehicle was introduced in December 1999 and for the next 45 months (through August 2003) there were a total of 95,778 hybrid vehicles sold. The first mass-marketed plug-in electric vehicles arrived in December 2010. By August 2014 (45 months later), cumulative sales of plug-in electric vehicles reached 247,188; that is two and one-half times more than hybrids at the same point in time after market introduction. It is noteworthy that the higher sales of plug-in electric vehicles came during a period of lower overall light vehicle sales. Following the economic recession, light vehicle sales reached just 12.5 million for 2011 and recovered to 15.3 million by 2013. During the 45 month introduction period of hybrid vehicles (December 1999-August 2003) overall light vehicle sales were about 17 million per year.

Cumulative Sales for Plug-In Electric Vehicles and Hybrid Electric Vehicles in the First 45 Months



Notes:

- Month 1 for hybrid electric vehicle introduction is December 1999 and month 45 is August 2003.
- Month 1 for plug-in electric vehicle introduction is December 2010 and month 45 is August 2014.
- Plug-in Electric Vehicles include plug-in hybrid vehicles and all-electric vehicles.
- Hybrid Electric Vehicles derive all of their energy from gasoline and cannot be plugged into any outlet.

Supporting Information

Cumulative Sales of Plug-In Electric Vehicles and Hybrid Electric Vehicles since their Market Introduction

Months since Market Introduction	Plug-In Electric Vehicle Cumulative Sales	Hybrid Electric Vehicle Cumulative Sales
1	345	17
2	769	568
3	1,133	1,129
4	2,039	1,800
5	3,105	2,460
6	4,736	3,437
7	7,005	4,158
8	8,062	4,666
9	9,727	5,228
10	11,481	5,904
11	13,455	6,667
12	15,367	7,947
13	18,108	9,367
14	19,535	10,959
15	21,197	12,497
16	25,358	14,299
17	28,953	15,744
18	32,331	17,773
19	35,649	19,746
20	38,665	21,106
21	43,409	22,722
22	49,218	24,135

23	56,450	25,728
24	63,608	27,550
25	71,277	29,649
26	76,003	33,306
27	81,458	36,375
28	89,090	39,805
29	96,228	43,356
30	103,982	46,370
31	112,724	49,018
32	120,166	51,384
33	131,529	54,527
34	139,656	56,972
35	149,756	59,919
36	158,589	62,895
37	168,379	65,691
38	174,284	69,477
39	181,329	74,744
40	190,501	81,636
41	199,406	85,254
42	211,859	88,431
43	223,352	91,071
44	234,785	93,614
45	247,188	95,778

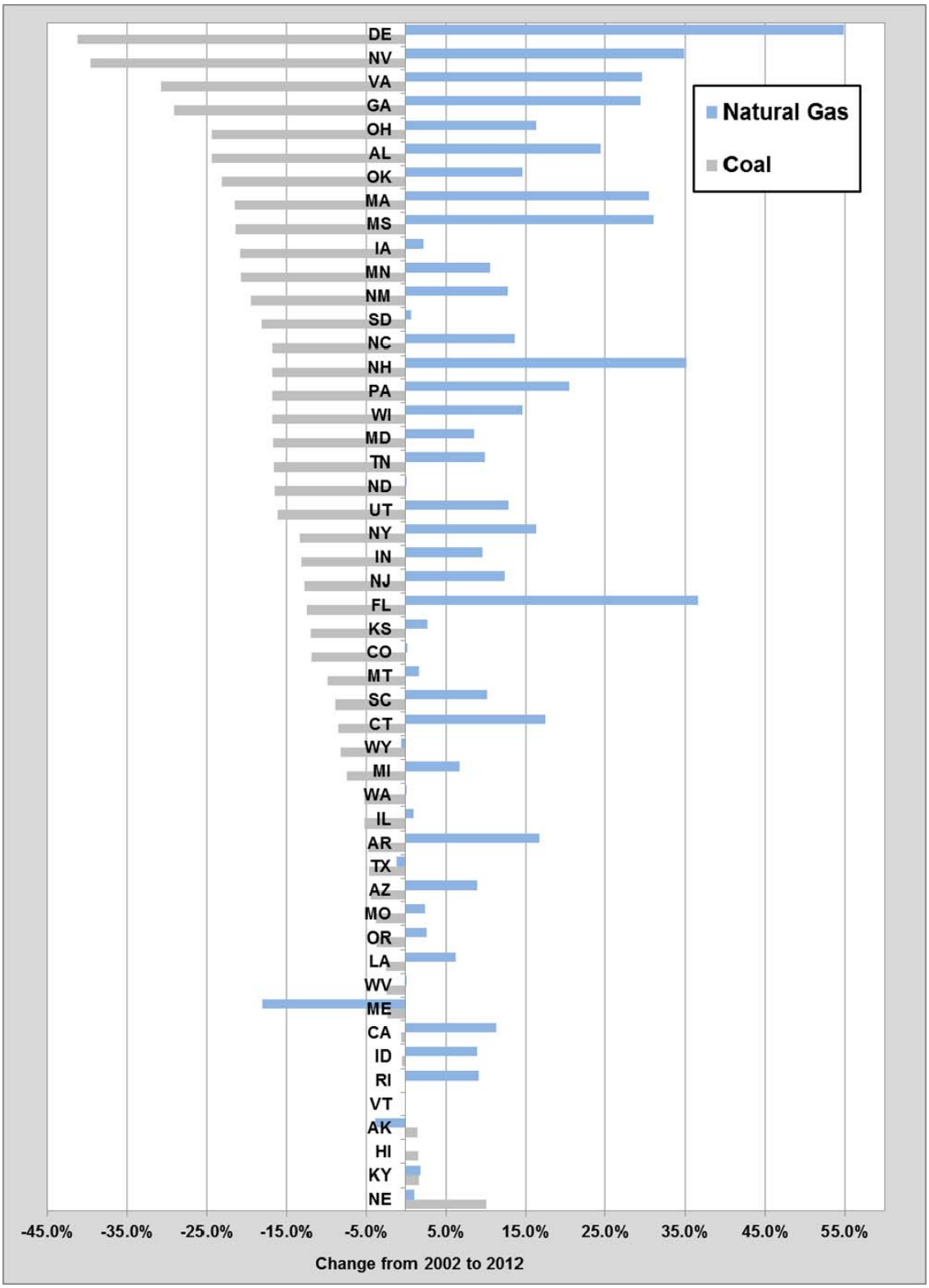
Source:
Provided by Yan (Joann) Zhou, Argonne National Laboratory, Light Duty Electric Drive Vehicles Monthly Sales Updates
Total annual light vehicle sales data in the text are from the *Transportation Energy Data Book: Edition 33*. Table 3.11.

Fact #844: October 27, 2014

Electricity Generated from Coal has Declined while Generation from Natural Gas has Grown

From 2002 to 2012, most states have reduced their reliance on coal for electricity generation. The figure below shows the percent change in electricity generated by coal and natural gas for each state. All but six states show a decline in the use of coal for electricity production with Delaware and Nevada reducing their use of coal by about 40%. Perhaps even more significant are the heavily populated states of Virginia, Georgia and Ohio which show declining coal use of around 25% to 30%. Many of the states that have reduced their reliance on coal are now generating more of their electricity from natural gas. Delaware's 41.2% coal decrease is offset by an increase of 54.9% in the use of natural gas for electricity generation. In fact, there were only four states (Maine, Alaska, Texas, and Wyoming) that show a decline in electricity generated with natural gas.

Change in the Use of Coal and Natural Gas for Electricity Generation – 2002 Compared to 2012



Supporting Information

Change in the Use of Coal and Natural Gas for Electricity Generation – 2002 Compared to 2012

State Name	State Abbreviation	Change from 2002 to 2012	
		Coal	Natural Gas
Alaska	AK	1.4%	-3.9%
Alabama	AL	-24.4%	24.5%
Arkansas	AR	-4.8%	16.7%
Arizona	AZ	-4.4%	8.9%
California	CA	-0.6%	11.3%
Colorado	CO	-11.9%	0.2%
Connecticut	CT	-8.5%	17.5%
Delaware	DE	-41.2%	54.9%
Florida	FL	-12.4%	36.6%
Georgia	GA	-29.0%	29.3%
Hawaii	HI	1.4%	0.0%
Iowa	IA	-20.8%	2.1%
Idaho	ID	-0.4%	8.9%
Illinois	IL	-5.2%	0.8%
Indiana	IN	-13.1%	9.6%
Kansas	KS	-12.0%	2.6%
Kentucky	KY	1.6%	1.8%
Louisiana	LA	-2.5%	6.2%
Massachusetts	MA	-21.5%	30.4%
Maryland	MD	-16.7%	8.5%
Maine	ME	-2.4%	-18.0%

Michigan	MI	-7.5%	6.7%
Minnesota	MN	-20.7%	10.6%
Missouri	MO	-3.8%	2.4%
Mississippi	MS	-21.4%	31.1%
Montana	MT	-9.9%	1.6%
North Carolina	NC	-16.8%	13.7%
North Dakota	ND	-16.5%	0.0%
Nebraska	NE	10.0%	0.9%
New Hampshire	NH	-16.8%	35.2%
New Jersey	NJ	-12.7%	12.4%
New Mexico	NM	-19.5%	12.8%
Nevada	NV	-39.6%	34.9%
New York	NY	-13.3%	16.3%
Ohio	OH	-24.4%	16.3%
Oklahoma	OK	-23.2%	14.5%
Oregon	OR	-3.7%	2.5%
Pennsylvania	PA	-16.7%	20.5%
Rhode Island	RI	0.0%	9.1%
South Carolina	SC	-8.9%	10.2%
South Dakota	SD	-18.1%	0.7%
Tennessee	TN	-16.5%	9.9%
Texas	TX	-4.7%	-1.2%
Utah	UT	-16.0%	12.9%
Virginia	VA	-30.7%	29.5%
Vermont	VT	0.0%	0.0%

Washington	WA	-5.2%	0.1%
Wisconsin	WI	-16.7%	14.6%
West Virginia	WV	-2.4%	0.1%
Wyoming	WY	-8.2%	-0.6%

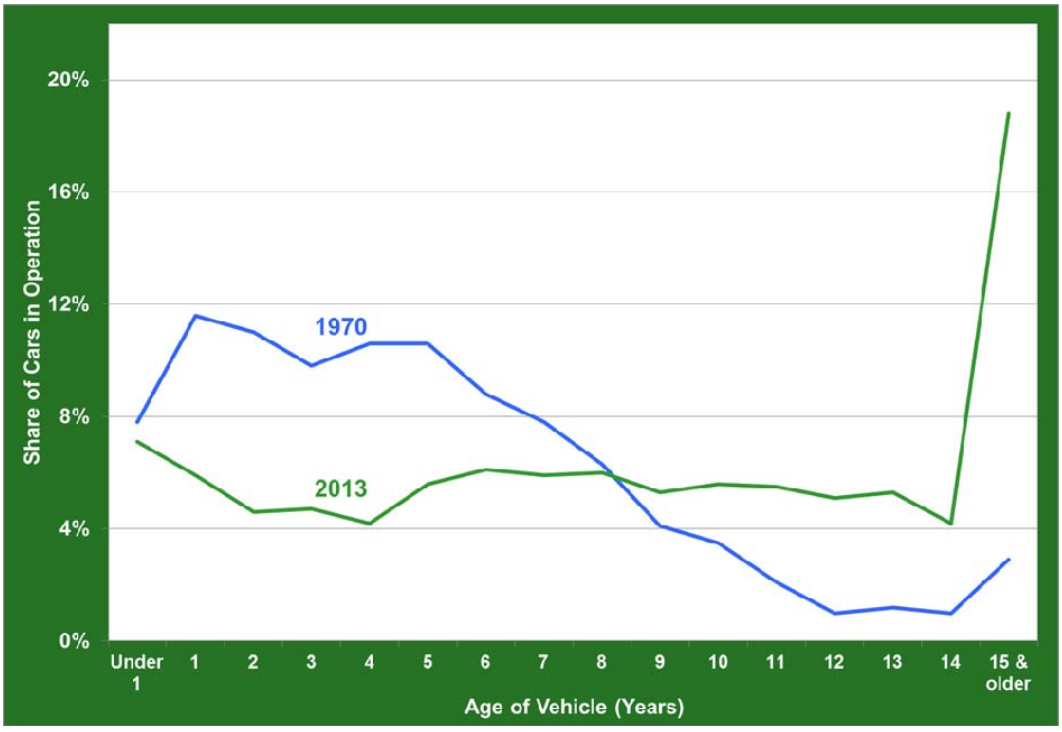
Source:
U.S. Department of Energy, Energy Information Administration, Electricity Detailed State Data, accessed September 17, 2014.

Fact #845 November 3, 2014

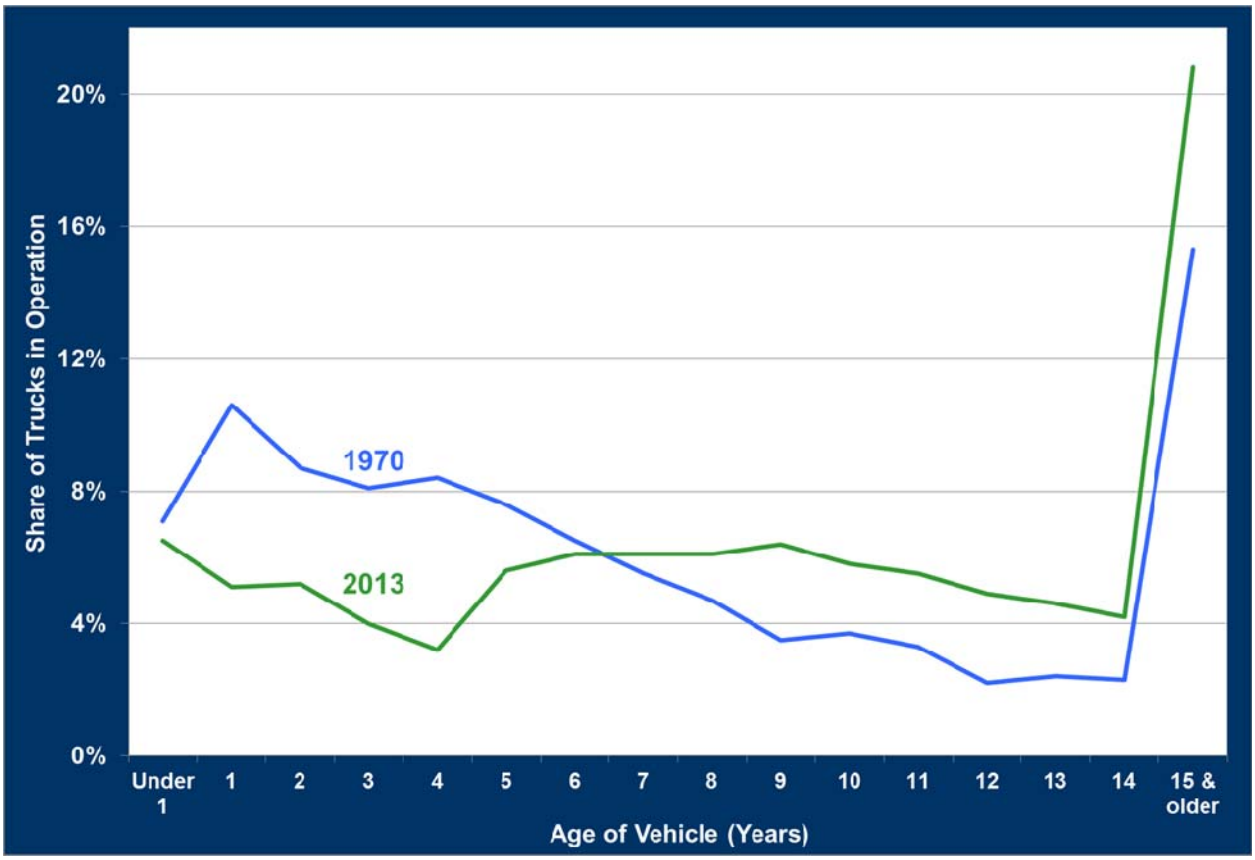
From 1970 to 2013 the Share of Older Vehicles in Operation has Increased

In 1970 only 3% of the cars in operation were 15 years old or older. With cars lasting much longer today, 19% of cars in operation in 2013 were that same category. The 15 years old and older category cannot be separated into individual years, thus the cumulative effect of all vehicles in that category causes a sharp rise in the data. Interestingly, the 1970 data and the 2013 data on cars in operation show that about 8% of cars were under one year old (green graph). The truck data for 1970 and 2013 show about 7% of trucks were under one year old - about the same percentage in both years. But the share of trucks 15 years or older is more than 20% in 2013, while only 15% in 1970. New vehicle acquisition was high in the 1960's, evidenced by the large number of newer cars and trucks in operation in 1970.

Share of Cars in Operation by Age, 1970 and 2013



Share of Trucks in Operation by Age, 1970 and 2013



Supporting Information

Share of Cars and Trucks in Operation by Age, 1970 and 2013

Age (Years)	Cars		Trucks	
	1970	2013	1970	2013
Under 1	8%	7%	7.1%	6.5%
1	12%	6%	10.6%	5.1%
2	11%	5%	8.7%	5.2%
3	10%	5%	8.1%	4.0%
4	11%	4%	8.4%	3.2%
5	11%	6%	7.6%	5.6%
6	9%	6%	6.5%	6.1%
7	8%	6%	5.5%	6.1%
8	6%	6%	4.7%	6.1%
9	4%	5%	3.5%	6.4%
10	4%	6%	3.7%	5.8%
11	2%	6%	3.3%	5.5%
12	1%	5%	2.2%	4.9%
13	1%	5%	2.4%	4.6%
14	1%	4%	2.3%	4.2%
15 & older	3%	19%	15.3%	20.8%

Note: Under 1 category includes cars from model years 1971 and 1970 sold prior to July 1, 1970. For 2013, cars sold prior to December 31, 2013 which were model year 2013, 2014 or 2015 were included. Trucks include light trucks (i.e., pickups, vans, sport-utility vehicles) as well as medium and heavy trucks.

Source:
Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 33*, July 2014, ORNL-6990, Tables 3.8 and 3.9.

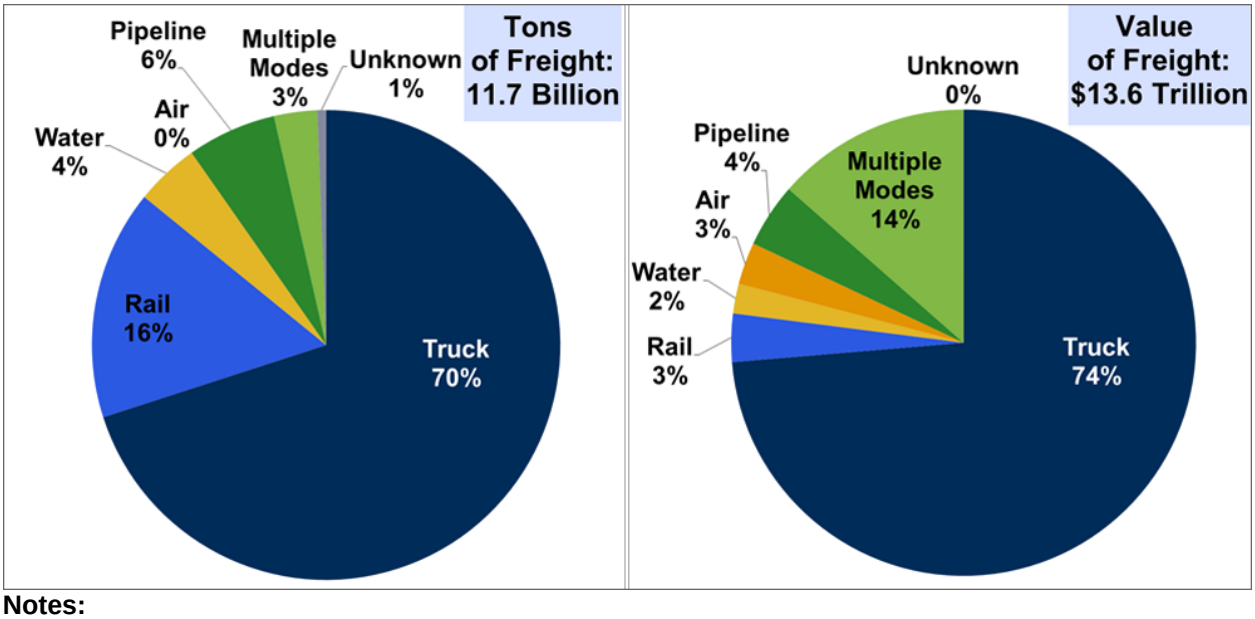
Fact #846: November 10, 2014

Trucks Move 70% of All Freight by Weight and 74% of Freight by Value

According to the preliminary 2012 Commodity Flow Survey (CFS) data, trucks transport the vast majority of freight by both weight and value. The two pie charts below show the share of freight moved by each transportation mode by weight (left) and by value (right). By weight, rail transports 16% of the freight but only 3% by value because rail is often used to haul bulk commodities like coal and grains that are h

eavy but low value. Conversely, air transport carries just 0.04% (rounds to 0% in the pie chart) of the freight by weight but 3% of the freight by value because lightweight, high value commodities are often shipped by air.

Weight and Value of Freight Moved in the United States, 2012



Notes:

- Air transport includes truck and air.
- The CFS data for pipeline exclude most shipments of crude oil.
- Multiple modes includes data for parcel, U.S. Postal Service, or courier; truck and rail; truck and water; rail and water; and other multiple modes.

Supporting Information

Weight and Value of Freight Moved in the United States, 2012

Mode	Weight (Million Tons)	Share of Tons	Value (Billion 2012 Dollars)	Share of Dollars
Truck	8,190.1	70%	10,038.1	74%
Rail	1,851.3	16%	455.1	3%
Water	510.7	4%	280.9	2%
Air	4.7	0%	397.4	3%
Pipeline	720.1	6%	607.2	4%
Multiple Modes	347.8	3%	1,844.2	14%
Unknown	70.9	1%	2.0	0%
Total	11,695.6	100%	13,625.1	100%

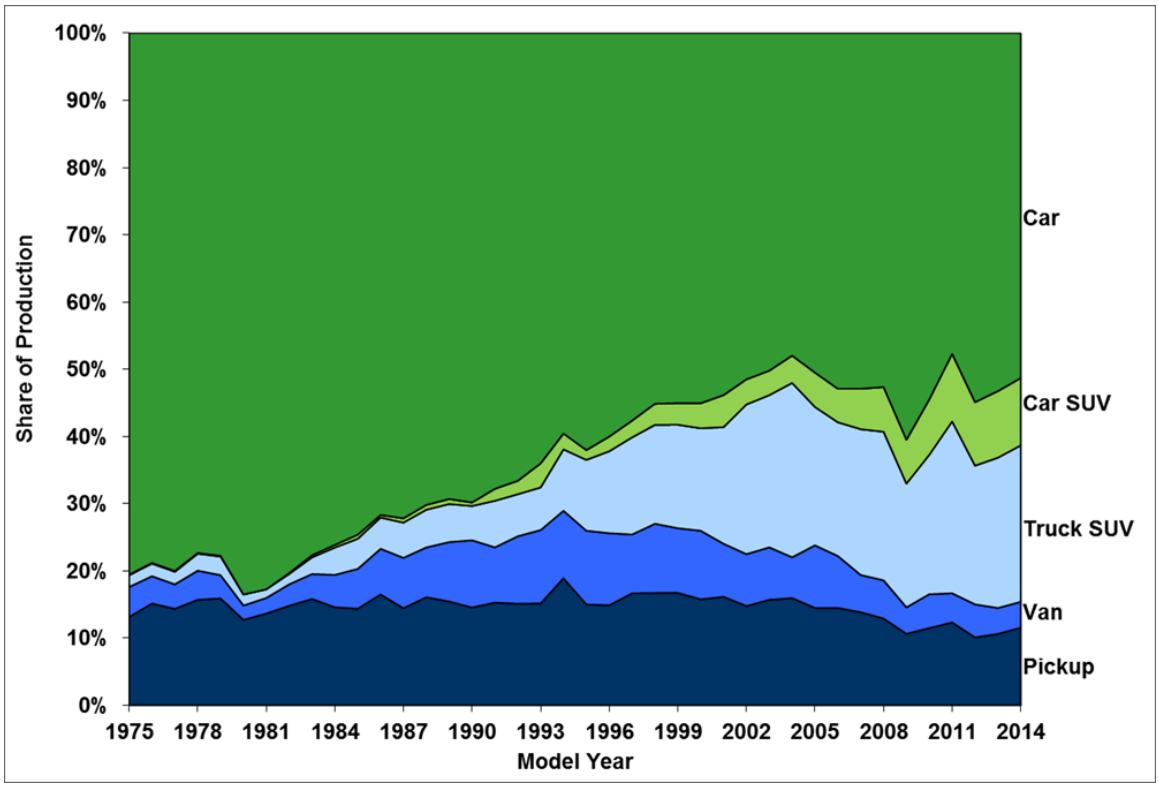
Source:
U.S. Department of Transportation, Bureau of Transportation Statistics, Commodity Flow Survey Preliminary Tables, December 2013.

Fact #847: November 17, 2014

Cars were Over 50% of Light Vehicle Production in 2014

In 1975, cars were just over 80% of light vehicle production. From the early 1980s to 2005, light trucks were an increasing share of the light vehicles produced. The share of sport utility vehicles (SUVs) has grown from about 6% of production in 1990 to one-third of the production in 2014 (counting both car SUVs and truck SUVs). The share of vans and pickups has generally declined since the mid-1990s.

Shares of Light Vehicle Production by Type, 1975–2014



Note: Car SUVs are those SUVs that must meet the car greenhouse gas emissions and corporate average fuel economy (CAFE) standards that were set in 2012 (Federal Register, Vol. 77, No. 199, Monday, October 15, 2012). Generally, they are two-wheel drive SUVs with a gross vehicle weight rating less than 6,000 lbs.

Supporting Information

Shares of Light Vehicle Production by Type, 1975–2014

Model Year	Car	Car SUV	Pickup	Van	Truck SUV
1975	80.6%	0.1%	13.1%	4.5%	1.7%
1976	78.8%	0.1%	15.1%	4.1%	1.9%
1977	80.0%	0.1%	14.3%	3.6%	1.9%
1978	77.3%	0.1%	15.7%	4.3%	2.5%
1979	77.8%	0.1%	15.9%	3.5%	2.8%
1980	83.5%	0.0%	12.7%	2.1%	1.6%
1981	82.7%	0.0%	13.6%	2.3%	1.3%
1982	80.3%	0.1%	14.8%	3.2%	1.5%
1983	77.7%	0.3%	15.8%	3.7%	2.5%
1984	76.1%	0.4%	14.6%	4.8%	4.1%
1985	74.6%	0.6%	14.4%	5.9%	4.5%
1986	71.7%	0.4%	16.5%	6.8%	4.6%
1987	72.2%	0.6%	14.4%	7.5%	5.2%
1988	70.2%	0.7%	16.1%	7.4%	5.6%
1989	69.3%	0.7%	15.4%	8.8%	5.7%
1990	69.8%	0.5%	14.5%	10.0%	5.1%
1991	67.8%	1.8%	15.3%	8.2%	6.9%
1992	66.6%	2.0%	15.1%	10.0%	6.2%
1993	64.0%	3.6%	15.2%	10.9%	6.3%
1994	59.6%	2.3%	18.9%	10.0%	9.1%
1995	62.0%	1.5%	15.0%	11.0%	10.5%
1996	60.0%	2.2%	14.9%	10.7%	12.2%
1997	57.6%	2.5%	16.7%	8.8%	14.5%

1998	55.1%	3.1%	16.7%	10.3%	14.7%
1999	55.1%	3.2%	16.7%	9.6%	15.4%
2000	55.1%	3.7%	15.8%	10.2%	15.2%
2001	53.9%	4.8%	16.1%	7.9%	17.3%
2002	51.5%	3.7%	14.8%	7.7%	22.3%
2003	50.2%	3.6%	15.7%	7.8%	22.6%
2004	48.0%	4.1%	15.9%	6.1%	25.9%
2005	50.5%	5.1%	14.5%	9.3%	20.6%
2006	52.9%	5.0%	14.5%	7.7%	19.9%
2007	52.9%	6.0%	13.8%	5.5%	21.7%
2008	52.7%	6.6%	12.9%	5.7%	22.1%
2009	60.5%	6.5%	10.6%	4.0%	18.4%
2010	54.5%	8.2%	11.5%	5.0%	20.8%
2011	47.7%	10.1%	12.3%	4.3%	25.6%
2012	54.9%	9.4%	10.1%	4.9%	20.6%
2013	53.3%	9.9%	10.6%	3.8%	22.4%
2014	51.3%	10.0%	11.5%	3.9%	23.3%

Note: 2014 estimates are based on preliminary production data.

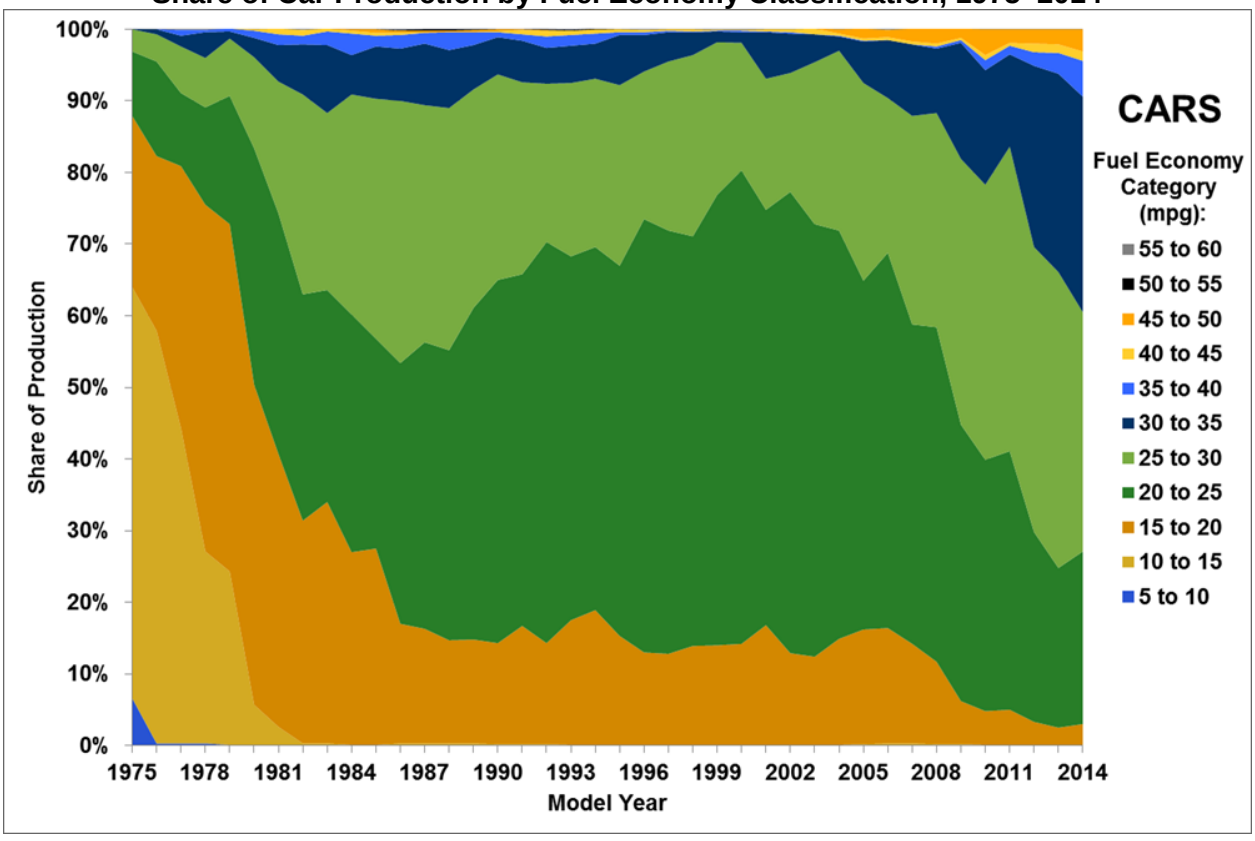
Source:
U. S. Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014*, EPA-420-R-14-023, October 2014.

Fact #848: November 24, 2014

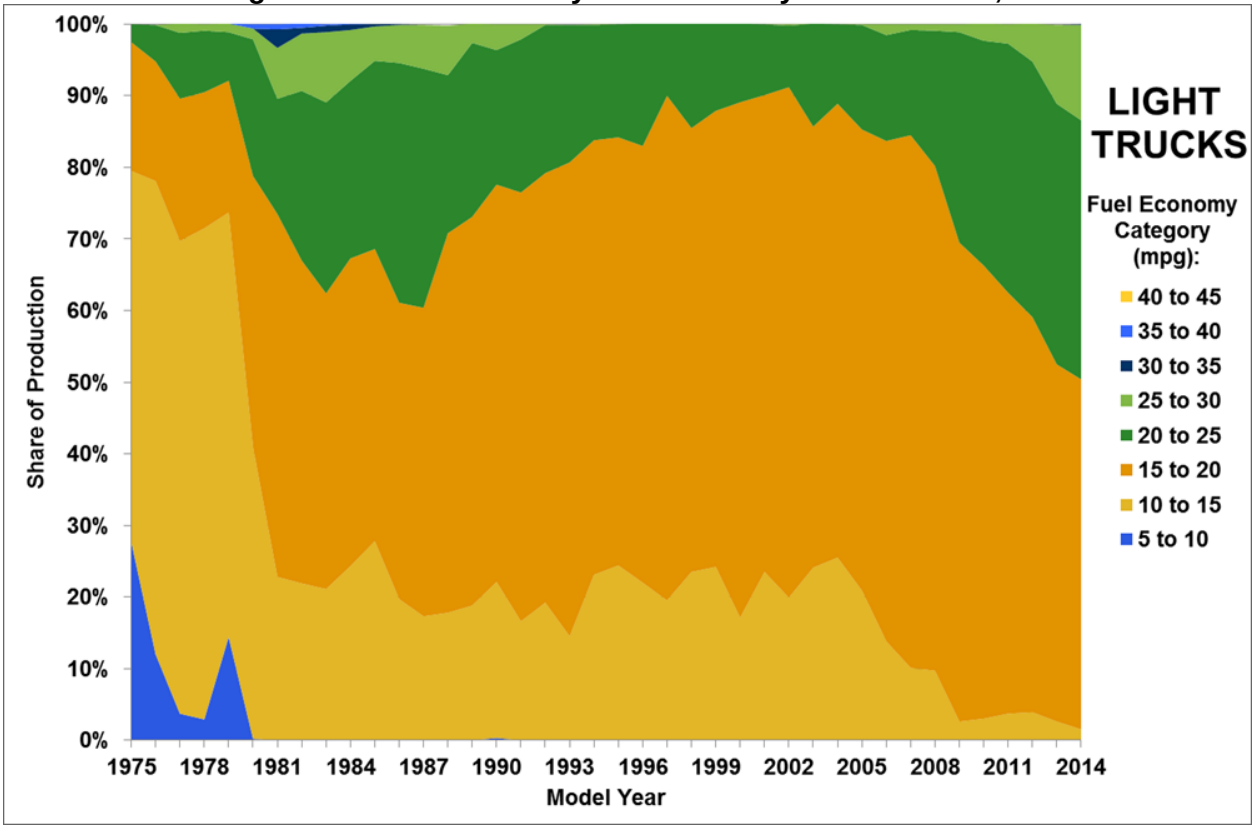
Nearly Three-Fourths of New Cars have Fuel Economy above 25 Miles per Gallon

In 1975, only three percent of all new cars had a fuel economy above 25 miles per gallon (mpg), but by 2014, 73% did. Great improvements were made in the fuel economy of cars from 1975 to 1985, so that by 1985 most of the cars produced had a fuel economy above 20 mpg. Light truck fuel economy showed an improvement during that same time period, so that by 1985 most light trucks produced had a fuel economy above 15 mpg. Due to more recent improvements, 40% of cars produced in 2014 have a fuel economy above 30 mpg and half of light trucks were over 20 mpg.

Share of Car Production by Fuel Economy Classification, 1975–2014



Share of Light Truck Production by Fuel Economy Classification, 1975–2014



Supporting Information

Share of Car Production by Fuel Economy Classification, 1975–2014

Model Year	5 to 10 mpg	10 to 15 mpg	15 to 20 mpg	20 to 25 mpg	25 to 30 mpg	30 to 35 mpg	35 to 40 mpg	40 to 45 mpg	45 to 50 mpg	50 to 55 mpg	55 to 60 mpg
1975	6.6%	57.4%	23.9%	9.0%	3.1%						
1976	0.3%	57.6%	24.4%	13.2%	3.8%	0.7%					
1977	0.3%	44.0%	36.6%	10.2%	6.5%	1.5%	0.8%				
1978	0.3%	26.8%	48.4%	13.6%	6.9%	3.6%	0.3%				
1979	0.1%	24.2%	48.5%	17.9%	8.0%	1.0%	0.4%				
1980	0.0%	5.7%	44.7%	33.0%	12.7%	2.7%	1.0%	0.2%			
1981	0.0%	2.6%	38.1%	33.6%	18.4%	5.1%	1.5%	0.8%			
1982	0.0%	0.3%	31.1%	31.6%	27.9%	7.0%	1.2%	0.8%			
1983	0.0%	0.3%	33.7%	29.6%	24.7%	9.5%	1.9%	0.4%	0.0%		
1984	0.0%	0.1%	26.9%	33.2%	30.7%	5.5%	3.0%	0.4%	0.2%		
1985	0.0%	0.1%	27.4%	29.3%	33.5%	7.3%	1.5%	0.4%	0.5%		

1986	0.0%	0.3%	16.7%	36.4%	36.6%	7.3%	1.9%	0.3%	0.3%	0.1%	0.2%
1987	0.0%	0.3%	16.0%	40.0%	33.1%	8.6%	1.5%	0.0%	0.3%	0.2%	
1988	0.0%	0.3%	14.4%	40.5%	33.8%	8.1%	2.5%	0.0%	0.2%	0.2%	
1989	0.0%	0.3%	14.5%	46.3%	30.5%	6.2%	1.8%	0.0%	0.3%	0.1%	
1990	0.0%	0.2%	14.1%	50.7%	28.7%	5.2%	0.7%	0.1%	0.3%	0.0%	
1991	0.0%	0.2%	16.5%	49.1%	26.8%	5.8%	0.9%	0.6%	0.1%	0.0%	
1992	0.0%	0.2%	14.1%	56.0%	22.1%	5.0%	1.6%	0.8%	0.1%	0.1%	
1993	0.0%	0.1%	17.4%	50.8%	24.2%	5.2%	1.5%	0.6%	0.0%	0.1%	
1994		0.1%	18.8%	50.7%	23.5%	4.9%	1.4%	0.6%	0.0%	0.1%	
1995	0.0%	0.1%	15.2%	51.7%	25.2%	7.0%	0.4%	0.4%	0.0%		
1996		0.1%	12.9%	60.5%	20.6%	5.1%	0.4%	0.3%			
1997		0.1%	12.7%	59.1%	23.6%	4.1%	0.2%	0.2%			
1998		0.1%	13.8%	57.2%	25.3%	3.2%	0.1%	0.3%			
1999		0.0%	14.0%	62.9%	21.3%	1.5%	0.1%	0.1%			
2000	0.0%	0.0%	14.2%	66.1%	17.8%	1.5%	0.2%	0.1%			0.1%
2001	0.0%	0.0%	16.8%	58.0%	18.3%	6.5%	0.1%	0.3%	0.0%		0.0%
2002		0.1%	12.8%	64.4%	16.6%	5.5%	0.2%	0.4%	0.0%		0.0%
2003	0.0%	0.1%	12.3%	60.4%	22.6%	3.9%	0.0%	0.8%	0.0%	0.0%	
2004		0.1%	14.8%	57.0%	25.1%	2.0%	0.1%	0.3%	0.6%	0.0%	
2005		0.2%	16.0%	48.7%	27.6%	5.8%	0.1%	0.3%	1.4%	0.0%	
2006		0.3%	16.1%	52.4%	21.6%	8.1%	0.0%	0.4%	1.0%	0.0%	
2007		0.3%	13.9%	44.6%	29.1%	10.0%		0.4%	1.8%		
2008		0.2%	11.5%	46.7%	29.9%	9.0%	0.3%	0.4%	2.1%		
2009		0.2%	6.0%	38.6%	37.1%	16.2%	0.4%	0.3%	1.3%		
2010		0.1%	4.7%	35.1%	38.4%	16.0%	1.4%	0.7%	3.6%		
2011		0.1%	4.9%	36.1%	42.5%	12.9%	1.2%	0.4%	1.9%		
2012		0.1%	3.2%	26.5%	39.8%	25.3%	1.9%	1.2%	2.0%		
2013		0.1%	2.4%	22.3%	41.3%	27.7%	2.9%	1.2%	2.1%		
2014		0.1%	2.9%	24.1%	33.4%	30.1%	5.0%	1.3%	3.1%		

Share of Light Truck Production by Fuel Economy Classification, 1975–2014

Model Year	5 to 10 mpg	10 to 15 mpg	15 to 20 mpg	20 to 25 mpg	25 to 30 mpg	30 to 35 mpg	35 to 40 mpg	40 to 45 mpg	45 to 50 mpg	50 to 55 mpg	55 to 60 mpg
1975	27.7%	51.8%	18.0%	2.5%							
1976	12.0%	66.1%	16.7%	5.1%							
1977	3.7%	66.0%	19.9%	9.2%	1.3%						
1978	2.9%	68.6%	19.0%	8.6%	0.9%						
1979	14.4%	59.3%	18.4%	6.8%	1.2%						
1980	0.2%	40.7%	37.9%	19.1%	1.5%		0.6%				
1981	0.0%	22.8%	50.7%	16.1%	7.1%	2.6%	0.7%				
1982		21.9%	45.1%	23.7%	8.0%	0.8%	0.6%				
1983		21.1%	41.3%	26.7%	9.8%	0.9%	0.2%				
1984	0.1%	24.2%	43.0%	24.8%	7.1%	0.8%	0.1%				
1985	0.0%	27.8%	40.8%	26.3%	4.8%	0.3%	0.0%				
1986		19.7%	41.4%	33.5%	5.3%	0.1%	0.0%				
1987		17.3%	43.1%	33.4%	6.1%	0.0%	0.0%				
1988	0.0%	17.8%	53.0%	22.1%	6.9%						
1989		18.8%	54.3%	24.3%	2.7%						
1990	0.3%	21.8%	55.5%	18.8%	3.6%						
1991		16.6%	59.9%	21.4%	2.1%						
1992		19.2%	60.0%	20.7%	0.1%						
1993		14.5%	66.2%	19.2%	0.0%						
1994		23.1%	60.7%	16.1%	0.1%						
1995		24.4%	59.8%	15.8%	0.0%						
1996		22.0%	61.0%	17.1%	0.0%						
1997		19.5%	70.5%	10.1%	0.0%						
1998		23.5%	62.0%	14.6%	0.0%						
1999		24.2%	63.7%	12.2%							
2000		17.1%	72.0%	11.0%							
2001		23.5%	66.6%	9.9%							
2002		19.9%	71.3%	8.6%	0.2%						
2003		24.1%	61.6%	14.4%							
2004		25.5%	63.4%	11.1%							
2005	0.0%	20.9%	64.4%	14.6%	0.1%						

2006	0.0%	13.8%	69.9%	14.8%	1.5%						
2007		10.1%	74.4%	14.7%	0.8%						
2008		9.7%	70.5%	18.9%	0.9%						
2009		2.6%	66.9%	29.4%	1.1%						
2010		3.0%	63.3%	31.4%	2.4%						
2011		3.7%	58.8%	34.8%	2.7%						
2012		3.9%	55.2%	35.7%	5.3%						
2013		2.6%	49.9%	36.4%	11.0%						
2014		1.5%	48.9%	36.2%	13.3%	0.1%					

Note: 2014 estimates are based on preliminary production data.

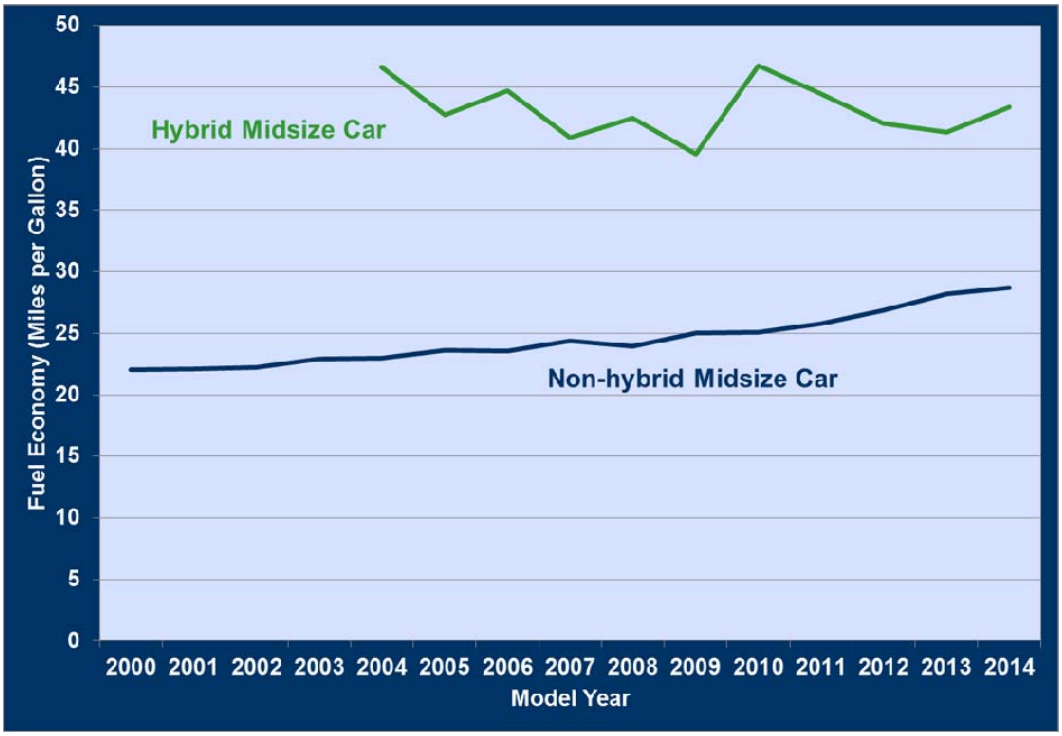
Source:
U. S. Environmental Protection Agency, Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014, EPA-420-R-14-023, October 2014.

Fact #849: December 1, 2014

Midsize Hybrid Cars Averaged 51% Better Fuel Economy than Midsize Non-Hybrid Cars in 2014

For the 2014 model year, midsize hybrid cars averaged 43.4 miles per gallon (mpg) while midsize non-hybrid cars averaged 28.7 mpg; the difference between the two has narrowed due to the rising average fuel economy of the non-hybrids and a slight decline in the hybrid fuel economy. The Toyota Prius was the only hybrid in the midsize segment in 2004, and had a fuel economy above 45 mpg. As the years progressed, other midsize hybrid cars were introduced with fuel economies lower than the Prius. The average fuel economy of midsize hybrid cars appears more erratic than midsize non-hybrid cars because there are fewer hybrid models and lower sales volumes.

Average Fuel Economy of New Midsize Cars – Hybrid vs. Non-Hybrid, 2000–2014



Notes:

- Data do not include light trucks or cars of other size classes.
- Data on non-hybrid midsize cars are for gasoline cars only.
- Fuel economy average is the production-weighted harmonic mean.
- 2014 data are preliminary.

Supporting Information

Average Fuel Economy of New Midsize Cars – Hybrid vs. Non-hybrid, 2000–2014

Model Year	Non-hybrid	Hybrid
	(Miles per Gallon)	
2000	22.0	No hybrids
2001	22.1	No hybrids
2002	22.3	No hybrids
2003	22.9	No hybrids
2004	23.0	46.6
2005	23.6	42.8
2006	23.6	44.7
2007	24.4	40.9
2008	23.9	42.5
2009	25.0	39.5
2010	25.1	46.8
2011	25.8	44.5
2012	26.9	42.0
2013	28.2	41.4
2014	28.7	43.4

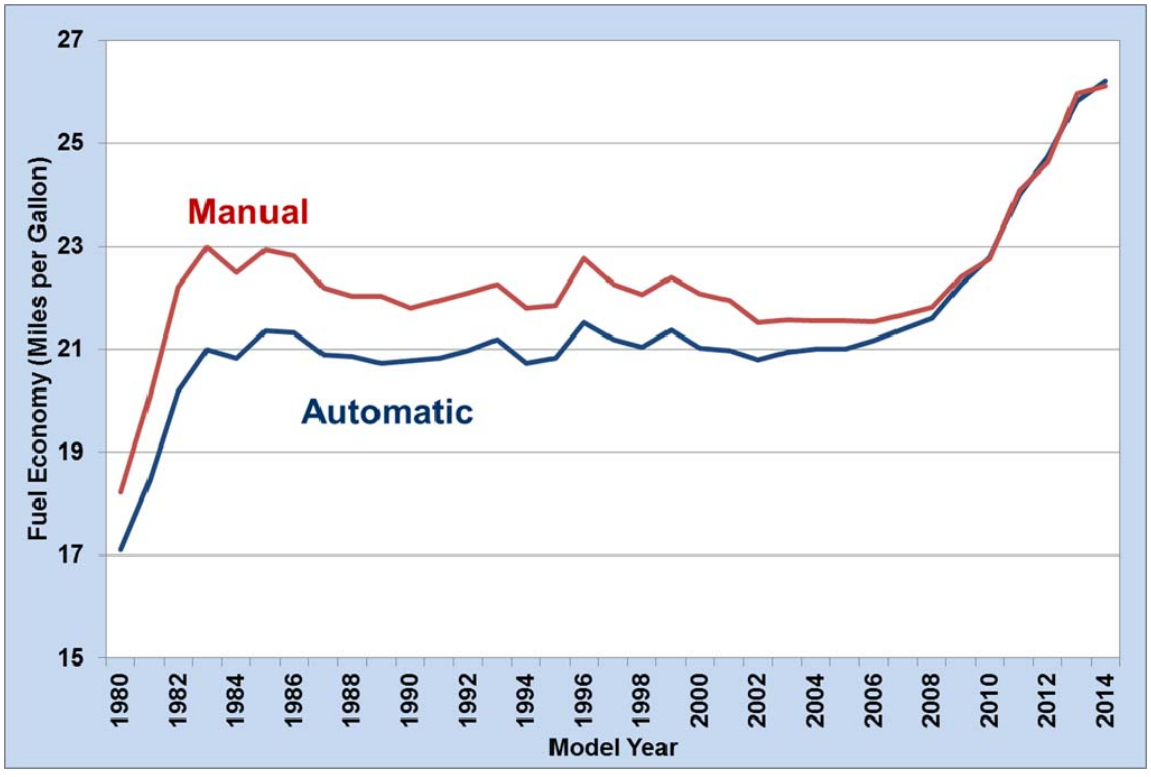
Source:
U. S. Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014*, EPA-420-R-14-023, October 2014.

Fact #850: December 8, 2014

Automatic Transmissions have Closed the Fuel Economy Gap with Manual Transmissions

Historically, manual transmissions have delivered better fuel economy than automatic transmissions. However, improvements in the efficiency of automatic transmissions have closed that gap in recent years. Improved designs and the increased number of gears used in automatic transmissions have contributed to the improved fuel economy of vehicles fitted with automatic transmissions. Automatic transmissions have added gears more quickly than their manual counterparts.

Comparison of Manual and Automatic Transmission Fuel Economy in Vehicles which have Both Options, Model Years 1980–2014



Note: Fuel economy average is the production-weighted harmonic mean.

Supporting Information

Comparison of Manual and Automatic Transmission Fuel Economy in Vehicles which have Both Options, Model Years 1980–2014

Model Year	Transmission Type	
	Automatic	Manual
1980	17.1	18.2
1981	18.4	20.1
1982	20.2	22.2
1983	21.0	23.0
1984	20.8	22.5
1985	21.3	22.9
1986	21.3	22.8
1987	20.9	22.2
1988	20.9	22.0
1989	20.7	22.0
1990	20.8	21.8
1991	20.8	21.9
1992	21.0	22.1
1993	21.2	22.3
1994	20.7	21.8
1995	20.8	21.9
1996	21.5	22.8
1997	21.2	22.3
1998	21.0	22.1
1999	21.4	22.4
2000	21.0	22.1
2001	21.0	21.9

2002	20.8	21.5
2003	20.9	21.6
2004	21.0	21.6
2005	21.0	21.6
2006	21.2	21.5
2007	21.4	21.7
2008	21.6	21.8
2009	22.3	22.4
2010	22.8	22.8
2011	24.0	24.1
2012	24.7	24.6
2013	25.8	26.0
2014	26.2	26.1

Note: 2014 estimates are based on preliminary production data.

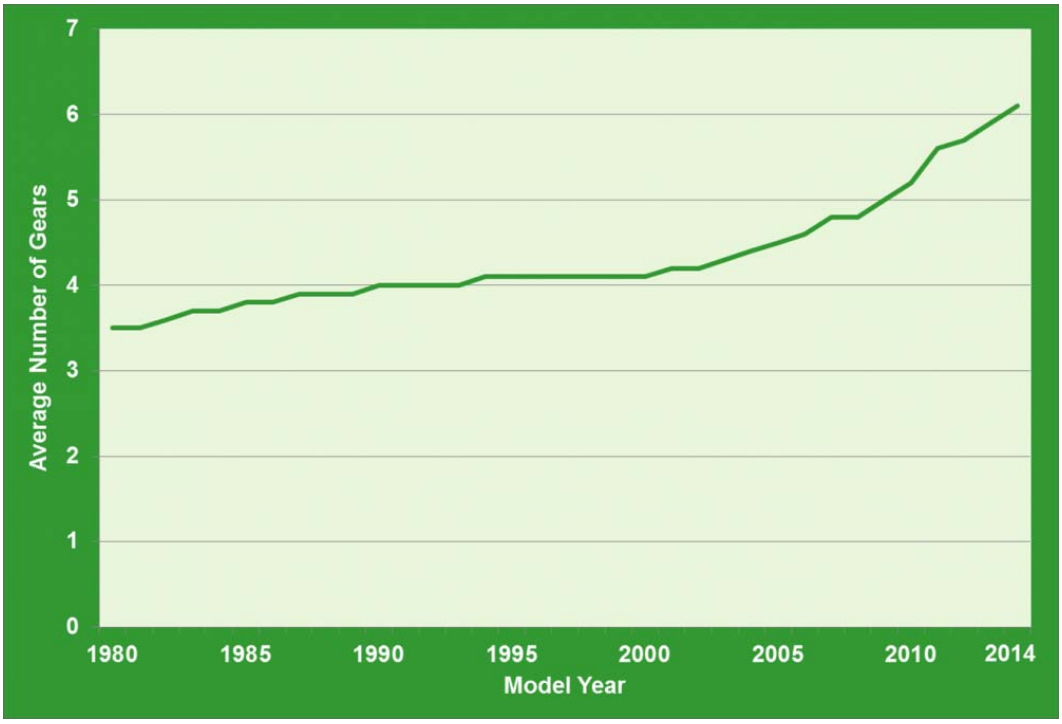
Source:
U.S. Environmental Protection Agency, Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014, EPA-420-R-14-023, October 2014.

Fact #851 December 15, 2014

The Average Number of Gears Used in Transmissions Continues to Rise

The number of gears in a transmission 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 1980, the average number of gears in light vehicles produced was just over 3, and that average rose only to about 4 gears over the next two decades. But beginning in 2001, the number climbed from about 4 gears to just over 6 gears in model year 2014.

Average Number of Gears in New Cars and Light Trucks



Note: Based on production. 2014 production data are preliminary.

Supporting Information

Average Number of Gears in New Cars and Light Trucks

Model Year	Gears
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
2013	5.9
2014	6.1

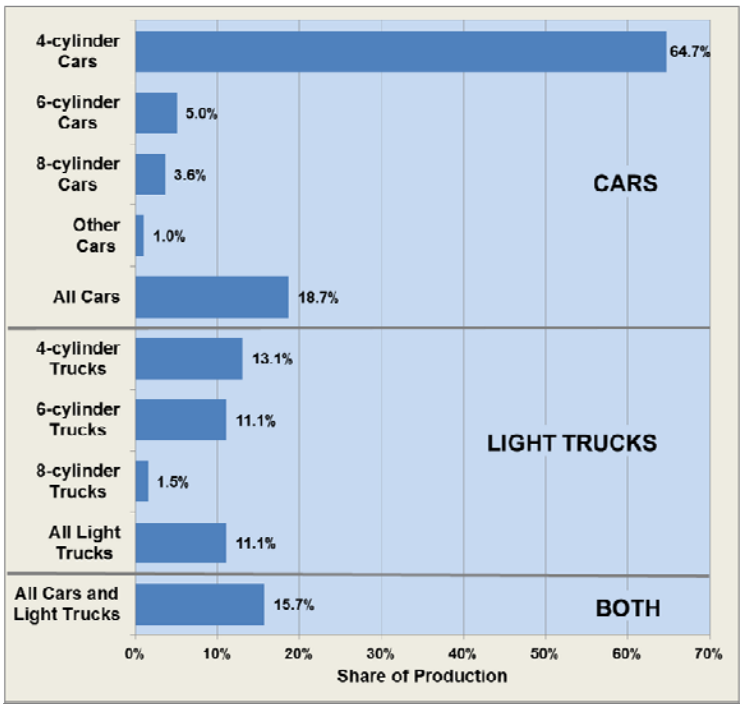
Source:
U. S. Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014*, EPA-420-R-14-023, October 2014.

Fact #852 December 22, 2014

Turbocharged Engines Account for 64.7% of All Four-Cylinder Gasoline Car Engines in 2014

As auto manufacturers pursue greater fuel economy, models are increasingly being offered with smaller displacement engines that consume less fuel. In order to meet performance expectations, turbocharging is used to increase power output of the smaller engines. Many midsized sedans that were previously installed with 6-cylinder engines are now only offered with a turbocharged 4-cylinder engine that delivers improved fuel economy and performance that meets or exceeds that of the old 6-cylinder engines. Light trucks have seen a similar trend where 8-cylinder engines are being replaced by turbocharged 6-cylinder engines. Turbocharged engines are now 15.7% of all light vehicle engines produced.

Penetration of Model Year 2014 Turbocharged Engines



Note: Excludes diesels. Estimates are based on preliminary 2014 data.

Supporting Information

Penetration of Model Year 2014 Turbocharged Engines

Category	Turbo Share
Cars	
4-cylinder Cars	64.7%
6-cylinder Cars	5.0%
8-cylinder Cars	3.6%
Other Cars	1.0%
All Cars	18.7%
Light Trucks	
4-cylinder Trucks	13.1%
6-cylinder Trucks	11.1%
8-cylinder Trucks	1.5%
All Light Trucks	11.1%
All Cars and Light Trucks	15.7%

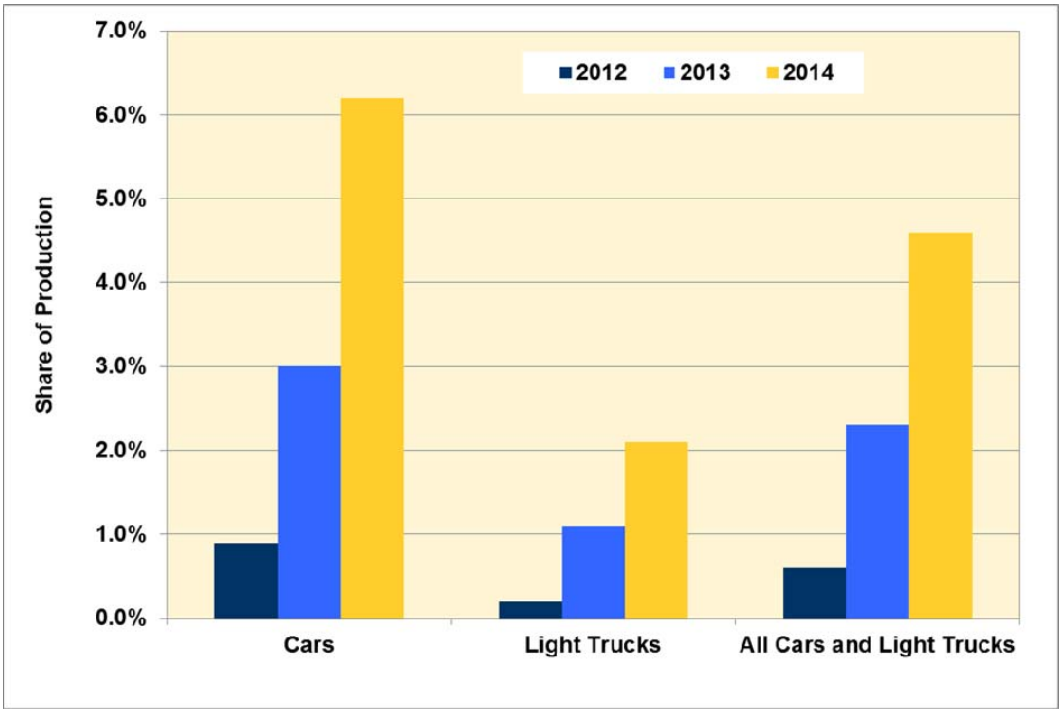
Source:
U. S. Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014*, EPA-420-R-14-023, October 2014.

Fact #853 December 29, 2014

Stop/Start Technology is in Nearly 5% of All New Light Vehicles Produced

Stop/Start technology improves fuel economy by reducing engine idle time. As a vehicle slows to a stop, the engine is shut down but then immediately restarts when the brake pedal is released so that the vehicle can accelerate without delay. Hybrid vehicles have always employed the strategy of shutting off their engines when not needed. However, manufacturers are beginning to add Stop/Start technology to non-hybrid vehicles sold in the U.S. to meet increasingly stringent fuel economy targets. Stop/Start technology is referred to by different names, such as the Mazda i-stop, the Kia Idle Stop and Go (ISG), and the Ford Auto Start-Stop. The use of Stop/Start technology on non-hybrid light vehicles increased from just 0.6% in 2012 to 4.6% in 2014.

Penetration of Non-Hybrid Stop/Start Technology in New Light Vehicles



Note: 2014 estimates are preliminary.

Supporting Information

Penetration of Non-Hybrid Stop/Start in New Light Vehicles

Model Year	Cars	Light Trucks	All Cars and Light Trucks
	Share of Production		
2012	0.9%	0.2%	0.6%
2013	3.0%	1.1%	2.3%
2014	6.2%	2.1%	4.6%

Source:
U. S. Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014*, EPA-420-R-14-023, October 2014.