

Transportation Data Programs:

Transportation Energy Data Book, Vehicle Technologies Market Report, and VT Fact of the Week



Project ID# VAN009

Principal Investigator:

Stacy C. Davis

June 18, 2014

2014 U.S. DOE Hydrogen Program and Vehicle Technologies Program
Annual Merit Review and Peer Evaluation Meeting

June 16-20, 2014

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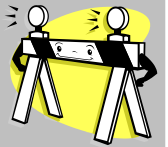
Overview

Timeline



- Project start date: October 2013
- Project end date: September 2014
- Percent complete: 80%

Barriers



- Barriers addressed
 - *Multi-Year Program Plan 2011 - 2015*
Section 2.6 Outreach, Deployment and Analysis A, B, C
 - Section 3.2 Program Analysis

Budget



- Total project funding
 - \$575K / year
- Funding received in FY13: \$575K
- Funding for FY14: \$575K

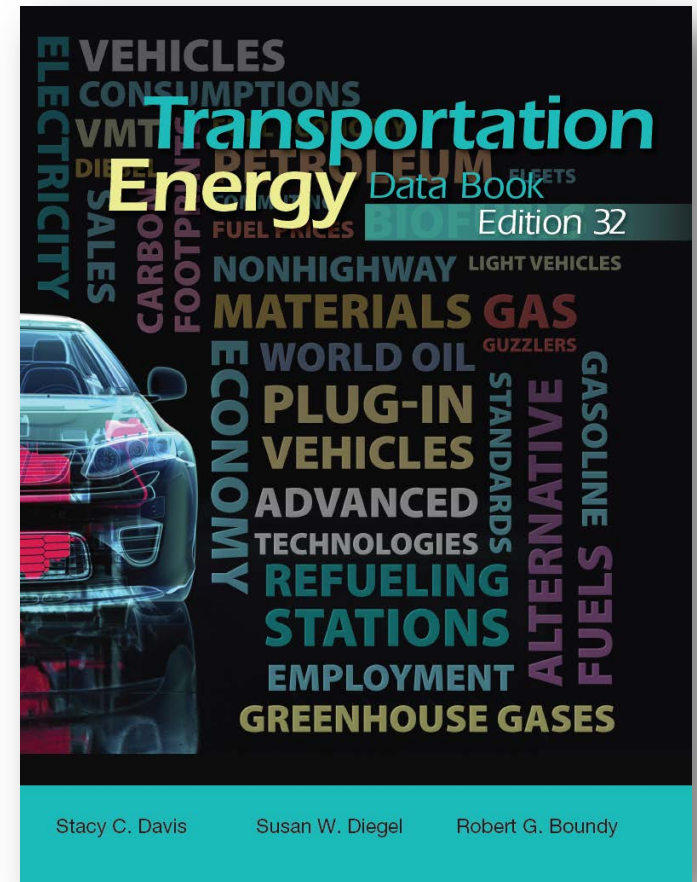
Partners



- Collaboration with:
 - Energy Information Administration
 - U.S. Department of Transportation
 - U.S. Environmental Protection Agency
 - U.S. Census Bureau
 - Argonne National Laboratory
 - National Renewable Energy Laboratory
 - Ward's Automotive

Transportation Energy Data Book Relevance

- This long-running project has been active at Oak Ridge National Laboratory since 1975. We are currently working on **Edition 33**.
- The purpose of the project is to draw together, under one cover, transportation data from diverse sources, to resolve data conflicts and inconsistencies, and to produce a comprehensive document.
- Policymakers, transportation analysts, and VTO staff require quality historical data and information on the transportation sector to affect good decisions for the future.
- The Data Book supports VTO public outreach and allows VTO staff and EERE Public Affairs Office to provide quick responses to outside queries.



Website address:
<http://cta.ornl.gov/data/>

Vehicle Technologies Market Report

Relevance

- The *Vehicle Technologies Market Report* began in 2009 and five editions have been published thus far.
- This report details the major trends in U.S. light-duty vehicle and medium/heavy truck markets and contains data on an individual manufacturer level.
- Special attention is given to the progress of high efficiency and alternative fuel technologies, in accordance with VTO's mission.
- The report supports VTO public outreach and allows VTO staff and EERE Public Affairs Office to provide quick responses to outside queries.



Website address:
<http://cta.ornl.gov/vtmarketreport/>

VTO Fact of the Week Relevance

- ORNL began developing the weekly VTO Fact of the Week in April 2001.
- The Fact topics align to VTO's mission, mainly concentrating on the energy uses and energy efficiencies of the highway mode.
- The Fact supports VTO public outreach and drives traffic to the VTO website.

Website address:

http://www1.eere.energy.gov/vehiclesandfuels/facts/2014_index.html

The screenshot shows the website for the Vehicle Technologies Office (VTO) under the U.S. Department of Energy. The page title is "2014 Facts of the Week". Below the title, it says "This Week's Fact" and "#817 February 17, Conventional and Alternative Fuel Price Trends from 2000 to 2013". A table lists several facts with their IDs, titles, and dates. The table includes links for facts from 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2007, 2006, and 2005.

ID	Fact Title	Date
#816	Natural Gas Refueling Stations Grow Over the Last Ten Years	February 10, 2014
#815	Global Sales of Top 10 Plug-In Vehicles	February 3, 2014
#814	More Choices when Buying Vehicles that Use Advanced Technology and Alternative Fuels	January 27, 2014
#813	New Light Vehicle Fuel Economy Continues to Rise	January 20, 2014
#812	The Number of Models Achieving 40 MPG or More is Increasing Rapidly	January 13, 2014
#811	Light Vehicle Sales Recovers	January 6, 2014

2013 Facts of the Week
2012 Facts of the Week
2011 Facts of the Week
2010 Facts of the Week
2009 Facts of the Week
2008 Facts of the Week
2007 Facts of the Week
2006 Facts of the Week
2005 Facts of the Week

The Mission of the Vehicle Technologies Office (VTO) is to develop and assist in the deployment of more energy-efficient and environmentally friendly technologies for highway transportation passenger and commercial vehicles that will meet or exceed performance expectations and environmental requirements, enabling the U.S. to use significantly less petroleum and reduce greenhouse gas emissions. - *Multi-Year Program Plan 2011 – 2015*

Transportation Energy Data Book Milestones

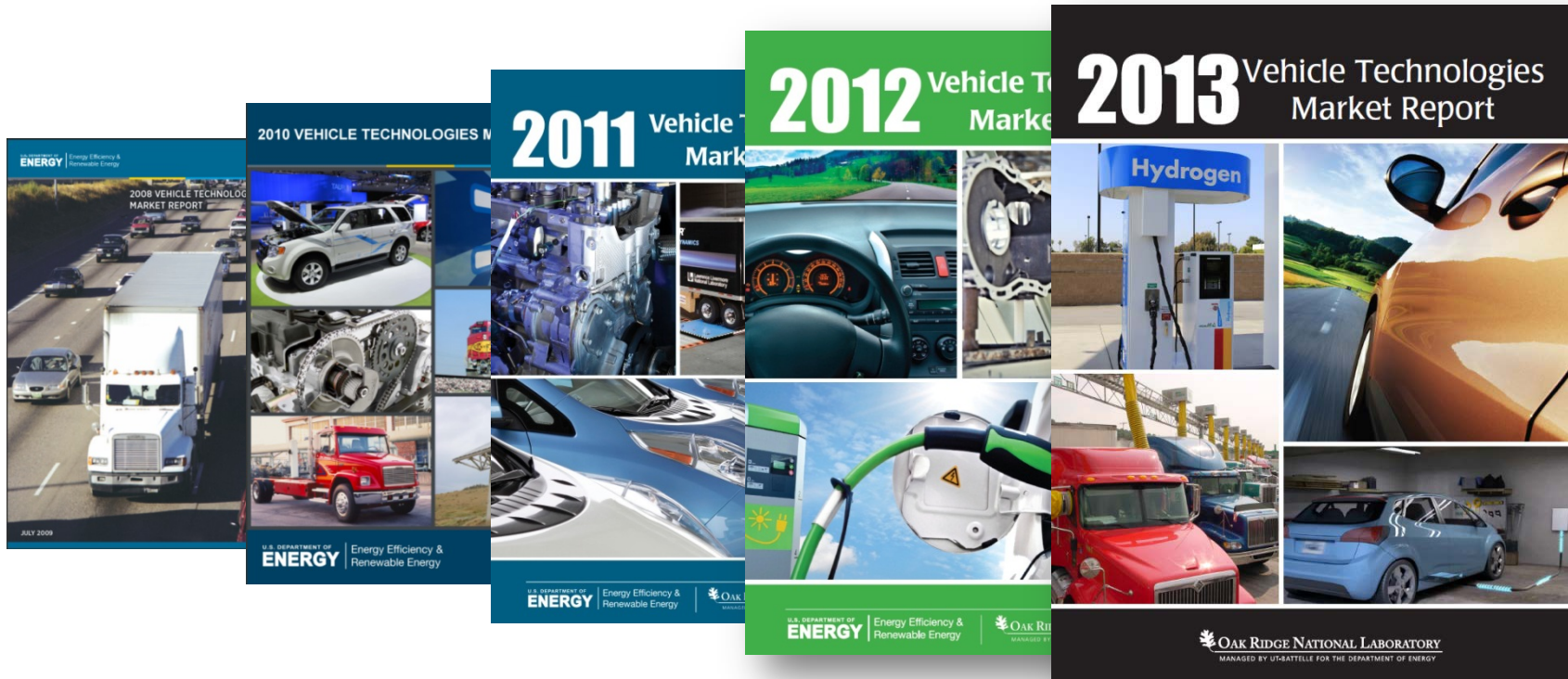
Transportation Energy Data Book: Edition 32 published July 2013

	Transportation Energy Data Book	32
	Transportation Energy Data Book	31
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ORNL-4888	TRANSPORTATION ENERGY BOOK	29
ORNL-4894	Transportation Energy Data Book	28
ORNL-4901	Transportation Energy Data Book	27
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ORNL-6176	Transportation Energy Data Book	14
ORNL-6743	TRANSPORTATION ENERGY DATA BOOK: 13	13
ORNL-6710	TRANSPORTATION ENERGY DATA BOOK: Edition 12	12
ORNL-6649	TRANSPORTATION ENERGY DATA BOOK: Edition 11	11
ORNL-4963	TRANSPORTATION ENERGY DATA BOOK: EDITION 10	9
ORNL-4935	TRANSPORTATION ENERGY DATA BOOK: EDITION 9	8
ORNL-4909	TRANSPORTATION ENERGY DATA BOOK: EDITION 8	7
ORNL-4900	TRANSPORTATION ENERGY DATA BOOK: EDITION 7 OF ORNL-4788	7
ORNL-4896	TRANSPORTATION ENERGY DATA BOOK: RUCP HIGHLIGHTS	6
ORNL-4891	Transportation Energy Conservation Data Book	5
ORNL-4881	Transportation Energy Conservation Data Book	4
ORNL-4847	Transportation Energy Conservation Data Book	
ORNL-4828	TRANSPORTATION ENERGY CONSERVATION DATA BOOK: EDITION 2	
ORNL-4816	TRANSPORTATION ENERGY CONSERVATION DATA BOOK	

Edition 33 will be published in July 2014

Vehicle Technologies Market Report Milestones

- Published the *2011 Vehicle Technologies Market Report* – February 2012
- Published the *2012 Vehicle Technologies Market Report* – February 2013
- Published the *2013 Vehicle Technologies Market Report* – March 2014



VTO Fact of the Week Milestones

- Developed a new Fact each week of FY 2013 to be posted on the Vehicle Technologies Home Page
- Developed and will continue to develop a new Fact each week of FY 2014 to be posted on the Vehicle Technologies Home Page

Vehicle Technologies Office

Fact #755: November 26, 2012
Chargepoint, Blink and Nissan Take the Lead in Public Electric Vehicle Chargers

According to the Department of Energy's Alternative Fuels Data Center, there is diversity in the public electric vehicle (EV) charging station network located throughout the nation. As of October 2012, there were over 1,700 Chargepoint EV stations, 900 Blink stations, and nearly 800 Nissan stations. It is important to note that in this database, there are some stations for which the station network is unknown.

Public EV Charging Stations by State and Network Type, October 2012

Vehicle Technologies Office

Fact #811: January 6, 2014
Light Vehicle Sales Recovers

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 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 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 projections 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

Year	1979	1980	1981	1982	1983	1984	1985	1986	1988	1989	1990	1991	1992	1993	1994	1995	2006	2007	2008	2009	2010	2011	2012	2013
Sales (Millions)	13.5	11.5	10.5	10.0	10.5	11.5	12.5	13.5	15.5	14.5	13.5	12.5	13.5	14.5	15.5	16.5	16.0	15.5	10.0	11.0	12.0	13.0	14.0	15.0

Vehicle Technologies Office

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, 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

Model Year	2009	2011	2013
Small SUV	0	0	1
Midsize Station Wagon	0	0	1
Small Station Wagon	0	0	1
Large	0	0	1
Midsize	0	0	1
Compact	0	0	1
Subcompact	0	0	1
Minicompact	0	0	1
Two Seater	0	0	1
Total	2	8	30

* 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.

Transportation Energy Data Book Approach/Strategy

Discovery

- Content review
 - Petroleum
 - Energy
 - Highway Vehicles
 - Light Vehicles
 - Heavy Vehicles
 - Alternative Fuel Vehicles
 - Fleet Vehicles
 - Household Vehicles
 - Nonhighway Modes
 - Transportation & the Economy
 - Greenhouse Gas Emissions
 - Criteria Pollutants
 - Unit Conversions
- Source identification
- Data collection
 - From Excel, pdf & hardcopy

Due Diligence

- Convert units
- Perform calculations
- Confirm all series revisions
- Analyze disparate data
- Study definitions
- Assemble notes
- Create tabulations and graphics

Outreach

- Update Website
 - Serve data in Excel and pdf
- Publish hardcopy
 - Distribute to mailing list of nearly 1,300 people
- Answer questions from the public

Vehicle Technologies Market Report Approach/Strategy

Discovery

- Content review
 - Energy & Economics
 - Light Vehicle Market
 - Heavy Truck Market
 - Advanced Technologies
 - Policy
- Source identification
- Data collection
 - From Excel, pdf & hardcopy

Due Diligence

- Convert units
- Perform calculations
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- Analyze disparate data
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Outreach

- Update Website
 - Serve data in Excel and pdf
- Answer questions from the public

VTO Fact of the Week Approach/Strategy

Discovery

- Probe for new report releases on:
 - Fuels
 - Vehicle efficiency
 - Policy
 - Advanced technology
 - Consumer trends
- Search for data on timely news topics
- Data collection
 - From Excel, pdf, html & hardcopy

Due Diligence

- Convert units
- Perform calculations
- Study definitions
- Assemble notes
- Create graphics and tabulations

Outreach

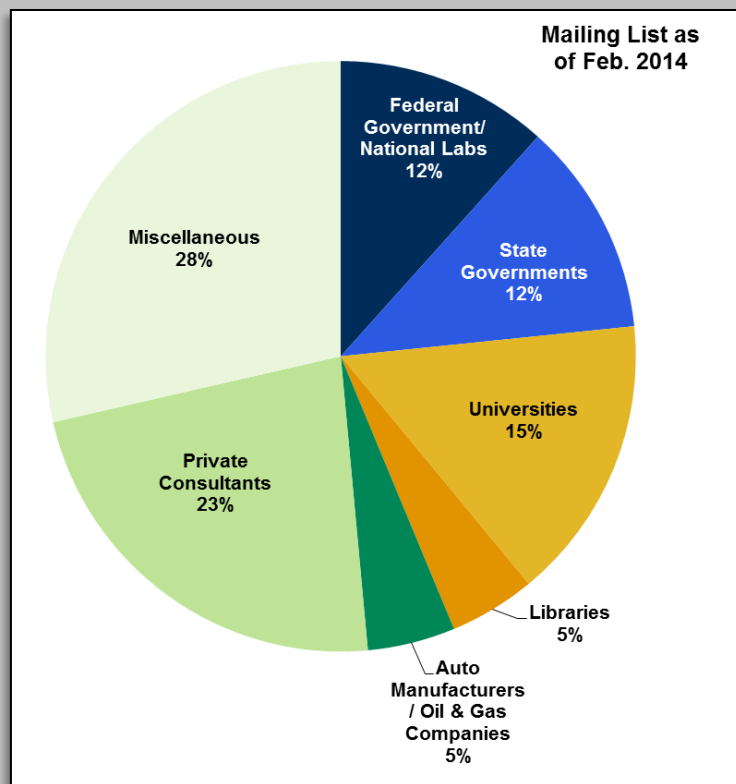
- Provide a new Fact of the Week for posting on the VTO website on a weekly basis

Transportation Energy Data Book

Technical Accomplishments and Progress

Successful Outreach: Hardcopies of the Data Book are preferred by many

Hardcopy mailing list of about 1,300 individuals



1,600 books printed in FY13

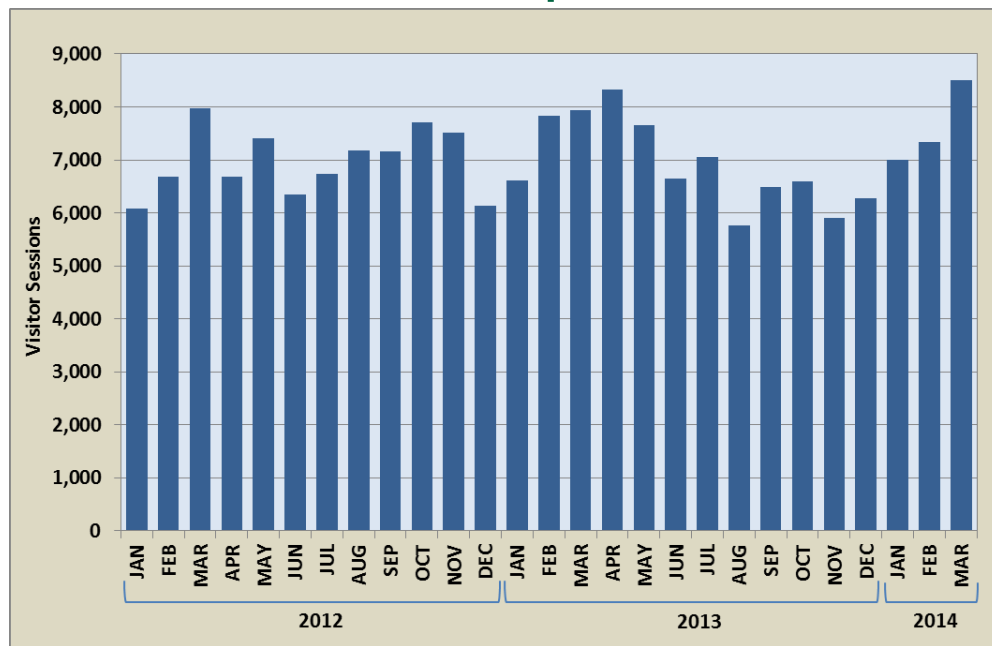
It costs less than \$25K to print and mail hardcopies – black & white pages with color cover – using the Government Printing Office and Media Mail postage rate.

If any hardcopies are left once the new edition is printed, they are sent to schools and universities for use as reference books for students.

The University of Michigan and Georgia Tech University have used the Data Book as a course textbook.

Transportation Energy Data Book Technical Accomplishments and Progress

Successful Outreach: Website content easily available and accessed by many
6-8,000 visitor sessions per month



Responsive to user comments

Researchers said they wanted to be able to “pack” all Excel spreadsheets from the Data Book onto their laptops for use when they had no Internet connection



Transportation Energy Data Book U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

Download Edition 30

Edtion 30 is available for download in PDF format. It is available as a single file however, for ease of downloading, it may also be downloaded in the sections listed below. **Note:** Previous editions of the Transportation Energy Data Book are not available from this website.

Front Cover	
Title Pages	
Table of Contents	
Foreword	Acknowledgments, Abstract, and Introduction
Chapter 1	Petroleum
Chapter 2	Energy
Chapter 3	All Highway Vehicles and Characteristics
Chapter 4	Light Vehicles and Characteristics
Chapter 5	Heavy Vehicles and Characteristics
Chapter 6	Alternative Fuel and Advanced Technology Vehicles and Characteristics
Chapter 7	Fleet Vehicles and Characteristics
Chapter 8	Household Vehicles and Characteristics
Chapter 9	Nonhighway Modes
Chapter 10	Transportation and the Economy
Chapter 11	Greenhouse Gas Emissions
Chapter 12	Criteria Air Pollutants
Appendix A	Sources
Appendix B	Conversions
Appendix C	Maps
Glossary	
Title Index	
Back cover	
Full Document	Download the Transportation Energy Data Book: Edition 30 in one large continuous file. (5,661 KB)
Download all Excel Spreadsheets (zip file)	Download all Excel spreadsheets for the Transportation Energy Data Book: Edition 30 in one zipped file. (3,687 KB)

TEDB

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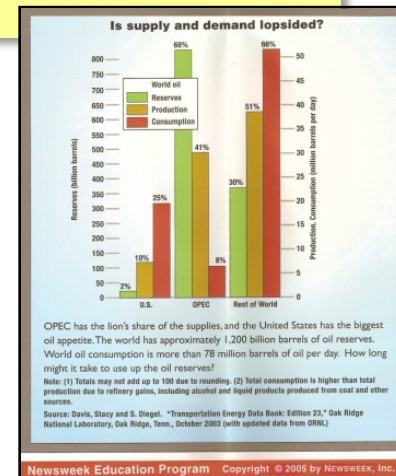
Transportation Energy Data Book Technical Accomplishments and Progress

Outreach via hardcopy and the web has led to widespread use of the data and public education on transportation

Besides being cited twice in the Vehicle Technologies *Multi-Year Program Plan*, data from the *Transportation Energy Data Book* has been used in a variety of other documents, such as *The Economic Report of the President*, *Popular Science Magazine*, and *Newsweek Education*.



Many models developed for VTO use input data from the book, as well as other agencies' models, such as EIA's National Energy Modeling System (NEMS) and EPA's Motor Vehicle Emission Simulator (MOVES).

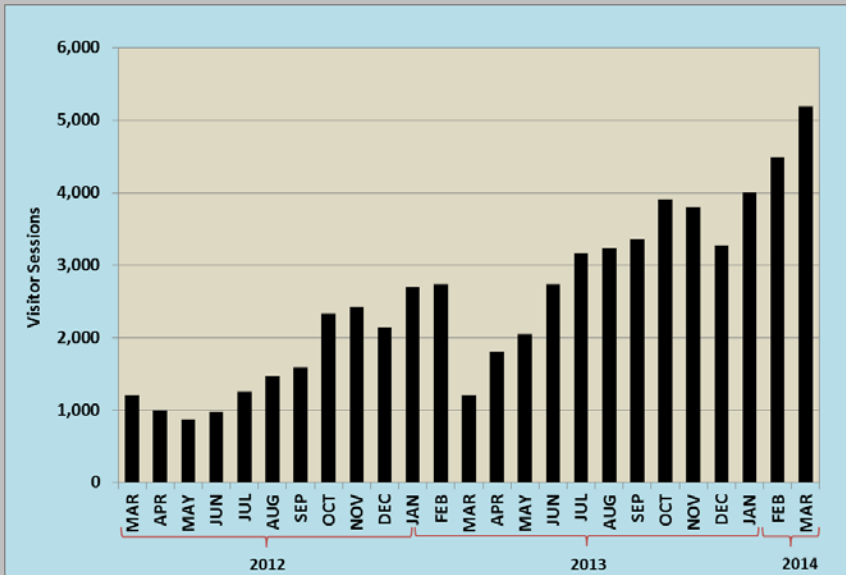


Searching Google Scholar shows more than 1,100 citations for the Data Book in scholarly reports.

Vehicle Technologies Market Report Technical Accomplishments and Progress

Website Traffic

Number of visitor sessions is growing – even before this year’s report was posted on-line at the end of March. Over 5,000 visitor sessions in March 2014.



Major Improvement

Changed from a two-column, small graph format to a format with a graph on each page and more room for highlights, sources and notes.

Transportation Energy Trends

Transportation accounts for 28.5% of total U.S. energy consumption

In 2010, the transportation sector used 27 quads of energy, which is 28.5% of total U.S. energy use (Figure 1). Nearly all of the energy consumed in this sector is petroleum (94%), with small amounts of renewable fuels (3%) and natural gas (3%). With the future use of plug-in hybrids and electric vehicles, transportation will begin to use electric utility resources. The electric-utility sector draws on the widest range of sources and uses only a small amount of petroleum. The energy sources have not changed much during the past five years, although renewable fuel use has grown slightly in each sector.

Figure 1. U.S. Energy Sector and Energy Source, 2008

Figure 2. Fuel Use per Mile

Vehicle miles are increasingly disconnected from the economy

From 1960 to 1998, the growth in vehicle miles of travel (VMT) closely followed the growth in the U.S. Gross Domestic Product (GDP) (Figure 3). Since 1998, however, the growth in VMT has slowed and has not kept up with the growth in GDP. Like the transportation sector's energy use, VMT declined from 2007 to 2009.

Figure 3. Relationship of VMT and GDP

Transportation is more efficient

The number of miles driven on our nation's highways has generally been growing during the past three decades, and energy use has grown with it. However, due to advanced engines, materials, and other vehicle technologies, the amount of fuel used per mile has declined from 1970 (Figure 2). The gallons per mile held steady from the early 1990s to 2008, showing that the fuel economy for new vehicles was stagnant during this period.

Energy prices affect the transportation sector

The prices of gasoline and diesel fuel affect the transportation sector in many ways. For example, price can impact the number of miles driven in a year, and affect the choices consumers make when purchasing vehicles. The price of gasoline rose dramatically from 2005 to 2008, then fell to near 2005 levels again in 2009, from an annual average of \$2.27 per gallon in 2005 to \$3.55 in 2008, and back to \$2.35 in 2009 (Figure 4). Diesel fuel prices rose even higher than gasoline in 2008 (\$5.00 per gallon), but

Source: EIA, Monthly Energy Review
Source: EIA, Survey of Current Business and FHWA, Highway Statistics
Source: EIA, Monthly Energy Review, July 2011, Table 2.2.1, 2.2.2, 2.2.3, and 2.9.
<http://www.eia.doe.gov/publications.cfm>
2008 Vehicle Technologies Market Report

Transportation Accounts for 28% of Total U.S. Energy Consumption

In 2010, the transportation sector used 27.4 quads of energy, which is 28% of total U.S. energy use. Nearly all of the energy consumed in this sector is petroleum (94%), with small amounts of renewable fuels (3%) and natural gas (3%). With the future use of plug-in hybrids and electric vehicles, transportation will begin to use electric utility resources. The electric-utility sector draws on the widest range of sources and uses only a small amount of petroleum. The energy sources have not changed much during the past five years, although renewable fuel use has grown slightly in each sector.

Figure 1. U.S. Energy Consumption by Sector and Energy Source, 2010

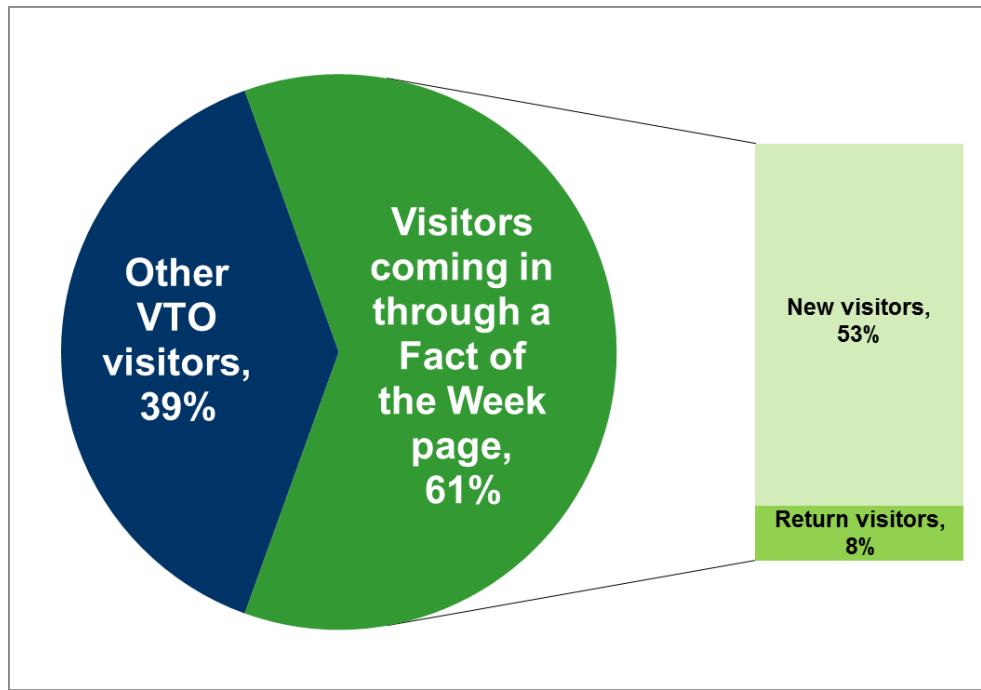
Source: EIA, Monthly Energy Review, July 2011, Table 2.2.1, 2.2.2, 2.2.3, and 2.9.
<http://www.eia.doe.gov/publications.cfm>
2011 Vehicle Technologies Market Report

2010 version vs. 2011 version

VTO Fact of the Week

Technical Accomplishments and Progress

More than 60% of the visitors to the VTO website come through the Fact of the Week web page and most of those are new visitors.



FY2014 through February.

Of the 18 Facts posted in this fiscal year (Oct–mid Feb), only one was from data that were included in the Data Book or Market Report

Amy Foster, an energy blogger, wrote in 2010:

“I have a secret. When I need a little pick-me-up at work, I often surf over to the EERE Vehicle Technologies Program website and read their latest [Fact of the Week](#). Updated like clockwork every week, the Fact of the Week site provides dozens (if not hundreds) of factoids of a broad variety of vehicle-related topics.”

“Call me crazy, but these little weekly statistical gems are always fascinating to me.... These archives are a treasure trove of interesting information.”

Responses to Previous Year Reviewers' Comments

This is the project's first AMR evaluation, thus there are no comments to be addressed.

Collaboration and Coordination with Other Institutions

In order to effectively communicate the data coming from an organization, one must know some of the details, definitions, and processes behind the data. ORNL continually communicates with the following organizations in order to gain better understanding of the data coming from those organizations.



Energy Information Administration



U.S. Environmental Protection Agency



U.S. Department of Transportation



U.S. Census Bureau



Argonne National Laboratory



National Renewable Energy Laboratory



Ward's Automotive Info Bank

Other sources, as necessary

Proposed Future Work

FY 2014

The final *Transportation Energy Data Book* will be sent to the printers and posted on the website in July.

A Fact of the Week will be developed and posted on the Vehicle Technologies Home Page weekly.

FY 2015

An updated annual *Transportation Energy Data Book* will be published.

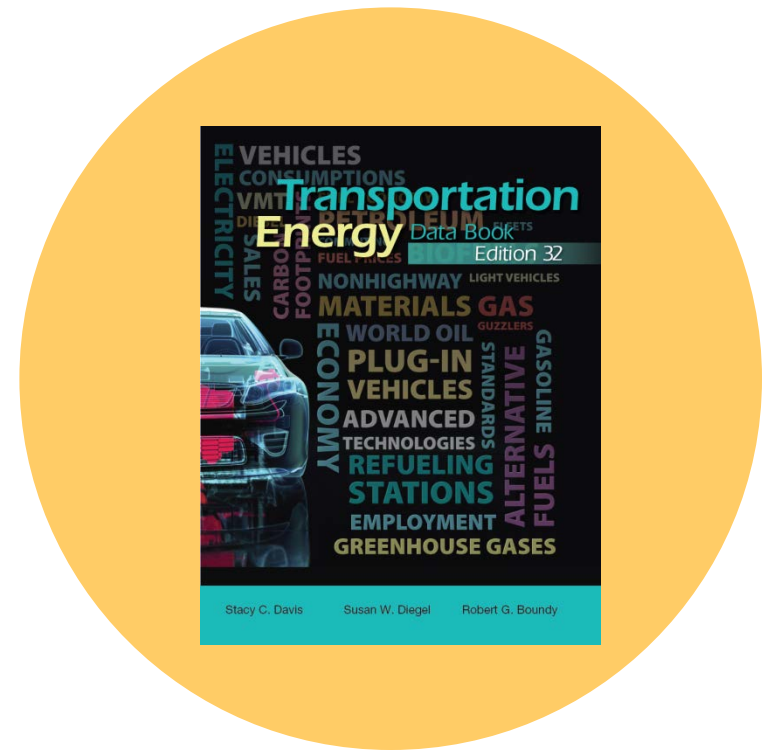
An updated annual *Vehicle Technologies Market Report* will be published.

The Fact of the Week will be developed and posted to the Vehicle Technologies home page on a weekly basis.

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Transportation Energy Data Book Summary

- The *Transportation Energy Data Book* is a black & white publication with historical data tables that provide the foundation for the analysis performed by VTO staff and other transportation analysts in pursuit of energy efficient and environmentally-friendly technologies.
- The associated website serves data in Excel format and pdf format to 6-8,000 monthly visitor sessions.
- Data from the book feeds into many other VTO products – from reports to models – as well as other Federal Agency projects.



Vehicle Technologies Market Report Summary

- The *Vehicle Technologies Market Report* is a colorful graphic-based report with figures that display data on an individual company level. The emphasis of the report is the vehicle market and new technologies coming into the market, which is useful to VTO staff and others.
- The associated website serves data in both Excel and pdf format. In the month of March 2014 there were nearly 5,200 visitors sessions.



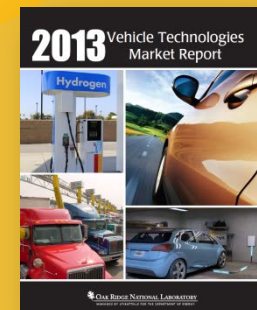
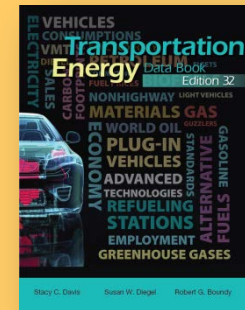
VT Fact of the Week Summary

- The VT Fact of the Week is presented graphically with summary text and posted “like clockwork” every Monday morning on the DOE VTO website home page, attracting visitors to the website.
- Transportation stakeholders and the general public benefit from VTO’s data expertise through these readily accessible Facts.



Summary

Though each of these three data products has its own focus, the synergy among the products adds to the efficiency of the project.



ACKNOWLEDGEMENTS

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