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Clean Cities 2013 Annual Metrics Report

Caley Johnson and Mark Singer
National Renewable Energy Laboratory

NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
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Technical Report
NREL/TP-5400-62838
October 2014

Contract No. DE-AC36-08GO28308

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Prepared under Task No. VTP2.0020

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Introduction

The U.S. Department of Energy's (DOE) Clean Cities program advances the nation's economic, environmental, and energy security by supporting local actions to cut petroleum use in transportation. A national network of nearly 100 Clean Cities coalitions, whose territory covers 80% of the U.S. population, brings together stakeholders in the public and private sectors to deploy alternative and renewable fuels, idle-reduction (IR) measures, fuel economy improvements, and new transportation technologies, as they emerge.

Each year, DOE asks Clean Cities coordinators to submit annual reports of their activities and accomplishments for the previous calendar year. Data and information are submitted via an online database that is maintained as part of the Alternative Fuels Data Center (AFDC) at the National Renewable Energy Laboratory (NREL). Coordinators submit a range of data that characterize the membership, funding, projects, and activities of their coalitions. They also submit data about sales of alternative fuels, deployment of alternative fuel vehicles (AFVs) and hybrid electric vehicles (HEVs), IR initiatives, fuel economy activities, and programs to reduce vehicle miles traveled (VMT). NREL analyzes the data and translates them into petroleum-use reduction impacts, which are summarized in this report.

Eighty-two of the 84 coalitions active throughout 2013 completed reports, representing a response rate of 98%. The coalitions that submitted 2013 annual reports are listed in the appendix to this report. Coalition coordinators assembled the data based on voluntary reports from their stakeholders—the private and public entities that are members of the coalitions. As such, each of these reports represents a subset of the Clean Cities activities throughout the nation, and taken together, they are an important indicator of the impact of the coalitions.

In addition to collecting data through the coordinator reports, NREL compiles metrics about activities funded by the Clean Cities program at NREL and Oak Ridge National Laboratory (ORNL). NREL provides a range of technical data, tools, and resources to support coalitions in their efforts to accelerate the use of alternative fuels, advanced vehicles, and other technologies. ORNL produces the Fuel Economy Guide, the FuelEconomy.gov website, and other public information related to fuel economy. Metrics pertaining to the uses and impacts of these resources are presented in this report.

A compilation of data from this report, along with reports from previous years, can be accessed at www.eere.energy.gov/afdc/data/cleancities.html. Previous years' reports can be downloaded in their entirety at www.afdc.energy.gov.

Summary of Key Findings

Clean Cities activities saved/displaced[1] approximately 1 billion gallons of gasoline in 2013. Table 1 represents the combined results of all strategies of petroleum savings. In this table, "Core Activities" resulted from activities reported by coalitions and national laboratory websites, as analyzed by NREL and ORNL. "Estimated outreach savings" resulted from coalition outreach, education, and training events, as estimated by NREL and ORNL.

[1] The petroleum saved includes both gasoline and diesel. Petroleum savings in this report are expressed in gasoline-gallon equivalents (GGEs), using the lower heating value ratio of the fuels.

As shown below in Table 1, savings from core activities increased 13% in 2013, while estimated outreach savings increased 4%. Total 2013 petroleum savings (including core and outreach activities) increased 11% compared to 2012, keeping the Clean Cities program ahead of schedule to meet its goal of 2.5 billion gallons per year by 2020.

Table 1. Petroleum Savings of Each Portfolio Element

	Technology	Million GGEs Saved	Percent of Total Core Savings	Percent of Grand Total Savings	Increase From Last Year
Core Activities	Alternative Fuels and AFVs	389.7	48%	39%	16%
	HEVs, PHEVs, and EVs	73.1	9%	7%	39%
	VMT Reduction	37.1	5%	4%	-8%
	IR	29.5	4%	3%	-5%
	Fuel Economy	15.4	2%	2%	13%
	Off-Road	7.9	1%	1%	19%
	ORNL Fuel Economy	201.4	25%	20%	14%
	AFDC	64.8	8%	6%	-7%
	Total Savings From Core Activities	818.8	100%	81%	13%
Estimated Outreach	Estimated Outreach Savings	189.0	–	19%	4%
Grand Total		1,007.8	–	100%	11%

* Totals may differ from the sums of subcategories due to rounding.

Clean Cities' core activities prevented 5.7 million tons of carbon dioxide equivalent (CO_2e) from being emitted into the atmosphere. Outreach events kept another 1.8 million tons of CO_2e out of the atmosphere, for a total of 7.5 million tons CO_2e. This greenhouse gas (GHG) emissions reduction is equivalent to removing 1.6 million cars from U.S. roads.

Coalitions were also remarkably successful in securing project awards from numerous sources, thereby leveraging DOE's investment in the program. In 2013, the coalitions won 132 new project awards (project-specific grants) worth a total of $47 million and another $42 million in leveraged funds from coalition members. This funding represents more than a 3:1 leveraging of the $26.5 million DOE Clean Cities program budget in Fiscal Year (FY) 2013.

Clean Cities coordinators spent more than 130,000 hours pursuing Clean Cities' goals in 2013, which is equivalent to having a national network of 67 full-time technical and sales professionals working in the field to reduce U.S. dependence on petroleum. Coordinators logged 2,229 outreach, education, and training activities in 2013, which reached an estimated 120 million

people and saved an estimated 189 million GGEs of petroleum. Local government fleets were the most common audience at these events, followed by the general public.

Changes to the 2013 Annual Metrics Report

To ensure continuity of data from one year to the next, we made very few changes to the Clean Cities Annual Metrics Report and reporting process in 2013. Most changes were small and were implemented to increase the accuracy, thoroughness, and resolution of the reporting process. These changes include the following:

- The report now goes into much greater detail when assessing the niche markets that were using various vehicles and fuels. This is located in the "AFV Types and Markets" section.
- The reporting tool now has a feature that allows coordinators to reload projects that were implemented in previous years. This feature decreased the number of incidents where coordinators forget to report a project that is still in operation and reducing petroleum. Checks are embedded to ensure that coordinators report relevant changes to the project.
- New technologies this year include lightweight materials in the fuel economy section and telematics devices in the IR section. One lightweight project and eight telematics projects were reported.
- Grants are now tracked and grouped with higher fidelity. In addition to the specific grantor listed, grants can be flagged to the following popular categories:
    - DOE
    - Congestion Mitigation and Air Quality Improvement Program
    - U.S. Environmental Protection Agency
    - Other federal agency
    - State government agency
    - Foundation or nonprofit
    - None of the above.

Attribution and Fuel Use Factors

To clarify the link between coalition activities and end results, the coalition annual report includes an attribution factor that accounts for the percentage of a project's outcome that may be due to coalition activities rather than to the activities of other project participants. This attribution factor was used in the estimates of impacts for fuel economy, VMT reduction, IR, alternative fuel use, and outreach projects. Coordinators estimated the percentage of the project's outcome their coalition was responsible for, and the project's overall outcome was multiplied by that percentage to determine the coalition's impact. Although subjective, this method attempts to address the issue of attribution where a coalition is one of several partners involved in a project. To reduce the subjectivity of this factor, NREL added a tool to help a coalition estimate its contribution to a given project.

Reported Petroleum Savings

Coordinators submitted information about their petroleum use reductions, broken down according to the technologies in the Clean Cities portfolio. NREL analyzed the data, converted it into a quantity of gasoline saved by each element of the portfolio, and reported in units of

GGEs—the amount of energy contained in a gallon of gasoline. As shown in Table 1, about 553 million GGEs (MGGEs) were saved through reported[2] Clean Cities coalition efforts in 2013—an average of 6.7 MGGEs per coalition. This is 15% higher than the total 2012 reported petroleum savings of 479 MGGEs.

Alternative Fuels and Vehicles

As shown in Table 1, alternative fuels (used in AFVs and in biodiesel blends) accounted for approximately 390 MGGEs, or 71% of the coalitions' reported petroleum savings. This is an increase of 16% over the amount of petroleum that was saved by alternative fuels in 2012.

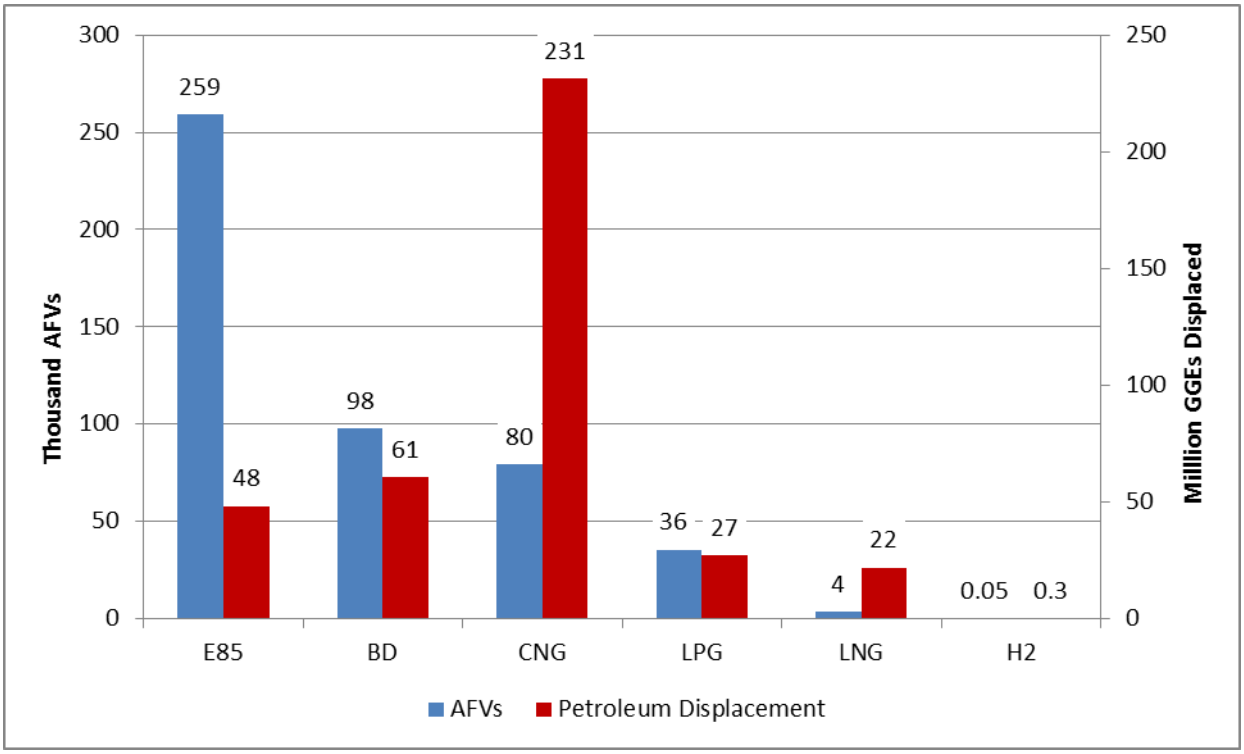

Figure 1. Number of AFVs and petroleum savings from fuel type

In 2013, coalitions reported a total inventory of just over 475,000 AFVs, split among six fuel types (Figure 1). This represents a 25% increase from last year. The number of AFVs powered by liquefied petroleum gas (LPG or propane), compressed natural gas (CNG), and liquefied natural gas (LNG) increased (115%, 34%, and 7%, respectively). The number of flexible fuel vehicles that can operate on E85 (a high-level ethanol blend) increased by 32%. Conversely, the numbers of AFVs powered by biodiesel and hydrogen decreased (5% and 8%, respectively).

Figure 1 also shows the total GGEs displaced by AFVs according to fuel type. CNG remains at the top of the list, accounting for 59% of the total AFV petroleum displacement, despite the fact that only 17% of the total AFVs use CNG. This is in stark contrast to E85, which accounts for only 12% of the AFV petroleum savings even though 54% of reported AFVs can use E85.

[2] Reported savings include the top six lines in Table 1. It is the core Clean Cities activities, minus the AFDC and fueleconomy.gov savings.

The amount of petroleum displaced by each fuel type increased from 2012 to 2013. Displacements from hydrogen, E85, and CNG increased the most (142%, 26%, and 21%, respectively). However, LNG, biodiesel, and LPG also showed increased petroleum displacements (3%, 3%, and 2%, respectively).

The average number of GGEs displaced per vehicle, as shown in Table 2, reveals some interesting trends. For a given vehicle, this number is influenced by four factors:

1. The frequency with which the AFV uses alternative fuel (dedicated AFVs tend to displace more petroleum than vehicles that can use petroleum-based fuels in addition to alternative fuels).
2. The number of miles per year the AFV travels (higher mileage displaces more petroleum).
3. The AFVs' fuel economy. Vehicles with lower fuel economy consume more fuel and therefore displace more petroleum. Therefore, table 2 shows LDVs and HDVs separated in order to increase fidelity.
4. The amount of petroleum contained in the alternative fuel (ethanol and biodiesel blends contain significant quantities).

For example, LNG HDVs captured in the data displace more petroleum per vehicle, on average, than other HDVs do—3% more than CNG vehicles and nearly 8 times more than biodiesel HDVs. This is not surprising, given that LNG vehicles are primarily used in heavy-duty applications and travel relatively long distances. In 2013, the average AFV displaced 818 GGEs of petroleum. This is a 7% drop from 2012.

Table 2. Average Annual Petroleum Displacement per Vehicle

Fuel*	GGEs per HDV	GGEs per LDV
LNG	6,011	none reported
CNG	5,823	699
Electric	3,591**	229
HEV	3,025	413
LPG	2,970	350
Total	2,302	303
PHEV	1,162	229
Biodiesel	619	609
E85	167	187

*Hydrogen is not represented on Table 2 because the sample size was too small. These vehicles are addressed in the Emerging Technologies section of this report.
**Electric projects omit three catenary bus lines so as to just represent battery EV projects.

Twenty-eight percent of the reported AFVs were heavy-duty vehicles (HDVs). These HDVs are responsible for 75% of the petroleum savings. The average HDV displaces 7.7 times as much petroleum as the average light-duty vehicle (LDV). The use of LNG is confined exclusively to HDVs. About 85% to 90% of the savings from CNG, biodiesel, and hydrogen comes from HDVs. Sixty-two percent of the petroleum savings from LPG occurred in HDVs. The only fuel whose use was dominated by LDVs was E85 (with only 2% used by HDVs).

Hybrid, Plug-In Hybrid Electric, and Electric Vehicles

The number of HEVs, PHEVs, and all-electric vehicles (EVs) decreased in 2013 to 115,526 from 161,583 in 2012. This was due largely to a single coalition reporting all 80,000 HEVs in the state of the coalition in 2012—a reporting error that should not have been allowed. Retroactively removing these vehicles from the 2012 HEV count would result in a 40% increase in HEVs, PHEVs, and EVs in 2013 over 2012. HEVs, PHEVs, and EVs represented 20% of the total vehicles (AFVs, HEVs, PHEVs, and EVs) reported. The use of these vehicles in place of conventional vehicles saved 73 MGGEs in 2013, for an average of 632 GGEs per vehicle.

HEV usage displaced 52 MGGEs of petroleum in 2013 for an average of 631 GGEs per vehicle. The number of PHEVs increased by 46% in 2013 to 3,581, and those vehicles displaced 892,361 GGEs of petroleum. EVs increased 59% to 28,606 vehicles while displacing 19,582,719 GGEs. The average PHEV and EV displaced 249 GGEs and 685 GGEs of petroleum, respectively, in 2013.

Categorization of AFVs, EVs, PHEVs, and EVs is arbitrary because EVs are AFVs, HEVs are fuel economy technologies, and PHEVs are somewhere in between. If EVs and PHEVs are combined with the AFVs, their relative petroleum displacement is shown in Figure 2.

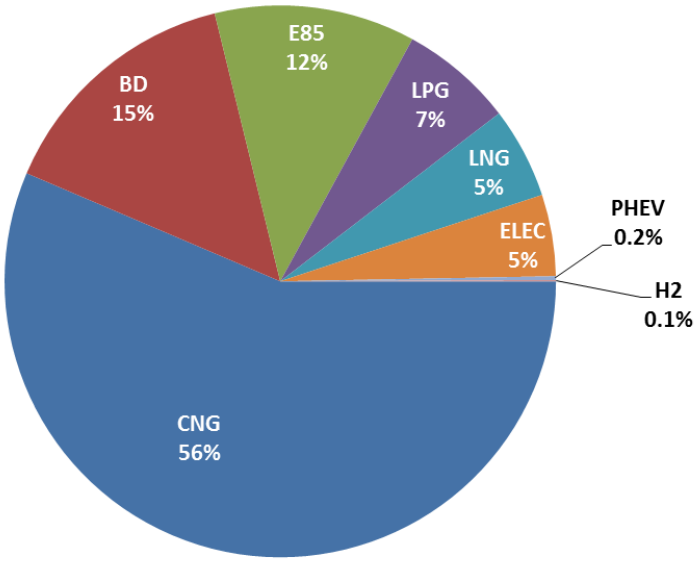

Figure 2. 2013 Petroleum displacement by AFVs, EVs, and PHEVs

Fuel Economy

Petroleum savings from non-HEV coalition fuel economy (FE) projects increased 13% in 2013, to 15.4 MGGEs. This savings resulted from nearly 24,000 vehicles, for an average displacement of 650 GGEs per vehicle. All nine categories displayed in Figure 3, except for "tire auto-inflation" and "switch to diesel," showed substantially increased displacement over 2012. Figure 3 shows that some FE improvement projects were much more effective at reducing petroleum than others. The first lightweight materials project was reported in 2013 and reported the second highest per-vehicle savings of any of the segments.

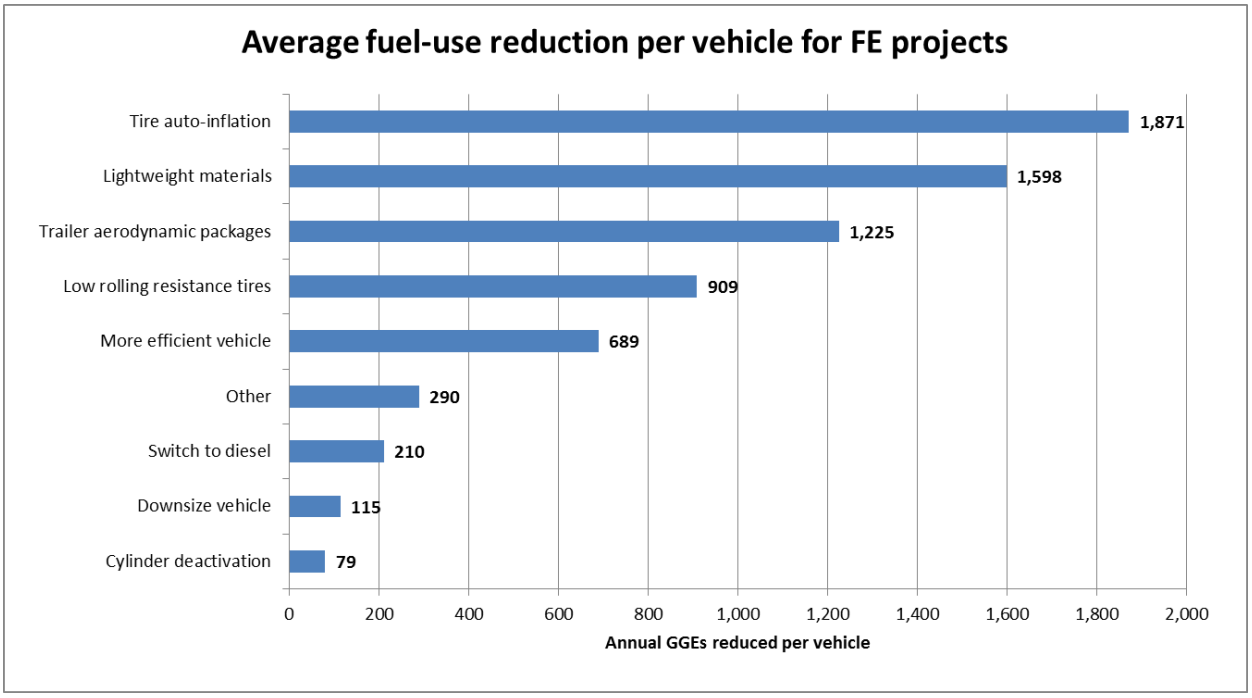

Figure 3. Average fuel-use reduction per vehicle for 2013 fuel economy projects

Vehicle Miles Traveled Reduction

VMT reduction projects save fuel by reducing the miles that vehicles travel. They include strategies such as carpooling, biking, teleworking, and public transportation. Seventy-six percent of the coalitions reported at least one VMT reduction project in 2013. The total number of projects slightly increased in 2013 to 286, but their cumulative displacement fell by 8%. Details of the project types, numbers, and sizes are shown below in Table 3.

Table 3. VMT Reduction Project Types, Number, and Displacement

Project type	Number of Projects	Increase in # of Projects	Total GGE Reduced	GGEs per Project
Carpooling	64	–1	15,318,146	239,346
Other	61	–17	4,776,404	78,302
Mass Transit	57	5	14,163,514	248,483
Non-Motorized Locomotion	47	8	763,084	16,236
Car Sharing (e.g., Zipcar)	28	9	1,337,500	47,768
Telecommute	23	2	660,822	28,731
Compressed Work Week	6	3	51,835	8,639
Total	286	9	37,071,304	129,620

Idle Reduction

IR strategies include truck-stop electrification (TSE), onboard IR, and IR policies. The estimated fuel savings for IR technologies and policies was 29.5 MGGEs in 2013. The number of IR projects increased 13% in 2013, yet the quantity of petroleum that these projects displaced declined 5%. As shown in Figure 4, TSE accounted for 10% of the IR petroleum displacement. The remaining displacement was split between onboard IR and IR policies (46% and 44%, respectively).

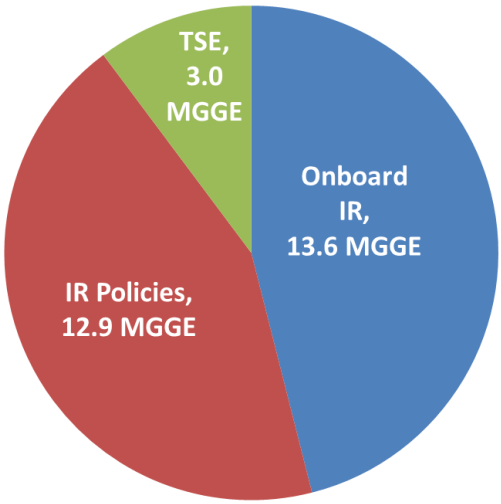

Figure 4. Fuel savings from IR projects

Estimated Petroleum Savings

Two categories comprise estimated petroleum savings: "estimated lab savings," which includes national lab activities, such as the Fuel Economy Guide and the AFDC website; and "estimated outreach savings," which includes coalition outreach activities. Both categories impact behaviors such as vehicle purchases, fuel choice, driving habits, vehicle maintenance, and transportation patterns. Calculating these petroleum savings involves a fair degree of uncertainty, but it is nevertheless important to quantify the impacts of educational and outreach activities as best we can. Not doing so would imply that these activities had no impact, which is inaccurate. This section outlines our approach and provides the results.

Methods Used To Estimate Petroleum Use Reduction by Websites and Outreach Activities

In 2013, petroleum use reduction was attributed for the fifth year in a row to the program's online information resources and to outreach events held by Clean Cities coalitions. To quantify these estimated savings, NREL and ORNL developed the Petroleum Impact Model (PIM) and NREL added related functionality to the Clean Cities annual report website.

Clean Cities coordinators reported the type of outreach event, the number of people reached by each event, the technologies presented, and the coalition's percent attribution. To determine the number of people reached by a given event, the annual report website multiplied the audience number by the percent attributed to the coalition. When multiple technologies were presented at a given event, the annual report assumed the number of people reached to be divided evenly among the technologies. This data is then entered into the PIM as "persons reached by the coalition about a given technology."

The PIM multiplies this persons-reached number by the probability a person will take action (defined as purchasing an AFV or more efficient vehicle, or as changing driving or fueling behavior). This probability is derived by comparing the outreach event and technology to comparable marketing media and products. Eleven of these media-product combinations have a "customer conversion ratio" that is recorded by various marketing firms, as shown in Table 4. The customer conversion ratio is the ratio of purchases made (desired action) over the total number of people contacted through the outreach activity. The code in Table 4 is provided for continuity through the calculation process.

Table 4. Benchmark Customer Conversion Rates and Their Sources

Code	Benchmark Conversion Rate	Reference
1	0.6% for electronics (expensive, complicated) websites	Fireclick.com. Accessed June 16, 2011
2	1.3% for environmentally related, incremental cost purchase	Bird, Lori. 2004. Utility Green Pricing Programs: Design, Implementation, and Consumer Response
3	2% for common websites	Fireclick.com. Accessed June 16, 2011
4	2.5% for industry-specific mail	Direct Marketing Association (DMA). 2011
5	3.2% for email	Fireclick.com. Accessed June 16, 2011
6	7% for affiliates	Fireclick.com. Accessed June 16, 2011
7	(Rate not listed here due to copyright restrictions) AdMeasure product: LDVs	GfK Mediamark Research & Intelligence, LLC. 2011
8	(Rate not listed here due to copyright restrictions) AdMeasure product: Gasoline	GfK Mediamark Research & Intelligence, LLC. 2011
9	(Rate not listed here due to copyright restrictions) AdMeasure smoking cessation	GfK Mediamark Research & Intelligence, LLC. 2011
10	2% for direct mail to current customers	Eisenberg, B. "The Average Conversion Rate: Is it a Myth?" ClickZ. February 1, 2008

For activity-type/audience-action combinations that weren't directly addressed by research, NREL adjusted the customer conversion ratios based on the Ostrow Model of Effective Frequency, Krugman's Three Exposure Theory, and the authors' assumptions. Table 5 lists a set of relationships that increase or decrease the impact of advertisements.

Table 5. Relationships for Media Effectiveness and Their Sources

Code	Relationships	Source
A	Degree of media interactivity increases impact	Ostrow Model of Effective Frequency
B	Brand recognition increases impact	Ostrow Model of Effective Frequency
C	Long purchase cycle increases impact	Ostrow Model of Effective Frequency
D	Less frequent usage of item increases impact	Ostrow Model of Effective Frequency
E	Affordability of item increases impact	Ostrow Model of Effective Frequency
F	Simple message increases impact	Ostrow Model of Effective Frequency
G	Media clarity (not cluttered) increases impact	Ostrow Model of Effective Frequency
H	Message in relevant environment increases impact	Ostrow Model of Effective Frequency
I	Audience attentiveness increases impact	Ostrow Model of Effective Frequency
J	More steps in processing the media increases impact	Krugman's Three Exposure Theory
K	Availability of item increases impact	Author's assumption
L	Length of vigilance required decreases impact	Author's assumption

We adjusted the benchmark conversion rates shown in Table 4 by the relationships for media effectiveness shown in Table 5. The direct application of these rates and relationships is shown in Table 6, where the number relates to the code in Table 4 and the letters relate to the code in Table 5. The final customer conversion ratios used are displayed in Table 7 (next page).

Table 6. Combination of Benchmarks and Relationships

Activity Type	Purchase New AFV	Use Alt. Fuel in Existing Vehicle	Use Biodiesel Blends in Diesel Vehicle	Purchase More Efficient Car	Operate Vehicle More Efficiently	Purchase HEV	Reduce Idling	IIR HDV (Equipment Purchase)	Reduce VMT
Advancing the Choice	6+H+I+J-E	6+H+I+J	6+H+I+J	6+H+I+J	6+H+I+J	6+H+I+J-E	6+H+I+J	6+H+I+J-E	6+H+I+J
Advertisement	7-K	8-K-L	8-K-L	7+E	9-G-L	7-K	9-L	7+E	9-L
Conference	6+H+J-E	6+H+J	6+H+J	6+H+J	6+H+J	6+H+J-E	6+H+J	6+H+J-E	6+H+J
Literature Distribution	4+B+H-E	4+B+H	4+B+H	4+B+H	4+B+H	4+B+H-E	4+B+H	4+B+H-E	4+B+H
Media Event	7-E-G-H-K	8-G-H-K	8-G-H-K	7-G-H+E-K	9-G-H-K	7-E-G-H+B-K	9-G-H-K	7-E-G-H-K	9-G-H-K
Meeting	6+A+B+I-E	6+A+B+I	6+A+B+I	6+A+B+I	6+A+B+I	6+A+B+I-E	6+A+B+I	6+A+B+I-E	6+A+B+I
Website	1+B+J	3+B+J	3+B+J	3+B+J	3+B+J	1+B+J	3+B+J	1+B+J	3+B+J

Table 7. Customer Conversion Ratios Used in the PIM

Activity Type	Purchase New AFV	Use Alt Fuel in Existing Vehicle	Use Biodiesel Blends in Diesel Vehicle	Purchase More Efficient Car	Operate Vehicle More Efficiently	Purchase HEV	Reduce Idling	IR HDV (Equip Purchase)	Reduce VMT
Advancing the Choice	2.0%	6.0%	6.0%	5.0%	7.0%	2.0%	5.0%	4.0%	8.0%
Advertisement	0.6%	5.5%	5.5%	2.0%	10.0%	2.0%	10.0%	3.0%	4.0%
Conference	2.0%	6.0%	6.0%	5.0%	7.0%	2.0%	5.0%	4.0%	8.0%
Literature Distribution	2.0%	3.0%	3.0%	2.5%	3.0%	2.5%	3.0%	2.5%	5.0%
Media Event	0.6%	2.5%	3.0%	1.2%	3.0%	1.2%	4.0%	2.0%	2.0%
Meeting—Other	2.0%	7.0%	6.0%	5.0%	7.0%	2.0%	5.0%	4.0%	8.0%
Website	2.0%	4.0%	3.0%	3.0%	4.0%	3.0%	3.0%	3.0%	3.0%

The persons-reached multiplied by the appropriate customer conversion ratio (from Table 7) results in the number of people assumed to take the intended action. Please note that the decreased percentages for media events implemented last year were revised this year because the E15 media events were no longer a consideration. After the conversion factors have been applied, the PIM is similar to the Clean Cities annual reporting tool, as it converts the estimated number of vehicles purchased or number of people changing their driving habits into reduced petroleum use. We make downward adjustments to the estimates to account for probable overlaps between audiences attending outreach events and entities reporting their own petroleum savings via a Clean Cities coalition. We apply the estimated petroleum savings only to the reporting year in question, even though many of the vehicle purchases and behavioral changes will likely last beyond that year.

We also used the PIM to estimate petroleum savings resulting from the AFDC. NREL gathers AFDC website statistics that allow us to estimate the number and characteristics of individual users. The PIM then uses inputs, defaults, and methodologies similar to those it employs in calculating the savings from coalition websites (including the website row of Table 4) to estimate the total petroleum savings attributable to the AFDC.

Estimated Lab Savings

Both NREL and ORNL use a variety of means to track the use of the information and resources they provide on behalf of the Clean Cities program. ORNL produces the Fuel Economy Guide based on fuel economy data from the U.S. Environmental Protection Agency. It also produces and maintains the FuelEconomy.gov website along with other print products and educational activities related to fuel economy. By tracking the number of new car buyers, used car buyers, and car drivers exposed to fuel economy products through their educational materials, and assuming a 1% to 3.3% improvement in fuel economy per customer, ORNL estimated that the fuel economy materials resulted in a savings of 201 MGGEs in 2013.

Online resources managed by NREL reached a large audience in 2013, as the Clean Cities and AFDC websites received a combined 7.1 million page views. The sites provide a range of resources to support coordinators, fleets, businesses, policymakers, and other transportation decision-makers in their efforts to implement the technologies and strategies in the Clean Cities portfolio. The sites' content includes technical data, case studies, and publications, along with databases of federal and state incentives and laws, fueling station locations, available vehicles, and other information and tools.

NREL estimates that the 6.7 million page views through 1.7 million sessions by 1.3 million users of the AFDC resulted in a petroleum savings of 65 MGGEs in 2013. Compared to 2012, this is a 22% increase in page views, yet a 7% reduction in petroleum savings. The discrepancy is largely due to a change in the value used in the calculation. Previously we had to estimate users based on unique page views, but now Google Analytics provides us with a more accurate value. The discrepancy is also partially due to a shift in page views from the station locator (with a high customer conversion ratio) to other pages with lower customer conversion ratios. The AFDC engaged the average visitor for 3.5 minutes

The Clean Cities website received 380,000 page views through 127,000 sessions from 65,000 visitors, and held the average visitor for more than 3 minutes. We assumed that 20% of the AFDC visitors were overlaps with activities reported by the coalitions. We did not make petroleum use reduction estimates for the Clean Cities website, because we assumed the majority of site visits were related to Clean Cities activities taking place through coalitions, and those activities were already reported by the coalitions. For the same reason, we did not make petroleum use reduction estimates for other Clean Cities activities performed by NREL, such as webinars, technical advice, presenting and exhibiting at conferences, and publications.

Estimated Outreach Savings

Coalitions' outreach, education, and training activities were classified into nine categories, as shown in Table 8. A total of 2,229 activities were reported, which were estimated to have reached nearly 120 million people. Compared to 2012, the number of events decreased by 5%, while the number of persons reached increased by 10%. This is because the average size of events increased slightly from last year—from 46,428 persons per event to 53,740. This average size is heavily influenced by large media events. The majority of people (94%) were reached through media events in 2013, even though only 10% of the outreach activities were media events. The overall increase in people reached through media events was largely driven by high-profile media stories in Minnesota and Utah that gained national coverage and syndication. Meetings were the most common type of outreach event (34%), but reached only 0.5% of the outreach audience. There was a sharp decline in website outreach in 2013. Advertisements, social media, and stakeholder meetings appeared to be less productive in 2013 because they reached far fewer people, even though the number of events didn't decline by much.

Table 8. Outreach, Education, and Training Activities

Activity Type	Persons Reached	Share of Total Persons Reached	Persons Increase Since 2012	Number of Activities	Share of Total Activities	Activities Increase Since 2012
Media Event	112,043,770	93.5%	103.9%	216	9.7%	–34.3%
Advertisement	4,185,510	3.5%	–91.3%	30	1.3%	20.0%
Conference Participation	1,966,714	1.6%	58.7%	381	17.1%	–0.3%
Workshop Held by Coalition	604,267	0.5%	–21.8%	279	12.5%	12.5%
Literature Distribution	384,823	0.3%	–71.7%	218	9.8%	–0.5%
Meeting—Other	362,919	0.3%	–27.8%	767	34.4%	0.5%
Website	142,030	0.1%	–84.4%	14	0.6%	–51.7%
Social Media	82,484	0.1%	–84.5%	33	1.5%	–5.7%
Meeting—Stakeholder	15,287	0.0%	–65.8%	291	13.1%	–5.5%
TOTAL	119,787,804	100.0%	10.4%	2,229	100.0%	–4.7%

Figure 5 illustrates the types of audiences reached through the 2,229 outreach activities. The coalitions could aim any one activity toward multiple audiences; in fact, each activity targeted an average of 3.8 different audiences. Government fleets were the most-cited target audience, followed by the general public, then private fleets. Entities with specialized applications—such as utility trucks, mass transit, delivery trucks, waste management, and airports—were identified as audiences in nearly 41% of the outreach activities. Outreach events that targeted the general public showed the largest change from last year—representing only 15% of all outreach events in 2013, which was a reduction of six percentage points from the previous year.

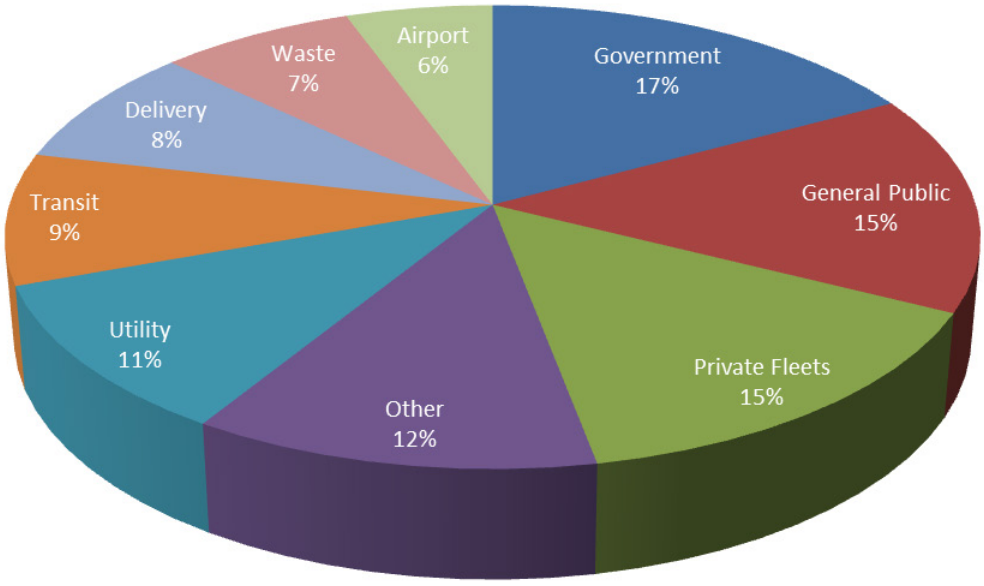

Figure 5. Percent of outreach activities split among audience types

Coalitions' outreach events featured a relatively even mix of technologies, as illustrated in Figure 6. No single technology dominated, but AFVs were covered more than any of the other technology types. There were no major shifts in the focus of outreach events this year, and the breakdown shown is very close to what it was in 2012. Just as with audience types, any one activity could address more than one technology; each activity featured an average of 2.9 different technologies.

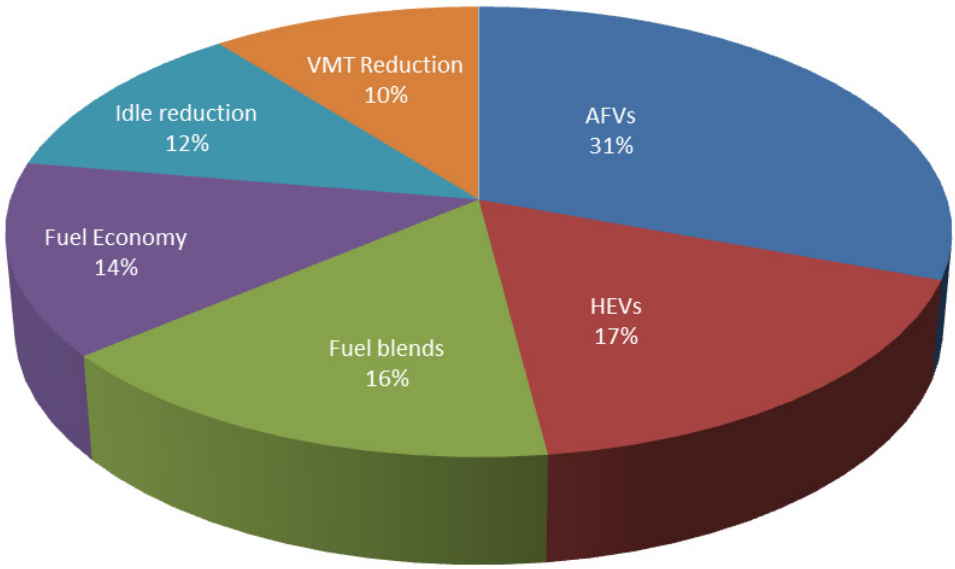

Figure 6. Percent of outreach activities by technology type

Using the PIM, NREL estimates that Clean Cities coalition outreach events prompted and enabled actions that saved 189 MGGEs of petroleum in 2013.

Goal Tracking and Cumulative Petroleum Savings

In 2005, Clean Cities set a goal of displacing 2.5 billion GGEs (BGGEs) per year by 2020. The data presented in this report show that Clean Cities is ahead of schedule to meet this goal. Clean Cities' progress toward its petroleum use reduction goal is shown in Figure 7, where the path toward achieving the 2020 goal is represented by the blue dashed line and actual petroleum savings are tracked by the black solid line. When the goal was originally set in 2005, meeting it required a compounded annual growth rate of 16.6%. However, because of higher-than-projected petroleum savings in subsequent years, the average growth rate required henceforth to meet the 2020 goal is 13.9%.

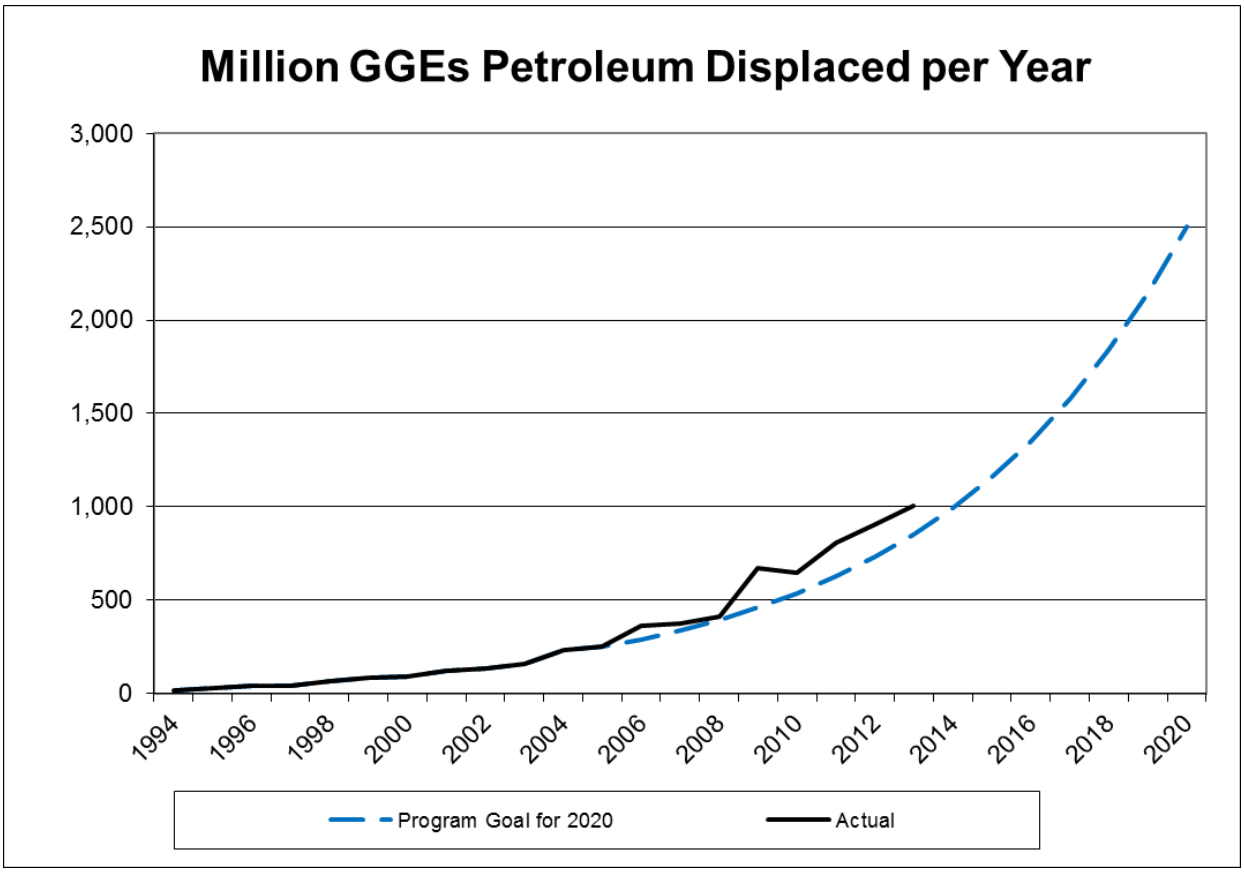

Figure 7. Annual petroleum savings trajectory to meet 2020 goal and actual progress

Clean Cities efforts have added up considerably over the years. When the annual savings shown in Figure 7 are aggregated to cumulative savings, the overall impact can be seen. This cumulative savings, shown in Figure 8, is now nearly 6.5 BGGEs.

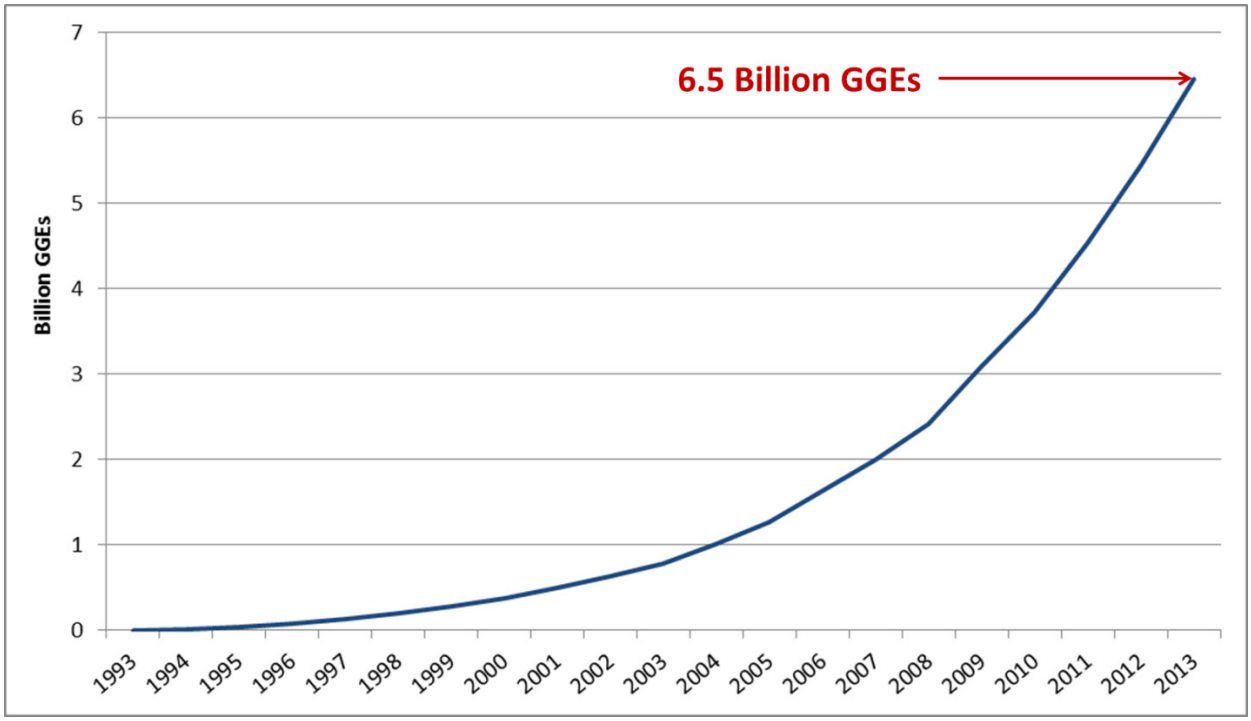

Figure 8. Cumulative petroleum savings of all Clean Cities activities

Greenhouse Gas Emissions Reduction

Clean Cities' petroleum use reduction leads to a substantial reduction in GHG emissions, the pollutants responsible for global climate change. To estimate the GHG reductions resulting from Clean Cities activities, we used a variation of Argonne National Laboratory's Greenhouse Gas, Regulated Emissions, and Energy Use in Transportation (GREET) model. This model takes into account the fuel life cycle, or "well to wheels," GHG emissions for transportation fuels, which include fuel production, transport, and use in the vehicle. It does not take into account the emissions from indirect land use changes or vehicle manufacturing. Table 9 lists 2013 Clean Cities GHG emissions reductions by technology type. The table also indicates the number of passenger cars that would need to be removed from the road to achieve an equivalent reduction in GHG emissions.

Table 9. GHG Emissions Reduced by Clean Cities in 2013

Technology	Tons of GHG Emissions Averted	Equivalent Cars Removed*	Percent of Coalition Total
Alternative Fuels and AFVs	1,213,818	255,004	41%
HEVs, PHEVs, and EVs	692,287	145,438	23%
VMT Reduction	457,216	96,054	15%
IR	359,532	75,532	12%
FE Improvements	190,411	40,002	6%
Off-Road Vehicles	63,982	13,442	2%
Coalition Reported Total	2,977,246	625,472	100%
ORNL Fuel Economy	2,495,205	524,203	N/A
AFDC	185,083	38,883	N/A
Outreach Events	1,802,685	378,715	N/A
Grand Total	7,460,219	1,567,273	N/A

* Calculated as total passenger car GHG emissions (Table 2–15 in the EPA's Inventory of 2012 GHG Emissions and Sinks) divided by total short wheelbase LDVs (Table VM-1 in the Federal Highway Administration's Highway Statistics, 2012).

Alternative fuels and AFVs were responsible for more GHG emissions reductions than any other coalition-reported activity. We calculated these reductions by subtracting the life cycle GHG emissions resulting from the use of an alternative fuel in a vehicle from the life cycle GHG emissions resulting from the use of gasoline or diesel fuel in an equivalent vehicle. For the purposes of these calculations, gasoline is considered the baseline fuel for all LDVs, except in the case of biodiesel, for which conventional diesel fuel is used as the baseline. Gasoline is considered the baseline fuel for HDVs using E85, CNG, LNG, and LPG, because these vehicles are equipped with spark-ignition (gasoline-like) engines. For all other alternative fuel HDVs, we used conventional diesel fuel as the baseline.

Figure 9 shows which fuels were used to achieve these reductions and how many AFVs were required for a given reduction. Notably, the GHG emissions reductions are not necessarily proportional to the petroleum displacement shown in Figure 1 because the various alternative fuels emit different levels of life cycle GHGs. It is also worth noting that VMT reduction, HEVs, IR, and fuel economy improvement projects have a disproportionately high reduction of GHGs relative to their petroleum displacement. This is because these technologies eliminate 100% of the GHG emissions per gallon of petroleum saved, while alternative fuels reduce GHG emissions by a lesser amount per gallon of petroleum saved.

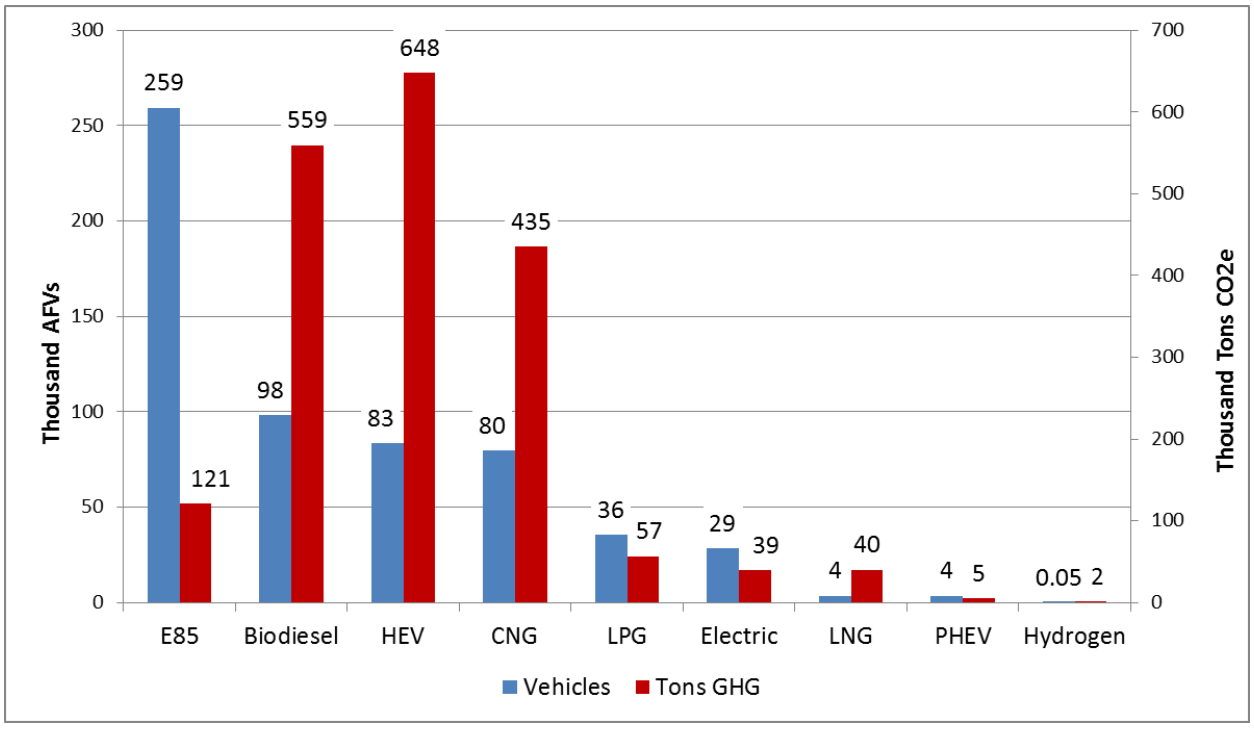

Figure 9. Number of AFVs and amount of GHG reduction by fuel type

Off-Road Vehicles

Vehicles used in off-road applications contributed to the petroleum savings reported by coalitions. Petroleum savings occurred when these vehicles were AFVs and used alternative fuel or when fuel economy or VMT efforts were implemented. Table 10 shows the number of off-road vehicles (or pieces of equipment) reported by coalitions in 2013. These categories are self-descriptive, with the exceptions of "construction equipment," which includes cranes, earth movers, and similar equipment; and "recreation equipment," which includes jet skis, snowmobiles, and all-terrain vehicles. The number of off-road vehicles decreased 7% from 2012 to 2013, yet their overall petroleum displacement increased 19%. This was primarily due to large increases in the amount of fuel displaced by projects in the railroads and ships segments where the numbers of vehicles were low, but the petroleum avoidance per vehicle was high. The largest growth in vehicles since 2012 was seen in railroads and street sweepers with 186% and 81% growth, respectively. The largest reduction was in the number of landscaping (mostly mowers) and construction equipment with 29% and 18% reductions, respectively.

Table 10. Number of Off-Road Vehicles or Equipment and Petroleum Saved

Application	Number of Vehicles	GGEs Saved	GGEs per Vehicle
Construction Equipment	4,260	687,651	161
Other	3,551	560,657	158
Forklifts	3,092	711,607	230
Mining Equipment	1,491	1,749,379	1,173
Landscaping Equipment	880	231,444	263
Recreational Equipment	450	23,299	52
Farm Equipment	127	179,502	1,413
Street Sweeper	58	19,421	335
Ships	44	2,892,052	65,728
Railroads	40	812,748	20,319
Planes	20	3,936	197
TOTAL	14,013	7,871,695	562

Overall savings from off-road vehicles totaled 7.9 MGGE. Vehicles using biodiesel accounted for 58% of the AFVs included in this category. Vehicles using other fuels in off-road applications included EVs (21%) and LPG vehicles (17%). The other six fuels and technologies together accounted for fewer than 4% of the total vehicles. Biodiesel use was focused in the construction equipment, mining equipment, and other equipment applications. EVs were primarily used in forklifts and other equipment. LPG vehicles were primarily reported as forklifts and construction equipment. Applications varied widely in the number of GGEs displaced per vehicle, as shown in Table 10.

Alternative Fuel Vehicle Types and Markets

The online reporting tool asked coordinators to categorize their AFVs into key vehicle types and niche market fleets. Figure 10 shows that the largest portion (32%) of AFVs were cars. "Unknown/Other" LDVs were the second most common AFV (at 23% of total). These are usually vehicles reported in conjunction with a Clean Cities-supported fueling station. Light trucks/vans/sport utility vehicles (SUVs) comprised the third-largest category, which accounted for 18% of the AFVs. Heavy trucks without trailers along with "unknown" or "other" HDVs , which were mostly reported in conjunction with biodiesel public fueling stations, each accounted for 6% of the vehicles. All remaining categories accounted for fewer than 4% of the vehicle population.

E85 LDVs were the most popular fuel/vehicle combination. E85 vehicles in the "unknown" or "other" light-duty segment (87,000 vehicles), the light trucks/vans/SUVs segment (79,000 vehicles), and the E85 car segment (77,000 vehicles) together comprised 41% of all vehicles. The combinations that have grown the most, in terms of a vehicle count basis since 2012 are "unknown" or "other" LPG LDVs, "unknown" or "other" E85 LDVs, E85 cars, and biodiesel delivery trucks. CNG and electric cars, along with CNG refuse trucks, have also shown strong increasing numbers.

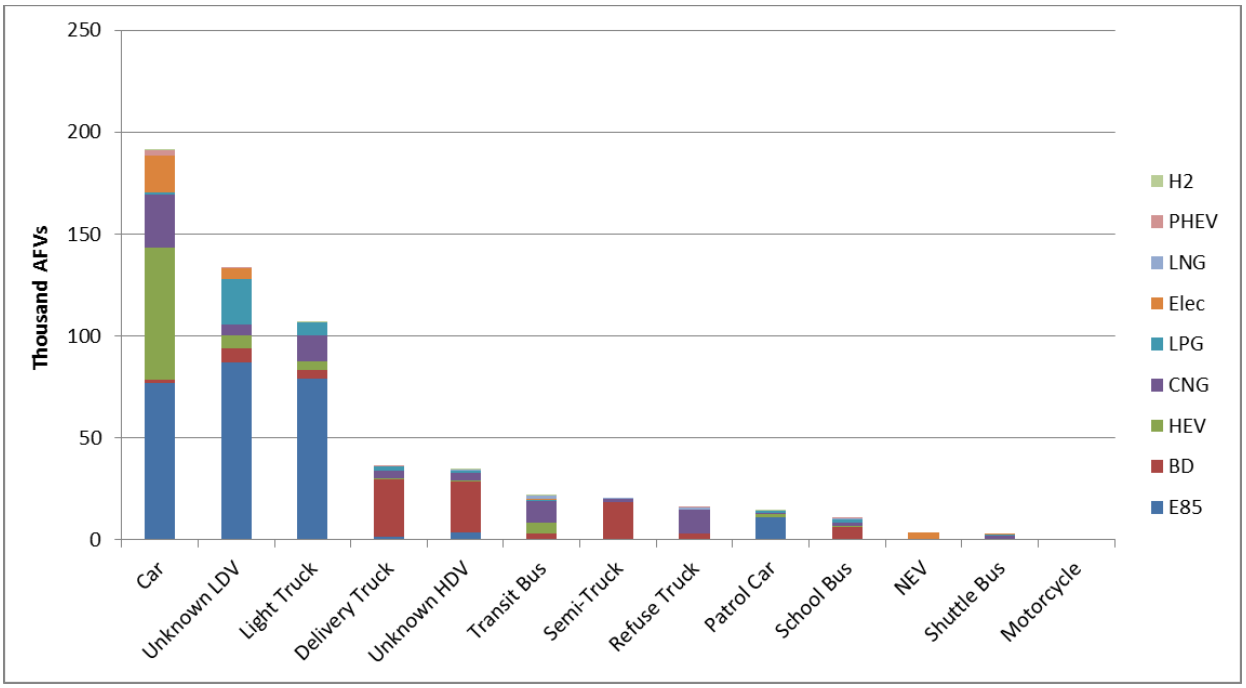

Figure 10. AFVs by vehicle and fuel type

In addition to reporting vehicle types, coordinators also provided information about vehicle ownership and the markets served by reported vehicles. As shown in Figure 11, half of the reported vehicles were owned by the general public or an unknown entity. Many of these vehicles were reported through fuel retailers. The next two largest ownership groups of AFVs are local governments and state governments, at 21% and 15%, respectively.

The number of vehicles in taxi fleets increased by 70%, which showed the most growth for any market in 2013. Most of these taxis were HEVs in Chicago and San Francisco. The number of airport vehicles, local government vehicles, and general public or unknown vehicles all increased significantly (29%, 20%, and 11%, respectively). The most popular fuels for these markets were CNG, E85 and biodiesel (tied), and E85, respectively. All other vehicle segments shrank in number between 1% and 9%.

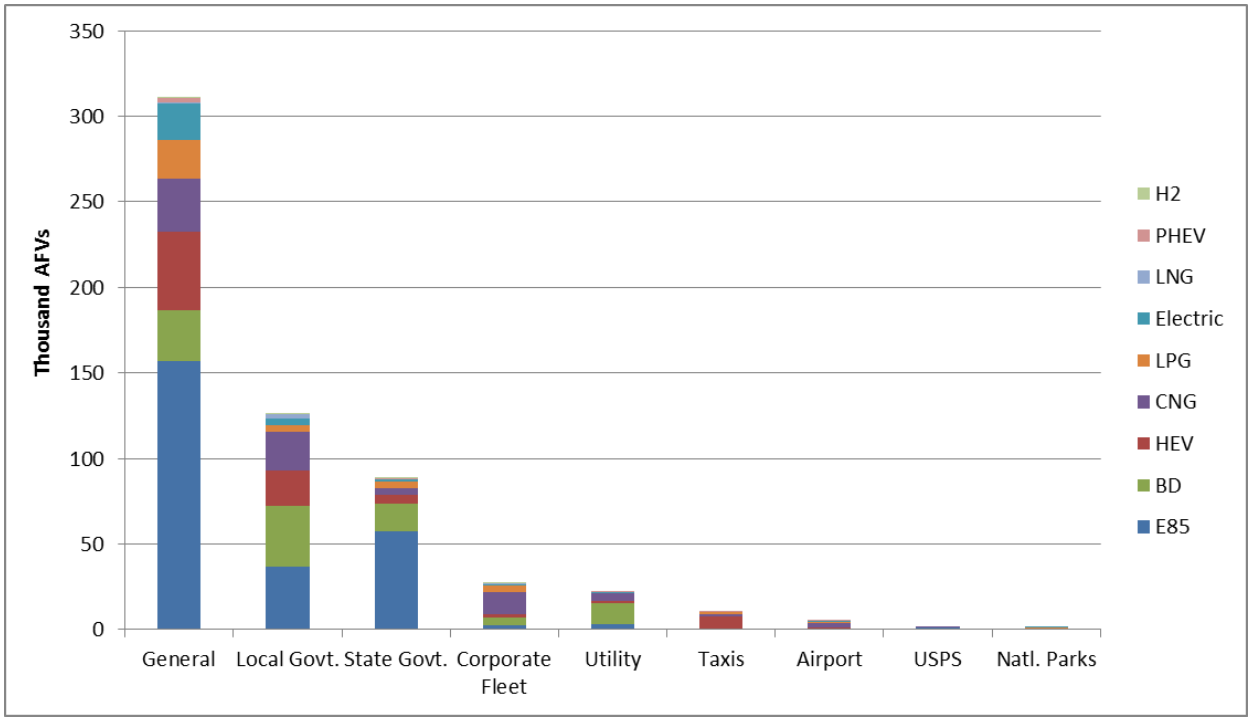

Figure 11. AFVs by market and fuel type

When assessing AFV types and markets, it is helpful to look at the average amount of petroleum reduced by given categories. This is shown in Table 11. The average Clean Cities AFV reduced 782 GGEs in 2013. Transit buses displaced the most petroleum (7,743 GGEs) through the use of eight different alternative fuels. Of these fuels, electricity reduced the most (15,600 GGEs) from each bus using it. CNG provided the greatest petroleum displacement in 11 different fleet/vehicle types, largely because CNG engines are widely used in high fuel use applications. LPG provided it for four, electricity and hydrogen for two, and LNG and HEVs for one category each.

Table 11. Average Petroleum Reduction by Vehicle Type, Fleet Type, and Fuel Type

Vehicle Type	Fleet Type	# of Alt. Fuels Used	Average Reduction* (GGE/veh)
Transit Bus	Local Govt., Corporate, General, State Govt., Airport, Natl. Parks	8	7,743
Multiple	Corporate Fleet	9	3,598
Shuttle Bus	Local Govt., Airport, Corporate, Taxis, State Govt., Natl. Parks	6	3,485
Multiple	Taxis	6	2,480
Refuse Truck	Local Govt., Corporate, Utility, State Govt., Airport	7	2,441
Semi-trailer Truck	Corporate, Local Govt., Utility, Postal Service, State Govt.	7	2,368
Multiple	Airport	8	1,867
Multiple	Local Govt.	8	1,151
School Bus	Local Govt., State Govt., Corporate	7	1,121
Mixed HDV	State Govt., Local Govt., Corporate, Utility, Airport, Postal Service, Taxis	9	804
All/Average	All/Average	9	782
Delivery Truck	Local Govt., Corporate, State Govt., Utility, Airport, Natl. Parks	8	616
Multiple	National Parks	6	441
Pickup/SUV/Van	State Govt., Local Govt., Corporate, Utility, Airport, Postal Service, Taxis, Natl. Parks	8	346
Patrol Car	Local Govt., State Govt., Corporate, Airport, Natl. Parks	7	337
Multiple	Utility	7	321
Multiple	United States Postal Service	2	308
Car	State Govt., Local Govt., Taxis, Utility, Corporate, Airport, Natl. Parks	8	300
Multiple	State Govt.	6	273
Mixed LDV	State Govt., Local Govt., Corporate, Utility, Taxis	7	272
Low-Speed	Local Govt., State Govt., Corporate, Airport, Utility, Natl. Parks	5	214
Motorcycle	Local Govt., Corporate	2	58

*Average reduction is the weighted average of all fleet types for a given vehicle type.

Emerging Technologies - Experimental, Prototype, and Demonstration Vehicle Projects

A small number of Clean Cities coalitions have worked with fleets and stakeholders who have an interest in field-testing advanced vehicle technologies (e.g.; hydrogen and fuel cell vehicles). Some of these projects involve limited production, experimental, or prototype/demonstration models that are made available from manufacturers under special lease arrangements. This is a way for OEMs to gather in-use performance data, evaluate durability, and refine engineering designs for future vehicle models that may be under development. Data reported for some of these vehicles shows the extraordinary potential they have for both energy and environmental benefits. This subset of vehicles represents less than 0.01% of the total number of alternative fuel or advance technology vehicles reported by coalitions. No significant market trends could be drawn from this limited data set.

Coordinators and Coalition Types

Collectively, coordinators reported spending a total of 2,702 hours per week on Clean Cities tasks, or more than 130,000 total hours over the course of the year. This translates into 67 full-time, experienced technical professionals working to reduce U.S. dependence on petroleum. For an individual coalition, the average amount of time spent coordinating Clean Cities business per week was 33 hours, and the median was 30 hours. The average increased from 31 hours in 2012, while the median remained consistent. The reporting website also gathered information on coordinator experience. The average coordinator has been on the job for seven years. Half of coordinators have had more than five years of experience as of 2013, and half have had five or fewer years of experience. Twenty-one coordinators have been with Clean Cities for at least 10 years.

Coalition types were tracked and the relationships between coalition type and general metrics were analyzed. The coalition types correspond to their host organization (who generally pays the coordinator's salary) and are listed in the first column in Table 12 and defined in Appendix B. Standalone nonprofits and independent businesses are coalition types that are self-sustaining and do not operate as part of a larger host organization.

The number of coalitions in each grouping is listed in the second column of Table 12 (next page), followed by metrics such as the average number of stakeholders, average funds (including grants and dues) received in 2013, the average GGEs of petroleum reduced, and the average number of persons reached through outreach events. The range of all metrics overlaps heavily between groups and the low sample size precludes statistical significance. Furthermore, many variables affecting the metrics in this table were not controlled for, so no cause/effect relationships can be inferred between coalition type and specific metrics. Coalitions that reported the highest number of stakeholders tended to be independent businesses, while those reporting the fewest stakeholders were hosted by universities. Coalitions that raised the most funds and reduced the most petroleum consumption tended to be hosted by city and county governments. Coalitions that reached the most people in outreach events were generally hosted in a nonprofit. Coalitions that brought in the least amount of funding were generally hosted by state governments. Coalitions that were independent businesses tended to reduce the least amount of petroleum and reach the fewest people through outreach.

Table 12. Coalition Metrics by Coalition Type

Coalition Type*	# of Coalitions	Average # of Stakeholders	Average Funds In	Average GGE Reduced	Average Persons Reached
Nonprofit - Standalone	28	195	$8,690,820	7,977,664	90,690
Nonprofit - Hosted	17	186	$11,620,771	5,448,210	6,602,112
Regional Governing Coalition	14	145	$4,443,285	6,015,430	68,542
Government—State	10	164	$1,065,127	4,731,180	258,850
Government—City or County	7	140	$19,406,545	12,240,525	192,444
University	4	99	$5,232,958	4,444,002	28,959
Independent Business	2	324	$5,537,903	809,850	766
Total/Overall Weighted Average	82	174	$8,312,278	6,739,041	1,460,827

*Coalition Types are defined in Appendix B below.

Project Funding

In 2013, 54 coalitions reported receiving 132 new project awards (project-specific grants) worth a total of $47 million. These coalitions also reported garnering $42 million in leveraged, or matching funds, for a combined total of $89 million. This funding represents well over a 3:1 leveraging of the $26.5 million program budget in FY 2013. The value of 11 of the 132 awards exceeded $1 million each. Table 13 presents a breakdown of the number and value of awards reported by the coalitions.

Table 13. Breakdown of 2013 Project Awards by Number and Value

Grant Range	Number of Grants	Share of Total Number	Total Value	Share of Grand Total Value
< $50,000	63	48%	$1,226,866	3%
$50,000–$99,999	16	12%	$1,231,123	3%
$100,000–$499,999	29	22%	$6,704,499	14%
$500,000–$999,999	13	10%	$9,557,643	20%
$1,000,000 +	11	8%	$28,438,279	60%
Grand Total	132	100%	$47,158,410	100%

In addition to new 2013 awards, coordinators reported the portions of previous multiyear awards spent during the calendar year. If a coordinator failed to report the amount spent during 2013, we assumed it to be the total amount of the award divided by the number of years of award duration. Coalitions reported already spending 47% of the funds they were awarded in 2013, suggesting that projects started quickly. In 2013, coalitions helped utilize a total of $165 million in project funds that were awarded and matched from 2007 to 2013.

The American Recovery and Reinvestment Act (ARRA) was signed into law on February 17, 2009, to create jobs in all areas of the country and spur future economic development in key areas such as clean energy. Clean Cities proved to be a highly effective avenue for identifying effective, shovel-ready projects across the nation and quickly funding them. In 2009, more than $190 million of the award funding reported by Clean Cities coalitions came from ARRA, and

that money attracted $176 million in leveraged funds. In 2010, 48 more ARRA awards were distributed to 33 coalitions. In 2011, nine projects were funded by $4.3 million which leveraged an additional $2 million in matching funds. In 2012, 22 projects were funded with $70 million, including matching funds. In 2013, the final 4 projects were funded for a total of $10.1 million ($1.6 million ARRA with matching funds of $8.5 million). ARRA funds distributed during all five years are still being utilized, accounting for $33 million in Clean Cities project funding spent in 2013.

Of the $89 million in project awards and leveraged funds awarded to coalitions in 2013, $5.9 million (7%) was listed as coming from DOE, independent of ARRA. DOE funds distributed in 2013 and previous years totaled $23 million of the $165 million (14%) utilized for projects in 2013. Funding from Clean Cities coalition support contracts was not included among the project awards, because those funds are intended to enable certain coalition operations rather than specific projects.

About the Stakeholders

In 2013, 82 coalitions reported a total of more than 14,000 stakeholders, for an average of 174 stakeholders per coalition. This data indicates that the average coalition shrank 20%, from 217 stakeholders in 2012.

Participation in Clean Cities is voluntary, and coalitions draw local stakeholders from the public and private sectors. Stakeholders include local, state, and federal government agencies, large and small businesses, auto manufacturers, car dealers, fuel suppliers, public utilities, and professional associations. Coalitions reported that 52% of the total stakeholders were from the private sector. This composition is up slightly from 51% in 2012 and shows a steady balance between public and private stakeholders in 2013.

Data Sources and Quality

Gathering data is always challenging for coordinators, because they rely on voluntary reporting from their numerous stakeholders. Therefore, the annual report website contains some questions related to data sources and quality. In these questions, coordinators were asked to rate the quality of their data as excellent, good, fair, or poor. The “cumulative” bar in Figure 12 presents the response breakdown for the 82 coordinators who answered the question. Twenty-eight percent of the respondents classified their data as excellent, 64% as good, 7% as fair, and 0% as poor. Relative to 2012, the poor category decreased one percentage point, the fair category increased three percentage points, the good category decreased by five percentage points, and the percentage of coordinators who felt their data was excellent increased three percentage points.

We also asked coordinators how they obtained their data. They could choose one or more of the following: online questionnaires (e.g., Survey Monkey), written (paper or electronic) questions to stakeholders, phone interviews with stakeholders, coalition records, or coalition estimates. Phone interviews were the most used method of data gathering, accounting for 27%. The second most common method was written questions (26%), then coalition records (21%), estimates (15%), and finally online questionnaires (11%). There have been only minor shifts in this breakdown since 2011. Figure 12 shows that estimates resulted in slightly lower levels of reliability than the other collection methods. This is likely due to coordinators’ confidence in the

numbers that come from stakeholder fleets as opposed to the numbers they estimate themselves. The quality of the data collected via the other four methods was rated very similarly from one method to the next.

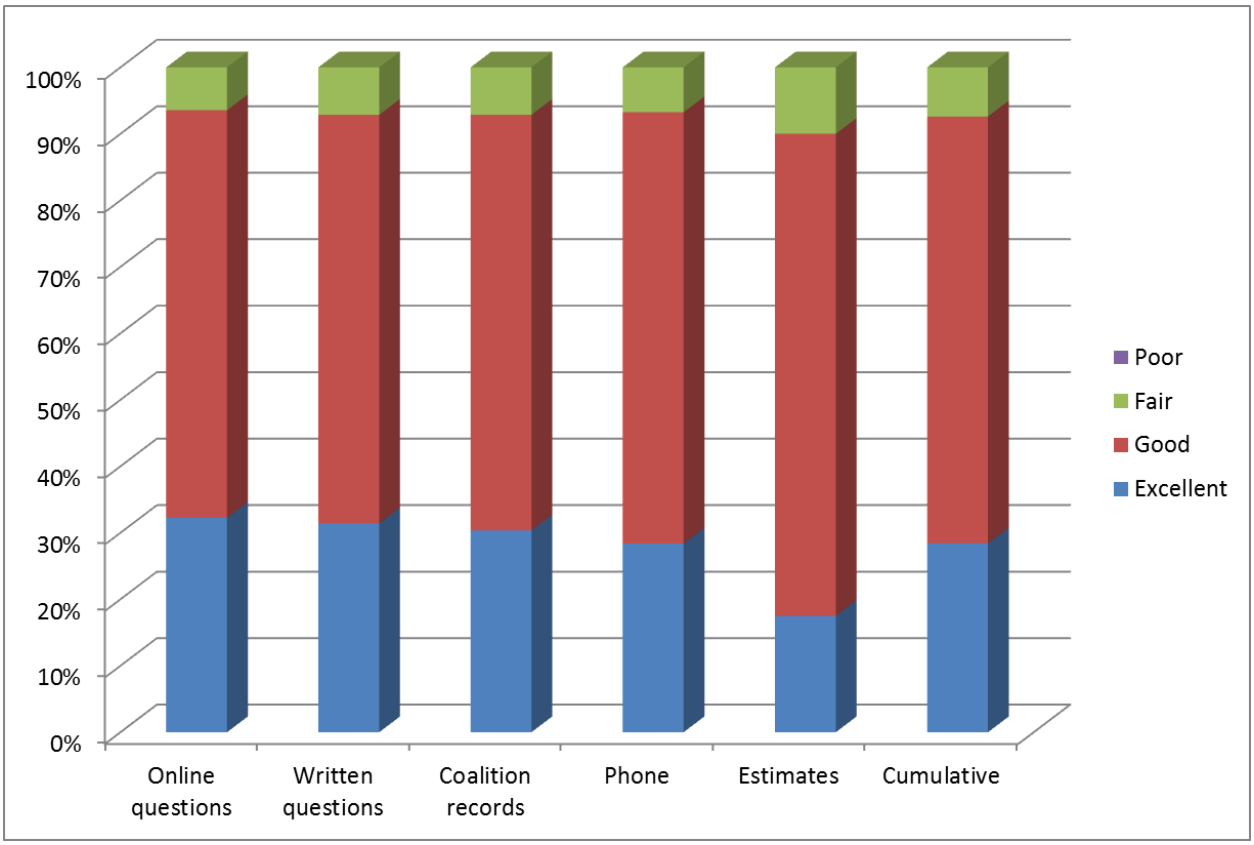

Figure 12. Data quality responses by data source

Conclusion

The Clean Cities 2013 Annual Metrics Report helps quantify the impact of the program as a whole and of the activities of individual coalitions. The report shows that Clean Cities had a very successful year on all accounts. The program outpaced its petroleum-savings goal by improving that metric 11% this year. It increased the number and diversity of AFVs and advanced vehicles on U.S. roads. The program also substantially increased its GHG savings, the number of people reached through its outreach events, stakeholder involvement, and reported data quality. The combined efforts of local Clean Cities coalitions, DOE, and its national laboratories brings together otherwise disparate groups and funding sources to accelerate the nation's progress toward petroleum savings, and thereby, toward improved energy independence, economic security, and environmental protection.

Appendix A: Clean Cities Coalitions That Completed 2013 Annual Reports

State	Coalition
AL	Alabama Clean Fuels Coalition
AR	Arkansas Clean Cities
AZ	Tucson Clean Cities
AZ	Valley of the Sun Clean Cities (Phoenix)
CA	Central Coast Clean Cities
CA	Clean Cities Coachella Valley Region
CA	East Bay Clean Cities (Oakland)
CA	Long Beach Clean Cities
CA	Los Angeles Clean Cities
CA	Sacramento Clean Cities
CA	San Diego Regional Clean Cities Coalition
CA	San Francisco Clean Cities
CA	San Joaquin Valley Clean Cities
CA	Silicon Valley Clean Cities (San Jose)
CA	Southern California Clean Cities
CA	Western Riverside County Clean Cities
CO	Denver Clean Cities
CO	Northern Colorado Clean Cities
CO	Southern Colorado Clean Cities
CT	Capitol Clean Cities of Connecticut
CT	Connecticut Southwestern Area Clean Cities
CT	New Haven Clean Cities
CT	Norwich Clean Cities
DC	Greater Washington Region Clean Cities
DE	State of Delaware Clean Cities
FL	Central Florida Clean Cities Coalition
FL	Southeast Florida
GA	Clean Cities-Georgia
HI	Honolulu Clean Cities
IA	Iowa Clean Cities Coalition
ID	Treasure Valley Clean Cities
IL	Chicago Area Clean Cities Coalition
IN	Greater Indiana Clean Cities
IN	South Shore Clean Cities
KS	Kansas City Regional Clean Cities
KY	Kentucky Clean Cities Partnership
LA	Louisiana Clean Fuels
LA	Southeast Louisiana Clean Fuels Partnership
MA	Massachusetts Clean Cities
MD	State of Maryland Clean Cities
ME	Maine Clean Communities

State	Coalition
MI	Ann Arbor Clean Cities
MI	Detroit Clean Cities
MI	Greater Lansing Area Clean Cities
MN	Twin Cities Clean Cities
MO	St. Louis Clean Cities
NC	Centralina Clean Fuels Coalition
NC	Land of Sky Clean Vehicles Coalition (Western North Carolina)
NC	Triangle Clean Cities (Raleigh, Durham, Chapel Hill)
ND	North Dakota Clean Cities
NH	Granite State Clean Cities
NJ	New Jersey Clean Cities
NM	Land of Enchantment Clean Cities (New Mexico)
NY	Capital District Clean Communities (Albany)
NY	Clean Communities of Central New York (Syracuse)
NY	Clean Communities of Western New York (Buffalo)
NY	Empire Clean Cities
NY	Genesee Region Clean Communities (Rochester)
NY	Greater Long Island Clean Cities
OH	Clean Fuels Ohio
OH	Northeast Ohio Clean Transportation (Cleveland)
OK	Central Oklahoma Clean Cities (Oklahoma City)
OK	Tulsa Clean Cities
OR	Columbia-Willamette Clean Cities
OR	Rogue Valley Clean Cities
PA	Greater Philadelphia Clean Cities
PA	Pittsburgh Region Clean Cities
RI	Ocean State Clean Cities
SC	Palmetto State Clean Fuels Coalition
TN	East Tennessee Clean Fuels Coalition
TN	Middle Tennessee Clean Cities
TX	Alamo Area Clean Cities (San Antonio)
TX	Dallas-Fort Worth Clean Cities
TX	Houston-Galveston Clean Cities
TX	Lone Star Clean Fuels Alliance (Central Texas)
UT	Utah Clean Cities
VA	Virginia Clean Cities
VT	Vermont Clean Cities
WA	Western Washington Clean Cities (Seattle)
WI	Wisconsin Clean Cities
WV	State of West Virginia Clean Cities
WY	Yellowstone-Teton Clean Energy Coalition

Appendix B: Definition of Clean Cities Coalition Types

Coalitions have categorized themselves into seven different types, depending on their organizational structures and relationship to hosts[3]. Some coalitions fit within multiple types. These types are as follows.

1. "Government—City or County" coalitions are hosted by a city or county government such as a city department of transportation or municipally-owned utility.
2. "Government—State" coalitions are hosted by a state government. This is generally in the state department of energy or department of environment. Coalitions hosted by a state university are not included in this category.
3. "Independent Business" coalitions are their own (not hosted), stand-alone for-profit companies. They are typically registered as a corporation or a limited liability corporation.
4. "Hosted in a Nonprofit" coalitions are hosted within a larger nonprofit or community service organization with 501c3 status. The host organization's activities are broader in scope than the Clean Cities coalition, such as the American Lung Association.
5. "Standalone Nonprofit" coalitions are nonprofits typically with 501c3 status and operate without the overhead support of a host organization.
6. "Regional Governing Coalition" coalitions are hosted in a multi-governmental body such as a Council of Governments (COG), Municipal Planning Organization (MPO), or Regional Planning Commission (RPC).
7. "Hosted in a University" coalitions are hosted by a university (public or private).

[3] The relationship between a host organization and the coalition varies across the country. Typically, the coordinator of the coalition is an employee of the host organization and the coalition benefits from the resources available at the host organization.