Clean Cities Coalitions 2020 Activity Report

Mark Singer and Caley Johnson

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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National Renewable Energy Laboratory
15013 Denver West Parkway
Golden, CO 80401
303-275-3000 • www.nrel.gov

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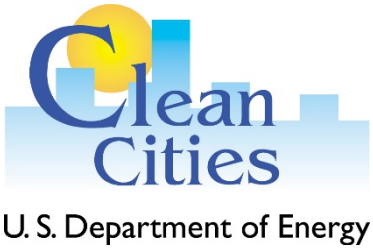
List of Acronyms

AFDC	Alternative Fuels Data Center
AFV	alternative fuel vehicle
BIM	Behavioral Impact Model
CNG	compressed natural gas
DOE	U.S. Department of Energy
E85	high-level ethanol blend
EUI	energy use impact
EV	electric vehicles
GGE	gasoline gallon equivalent
GHG	greenhouse gas
GREET model	Greenhouse gases, Regulated Emissions, and Energy use in Transportation model
HDV	heavy-duty vehicle
HEV	hybrid electric vehicle
IR	idle reduction
LDV	light-duty vehicle
LNG	liquefied natural gas
MGGE	million GGE
NCFP	National Clean Fleets Partnership
NO_x	nitrogen oxides
NREL	National Renewable Energy Laboratory
RNG	renewable natural gas
VMT	vehicle miles traveled
VOCs	volatile organic compounds
VTO	Vehicle Technologies Office

Acknowledgements



The authors would like to acknowledge the efforts of thousands of Clean Cities coalition stakeholders and coordinators, who provided the basis for this analysis by reporting data from their alternative fuel and energy-saving transportation projects.

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This publication is part of a series. Past Clean Cities Coalitions Activity Reports and multiyear data compilations can be found at *www.afdc.energy.gov*.

Introduction

The U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Office (VTO) works with local Clean Cities coalitions across the country as part of its Technology Integration Program. These efforts help businesses and consumers make smarter/more-informed transportation energy choices that can save energy, lower costs, provide resilience through fuel diversification, and reduce air emissions. This report summarizes the success and impact of coalition activities based on data and information provided in their annual progress reports.

A national network of more than 75 Clean Cities coalitions covering nearly every state brings together stakeholders in the public and private sectors to use alternative and renewable fuels, idle-reduction (IR) measures, fuel economy improvements, and new transportation technologies as they emerge. To ensure success, coalitions leverage a robust set of expert resources and tools provided by DOE and its national laboratories. From technical assistance and handbooks to websites and targeted analysis, these resources contribute to every facet of coalition success. This strong national framework of resources, which facilitates consistent vision and informed coalitions, is a hallmark of the program.

Clean Cities coalitions use an online tool to report advanced vehicle technology activity, infrastructure development, and relevant energy/fuel use information for their regions.

Each year, Clean Cities coordinators submit annual reports of their activities and accomplishments for the previous calendar year. Data and information are submitted via an online reporting tool 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; use of alternative fuel vehicles (AFVs), including electric vehicles (EVs[1]); hybrid electric vehicles (HEVs); IR initiatives; fuel economy improvement activities; and programs to reduce vehicle miles traveled (VMT).

This report compiles the accomplishments of all coalitions throughout the nation in calendar year 2020. Coalition leaders assembled the data based on voluntary reports from their stakeholders—the private and public entities that are members of the coalitions. As such, each individual coalition report represents a subset of Clean Cities coalition activities. Taken together, they are an important indicator of how data, information, and resources can be effectively leveraged through the national network of Clean Cities coalitions and stakeholders to achieve significant results. Accomplishments from the National Clean Fleets Partnership (NCFP) are also reported directly by the national partners.

NREL analyzes the submitted data to determine how broadly energy use in the United States has shifted as a result of coalition activities. The two main components of energy use tracked by NREL are (1) energy savings from efficiency projects, measured in gasoline gallon equivalents (GGE), and (2) alternative fuel use. The alternative fuel use numbers in this report have been adjusted to account for any gasoline or diesel content (e.g., with biodiesel or ethanol blends) as

[1] EVs include all-electric vehicles and plug-in hybrid electric vehicles, but not hybrid electric vehicles.

well as for any conventional fuels used upstream to produce, distribute, or deliver alternative fuels. Efficiency differences between AFVs and conventional vehicles are also taken into account.[2] Ultimately, these two components are combined and reported as energy use impact (EUI) in GGE. EUI is a metric that measures combined progress in both energy savings from efficiency projects and increased fuel diversity through use of domestic alternative fuels. Both of these components provide consumers and businesses with more energy choices. When achieved at scale, these strategies support DOE's mission to pursue more affordable, efficient, and clean energy choices. This report summarizes EUI as well as the related greenhouse gas (GHG) emission reduction impacts of coalition activities.

A compilation of data from this report, along with reports from previous years, can be accessed on the AFDC's Maps and Data page (*afdc.energy.gov/data/categories/clean-cities*). Previous years' reports can be downloaded in their entirety at *www.afdc.energy.gov*.

Summary of Key Findings

Coalitions achieved an EUI of nearly 1 billion GGEs in 2020.

Clean Cities coalition activities resulted in an EUI of nearly 1 billion GGE, comprised of net alternative fuels used and energy savings from efficiency projects, in 2020. Table 1 represents the combined results of all strategies to increase fuel diversity and energy efficiency in the nation's fleets. Clean Cities coalition and stakeholder participation in vehicle and infrastructure development projects remained strong, although transportation activity and resulting EUI decreased in 2020 due to the COVID 19 pandemic.

[2] Net alternative fuel used, and energy savings from efficiency projects, in this report are expressed in GGE, using the lower heating value ratio of the fuels.

Table 1. Energy Use Impact of Each Portfolio Element

Project Type	Coalition Impact (MGGE[a])	Percent of Total Coalition Impact[b]	Change from Last Year
Alt. Fuels and Vehicles	665.8	70%	-13%
Idle Reduction	44.1	5%	-7%
Fuel Economy	43.5	5%	6%
EVs	38.7	4%	-21%
VMT Reduction	37.8	4%	7%
HEVs	35.6	4%	-31%
Off-Road	33.0	3%	3%
Estimated Outreach Impact	56.5	6%	33%
Total EUI[c]	955.0	100%	-10.2%

[a] Million GGEs
[b] Totals and subtotals may differ from the sums due to rounding.
[c] The 2020 Clean Cities Coalitions Activity Report is focused on the impacts of coalition activities and projects and excludes related DOE-led efforts that were included in this report in years prior to 2016.

Coalitions averted nearly 5 million tons of GHG emissions- the equivalent of removing over one million conventional cars from the roads.

Clean Cities coalition activities reduce GHG emissions as they impact energy use. Table 2 shows that coalition-reported activities prevented nearly 5 million carbon dioxide-equivalent tons of emissions (only GHG emissions are reported here; criteria pollutants and other emissions are not included in this report). The GHG benefits increased in 2020 despite a decrease in EUI because coalitions focused more on technologies with higher GHG benefits per GGE reduced and because the lifecycle of many alternative fuels such as electricity or biofuels is becoming less carbon intense.

Table 2. GHG Emissions Reduced by Clean Cities Coalitions in 2020

Project Type	Tons of GHG Emissions Averted	Equivalent of Conventional Cars Removed[a]	Percent of Coalition Total
Alternative Fuels and Vehicles	2,353,521	526,803	47%
Idle Reduction	527,561	118,087	11%
Fuel Economy Improvements	520,486	116,503	10%
VMT Reduction	448,808	100,460	9%
HEVs	424,649	95,052	9%
EVs	310,074	69,406	6%
Off-Road Vehicles	83,636	18,721	2%
Outreach Events Estimate	314,459	70,387	6%
Coalition Total	4,983,195	1,115,419	100%

[a] Calculated as total passenger car GHG emissions (Table 2–13 in the U.S. Environmental Protection Agency's *Inventory of GHG Emissions and Sinks:1990-2015*) divided by total short wheelbase light-duty vehicles (Table VM-1 in the Federal Highway Administration's *Highway Statistics*, 2015).

Coalitions were successful in securing project grant awards from numerous outside (non-DOE) sources. For other federal, state, and local agencies and private sector foundations, see Funding section on page 24. The 90 project grant awards in 2020 generated $151 million in funds from coalition members and project partners in addition to $12.8 million in DOE grant funds. Coalitions also collected $1.1 million in stakeholder dues and $3.1 million in operational funds from host organizations. In macro terms, this non-DOE supplemental funding represents a 4:1 leveraging of the $38 million that was included in the VTO Technology Integration budget in 2020.

Coalitions conducted 3,290 outreach, education, and training activities in 2020.

Clean Cities coordinators spent nearly 135,700 hours pursuing their coalitions' goals in 2020. The average coordinator is quite experienced and has held the coordinator position for nearly eight years. Coordinators logged more than 3,290 outreach, education, and training activities in 2020, which reached an estimated 31 million people. Activities that reached underserved communities were tracked for the first time in 2020 and accounted for 17% of all activities.

Attribution and Fuel Use Factors

To clarify the link between coalition activities and end results, this *Clean Cities Coalitions Activity Report* includes an attribution factor that accounts for the percentage of a project's outcome that is likely to be a result of coalition activities, rather than 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 each project's outcome that the coalition was responsible for, and then the project's overall outcome was multiplied by that percentage to determine the individual 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 provides a tool to help a coalition estimate its contribution to a given project.

Coalition-Reported Data

Coordinators submitted information about their stakeholders' alternative fuel use and energy savings, broken down according to the technologies in the Technology Integration portfolio, using an online reporting tool. NREL analyzed the data, converted them into an equivalent net quantity of gasoline for each element of the portfolio, and reported the data in GGEs. As shown in Table 1, Clean Cities coalition efforts impacted 955 million GGE (MGGE) of energy in 2020.

Clean Cities coalitions' work with local fleets led to a substantial reduction in GHG emissions. To estimate the GHG reductions resulting from coalition activities, NREL used a version of the GREET model.[3] This model accounts for the fuel life cycle, or "well-to-wheels" factor of GHG emissions for transportation fuels, which includes fuel production, transport, and usage in the vehicle. It does not consider emissions from indirect land use changes or vehicle manufacturing and decommissioning.

Alternative Fuels and Vehicles

As shown in Figure 1, alternative fuels (used in AFVs and in biodiesel blends) and fuel savings from HEVs collectively accounted for approximately 740 MGGE, or 82% of the coalition-reported net alternative fuel use and energy savings from efficiency projects.

In 2020, coalitions reported a total inventory of one million AFVs, split among 10 fuel and technology types. The total vehicles reported by coordinators increased by 0.2% from 2019.

RNG use grew by 80% in 2020—the fastest of all fuels.

Among the more common fuel types, vehicles operating on biodiesel grew by 25% to 203,839 vehicles. Compressed natural gas (CNG) vehicles decreased by 13% to 87,392. EVs decreased by 11% to 234,277, and HEVs increased by 9% to 157,540. Large increases were reported for vehicle technologies with relatively low vehicle counts. Vehicles operating on renewable natural gas (RNG or bio-methane) grew by 47%, to 7,229. The least common vehicle technology type, hydrogen vehicles, decreased by 40% to 413. Propane vehicles decreased by 6% to 30,156.

The EUI decreased by 14% across vehicle technologies. The EUI decreased for HEVs by 31%, liquefied natural gas (LNG) vehicles by 28%, propane vehicles by 27%, renewable diesel vehicles by 24%, CNG vehicles by 21%, and EVs by 21%. However, the EUI increased for a number of technologies as well: 7% for biodiesel vehicles, 15% for hydrogen vehicles, and 80% for RNG vehicles.

[3] Argonne National Laboratory. 2019. The Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) Model.

Figure 1 shows the percentage of EUI according to fuel type. CNG remains at the top of the list, accounting for 46% of the EUI, even though only 9% of the total vehicle population uses CNG. This contrasts with E85, a high-level ethanol blend, which accounts for only 10% of the AFV EUI, although 27% of reported AFVs can use E85.

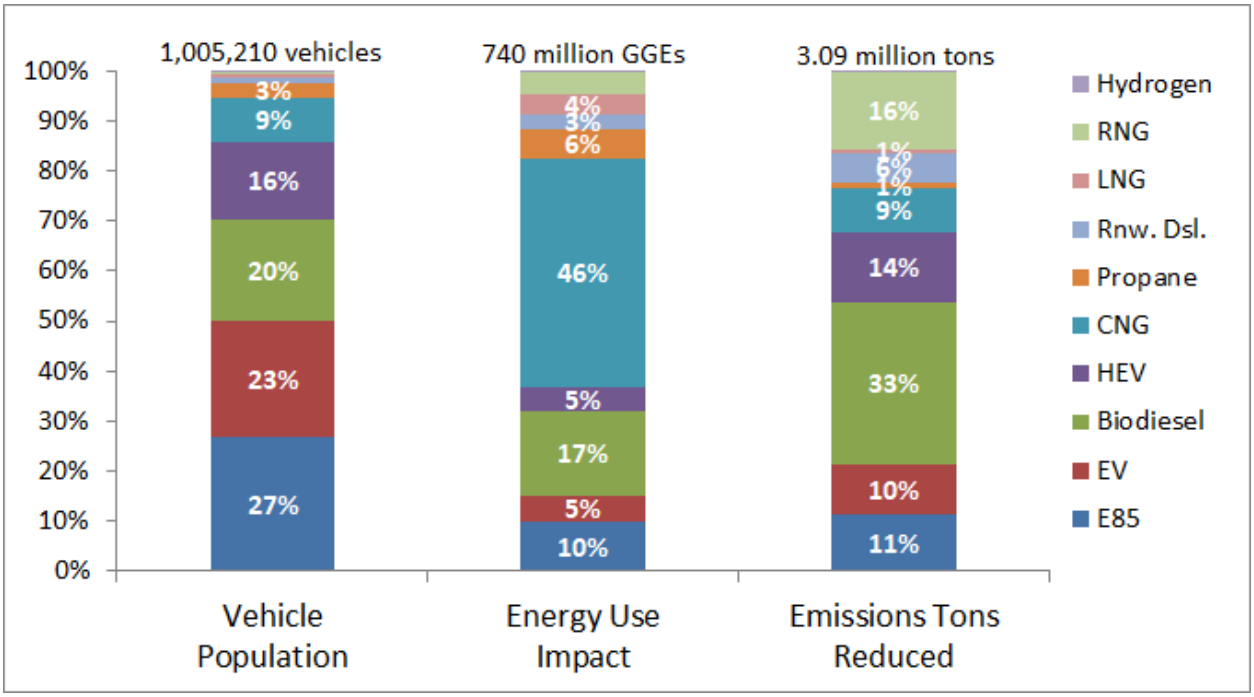

Figure 1. 2020 percentage of AFVs, EUI, and GHG emissions reductions by fuel type.

The average EUI per vehicle, shown in Table 3, reveals some interesting trends. For a given vehicle, this number is influenced by five factors:

1. Dedicated AFVs (those that can only operate on alternative fuel) have a higher EUI than flex-fuel, dual-fuel, or bi-fuel vehicles that can switch between fuels. Simply stated, dedicated AFVs use alternative fuel 100% of the time, while those with interchangeable fuel systems may only use alternative fuel some of the time.
2. The number of miles per year that the AFV travels (higher mileage uses more alternative fuel).
3. The AFV's fuel consumption. Large vehicles that are doing more work tend to consume more fuel. Therefore, Table 3 shows light-duty vehicles (LDVs) and heavy-duty vehicles (HDVs) separated to increase fidelity.
4. The amount of conventional fuel contained in an alternative fuel blend (e.g., B20 still contains 80% conventional diesel, so only a portion of the B20 fuel consumed counts toward the alternative fuel usage).
5. The amount of conventional fuel used to produce or transport the alternative fuel. For example, the diesel used to grow the corn that is turned into ethanol is subtracted from the EUI.

Table 3. Average Annual EUI per Vehicle in 2020

Fuel	GGE per HDV	# of HDVs	GGE per LDV	# of LDVs
Hydrogen	8,523	58	263	355
LNG	6,851	4,510	NA	0
CNG	5,778	54,226	715	33,166
RNG	5,171	6,442	826	787
EV	3,690	5,486	81	228,791
HEV	2,353	7,766	116	149,774
Propane	1,817	14,947	1,190	15,209
Renewable Diesel	2,117	8,148	664	3,659
Biodiesel	1,177	98,328	90	105,511
E85	316	3,241	272	264,806

Alternative fuels and AFVs were responsible for higher total GHG emissions reductions than any other coalition-reported activity. These reductions were calculated 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 these calculations, gasoline is considered the baseline fuel for all LDVs, and diesel is considered the baseline fuel for HDVs. An exception is made for school buses where gasoline is considered the baseline fuel for buses using E85, CNG, LNG, and propane because many baseline buses use gasoline, and these vehicles are equipped with spark-ignition (gasoline-like) engines.

VMT Reduction, HEVs, IR, and fuel economy improvement projects have a disproportionately high emissions reduction compared to their EUI.

As shown in Figure 1, the emissions reductions are not necessarily proportional to the alternative fuel used because the various alternative fuels emit different levels of life cycle emissions. RNG is a prime example of a fuel that has extremely low life cycle emissions because it has the net effect of reducing methane (a GHG) emissions from landfills, wastewater treatment facilities, and farms. It is also worth noting that VMT reduction, HEVs, IR, and fuel economy improvement projects have a disproportionately high emissions reduction compared to their EUI because these conservation measures "eliminate" 100% of the emissions that would have resulted from the fuel they save. AFVs generally demonstrate a net "reduction" in emissions compared to vehicles that use conventional fuels but usually do not "eliminate" all the GHG emissions.

The average EUI of an HDV in the Technology Integration Program is 14 times as much as an LDV.

High Impact Fleets and Vehicle Segments – Although HDVs represented only 20% of the reported AFVs, these HDVs are responsible for 78% of the alternative fuel use. The average HDV that operates on alternative fuels impacts 14 times as much fuel use as the average LDV. The use of LNG is confined exclusively to HDVs. Likewise, the overwhelming majority of RNG, CNG, biodiesel, renewable diesel, and hydrogen is used by HDVs (98%, 93%, 92%, 88%, and 84% respectively). Technologies with contributions more evenly split between LDVs and HDVs include propane vehicles, EVs, and HEVs where HDVs accounted for 60%, 52%, and 51%, respectively. The only technology whose contributions were dominated by LDVs was E85 (with only 1% from HDVs).

Idle Reduction

Savings from onboard batteries grew by 60% from 2019 to 2020.

The estimated energy savings in 2020 for IR technologies and policies was 44.1 MGGEs. The number of IR projects decreased 13% in 2020, but the quantity of energy that these projects saved decreased only 7%. As shown in Figure 2, at 13.7 MGGE, automatic engine shutoff was responsible for the greatest percentage (31%) of energy savings. Auxiliary power units, at 11.8 MGGE; IR policies, at 5.5 MGGE; on-board batteries at 4.4 MGGE; and the "other" category, at 4.1 MGGE; followed with significant percentages (27%, 12%, 10%, and 9% respectively). Driver training, at 2.8 MGGE; truck-stop electrification, at 1.6 MGGE; and direct-fire heater, at 0.3 MGGE represented 6%, 4%, and 1% respectively of the IR energy savings. The remaining methods combined to represent less than 1% of the total savings.

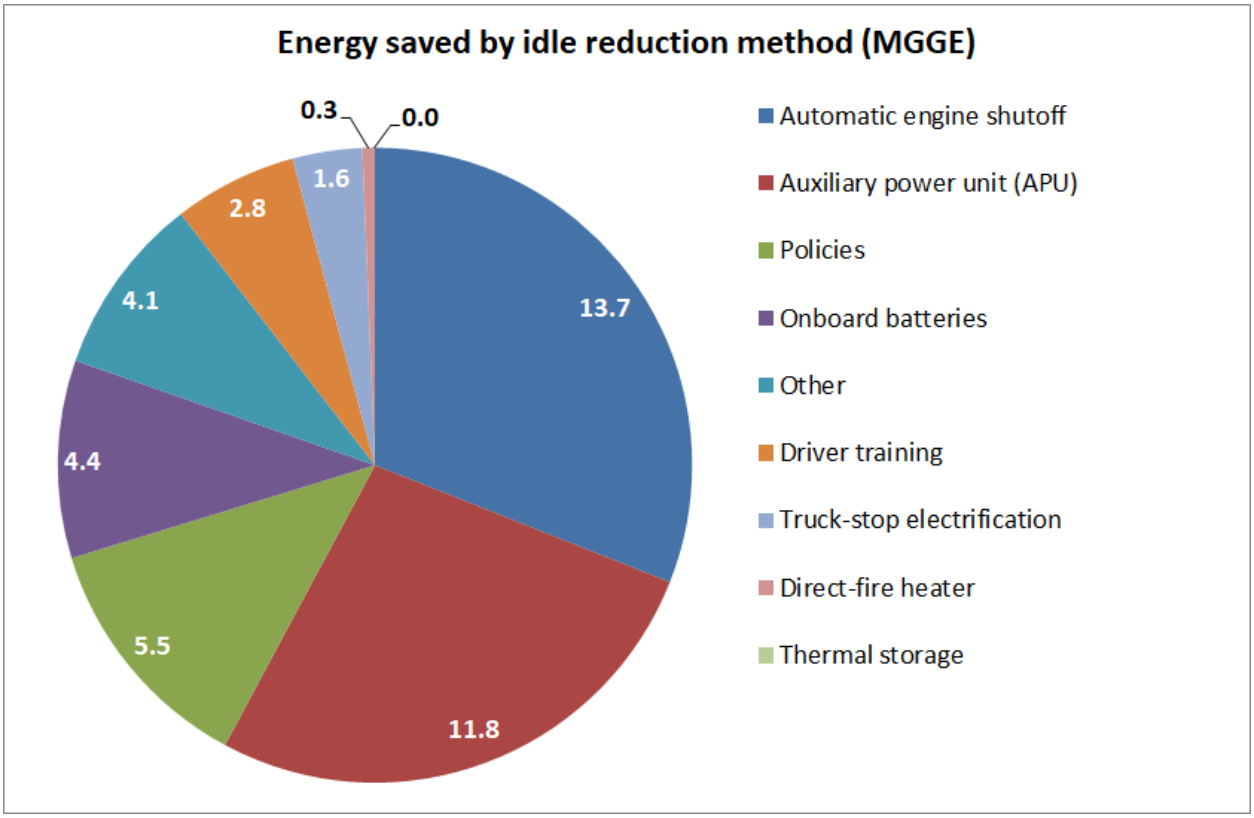

Figure 2. Energy savings measured in MGGE from IR projects, 2020.

Fuel Economy

Coalitions completed a range of fuel economy projects aimed at using energy more efficiently. Non-HEV coalition-reported fuel economy projects accounted for a total savings of over 43 MGGE, which was an increase of 6% from the reported 2019 savings. Figure 3 includes the range of fuel economy technologies advanced by coalitions. There were 78,149 vehicles in the non-HEV fuel economy technology category, equating to an average annual EUI of 557 GGE per vehicle. Figure 3 shows the fuel economy improvement projects with the largest improvements were those involving the "other" category, replacing vehicles with more efficient vehicles (including diesel vehicles), and using lightweight materials. The "other" category in 2020 included several large semi-trailer and transit bus projects that resulted in the significant

gains in that category. Trailer aerodynamic packages, driver training, hydraulic hybrid vehicles, and automatic tire inflation systems all showed fuel economy improvements of over 500 GGEs per year per vehicle.

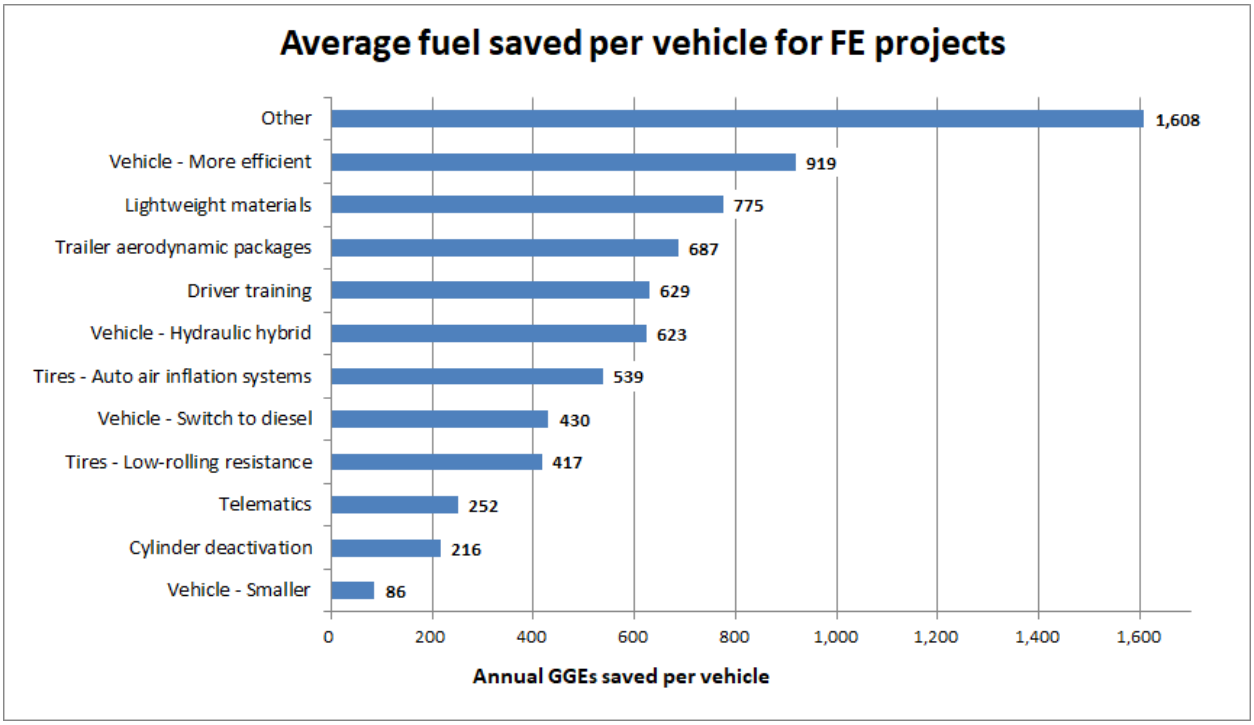

Figure 3. Average energy saved per vehicle for 2020 Clean Cities coalition fuel economy projects.

Vehicle Miles Traveled Reduction

VMT-reduction projects save fuel and therefore money, while simultaneously curbing emissions. These types of projects include strategies such as carpooling, biking, teleworking, and public transportation. Of the 79 reporting coalitions, 57 (72%) reported at least one VMT-reduction project in 2020, with a total of 391 projects reported. VMT projects are generally outside the scope of advanced vehicle, fuel, and systems research addressed by VTO. Since the primary purpose of this report is to analyze and document the impact of Clean Cities coalition efforts related to VTO technologies, the contribution of VMT projects to this analysis is limited to 15% of any given coalition's total energy savings. This cap affected 8 coalitions; however, even with this limit in place, coalitions saved 37.8 MGGE of fuel with VMT activities. The project types, numbers, and sizes of the VMT projects are shown in Table 4.

Table 4. VMT Reduction Project Types, Number, and Energy Savings in 2020

Project Type	Number of Projects	Increase in # of Projects over 2019	GGE Saved per Project[a]	DOE-capped GGE Saved per Project[a]
Route Optimization	127	41	65,503	50,034
Mass transit	60	-8	454,023	286,350
Non-motorized locomotion (e.g., bicycles)	54	-18	19,546	19,275
Carpooling	52	-16	459,879	73,200
Telecommute	38	12	55,937	46,068
Other	29	2	127,511	71,162
Vanpooling	14	-4	306,091	285,695
Car sharing (e.g., Zipcar)	8	-6	12,304	12,304
Compressed work week	9	-1	164,803	164,803
Total/Average	**391**	**2**	**184,705[a]**	**96,620**

[a] GGE per project calculated before the 15% limit of coalition overall energy savings was implemented.

Off-Road Vehicles

Coalition impact extends beyond the road. Off-road project EUI was nearly 33 MGGE in 2020.

Vehicles used in off-road applications contributed to coalitions' overall accomplishments. Many of these projects were born out of synergy with on-road projects, with existing stakeholders using several of the same alternative fuels, technologies, and strategies. Table 5 shows the number of off-road vehicles (or pieces of equipment) reported by coalitions in 2020. These categories are self-descriptive, except for three. "Construction equipment" includes cranes, earth movers, and similar equipment. The "recreation equipment" application includes jet skis, snowmobiles, and all-terrain vehicles. The "other" category includes vehicle speed limitations and changes to hydraulic pumps.

Table 5. Number of Off-Road Vehicles or Equipment and EUI in 2020

Application	Number of Vehicles	Energy Use Impact (GGE)	GGE saved per Vehicle
Construction equipment	12,430	1,498,530	121
Forklifts	4,724	3,736,452	791
Other	3,748	1,459,015	389
Landscaping and lawn equipment	3,062	338,604	111
Mining equipment	1,933	1,995,898	1,033
Recreational equipment	748	176,747	236
Farm equipment	221	193,390	875
Ships	172	19,440,814	113,028
Street sweeper	139	80,023	576
Railroads	58	4,055,625	69,925
Total	**27,235**	**32,975,098**	**1,211**

Overall EUI contributions from off-road vehicles totaled 33 MGGE. Ships used the most fuel, despite having second-to-least number of vehicles. This is largely due to four large LNG vessels

that use a considerable amount of fuel per vessel per year. Vehicles using biodiesel accounted for 27% of the AFVs included in this category. Vehicles using other fuels in off-road applications included all-electric vehicles (16% of the total) and propane vehicles (19%). Biodiesel use was focused in mining equipment, ships, and construction equipment applications. All-electric vehicles were primarily used in the other equipment, forklifts, and recreational equipment. Propane vehicles were primarily reported as forklifts and landscaping equipment. Applications varied widely in number of GGE saved per vehicle, as shown in Table 5.

National Clean Fleets Partnership Contributions

Six national fleets have partnered with Clean Cities coalitions, sharing data reflecting efforts that span geographic areas larger than that of any single coalition.

In April 2011, DOE began partnering with national fleets that operate in more expansive geographic areas than any one coalition covers. The NCFP currently has 28 partners, who lead by example and are pacesetters for local stakeholder fleets. Six of them reported their fuel use data directly to NREL. NREL then allocated NCFP fuel use from these data to 72 individual coalitions based on fleet garage locations, refueling locations, and partner estimates. The coordinators then verified that they did assist the NCFP fleets operating in their regions and claimed full, partial, or no credit for the partner's alternative fuel use that was attributed to them. Table 6 shows the contributions to total Clean Cities EUI that were attributed to national partners. The EUI of 177 MGGE represents a 14% reduction from 2019. This is largely due to three fewer partners reporting projects this year.

Table 6. Vehicles, EUI, and Emissions Reduction from National Partners

Fuel	Vehicles	Energy Use Impact (GGE)	GHG Reduced (tons)
CNG	18,527	112,353,091	75,977
LNG	1,496	25,286,270	17,032
Propane	4,155	11,942,236	9,308
EV	3,539	10,824,423	78,557
Biodiesel	601	7,136,684	52,592
Fuel Economy	14,674	3,896,583	46,683
Renewable Natural Gas	291	3,440,352	41,868
HEV	1,138	1,789,435	21,432
Idle Reduction	1,339	73,081	876
Hydrogen	3	39,818	215
Vehicle miles traveled	0	16,100	193
Off-Road	319	6,531	34
Total	**46,082**	**176,804,605**	**344,767**

Estimated Contributions from Outreach Activities

This category measures impact from behavior changes such as vehicle purchases, fuel choice, driving habits, vehicle maintenance, and transportation patterns that were influenced by coalition outreach activities. Calculating these contributions involves a fair degree of uncertainty, but it is nevertheless important to quantify the impacts of educational and outreach activities as much as possible. 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 Energy Use Impact from Outreach Activities

To estimate net alternative fuel use and emission reductions from outreach events, NREL and Oak Ridge National Laboratory developed the Behavioral Impact Model (BIM) and added related functionality to the Clean Cities coalition annual reporting tool to make it compatible with the BIM.

Impacts from coalition outreach events are estimated using standard analytical methods derived from advertising and marketing industries.

Clean Cities coordinators reported the type of outreach event, the number of people reached by each event, the technologies presented, and the percent that should be attributed to the coalition. To determine the number of people reached by a given event, the total number of people attending the event was multiplied by the percent of the event that the coalition claimed credit for. 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. These data are then entered into the BIM as "persons reached by the coalition about a given technology."

The BIM multiplies this persons-reached number by the probability a person will take an action as a result of the outreach (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. Ten of these media-product combinations have a "customer conversion rate" that is recorded by various marketing firms, as shown in Table 7. The customer conversion rate is the ratio of purchases made (desired action) divided by the total number of people contacted through the outreach activity. The code column in Table 7 is provided for trackability through the calculation process, as continued to Table 9.

Table 7. 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 and website ads	Nielsen and Facebook, 2010. *Advertising Effectiveness: Understanding the Value of a Social Media Impression*. And Fireclick.com, accessed June 16, 2011
4	2.5% for industry-specific mail	Direct Marketing Association. 2011
5	3.2% for email	Fireclick.com, accessed June 16, 2011
6	7% for affiliates and 8% for "social ads" that are endorsed by peers	Fireclick.com, accessed June 16, 2011. Nielsen and Facebook, 2010. *Advertising Effectiveness: Understanding the Value of a Social Media Impression*
7	0.6% AdMeasure product: LDVs	GfK Mediamark Research & Intelligence, LLC. 2011
8	5.5% AdMeasure product: Gasoline	GfK Mediamark Research & Intelligence, LLC. 2011
9	17% AdMeasure smoking cessation "actions taken"	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 were not directly addressed by research, NREL adjusted the customer conversion rates based on the Ostrow Model of Effective Frequency, Krugman's Three Exposure Theory, and the authors' assumptions. Table 8 lists a set of relationships that increase or decrease the impact of advertisements.

Table 8. 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 7 by the relationships for media effectiveness shown in Table 8. The direct application of these rates and relationships is shown in Table 9, where the number relates to the code in Table 7 and the letters relate to the code in Table 8. The final customer conversion rates used are displayed in Table 10.

Table 9. 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	IR 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 10. Customer Conversion Rates Used in the BIM

Activity Type	Purchase New AFV	Use Alternative Fuel in Existing Vehicle	Use Biodiesel Blends in Diesel Vehicle	Purchase More Efficient Car	Operate Vehicle More Efficiently	Purchase HEV	Reduce Idling	HDV IR Equipment 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 number of people reached multiplied by the appropriate customer conversion rate (from Table 10) results in the number of people assumed to take the intended action. After the conversion factors have been applied, the BIM is like the Clean Cities coalition annual reporting tool, as it converts the estimated number of vehicles purchased or number of people changing their driving habits into an EUI. We make downward adjustments of 30%–40% to the estimates, based on subject matter estimates, to account for probable overlaps between audiences attending outreach events and entities reporting their own EUI via a Clean Cities coalition. We apply the estimated EUI only to the reporting year in question, even though many of the vehicle purchases and behavioral changes will likely last beyond that year.

Estimated Outreach Accomplishments

Coalitions' outreach, education, and training activities were classified into nine categories, as shown in Table 11. A total of 3,290 activity days were reported, which were estimated to have reached over 31 million people. This was heavily influenced by a media event effort by a single coalition that distributed a series of news releases that reached nearly 20 million people. Apart from this effort, outreach events reached over 11.8 million people overall and 3,588 people per event on average. Media events continued to be the activity that reached the most people. Social media replaced conference participation this year in second place for outreach events, reaching nearly 2 million people. The drop in conference participation and the rise in social media in this list were most likely impacted by the COVID pandemic. Estimated persons reached through outreach increased by 36% in 2020.

Table 11. Outreach, Education, and Training Activities

Activity type	Number of Activity Days	Share of Total Activities	Activities Increase Since 2018	Persons Reached	Share of Total Persons Reached	Persons Increase Since 2019
Meeting - Stakeholder	831	25.3%	6%	19,694	0.1%	7%
Meeting - Other	799	24.3%	3%	49,634	0.2%	9%
Workshop held by coalition	424	12.9%	-1%	153,195	0.5%	213%
Conference participation	388	11.8%	-32%	566,191	1.8%	2%
Social Media	346	10.5%	120%	1,961,473	6.2%	1827%
One-on-One Fleet Outreach	149	4.5%	19%	1,016	0.0%	-56%
Media Event	141	4.3%	-30%	26,677,090	84.9%	22%
Literature Distribution	109	3.3%	-71%	50,291	0.2%	-74%
Website	74	2.2%	106%	121,437	0.4%	-35%
Advertisement	29	0.9%	-62%	1,815,057	5.8%	5546%
TOTAL	**3,290**	**100.0%**	**-7%**	**31,415,078**	**100.0%**	**36%**

Figure 4 illustrates the types of audiences reached through the 3,290 outreach activity days. Each activity could be, and often was, aimed at multiple audiences; each activity targeted an average of 3.7 different audiences. Government fleets were the most-cited target audience, followed by the general public and private fleets. The "other" audience group, utility trucks, and mass transit groups were reached by similar percentages of activities. Fleets with delivery truck, waste management, and airport applications were identified as audiences in less than 30% of the outreach activities. This composition of outreach activity audiences was consistent with 2019. Activities that included underserved communities were tracked for the first time in 2020 and accounted for 17% of the total.

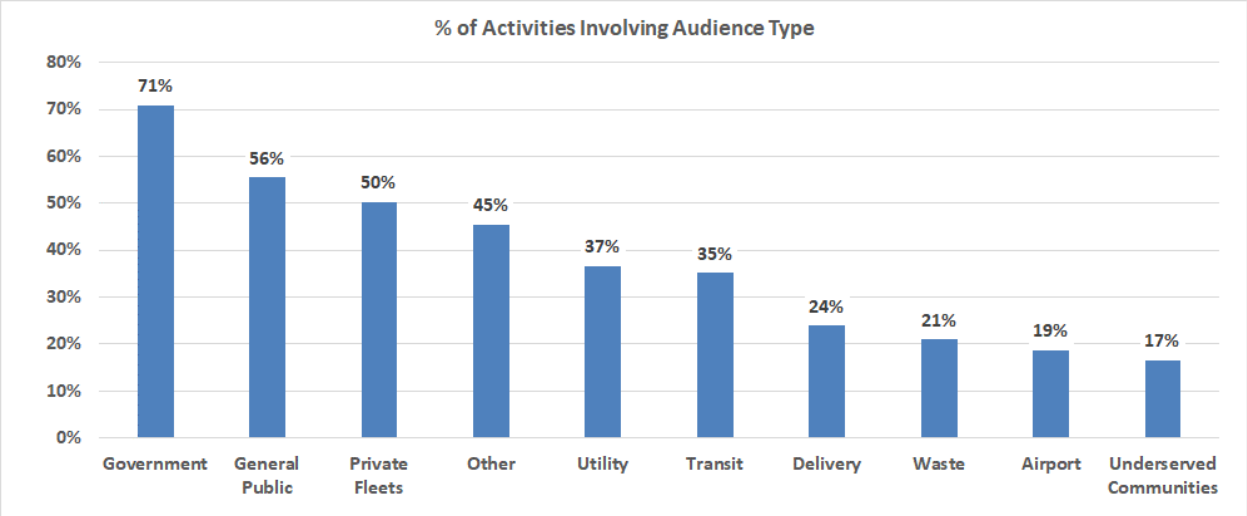

Figure 4. Percentage of outreach activities reaching each audience type.

Figure 5 shows that coalition outreach events covered EVs much more than any other technology type. The remaining technologies were covered relatively evenly, being included in 14%–37% of

outreach activities. Just as with audience types, any one activity could address more than one technology; each activity featured an average of 3.5 different technologies.

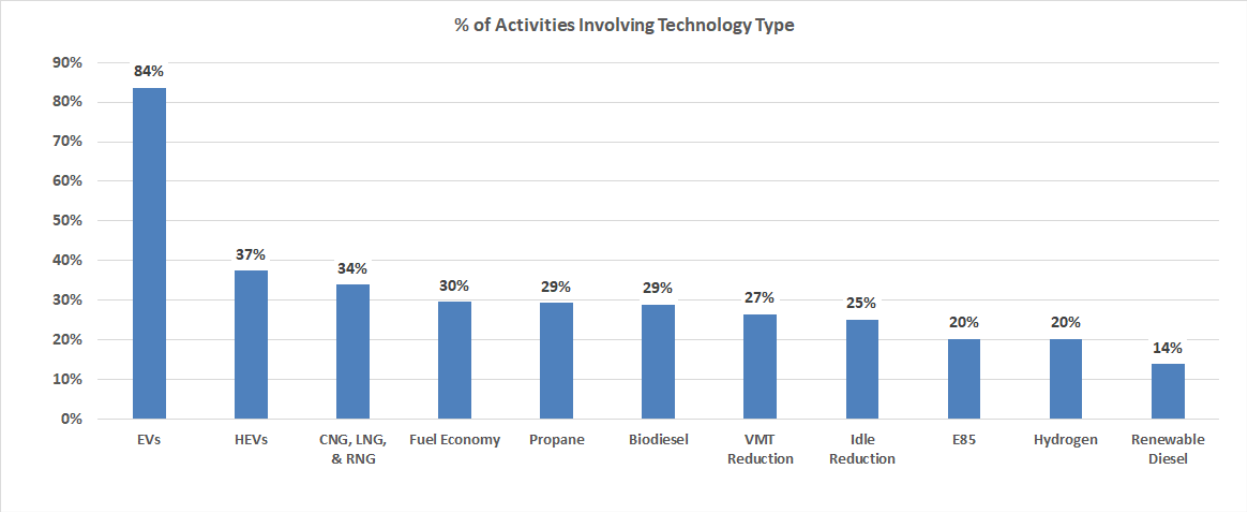

Figure 5. Percentage of outreach activities by technology type.

Using the BIM, NREL estimates that Clean Cities coalition outreach events prompted and enabled actions that impacted over 56.5 MGGE of energy use in 2020, after accounting for a substantial overlap with reported impacts.

EVs were the most common topic of coalition outreach events.

Cumulative Energy Use Impact

Clean Cities coalitions have steadily increased their annual EUI as projects have been expanded and built upon each year. Figure 6 shows coalition annual EUI has reached new levels in recent years. In the last five years of tracking (2016–2020) annual coalition EUI has been around 1 billion GGE. The 2020 reporting year showed the coalitions achieved an annual EUI of nearly a billion GGE, which is a slight decline from previous years, likely due to the COVID 19 pandemic.

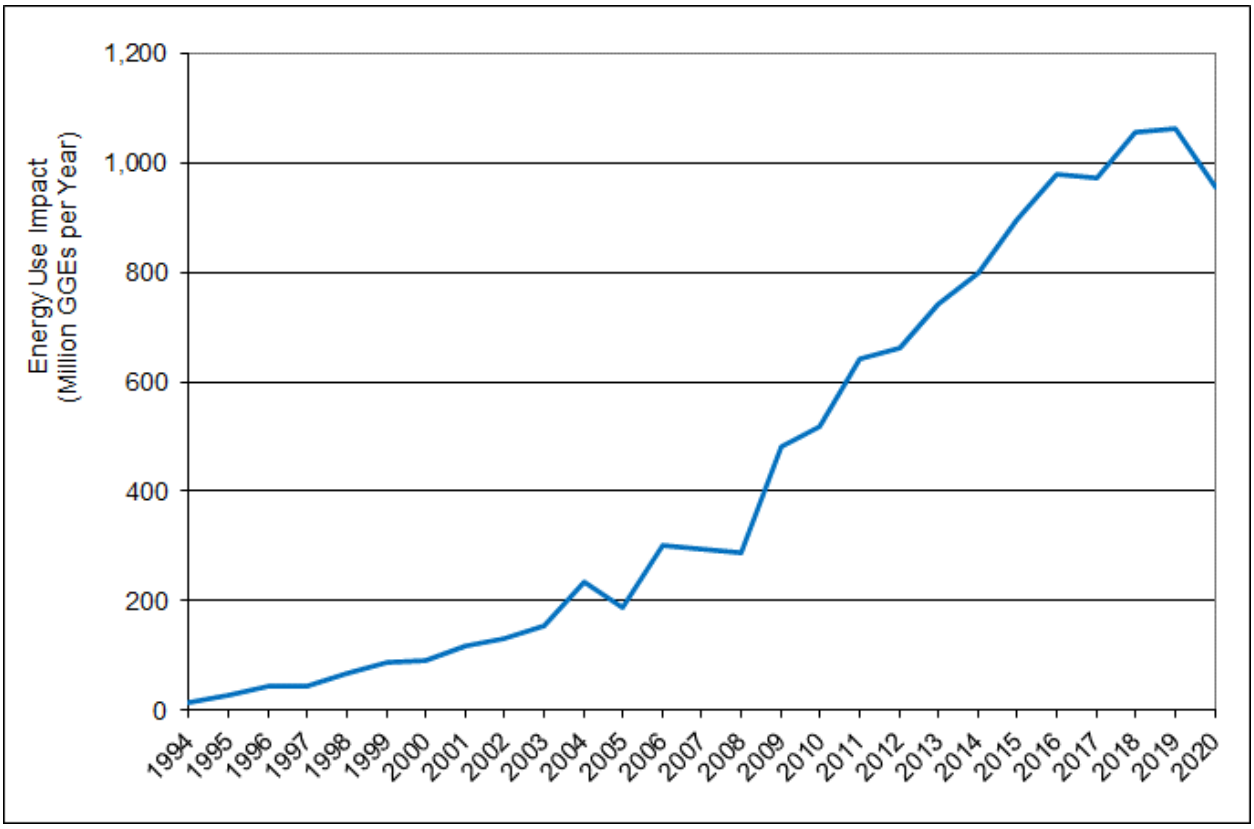

Figure 6. Increasing energy use impact (EUI) from coalitions.

The impacts of Clean Cities coalition efforts have added up considerably over the years. The full extent of the program's effect can be seen when the annual EUIs shown in Figure 6 are aggregated to a cumulative EUI. This cumulative measure, shown in Figure 7, is now nearly 12 billion GGE.

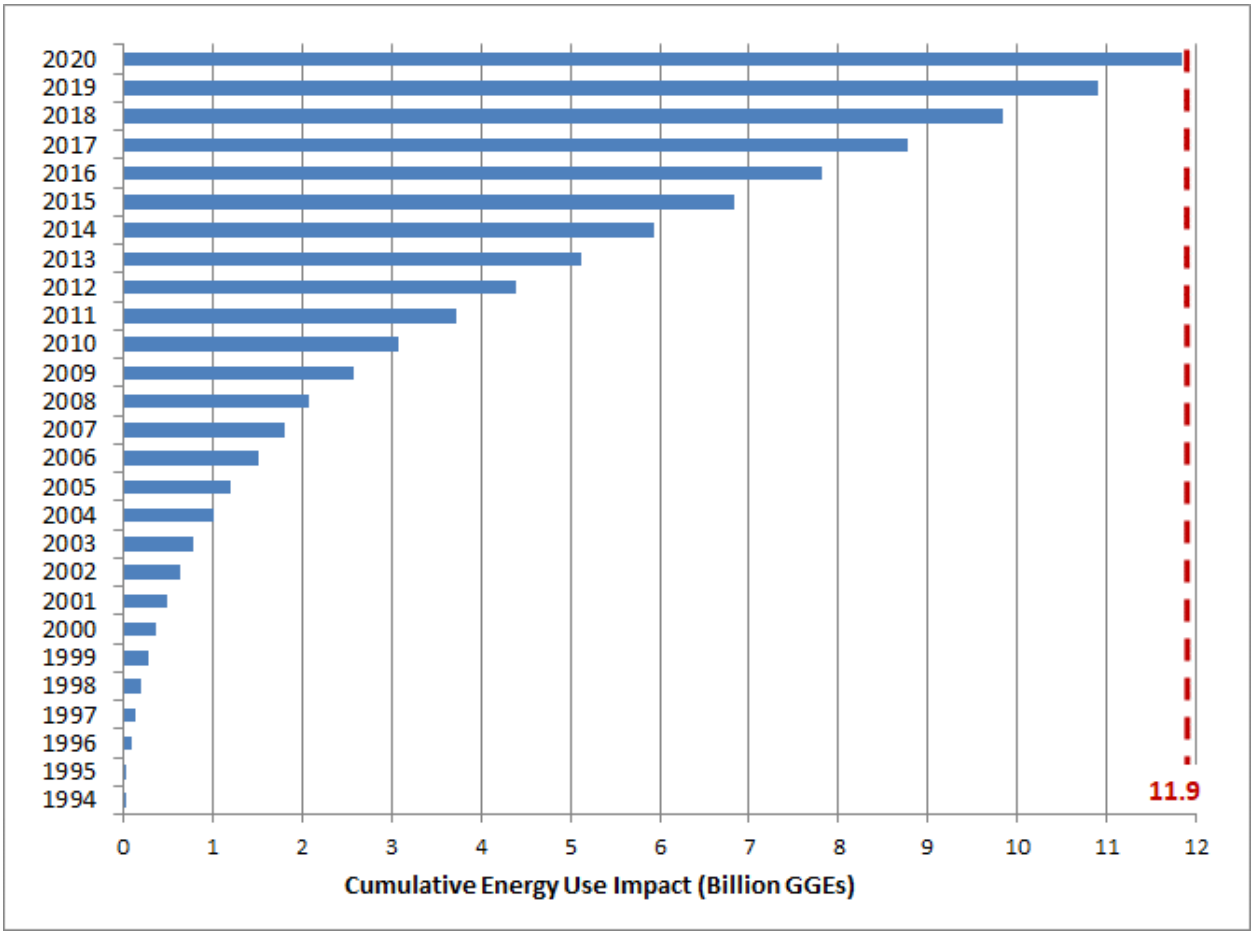

Figure 7. Cumulative accomplishments of all Clean Cities coalition activities.

Notable GHG and Criteria Pollutant Emissions Trends

Clean Cities activities reduced 5 million tons of GHG emissions in 2020–2% more than in 2019. These efforts have led to a cumulative emissions reduction of 62 million tons over the years, as shown in Figure 8. The relationship between the two has not always been consistent, since some technologies can be more effective at increasing EUI or reducing emissions than others (see Figure 3), and the Technology Integration portfolio evolves over time to stay relevant. Therefore, Figure 7 and Figure 8 do not reflect one another exactly. Furthermore, there was a shift in the emissions calculations in 2020 as the reporting tool was updated, along with the 2019 GREET model, which led to some discontinuities between the 2019 and 2020 reports.

Alternative fuels and AFVs were responsible for more GHG emissions reductions than any other coalition-reported activity.

RNG is a prime example of a fuel that has extremely low life cycle emissions because it has the net effect of reducing methane (a GHG) emissions from landfills, wastewater treatment facilities, and farms.

The average Clean Cities HDV reduced nearly 7 times as many GHGs as the average LDV. This is largely for the same reasons that HDVs have a larger EUI per vehicle ratio relative to LDVs.

Other notable trends in GHG emissions that have been mentioned in other sections have been called out in boxes in this section.

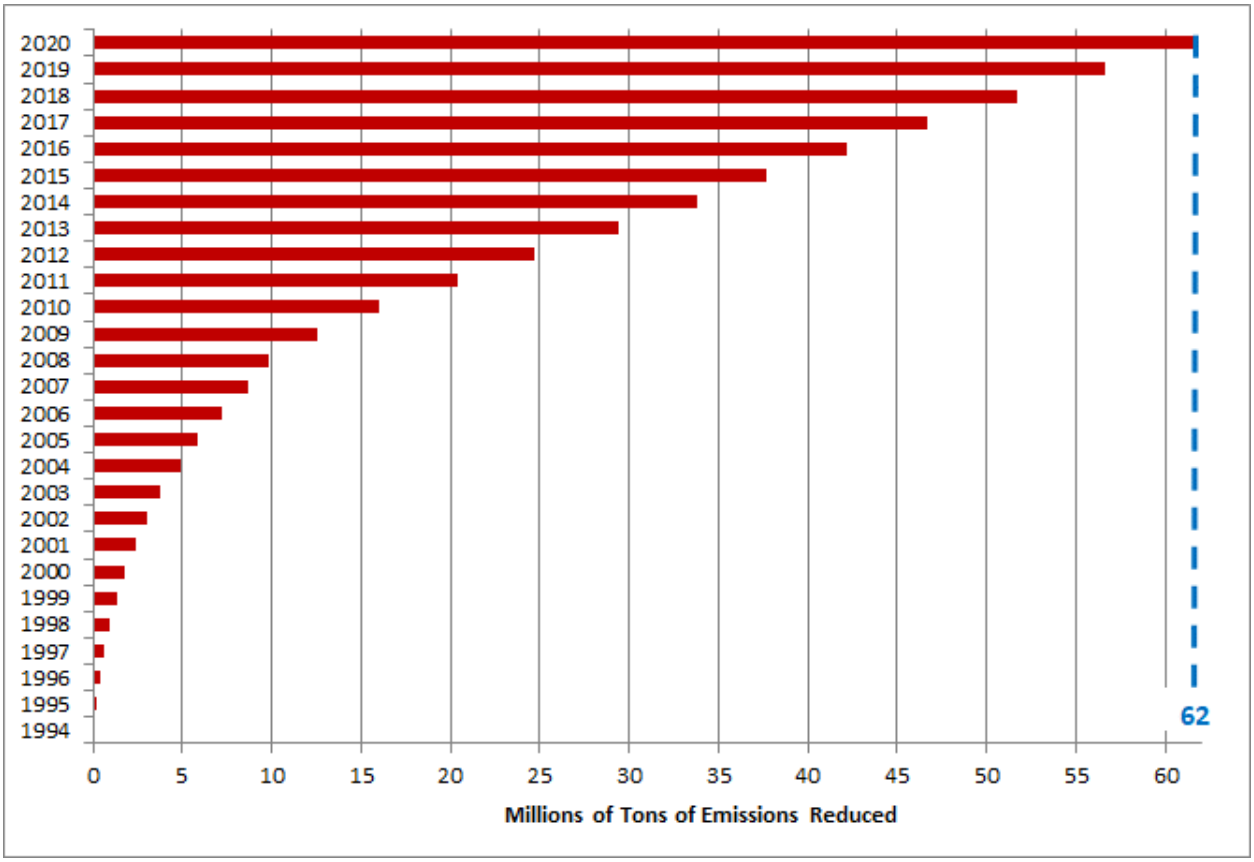

Figure 8. Cumulative emissions reductions from all Clean Cities coalition activities.

Conservation measures "eliminate" 100% of the emissions that would have resulted from the fuel they save.

In addition to reducing GHG emissions, Clean Cities activities improve air quality by reducing NO_x (nitrogen oxides) and VOCs (volatile organic compounds). These are two categories of emissions that react to form tropospheric (ground-level) ozone or smog and are frequently linked to health impacts and respiratory issues. Clean Cities reduced over 10 tons of NO_x emissions in 2020, with CNG being the dominant reduction technology. The coalitions also reduced 244 tons of VOCs, with VMT reduction, hybrids, and electric vehicles being the leading technologies achieving these reductions.

Alternative Fuel Vehicle Types and Applications

The online reporting tool allows coordinators to categorize their AFVs into key vehicle types and fleet applications. Figure 9 shows that the largest portion (37%) of AFVs were cars. Unknown LDVs—which are usually vehicles reported in conjunction with a Clean Cities coalition-supported fueling station—were the second most reported vehicle type (33%). Light trucks/vans/sport utility vehicles represented 10% of vehicles. Unknown HDVs—typically reported in conjunction with public biodiesel fueling stations—accounted for 7% of vehicles,

while heavy duty trucks without trailers, or delivery trucks, accounted for 4%. All remaining categories individually accounted for 3% or less of the vehicle population.

EVs in the car segment were the most frequently reported fuel/vehicle combination at 144,518. HEVs in the car segment followed closely, with 143,808 vehicles. E85 capable vehicles were the largest portion (138,398 vehicles) of the unknown light-duty segment and were the most common fuel type reported across all vehicle types (268,047 vehicles).

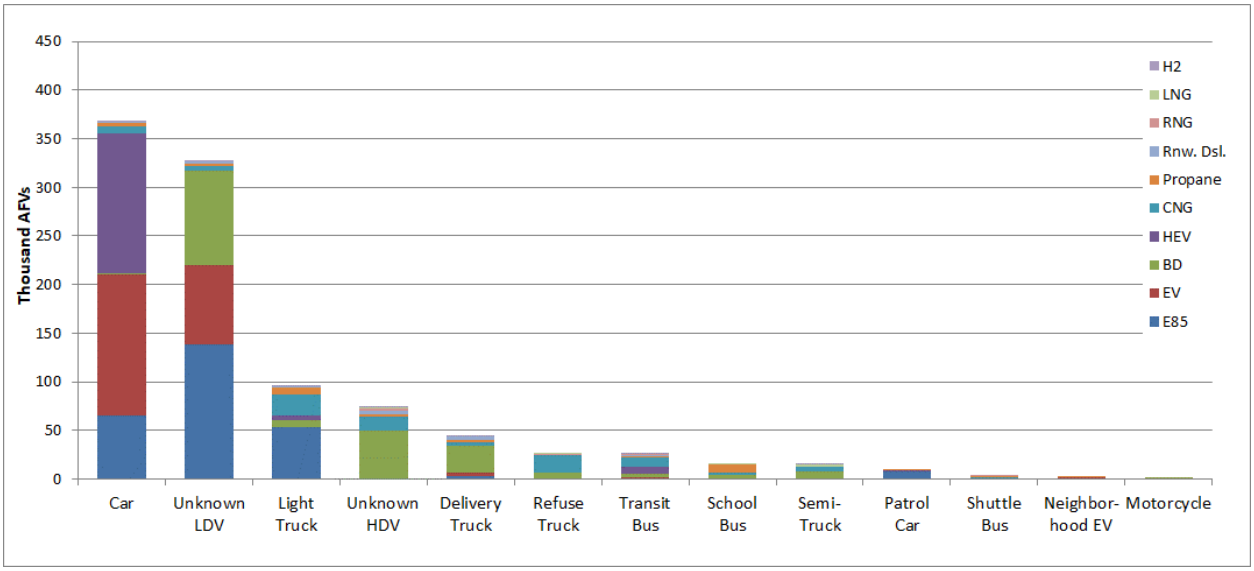

Figure 9. AFVs by vehicle and fuel type.

**Neighborhood EVs are small EVs only allowed on low-speed roads.*

In addition to reporting vehicle types, coordinators also provided information about vehicle ownership and vehicle end use applications. As shown in Figure 10, more than half of the reported vehicles (56%) were owned by the general public or an unknown entity. Many of these vehicles were reported by fuel retailers to the coordinator, often back-calculated from fuel sales and an assumption for how much fuel the average car uses per year. The next largest ownership groups of AFVs were local government fleets, commuters, state government fleets, and corporate fleets at 15%, 9%, 7%, and 6% of the total vehicles, respectively. If commuters are combined with the general public category, 66% of vehicles are owned by the general public.

Of these ownership groups with greater than 5% of reported vehicles, local and state government fleets each increased by 9% from 2019 (to 153,224 and 66,646 vehicles respectively) while reported corporate fleet vehicles shrank by 19% to 64,357 vehicles.

66% of coalition-reported vehicles are owned by the general public and have benefited from Clean Cities coalition projects.

Flex fuel vehicles or E85-capable vehicles and biodiesel vehicles were most often reported for the general public, state fleets, and local government fleets. EVs and HEVs comprised 79% of commuter vehicles (52% and 27% respectively). CNG and

propane vehicles made up the largest portion of corporate vehicles at 65% combined (44.4% and 20.1% respectively).

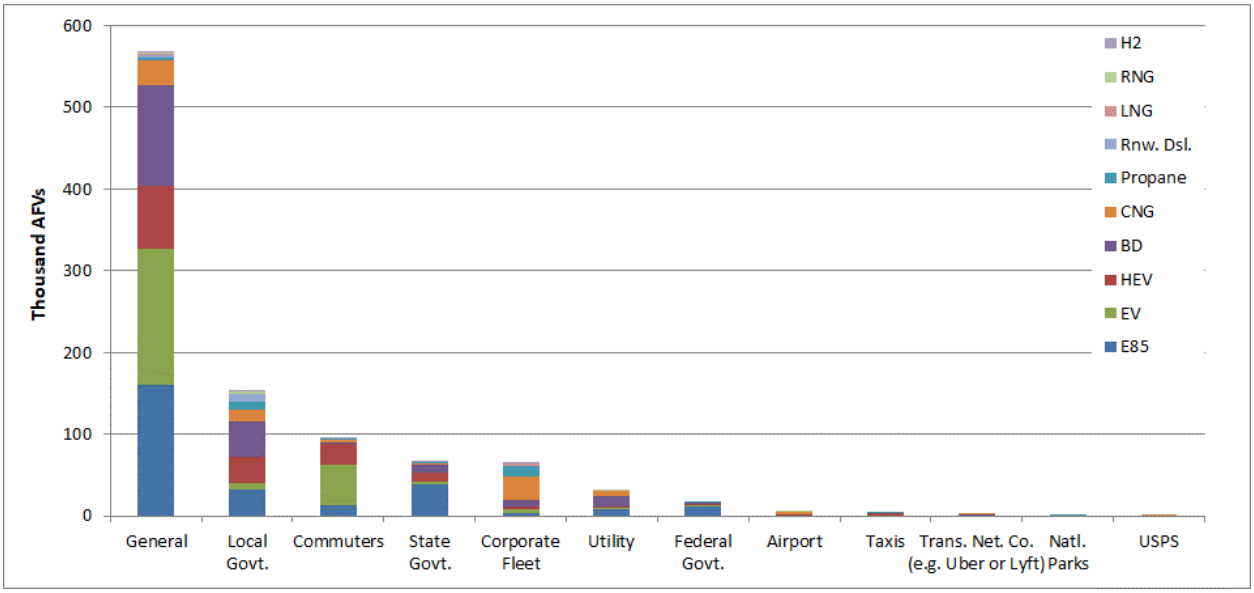

Figure 10. AFVs by application and fuel type.

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). This subset of vehicles represents less than 0.1% of the total number of alternative fuel or advanced technology vehicles reported by coalitions. Some of these projects involve limited production, experimental, or prototype/demonstration models that vehicle manufacturers make available under special lease arrangements. This is a way for the manufacturers to gather in-use performance data, evaluate durability, and refine engineering designs for future vehicle models that may be under development. In 2020, 413 hydrogen vehicles were reported, and the largest portion were for general public owners as reported for fueling stations. Data reported to Clean Cities coalitions for some of these vehicles show the noteworthy potential of these technologies for both energy and environmental benefits, but no significant market trends could be drawn from this limited data set.

Coordinators and Coalition Types

The average Clean Cities coordinator has eight years of experience.

Collectively, coordinators reported spending a total of 2,714 hours per week on Clean Cities coalition tasks, which is equivalent to more than 135,700 total hours during the year.[4] This translates into nearly 68 full-time, experienced technical professionals working to increase the use of domestic alternative fuels and reduce transportation energy use. For an individual coalition, the average amount of time spent coordinating Clean Cities coalition business per week was 34.8 hours. The average increased from 34 hours in 2019, while

[4] Assuming 50 work weeks per year.

the median increased to 34 from 30 hours. The reporting tool also gathered information on coordinator experience. Coordinators have been on the job for an average of nearly eight years. Forty-nine percent of coordinators have held their position for five years or less. Thirty-five percent, or 28 coordinators, have 10 years or more of experience.

Table 12. Coalition Metrics by Coalition Type

Coalition Type [a]	Total # of Coalitions	Average # of Stakeholders	Average Funds Raised	Average Program Impact (GGE)	Average Persons Reached
Nonprofit - Standalone	38	329	$4,238,728	12,913,027	247,354
Regional Governing Coalition	15	160	$4,168,904	10,525,062	52,820
Nonprofit - Hosted	11	108	$2,054,081	5,951,092	1,848,602
Government - State	10	352	$5,597,825	6,685,476	88,204
Government - City or County	3	49	$61,130,361	10,411,725	1,695
University	2	169	$24,100	5,054,023	797
Total/Overall Weighted Average	79	254	$6,147,059	10,407,987	397,659

[a] Coalition types are defined in Appendix B.

Coalition types were tracked, and the relationships between coalition type and general metrics were analyzed. The coalition types correspond to their host organizations (which generally pay the coordinator's salary) and are listed in the first column in Table 12 and defined in Appendix B. Standalone nonprofits 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, followed by metrics such as the weighted average number of stakeholders, average funds (including grants and dues) received in 2020, the average GGE of energy impacted, 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 based in standalone nonprofits were the most common and created the highest average EUI.

The most common coalition type was the standalone nonprofit, which also reported the highest average EUI of stakeholders. Coalitions hosted in state governments had the highest average number of stakeholders. Coalitions hosted by city and county governments reported the fewest number of stakeholders. However, these coalitions raised the most funds on average. University-based coalitions were the least common coalition type, brought in the least amount of funding on average, and had the lowest average EUI. Coalitions in hosted nonprofits reached the most people in outreach events, a total which was heavily influenced by a single coalition that reached over 19 million people in press releases. Without this outlier, standalone nonprofit coalitions would have reached the most people on average.

Funding

In 2020, 32 coalitions reported receiving 90 new project awards (project-specific grants) worth a total of $108 million. These coalitions also reported garnering nearly $56 million in leveraged or matching funds for a combined total of $164 million in new grant and matching contributions. Thirteen of the 90 awards were at or above $1 million each. Table 13 presents a breakdown of the number and value of awards reported by the coalitions without the matching funds.

Table 13. Breakdown of 2020 Project Awards by Number and Value

Grant Range	Number of Grants	Share of Total Number	Total Value	Share of Grand Total Value
<$50,000	40	44%	$782,639	1%
$50,000 - $99,999	11	12%	$749,000	1%
$100,000 - $499,999	15	17%	$3,570,719	3%
$500,000 - $999,999	11	12%	$7,204,552	7%
$1,000,000+	13	14%	$95,780,162	89%
Total	**90**	**100%**	**$108,087,072**	**100%**

Of the nearly $108 million in primary grant dollars received, $12.8 million (12%) was reported as coming from DOE. State governments were involved in the largest portion of the funding at 54%. Other federal contributors included the Department of Transportation's Federal Transit Administration and the Congestion Mitigation and Air Quality Improvement Program, the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, and a grouping of other federal agencies. The largest nongovernment contributor was from the Volkswagen settlement with $7.7 million (7%).

Coalitions leveraged $4 of project funding for every $1 directed to coalitions by DOE.

In addition to new 2020 awards, coordinators reported the portions of previous multiyear awards spent during the calendar year. If a coordinator failed to report the amount spent during 2020, the total amount of the award divided by the number of years of award duration was assumed. Coalitions reported spending 21% of the funds they were awarded in 2020, suggesting that projects start quickly after being awarded. In 2020, coalitions used a total of $46 million in project funds that were awarded and matched between 2016 and 2020.

In addition to project-related funds, coalitions reported collecting $1.1 million in stakeholder dues and receiving $3.1 million in operational funds, primarily from their host organizations. Combining these funds with non-DOE grant and matching funds totaled $155 million in supplemental non-DOE funds. This total represents 4:1 leveraging of the $38 million that was included in the VTO Technology Integration budget for 2020.

About the Stakeholders

Coalitions included over 20,000 stakeholders in 2020, with 31% of them from the private sector.

In 2020, 79 coalitions reported a total of 20,062 stakeholders, for an average of 254 stakeholders per coalition, which is more than the average of 224 stakeholders in 2019. Coalitions drew local stakeholders from the public, private, and nonprofit sectors. Stakeholders included local, state, and federal government agencies; large and small businesses; auto manufacturers; car dealers; fuel suppliers; public utilities; nonprofits; and professional associations. Coalitions reported that 31% of stakeholders were from the private sector. This composition is less than the 39% reported in 2019 but shows a balance between public and private stakeholders.

Data Sources and Quality

Gathering data is often 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 11 presents the response breakdown for the 79 coordinators who answered the question. Thirty-three percent of the respondents classified their data as excellent, 62% as good, and 4% as fair. No respondents reported their data as poor.

The reporting tool 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 (e.g., from project participation earlier in the year), or coalition estimates. Written questions and phone interviews were the most used method of data gathering, accounting for 26% and 24% respectively. The third most used method was coalition records (20%), then estimates (17%), and finally online questionnaires (13%). Figure 11 shows that all collection methods resulted in similar levels of reliability, with no coalitions rating their data as poor.

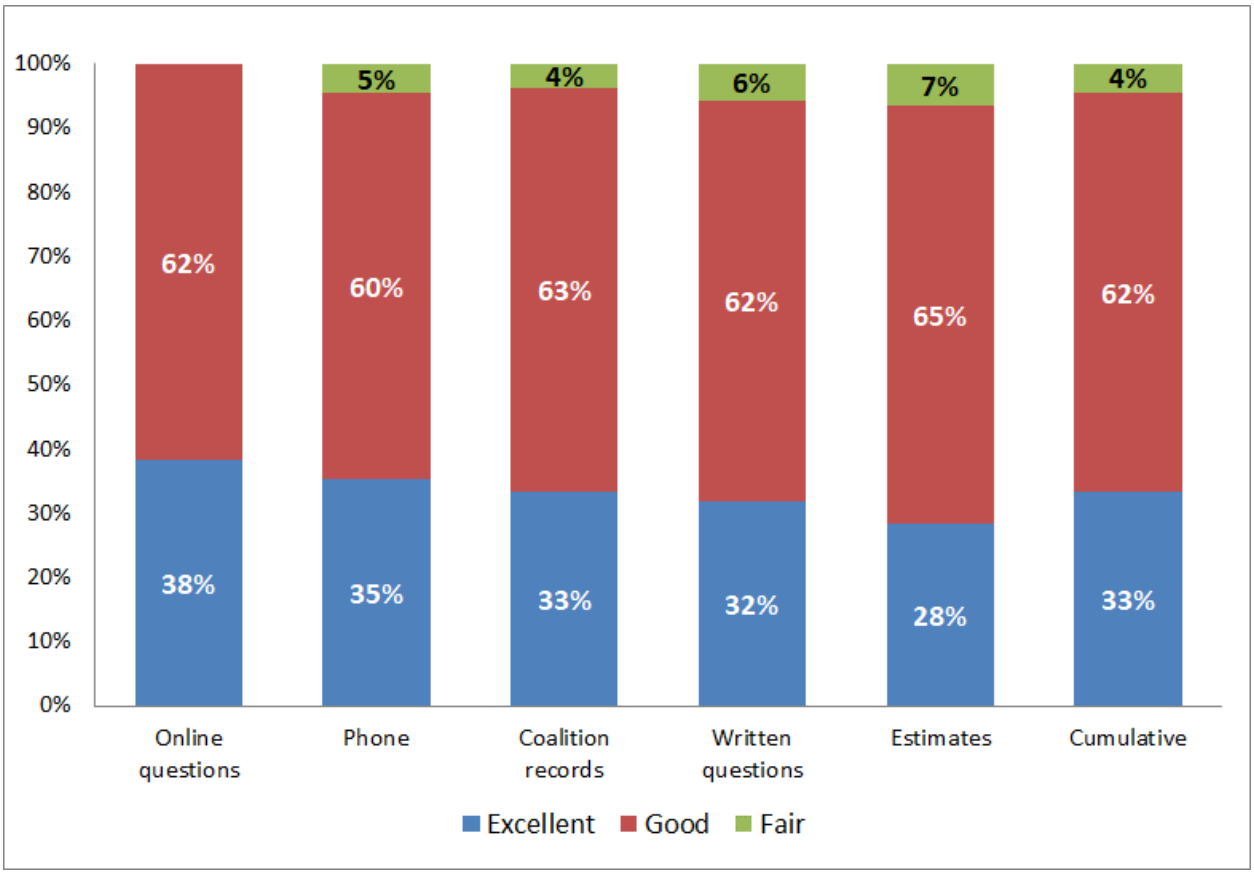

Figure 11. Data quality responses by data source.

Conclusion

The 2020 *Clean Cities Coalitions Activity Report* helps quantify accomplishments and the impact of the coalition network. The report shows that Clean Cities coalitions had a year of many successful projects. The data indicate that the EUI is nearly 1 billion GGE for activities reported by coalitions in 2020. This is a slight decrease from 2019 due to COVID 19, but other metrics including the number of vehicles on the road, the number of people reached by outreach events, and the GHG emissions reduced, have grown from 2019.

Overall, Clean Cities coalitions maintained a high level of accomplishments. Coalition efforts continued to increase the number and diversity of AFVs and advanced vehicles on U.S. roads in 2020. The combined efforts of local Clean Cities coalitions, DOE, and DOE national laboratories bring together otherwise disparate groups to leverage people, funding, and resources, to accelerate the nation's progress in increasing affordable, efficient, and clean transportation options.

Appendix A: Clean Cities Coalitions that Completed 2020 Annual Reports

State	Coalition
AL	Alabama Clean Fuels Coalition
AR	Arkansas Clean Cities
AZ	Valley of the Sun Clean Cities Coalition (Phoenix)
CA	Central Coast Clean Cities
CA	Clean Cities Coachella Valley Region
CA	East Bay Clean Cities Coalition (Oakland)
CA	Long Beach Clean Cities
CA	Los Angeles Clean Cities Coalition
CA	Sacramento Clean Cities Coalition
CA	San Diego Regional Clean Cities Coalition
CA	San Francisco Clean Cities Coalition
CA	San Joaquin Valley Clean Cities
CA	Silicon Valley Clean Cities (San Jose)
CA	Southern California Clean Cities Coalition
CA	Western Riverside County Clean Cities Coalition
CO	Denver Metro Clean Cities Coalition
CO	Northern Colorado Clean Cities Coalition
CT	Capitol Clean Cities of Connecticut
CT	Connecticut Southwestern Area Clean Cities
CT	Greater New Haven Clean Cities Coalition
DC	Greater Washington Region Clean Cities Coalition
DE	State of Delaware Clean Cities
FL	Central Florida Clean Cities Coalition
FL	North Florida Clean Fuels Coalition
FL	Southeast Florida Clean Cities Coalition
FL	Tampa Bay Clean Cities Coalition
GA	Clean Cities-Georgia
HI	Sustainable Transportation Coalition of Hawaii
IA	Iowa Clean Cities Coalition
ID	Treasure Valley Clean Cities
ID MT WY	Yellowstone-Teton Clean Cities Coalition
IL	Chicago Area Clean Cities

State	Coalition
IN	Greater Indiana Clean Cities Coalition
IN	South Shore Clean Cities
KS	Central Kansas Clean Cities
KS MO	Kansas City Regional Clean Cities
KY	Kentucky Clean Cities Partnership
LA	Louisiana Clean Fuels
LA	Southeast Louisiana Clean Fuel Partnership
MA	Massachusetts Clean Cities
MD	State of Maryland Clean Cities
ME	Maine Clean Communities
MI	Greater Lansing Area Clean Cities
MN	Twin Cities Clean Cities Coalition
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 Coalition
NJ	New Jersey Clean Cities Coalition
NM	Land of Enchantment Clean Cities (New Mexico)
NY	Capital District Clean Communities Coalition (Albany)
NY	Clean Communities of Central New York (Syracuse)
NY	Clean Communities of Western New York (Buffalo)
NY	Empire Clean Cities
NY	Greater Long Island Clean Cities
NY	Greater Rochester Clean Cities
OH	Clean Fuels Ohio
OK	Central Oklahoma Clean Cities (Oklahoma City)
OK	Tulsa Clean Cities
OR	Columbia-Willamette Clean Cities
OR	Rogue Valley Clean Cities
PA	Eastern Pennsylvania Alliance for Clean Transportation
PA	Pittsburgh Region Clean Cities
RI	Ocean State Clean Cities

State	Coalition
SC	Palmetto Clean Fuels Coalition
TN	East Tennessee Clean Fuels Coalition
TN	Middle-West Tennessee Clean Fuels Coalition
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
WI	Wisconsin Clean Cities
WV	State of West Virginia Clean Cities

Appendix B: Definition of Clean Cities Coalition Types

Coalitions have categorized themselves into six different types, depending on their organizational structures and relationship to hosts.[5] 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. "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.
4. "Standalone Nonprofit" coalitions are nonprofits typically with 501c3 status and operate with no or minimal oversight and management of a host organization.
5. "Regional Governing Coalition" coalitions are hosted in a multigovernmental body such as a council of governments, municipal planning organization, or regional planning commission.
6. "Hosted in a University" coalitions are hosted by a university (public or private).

[5] 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.