

From: Sherrie Merrow
To: [Paula Wilson](#)
Cc: [Daniel J. Gage](#); [Clarke, Jeff](#)
Subject: NGVAmerica Additional Comments on the Idaho VW Beneficiary Mitigation Plan
Date: Monday, April 2, 2018 1:48:13 PM
Attachments: [NGVAmerica ID VW State Mitigation Plan Comments - May 9 2017.pdf](#)
[NGVAmerica Comments on the State of Idaho VW Beneficiary Mitigation Plan - Jan 5 2018.pdf](#)
[NGVA VW Flyer.pdf](#)
[NGVAmerica ID VW Beneficiary Mitigation Plan Additional Comments - April 2 2018.pdf](#)

Ms. Wilson:

Natural Gas Vehicles for America (NGVAmerica), the national trade association for the natural gas vehicle industry, respectfully submits the following comments on the State of Idaho Department of Environmental Quality's Volkswagen Beneficiary Mitigation Plan. These comments are in addition to the NGVAmerica comments submitted to you on May 9, 2017 and January 5, 2018 (both attached) regarding NGVAmerica's recommendations on how states can best use the Environmental Mitigation Trust funds provided by the Volkswagen diesel emission settlement.

Please let me know if you have any questions.

Thank you.

Sherrie Merrow

Sherrie Merrow
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From: Sherrie Merrow
Sent: Friday, March 30, 2018 11:52 AM
To: Daniel J. Gage; Clarke, Jeff; Raymond C. Drake; Jim Grambihler; Scott Hutch Hutchings
Subject: NGVA Comments for the Idaho VW Plan

Please see attached Word file for our latest letter... this is the 3rd comment letter, but they put out a new plan in March and I wanted to reiterate our points and add the HDVEC tool. Let me know if you have any changes by noon MT on Monday (I will submit that afternoon).

Enjoy your weekends!

Thanks.

Sherrie

Sherrie Merrow

Director, State Government Advocacy

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April 2, 2018

Ms. Paula Wilson
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

RE: NGV America Comments on the State of Idaho Volkswagen Settlement Beneficiary Mitigation Plan

Dear Ms. Wilson:

Natural Gas Vehicles for America (NGV America) respectfully submits the following additional comments on how the Idaho Department of Environmental Quality (DEQ) can best use the Environmental Mitigation Trust (EMT or Trust) funds (\$17.35 million) that the state will receive as part of the Volkswagen (VW) diesel emission settlement.

NGV America agrees that barring special circumstances, the priority should be on funding projects that deliver greatest NOx reductions for the least cost, as Idaho shows in its evaluation criteria for VW projects. Consistent with this principle, the Idaho DEQ should find that projects involving on- and off-road medium- and heavy-duty natural gas vehicles (both CNG and LNG) are proven to reduce more NOx than their diesel counterparts (see attached NGVA VW Flyer), while not requiring any aftertreatment equipment on the vehicles.

The latest natural gas engines are the only zero emission equivalent or near zero engines that are certified to perform at 0.02 g/bhp-hr of nitrogen oxide (NOx) emissions or better and should not be confused with diesel engines certified to the 2010 EPA standard of 0.2 g/bhp-hr NOx standard.¹ The 0.02 g/bhp-hr NOx standard requires that new engines outperform the federal standard by 90 percent and is the cleanest heavy-duty engine standard today. It also is the lowest level currently recognized under California's Optional Low-NOx Standard (OLNS) for engines.

Additionally, if renewable natural gas (RNG) is used to produce CNG or LNG, life cycle greenhouse gas emissions from NGVs are reduced further. Using RNG also creates a market for energy produced from waste water treatment, landfills, animal waste and other methane sources, significantly increasing air quality by reducing the amount of methane released.

As was shown in our comments submitted May 9, 2017 (attached), in some duty cycles often even new diesel engines do not perform at the EPA standard for NOx reduction when operating at low speeds or idling, which is much of the operating time for many heavy duty vehicles (especially refuse trucks, transit and school buses, and drayage trucks in ports and loading areas). NGV America strongly encourages the Idaho DEQ to use different types of alternative fuel applications and technologies that will reduce the most NOx for the funds expended as shown in the attached 2017 NGVA Comment Letter and NGVA VW Flyer.

¹ See SCAQMD press release from June 3, 2016 providing details on the petition filed by state authorities urging the U.S. EPA to adopt the 0.02 NOx standard (<http://www.aqmd.gov/home/library/public-information/2016-news-archives/nox-petition-to-epa>) (Today's action follows a March 4 vote by the SCAQMD's Governing Board to formally petition the U.S. EPA to adopt a so-called "near-zero" or "ultra-low" emissions standard for heavy-duty truck engines that is 90 percent cleaner than the current standard).

The Idaho Volkswagen Beneficiary Mitigation Plan (Plan) does reflect the goals of the Trust and provides categories with percentages of total funding that will reduce significant NOx emissions. Besides Idaho's Plan goal of maximizing the amount of diesel emissions reduced each year per dollar spent, NGVAmerica applauds Idaho's focus on promoting widespread acceptance of alternative fuel vehicles (AFVs). To this point, NGVAmerica suggests that Idaho consider the approach that Colorado has taken to minimize any VW funds spend on diesel projects.

In reviewing Idaho's project evaluation criteria, NGVAmerica suggests adding an evaluation criteria segment for projects that promote the widespread growth of AFVs by providing partnerships that will fund infrastructure for non-electric AFVs. Additionally, projects in attainment areas that provide connecting stations between non-attainment areas (creating AFV corridors) should be viewed favorably.

In our January 5, 2018 comments NGVAmerica recommended the use of the new (August 2017) Argonne National Laboratory's AFLEET tool should be used to calculate vehicle / fuel type emissions since this tool has recently been updated to include current data on all vehicles and fuels including in-use emissions data (*other tools such as the EPA DEQ are not using current emissions and cost data*). The AFLEET Tool 2017 updates include:

- Added low-NOx engine option for CNG and LNG heavy-duty vehicles
- Added diesel in-use emissions multiplier sensitivity case
- Added Idle Reduction Calculator to estimate the idling petroleum use, emissions, and costs for light-duty and heavy-duty vehicles
- Added well-to-pump air pollutants and vehicle cycle petroleum use, GHGs, and air pollutants
- Added more renewable fuel options
- AFLEET Tool spreadsheet and user manual at: http://greet.es.anl.gov/afleet_tool and tool link is: <http://www.afdc.energy.gov/tools>

ANL has also just released a new VW heavy-duty vehicle emissions calculator (HDVEC) to provide state officials and fleet managers with an accurate tool to gauge emissions reductions across various medium- and heavy-duty vehicle project options affiliated with the Volkswagen Environmental Mitigation Trust Settlement. The HDVEC tool is available at: <http://afleet-web.es.anl.gov/hdv-emissions-calculator/>.

In using either the AFLEET or HDVEC tools, the options for the NGV low-NOx engine, renewable fuels, and the in-use diesel factors should be used to gain the full advantage of the current data that produces more accurate estimations.

Lastly, Idaho has not stated in their Plan the percents of funding planned for use by type of vehicle. NGVAmerica strongly recommends that Idaho strive to achieve "parity" between fuels by following a model similar to Colorado's Plan where all alternative fuels are funded at 40% of the vehicle cost for government and public entities, while private vehicles are funded at 25% of the vehicle cost (not the 75% allowed for EVs because that would use the funds for a smaller number of vehicles (reducing less NOx) and there are other sources for EV funding).

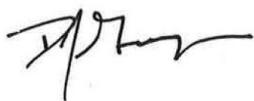
Summary of NGVAmerica's Recommendations for EMT Funding

- ✓ Given that the EMT was created because of NOx pollution associated with non-compliant diesel vehicles, we believe that the funding should be set aside for clean, **alternative fuel vehicle projects that focus on maximizing NOx reduction for the funds spent**
- ✓ Provide a larger incentive and greater overall funding for medium- and heavy-duty engines that deliver **greater NOx reductions than currently required** for new vehicles and engines
- ✓ Target funding for technologies that have demonstrated the ability to deliver actual **lower in-use emissions** when operated in real-world conditions
- ✓ Provide the **highest level of funding to applications that produce the largest share of NOx emissions** (in most regions this means prioritizing for short-haul, regional-haul and refuse trucks)
- ✓ Prioritize funding for **commercially available products that are ready for use**
- ✓ Prioritize funding for **clean vehicles rather than fueling infrastructure**
- ✓ **Scale funding to incentivize the cleanest engines available** – at a minimum, provide parity among alternative fuels by following a version of the Colorado VW Plan that funds non-diesel alternative vehicles in the private sector at 25% of the cost of the vehicle and public sector vehicles at 40%
- ✓ Ensure that funding incentivizes adoption by **both public and private fleets**
- ✓ Prioritize projects that include **partnerships that provide a match** such as a CNG or LNG station being built in locations that will receive the VW funding
- ✓ **Accelerate the funding** in the early years to maximize the NOx reduction benefits
- ✓ Use vehicles emissions measurement tools that reflect current technologies and performance under real world operation duty cycles – **Argonne National Laboratory's AFLEET and HDVEC tools** are the most current tools available

NGVAmerica and its members are eager to serve as a resource to assist the Idaho DEQ in its finalization of the state's proposed Beneficiary Mitigation Plan. We strongly encourage the state to recognize the unmatched role that natural gas vehicles can play in delivering NOx emissions reductions required by the settlement and Trust.

NGVAmerica welcomes the opportunity to meet with you to provide further information and analysis on the economic and environmental benefits of natural gas vehicles in Idaho. Please contact Jeff Clarke, NGVAmerica General Counsel & Director of Regulatory Affairs at 202.824.7364 or jclarke@NGVAmerica.org, or Sherrie Merrow, Director of State Government Advocacy at 303.883.5121 or smerrow@NGVAmerica.org to set up a meeting and for additional information.

Sincerely,



Daniel J. Gage
President, NGVAmerica



January 5, 2018

Ms. Tiffany Floyd
Air Quality Division Administrator
Department of Environmental Quality State Office
1410 N. Hilton
Boise, ID 83706

RE: NGVAmerica Comments on the State of Idaho VW Beneficiary Mitigation Plan

Dear Administrator Floyd:

Natural Gas Vehicles for America (NGVAmerica), the national trade association for the natural gas vehicle industry, respectfully submits the following comments on the State of Idaho (ID) Department of Environmental Quality's Volkswagen (VW) Beneficiary Mitigation Plan (Plan). These comments are in addition to the NGVAmerica comments submitted to you on May 9, 2017 (attached) regarding NGVAmerica's recommendations on how states can best use the Environmental Mitigation Trust (EMT or Trust) funds provided by the Volkswagen diesel emission settlement.

Idaho has a significant opportunity to use the VW Trust funds (\$17.35 million) to positively impact the future of its emissions from on-road and non-road vehicles. The proposed ID VW Plan aligns well with the goals outlined by the U.S. Department of Justice for the EMT. As Stated in the ID VW Beneficiary Mitigation Plan, "Idaho's strategy for implementing the trust is to select projects that improve and protect ambient air quality by achieving the following high level goals:

- Achieve significant and sustained reductions in diesel emission exposures in
 - Priority air quality areas
 - Areas that receive a disproportional amount of air pollution from diesel vehicles.
- Maximize the amount of diesel emissions reduced each year per dollar spent.
- Promote widespread acceptance of electric and hybrid vehicles (e.g. zero emission and near-zero emission vehicles and engines)."

In support of the State's high level goals stated above, NGVAmerica strongly encourages the Department of Environmental Quality to prioritize investments in natural gas zero emission equivalent (near-zero) vehicles since these vehicles are now commercially available in all the desired vehicle categories stated in the Plan, and can begin improving Idaho's air quality immediately at a much lower cost than other clean technologies (please refer to NGVAmerica's May 9, 2017 Comment Letter for additional information). NGVAmerica suggests that the third goal above be modified to include the natural gas near-zero engine.

Current State Beneficiary Mitigation Plans

Sixteen states have released draft VW Mitigation Plans and NGVAmerica has reviewed these plans and offered comments to the states. NGVAmerica believes the Colorado Plan provides an excellent model for other states that wish to segment their funding, maximize the use of alternative fuels, and provide parity among alternative fuels (https://www.colorado.gov/pacific/sites/default/files/AP_VW_Beneficiary_Mitigation_Plan.pdf).

In allocating its funds, Colorado did not pick a preferred fuel and kept the categories simple and broad. The \$18M set aside by Colorado for Alt Fuel Trucks/School and Shuttle Buses funds all alternative fuels at 40% of the vehicle cost for government and public entities, while private vehicles are funded at 25% of the vehicle cost (not the 75% allowed for EVs because that would use the funds for a smaller number of vehicles (reducing less NOx) and there are other sources for EV funding). NGVAmerica recommends that Idaho consider adopting a similar “parity” approach to alternative fuel vehicles.

Colorado has other funding they can apply to Transit, so it created a structure to augment the funding provided by the \$18M segment. Colorado also set aside \$12.2M in Flex Funds to support projects in the segments that turn out to be successful and oversubscribed. For the DERA option, liquefied natural gas (LNG) drilling rig and hydraulic fracturing engines, mining trucks and locomotives are potential projects.

Additional Options for Vehicle Scrappage

NGVAmerica also recommends that the Idaho Department of Environmental Quality consider the following vehicle scrappage options in the Plan:

- Increase the options for scrappage beyond a strict replacement of a current fleet vehicle (e.g., allow a fleet to acquire an older vehicle from another fleet or allow a fleet to exchange one of its newer vehicles for another fleets older vehicle that is then scrapped)
- Since the Trust does not specify the fuel of the scrappage vehicle, allow older natural gas vehicles that meet the year criteria to be scrapped and replaced with new NGVs

Use the Most Current Emissions and Cost Benefit Calculation Tools

Idaho’s draft plan indicates that the state intends to use the Diesel Emission Quantifier to assess the cost-effectiveness of different mitigation actions. We urge Idaho to also consider and allow the use of other available emission tools include Argonne National Laboratory’s AFLEET tool. The AFLEET tool provides more specific emission factors for alternative fuel vehicle and therefore is better suited to estimating the cost and benefits provided by projects that include alternative fuel vehicles. The AFLEET tool on all vehicles and fuels including in-use emissions data. The AFLEET Tool 2017 updates include:

- Added low-NOx engine option for CNG and LNG heavy-duty vehicles
- Added diesel in-use emissions multiplier sensitivity case

- Added Idle Reduction Calculator to estimate the idling petroleum use, emissions, and costs for light-duty and heavy-duty vehicles
- Added well-to-pump air pollutants and vehicle cycle petroleum use, GHGs, and air pollutants
- Added more renewable fuel options
- AFLEET Tool spreadsheet and user manual at: http://greet.es.anl.gov/afleet_tool and tool link is: <http://www.afdc.energy.gov/tools>

Summary of NGVAmerica's Recommendations for EMT Funding

- ✓ Given that the EMT was created because of NOx pollution associated with non-compliant diesel vehicles, we believe that the funding should be set aside for clean, **alternative fuel vehicle projects that focus on maximizing NOx reduction for the funds spent**
- ✓ Provide a larger incentive and greater overall funding for medium- and heavy-duty engines that deliver **greater NOx reductions than currently required** for new vehicles and engines
- ✓ Target funding for technologies that have demonstrated the ability to deliver actual **lower in-use emissions** when operated in real-world conditions
- ✓ Provide the **highest level of funding to applications that produce the largest share of NOx emissions** (in most regions this means prioritizing for short-haul, regional-haul and refuse trucks)
- ✓ Prioritize funding for **commercially available products that are ready for use**
- ✓ Prioritize funding for **clean vehicles rather than fueling infrastructure**
- ✓ **Scale funding to incentivize the cleanest engines available** – at a minimum, provide parity among alternative fuels by following a version of the Colorado VW Plan that funds non-diesel alternative vehicles in the private sector at 25% of the cost of the vehicle and public sector vehicles at 40%
- ✓ Ensure that funding incentivizes adoption by **both public and private fleets**
- ✓ Prioritize projects that include **partnerships that provide a match** such as a CNG or LNG station being built in locations that will receive the VW funding
- ✓ **Accelerate the funding** in the early years to maximize the NOx reduction benefits
- ✓ Use vehicles emissions measurement tools that reflect current technologies and performance under real world operation duty cycles – **Argonne National Laboratory's AFLEET tool** is the most current

NGVAmerica and its members are eager to serve as a resource to assist the Idaho Department of Environmental Quality in its further evaluation and development of the state's proposed Beneficiary Mitigation Plan. We strongly encourage the state to recognize the unmatched role that natural gas vehicles can play in delivering NOx emissions reductions required by the settlement and Trust.

NGVAmerica welcomes the opportunity to meet with you to provide further information and analysis on the economic and environmental benefits of natural gas vehicles in Idaho. Please contact Jeff Clarke, NGVAmerica General Counsel & Director of Regulatory Affairs at 202.824.7364 or jclarke@NGVAmerica.org, or Sherrie Merrow, NGVAmerica Director of State Government Advocacy at 303.883.5121 or smerrow@NGVAmerica.org to set up a meeting and for additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Gage", with a long horizontal flourish extending to the right.

Daniel J. Gage

President, NGVAmerica



Natural Gas Vehicles for America

400 North Capitol Street, N.W.
Washington, D.C. 20001
ngvamerica.org



May 9, 2017

Ms. Tiffany Floyd
Air Quality Division Administrator
Department of Environmental Quality State Office
1410 N. Hilton
Boise, ID 83706

RE: NGVAmerica Comments on the Volkswagen Diesel Emissions Settlement and the Environmental Mitigation Trust Implementation for the States

Dear Administrator Floyd:

Natural Gas Vehicles for America (NGVAmerica), the national trade association for the natural gas vehicle industry, respectfully submits the following comments on how the State of Idaho can best use the Environmental Mitigation Trust (EMT or Trust) funds (\$17.35 million) that the state will receive as part of the Volkswagen (VW) diesel emission settlement. These comments are intended to inform the decision-making process as Idaho begins to consider and develop the Environmental Mitigation Plan required by Trust.

The VW EMT funds provide an extraordinary opportunity for Idaho and other states to put significantly cleaner, lower-polluting vehicles on the road in public and private fleets. This funding can and should be used by Idaho to continue its commitment to accelerating the use of cleaner, alternative fuels that offer a cost-effective alternative to funding diesel vehicles.

The latest natural gas engines are the only “near-zero” engines that are certified to perform at 0.02 g/bhp-hr of nitrogen oxide (NOx) emissions or better and should not be confused with diesel engines certified to the 2010 EPA standard of 0.2 g/bhp-hr NOx standard.¹ The 0.02 g/bhp-hr NOx standard requires that engines outperform the federal standard by 90 percent and is the cleanest heavy-duty engine standard today. It also is the lowest level currently recognized under California’s Optional Low-NOx Standard (OLNS) for engines.

NGVAmerica’s comments rely on data generated by evaluating the latest commercially available technology when comparing emissions benefits between natural gas, diesel and electric vehicle and engine types. Natural gas engines are the only available internal combustion engines that have been certified to California’s 0.02 OLNS and thus are the only true Near Zero engines available in the marketplace today. Additionally, if renewable natural gas (RNG) is used, life cycle emissions from NGVs are reduced further. Putting more NGVs on the road today provides a strong customer base for the growing RNG market.

¹ See SCAQMD press release from June 3, 2016 providing details on the petition filed by state authorities urging the U.S. EPA to adopt the 0.02 NOx standard (<http://www.aqmd.gov/home/library/public-information/2016-news-archives/nox-petition-to-epa>) (*Today’s action follows a March 4 vote by the SCAQMD’s Governing Board to formally petition the U.S. EPA to adopt a so-called “near-zero” or “ultra-low” emissions standard for heavy-duty truck engines that is 90 percent cleaner than the current standard*).

Compared to other alternative fuels and to diesel vehicles, natural gas vehicles that are commercially available today, offer the best solution for addressing the goals of the EMT and delivering the most nitrogen oxide (NOx) emission reductions for the lowest cost.

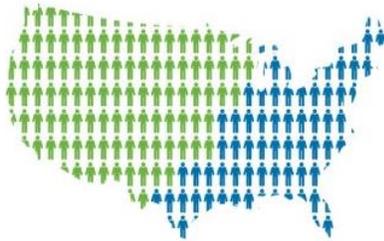
The following pages outline key facts related to vehicle emissions, total cost of ownership, and current availability, and NGVAmerica's recommendations on how EMT funds can be allocated effectively for reducing emissions.

The Need to Take Meaningful Action Today

The funding available through Volkswagen's Environmental Mitigation Trust comes at a time when it is critical to address transportation emissions. The American Lung Association's "State of the Air 2016" report found that air pollution continues to be a pressing concern with more than half of all Americans—166 million people—living in counties where they are exposed to unhealthy levels of ozone and particulate pollution.

Medium- and heavy-duty on-road vehicles are the number one source of ozone-forming emissions of nitrogen oxides (NOx) in almost every metropolitan region in the U.S., therefore there is considerable opportunity to develop and deploy funding programs that make an immediate and tangible impact on air quality and related public health issues.

166 Million



*Approximately
50% of Americans
live in
areas with air that
is unhealthy to
breathe*

#1 Source



*Medium- and
heavy-duty
vehicles are the
#1 source of
smog*

Sustainable, Responsible, Available: Natural Gas Vehicles

Today's natural gas vehicles (NGVs) are proven technologies that can uniquely, immediately, and cost-effectively transform our nation's medium- and heavy-duty transportation sector. The advantages of natural gas as a transportation fuel include its domestic availability, widespread distribution infrastructure, low cost, and inherently clean-burning qualities.

In these comments NGVAmerica presents the compelling reasons that states should prioritize funding for NGVs to *maximize the impact* of the available funding. As your organization is aware, the EMT was set up to fund projects that make an impactful reduction on NOx emissions to mitigate the excess emissions currently in our air from the non-compliant light-duty diesel vehicles VW sold. NGVAmerica strongly believes that NGVs are the best solution to meet the core goals put forth by the Volkswagen EMT funding. NGVs are:

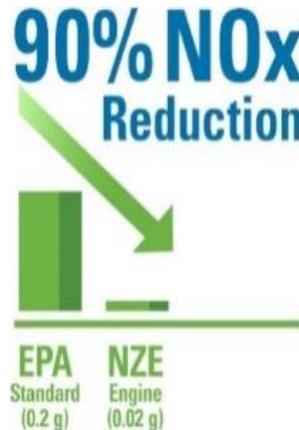
1. **Sustainable:** NGVs maximize long-term emission reductions
2. **Responsible:** NGVs extend the funding and foster economic development
3. **Available:** NGVs meet the diverse operating requirements of every fleet application

1. Sustainable: NGVs Maximize Long-Term Emission Reductions

- ❖ **Key Point:** Today's natural gas medium- and heavy-duty engines provide *unmatched* reductions of smog-forming emissions of nitrogen oxides (NOx).

“Near Zero-Emissions”: EPA and CARB Certified a Heavy-Duty Natural Gas Engine to 0.02 g Standard

In September 2015, the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) certified the world's first heavy-duty engine that emits oxides of nitrogen (NOx) at levels so low that they are considered at “near-zero” (0.02g NOx/bhp-hr). This is the cleanest commercially available heavy-duty truck engine available in the market today, offering the ability to reduce emissions 90% below even the most stringent U.S. EPA standards.



Today's natural gas engines offer a 90% NOx reduction over the EPA's strictest emission standards, making them the cleanest commercially available technology



The “Game Changer” report shows that “Near-Zero” NGVs are cleaner than “Zero-Emission” All-Electric trucks

NGVs Have Lower NOx Emissions Than All-Electric Trucks

The emission benefits of the new “Near-Zero” engine are well documented in the 2016 *Game Changer* report issued by Gladstein, Neandross and Associates (GNA)². The GNA report indicates that a truck or bus equipped with a natural gas engine that has been certified to the 0.02 g/bhp-hr Optional Low NOx Standard has tailpipe NOx emissions that are comparable to – or possibly lower than – the amount of NOx emitted to produce electricity used to charge a comparable heavy-duty All-Electric Truck.

² Gladstein, Neandross & Associates, *Game Changer Technical White Paper* (2016) <http://ngvgamechanger.com/>, Section 6.4 and Appendix 1. Emissions of low-NOx natural gas engines produce NOx emissions that are comparable to or lower than similar electric drive vehicles in all 50 U.S. states when considering upstream NOx.



Heavy-duty drayage trucks:

Diesel trucks tested in study exceed certification level

Critical Insight:

Study Finds that Natural Gas Engines Outperform Diesel Engines in Real World Situations

Natural gas (NG) engines today meet an optional Low NOx standard that is ten times cleaner than the standard required for new diesel and natural gas engines. However, the in-use emission benefits of NG engines could be even more significant.

A recent report published in *Environmental Science and Technology*³, evaluated in-use emissions of earlier model year NG vehicles and found that NG engines performed much better in real world conditions (i.e., operating within city limits in low-speed, high-idling situations), registering NOx levels that were 96% lower than levels produced by tested diesel engines equipped with the latest emissions controls. The study found that diesel NOx emissions operating in similar conditions produced emissions that were 5 -7 times higher than in-use certification limits in some cases.

Related Recommendations for EMT Funding

- ✓ **Provide a higher level of funding for technologies that are proven to exceed federal emission levels for nitrogen oxides**
 - Vehicles with engines certified to California's Optional Low-NOx Standard should receive the highest level of funding (e.g., 25% in the case of private sector vehicle replacements)
 - Use the state's approved DERA plan to fund low-NOx natural gas trucks (i.e., 35% of the replacement cost for private vehicles equipped with low-NOx engines)
- ✓ **Provide the highest level of funding to applications that will reduce the largest share of NOx emissions**
 - Evaluate the main mobile source(s) of NOx emissions in urban and non-attainment areas (Note: In most regions, this means prioritizing funding for short-haul, regional-haul, and refuse trucks)
 - Do not segment the funding – fund the projects that best achieve the most NOx reductions

³ *Environ. Sci. Technol.*, **2015**, 49 (8), pp 5236–5244 (Emission Rates of Regulated Pollutants from Current Technology Heavy-Duty Diesel and Natural Gas Goods Movement Vehicles).

2. **Responsible:** NGVs Extend the Funding and Foster Economic Development

- ❖ **Key Point:** NGVs are far more cost-effective in delivering emission reductions than other alternative fuel options, such as hybrid and electric vehicles.



Due to lower fuel and maintenance costs, NGVs offer an 18 to 24 month payback. As production increases and fuel tank prices come down, vehicles will become less expensive and enjoy a shorter payback period

NGVs Offer a Fast Return on Investment

While NGVs typically cost more than gasoline or diesel vehicles upfront (largely due to the cost of high-pressure and insulated fuel tanks which are necessary to store CNG or LNG), owners and operators of high mileage vehicles typically see a pay back in as little as 18–24 months. This is due to:

- **Lower Fuel Costs:** Natural gas fuel prices have historically had a significant discount relative to gasoline and diesel and offer more stability compared to the costs of petroleum based fuels. Lower oil prices have recently reduced the differential in price, but according to the Energy Information Agency, the long-term outlook is for natural gas prices to remain stable and low, while volatility and higher prices return for gasoline and diesel fuels. For many users, the savings in fuel costs can translate into significant savings over the life of a vehicle, depending on fuel efficiency and the number of miles driven. The greatest savings are currently being seen in heavy-duty, high mileage fleets.
- **Lower Maintenance Costs:** NGVs are easier and cheaper to maintain than diesel trucks because they have:
 - No diesel particulate filter (DPF)
 - No DPF regeneration or waste disposal
 - No selective catalytic reduction (SCR)
 - No diesel emission fluid (DEF)



High-profile fleets across the U.S. are using natural gas vehicles in their everyday operations, transporting passengers, and hauling waste, packages, beverages, and other goods

NGVs Have Been Road-Tested by Leading Fleets

There are more than 160,000 NGVs on U.S. roads today, spanning all weight classes and vehicle applications. The adoption of NGVs has been pioneered by several high-profile fleet operators, including UPS, Anheuser-Busch, Kroger, FedEx, Frito Lay, Waste Management, LA Metro, all of which performed exhaustive analysis to determine the best vehicle and fueling options for their fleet based on application, range, duty cycle, and payload.

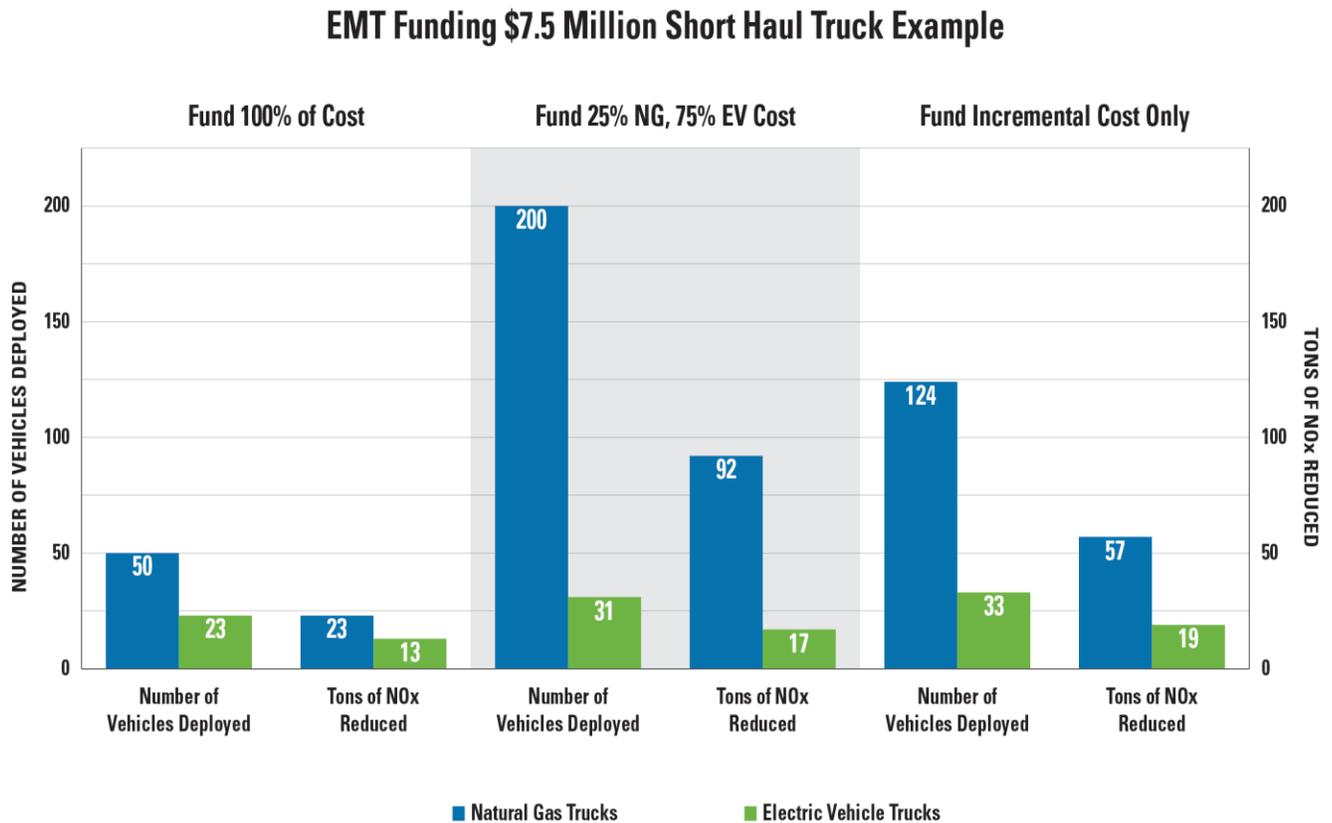
Given the significant fuel and emission reductions realized by early adopters, the popularity of NGVs has continued to build in the U.S., with 20% of all U.S. transit buses now running on CNG or LNG, 35 airports operating NGVs in their private fleets or championing policies that encourage use by private fleets, and more than 50% of new refuse trucks running on natural gas.

To fuel these vehicles, natural gas infrastructure is rapidly expanding with more than 1,640 CNG and 123 LNG fueling stations operating today.

Dollar-for-Dollar Natural Gas Delivers Greater Numbers of Total Vehicles and Greater Total Tons of NOx Emission Reductions

This is illustrated by the chart below which looks at several different funding options for natural gas and electric vehicles including providing 100% of the cost of new, replacement vehicles for public fleets, using the maximum funding levels specified in the settlement for natural gas and electric vehicles purchased by private fleets, or funding only the incremental cost of new, replacement vehicles. In each case, the deployment of natural gas vehicles (e.g., regional haul trucking, refuse trucks, and transit buses) will provide the most NOx emissions reduction to comply with the EPA’s latest national ozone standards.

Chart: Heavy-Duty Truck Deployment & NOx Reduction Comparisons Under Different Funding Scenarios



Critical Insight:
Comparable All-Electric Vehicles Cost 2-3x More Than an NGV

While actual cost depends on the application, an all-electric medium- or heavy-duty vehicle usually costs two to three times the amount of a comparable vehicle powered by a 0.02 g NOx natural gas engine. As noted above, funding heavy-duty NGVs delivers greater emission reductions than similar projects involving all-electric trucks, and they offer the best ability to reduce emissions on a large scale because the funding will extend further.

Related Recommendations for EMT Funding

- ✓ **Ensure that funding incentivizes adoption by both public and private fleets**
 - While it might be tempting to fund public vehicles at the 100% level, this will limit the total number of deployed vehicles and therefore lessen the overall emission reductions
 - Funding levels should be large enough to offset the incremental cost (as compared to cost of a new diesel vehicle) of new, cleaner vehicles, as well as to address the fact that replaced vehicles must be scrapped
 - For private fleets, use available state funding sources to supplement the Volkswagen funds to ensure that new, cleaner trucks are truly incentivized by covering the full incremental cost (compared to baseline diesel vehicles) and to address economic loss associate with scrappage
- ✓ **Prioritize funding for clean vehicles rather than fueling infrastructure**
 - Funding should be used to incentivize fleets and vehicle acquisitions where existing fueling infrastructure exists to better support investments that have already been made
 - If fueling infrastructure needs to be developed, funding should be secured as part of private-public partnerships. Using the funding in this way will encourage additional economic development in the state and increase the availability of stations for future deployments

3. Available: NGVs Meet the Diverse Operating Requirements of Every Fleet Application

- ❖ **Key Point:** Dozens of models of medium- and heavy-duty low-emission natural gas vehicles and engines are commercially available from reputable, world-known OEMs with established sales and service networks.



Wide Array of NGV Options Commercially Available

There are many natural gas vehicle options available from several original equipment manufacturers (OEM). These vehicles can be purchased from the dealership through a process that has been streamlined for the customer.



Many other medium- and heavy-duty vehicle options are available through small vehicle modifiers (SVM). These companies manufacture conversion systems that have been certified and approved by the U.S. Environmental Protection Agency and/or the California Air Resources Board. These approved systems can be installed on new and used vehicles to run on natural gas.



Additionally, Cummins Westport currently offers the 6.7L ISB-G, 8.9L ISL-G and the 11.9L ISX-G natural gas engines. These spark-ignited engines are used in a variety of applications, including refuse trucks, transit buses, cement trucks, short- and regional-haul tractors, delivery trucks, school buses, and shuttles. Roush offers a school bus engine that is certified to the Low-NOx standard of 0.10. Retrofit and repower options are also available from a variety of manufacturers.

For a full list of EPA and CARB certified engines, visit www.ngvamerica.org/vehicles/vehicle-availability. A list of available NGV manufacturers and conversion companies follows.



HD Vocational OEMs

Autocar Truck
Capacity
Crane Carrier
Elgin
Johnston
Kalmar
McNeilus
Mack
Peterbilt
Power Solutions Int'l.
Schwarze
Tymco



HD Bus OEMs

Blue Bird Bus
DesignLine
El Dorado
Gillig
New Flyer/NABI Bus
NOVA Bus
Motor Coach Industries
Thomas Built Bus

HD Retrofit/ Repowers

American Power Group
Clean Air Power
Diesel 2 Gas
Fyda Energy Solutions
NGV Motori
Omnitek Engineering

MD Retrofits

AGA Systems
Altech-Eco
Crazy Diamond Performance
Greenkraft
Landi Renzo USA/Baytech
M-Tech Solutions
NAT G
NGV Motori USA
PowerFuel Conversions
Roush CleanTech
STAG
Westport Fuel Systems
Zavoli

Fuel Systems

Agility Fuel Systems
Mainstay
Momentum Fuel
Technologies



HD Truck OEMs

Cummins Westport
Freightliner
Kenworth
Mack
Peterbilt
Volvo

Critical Insight: Heavy-Duty Electric and Fuel Cell Vehicles are Not Commercially Available

As of today, three unique fuel-technology combinations hold the most promise to successfully transform America's HDV transportation sector to zero and near-zero emissions:

1. Near-zero-emission internal combustion engines fueled by conventional or renewable natural gas
2. Zero-emission battery-electric-drive systems
3. Zero-emission hydrogen fuel cell systems

While battery-electric and hydrogen fuel cell systems can offer extremely low emissions profiles, the lack of commercially available heavy-duty and limited medium-duty products and charging/fuel distribution networks makes implementation in the near future impractical. Furthermore, these vehicles are being developed by niche, start-up companies and have only been used in early test programs; comparatively, medium- and heavy-duty NGVs from major OEMs have been widely, commercially available in dozens of applications for over two decades. Near-zero-emission internal combustion engines fueled by conventional or renewable natural gas are the only option to immediately and cost-effectively provide extremely low NOx and GHG emissions in high-impact HDV sectors.

Related Recommendations for EMT Funding

- ✓ **Prioritize funding for commercially available products**
 - Given that the NOx emissions from Volkswagen vehicles are already in the air, funding should be concentrated to projects that allow us to deploy the cleanest vehicles available today (i.e., not pre-commercial or research and development projects)
- ✓ **Scale funding to incentivize the cleanest engines available**
 - Provide greater funding for medium- and heavy-duty engines that deliver NOx reductions over and above what is currently required for new diesel vehicles
 - Given that the EMT was created because of NOx pollution associated with non-compliant diesel vehicles, we believe that the funding should be set aside for clean, alternative fuel vehicle projects and should not be used to fund more diesel fueled vehicles

Let's Transform Clean Transportation Together

NGVAmerica and its members are eager to serve as a resource to assist the State of Idaho in its evaluation and development of the state's Beneficiary Mitigation Plan. We strongly encourage the state to recognize the superior and unmatched role that natural gas vehicles can play in delivering nitrogen oxide (NOx) emissions reductions required by the settlement and Trust.

NGVAmerica welcomes the opportunity to meet with you to provide further information and analysis on the economic and environmental benefits of natural gas vehicles in Idaho. Please contact Jeff Clarke, NGVAmerica General Counsel & Director Regulatory Affairs at 202.824.7364 or jclarke@NGVAmerica.org, or Sherrie Mellow, NGVAmerica State Government Advocacy Committee Chair at 303.883.5121 or smellow@NGVAmerica.org to set up a meeting and for additional information.

Sincerely,



Matthew Godlewski
President

Summary of NGVAmerica's Recommendations for EMT Funding

- ✓ Provide a larger incentive and greater overall funding for medium- and heavy-duty engines that deliver greater NOx reductions than currently required for new vehicles and engines
- ✓ Target funding for technologies that have demonstrated the ability to deliver actual lower in-use emissions when operated in real-world conditions
- ✓ Provide the highest level of funding to applications that produce the largest share of NOx emissions (in most regions this means prioritizing for short-haul, regional-haul and refuse trucks)
- ✓ Prioritize funding for commercially available products that are ready to begin
- ✓ Prioritize funding for clean vehicles rather than fueling infrastructure
- ✓ Scale funding to incentivize the cleanest engines available
- ✓ Ensure that funding incentivizes adoption by both public and private fleets
- ✓ Accelerate the funding in the early years to maximize the NOx reduction benefits
- ✓ Given that the EMT was created because of NOx pollution associated with non-compliant diesel vehicles, we believe that the funding should be set aside for clean, alternative fuel vehicle projects that focus on maximizing NOx reduction for the funds spent

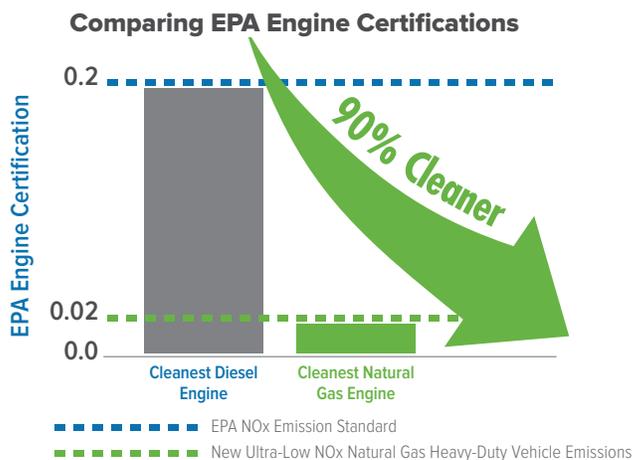
Make a Bold Impact on Air Quality Today

Allocating funds to deploy low-NOx natural gas vehicles provides the best way to deliver immediate and cost-effective NOx reductions and air quality benefit. Nearly 40% of Americans are exposed to unhealthful levels of ozone and particulate pollution. Volkswagen's \$2.9 billion Environmental Mitigation Trust fund provides each state an incredible opportunity to make an immediate and tangible impact on air quality by targeting medium- and heavy-duty vehicles, the leading source of these toxic air contaminants in almost every metropolitan area.

Natural gas vehicles (NGVs) are transforming the medium- and heavy-duty transportation sector.

Sustainable:

NGVs Offer the Cleanest Heavy-Duty Truck Engines in the World



Natural gas medium- and heavy-duty engines provide unmatched reductions of smog-forming emissions of nitrogen oxides (NOx). In 2015, a revolutionary natural gas engine was certified by the U.S. Environmental Protection Agency and California Air Resources Board to a level 90% below the EPA's current exhaust standard and 90% below the cleanest diesel engine. A truck with this engine has an emission profile equivalent to that of a heavy-duty battery electric truck.

Available:

NGVs are Commercially Available Today Across All Applications Qualified for Funding

NGVs are commercially available from traditional truck and bus OEMs with established sales and service networks. Retrofit and repower options are also available from a variety of manufacturers.

- Applications Include:**
- Heavy Semi Tractor
 - Single Axle Van
 - Cement Mixer
 - Large Walk In Van
 - School Bus
 - City Delivery Truck
 - Motor Coach
 - Shuttle Bus
 - Conventional Van
 - Rack Truck
 - Transit Bus
 - Dump Truck
 - Refrigerated Van
 - Tow Truck
 - Fuel Truck
 - Refuse Truck
 - Utility Truck

Responsible:

Dollar-for-Dollar, NGVs Deliver the Most Cost-Effective NOx Emissions Reductions

The calculations shown below assume the deployment of the cleanest commercially available model for each application. Funding natural gas vehicles will lead to the largest total reduction in NOx emissions.

Short/Regional Haul Trucks

| | | |
|---|---|---|
| <p>\$39 per lb of NOx</p> <p>Natural Gas Technology Cost \$150,000 NOx Reduced 3,810 lbs</p> | <p>\$54 per lb of NOx</p> <p>Diesel Technology Cost \$100,000 NOx Reduced 1,858 lbs</p> | <p>\$85 per lb of NOx</p> <p>Electric Technology Cost \$324,000 NOx Reduced 3,810 lbs</p> |
|---|---|---|

Refuse Trucks

| | | |
|--|--|--|
| <p>\$140 per lb of NOx</p> <p>Natural Gas Technology Cost \$300,000 NOx Reduced 2,141 lbs</p> | <p>\$190 per lb of NOx</p> <p>Diesel Technology Cost \$270,000 NOx Reduced 1,417 lbs</p> | <p>\$313 per lb of NOx</p> <p>Electric Technology Cost \$670,000 NOx Reduced 2,141 lbs</p> |
|--|--|--|

School Buses

| | | |
|--|--|--|
| <p>\$220 per lb of NOx</p> <p>Natural Gas Technology Cost \$148,000 NOx Reduced 671 lbs</p> | <p>\$291 per lb of NOx</p> <p>Diesel Technology Cost \$115,000 NOx Reduced 396 lbs</p> | <p>Not Commercially Available</p> <p>Electric</p> |
|--|--|--|

Transit Buses

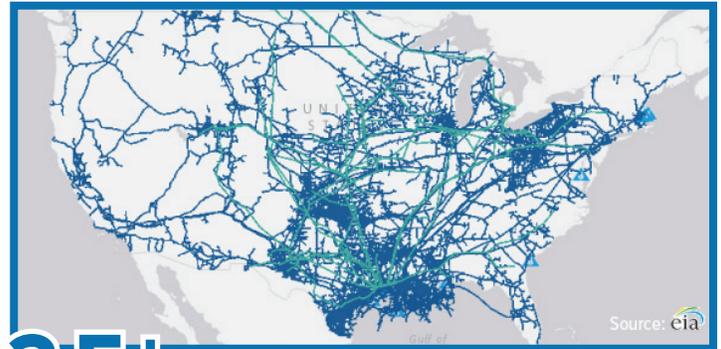
| | | |
|--|--|--|
| <p>\$273 per lb of NOx</p> <p>Natural Gas Technology Cost \$360,000 NOx Reduced 1,318 lbs</p> | <p>\$540 per lb of NOx</p> <p>Diesel Technology Cost \$300,000 NOx Reduced 555 lbs</p> | <p>\$569 per lb of NOx</p> <p>Electric Technology Cost \$750,000 NOx Reduced 1,318 lbs</p> |
|--|--|--|

#1

Natural Gas Producer in the World

90+ years supply of recoverable natural gas

Continual supply by harnessing renewable sources



2.5+ million

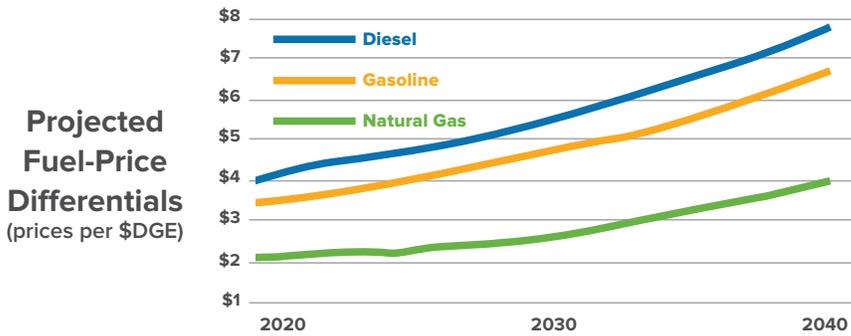
miles of U.S. pipeline infrastructure

The U.S.' expansive natural gas pipeline system is well poised to support a national network of natural gas fueling stations. Nearly 2,000 CNG and LNG fueling stations are operating today, with continual expansion underway.

Source: U.S. Energy Information Administration

Natural gas is a clean, low-cost, and domestically abundant transportation fuel.

Natural Gas Provides Long-Term Fuel Price Stability and Cost Savings



Source: U.S. Energy Information Administration

Natural Gas Reduces WTW Greenhouse Gas Emissions

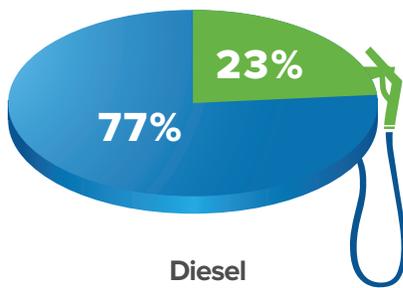
Compared to Diesel:

- LNG** 11% reduction
- CNG** 17% reduction
- RNG** 115% reduction

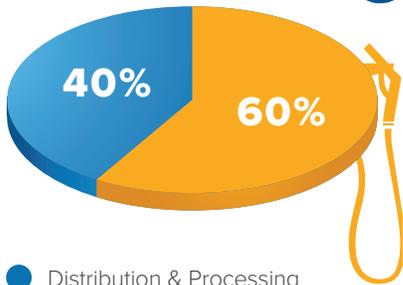


Source: NGV America Fleets Run Cleaner on Natural Gas White Paper 2016

Natural Gas



Diesel



- Distribution & Processing
- Natural Gas Commodity Cost
- Crude Oil Commodity Cost

Currently, natural gas prices can be \$0.75 to \$1 or more lower than diesel at the pump, with a firm price advantage expected to remain for decades as shown in the chart above.

Beyond the fuel-price differential, the pump price of natural gas remains relatively stable for two reasons. First, it is domestically sourced. Second, the commodity cost of natural gas only makes up 23% of the pump price so price fluctuations have minimal impact.

In contrast, approximately 60% of the price of diesel fuel is impacted by the market cost of crude oil, which is largely sourced from politically unstable, high-conflict regions. When crude oil prices increase, diesel prices follow suit which can lead to significant swings in a fleet's fuel costs.



Volkswagen EMT Funding Recommendations

- ✓ Fund alternative fuel vehicle projects that cost effectively maximize NOx reductions for both public and private fleets
- ✓ Provide higher funding levels for medium- and heavy-duty engines that deliver NOx reductions greater than current EPA standards
- ✓ Target funding for technologies that have demonstrated lower in-use emissions
- ✓ Prioritize funding for commercially available products and projects that are ready to begin
- ✓ Stay flexible in plans and leverage private investment to stretch dollars and get more alternative vehicles on the road

Natural gas vehicles can fulfill all of these recommendations today!