The Volkswagen Settlement: How Much Colorado Would Receive and the Smart Investments that Will Lead Toward a Zero Emission Future

October 18th, 2016

Authors
Will Toor, Southwest Energy Efficieny Project
Danny Katz, CoPIRG

Volkwagen's Emissions Cheating

In 2015, the Environmental Protection Agency (EPA) found Volkswagen installed "defeat devices" on some 567,000 "clean" diesel cars in the US market to avoid emission control laws. As many as 11 million cars worldwide are equipped with the "defeat device."

These devices are elaborate software that turn on emission controls when vehicle's emissions are tested to ensure they meet clean air standards and turn them off during regular driving. When emissions controls are off, the vehicles emit as much as 40 times the legal limit of NOx, a major smog-forming pollutant.

Volkswagen marketed these "clean" diesel cars to their customers as vehicles that could meet clean air standards while also maintaining high levels of fuel economy and performance. Unfortunately, the only way these vehicles could meet the marketed fuel economy and performance standards was by disabling the emissions controls and endangering our health and the environment.

In a round of tests of Volkswagen vehicles with the "defeat device" Consumer Reports concluded that indeed dodging emissions rules did result in better fuel economy and car performance.[1]

Health and Environmental Impacts

According to the EPA, high concentrations of NOx contributes to ground level ozone and fine particulate matter and can have a negative impact on our environment. For example, NOx contributes to acid rain, nutrient pollution in coastal waters and

[1] Jake Fisher, Consumer Reports Tests VW Diesel Fuel Economy, Performance in "Cheat" Mode, Consumer Reports, October 9, 2015.

contributes to hazy air.[2]

In addition, NOx poses a serious threat to human health. The EPA warns, "Breathing air with a high concentration of NO_x can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly, are generally at greater risk for the health effects of NO_2."[3]

Here in Colorado, the Colorado Department of Public Health and Environment (CDPHE) estimated in a December 2015 briefing to the Regional Air Quality Council, that Colorado had 9,668 noncompliant Volkswagen vehicles. The estimated excess emissions was 480-1400 lbs of NOx per day.[4]

Figure 1. Impacted Models – Source Consumer Reports[5]

Volkswagen Beetle, Beetle Convertible (2013-2015)	Volkswagen Touareg (2009-2016)	Porsche Cayenne (2014-2016)
Volkswagen Golf (2010-2015)	Audi A6 Quattro (2014-2016)	Audi A8/A8L (2014-2016)
Volkswagen Golf SportWagen (2015)	Audi A7 Quattro (2014-2016)	Audi Q5 (2014-2016)
Volkswagen Jetta, Jetta SportWagen (2009-2014)	Audi A3 (2010-2015)	Audi Q7 (2009-2016)
Volkswagen Passat (2012-2015)		

[2] Environmental Protection Agency, Basic Information about NO2,
[3] Ibid
[4] Colorado Department of Public Health and Environment, "Volkswagen Emissions Control System Tampering," presentation to Regional Air Quality Council, December 4, 2015.
[5] Jeff Bartlett and Michelle Naranjo, Guide the Volkswagen Emissions Recall, Consumer Reports, July 25th, 2016.

Partial Volkswagen Settlement – October 18th, 2016

When Volkwagen was caught systematically cheating on emissions tests, the US Department of Justice (DOJ) filed suit for violations of the Clean Air Act. The company and the DOJ have reached a partial settlement, which the federal judge on the case said he was "strongly inclined" to approve and would make a final decision by October 25th. The proposed settlement includes approximately $10 billion in compensation to owners of noncompliant VWs, but also includes $4.7 billion dollars that could help to accelerate the adoption of electric vehicles.[6]

According to the proposed settlement, the $4.7 billion would be distributed in two ways:

1. $2.7 billion to an **Environmental Remediation Fund**, designed to reduce emissions of nitrogen oxides (NOx). This is distributed to each state by a formula based on how many VW diesel cars were registered in that state.
2. $2 billion to a **Zero Emission Vehicle Fund** with investments proposed by VW and reviewed by the EPA. Of this $2 billion, $800 million is earmarked for California, leaving $1.2 billion for the rest of the country.

The Environmental Remediation Fund

The Environmental Remediation Fund is distributed to each state by a formula based on how many VW diesel cars were registered in that state. Each state may decide how they want to allocate the money within a set of allowable uses.

Up to 15% of the funds may be used to build out the electric vehicle charging network. The other allowable uses include replacing older diesel trucks and buses with vehicles with much lower NOx emissions as well as improving the emissions of boats, trains, forklifts and airport support equipment.

It will be up to the Governor in each state to designate a lead agency, which must then develop a plan describing how the state will spend the Environmental Remediation Funds. Funds will be available starting in mid-2017 and can be spent over no less than 3 years and no more than 10 years.

Here in Colorado, the designated agency is the Colorado Department of Public Health and Environment (CDPHE). CDPHE is expected to begin a public comment process in November seeking input on how the funds allocated to Colorado should be spent.

---

[6] Environmental Protection Agency, Volkswagen Clear Air Act Partial Settlement,

Figure 2. Environmental Remediation Funds: Colorado and Neighboring States

Arizona	$53.0 million
Colorado	$61.3 million
Nevada	$22.3 million
New Mexico	$16.9 million
Utah	$32.4 million
Wyoming	$7.5 million

Using Colorado's Environmental Remediation Funds to Accelerate the Electrification of Our Transportation System

Volkswagen's emissions cheating vehicles emitted pollutants by as much as 40 times the legal limit. Coloradans who thought they were driving cleaner cars were actually pouring huge amounts of pollution into our air every time they drove. It is critical that Colorado invest 100% of the Environmental Remediation Funds in the cleanest options available. In addition, Colorado has an opportunity to invest these dollars in a way that can accelerate the electrification of our transportation system.

Because Colorado's major utilities have been closing their most polluting older power plants and rapidly adding wind and solar, the state's electricity mix is getting cleaner and cleaner. By moving our vehicles over to electricity as a fuel, Colorado can drastically reduce emissions from our transportation sector, which makes electrification of our transportation system one of the best ways to reduce air pollution from vehicles.

Therefore, we are calling on CDPHE to invest the maximum allowed, or 15% of the funds, into electrifying the Colorado highway system with a network of electric vehicle charging stations and invest the rest of the funds into electrifying our bus system. This approach maximizes the long-term benefits to Colorado's air quality and creates a fundamental market transformation towards electrifying transportation.

As wind and solar technology continue to advance, investing in the electrification of our transportation system offers the best path for Colorado to achieve zero emissions from vehicles.

Investing in Electric Highways in Colorado

One of the biggest challenges to electric vehicle (EV) adoption in Colorado is the lack of charging infrastructure. Even though most daily trips are easily within the range

of an EV, many people want to be assured that they can take longer trips to the mountains or across the state.

There is strong evidence that increased investment in charging infrastructure leads to greater adoption of EVs. A study from Cornell University found that a 10% increase in charging leads to an 11% increase in EV sales[7]. Another analysis by the International Council for Clean Transportation also found strong correlations between public charging density and EV uptake[8]. Finally, a survey conducted in early 2016 by SWEEP of Coloradans who considered buying an electric vehicle but did not actually purchase one, found that the single biggest reason was concern about range and the lack of fast charging stations in the state.

A number of other states have tackled this challenge by investing in fast charging electric vehicle stations along their highways, giving travelers range confidence – and getting much higher uptake in EV ownership.

The VW settlement is a unique opportunity for Colorado to invest in a network that can make EVs practical for trips anywhere in the state by locating fast charging stations at a 30-50 mile spacing. Fast chargers can provide an 80% charge for an EV in 20-30 minutes.

Assuming Colorado invests the maximum Environmental Remediation Funds of 15% that the proposed settlement allows in EV charging stations, Colorado could invest $9.2 million into electrification of our highway system. This would be a major expansion of funding available in the state and would make major progress in building out the fast charge network across Colorado.

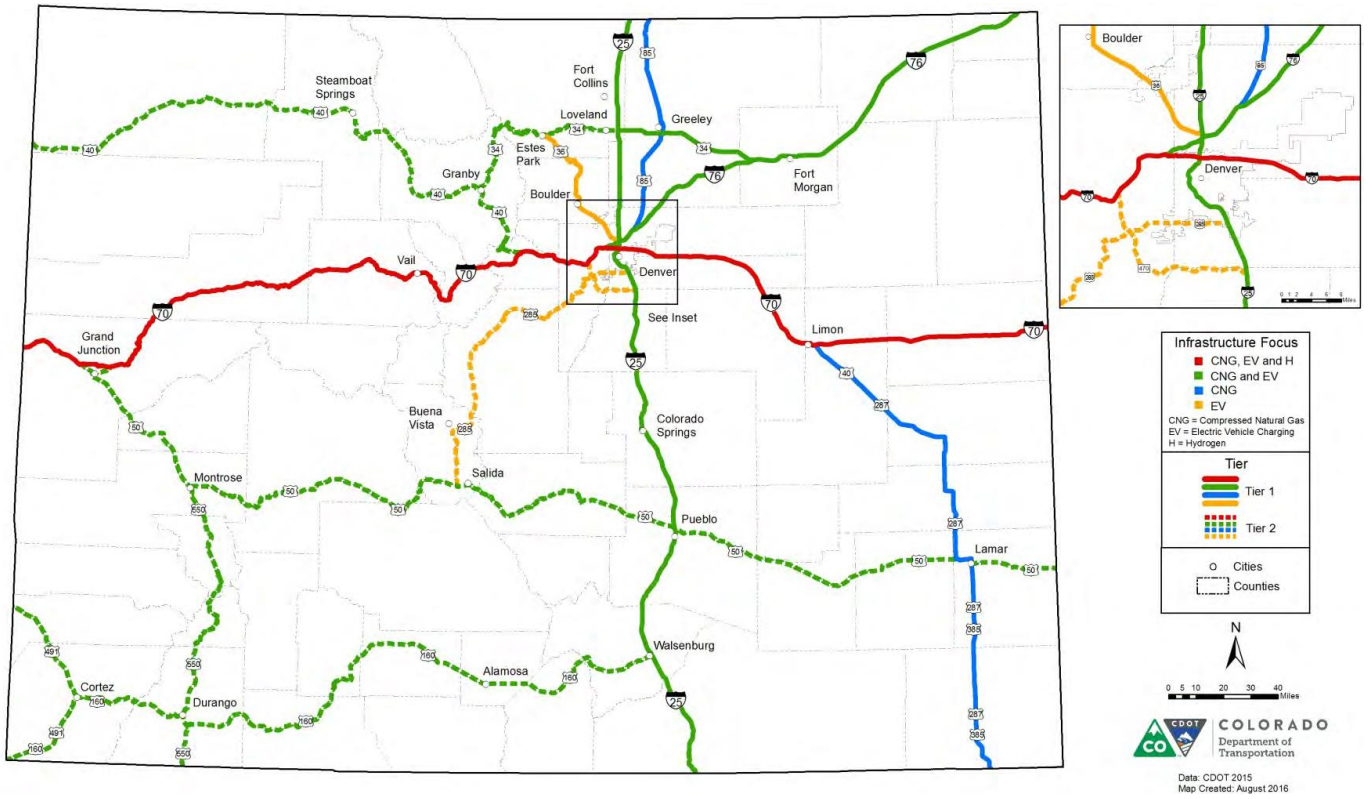
A typical station that combines fast charging with multiple level 2 (slower) chargers will cost approximately $150,000 to install. Thus, these funds could cover at least 60 locations (even more if other public or private funds are leveraged). If one of these stations was placed every 30 miles in Colorado, it would be enough to cover I-70, I-25, I-76, and most of U.S. 160, U.S. 550, U.S. 50, U.S. 285 and U.S. 40.

The map below shows the proposed EV corridors that the Colorado Department of Transportation submitted to the US Department of Transportation for designation as national Alternative Fuel Vehicle corridors.

---

[7] Shanjun Li, Lang Tong, Jianwei Xing, Yiyi Zhou, Cornell University, The Market for Electric Vehicles: Indirect Network Effects and Policy Design, May 2016.
[8] Sarah Chambliss, International Council on Clean Transportation, Electric vehicle incentives, chargers, and sales: What we see and what we don't (yet), March 25, 2015.

Figure 3. Colorado Department of Transportation's Proposed Alternative Fuel Vehicle Corridors – Source CDOT



Colorado could go even further by working with surrounding states to collectively build out fast charging infrastructure along the connecting corridors, and in national parks and key attractions, to enable residents of the southwest to have confidence in their ability to travel anywhere across the region in an EV and thus maximize the impact of these funds.

Electrifying Public Transit

The most significant way to meet the Environmental Remediation Fund's goal of reducing NOx emissions would be to invest the rest of the funds in Colorado in replacing existing older, diesel transit buses with new electric buses. This investment would also more effectively reduce VOCs and greenhouse gases.

While new diesel and compressed natural gas (CNG) transit buses offer some emissions reductions, the most significant emission reductions would come from going to electric transit buses. Electrifying public transit also helps to transform the market, allowing transit to move to near zero emissions over time; neither diesel nor CNG leads towards near zero emissions.

In addition, because bus routes often run through dense areas with high volumes of pedestrians, reducing the noise and emissions from diesel buses has a big benefit to those neighborhoods.

SWEEP has recently used data from the Xcel Energy integrated resource plan on electricity generation mix as an input to the Argonne National Laboratory GREET model to calculate the emissions from different transit buses in Colorado and found deep reductions in NOx, VOCs, and greenhouse gases for electric buses.

Figure 4. Comparison of Denver Metro Ozone Precursor Emissions from New Transit Buses by Technology, 2025 electricity mix – Source SWEEP

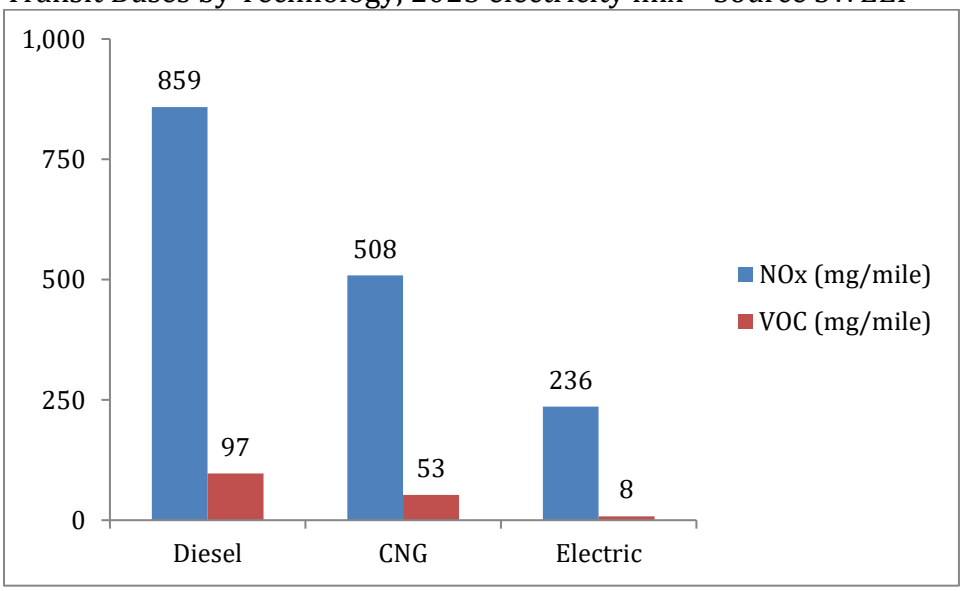
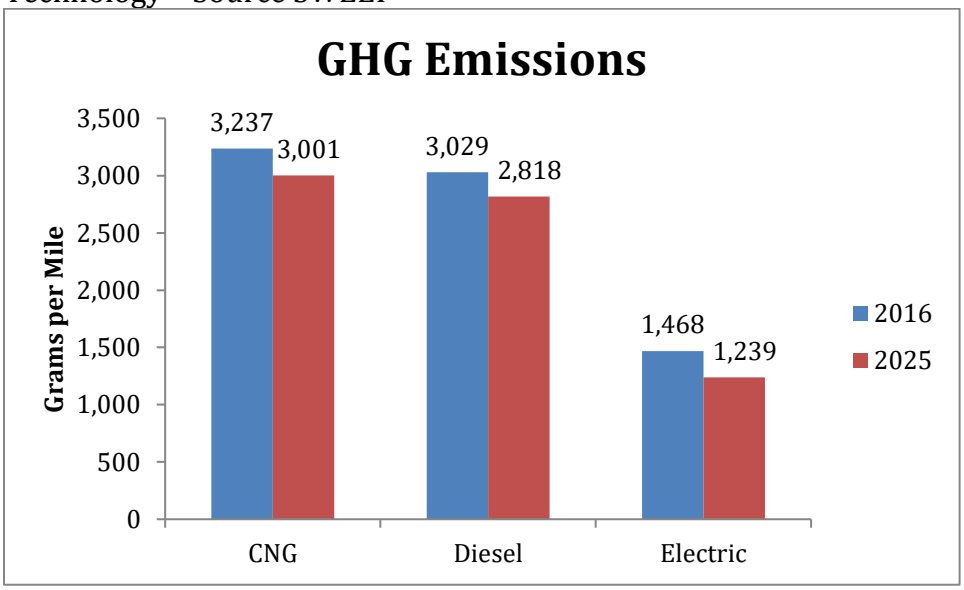


Figure 5. Comparison of Greenhouse Gas Emissions from New Transit Buses by Technology – Source SWEEP



Assuming a cost of $400,000 for an electric bus, Colorado's share of the Environmental Remediation Funds could purchase 100-125 electric buses depending on what additional money was needed to build the charging and maintenance infrastructure.

Zero Emission Vehicle Fund

In addition to the Environmental Remediation Funds, which CDPHE will begin seeking input on in the next month, VW will also have to commit $2 billion dollars to a Zero Emission Vehicle fund. Of this, $800 million will go to California and $1.2 billion to the rest of the country. This will go to building out charging infrastructure and to other activities that promote the sales and use of zero emission vehicles.

Volkswagen will propose the investments and the EPA will review their plans.

Colorado and the rest of the southwestern states should immediately identify ways to maximize the likelihood of significant, well-targeted investments in expanding zero emissions vehicles infrastructure and sales across the region and aggressively pursue these funds, working together with other neighboring states to leverage additional funds.

Conclusion

Volkswagen's systematic emissions cheating resulted in 567,000 Americans purchasing a "clean" diesel vehicle that emitted pollution up to 40 times the legal limit. Volkswagen was caught and the partial settlement announced on October 18, 2016 is one way they are being held accountable.

Coloradans have no way of clawing back the unnecessary and damaging pollution that spewed into Colorado's air because of Volkswagen's defeat devices. Therefore, we need to ensure that any money that Volkswagen pays in settlements is invested in the cleanest form of transportation. Focusing this investment in electrification not only significantly reduces pollution from vehicles now, it can lead a market transformation towards near a zero emission transportation system.

Colorado is expected to receive $61 million from an Environmental Remediation Fund, which CDPHE will invest over the next 3-10 years.

Colorado should invest 15% of that money in building out an electric vehicle charging station grid along our highways and the rest should replace older diesel buses with electric buses.

In addition, Colorado should actively compete for additional funds from the $1.2 billion available in the Zero Emission Vehicle Fund, working with neighboring states if that leverages additional dollars.

This approach will maximize the long-term benefits to Colorado's air quality and create a fundamental market transformation towards electrifying transportation and leading us to a zero emissions future.

About the Authors:

Will Toor – Transportation Program Director. The Southwest Energy Efficiency Project (SWEEP) is a public interest organization promoting greater energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. SWEEP focuses on utility energy efficiency policy and programs, combined heat and power system, buildings and transportation. ***For more information about SWEEP, please visit*** *www.swenergy.org*.

Danny Katz – Director. CoPIRG – the Colorado Public Interest Research Group is a non-profit, non-partisan, public interest advocacy group with thousands of dues paying members across the state. For more information – www.copirg.org