



*Via Electronic and First Class Mail*

October 1, 2015

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**RE: Petition for Rulemaking to Implement New Emissions Testing for Motor Vehicles and Increase Penalties for Violations of Fuel Standards**

Dear Administrator McCarthy and Administrator Rosekind,

The Center for Biological Diversity (the “Center”) requests that you take immediate action to protect public health and the environment from the toxic impacts of greenhouse gas and nitrogen oxides emissions from motor vehicles, and from corporate practices designed to evade regulations restricting the quantity of these dangerous emissions. Specifically, pursuant to the Administrative Procedure Act, 5 U.S.C. § 553(e), Title II of the Clean Air Act (“CAA”), 42 U.S.C. §§ 7521-7554, and Title VI of the Energy Policy and Conservation Act (“EPCA”), 49 U.S.C. §§ 32901-32919, the Center requests that the U.S. Environmental Protection Agency (“EPA”) and the National Highway Traffic Safety Administration (“NHTSA”):

- (1) immediately conduct in-use emissions testing of each make and model of diesel-powered motor vehicles sold in the United States since 2009 that have not previously undergone such tests;**
- (2) immediately conduct in-use emissions testing of each make and model of other fossil fuel-powered motor vehicles sold in the United States since 2009 that have not previously undergone such tests;**
- (3) promulgate regulations to require on-road emissions testing for all types of new diesel-powered motor vehicles;**

**(4) promulgate regulations to require on-road emissions testing for all other types of new fossil fuel-powered motor vehicles; and**

**(5) promulgate regulations to increase the penalties for violations of corporate average fuel economy standards.**

As you are well-aware, Volkswagen recently admitted that 11 million of its diesel cars sold worldwide since 2009, including nearly half a million sold in the United States, contain software specifically designed to cheat emissions tests. The software — known as “defeat devices” — can detect when a car is being tested in a laboratory setting and adjusts engine operations to emit less-polluting exhaust during the test than in real-world driving conditions. EPA has said that these devices allowed each car to spew up to *40 times* the legal limit of nitrogen oxides emissions in the United States. Accordingly, in addition to the specific actions requested above, **the Center also requests that EPA assess the maximum permissible penalties against VW for such egregious violations of law.**

This widespread fraud not only deceived consumers who purchased VW cars based on the belief the cars were “clean diesel,” but is a significant threat to public health and the environment. Emissions of nitrogen oxides contribute to climate change and ocean acidification — nitrogen oxides react with other substances to form the greenhouse gas ozone, and contain a highly potent and long-lived greenhouse gas. In addition, ground-level ozone can trigger or worsen asthma and other respiratory ailments, make the lungs more susceptible to infection, damage vegetation and reduce crop yields. Nitrogen oxides are also a precursor to particulate matter which causes breathing problems, lung tissue damage and premature death.

To make matters worse, the use of such devices, and thus unlawful emissions of such dangerous pollutants, may not be limited to VW. Indeed, defeat devices have existed almost since the inception of the CAA, and EPA has previously levied fines against car and truck manufacturers for the use of such devices. Recent reports indicate that tests of on-road emissions of cars made by other companies exceed that of laboratory testing, indicating that these manufactures might also be using defeat devices — or, at a minimum, are not performing as required. Despite the existence of technology that can measure emissions during normal operation and use, EPA does not require such tests for the vast majority of motor vehicles.

And the recent scandal highlights yet another industry-wide problem — that car manufacturers routinely pay fines, rather than comply with mandatory fuel economy standards that seek to improve fuel efficiency and reduce carbon dioxide emissions. As we have frequently pointed out, and as government reports indicate, the meager fines are too low to act as a deterrent, thereby failing to inspire the technological innovation contemplated by EPCA and the CAA. Yet NHTSA has not increased the penalty for violation of the standards in nearly two decades.

Comprehensive action is therefore needed to ensure long-term solutions to such pervasive problems. Taking the actions requested in this petition will improve the accuracy of emissions testing of motor vehicles and help ensure against future deception, and incentivize compliance with fuel economy standards intended to reduce greenhouse gas emissions and improve energy security. In other words, granting this petition will help better protect public health and the

environment from dangerous air pollutants from motor vehicles, while ensuring fuel economy continues to improve as intended by the CAA and EPCA.<sup>1</sup> The Center requests that EPA and NHTSA take the regulatory actions requested in this petition within 180 days.

## **I. Factual Background: Harmful Emissions from Motor Vehicles**

As the VW scandal demonstrates, motor vehicles emit harmful air pollutants. In fact, according to the Union of Concerned Scientists, transportation is the largest single source of air pollution in the United States.<sup>2</sup> Motor vehicles emit carbon dioxide, oxides of nitrogen, particulate matter, hydrocarbons, carbon monoxide, sulfur dioxide, as well as benzene and other hazardous air pollutants.<sup>3</sup> These emissions contribute to a myriad of public health problems, negative impacts to public welfare and the environment, and climate change.

### **A. Emissions from Motor Vehicles Are Harmful to Public Health**

Motor vehicles emit air pollutants that cause or contribute to health problems, including nitrogen oxides. For example, ground level ozone is created by chemical reaction between nitrogen oxides and volatile organic compounds. Ground-level ozone pollution is linked to many public health impacts, especially those related to respiratory function. Ozone can irritate the respiratory tract and throat, impair lung function, and cause coughing, chest pains and lung inflammation.<sup>4</sup> EPA has recognized the association between ozone exposure and hospital visits for respiratory problems — especially for children — noting that ozone pollution is responsible for as much as twenty percent of all summertime respiratory hospital visits.<sup>5</sup> Ozone is also linked to the development of respiratory diseases, such as asthma.<sup>6</sup> But the health effects of ozone are not limited to respiratory illnesses. Ozone pollution is linked to other serious health impacts, such as heart disease and certain types of strokes.<sup>7</sup> “[M]ost importantly,” according to the American Lung Association, ozone exposure and the associated health impacts can shorten lives

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<sup>1</sup> The provisions of this Petition are severable. If any request contained within this Petition is found to be invalid or unenforceable, the invalidity or lack of legal obligation shall not affect other provisions of the Petition.

<sup>2</sup> Union of Concerned Scientists, *Cars, Trucks and Air Pollution*, [http://www.ucsusa.org/clean\\_vehicles/why-clean-cars/air-pollution-and-health/cars-trucks-air-pollution.html#.Vgh8P\\_IViko](http://www.ucsusa.org/clean_vehicles/why-clean-cars/air-pollution-and-health/cars-trucks-air-pollution.html#.Vgh8P_IViko) (last updated Dec. 5, 2014).

<sup>3</sup> *Id.*

<sup>4</sup> Barbara Hackley et al., *Air Pollution: Impact on Maternal and Perinatal Health*, 52 J. MIDWIFERY & WOMEN'S HEALTH 435, 436 table 1 (2010), available at <http://www.sciencedirect.com/science/article/pii/S1526952307001079>.

<sup>5</sup> Ozone Action Days, Region 7 Air Program, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/region07/air/quality/action.htm> (last updated Aug. 28, 2015).

<sup>6</sup> *Id.*; Michelle L. Bell et al., *The Exposure-Response Curve for Ozone and Risk of Mortality and the Adequacy of Current Ozone Regulations*, 114 ENVTL. HEALTH PERSPECTIVES 532, 532 (2006), available at <http://www.ncbi.nlm.nih.gov/pubmed/16581541>.

<sup>7</sup> Jean-Bernard Ruidavets et al., *Ozone Air Pollution Is Associated with Acute Myocardial Infarction*, 111 CIRCULATION 563, 566 (2005), available at <http://circ.ahajournals.org/content/111/5/563.long>; J. B. Henrotin et al., *Short Term Effects of Ozone Air Pollution on Ischaemic Stroke Occurrence: A Case Crossover Analysis from a 10-Year Population-Based Study in Dijon, France*, 64 OCCUPATIONAL & ENVTL. MED. 439, 442 (2007), available at <http://oem.bmj.com/content/64/7/439.short>

by months and even years.<sup>8</sup> “Even at very low levels including days that meet current regulatory requirements,” ozone is associated with premature mortality.<sup>9</sup>

Ozone also has detrimental ecological effects. According to EPA, ozone “affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas,” especially during growing seasons.<sup>10</sup> Ozone can interfere with a plant’s ability to produce and store food, visibly damage leaves, and make plants susceptible to damage from disease, insects, competition and severe weather.<sup>11</sup>

Nitrogen oxides also mix with other air pollutants to create particulate matter (“PM”). The effects associated with PM exposure are “premature mortality, increased hospital admissions and emergency department visits, and development of chronic respiratory disease.”<sup>12</sup> California has identified diesel PM as a toxic air contaminant and has estimated that 70 percent of the cancer risk from the air Californians breathe is attributable to diesel PM; EPA says that diesel PM is “likely to be a carcinogen.”<sup>13</sup> Diesel exhaust is a major contributor to PM pollution. In fact, it is estimated that diesel-powered vehicles and equipment account for nearly half of all nitrogen oxides and more than two-thirds of all PM emissions from U.S. transportation sources.<sup>14</sup>

## B. Emissions from Motor Vehicles Contribute to Climate Change

The burning of fossil fuels is the largest source of domestic greenhouse gas emissions, accounting for 77 percent of total warming emissions in 2013.<sup>15</sup> One of the primary sources of such emissions is from the transportation sector, which in 2013 accounted for 27 percent of all greenhouse gas emissions in the United States.<sup>16</sup> The largest source of such emissions from the transportation sector is passenger cars, representing nearly 43 percent of emissions in 2013.<sup>17</sup>

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<sup>8</sup> Stephanie Carroll Carson, Ozone, Warming Temperatures, Coal-Fired Power Plants Impact NC Air, PUB. NEWS SERV. (May 2, 2014), <http://www.publicnewsservice.org/2014-05-02/climate-change-air-quality/ozone-warmingtemperatures-coal-fired-power-plants-impact-nc-air/a39132-1>.

<sup>9</sup> Bell, *supra* note 6 at 535.

<sup>10</sup> Ecosystem Effects, Ground-Level Ozone, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/airquality/ozonepollution/ecosystem.html> (last updated Sept. 25, 2015).

<sup>11</sup> *Id.*

<sup>12</sup> EPA, Fine Particulate Matter National Ambient Air Quality Standards, 80 Fed. Reg. 15340, 15347 (Mar. 23, 2015).

<sup>13</sup> Union of Concerned Scientists, *California: Diesel Trucks, Air Pollution and Public Health*, [http://www.ucsusa.org/clean\\_vehicles/why-clean-cars/air-pollution-and-health/trucks-buses-and-other-commercial-vehicles/diesel-trucks-air-pollution.html#.VXRuhc9Viko](http://www.ucsusa.org/clean_vehicles/why-clean-cars/air-pollution-and-health/trucks-buses-and-other-commercial-vehicles/diesel-trucks-air-pollution.html#.VXRuhc9Viko); Trade, Health and Environmental Impact Project, *Driving Harm: Health and Community Impacts of Living Near Truck Corridors* (Jan. 2012), <http://hydra.usc.edu/scehsc/pdfs/Trucks%20issue%20brief.%20January%202012.pdf>.

<sup>14</sup> Union of Concerned Scientists, *Diesel Engines and Public Health*, [http://www.ucsusa.org/clean\\_vehicles/why-clean-cars/air-pollution-and-health/trucks-buses-and-other-commercial-vehicles/diesel-engines-and-public.html#.Vgh-7vlViko](http://www.ucsusa.org/clean_vehicles/why-clean-cars/air-pollution-and-health/trucks-buses-and-other-commercial-vehicles/diesel-engines-and-public.html#.Vgh-7vlViko) (last accessed Sept. 28, 2015).

<sup>15</sup> EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2013* (Apr. 15, 2015), EPA 430-R-15-004, available at <http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>.

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

The transportation sector has been the fastest-growing source of greenhouse gas emissions since 1990.<sup>18</sup>

Carbon dioxide is the dominant greenhouse gas driving observed changes in the Earth's climate.<sup>19</sup> Emissions of nitrogen oxides also contribute to climate change through two primary means: (1) nitrogen oxides react with other substances to form the greenhouse gas ozone; and (2) nitrous oxide is itself a highly potent and long-lived greenhouse gas. Nitrous oxide behaves very similarly to carbon dioxide in that it both directly traps heat in the atmosphere and remains in existence for many decades once emitted.<sup>20</sup>

There is a strong, international scientific consensus that anthropogenic climate threatens human society and natural systems. The U.S. Global Change Research Program in its 2009 report *Climate Change Impacts in the United States* similarly stated that “global warming is unequivocal and primarily human-induced” and “widespread climate-related impacts are occurring now and are expected to increase.”<sup>21</sup> The U.S. National Research Council similarly concluded that “[c]limate change is occurring, is caused largely by human activities, and poses significant risks for — and in many cases is already affecting — a broad range of human and natural systems.”<sup>22</sup> Based on observed and expected harms from climate change, in 2009 EPA concluded that greenhouse gas pollution endangers the health and welfare of current and future generations.<sup>23</sup> Current atmospheric concentrations of greenhouse gases are already resulting in significant climate change impacts that are projected to worsen as emissions rise.<sup>24</sup>

Key changes include warming temperatures, the increasing frequency of extreme weather events, rapidly melting glaciers, ice sheets, and sea ice and rising sea levels.<sup>25</sup> There will be significant costs associated with these changes. For example, in the United States in 2011 alone, a record 14 weather and climate disasters occurred, including droughts, heat waves, and floods, that cost at least \$1 billion each in damages and loss of human lives.<sup>26</sup> In addition, air pollution components that trigger asthma attacks, specifically air particulates and ozone, are expected to increase with climate change;<sup>27</sup> in 2020, the continental United States could pay an average of

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<sup>18</sup> *Id.*

<sup>19</sup> NRC. 2011. *Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia*. Washington, DC: National Academies Press, available at <http://www.nap.edu/catalog/12877.html>.

<sup>20</sup> Solomon, S., et al., Technical Summary, Working Group I, (2007), at 27, available at [http://ipccwgl.ucar.edu/wgl/Report/AR4WG1\\_Print\\_TS.pdf](http://ipccwgl.ucar.edu/wgl/Report/AR4WG1_Print_TS.pdf).

<sup>21</sup> Karl, T. R. et al. 2009. *Global Climate Change Impacts in the United States*. U.S. Global Change Research Program. Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009.

<sup>22</sup> NRC. 2010. *Advancing the Science of Climate Change*, National Research Council, available at [www.nap.edu](http://www.nap.edu).

<sup>23</sup> U.S. Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule*, 74 Federal Register 66496 (2009).

<sup>24</sup> Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program, 841 pp.

doi:10.7930/J0Z31WJ2; IPCC. 2013. *Summary for Policymakers*. Working Group I Contribution to the IPCC Fifth Assessment Report *Climate Change 2013: The Physical Science Basis*.

<sup>25</sup> Melillo, supra n. 24; IPCC, supra n. 24.

<sup>26</sup> NOAA. 2012. *NOAA : Extreme Weather 2011*, available at <http://www.noaa.gov/extreme2011/>; WMO. 2012. *World's 10th warmest year, warmest year with La Niña on record, second-lowest Arctic sea ice extent*.

<sup>27</sup> Bernstein, A. S., and S. S. Myers. 2011. *Climate change and children's health*. *Current Opinion in Pediatrics* 23:221–6.

\$5.4 billion (2008\$) in health impact costs associated with the climate penalty on ozone, with California experiencing the greatest estimated impacts averaged at \$729 million.<sup>28</sup>

Anthropogenic climate change also poses a significant threat to biodiversity. Climate change is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extirpations.<sup>29</sup> Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to result in catastrophic species losses during this century.

The Intergovernmental Panel on Climate Change (“IPCC”) concluded that 20 to 30 percent of plant and animal species will face an increased risk of extinction if global average temperature rise exceeds 1.5°C to 2.5°C relative to 1980-1999, with an increased risk of extinction for up to 70 percent of species worldwide if global average temperature exceeds 3.5°C relative to 1980-1999.<sup>30</sup> Other studies have predicted similarly severe losses: 15 to 37 percent of the world’s plants and animals committed to extinction by 2050 under a mid-level emissions scenario;<sup>31</sup> the potential extinction of 10 to 14 percent of species by 2100 if climate change continues unabated;<sup>32</sup> and the loss of more than half of the present climatic range for 58 percent of plants and 35 percent of animals by the 2080s under the current emissions pathway, in a sample of 48,786 species.<sup>33</sup> Scientists have warned that the Earth is fast approaching a global “state-shift” that could result in unanticipated and rapid changes to Earth’s biological systems.<sup>34</sup> As summarized by the 2014 National Climate Assessment, “landscapes and seascapes are changing rapidly, and species, including many iconic species, may disappear from regions where they have been prevalent or become extinct, altering some regions so much that their mix of plant and animal life will become almost unrecognizable.”<sup>35</sup>

In addition, the ocean’s absorption of anthropogenic greenhouse gas emissions, including both carbon dioxide and nitrogen oxides, has already resulted in more than a 30 percent increase

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<sup>28</sup> Union of Concerned Scientists, *Rising Temperatures and Your Health: After the Storm - The Hidden Health Risks of Flooding in a Warming World* (2012), available at [http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global\\_warming/climate-change-and-flooding.pdf](http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/climate-change-and-flooding.pdf).

<sup>29</sup> Maclean, I. M. D., and R. J. Wilson. 2011. Recent ecological responses to climate change support predictions of high extinction risk. *Proceedings of the National Academy of Sciences of the United States of America* 108: 12337-1234; Warren, R., J. Price, A. Fischlin, S. de la Nava Santos, and G. Midgley, Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise, 106 *CLIMATE CHANGE* 141–177 (2011); Cahill, A.E. et al. 2012. How does climate change cause extinction? *Proceedings of the Royal Society B*, doi:10.1098/rspb.2012.1890.

<sup>30</sup> IPCC. 2007. *Climate Change 2007 : Synthesis Report: An Assessment of the Intergovernmental Panel on Climate Change*. www.ipcc.ch.

<sup>31</sup> Thomas, C. D., et al., Extinction risk from climate change, 427 *NATURE* 145-48 (2004).

<sup>32</sup> Maclean and Wilson, supra n. 29.

<sup>33</sup> Warren, R. et al. 2013. Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss. *Nature Climate Change* 3:678-682.

<sup>34</sup> Barnosky, A.D. et al., Approaching a state shift in Earth’s biosphere, 486 *NATURE* 52 (2012).

<sup>35</sup> Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.

in the acidity of ocean surface waters, at a rate faster than anything believed to have occurred in the past 300 million years.<sup>36</sup> Ocean acidity is projected to increase by 150 to 200 percent by the end of the century if carbon dioxide emissions continue unabated.<sup>37</sup> Ocean acidification negatively affects a wide range of marine species by hindering the ability of calcifying marine creatures to build protective shells and skeletons and by disrupting metabolism and critical biological functions.<sup>38</sup> The adverse effects of ocean acidification are already being observed in wild populations, including reduced coral calcification rates,<sup>39</sup> dissolution of pteropod shells in the California Current,<sup>40</sup> reduced shell weights of foraminifera in the Southern Ocean,<sup>41</sup> and mass die-offs of larval Pacific oysters in the Pacific Northwest.<sup>42</sup>

## II. Legal Background: The Regulation of Emissions from Motor Vehicles

Given the negative impacts on public health and the environment caused by the emission of air pollutants from various sources, including the transportation sector, Congress has enacted several laws to regulate and limit the amount of air pollutants from motor vehicles.

### A. The Clean Air Act

In enacting the CAA, Congress found that “that the growth in the amount and complexity of air pollution brought about by urbanization, industrial development, *and the increasing use of*

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<sup>36</sup> Doney, S.C., Mahowald N. Lima, et al., “Impact of Anthropogenic Atmospheric Nitrogen and Sulfur Deposition on Ocean Acidification and the Inorganic Carbon System”, Proc. Nat. Acad. Sci. 2007; 104(37): 14580. doi: 10.1073/pnas.0702218104; James C Orr, et al., Anthropogenic Ocean Acidification over the Twenty-First Century and its Impacts on Calcifying Organisms, 437 NATURE 681-86 (2005).

<sup>37</sup> Feely, Richard A., S. Doney and S. Cooley, 2009, “Ocean Acidification: Present Conditions and Future Changes in a High CO<sub>2</sub> World”, Oceanography 22 (4) (June): 36-47; Hönisch, Bärbel, Andy Ridgwell, Daniela N. Schmidt, Ellen Thomas, Samantha J. Gibbs, Apply Slujs, Re Zeebe et al. 2012; “The Geological Record of Ocean Acidification”, Science 335 (6072) March: 1058-63. doi. 10.1126/science.1208277; Orr, James C. Victoria, J. Fabry, Oliver Aumont, Laurent Bopp, Scott C. Doney, Richard A. Feely, Anand Gnandaesikan, et al., Anthropogenic Ocean Acidification over the Twenty-First Century and Its Impact on Calcifying Organisms, 437 NATURE 681-86 (2005), doi: 10.1038/nature 04095.

<sup>38</sup> Feely, supra n. 37; Fabry V.J., Seibel BA, Feely, RA, Orr J., “Impacts of Ocean Acidification on Marine Fauna and Ecosystem Processes” 65 ICES J. MAR SCI. 414 (2008); Kroeker K.J., Kordas, R.L., Crim R.N., Singh G.G., Meta-analysis Reveals Negative Yet Variable Effects of Ocean Acidification on Marine Organisms, ECOL. LETT., 2010:no-no. doi:10.1111/j.1461-0248.2010.01518.x.

<sup>39</sup> De’ath G. Lough JM, Fabricius KE, “Declining Coral Calcification on the Great Barrier Reef”, 323 SCIENCE 116, doi:10.1126/science.1165283; Cooper T.F., De’Ath G., Fabricius KE, Lough, JM, Declining Coral Calcification in Massive Porties in Two Nearshore Regions of the Northern Great Barrier Reef, 14 GLOB CHANGE BIO. 529-538 (2008), doi:10.1111/j. 1365-2486.2007.01520 x; Bates N. Amat A., Andersson A., Feedbacks and Responses of Coral Calcification on the Bermuda Reef System to Seasonal Changes in Biological Processes and Ocean Acidification on the Bermuda Reef System, 7 BIOGEOSCIENCES 2509-2530 (2010), doi:105194/bg-7-2509-2010.

<sup>40</sup> Bednaršek N. Feely, RA, Reum JCP, Peterson B., Menkel J., Limacina Helicina Shell Dissolution as an Indicator of Declining Habitat Suitability Owing to Ocean Acidification in the California Current Ecosystem, Proc. R. Soc. B. 2014:281:20140123; Gledhill, D.K., Wannikhof R. Millero FJ, Eakin M. Ocean Acidification of the Greater Caribbean Region 1996- 2006, J. Geophys Res. 2008; 113(C10): C10031. doi:10.1029/2007JC004629.

<sup>41</sup> Moy, A.D., Howard W.R., Bray S.G., Trull, T.W., Reduced Calcification in Modern Southern Ocean Planktonic Foraminifera, 2 NAT. GEOSCI. 276-280 (2009), doi:10.1038/ngeo460.

<sup>42</sup> Barton A., Hales B., Waldbusser G.G., Langdo C., Feely R., The Pacific Oyster, *Crassostrea Gigas*, Shows A Negative Correlation to Naturally Elevated Carbon Dioxide levels: Implications for Near Term Ocean Acidification Effects, 57 LIMMOL OCEANOGR. 698-710 (2012), doi:10.4319/lo. 2012.573.0698.

*motor vehicles*, has resulted in mounting dangers to the public health and welfare, including injury to agricultural crops and livestock...<sup>43</sup> Accordingly, the CAA establishes a comprehensive scheme “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population.”<sup>44</sup>

To reach these goals, Title II of the CAA prescribes a regulatory scheme to control emissions from mobile sources.<sup>45</sup> Specifically, the CAA requires EPA to promulgate regulations that establish standards for the emissions of air pollutants from new motor vehicles that “cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare” and prohibits exceedances of those standards.<sup>46</sup> The CAA mandates that EPA set emission standards for particular pollutants from light and heavy duty vehicles, including carbon monoxide, hydrocarbons and oxides of nitrogen and amend the standards as necessary to protect public health and welfare.<sup>47</sup>

Pursuant to these statutory requirements, EPA has established emissions standards and testing procedures for light duty vehicles and heavy trucks.<sup>48</sup> To ensure compliance with these standards, EPA requires manufacturers to receive a certificate of conformity from EPA before a manufacturer can introduce vehicles into U.S. commerce.<sup>49</sup> To receive such a certificate, manufacturers must submit a detailed application to EPA for each test group of vehicles it intends to sell in the United States; the application must include a certification that the vehicles comply with emission standards as determined by specific testing procedures required by EPA, and a description of any air emission control devices contained within the vehicles.<sup>50</sup> The CAA provides for a fine of up to \$37,500 for each car that does not conform to details within the certificate of compliance.<sup>51</sup>

In recognition of the fact that manufacturers may attempt to circumvent emission standards, the CAA prohibits any person from manufacturing, selling, offering to sell or installing any part in a motor vehicle that bypasses, defeats or renders inoperative any device or element of a vehicle’s emission control technology.<sup>52</sup> EPA’s implementing regulations specifically prohibit the use of “defeat devices,” defined generally as an air emission control device “that reduces the effectiveness of the emission control system under conditions which may reasonably be expected to be encountered in normal vehicle operation and use...”<sup>53</sup> Under the CAA and EPA’s regulations, manufacturers may be liable for up to \$3,750 for each use of a defeat device.<sup>54</sup>

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<sup>43</sup> 42 U.S.C. § 7401(a)(2).

<sup>44</sup> *Id.* § 7401(b)(1).

<sup>45</sup> *Id.* §§ 7521-7590.

<sup>46</sup> *Id.* §§ 7521; 7522.

<sup>47</sup> *Id.* § 7521.

<sup>48</sup> 40 C.F.R. Part 86 (emission standards and testing procedures for light-duty vehicles and light trucks); 40 C.F.R. § 86.1811-04 (emission standards for light-duty vehicles including NOx); *id.* § 86.1816-05, -18 (emission standards for heavy-duty vehicles).

<sup>49</sup> 40 C.F.R. § 86.1848-01.

<sup>50</sup> *Id.* §§ 86.1843-01; 86.1844-01.

<sup>51</sup> 42 U.S.C. § 7524(a); 40 C.F.R. § 19.4.

<sup>52</sup> 42 U.S.C. § 7522(a)(3)(B).

<sup>53</sup> 40 C.F.R. § 86.1809-01; *id.* § 86.1803-01.

<sup>54</sup> 42 U.S.C. § 7524(a); 40 C.F.R. § 19.4.

## B. The Energy Policy and Conservation Act

Congress enacted the EPCA in 1975 following the energy crisis caused by the 1973 Mideast oil embargo.<sup>55</sup> In enacting EPCA, Congress observed that “[t]he fundamental reality is that this nation has entered a new era in which energy resources previously abundant, will remain in short supply retarding our economic growth and necessitating an alteration in our life’s habitats and expectations.”<sup>56</sup> Among the goals of EPCA are to “decrease dependence on foreign imports, enhance national security [and to] achieve the efficient utilization of scarce resources...”<sup>57</sup> The fundamental purpose of EPCA, however, is energy conservation.<sup>58</sup>

To comply with these goals, EPCA vests NHTSA with broad regulatory authority,<sup>59</sup> and requires NHTSA to set fuel economy standards at “the maximum feasible average fuel economy level that the Secretary decides the manufacturers can achieve in that model year.”<sup>60</sup> In this way, EPCA is meant to encourage technological innovation — meaning new technologies, not simply better versions of what exists today. As the court in *Center for Auto Safety v. Thomas* noted, “[t]he experience of a decade leaves little doubt that the congressional scheme in fact induced manufacturers to achieve major technological breakthroughs as they advanced towards the mandated goal.”<sup>61</sup> And as explained by the D.C. Circuit “when a statute is technology forcing, the agency can impose a standard which only the most technologically advanced plants in an industry have been able to achieve — even if only in some of their operations some of the time.”<sup>62</sup>

In 2007, Congress passed the Energy Independence and Security Act of 2007 (“EISA”), which amended EPCA.<sup>63</sup> The EISA eliminated the previous 27.5 mpg standard for passenger cars with a mandate that NHTSA set separate passenger car and light truck standards for each model year beginning in 2011 “to achieve a combined fuel economy average for model year 2020 of at least 35 miles per gallon for the total fleet of passenger and non-passenger automobiles manufactured for sale in the United States for that model year.”<sup>64</sup> Fuel economy standards for model years 2021 through 2030 must be the maximum feasible average fuel economy standard for each fleet of passenger and non-passenger cars for that model year.<sup>65</sup> These standards are known as the corporate average fuel economy (“CAFE”) standards.

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<sup>55</sup> *Center for Biological Diversity v. Nat’l Highway Safety Transportation Administration*, 538 F.3d 1172, 1182 (9th Cir. 2008).

<sup>56</sup> H.R. Rep. No. 94-340 at 1-3 (1975), as reprinted in 1975 U.S.C.C.A.N. 1762, 1763.

<sup>57</sup> *Center for Biological Diversity*, 538 F.3d at 1182 (quoting S.Rep. No. 94-516 (1975) (Conf. Rep.), as reprinted in 1975 U.S.C.C.A.N. 1956, 1957).

<sup>58</sup> *Id.* at 1195.

<sup>59</sup> 49 U.S.C. § 32910.

<sup>60</sup> *Id.* § 32902(a). In determining what constitutes the “maximum feasible” level, NHTSA must take into account four factors: technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy. *Id.* § 32902(f).

<sup>61</sup> 847 F.2d 843, 870 (D.C. Cir. 1988) (overruled on other grounds); see also *Green Mt. Chrysler Plymouth Dodge Jeep v. Crombie*, 508 F. Supp. 2d 295, 358-59 (D. Vt. 2008) (discussing technology-forcing character of EPCA and the use of increased fuel efficiency to augment performance rather than mileage).

<sup>62</sup> *Kennecott Greens Creek Min. Co. v. Mine Safety and Health Admin.*, 476 F.3d 946, 957 (D.C. Cir. 2008).

<sup>63</sup> Pub. L. 11-140, 121 Stat. 1492 (Dec. 18, 2007).

<sup>64</sup> 49 U.S.C. § 32902(b)(2)(A).

<sup>65</sup> *Id.* § 32902(b)(2)(B).

To help manufacturers comply with the CAFE standards, EPCA prescribes civil penalties that NHTSA can impose if their cars do not meet regulatory requirements. Specifically, a manufacturer is liable for a civil penalty of five dollars per automobile for each 0.1 mile per gallon shortfall.<sup>66</sup> The Act vests NHTSA with the authority to raise the total penalty up to ten dollars for each 0.1 mile per gallon shortfall, provided it first makes certain findings. NHTSA raised the penalty to \$5.50 for each 0.1 mile per gallon shortfall in 1997, but has not raised it since, nor has the penalty been adjusted for inflation.<sup>67</sup>

### **III. The VW Scandal Reveals the Need to Issue Regulations to Amend Testing Procedures and Increase Penalties for Violations of Fuel Economy Standards**

Volkswagen recently admitted that 11 million of its diesel cars sold worldwide since 2009, including nearly half a million sold in the United States, contain software specifically designed to cheat emissions tests. EPA has said that these devices allowed each car to spew up to *40 times* the legal limit of nitrogen oxides in the United States. Better testing procedures that more accurately reflect a vehicle's on-road emissions could prevent such egregious actions from occurring in the future.

This scandal raises yet another problem in the government's regulation of emissions from motor vehicles — that manufacturers regularly pay civil penalties rather than comply with NHTSA's CAFE standards. The penalties are therefore clearly inadequate to deter violations and inspire the technological innovation contemplated by EPCA, and reduce carbon dioxide emissions, and must be increased as a result.

#### **A. EPA Must Promulgate Regulations to Require On-Road Emissions Testing, and Must Test Cars Sold in the United States Since 2009**

The VW scandal demonstrates that EPA's current testing procedures for passenger cars and light trucks do not accurately reflect the actual emissions of these vehicles. EPA must promulgate regulations that require accurate, on-road testing sufficiently rigorous to detect defeat devices and thereby protect public health and welfare from the deleterious impacts of motor vehicle emissions.

As explained by EPA in its Notice of Violation to VW, "defeat devices" can detect when a car is being tested in a laboratory setting and adjusts engine operations to emit less-polluting exhaust during the test than in real-world driving conditions. Specifically, VW manufactured and installed software in the electronic control modules ("ECM") of vehicles equipped with 2.0 liter diesel engines.<sup>68</sup> The software could sense when the vehicle was being tested pursuant to EPA's dynamometer testing equipment.<sup>69</sup> When the software sensed testing, it produced compliant emission results under an ECM calibration, but at all other times the ECM ran a separate calibration that reduced the effectiveness of the emission control system, and the selective

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<sup>66</sup> *Id.* § 32912(b).

<sup>67</sup> See 62 Fed. Reg. 5,167, 5,168 (Feb. 4, 1997) (raising the penalty to \$5.50 for every 0.1 mpg); *codified at* 49 C.F.R. § 578.6(h)(2).

<sup>68</sup> EPA, Notice of Violation to Volkswagen AG, Sept. 18, 2015.

<sup>69</sup> *Id.*

catalytic reduction, or the lean NOx trap, in particular.<sup>70</sup> EPA has determined that the software is an air emission control device that was not described in VW's certification applications and is an illegal defeat device, and that "VW violated section 203(a)(1) the CAA, 42 U.S.C. § 7522(a)(1), each time it sold, offered for sale, introduced into commerce, delivered for introduction into commerce, or imported..." one of the offending vehicles as a result.<sup>71</sup>

But this is not the first time a manufacturer has used these illegal, deceitful devices. Despite the express prohibitions on the use of defeat devices in the CAA and EPA's regulations, the use of such devices by a variety of manufacturers has been discovered on several occasions.<sup>72</sup> Indeed, such devices have been used beginning shortly after the enactment of the CAA, with early regulatory actions specifically intended to prevent their use.<sup>73</sup> And car and truck manufacturers have repeatedly been caught using such devices for almost as long as their use has been prohibited. For example, in 1973, EPA found that VW had installed temperature-sensitive devices that turned off emissions controls on tens of thousands of its vehicles.<sup>74</sup> And in 1998, the U.S. Department of Justice and EPA settled an enforcement case against the diesel engine industry for the widespread use of defeat devices in everything from tractor trailers to pick-up trucks. The settlement required seven companies, which comprised 95 percent of the U.S. heavy duty diesel engine market, to pay over one billion dollars, including \$83.4 million in civil penalties, the largest ever imposed in environmental enforcement at that time.<sup>75</sup>

As suggested by EPA's letter to VW, a key reason vehicle manufacturers are able to use such devices to beat emissions tests are the inadequate testing procedures currently required by EPA. In particular, EPA's requirements for testing light-duty vehicles and trucks, known as the Federal Test Procedure ("FTP"), use a chassis dynamometer to test for various emissions, including nitrogen oxides, in a laboratory setting by simulating driving conditions. But given the artificial, predictable conditions in which the tests are run, software can sense when treadmill-like dynamometer equipment is being used based on the position of the steering wheel, vehicle speed and how long the engine operates, among other inputs.<sup>76</sup>

But alternative, on-road testing technologies exist. For example, on-road vehicle remote sensing is a type of technology that can scan the emissions of thousands of vehicles within a single day, and has previously been used to monitor real driving conditions by using optical sensors or a laboratory vehicle that follows cars and samples exhaust plumes.<sup>77</sup> And EPA already

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<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> See e.g., U.S. Dep't of Justice, *Clean Air Act Mobile Sources Cases*, <http://www.justice.gov/enrd/mobile-sources> (updated May 14, 2015) (describing past enforcement actions for the use of defeat devices).

<sup>73</sup> See e.g., 37 Fed. Reg. 28,775 (Dec. 29, 1972) (order requiring defeat devices to be eliminated by March 1973).

<sup>74</sup> See e.g., Michael Biesecker and Eric Tucker, *German automaker facing 'tsunami' of possible enforcement actions after emissions scandal*, Associated Press, Sept. 28, 2015, <http://www.usnews.com/news/business/articles/2015/09/28/volkswagen-faces-major-legal-trouble-in-emissions-scandal>.

<sup>75</sup> U.S. Dep't of Justice, Press Release: DOJ, EPA Announce One Billion Dollar Settlement With Diesel Engine Industry For Clean Air Act Violations, Oct. 22, 1998, *available at* [http://www.justice.gov/archive/opa/pr/1998/October/499\\_enr.htm](http://www.justice.gov/archive/opa/pr/1998/October/499_enr.htm).

<sup>76</sup> Notice of Violation to Volkswagen.

<sup>77</sup> International Council on Clean Transportation, Guidance note about on-road vehicle emissions remote sensing, June 2013, *available at* [http://www.theicct.org/sites/default/files/publications/RSD\\_Guidance\\_BorKlee.pdf](http://www.theicct.org/sites/default/files/publications/RSD_Guidance_BorKlee.pdf).

requires on-road testing for heavy-duty diesel trucks.<sup>78</sup> Specifically, EPA has established a mandatory manufacturer-run, in-use emissions testing for heavy-duty diesel trucks using a portable emission measurement system (“PEMS”).<sup>79</sup> PEMS typically involves equipping a test vehicle with a portable gas analyzer, and measuring emission rates during the driving. In announcing the regulatory change, EPA specifically noted that using such systems is “a significant step forward. . . in helping ensure that heavy-duty diesel engines comply with applicable emission standards” and that “these systems offer[] advantages over conventional approaches to assess in-use exhaust emissions from engines for design improvement, research, modeling, and compliance purposes.”<sup>80</sup> Nevertheless, EPA has not implemented a similar requirement for passenger cars and light trucks.

The urgent need for such testing is now beyond dispute, and its benefits would not be limited to detecting the use of unlawful defeat devices alone. Even when cars do not contain defeat devices, the laboratory tests often fail to accurately reflect emissions as laboratory settings do not adequately incorporate road and weather conditions, use of accessories and aggressive driving. On-road tests reflect normal operation and use, and therefore a more accurate picture of emissions. And the benefits would not be limited to emissions of nitrogen oxides — the use of on-road emissions testing would also enable tests to more accurately reflect a vehicle’s fuel efficiency and thus, its carbon dioxide emissions.

While current regulations vest EPA with the authority to conduct or require testing on any vehicle using driving cycles and conditions that may reasonably be expected to be encountered in normal operation and use (i.e., on-road conditions) for purposes of investigating the use of defeat devices,<sup>81</sup> the regulations do not go far enough as they do not mandate such inspections prior to putting new cars and light trucks on the road.<sup>82</sup> Mandating on-road inspections prior to the introduction of new light-duty motor vehicles is thus necessary to ensure cars comply with emission standards.

Accordingly, the Center hereby requests that EPA promulgate regulations to require on-road testing for all types of new diesel-powered motor vehicles not already subject to such testing requirements. The Center also requests that EPA promulgate regulations to require on-road testing for all other types of fossil fuel-powered motor vehicles. While VW’s scandal involved diesel-powered cars, there is no indication that the use of such devices is limited to diesel vehicles. In fact, recent reports indicate that VW’s gasoline-powered cars, as well as models from other manufacturers, consume significantly more fuel than measured in laboratory tests.

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<sup>78</sup> See e.g., EPA, Regulatory Announcement: Final Rule on In-Use Testing Program for Heavy-Duty Diesel Engines and Vehicles, EPA420-F-05-021, June 2005, available at <http://www3.epa.gov/otaq/regs/hd-hwy/inuse/420f05021.pdf>.

<sup>79</sup> *Id.*

<sup>80</sup> *Id.*

<sup>81</sup> 40 C.F.R. § 86.1809.

<sup>82</sup> See e.g., International Council on Clean Transportation, In-use emission testing of light-duty diesel vehicles in the U.S., May 30, 2015, available at [http://www.theicct.org/sites/default/files/publications/WVU\\_LDDV\\_in-use\\_ICCT\\_Report\\_Final\\_may2014.pdf](http://www.theicct.org/sites/default/files/publications/WVU_LDDV_in-use_ICCT_Report_Final_may2014.pdf) (noting that there is no regulatory requirement in the United States to verify compliance of Tier 2 vehicles for emissions standards over off-cycle tests such as on road emissions testing).

Specifically, the Center requests that EPA adopt regulations in 40 C.F.R. part 86 and/or 1066 requiring on-road emissions testing as part of the certification process necessary to introduce any vehicle type into U.S commerce. These regulations could emulate those required for heavy-duty highway engines, adjusted as necessary to accommodate testing parameters needed for passenger cars and lighter trucks, and require state-of-the art on-road emission testing technology.<sup>83</sup>

The Center also requests that EPA conduct immediate in-use testing of each make and model of diesel-powered motor vehicles sold in the United States since 2009 that have not already undergone such tests, and each make and model of other fossil fuel-powered motor vehicles sold in the United States since 2009<sup>84</sup> to ensure that emissions comply with relevant standards, and any additional violators are held accountable.

#### B. NHTSA Must Promulgate Regulations to Increase the Penalties for Violations of CAFE Standards

NHTSA must increase the penalty for violations of CAFE standards. As explained above, EPCA vests NHTSA with the authority to impose a civil penalty of five dollars per automobile for each 0.1 mile per gallon a car falls short of the standards.<sup>85</sup> EPCA also vests NHTSA with the authority to increase the penalty for violations, provided it first makes certain findings. These findings include that increasing the penalty “will result in, or substantially further, substantial energy conservation for automobiles in model years in which the increased penalty may be imposed; . . . will not have a substantial deleterious impact on the economy of the United States, a State, or a region of a State” and will not cause significant unemployment, a significant increase in automobile imports or adversely affect competition.<sup>86</sup>

NHTSA exercised its statutory authority to increase the maximum civil penalty to \$5.50 for each 0.1 mile per gallon shortfall in 1997. But NHTSA has not increased the penalty since, nor has it been adjusted for inflation. It is no surprise then that NHTSA has repeatedly acknowledged that many companies choose to regularly pay the fines rather than comply with the standards.<sup>87</sup> Indeed, the Government Accountability Office (“GAO”) has reported that because the fines for violations of the CAFE standards have not increased, “CAFE penalties may not provide a strong enough incentive for manufacturers to comply with CAFE.”<sup>88</sup> In this way, EPCA has not been implemented to its full potential, and continuing technological innovation and reductions in greenhouse emissions are thwarted. However, the GAO also found that “stricter penalties” for “noncompliance could improve compliance with CAFE standards.”<sup>89</sup>

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<sup>83</sup> See 40 C.F.R. part 1065 (emission testing requirements for heavy-duty highway vehicles).

<sup>84</sup> To the extent conducting these tests is not feasible, the Center alternatively requests that EPA conduct in-use testing of a significant portion of the top selling makes and models of motor vehicles in the United States.

<sup>85</sup> 49 U.S.C. § 32912(b).

<sup>86</sup> *Id.*

<sup>87</sup> GAO, Report to Congress, Vehicle Fuel Economy: NHTSA and EPA's Partnership for Setting Fuel Economy and Greenhouse Gas Emissions Standards Improved Analysis and Should Be Maintained, Feb. 2010, GAO-10-336, available at <http://www.gao.gov/assets/310/301199.html>.

<sup>88</sup> *Id.*

<sup>89</sup> *Id.*

Accordingly, the Center hereby requests that NHTSA promulgate regulations to increase the penalty for a violation of the CAFE standards. Specifically, the Center requests that NHTSA amend its regulation at 49 C.F.R. § 578.6(h)(2) to increase the penalty to the statutory maximum of \$10 per 0.1 mile per gallon shortfall. The Center believes that NHTSA can easily make the requisite statutory findings in order to do so. Ensuring compliance with CAFE standards will promote competition by encouraging innovation and technological improvements, and will lead to economic benefits by reducing costly greenhouse gas emissions.<sup>90</sup> And the requested increase in the penalty is reasonable, as it is still below the statutory minimum adjusted for inflation. Specifically, the five dollar fine in 1975 adjusted for inflation would be roughly \$22.15 today.<sup>91</sup>

#### **IV. Conclusion**

The transportation sector is the single largest source of air pollution and the second largest source of greenhouse gas emissions in the United States. While there are laws in place to attempt to reduce the impacts of these emissions by prescribing limits on the quantity of such emissions, the recent VW scandal reveals that car manufacturers often find ways to skirt such requirements. Improving testing procedures by requiring in-use testing of vehicles currently on the road, and on-road testing of all new motor vehicles in the future would help ensure emissions tests better reflect actual emissions, and thus provide a more accurate picture of whether car manufacturers are actually complying with emission standards. Similarly, increasing the penalties for a violation of the CAFE standards would incentivize compliance with fuel economy standards and reduce emissions of greenhouse gases from motor vehicles. All of these actions would promote the protection of public health, welfare and the environment by reducing dangerous emissions and reducing our dependency on dirty fossil fuels, as envisioned by the CAA and EPCA.

Sincerely,

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<sup>90</sup> See e.g., Ker Than, *Estimated social cost of climate change not accurate, Stanford scientists say*, Stanford Report, Jan. 12, 2015, <http://news.stanford.edu/news/2015/january/emissions-social-costs-011215.html> (estimating the social cost of carbon to be \$220 per ton rather than \$37 as estimated by the government); see also Marten, A.L., and Newbold, S.C., *Estimating the social cost of non-CO2 GHG emissions: Methane and nitrous oxide*, 51 Energy Policy 957 (2012), available as EPA Working Paper No. 11-10 at [http://yosemite.epa.gov/ee/epa/eed.nsf/ec2c5e0aaed27ec385256b330056025c/f7c9fc6133698cc38525782b00556de1/\\$FILE/2011-01v2.pdf](http://yosemite.epa.gov/ee/epa/eed.nsf/ec2c5e0aaed27ec385256b330056025c/f7c9fc6133698cc38525782b00556de1/$FILE/2011-01v2.pdf) (estimating the social cost of nitrous oxide to be \$4,300 to \$33,000 per metric ton in 2015).

<sup>91</sup> U.S. Dep't of Labor, CPI Inflation Calculator, [http://www.bls.gov/data/inflation\\_calculator.htm](http://www.bls.gov/data/inflation_calculator.htm).