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Environmental Protection Agency, EPA West
Room 3334
1301 Constitution Ave., NW.
Washington, DC. 20460

Sent by email (a-and-r-Docket@epa.gov)

RE: Comments on National Ambient Air Quality Standards for Ozone, proposed rule, 75 Fed. Reg. 2938 (January 19, 2010) (Docket ID No. EPA-HQ-OAR-2005-0172)

The American Clean Skies Foundation (ACSF) is a non-profit organization founded in 2007 to advance America's energy independence, and to promote a cleaner environment through the expanded use of natural gas and renewable energy.

The EPA's January 19, 2010 notice in the Federal Register proposes to adopt a new rule that would make the National Ambient Air Quality Standards (NAAQS) for ozone more stringent.¹ ACSF supports tightening these standards based on sound science so as to reduce airborne pollution which, as documented in the EPA's notice, has very serious health impacts and foreshortens many lives. Furthermore, ACSF submits that greater use of natural gas in the electric power and transport sectors can play a major role in enabling states—and regulated parties—to comply with more stringent ozone standards in a cost-effective and timely way.

The EPA's health-based ozone standards have been the subject of ongoing rulemaking and litigation for too long and the agency is to be commended for seeking support to adopt new standards in an accelerated time frame.² However, in the range of

¹ The proposed rule can be found at 75 Fed. Reg. 2938 (hereafter referred to as the "Proposed Rule").

² Indeed, NAAQS for ozone date back as far as the 1970s. The ozone standards have undergone several periodic reviews and rounds of litigation. And yet our nation still struggles to adequately reduce ground-level ozone to protect public health and welfare. For additional background, see EPA Staff Paper, *Review of the National Ambient Air Quality Standards for Ozone: Policy Assessment of Scientific and Technical Information* (July 2007), pp. 1-3 to 1-6, available at http://www.epa.gov/ttnnaqs/standards/ozone/data/2007_07_ozone_staff_paper.pdf.

limits that EPA is considering, ACSF cautions that ozone limits should not be set at levels that are so stringent that the production and use of natural gas are unduly impacted, given that increased natural gas use is a key part of the solution to reducing overall ground-level ozone.

In sum, as further described in these comments, ACSF supports EPA's proposal to implement science-based reductions in the ozone standard and emphasizes the important role natural gas can play, particularly with renewable sources of energy, in reducing smog, through the increased use of natural gas in the electric generation and transportation sectors.

How Ozone is Formed, and the Negative Impacts of Ground-Level Ozone on Health and Welfare

Ground-level ozone (smog) is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from electric utilities, motor vehicle exhaust, and gasoline vapors are major sources of NO_x and VOC. In fact, the great majority of man-made NO_x emissions—one of the two key ingredients to smog—comes from two types of emissions sources: power plants (in the range of 23% of NO_x emissions) and transportation (over *half* of total NO_x emissions).³

Ground-level ozone has been recognized as causing significant, adverse health and welfare impacts. Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level ozone also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. EPA also notes that it is undertaking this tightening of the ozone standard for increased protection of children and other “at risk” populations, and to address serious health impacts that range from emergency department visits and hospital admissions for respiratory causes to cardiopulmonary mortality.⁴ Ground-level ozone also damages vegetation and ecosystems. In the United States alone, ozone is responsible for an estimated \$500 million in reduced crop production each year.⁵

³ See *Evaluating Ozone Control Programs in the Eastern United States: Focus on the NO_x Budget Trading Program* (EPA, 2005)(hereafter, “EPA 2005”), p. 2, available at <http://www.epa.gov/airtrends/2005/ozonenbp.pdf#page=1>. Data is for the eastern United States.

⁴ See 75 Fed. Reg. at 2938.

⁵ See <http://www.epa.gov/groundlevelozone/basic.html> for additional information.

EPA Authority to Reduce Ground-Level Ozone

Under the Clean Air Act, EPA sets standards for ozone in the air that we all breathe. The Proposed Rule is part of the National Ambient Air Quality Standards (NAAQS), which set standards for several key pollutants. Thus, NAAQS are a cornerstone of air emissions regulation under the Clean Air Act and are fundamental to keeping our nation's air clean, as they protect health and the environment. More specifically, the NAAQS involve setting a protective, health-based "primary" standard, as well as a "secondary" standard to promote welfare and prevent environmental harm.

In the Proposed Rule, EPA is considering a primary (health-based) ozone standard of between 0.070 and 0.060 ppm based on an 8-hour measuring period. At 0.070 ppm, EPA estimates the value of health benefits to range from about \$13 billion to \$37 billion per year in 2020. At 0.060 ppm, EPA estimates the value of such benefits to range from about \$35 billion to \$100 billion per year in 2020.⁶

It has been widely recognized that combusting clean-burning natural gas has much lower health impacts than combusting coal. For instance, the U.S. National Research Council (NRC), in response to a request from the U.S. Congress, recently evaluated health, environmental, national security, and other external costs associated with energy. NRC found that in 2005, damages per kilowatt-hour (kwh) from NO_x, sulfur dioxide, and particulate matter emissions were an order of magnitude higher for coal than for natural gas electric power plants: on average, approximately 3.2 cents per kwh for coal and only 0.16 cents per kwh for natural gas.⁷

Because of the important health and welfare benefits from reducing ozone, ACSF supports EPA's efforts to regulate it through the use of science-based standards, and emphasizes that significant emission reductions can be obtained through (as further described immediately below) the increased use of cleaner burning natural gas and also renewables, which do not create ozone.

⁶ See EPA, *Fact Sheet: Supplement to the Regulatory Impact Analysis for Ozone* (January 7, 2010), available at <http://www.epa.gov/groundlevelozone/pdfs/fs20100106ria.pdf>.

⁷ See National Research Council, *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* (2009), p. 262. The National Research Council is a private, nonprofit institution under the auspices of the National Academy of Sciences, Institute of Medicine, and National Academy of Engineering.

Reducing Ground-Level Ozone Through the Increased Use of Natural Gas

As noted above, the great majority of man-made NO_x emissions comes from two sources: power plants and transportation. Natural gas can significantly reduce NO_x emissions from both power plants and transportation, addressing two key sources of NO_x emissions (and thus smog formation).

Dramatic increases in domestic natural gas supply allow for significant ozone reductions

Discoveries in the last few years of new domestic natural gas supplies have vastly increased U.S. natural gas reserves, which has significant implications for reducing smog. These discoveries have centered on gas in shale formations, which are located deep underground. Advances and increased experience with drilling technologies now make them commercially accessible. These vast new shale-gas reserves have been widely recognized as a “game changer” in U.S. energy supply. The U.S. Energy Information Agency, for instance, has said that shale gas enables growth in U.S. reserves, production and consumption, and reduces projected gas prices.⁸ Furthermore, leading analysts have recognized the significance of new natural gas discoveries. For instance, IHS Cambridge Energy Research Associates (CERA) has found that:

A major new factor—unconventional natural gas—is moving to the fore in the US energy scene and the national energy discussion. ... [I]t ranks as the most significant energy innovation so far this century—and one that, because of its scale, requires a reassessment of expectations for energy development. It has the potential, at least, to cause a paradigm shift in the fueling of North America’s energy future.⁹

CERA also notes that:

Shale gas and other forms of unconventional natural gas would underpin a significant increase in US natural gas consumption—and could allow the electric power industry to almost double its use of natural gas, from 19 billion cubic feet (Bcf) per day at present to 35 Bcf per day by 2035. An abundant natural gas resource shifts the choices for power generation technologies to meet both growing demand for electricity and the needs from retirements of

⁸ See EIA, *Shale Gas: A Game Changer for U.S. and Global Gas Markets?* (March 2010), p. 2, available at <http://www.eia.doe.gov/neic/speeches/newell030210.pdf>.

⁹ See CERA, *Fueling North America’s Energy Future* (2010, hereafter “CERA Report”), executive summary, p. ES-1, available at http://www2.cera.com/docs/Executive_Summary.pdf.

*aging power plants. It changes the relative costs for addressing greenhouse gas (GHG) emissions. It could also have an effect on transportation fuels—whether in the form of natural gas vehicles or via the turbine blades of a gas-fired power station that is, among other things, recharging the batteries of an electric vehicle.*¹⁰

These new natural gas discoveries have significant implications for ozone reduction because, as CERA notes, they open up expanded possibilities for the use of clean-burning natural gas in the electric generation and transportation sectors. And increased use of natural gas can significantly reduce a variety of other air pollutants, such as greenhouse gases, mercury, and acid rain.

Natural gas can significantly reduce NOx emissions from power plants

Using natural gas can *significantly* reduce NOx emissions from power plants using known, readily available, cost-effective technology. A modern natural gas-fired power plant emits 85% less nitrogen oxide, as well as 97% less sulfur dioxide, 50% less carbon dioxide, and 100% less mercury than a comparable modern pulverized coal-fired plant.¹¹ If a modern natural gas-fired power plant replaces an older coal-fired plant, the emissions reductions would be even greater.¹²

The Governor of Colorado and Xcel Energy has recently underscored the potential of gas-fired power plants to reduce ground ozone levels and regional haze in endorsing a landmark legislative proposal to phase out several coal-fired power plants in the eastern part of the state.¹³ More specifically, the Colorado proposal would require Xcel Energy to sharply reduce pollutants by retiring, retrofitting or repowering at least 900 MW of coal-fired power plants by the end of 2017. Alternative facilities must be fueled by natural gas and other lower- or non-emitting energy sources. Under the proposed legislation, Xcel must submit plans by this summer to reduce NOx emissions at its coal plants by up to 80 percent over the next eight years (if not sooner). The Governor

¹⁰ See CERA Report, p. ES-1.

¹¹ See EPA BACT/LAER clearinghouse (<http://cfpub.epa.gov/RBLC/htm/bl02.cfm>); EPA, *Environmental Footprints and Costs of Coal-Based Integrated Gasification Combined Cycle and Pulverized Coal Technologies*, EPA-430/R-06-006 (July 2006), p. ES-8, available at http://www.epa.gov/air/caaac/coaltech/2007_01_epaigcc.pdf.

¹² This is particularly true if natural gas combines with renewable sources of energy. See e.g., Jad Mouwad, "The Newest Hybrid Model," *The New York Times* (March 5, 2005), available at, <http://www.nytimes.com>.

¹³ "Gov. Ritter, Xcel & Coalition Announce Energy Plan," (Press Release, March 5, 2010), available at: <http://www.colorado.gov/energy/index.php?/about/press/2010>.

and Xcel have noted that natural gas “can play a key role as a cleaner-burning source of baseload electricity generation,” and that the proposed plan could reduce ozone levels.¹⁴

Natural gas vehicles can significantly reduce ozone levels

The use of natural gas vehicles (NGVs) can also significantly reduce smog. Natural gas is the cleanest-burning alternative transportation fuel commercially available today. Compared with most gasoline-powered vehicles, NGVs typically reduce exhaust VOCs by 89 percent and NOx by 87 percent, and significantly reduce other types of pollutants (such as carbon monoxide).¹⁵ The natural gas-powered Honda Civic GX is recognized by the U.S. EPA as the cleanest commercially available, internal-combustion vehicle available, and it produces less emissions than the Civic gasoline-hybrid. Though not the subject of this rulemaking, NGVs also reduce greenhouse gas emissions. NGVs produce 20 percent less greenhouse gases than a comparable gasoline vehicle and up to 15 percent less than a comparable diesel vehicle, and these emission reductions can be even much greater if the natural gas used is from biomethane (i.e., methane produced from renewable sources like landfills, sewage and animal or crop waste).¹⁶

ACSF supports aggressively developing markets for NGVs within strategic sectors such as: commercial and other private fleets (including light-duty commercial trucks, vans, and sport-utility vehicles); other delivery/distribution vehicles; government vehicles (including for the Department of Defense and other agencies); vehicles used for telecommunications, utility, and exploration and production (E&P) uses; refuse/trash trucks; transit and school buses; heavy-duty vehicles (Class 8 trucks); and taxi cabs and shuttles. These vehicles are the largest consumers of foreign oil, largest polluters, most costly for governments, and the most simplified from an infrastructure perspective. Although natural gas vehicles require special fueling stations, these fueling stations have been readily deployed for fleet vehicles and are suitable for urban areas and other locations with concentrated vehicle use.

Programs to promote NGVs should be undertaken in both areas that have attained the NAAQS standards and particularly those that have not (so-called “non-attainment areas”). In many urban areas, vehicles are the single largest source of NOx and VOCs. Deploying natural gas vehicles can help to meet the important health and welfare goals of the ozone standard, particularly in urban areas where some of the adverse impacts are

¹⁴ See Note 13.

¹⁵ See Natural Gas Vehicle for America (NGV America), *NGVs and the Environment*, available at http://www.ngvc.org/about_ngv/ngv_envIRON.html.

¹⁶ See Note 15.

most severe. The use of NGVs, particularly as part of fleet vehicle programs, has been implemented or used in a number of states and should continue to be promoted.¹⁷

Implementation of Proposed Standards to Reduce Ground-Level Ozone

EPA and states, through their state implementation plans (SIPs), should pursue regulatory approaches that maximize the use of clean-burning natural gas and renewable sources of energy.

Past regulatory approaches have shown the ability to dramatically reduce power plant NO_x emissions. For instance, recognizing a persistent problem with NO_x emissions in the eastern half of the United States, EPA implemented a multistate regime for capping NO_x emissions known as NO_x “SIP Call.” This SIP Call focuses on regulating fossil-fuel power plant emissions through a NO_x “cap and trade” program that caps NO_x emissions and creates a limited number of “allowances” (in essence, a permit to emit one ton of NO_x) that regulated entities, such as electricity generators can trade amongst themselves. After implementation of the NO_x SIP Call in 2004, NO_x emissions from regulated sources were 50% lower than before this program was implemented.¹⁸

Importantly, almost all the SIP Call NO_x reductions were from coal-fired electric generating units.¹⁹ This is because, other things equal, a regulated generator with predominately gas-fired units, will require less allowances than a generator with mainly coal-fired units. Thus, uncontrolled, high-emitting coal fired power plants are the “low hanging fruit” for emission reductions.

To achieve the emissions levels mandated by NAAQS, states have the primary responsibility for ensuring attainment and maintenance of ambient air quality standards once EPA has established them.²⁰ In non-attainment areas, ACSF believes that state governments should actively promote measures under SIPs to increase the use of clean-burning natural gas and renewable sources of energy. As discussed above, the recently proposed Colorado legislation mandating fuel switching at power plants also provides an important example of the type of local SIP related initiatives that might be used to reduce NO_x emissions from coal-fired power plants.

¹⁷ Increased use of NGVs also should be promoted to further the aims of the EPA’s transportation conformity rule, which implements the Clean Air Act principle that transportation activities not worsen air quality.

¹⁸ See EPA 2005, pp. 8-10. The NO_x SIP Call also applied to large industrial units that produce electricity and/or steam with equipment such as fossil-fuel fired boilers and turbines.

¹⁹ See EPA 2005, pp. 28-30.

²⁰ See *e.g.*, 75 Fed. Reg. at 2941.

In attainment areas, EPA also should promote the use of high-efficiency natural gas power plants as best available control technology (BACT) for new fossil fuel fired power plants. Indeed, in both attainment and non-attainment areas, natural gas should be considered a control technology of choice for new fossil fuel-fired electric generating facilities.

ACSF also recommends that EPA enter into consultations with individual states to explore what barriers prevent the increased use of natural gas and renewable sources of energy, at existing fossil fuel power plants, and provide recommendations on how to reduce those barriers, either through the SIP process or otherwise. For instance, the Congressional Research Service has noted that existing, modern natural gas combined-cycle power plants have a “large amount of unused capacity.”²¹ Efforts should be undertaken to maximize the use of this low-emitting, modern, highly-efficient baseload natural gas generating capacity, including through the retirement of much older, less-efficient, high-emitting coal-fired power plants.

In addition, SIP programs should also promote the use of natural gas vehicles as an ozone-reducing strategy. As discussed above under the section on natural gas vehicles, NGVs can significantly reduce ground-level ozone, including in urban areas where ozone-related health issues are significant. Electric vehicles are often looked to as a potential source of low-emitting vehicles. However, even if electric vehicles are used as a means to reduce smog, the power plants that provide this electricity should be clean burning – maximizing clean sources such as natural gas and renewables.

Stringency of the Proposed Regulations

EPA proposes a range for both the primary and secondary ozone standards. As noted above, for the human health-based primary standard, EPA proposes a range of .060 to .070 ppm based on an 8-hour measuring period. For the secondary standard (designed to protect vegetation and forested ecosystems), EPA proposes a cumulative, seasonal limit rather than a short term (e.g., 8-hour) standard, with a range of 7 to 15 ppm-hours. ACSF supports an EPA standard that is science-based and adequately protects public health and the environment.

As stated earlier, however, EPA should not set the ozone standards at levels that are so stringent that the production and use of natural gas is unduly adversely impacted.

²¹ See CRS, *Displacing Coal with Generation from Existing Natural Gas-Fired Power Plants* (January 19, 2010), p.7.

That could be counter-productive if such standards force undue restrictions on natural gas use. After all, as described above, natural gas is a key part of any solution to reducing smog.

Summary

ACSF supports EPA's choice of ozone NAAQS standards that are science-based and adequately protect public health and the environment. ACSF also supports the accelerated adoption and implementation of EPA's proposed ozone standards in order to achieve the Proposed Rule's important public health and welfare benefits.

Furthermore, it should be recognized that greater use of natural gas in the electric power and transport sectors can play a major role in enabling states – and regulated parties – to comply with new standards in a cost-effective and timely way. Finally, ACSF cautions that the ozone standards should not be so stringent as to unduly impact natural gas production, because increased natural gas use is a key part of any solution to reducing ground-level ozone. Indeed, the enhanced use of natural gas can not only significantly reduce ground-level ozone, but also the emissions of pollutants such as sulfur dioxide, particulate matter, mercury, and carbon dioxide.

ACSF would be happy to further discuss implementation approaches regarding the ozone standards with EPA or state regulators in order to help reduce our nation's airborne pollution.

Sincerely,

Gregory C. Staple
Chief Executive Officer
American Clean Skies Foundation