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Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Attention Docket ID No. OAR-2008-0318

Subject: National Petrochemical & Refiners Association's Comments on the Environmental Protection Agency's Advanced Notice of Proposed Rulemaking for Greenhouse Gases Under the Clean Air Act, 73 Fed. Reg. 44354 (July 30, 2008).

Dear Sir/Madam:

National Petrochemical & Refiners Association ("NPRA") is pleased to provide comments on the Advanced Notice of Proposed Rulemaking ("ANPR") referenced above. NPRA's members comprise more than 450 companies, including virtually all U.S. refiners and petrochemical manufacturers. Our members supply consumers with a wide variety of products and services that are used daily in homes and businesses. These products include gasoline, diesel fuel, home heating oil, jet fuel, asphalt products, and the chemicals that serve as "building blocks" in making plastics, clothing, medicine and computers.

Like virtually every other industrial sector, NPRA's members emit greenhouse gases ("GHGs") as a result of their manufacturing activities. They also manufacture and/or refine products that release GHGs when used or combusted by downstream users. As such, NPRA's members have a great interest in, and will be directly impacted by, decisions EPA makes in response to *Massachusetts v. EPA* and this ANPR.

I. Introduction

NPRA supports EPA's decision to solicit comments through an ANPR in response to the Supreme Court's decision in *Massachusetts v. EPA*, 127 S. Ct. 1438 (2007).[1] NPRA likewise is pleased to comment on the appropriateness of regulating greenhouse gases ("GHGs") under the Clean Air Act ("CAA"), and the potential consequences of such regulation, before EPA makes a final decision on whether GHG emissions from automobiles endanger public health or welfare.

The regulation of GHGs under the CAA would constitute EPA's single largest and potentially most complex assertion of authority over the United States economy and Americans' lifestyles. Regulation of GHGs under the Act would have enormous consequences for every facet of the economy, for industry large and small, as well as for the general population. Indeed,

[1] *See* 73 Fed. Reg. 44354, 44422 (July 30, 2008) ("Regulating Greenhouse Gas Emissions Under the Clean Air Act ").

the potential impact on the country of any decision to regulate GHGs cannot be overstated and makes all prior EPA regulatory efforts pale by comparison.

Given the enormous implications of the issue, good government warrants that EPA solicits early and meaningful input on all aspects of this important issue. It would be inappropriate for EPA to regulate GHGs without first understanding the myriad implications of that decision and ensuring that decision-makers and the public are fully informed. A thorough and transparent process will help identify and potentially avoid unintended consequences. Therefore, those that are suggesting that the agency should skip or abbreviate the debate are simply wrong. EPA has a long history of successfully using the ANPR process for difficult and complex issues.[2]

As many federal agencies and offices (*e.g.*, the EPA Administrator, the Departments of Energy and Agriculture, the Small Business Administration, and the Council on Environmental Quality) have commented, the CAA is ill-suited to address global climate change. The CAA was designed primarily to deal with local ambient air quality issues, not global issues like the impact of GHG emissions on climate change. To the extent that the CAA addresses international issues (*e.g.*, stratospheric ozone), it does so with programs Congress specifically tailored to address the problem. At best, regulating GHGs under the CAA would not meaningfully reduce ambient GHG concentrations and thus likely would have no impact on the global "issue." At worst, using the NAAQS program as an example, regulation under the CAA likely would result in a U.S. standard incompatible with the terms of any eventual international agreement, thereby adversely affecting international negotiations. And, depending on the stringency of the U.S. target, this approach could either undermine global efforts to reduce GHGs or make the U.S. standard impossible to meet due to other countries' ongoing emissions. Furthermore, in almost any foreseeable scenario, CAA regulation would, however, impose enormous costs on United States industry and further damage the nation's distressed economy, costs that would be out of proportion to any potential benefit gained. Although EPA acknowledges some of the problems associated with regulating GHGs under the CAA – including legal, scientific, technical, and economic difficulties – NPRA believes that the agency has greatly downplayed their significance.

In summary, NPRA does not believe that regulation of GHGs under the CAA would be an effective or efficient means to address climate change. Such regulation would impose enormous costs and burdens on society and U.S. manufacturers without any measurable environmental benefits. Before moving forward with GHG regulation, the United States must ensure that other major global contributors are similarly committed to doing their part to reduce global ambient GHG concentrations. Otherwise, any U.S. efforts will be in vain.

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[2] *See, e.g.*, 61 Fed. Reg. 59,849 (Nov. 25, 1996) (ANPR for National Emission Standards for Hazardous Air Pollutant Emissions: Group I Polymers and Resins and Group IV Polymers and Resins); 62 Fed. Reg. 14740 (March 27, 1997) (ANPR for national emission regulations that affect small spark-ignited engines).

II. Endangerment

A. General Comments on the Scientific Support for an Endangerment Finding.

NPRA has carefully reviewed the ANPR and Technical Support Document ("TSD") relating to endangerment and believes that EPA still has much to do before making a final decision on whether GHG emissions from domestic automobiles cause or contribute to a public health or welfare endangerment. EPA's analysis draws most heavily on reports prepared by only a handful of entities, particularly the Intergovernmental Panel on Climate Change ("IPCC"), and especially with respect to its analysis of human health and welfare effects.[3] The agency has an obligation, however, to consider all relevant science on climate change, impacts, and effects on health and welfare. It may not disregard data without justification. Furthermore, the reports on which EPA relies generally present data and projections on a global or broad regional scale (*e.g.*, North America). As discussed in more detail below, the plain language of the CAA makes clear that, except in circumstances when it is appropriate to make an endangerment finding under section 115, any endangerment finding under the CAA must be confined to an assessment of impacts and effects in the United States, not in locations beyond our borders. Thus, EPA should do a more thorough job of identifying and assessing the information (and information gaps) that exist at the national scale.

Based on the data presented by EPA to date, the agency has not made a sufficient case for endangerment. First, EPA has not set forth in a detailed and transparent manner the assumptions and possible limitations of models used in the reports on which it relies most heavily. For example, in Section 5 of the TSD on endangerment, which focuses on attribution of observed climate change, EPA cites conclusions from IPCC reports on the "linkage between greenhouse gases and temperatures," but does not adequately address limitations of the methods and models used to make those findings. EPA has "undoubted power to use predictive models" . . . provided it "explain[s] the assumptions and methodology used in preparing the model" and "provides a complete analytic defense should the model be challenged." *Appalachian Power Co. v. EPA*, 249 F.3d 1032, 1052 (D.C. Cir. 2001) (internal quotations omitted); *Eagle-Pitcher Industries, Inc. v. EPA*, 759 F.2d 905, 921 (D.C. Cir. 1985); *Small Refiner Lead Phase-down Task Force v. EPA*, 705 F.2d 506, 535 (D.C. Cir. 1983). While courts generally defer to agency modeling, "model assumptions must have a rational relationship to the real world." *West Virginia v. EPA*, 362 F.3d. 861, 866-7 (D.C. Cir. 2004). Some have raised important concerns that the models on which IPCC relies do not, in fact, bear a relationship to the real world because they do not consider solar dimming and brightening, do not accurately model the role of clouds, do not simulate a possible negative feedback from water vapor, do not explain many features of the Earth's observed climate, and cannot produce reliable predictions of regional climate change. If EPA cannot analytically defend the models it uses or if the results of such models are contradicted by the "real world," then reliance on such models would be arbitrary and capricious.

[3] The TSD states that the agency's endangerment analysis relies "most heavily" on a selection of synthesis reports published by, among others, the U.S. Climate Change Science Program and the Intergovernmental Panel on Climate Change. *Technical Support Document for Endangerment Analysis for Greenhouse Gas Emissions under the Clean Air Act*, June 21, 2008, p. 4.

At the very least, EPA must acknowledge and address the inherent weaknesses of the models that underpin the assessment relied upon by EPA, and how those weaknesses factor into EPA's analyses.

Moreover, EPA itself acknowledges formidable gaps in its ability to characterize climate change effects on health or welfare, which greatly complicate understanding of net effects. For example, "It is not clear whether reduced mortality from cold will be greater or less than increased heat-related mortality in the U.S. due to climate change."[4] In addition, "the scientific literature does not provide definitive data or conclusions on how climate change might impact aeroallergens and subsequently the prevalence of allergic illnesses in the U.S."[5] EPA also suggests that existing data and analysis may yield untrustworthy results in certain key human health-related areas: "The influence of climate change on air quality will play out against a backdrop of ongoing regulatory control of both ozone and particular matter (PM) that will shift the baseline concentrations of these two important pollutants. *However, most studies to date that have examined potential future climate change impacts on air quality isolate the climate effect by holding precursor air pollutant emissions constant over time*."[6] Notwithstanding these difficulties, existing studies reveal that "[t]he overall directional impact of climate change on PM levels in the U.S. remains uncertain."[7]

B. General Comments on the Legal Test for Endangerment.

As EPA has correctly acknowledged, a GHG endangerment finding under section 202 could have significant ramifications under the CAA because the different sections of the Act are highly interconnected.[8] It could trigger mandatory or discretionary regulatory actions under various sections of Title I regulating stationary sources, as well as under sections of Title II regulating mobile sources and fuels. In other words, an endangerment finding in response to *Massachusetts v. EPA* would likely carry consequences that extend well beyond the automobile industry, which was the focus of the provision at issue in that lawsuit. EPA, the public, and other decision-makers should understand these consequences before EPA acts.

One general comment regarding endangerment is necessary at the outset. The ANPR provides a history of the CAA's endangerment language, including statements by the D.C. Court of Appeals in *Ethyl Corp. v. EPA*, 541 F.2d 1 (D.C. Cir. 1976), interpreting one of the CAA's several endangerment provisions.[9] To the extent EPA describes the *Ethyl Corp.* decision as interpreting the endangerment language as "precautionary" and "preventative" in nature, EPA should make clear that the CAA does not adopt the "precautionary principle" as that term is

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[4] *Id*. at 64.

[5] *Id*. at 68.

[6] *Id*. at 72 (emphasis added).

[7] *Id*. at 73.

[8] 73 Fed. Reg. 44354, 44418.

[9] 73 Fed. Reg. 44354, 44422.

sometimes used in certain foreign jurisdictions, most notably the European Union, to justify stringent regulation unless industry can demonstrate that a practice or product is safe. The *Ethyl Corp.* decision and the legislative history of the 1977 CAA Amendments characterize the CAA as "precautionary" only in that it authorizes the Administrator to consider regulating risks that are small or perhaps of an uncertain magnitude (but, nonetheless, real), especially when the severity of a potential resulting harm is great. Indeed, the House Report accompanying the Amendments expressly disavows the idea that the 1977 revisions to the endangerment language were intended to favor regulation unless safety could be proven.[10] It says that the Amendments were designed more as a compromise to:

> authorize the Administrator to weight risks and make reasonable projections of future trends; thus, to find a middle road between those who would impose a nearly impossible standard of proof on the Administrator before he may move to protect public health and those who would shift the burden of proof for all pollutants to make the pollution source prove the safety of its emissions as a condition of operation.[11]

Thus, although the CAA affords EPA the authority to act in the face of uncertainty, it does not mandate that EPA so act.

Returning to the immediate issue of GHGs, the difficulty in determining endangerment for GHGs cannot be overstated. There is little or no guidance on whether it would be permissible for EPA to look beyond the United States for health or welfare effects, how far into the future the agency can or should consider effects, how adaptation should be considered, or whether and how to discount benefits and costs of regulation into the future. There are significant data gaps, as well.[12]

C. General Comments on the Scope of an Endangerment Finding: Public Health Versus Public Welfare.

As discussed above in Section II.A, NPRA does not believe that EPA has set forth sufficient information on which to base on endangerment finding. In particular, NPRA believes that EPA should not make a public health endangerment finding because it cannot identify likely direct health effects from GHGs. As EPA states, "Current ambient concentrations of CO_2 and other GHGs remain well below published thresholds for any direct adverse health effects, such

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[10] H.R. Rep. 95-294, at 49 (1977).

[11] *Id*.

[12] A recent report from the IPCC acknowledges that the lack of longitudinal health data makes attribution of adverse health outcomes to observed climate trends difficult. Confalonieri, U., B. Menne, R. Akhtar, K.L. Ebi, M. Hauengue, R.S. Kovats, B. Revich and A. Woodward, 2007: Human health. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 419.

as respiratory or toxic effect."[13] The evidence of health effects that EPA does identify (*i.e.*, increases in risks of respiratory infection due to declining air quality in cities) is primarily in the nature of indirect effects.[14] In other words, potential impacts on health are not tied to direct exposure to GHGs in the ambient atmosphere, but rather to the effect of GHGs on global temperatures and climate. In fact, EPA acknowledges,

> [T]he direct effects of GHG emissions appear to be principally or exclusively welfare-related. GHGs are unlike other current NAAQS pollutants in that direct exposure to GHGs at current or projected ambient levels appears to have no known adverse effects on human health. Rather, the health impacts associated with ambient GHG concentrations are a result of the changes in climate at the global, regional, and local levels, which trigger myriad ecological and meteorological changes that can adversely affect public health . . . . The effects on human health are thus indirect impacts resulting from these ecological and meteorological changes, which are effects on welfare.[15]

A public health finding would be particularly problematic if it led EPA to make a similar public health endangerment finding under section 108 and then promulgate a primary National Ambient Air Quality Standard ("NAAQS") for GHGs. Development of a primary NAAQS for GHGs would truly be an unprecedented decision in light of the history of primary NAAQS development. EPA has previously promulgated primary NAAQS based on demonstrated health effects resulting from direct human exposure to pollutants in the environment. For example, in its recent revision of the primary NAAQS for ozone, EPA relied heavily on evidence of the human respiratory effects associated with prolonged exposures to ozone in the ambient air.[16] Likewise, in 2006, EPA revised the primary standards for fine particles ("$PM_{2.5}$") based in part on human health effects associated with short-term exposure to such particles in the ambient air, including premature mortality and increased hospital admissions and emergency room visits.[17] By contrast, in their ambient concentrations, GHGs have very little or no direct human health implications.

Enforcing a primary GHG NAAQS would also be unworkable and place states and industry in the untenable position of demonstrating attainment with a standard that requires global reductions. As described more fully in the following Section, if EPA develops a primary GHG NAAQS, the entire country would be designated as either in attainment or nonattainment,

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[13] 73 Fed. Reg. 44354, 44425.

[14] For example, the IPCC's recent report on human health impacts states that evidence shows that climate change has, at the global scale, altered the distribution of some infectious disease vectors, altered the seasonal distribution of some allergic pollen species, and increased heatwave-related deaths. *Climate Change 2007: Impacts, Adaptation and Vulnerability, supra* note 12, p. 393.

[15] *Id*. at 44478.

[16] 73 Fed. Reg. 16436, 16440 (March 27, 2008).

[17] 71 Fed. Reg. 61144, 61145 (Oct. 17, 2006).

which would usher in an array of new stringent and futile requirements, particularly in the case of nonattainment. For instance, all states would have to come into compliance with the NAAQS no later than 10 years from the effective date of the nonattainment designation. This would be unachievable, given the long lifespan of GHGs in the atmosphere and the substantial (and growing) contribution of international sources to ambient global GHG concentrations.

Of course, as with a public health endangerment finding, a public welfare endangerment finding would likewise trigger inefficient and ineffective regulation under the CAA. Most importantly, if EPA developed a secondary NAAQS based on a welfare endangerment finding, the same nonattainment requirements such as NSR that apply to SIPs for a primary standard would also apply for a secondary standard.[18] Moreover, in the case of nonattainment with a secondary standard, states must reach attainment "as expeditiously as practicable," using "reasonably available control measures." Because nonattainment areas would have essentially no control over ambient GHG concentrations, it would be impossible for EPA to define a practicable timeline for state compliance and it would make little sense to subject states to costly requirements in a vain attempt to reach the global GHG levels required for attainment. It may in fact, therefore, be arbitrary and capricious for EPA to adopt a GHG NAAQS when it knows that the standard could not be met.

III. Stationary Sources

A. Regulation of GHGs Under the CAA is Infeasible and Imprudent.

1. The CAA was not designed to address emissions of a global pollutant in a comprehensive manner.

As evidenced by the language of the CAA's declaration of purpose, the main goals of the statute include the protection and enhancement of the quality of the nation's air resources and development and operation of regional air pollution prevention and control programs.[19] Congress did not include as a purpose of the CAA the prevention or control of emissions affecting the entire globe. In fact, control of global pollution could not reasonably be interpreted as a goal of the CAA based on the specific tools that Congress provided to address pollution under the Act, which are discussed in greater detail, below. As EPA has expressly observed, "[T]he CAA was not specifically designed to address GHGs . . . ."[20]

The following sections make clear that, were GHGs to become regulated pollutants under the CAA, it would trigger so many new requirements and produce so many regulatory bottlenecks as to intrude into and disrupt the lives of ordinary citizens in a way that Congress could not have envisioned when it enacted the law over twenty-five years ago. What is more, all

[18] A secondary NAAQS must be set at a level requisite to protect public welfare. 42 U.S.C. § 7409(b)(2).

[19] 42 U.S.C. § 7401(b)(1), (4).

[20] 73 Fed. Reg. 44354, 44397.

of these costs would likely be incurred with minimal to no environmental or public health benefit.

2. EPA is limited in the extent it may consider and act on international impacts of transboundary air pollution.

That the CAA was never designed to address global pollutants is evident from the fact that, aside from the amendments tailored to ozone-depleting substances, only one provision of the statute deals explicitly with impacts of air pollution that transcends United States borders. That provision, section 115, expressly authorizes the Administrator to consider endangerment abroad and to act in light of overseas impacts if certain preconditions are met.

Section 115 gives EPA power to require states to amend their state plans to address international pollution if the Administrator, based on the receipt of reports, surveys, or studies from any duly constituted international agency or at the request of the U.S. Secretary of State, has reason to believe that air pollutants emitted in the United States cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare in a foreign country.[21] To the extent EPA acts to require a state to revise its plan, however, it can only do so if the foreign country has given the United States "essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country . . . ."[22]

Two truisms thus emerge from section 115's language. First, EPA may only consider overseas impacts if it receives information from a duly constituted international agency or if the U.S. Secretary of State makes such a request. Second, it may act to alleviate impacts abroad only if (1) it has reason to believe that air pollutants from within the United States are causing or contributing to air pollution that may reasonably be anticipated to endanger public health or welfare in a foreign country and (2) it determines that the foreign country has given the United States similar pollution control rights.

Thus, unless and until the United States receives global reciprocity, it is precluded by Section 115 from regulating domestic GHG emissions to address global impacts allegedly associated with climate change. Without global reciprocity, EPA's authority is limited to addressing only domestic impacts, and even then only if it determines that climate change is indeed endangering domestic health or welfare.

B. The CAA's Stationary Source Authorities Are Ill-Suited to GHG Regulation.

The ANPR identifies three main ways of regulating GHGs from stationary sources under Title I of the CAA: (1) listing GHGs (individually or as a group) as criteria pollutants and developing NAAQS through sections 108 and 109, (2) developing performance standards through section 111, and (3) regulating GHGs as hazardous air pollutants under section 112.

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[21] 42 U.S.C. § 7415(a), (b).

[22] 42 U.S.C. § 7415(c).

There are numerous problems inherent in the application of each of these programs to mitigate GHGs, the more readily apparent of which are discussed below.

1. The NAAQS Approach

a. Overview

The NAAQS program, which addresses pollution that endangers public health and welfare, is the centerpiece of the CAA.[23] EPA has, to date, promulgated NAAQS for only six "criteria" pollutants: (1) sulfur dioxide, (2) nitrogen dioxide, (3) particulate matter, (4) carbon monoxide, (5) ozone, and (6) lead.

Section 108 of the CAA authorizes the Administrator to list air pollutants to be regulated through NAAQS if certain criteria are met. Most importantly, a pollutant may be listed if, in the Administrator's judgment, the pollutant "cause[s] or contribute[s] to air pollution which may reasonably be anticipated to endanger public health or welfare" and the pollutant is emitted from "numerous or diverse mobile or stationary sources."[24] Section 108 also requires that once a pollutant is listed, EPA must issue "air quality criteria," which includes "all identifiable effects on public health or welfare," and it must issue information on air pollution control techniques at the same time it issues air quality criteria.[25]

As mentioned in Section II,C. where appropriate, NAAQS are developed for each pollutant at two levels: "primary" NAAQS are developed at a level "requisite to protect the public health" with an adequate margin of safety and "secondary" NAAQS are developed at a level "requisite to protect public welfare" against known or anticipated adverse effects. Welfare effects are defined under section 302(h) to include "effects on soils, water, crops . . . wildlife, weather, visibility and climate." Once a NAAQS is established for a particular pollutant, areas within the United States that meet the NAAQS are designated as areas of "attainment," whereas areas that do not meet the NAAQS are designated as areas of "nonattainment."[26] One area can be simultaneously in attainment with the NAAQS for one criteria pollutant and in nonattainment with the NAAQS for a different pollutant.

The CAA gives states primary responsibility for ensuring that they attain the NAAQS.[27] States must develop state implementation plans ("SIPs") to address NAAQS, and these plans must include a program for enforcement of emission limitations and control measures for stationary sources, as well as a host of other requirements, such as preconstruction review and

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[23] *Sierra Club v. Costle*, 657 F.2d 298, 315n.23 (D.C. Cir. 1981) ("Since 1967 the centerpiece of the Clean Air Act has been the provision for setting National Ambient Air Quality Standards (NAAQS)").

[24] 42 U.S.C. § 7408(a)(1)(A), (B).

[25] 42 U.S.C. § 7408(a)(2), (b)(1).

[26] 42 U.S.C. § 7407.

[27] 42 U.S.C. § 7410.

notification requirements.[28] Furthermore, a SIP must prohibit emissions that significantly contribute to nonattainment or interference with maintenance of the NAAQS, or with visibility protection requirements in another state.[29] [30] States must submit their SIPs to EPA for approval. If EPA finds that a state has failed to comply with SIP submission requirements or disapproves a plan in whole or in part, EPA must promulgate a federal implementation plan ("FIP") for the state within two years after EPA's disapproval.[31]

b. Problems with the NAAQS Approach

The ANPR suggests that it may be appropriate for EPA to list GHGs as a pollutant under section 108(a) and set a NAAQS for these pollutants under section 109. EPA's discussion, however, does not raise or adequately address many of the serious difficulties associated with the prospect of regulating GHGs under the NAAQS program. First among them is the development of criteria documents and subsequent development of a NAAQS that is based upon impacts identified by the criteria documents. Today, future impacts of climate change are still being studied and investigated. Of course, some degree of uncertainty does not provide sufficient reason by itself to refrain from listing pollutants under section 108, but unlike other pollutants for which NAAQS have been established, the scope and variety of uncertainties regarding climate change and its impacts means that there is a risk that a GHG NAAQS developed today might be wholly inappropriate based on emerging science tomorrow. In particular, unlike understandings about the mechanisms and impacts of the six current criteria pollutants, which tend to build on previous science with some predictability, emerging facts on population and emission trends, developing science on feedbacks and impacts, and emerging technologies may create an entirely new outlook about future scenarios and appropriate responses in the GHG context. Although the CAA provides a mechanism for EPA to periodically revise NAAQS, such revisions, like the original promulgation of NAAQS, are typically subject to years of costly litigation.

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[28] *See* 42 U.S.C. § 7410(a)(1), (2).

[29] 42 U.S.C. § 7410(a)(2)(D). If the Administrator finds that a SIP is substantially inadequate to attain or maintain a NAAQS, to mitigate interstate air pollution, or to comply with any other requirement of the act, he or she must publicly notify the state and establish reasonable deadlines for submitting SIP revisions to correct the deficiency. 42 U.S.C. § 110(k)(5). EPA used this authority, for example, in issuing its "NOx SIP call rule" to place new requirements on certain eastern states to address nonattainment of the ozone standard. *See* 63 Fed. Reg. 57356 (1998).

[30] Additional SIP requirements apply to nonattainment areas for the purpose of ensuring that states make reasonable progress toward attaining ambient standards. To this end, SIPs must provide that stationary sources institute "all reasonably available control measures as expeditiously as practicable," including application of reasonably available control technology ("RACT") for existing sources. 42 U.S.C. § 7502(c)(1). In addition, SIPs must provide require "reasonable further progress" toward attaining NAAQS by an applicable attainment date. *Id*. at § 7502(c)(2). SIPs must also require that new and modified stationary sources within the nonattainment area meet a stringent standard called the "lowest achievable emission rate." *Id*. at 7503(a)(2). New and modified major stationary sources must, in addition, obtain emission offsets for increased emissions of the nonattainment pollutant. *id*. at § 7503(a)(1), (c).

[31] *See* 42 U.S.C. § 7410(c)(1).

Second, the problems in establishing appropriate NAAQS for GHGs are amplified by the fact that EPA has no guidance on how to formulate a GHG standard that is "requisite" to protect either human health or welfare. Today, no state, country, or international body has formulated a numeric standard representing a "safe" level of ambient GHGs. Because there are significant gaps in the data needed to define and quantify risks associated with climate change and regulation, determining a "requisite" standard is particularly challenging. To complicate matters, and as EPA has acknowledged, climate change is a global phenomenon. Almost everyone agrees that if global reductions in emissions are to be achieved, the only effective way to do so is through concerted action by developed and developing countries. In light of this recognition, negotiations to establish an international framework have hastened in recent years and are scheduled to continue at the end of 2008 and in 2009, with the participation of the United States. If EPA were to establish a GHG NAAQS before an international agreement on GHGs is reached, there is a risk that the EPA standard would be incompatible with the internationally agreed upon targets. As a result, depending on whether the NAAQS were more or less stringent than the global target, either (1) EPA's NAAQS may undermine a global effort toward GHG reductions or (2) EPA's NAAQS would be impossible to attain based on other countries' continued emissions.

Third, as EPA has noted, if EPA sets a GHG NAAQS, it would necessarily have to designate the entire country as either in "attainment" or "non-attainment." The consequences of developing a NAAQS for GHGs cannot be understated, particularly if a NAAQS were set at a level below current ambient concentrations. Were this to occur, it would likely result in the imposition of stringent and costly measures to abate GHGs emissions within the states (and possible sanctions for failure to demonstrate attainment by a required date), with no real overall effect on the atmospheric concentrations of such gases, given their long atmospheric lifetime and numerous diverse sources around the world. In fact, given that non-U.S. emissions are continuing to increase, global concentrations of GHGs are highly likely to continue to increase even if United States emissions were reduced to zero. On top of this, stringent domestic measures and unattainable goals could force businesses to move abroad to remain competitive, thereby offsetting any perceived gains from domestic regulation. Indeed, if businesses relocated, it would likely result in a net increase in global GHG emissions. Products manufactured in countries with less-stringent GHG regulations could use more GHG-intensive processes, and transportation of these products back to the U.S. market would also increase GHG emissions. This GHG leakage and overall global increase would have a negative effect on the U.S. economy due to the job losses and lower domestic business investment, while not advancing the goals the domestic measures were intended to achieve.

Finally, the ANPR does not adequately address the risk of incoherent and conflicting regulation that is likely to result from using the NAAQS approach to regulate GHGs. Under the NAAQS approach, regulation is left primarily to states under section 110. This means that there is a potential for industry to face different regulatory requirements in different states. This could cause competitiveness problems among the states, leading industries to abandon states that contain "unfavorable" regulatory environments.

2. New Source Performance Standards Approach

a. Overview

Under CAA Section 111, the Administrator must develop a list of certain categories of stationary sources and develop new source performance standards ("NSPS") governing emissions from new and modified sources in those categories. More specifically, under section 111(b)(1)(A), the EPA Administrator "shall" include on a list a category of stationary sources "if in his judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[32] There are, today, over seventy categories and subcategories of sources on this list.[33]

After categories are listed pursuant to section 111(b)(1)(A), the CAA requires the Administrator to establish national emissions "standards of performance" for new, modified, or reconstructed sources within the listed category.[34] These standards must reflect the "degree of emission reduction achievable" through the best technology that has been "adequately demonstrated," taking into consideration "non-air-quality health and environmental impacts and energy requirements."[35] This limitation is sometimes referred to as that achieved by the best demonstrated technology, or BDT.

In addition to authorizing the promulgation of standards for categories of new sources, section 111(d) of the CAA creates a SIP-like procedure for states to submit to EPA regulations covering standards for existing source categories on the list, with certain exceptions.[36] These standards must conform to EPA guidelines before being approved, but states are primarily responsible for their development. Moreover, standards for existing sources must take into account factors that are not considered when setting performance standards for new sources, including the useful life of the existing facilities and the physical ability of installing control equipment at the facilities, as well as other factors.[37]

b. Problems with the NSPS Approach

There are numerous problems with the prospect of regulating GHGs from stationary sources under section 111. Chiefly, section 111 does not lend itself to efficient and effective mechanisms for achieving GHG reductions in the United States because, whereas the sources of GHG emissions are ubiquitous, the section focuses on setting standards for particular sources

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[32] 42 U.S.C. § 7411(b)(1)(A).

[33] 40 C.F.R. Part 60.

[34] 42 U.S.C. 7411(b)(1)(B).

[35] 42 U.S.C. § 7411. Where numerical emission limits are not feasible, EPA may establish NSPS as design, equipment, work practice, or operational standards. 42 U.S.C. § 111(h)(1).

[36] 42 U.S.C. § 7411(d). Section 111(d) prohibits regulation of a NAAQS pollutant under that section and it prohibits regulation of HAP from a source category that is regulated under section 112.

[37] 42 U.S.C. § 7411(d)(1).

that have been listed pursuant to section 111(b). An NSPS approach to GHG regulation would thus fail to create incentives for GHG reductions that could be felt throughout the U.S. economy, which means it is highly unlikely that section 111 regulations would achieve the relatively cheap reductions available in various sectors today (*e*.g, residential energy efficiency improvements). At the same time, regulation under section 111 could potentially place disproportionate burdens for GHG reductions on categories of sources that EPA has previously identified for entirely distinct regulatory purposes.[38]

In addition to being a poor tool to achieve meaningful and cost-effective GHG reductions, section 111 regulations for GHGs may lead to very costly controls that are unrealistic for certain sources. As explained above, the goal of NSPS is to "reflect the degree of emission limitation achievable through the application of the best system of emissions reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." Although the statute expressly authorizes EPA to consider costs in choosing the standard, EPA has stated that the systems on which a standard is based need not be actually in use or achieved in practice at potentially regulated sources or even at a commercial scale.[39] In addition, the benefits of an NSPS program may take years to be realized as the high compliance costs may provide a disincentive for industries to install new equipment or otherwise modify or reconstruct operations. Facilities have faced similar circumstances under the New Source Review program.

Furthermore, if EPA were to create a NAAQS for GHGs, it would severely limit the scope and effectiveness of a regulatory program under section 111 and place inordinate burdens on new stationary sources. As explained above, section 111(d) allows EPA to establish a SIP-like procedure for implementation of performance standards for categories of existing sources. But EPA may not use its 111(d) authority to regulate those pollutants that are already regulated under sections 108 and 109. In fact, were EPA to develop a GHG NAAQS after regulating existing stationary sources under 111(d), it is not clear whether the 111(d) standards would continue to be legally enforceable.[40]

This approach is also problematic inasmuch as reliance on CAA section 111(d) would likely lead to a patchwork of various controls. Section 111(d) authorizes EPA to make a SIP call to states to regulate certain pollutants, but the agency cannot mandate a particular approach. States are free to develop their own programs provided they are as stringent as the federal

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[38] EPA suggests that it may be appropriate to begin establishing performance standards for new and existing sources within certain existing source categories before considering whether to list any additional categories of sources based on their greenhouse gas emissions specifically.

[39] 73 Fed. Reg. 44354, 44487.

[40] The statute states that the Administrator cannot develop a procedure for states to develop standards for existing sources under section 111(d) for a NAAQS pollutant, but it is silent on the question of what the agency can or cannot do under sections 108 and 109 once section 111(d) standards are developed. 42 U.S.C. §7411(d)(1).

program. Thus, even if EPA were to develop NSPS for GHGs, there is no guarantee that they would be universally adopted.

3. The Hazardous Air Pollutant Approach

a. Overview

Like section 111, section 112 of the CAA gives the Administrator direct authority to establish and implement emission standards for certain sources. Section 112 requires EPA to regulate air pollutants classified as "hazardous" under section 112(b) from "major" and "area" sources.[41] Typically, hazardous air pollutants ("HAPs") are emitted at low volumes and have known direct health effects at low levels. Under section 112, sources must employ costly technologies to eliminate even small amounts of a HAP from their emissions. GHGs are not currently listed as HAPs.

Regulation of new pollutants under section 112 involves a two step process. The first step consists of the Administrator's listing hazardous air pollutants pursuant to section 112(b)(1)(A), which provides: "The Administrator shall, within 90 days after December 31, 1970, publish (and shall from time to time thereafter revise) a list which includes each hazardous air pollutant for which he intends to establish an emission standard under this section."[42] A pollutant may be listed based on human health effects or adverse environmental impacts.[43]

The second step of the process is the establishment by the Administrator of an emission standard for the pollutant.[44] Standards must reflect "the maximum degree of reduction in HAP emissions that is achievable, taking into consideration the cost of achieving the emission reduction, any nonair quality health and environmental impacts, and energy requirements." This standard is also referred to as the maximum achievable control technology, or MACT. For new sources, MACT must be set at a level that is at least as stringent as the level achieved in practice by the best controlled similar source.[45] For existing sources, MACT must be set at a level that is at least as stringent as the average emissions limitation achieved by the best performing 12 percent of sources in the category or subcategory (provided that there are at least 30 sources in the category or subcategory).

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[41] 42 U.S.C. § 7412(b).

[42] 42 U.S.C. § 7412(b)(1)(A)

[43] The 1990 CAA Amendments called specifically for an initial list of more than 180 substances to be regulated. The statute requires the Administrator to periodically revise this list by adding pollutants that "present, or may present, through inhalation or other routes of exposure, a threat of adverse human health effects . . . or adverse environmental effects whether through ambient concentrations, bioaccumulation, deposition, or otherwise . . . ." 42 U.S.C. § 7412(b)(2).

[44] 42 U.S.C. § 7412(b)(1)(B).

[45] 42 U.S.C. § 7412(d)(3).

b. Problems with the HAP Approach

EPA's suggestion that it may be appropriate to regulate GHGs as HAPs under section 112 raises a number of concerns, first of which is the fact that CO_2 is essential to sustaining all life on our planet so it would be facially absurd to characterize it as "hazardous." There is no legal or factual basis for EPA to conclude GHGs are HAPs and it would be arbitrary and capricious for EPA to regulate GHGs in this fashion.

In addition, it would be imprudent of EPA to regulate GHGs under section 112 even if it did have authority to do so. Of all of the main stationary source control programs available under Title I, section 112 carries the most onerous requirements for sources. This was, of course, by design, as section 112 is intended to address toxic pollutants that have direct health effects. Major sources under the provision must employ MACT, and they must do so within 3 years after a standard is promulgated. Thus, as soon as a control limit is available for relevant sources, it may become required, even if it is cost prohibitive. In many cases, there also may not be a control technology available or at least not within the three-year compliance period. In interagency review comments on the ANPR, the Department of Energy contended that, "Compliance with the standards under section 112 is required to be immediate for most new sources and within 3-4 years for existing sources. Such a strict timeline would leave little or no time for emission capture and reduction technologies to emerge, develop, and become cost effective."

Application of the very low "major source" thresholds in this section to GHGs would mean that EPA is required to regulate many small sources never previously regulated, including many commercial and institutional buildings, as well as some residences. A major source is defined by statute as one that emits or has the potential to emit 10 tons per year ("tpy") or more of any one HAP or 25 tpy of any combination of HAPs. There is no reason to believe that EPA could circumvent these statutory limits.

Moreover, there appears to be very little regulatory flexibility for innovative control programs under section 112. This is because the statutory language requires the establishment of emission standards for sources within "each category," and those standards cannot be less stringent than the "floor," or level of performance achieved by the best-performing sources within that category. Finally, as mentioned earlier, it is problematic to regulate as "hazardous" a substance that is requisite to sustaining all life on the planet.

4. New Source Review and Title V Permitting Requirements

As the ANPR recognizes, both the CAA's Prevention of Significant Deterioration ("PSD") program and Title V would apply immediately to GHGs if they were to become regulated pollutants under section 202 of the CAA. The ANPR downplays the implications of this outcome for potentially regulated entities and permitting officials, as well as broader implications for the nation's economy. Based on the emission thresholds for sources subject to these programs (250/100 tpy for PSD and 100 tpy for Title V), if GHGs were regulated pollutants, many more facilities would be subject to PSD and Title V requirements than ever before. Even by EPA's own estimations, which are admittedly incomplete, the increase in number of sources that would become newly regulated under these programs would very likely

overwhelm state and federal permitting authorities, causing massive delays and disruptions. This section discusses just some of the serious implications of regulating GHGs pursuant to the PSD and Title V programs, after giving brief overviews of both programs.

a. Overview of the New Source Review/Prevention of Significant Deterioration Program

When EPA has promulgated NAAQS, preconstruction review and permitting requirements apply to new and modified sources of criteria pollutants in all states, but the contours of those requirements differ depending on whether the sources are located in an attainment or nonattainment area. For areas that are in attainment with a NAAQS, sources are subject to the PSD program contained in Title I, Part C of the CAA. For areas that are in nonattainment with a NAAQS, sources are subject to the nonattainment New Source Review ("NSR") permit program found in Title I, Part D of the CAA. Under the PSD program, "major" sources are defined as those that have the potential to emit at least 250 tpy of a regulated pollutant or, if the pollutant is emitted from one of twenty-eight listed source categories, at least 100 tpy of a regulated pollutant.[46] In contrast, the nonattainment program defines "major" sources as those that have the potential to emit at least 10 to 100 tpy of a nonattainment pollutant, based on the particular pollutant and source location.[47] The overview and subsequent comments in this section will focus on the PSD program requirements, but will raise NSR issues where a particular comment is relevant.

The PSD program applies to new and modified major sources. Before an owner or operator can construct a major new source or undertake a major modification of an existing source in an attainment area, he must obtain a PSD permit that meets several requirements. First, the PSD permit must show how the source will comply with the ambient air quality levels designed to prevent deterioration of air quality, known as a PSD increment.[48] Second, the source must employ the best available control technology ("BACT") for each pollutant regulated under the Act that it will emit in "significant" amounts.[49] BACT is defined as the "maximum degree of [emission] reduction . . . achievable," and a BACT determination is based on the balancing of several factors, including economic, energy, and environmental impacts of alternate controls.[50] Third, it must avoid adverse impacts on federal "Class I" areas, which include designated Wilderness Areas and National Parks and are typically the cleanest areas.

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[46] 40 C.F.R. 52.21(b)(1).

[47] 42 U.S.C. § 182(b)-(e).

[48] 42 U.S.C. §§ 163, 166.

[49] "Significance" levels are published at 40 C.F.R. § 52.21(b)(23). BACT review is not required for HAPs for states that have been delegated authority to implement the federal PSD program of that have revised their PSD programs in response to the 1990 CAA Amendments.

[50] As previously mentioned, new and modified sources in nonattainment areas must meet a more stringent requirement of achieving the Lowest Achievable Emission Rate ("LAER"), which is defined as "the most stringent emission limitation" contained in any SIP or that is "achieved in practice" by the same or a similar source category, whichever is more stringent.

b. Implications of Regulating GHGs under the NSR/PSD Program

Were EPA to decide to regulate GHGs under section 202 or other provisions of the CAA, the implications under the PSD program for regulated sources, permitting authorities, and the national economy would be immediate, potentially vast and deleterious.[51] The ANPR gives short shrift to these implications, however, suggesting that PSD hurdles may be overcome through untested approaches of dubious legality.

The main problem that would arise, were GHGs to be covered by the PSD program, is the sheer increase in the number of construction and modification activities that would trigger PSD review. Today, EPA estimates that permitting authorities issue approximately 200 to 300 PSD permits nationally each year. The ANPR estimates a more than tenfold increase in the number of permits that would need to be issued in the event GHGs become a regulated pollutant.[52] Admittedly, this estimate does not even take into account sources that would come under regulation based on their "potential to emit," in addition to their actual emissions. Nor does EPA's estimate take into account the increase in permits that would be required for modifications to existing major GHG sources.[53] A recent report by the U.S. Chamber of Commerce estimates that, at a 250 tpy threshold for carbon dioxide, at least one million mid-sized to large commercial buildings and nearly 200,000 manufacturing operations emit enough CO_2 per year to become subject to PSD requirements.[54] This estimate does not account for sources with significant non-CO_2 GHG emissions, and like EPA's estimate, it is based on actual emissions, rather than a source's potential emit. Furthermore, should EPA choose to regulate GHGs under section 112, the corresponding major source threshold will be substantially lower for NSR permitting purposes. This would potentially trigger permitting requirements for an exponentially larger host of sources that could conceivably include the majority of business establishments in the nation.

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[51] The PSD program applies to each air pollutant (other than a HAP) that is "subject to regulation under the Act" within the meaning of sections 165(a)(4) and 169(3) of the CAA and regulations.

[52] *See* 73 Fed. Reg. 44354, 44499.

[53] *See* 73 Fed. Reg. 44354, 44499 ("Regulating GHGs under the PSD program would also cause a large increase in the number of modifications at existing sources that would be required to obtain PSD permits."). If GHGs become regulated pollutants, as of now, a modification of a "major" GHG source that increases emissions in *any* amount would be subject to PSD requirements. This is because the statute defines "modification" of a major source as any significant increase in emissions. EPA's regulations place limitations on what emissions increases may be regulated under PSD by defining "significant" emissions increases for several categories of pollutants. However, for those pollutants that do not have defined significance levels, such as greenhouse gases, any increase in emissions would constitute a "significant" increase unless and until EPA promulgates a rule setting a significance threshold for those pollutants.

[54] U.S. Chamber of Commerce, "A Regulatory Burden: The Compliance Dimension of Regulating CO_2 as a Pollutant," September 2008.

Importantly, EPA is severely limited by statutory authority to alleviate the problems raised here because the CAA defines "major source."[55] EPA suggests that it could ignore the "plain meaning" of the statute by relying on certain judge-made doctrines. However, courts seldom invoke these doctrines and, when they do, it is only in very limited circumstances. Most critically, these doctrines have never been applied to the relevant CAA provisions, and thus EPA's assertion that they could be applied to the PSD program is entirely speculative and, as the following discussion explains, extremely doubtful.

First, EPA suggests that it may ignore the 100/250 tpy thresholds set forth in the definition of "major emitting facility," found in section 169 of the CAA, because Congress likely did not intend to regulate relatively small GHG sources under the PSD program. However, this claim ignores the fact that courts will not even look to Congressional intent where, as here, the plain language of the statute is unambiguous.[56] Moreover, EPA has not offered clear evidence that the drafters of the statute unambiguously intended not to regulate GHGs from relatively small sources. Instead, it relies primarily on its own statements from legislative history and dicta from an opinion by the D.C. Court of Appeals three years after passage of the CAA Amendments, as well as the statement of a sole legislator about what sources should not be covered by the PSD program.[57]

Second, EPA suggests that it may ignore the PSD thresholds based on the doctrine of "administrative necessity," relying on statements from the D.C. Circuit in *Alabama Power Co. v. Costle*, 636 F.2d 323 (D.C. Cir. 1980). In *Alabama Power*, however, the court made clear that the bar is high for an agency seeking an exemption from the express dictates of a statute. Importantly, the agency cannot create exemptions to statutory requirements based upon the agency's perceptions of costs and benefits.[58] Thus, while it may be argued that the regulation of small GHG sources does provide some benefits in the form of reduced GHGs, it appears the agency cannot justify an exemption on the basis that the costs of regulation exceed the benefits. Moreover, the D.C. Circuit has acknowledged that it will not look favorably upon an agency's request for relief based on a prediction that regulation is infeasible, absent a good faith effort by the agency to fulfill its charge.[59] At this point, EPA's statements that permitting authorities will have the resources to cover all relatively small GHG sources under the PSD program are speculative and at odds with the agency's own cost estimates for the PSD program.[60]

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[55] The Act lists 28 specific categories of stationary sources that are considered "major" under the PSD program if they emit at least 100 tpy of any air pollutant. 42 U.S.C. § 7479(1). Other categories of stationary sources qualify as "major" sources only if they emit at least 250 tpy of any pollutant. *Id*.

[56] *U.S. v. Evinger*, 919 F.2d 381, 383 (5th Cir. 1990) ("If the statute is unambiguous, the court does not look beyond its express terms.") (citation omitted) ("We must take the intent of Congress . . . to be that which its language clearly sets forth") (citation and quotation omitted).

[57] 73 Fed. Reg. 44354, 44506.

[58] *Alabama Power*, 636 F.2d at 357.

[59] *Id*. at 359-60.

[60] In addition, EPA's discussion in the ANPR suggests that any attempt to set a higher cutoff for GHG major sources and/or significance levels would be entirely arbitrary because EPA does not have enough

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According to EPA's August 2008 NSR Information Collection Request, the average cost to a PSD permit applicant in 2007 was $125,120[61] and 866 hours. Importantly, each PSD permit also costs state permitting authorities $23,280 and 301 hours. Using EPA's very low-end estimate of a tenfold increase in PSD permits, if GHGs became a regulated pollutant under the current Act, and using EPA's own figure of 282 PSD permits issues in 2007, state agencies would spend over $65 million dollars and be required to commit 848,820 hours. In light of its own data and estimates, it is difficult to see how EPA can claim that state permitting authorities will have adequate resources to regulate GHGs under the Act.

In addition to the problem of significant increases in permitting demands, another obvious problem of regulating sources under the PSD program is the requirement that sources employ BACT for each pollutant that is "subject to regulation" under the Act.[62] As explained above, BACT is determined on a "case-by-case basis," taking into consideration energy, environmental, and economic impacts and other costs.[63] If GHGs were subject to regulation, these case-by-case BACT determinations have the potential to overwhelm permitting authorities and result in severe construction delays that would be felt by many entities, including those not directly subject to PSD requirements. EPA cavalierly suggests that it may get around this case-by-case requirement using the judge-made doctrine of administrative necessity. Again, however, EPA's suggestion that it might be able to substitute "presumptive BACT" or employ general permits[64] for case-by-case decision-making, in order to streamline the PSD permitting process, would likely face a viable legal challenge because there is no statutory authorization for these shortcuts. In any event, use of presumptive BACT or general permits would constitute only a partial solution to the dramatic increase in permitting demands that would flow from regulation of GHG sources under the PSD program.

Finally, new and potentially significant developments in application of the PSD program to GHGs warrant caution on EPA's part. On November 13, 2008, the Environmental Appeals Board ("EAB") issued its decision in *In re: Deseret Power Electric Cooperative* (PSD Appeal No. 07-03). At issue in that case was whether EPA Region 8 properly concluded that GHGs are

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data to estimate the number of sources likely to be affected at various cutoff levels, nor can it point to scientific literature that establishes a specific numeric threshold below which GHG emissions might be considered *de minimis.* *See* 73 Fed. Reg. 44354, 44505. At the same time, there is no rational reason, grounded in the statute, for EPA's suggestion that it could tailor PSD applicability for GHGs to cover a similar universe of sources to the universe now regulated for other pollutants, or that it could chose a major source size based on GHG cutoffs from other regulatory programs. *Id.*

[61] EPA, Information Collection Request for Prevention of Significant Deterioration and Nonattainment New Source Review (40 CFR Parts 51 and 52), August 2008.

[62] 42 U.S.C. § 7475(a)(4).

[63] 42 U.S.C. § 7479(3).

[64] 73 Fed. Reg. 44354, 44508-10.

not "subject to regulation under [the Clean Air Act]," and hence not subject to PSD. Although EAB rejected the argument advanced by some that the phrase "subject to regulation" has a plain meaning that unambiguously includes GHGs, it nevertheless found that the administrative record for the Region 8's permitting decision does not support its conclusion that "subject to regulation" means "subject to a statutory or regulatory provision that requires actual control of emissions of that pollutant." It thus remanded the permit back to Region 8 for it to reconsider whether to impose BACT on GHGs in light of the fact that it is not "limited by an historical Agency interpretation" of what it means to be "subject to regulation."

NPRA believes that EAB's decision in this matter in fundamentally flawed and that it should have deferred to the interpretation shared by the Administrator, the Office of Air and Radiation, the Office of General Counsel, and Region 8 that GHGs are not regulated air pollutants. EAB's decision is simply not true to EPA's longstanding interpretation of "subject to regulation" as requiring actual controls or the Board's charter. Regardless, NPRA does agree with the EAB that if EPA intends to change its historical interpretation the agency should do so through notice and comment rulemaking and not within the context of a specific permitting proceeding.

c. Overview of Title V

Title V of the 1990 CAA Amendments requires each state to develop and implement a comprehensive operating permit program for most sources of air pollution. This program facilitates enforcement by requiring that all federal regulations applicable to a source be contained in one single document. Typically, each state administers its own Title V permit program, but EPA retains authority to review and approve the state's program, as well as individual permits.

Title V requires a state program to provide for permitting of any major stationary source that has the potential to emit 100 tons or more of any air pollutant, as well as any "major source" as defined by section 112 of the CAA (which, as discussed above, includes sources that emit 10 tpy of one HAP or 25 tpy of more than one HAP). Title V may require major sources to obtain permits even when no NAAQS has been promulgated. These permits would have to contain any "applicable requirements," such as state opacity limitations. Because Title V's "major source" definition uses lower emissions thresholds than that of the PSD program,[65] Title V applies to more sources than the PSD program.

Title V permit applications must contain detailed information, including all emissions of pollutants for which the source is major and all emissions of regulated air pollutants, a description of air pollution control equipment, and identification of all federal air pollution control requirements. Moreover, a responsible corporate official must certify the truth, accuracy, and completeness of the application.[66] Before issuing a permit, the permitting authority must

[65] As explained above, many sources are not regulated under the PSD program unless they have the potential to emit 250 tpy of a regulated pollutant.

[66] 40 C.F.R. § 70.5(d).

provide procedures for public notice and comment, as well as the opportunity to hold a public hearing on the draft permit.[67] Moreover, once the permit is issued, permittees are subject to semi-annual self-reporting requirements.

d. Implications of Regulating GHGs Under Title V

Application of Title V to sources based on their GHG emissions would create some of the same types of serious problems raised in the PSD context, as well as several additional difficulties. The discussion herein will focus on a subset of these problems.

Most importantly, if GHGs became "regulated pollutants" under the CAA, even more sources would be subject to regulation under Title V than under the PSD program because, as explained above, the Title V applicability threshold is 100 tpy for all source categories (rather than 250 tpy for certain categories under the PSD program). According to EPA's own estimates, more than 550,000 additional sources would require Title V permits, a staggering number that is more than 35 times greater than the approximately 15,000 to 16,000 sources currently regulated under Title V. Newly regulated sources would include residential and commercial buildings.

Moreover, regulatory deadlines make Title V particularly problematic as applied to a newly regulated pollutant traceable to so many sources, like GHGs. Title V requires sources to submit permit applications within one year of a source becoming subject to the program, which means that if GHGs were to become subject to control requirements, many sources would be applying for Title V permits in a small window of time. As a result, permitting authorities would face unrealistic Title V permit processing demands. Such demands would likely make it impossible for authorities to act on Title V applications within 18 months, as generally required, which will likely ignite a wave of litigation over missed deadlines, increasing uncertainty for small businesses in an already uncertain economy.[68]

NPRA's members may be directly and adversely affected by permitting delays caused by the expansion of Title V were GHGs to become regulated under the CAA. Faced with tight refining capacity margins, the industry since 1994 has annually increased refining capacity by more than 183,000 barrels per day (the equivalent of a mid-sized refinery). Not only could additional capacity expansions be delayed by these permitting backlogs, but substantial new refineries being planned in Arizona and South Dakota could also be adversely affected by these Title V permitting delays.

Finally, as applied to GHGs, Title V would very likely involve large costs with little or no environmental benefit. The primary purpose of Title V is to improve compliance with CAA requirements and facilitate enforcement. However, requirements imposed on small sources that are regulated solely by virtue of their GHG emissions are likely to be limited, thereby making the need for compliance assurance less pressing for these sources.

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[67] 40 C.F.R. § 70.7(h).

[68] 42 U.S.C. § 7661b(c).

C. EPA's ANPR Disregards the Potential for Duplicative Regulation.

In addition to the problems identified above, NPRA is also concerned about the possibility that multiple and potentially conflicting approaches could be adopted at the state and federal levels, an issue that EPA's ANPR does not adequately address. Many states, such as California, have adopted requirements relating to GHGs. Members of Congress are also considering several different proposals for GHG regulation at this time. Thus, industries are genuinely concerned that they could be subject to a patchwork of requirements that are at best out of sync and at worst conflicting (*e.g.*, a regional cap-and-trade approach conflicting with mandatory controls). Nor is there any guarantee that any future federal legislation would repeal or otherwise trump existing CAA requirements once EPA starts down that path. Consequently, EPA should not go forward using the current CAA to regulate GHGs.

D. If EPA Were to Regulate GHGs Under the CAA, the U.S. Would Be the Only Country to Attempt to Address Climate Change Through An Out-Dated, National Air Pollution Permitting Program.

As further evidence of the impropriety of regulating GHGs under the CAA, a decision to regulate GHGs under the existing CAA framework would place the United States alone in the world in application of an out-dated local pollution law to address a global problem. While the CAA's air permitting framework, like similar programs in other countries, is well-suited to address local pollution impacts, it is fundamentally incapable of addressing the global impacts of GHG emissions. Other countries have recognized this critical limitation of their air permit programs and have specifically chosen to exclude GHG emissions from source-specific permitting absent localized impacts. A decision to regulate GHGs under the existing U.S. CAA framework would essentially mean the adoption of an approach rejected in the rest of the world and could have a devastating effect on an already strained U.S. economy.

E. Comments on EPA's Technical Support Document for Stationary Sources.[69]

NPRA disagrees with EPA's assessments of the GHG emissions benefits of flare gas recovery and delayed coker depressurization control. As noted in the TSD, EPA has recently promulgated a refinery NSPS that will likely curtail or require recovery of material amounts of flare gas. In other words, EPA has already implemented a regulatory program to address this option, so its benefits will already be incorporated and therefore will not provide any additional benefits as part of a GHG regulatory program. This would also apply to delayed coker requirements that are included as part of the refinery NSPS rule.

Some of the controls EPA lays out in the TSD will create competing and conflicting objectives. Many requirements to reduce criteria pollutants will likely increase energy intensity

[69] See *Technical Support Document for Advanced Notice of Proposed Rulemaking for Greenhouse Gases; Stationary Sources, Section VII,* EPA-HQ-OAR-2008-0318-0081.

and could lead to GHG increases. Combined Heat and Power ("CHP") is a classic example where conflicts may arise. CHP is not a solution that will work in all situations, because in order for it to be successful, a steam host is needed along with a regulatory framework to facilitate access to the electric grid in order to sell the excess power. Efforts to achieve these requirements often meet resistance from the utility industry, as well as regulatory barriers which deter CHP project development. For instance, in some areas of the country, electric grid access is difficult or impossible due to complex interconnection rules and/or infrastructure constraints, making CHP projects economically challenging at best. In addition, adding more efficiency standards on top of existing efficiency requirements only adds more complexity and confusion to any potential project, including complexities regarding safety considerations relating to that project. For the refining industry, safety always comes first and must remain an objective that cannot be compromised.

The TSD discusses opportunities for retrofits, but it should be stressed that in some cases retrofits may not be feasible. As noted in our NSPS comments, some retrofits for process heaters are not feasible due to space constraints that do not allow additional control equipment to be installed. In addition, even newly built boilers may not be able to be retrofitted, given the complexity and specificity of some of the controls.

EPA suggests using a benchmark approach to gauge refinery operations, likely a ton/bbl approach. This methodology is inappropriate for our industry, as it does a poor job of recognizing differences in process complexity and severity, and of accounting for variations in both crude selection and product output. Because of these significant limitations, a simple ton/bbl approach is generally not representative of actual, individual refinery operations, which are very diverse and complex. Developing a benchmark methodology that adequately represents this diversity and complexity requires significant further study.

The industry generally supports work practice standards, but only if they are developed with significant industry input and are not overly prescriptive. To maximize flexibility, the work practice standards must allow the use of alternative work practices that recognize operational differences and the resulting need for operational flexibility where such practices provide equivalent emission reductions. The industry believes that overly prescriptive regulations could often compromise safety, an outcome that cannot be permitted to occur under any circumstances.

While the TSD outlines opportunities for refineries through energy efficiency projects, even these are limited. Energy efficiency is likely a source of reductions in the refinery, but the magnitude of absolute reductions is unlikely to be significant relative to the refinery total emissions. With high fuel prices over much of the last five years, refiners have already spent large amounts to achieve the highest efficiencies practical at their facilities. A great deal of the energy efficiency "low hanging fruit" has already been picked.

IV. Comments on Fuels Issues Raised by the ANPR.

EPA's ANPR requests comments on a number of significant issues regarding the transportation sector, including how a long term GHG target for the transportation sector should be established, how the fuels sector should contribute to that goal, and what role a low carbon

fuels standard ("LCFS") should play in the potential program. Unfortunately, EPA's ANPR fails to deal with many of the fundamental legal, scientific, and policy issues associated with setting a GHG standard for fuels today.

First, not all sectors are in the same position today. Under the Energy Independence and Security Act of 2007 ("EISA"), the fuels sector is already facing mandates that may not be achievable. Specific GHG reductions are required under these mandates. It is ill advised to regulate further when serious questions remain about what is possible even under existing mandates. Second, significantly more scientific research needs to be conducted before government can consider creating a LCFS. As discussed below there is serious concern in the scientific community over what tools are even available or obtainable to achieve such a standard. Third, even if the science were available today, such a standard cannot and should not be implemented in isolation from other significant technical issues and without consideration of fundamental national concerns. Energy security, a stable energy supply, and the fundamental health of the American economy are factors that must be considered, and which the notice fails to adequately address. In particular, the stability of our energy supply is dependent on full use of all available supply options. Any approach that cuts off these options is unwarranted, would jeopardize energy security and could have serious economic consequences, both regionally and nationally. These points are elaborated further below. They demonstrate that it is simply premature to frame a new fuels program until these issues are thoroughly assessed (and a serious national dialog takes place on the costs and benefits of further GHG reductions in the fuels sector).

A. Do No Harm.

A key principle to follow in developing policy recommendations is "do no harm." Policymakers should carefully consider the potential impact of policies on the environment, energy security, and consumers. Unfortunately, well-intentioned regulations or legislation, especially involving energy and environmental policies, can and do have significant unintended negative consequences. An example of such consequences can be seen with biofuels mandates that are being rethought across the globe amid serious economic and environmental concerns. EPA would do well to exercise caution before imposing any new requirements.

To ensure energy security, legislatures and regulators should consider all potential impacts of new policy changes prior to imposing them on the refining sector, which already faces significant operational challenges. This is particularly the case as EPA examines a low-carbon performance standard for our nation's fuel supply. Policy makers must recognize existing federal motor fuels policy, and work to prevent duplicative, costly and potentially competing new regulations while addressing fuels in climate regulation or legislation. They must also look to avoid the pitfalls of regulatory policies of the past, many of which indicate that any type of LCFS could be either unachievable or carry significant, adverse consequences for consumers and our nation's energy security.

One need only look at our nation's Renewable Fuels Standard ("RFS") – which was dramatically expanded by EISA (also referred to later in this document as "EISA RFS2") – to see the potential pitfalls of advancing regulation without fully understanding the consequences. Despite already being the law of the land, the RFS faces several hurdles that, if not overcome,

could have significant adverse impacts on our nation's fuel supplies and consumers in the very near future.

1. There are several challenges with E-85 and mid-level ethanol blends that must be met in the very near future for the RFS to be achievable.

Failure to demonstrate sufficient certainty in regards to the cost/benefit relationship of the RFS program - as well as the impact on consumers of motor fuels – raises achievability and economic concerns in the near term. Such factors have challenged other attempts such as the California ZEV and M85 programs as well as efforts over the last ten years to develop markets for E-85 fuels.

Given the volumes of ethanol and other alternative fuels required under EISA, the inability of our nation's automobile fleet to accommodate transportation motor fuels containing more than ten percent ethanol will soon become a significant issue - possibly as early as the 2010-2012 time frame. The costs and logistical consequences of converting the nation's engines to accommodate higher levels of ethanol represent enormous engineering hurdles that we believe will require a reexamination of the objectives set forth in EISA. Even if it were realistic to expect that "overnight" the engine composition in America could be changed to adjust for higher ethanol blends, there are still no projections of when and to what extent second-generation fuels such as cellulosic ethanol – mandated in large quantities as early as 2010 under EISA - will be available.

In addition to the lack of physical availability of volume and the inability of conventional engine motor vehicles to accommodate that volume, there is no expectation that E-85 sales will substantially contribute to meeting the renewable mandates of EISA as long as the poor purchasing economics continue for the consumer. E-85 is a mixture of 85 percent ethanol and 15 percent gasoline and can only be used in Flexible Fuel Vehicles ("FFVs") – cars capable of running on either gasoline or E-85. There are a relatively small number of these vehicles on the road and this percentage is projected to increase only slowly in coming years. Unfortunately, any attempt by industry or government to entice increased purchases of E-85 by selectively lowering the street price of E-85 via additional subsidies or mandates will also introduce the likelihood of improper fuel purchases by cost-conscious consumers that do not have FFVs. This situation would cause an increase in fuel-related failures in incompatible motor vehicles and/or small engine equipment that are not designed for E-85. There are currently no physical means or procedures in the E-85 fuel distribution system to prevent consumers from using E-85 fuel in non-compliant engines. In short, the American driving consumer is set up for mass confusion and harm in the near future.

A gallon of ethanol also has lesser energy content than a gallon of gasoline. According to the Department of Energy's Office of Energy Efficiency and Renewable Energy, FFVs get "about 20-30% fewer miles per gallon when fueled with E-85."[70] (A gallon of biodiesel also has

[70] U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Fueleconomy.gov: http://www.fueleconomy.gov/feg/flextech.shtml.

a lower energy content than a gallon of diesel fuel.[71]) Therefore, increased use of E-85 (and biodiesel) is – at best - an RFS compliance strategy rather than sound energy policy, the implementation of which will displace only a fraction of demand for transportation fuels because of energy content and fuel economy differences. In addition to these factors, E85 will likely come at a higher cost to consumers. The Automobile Association of America (AAA) publishes a daily "Fuel Gauge Report" comparing average fuel prices. The report contains a BTU adjusted price for E-85 based on its lower energy content. Over the last several months, the BTU adjusted price of E-85 has regularly been anywhere from 30-80 cents per gallon more expensive than regular gasoline.[72]

Not only are consumer costs a problem, but there will be significant investment requirements imposed on retail stations to offer E-85 to a reluctant public. As the Energy Information Administration ("EIA") has noted that, "estimates for replacing one gasoline dispenser and retrofitting existing equipment to carry E-85 at an existing fueling station range from $22,000 to $80,000 (2005 dollars), depending on the scale of the retrofit. By these estimates, the total investment cost for installation of biofuel pumps would range from about $0.8 billion to about $3 billion."[73] These are described in Appendix B.

The limited number of FFVs will become even more of a problem as significantly larger volumes of renewable fuels are to be forced into the market due to EISA mandates. As previously mentioned, the only vehicles that can operate on fuel blended with more than 10 percent ethanol (known as "E-10") are FFVs. The Alliance of Automobile Manufacturers' website (www.discoveralternatives.org) notes there are currently 11 million alternative fuel vehicles on American roads – a small fraction of the 240 million plus vehicles Americans are driving today.[74] The National Ethanol Vehicle Coalition estimates about 6 million of these are FFVs.[75] In addition, over the next several years, automakers have indicated that while they intend to produce more FFVs, they will still be producing gasoline-only (*i.e.* E-10 compatible) vehicles at a rate of about seven or eight to one in relation to FFV production. As previously mentioned, the new ethanol mandate will most likely require fuel blends in excess of E-10 possibly as early as 2010. However, the automakers statements indicate that in addition to existing legacy vehicles (*i.e.*, cars that have been purchased up to this point in time that run only on gasoline and won't be retired for several years), there will be a significant portion of newer vehicles entering the fleet that may be unable to operate on blends greater than E-10.

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[71] EPA, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions, Draft Technical Report," EPA420-P-02-001, October 2002: http://www.epa.gov/otaq/models/analysis/biodsl/p02001.pdf.

[72] AAA Daily Fuel Gauge Report: http://www.fuelgaugereport.com/.

[73] U.S. Energy Information Administration, "Energy and Economic Impacts of Implementing Both a 25-Percent Renewable Portfolio Standard and a 25-percent Renewable Fuels Standard by 2025," August, 2007, p. 6.

[74] U.S. Department of Transportation, Bureau of Transportation Statistics, "National Transportation Statistics 2007":
http://www.bts.gov/publications/national_transportation_statistics/html/table_01_11.html.

[75] http://www.e85fuel.com/e85101/faqs/number_ffvs.php.

Some have argued that "intermediate ethanol blends," such as E-20, may represent a way to expand direct ethanol blending in the gasoline pool to meet the higher mandates. This presumes that such blends could be used in conventional engine (non-FFV) vehicles. Determining that this is the case will require significant further study, as there are a number of major hurdles facing the integration into and use of intermediate ethanol blends in the fuel supply. Foremost among these is the fact that most of the nation's vehicle fleet on the road and new models being sold today are built with fuel system materials that not are designed to withstand fuel ethanol concentrations greater than E10. The auto manufacturers have made clear that use of E10+ in anything but a flex fuel vehicle voids the warranty. In addition, the fuel metering systems are not designed to optimize the fuel mixtures over the wide operating range of fuel oxygen of 0 to 7 wt% associated with a E20 fuel. Therefore, random fuel purchases between E0 and E20 fuels in the marketplace can contribute to poor operating performance and higher exhaust emissions.

In addition to vehicles and infrastructure, the material compatibility risk and operating range limits for the nation's 500 million smaller off road engines are even a greater concern because most of them use simple carburetors for fuel metering instead of the more sophisticated injections systems used in most motor vehicles.

2. The RFS will likely continue to exacerbate the global food versus fuel issue.

Not only are biofuels more costly and less efficient than gasoline from a fuel supply perspective, but biofuels mandates have led to price increases for food and unintended environmental consequences. Several trade associations representing grocers to restaurant owners to cattlemen note how biofuels mandates have dramatically increased the price of corn, making feed for livestock and cattle more expensive. This situation translates directly into higher food prices for American consumers. A FarmEcon.com study noted: "The ethanol subsidy program is now increasing the cost of food production through side effects on major crop prices and plantings. The cost increases are already starting to show up in the prices of meat, poultry, dairy, bread, cereals and many other products made from grains and soybeans."[76] The OECD has also expressed concern over the "food-vs-fuel" conflict that has arisen from biofuels mandates.[77] See Appendix C for more information on this topic.

3. First generation biofuels have adverse environmental impacts.

Recent studies have also noted the negative impacts biofuels mandates are having on the environment. An Environmental Defense report revealed how a dramatic increase in ethanol

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[76] Dr. Thomas Elam, *Fuel Ethanol Subsidies: An Economic Perspective*, FarmEcon.com, September 19, 2007, p. 2.

[77] Richard Doornbosch and Ronald Steenblik, *Biofuels: Is The Cure Worse Than The Disease?*, Organisation for Economic Co-operation and Development , September 2007.

plants is draining the Ogallala Aquifer, which stretches from Texas to Wyoming.[78] The National Academy of Sciences has also written a report on the negative water supply impacts of increased biofuels production.[79] Press reports from last year described how an increase in farm waste from the corn boom flowing into the Mississippi River has greatly exacerbated an area off the Louisiana coast where shrimp and other sea life cannot survive.[80]

Dr. S. Kent Hoekman, Desert Research Institute, identified the following environmental concerns with biofuels:

- Water quantity and quality
- Runoff of nutrients and agricultural chemicals
- Long-term impacts of crop residue removal
- Disruption of habitat
- Effects of biodiversity
- Sustainability of agricultural and forestry practices[81]

He also listed potential emissions and health issues:

- Feedstock production:
  - Increased pesticide use
  - Genetically modified crops
- Fuel manufacturing processes:
  - By-products of enzymatic degradation, fermentation, pyrolysis, gasification, etc.
- Fuel distribution and storage:
  - Spills and leaks[82]

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[78] Martha G. Roberts, Timothy D. Male, Theodore P. Toombs, "Potential Impacts of Biofuels Expansion on Natural Resources: A Case Study of the Ogallala Aquifer Region," Environmental Defense, October 2007.

[79] National Academy of Sciences, "Report in Brief: Water Implications of Biofuels Production in the United States," October 2007.

[80] Tony Cox, "Ethanol Demand Seen Harming U.S. Fishermen," Bloomberg, July 23, 2007.

[81] "Biofuels on the Rise," presentation at the Health Effects Institute Annual Conference, April 27, 2008: http://www.healtheffects.org/Slides/AnnConf2008/Hoekman.pdf.

Mike Shapiro, EPA's Deputy Assistant Administrator in the Office of Water, recently listed several water quality concerns from biofuels:

- Increased use of nutrients, pesticides
- Increased erosion
- Loss of habitat, soil carbon
- Loss of corn/soybean rotations
- Use of distillers' grain for animal feed – high P content
- Increase runoff from marginal lands converted to corn production[83]

While these studies are relatively new, all point in one direction — the environmental impacts of biofuels mandates are severe.

4. Biodiesel and ethanol may contribute to increases in ozone levels (smog) during the summer.

EPA has concluded that biodiesel reduces fuel economy because of its lower energy content and increases NOx emissions, which in turn contributes to greater ground-level ozone formation. [84] It is also well known that ethanol increases the Reid vapor pressure ("RVP") of gasoline. Higher-level ethanol blends will result in higher VOC emissions, another ozone precursor, in the summer months.

5. Cellulosic ethanol may not provide an answer to the problems associated with first generation biofuels.

While many point to cellulosic ethanol as a potential solution to some of the GHG emissions problems with first generation biofuels, it does not overcome the previously mentioned vehicle, infrastructure, and environmental problems. In addition, it poses its own set of challenges. Cellulosic ethanol technology is still very costly and is not yet commercially available – let alone produced at levels adequate to meet EISA's mandates. Early last year, the EIA noted, "Capital costs for a first-of-a-kind cellulosic ethanol plant with a capacity of 50 million gallon per year are estimated by one leading producer to be $375 million (2005 dollars), as compared with $67 million for a corn-based plant of similar size, and investment risk is high

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(continued)

[82] Ibid.

[83] Presentation to the Farm, Ranch, and Rural Communities Federal Advisory Committee on March 13, 2008, page 12: http://www.epa.gov/agriculture/frrcc/pdf/Mike%20Shapiro%20-%203-13-08.pdf

[84] *See* http://www.epa.gov/otaq/models/analysis/biodsl/p02001.pdf.

for a large-scale cellulosic ethanol production facility."[85] The report noted that given those costs, no cellulosic plant had been built or was in operation at that time (February 2007). At that same time last year, the Department of Energy announced they were allocating $385 million to help fund six cellulosic ethanol plants that would produce about 130 million gallons annually, but it is highly unlikely those plants will be producing at full capacity in time to meet EISA's mandates.[86]

The Energy Policy Act of 2005 included a cellulosic ethanol mandate of 250 million gallons starting in 2013. The Food and Agriculture Policy Research Institute ("FAPRI"), however, projects only about 213 million gallons of cellulosic ethanol may be produced in that year.[87] This adds little support to the argument that a mandate will drive the technology and economics of producing a certain product. As previously mentioned, the new energy law mandates 100 million gallons of cellulosic ethanol in 2010 – only a year from now. FAPRI's estimate on cellulosic production for that year is only 27 million gallons – 27 percent of what is required in the law. That's significant ground to make up in a short time frame. In addition, a recent Congressional Research Service Report on cellulosic ethanol raises uncertainty over the achievability of the cellulosic targets in EISA. The report states:

> "Cellulosic biofuels are produced on a very small scale at this time – significant hurdles must be overcome before commercial-scale production can occur. The renewable fuels standard (RFS), a major federal incentive, mandates 100 million gallons per year (mgpy) of cellulosic biofuels use in 2010. After 2015, most of the increase in the RFS is intended to come from cellulosic biofuels, and by 2022, the mandate for cellulosic biofuels will be 16 billion gallons. Whether these targets can be met is uncertain. Research is ongoing, and the cellulosic biofuels industry may be on the verge of rapid expansion and technical breakthroughs. However, at this time, only two small refineries are scheduled to begin production in 2009, and an additional nine are expected to commence production by 2011 for total output of 200 mgpy per year, compared with an RFS requirement of 500 mgpy in 2012."[88]

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[85] U.S. Energy Information Administration, "Biofuels in the U.S. Transportation Sector," February 2007: http://www.eia.doe.gov/oiaf/analysispaper/biomass.html.

[86] Wong, Jetta, "U.S. Bioenergy Policies: What is Currently Being Done and What Needs to be Done?", Environmental & Energy Study Institute, May 8, 2007, p. 13: http://www.eesi.org/publications/Presentations/2007/jw_swedish_5-8-07.pdf.

[87] Food and Agricultural Policy Research Institute, "World Biofuels: FAPRI 2007 Agricultural Outlook," p. 319.

[88] Capehart, Tom, "Cellulosic Biofuels: Analysis of Policy Issues for Congress," Congressional Research Service Report for Congress, Report # RL34738, November 7, 2008, summary page.

Failure to meet these figures could prevent refiners from complying with the law's targeted volumes, leading not only to cost increases from unavoidable and onerous financial penalties and a tight RFS credit market, but potentially creating significant supply shortages.

These realities highlight the fact that advanced biofuels are not available in sufficient commercial quantities. This situation presents additional obstacles to meet the EISA RFS2 mandates. Although DOE has been liberally providing multi-million dollar grants to various projects for some time now, the technology for cellulosic ethanol via fermentation has still not been commercially developed. Even if a cellulosic fermentation ethanol process eventually makes a process technology break-through, some researchers believe it would not be economically competitive with corn-based ethanol or reduce food price security risk.[89]

Furthermore, the current credit problems may inhibit investment in the necessary R&D to bring new technology products, like cellulosic ethanol, to the market in commercial volumes.

6. There are still several questions as to whether biofuels can meet the GHG reduction requirements mandated in EISA.

In EISA, Congress for the first time imposed requirements for GHG reductions from the fuel supply on a "lifecycle" basis. These requirements obligate EPA to consider and account for

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[89] Crop-Based Biofuel Production under Acreage Constraints and Uncertainty, Mindy L. Baker, Dermot J. Hayes, and Bruce A. Babcock, Center for Agricultural and Rural Development, Iowa State University, Paper prepared for presentation at the American Agricultural Economics, Association Annual Meeting, Orlando, FL, July 27-29, 2008. The study states:

> "Our results lead to some general conclusions about the future of biofuels in the United States. Competition for land ensures that providing an incentive to just one crop will increase equilibrium prices of all… In order for switchgrass ethanol to be commercially viable, it must receive a differential subsidy over that awarded to corn-based ethanol. Since switchgrass competes for the same acres as corn, and corn-based ethanol is less expensive to produce, corn-based ethanol will always have a comparative advantage over switchgrass ethanol with a homogeneous subsidy.
>
> Corn and soybeans compete for the same acreage, so when energy prices are such that corn-based ethanol is stimulated, then the price of soybeans must also increase if the farmer is to continue to allocate land to soybeans. This increase in soybean prices reduces the profitability of biodiesel even in scenarios in which energy prices are high. This means that under pre-EISA subsidy levels, the soy oil biodiesel sector is not viable under any energy price considered. If the EISA mandates are to be met in a voluntary fashion, then the biodiesel sector will require a higher relative subsidy than it enjoys today.
>
> We calculate the subsidies required to stimulate biofuel production to the levels required by the EISA RFS. We find that subsidy levels are needed in the range of $0.22 to $0.78 per gallon for corn ethanol, $1.97 to $2.90 per gallon for biodiesel, and $1.55 to $2.11 for cellulosic ethanol. Crude oil price realizations in the future will determine the subsidy levels required to maintain industry sizes required by the new RFS. The new RFS results in much higher commodity prices than in the baseline. This suggests that the cellulosic mandates in the EISA that appear designed to avoid the feed-versus-fuel trade-off may actually exacerbate the situation relative to a situation in which corn-based ethanol is allowed to expand. Cellulosic ethanol is more expensive to produce, and switchgrass-based ethanol is more land intensive than corn-based ethanol."

factors such as direct and indirect land use when determining the "lifecycle" GHG emissions associated with biofuels. This first time linkage between biofuels production and their resulting GHG "footprint" reveals an inherent contradiction between a policy encouraging greater reliance and use of these alternative fuels and another policy that begins to try and control global GHG emissions. This inherent contradiction, not to mention the challenges posed by simply trying to conduct lifecycle analysis ("LCA") for GHG emissions, provides a perfect illustration of the hazards created through hastily developed public policy. Concurrently, it exposes the underlying weakness behind the premise of any sort of a LCFS.

Despite the mandate for a LCA in EISA, Congress remarkably exempted or "grandfathered" renewable fuel produced from production facilities either in existence or under construction on the date of enactment (December 17, 2007) from the LCA requirement. Many of these plants are coal-fired. This exemption has the effect of making more than 13 billion gallons of crop based ethanol and biodiesel exempt from any lifecycle GHG emissions reduction requirement. Several recent studies since EISA enactment have concluded the quantified GHG impacts of first generation biofuels create an exponentially larger "carbon footprint" than conventional gasoline. As a result, it now appears that there will be billions of gallons of ethanol and biodiesel produced over the next decade that ***must*** be blended into our nation's fuel supply and that will dramatically ***increase*** GHG emissions.

Ethanol and biodiesel are hydrocarbons – they are not carbon-free. Biofuels are often perceived as carbon-neutral because the carbon released when combusted is recycled as the biomass feedstock is grown. However, many scientists are concerned that the GHG emissions resulting from biofuel production and associated agricultural practices could effectively negate or even reverse any reduction in emissions that could be achieved by significantly expanding the use of ethanol as a transportation fuel. Nobel Prize winner Paul Crutzen concluded that increased biofuels production is accompanied with a dramatic increase in emissions of N_2O, which has nearly 300 times greater warming potential than CO2.[90] This would offset all GHG emissions reductions from the displaced petroleum fuels and actually result in a net increase in total GHGs. In fact, the European Union recently passed a law that may essentially ban certain biofuels due to alleged adverse environmental impacts.[91]

A large increase in the production of biofuels could lead to further deforestation and land clearing to grow crops as a feedstock for biofuels, which can increase GHG emissions. Carbon in the soil and plants is released during these processes and can be higher than the reduction in carbon releases by replacing fossil fuel combustion with biofuel combustion. It would take many years for these increased GHG emissions to be offset by the decreased GHG emissions from the replacement of fossil fuel with biofuel combustion – a biofuel carbon debt. This biofuel carbon debt is substantial and is projected to take decades or centuries from which to recover.

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[90] P. J. Crutzen, A. R. Mosier, K. A. Smith, and W. Winiwarter, "N_2O Release from Agro-Biofuel Production Negates Global Warming Reduction by Replacing Fossil Fuels," Atmospheric Chemistry and Physics Discussions, August 1, 2007.

[91] John W. Miller, "EU is Planning Measures to Protect Biofuels Industry," January 23, 2008, P. A11.

Several analyses outline the land-use impacts from biofuels production. The following are excerpts from two studies published in 2008:

> Ethanol from corn produced on newly converted U.S. central grasslands results in a biofuel carbon debt repayment time of ~93 years. . . . At least for current or developing biofuel technologies, any strategy to reduce GHG emissions that causes land conversion from native ecosystems to cropland is likely to be counterproductive. . . . Our results demonstrate that the net effect of biofuel production via clearing of carbon rich habitats is to increase CO2 emissions for decades or centuries relative to the emissions caused by fossil fuel use.[92]

> We calculated that GHG savings from corn ethanol would equalize and therefore "pay back" carbon emissions from land-use change in 167 years, meaning GHGs increase until the end of that period. Over a 30-year period, counting land-use change, GHG emissions from corn ethanol nearly double those from gasoline for each km driven. . . . As part of our sensitivity analysis, we found that, even if corn ethanol caused no emissions except those from land-use change, overall GHGs would still increase over a 30-year period.[93]

In addition, a recent University of California, Berkeley memo to the California Air Resource Board affirms these earlier studies. This memo states that estimates of greenhouse gas emissions from indirect land use changes are very large and are much larger than the emissions associated with the fuel itself because there are large amounts of carbon stored in ecosystems of all sorts.[94]

The biofuel carbon debt summarized in these studies refutes the perception that biofuels are part of the solution to quickly reduce lifecycle greenhouse gas emissions. However, EPA is tasked with developing an LCA to meet the mandates in EISA in a very compressed time frame. NPRA is concerned with the methodology utilized in projecting a GHG LCA of various fuels as the results will obviously impact future fuel choices. As previously stated, while there is still work ongoing, there is extensive scientific opinion on the record today supporting the conclusion that first generation biofuels are <u>not less carbon intensive</u> than gasoline. NPRA is concerned that the only way crop based ethanol can be "carried across the finish line" toward EISA compliance is via the potential use of tenuous models projecting over a very long period of time with questionable GHG emissions amortization rates. The frequent adage of attempting to maintain a

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[92] "Land Clearing and the Biofuel Carbon Debt;" Joseph Fargione, *et al.*; *Science* 319, 1235 (2008); DOI: 10.1126/science.1152747.

[93] "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change;" Timothy Searchinger, *et al. Science* 319, 1238 (2008); DOI: 10.1126/science.1151861.

[94] Memo from Alex Farrell and Michael O'Hare (U. of California Berkeley professors) to the California Air Resources Board, "Greenhouse gas (GHG) emissions from indirect land use change (LUC)," January 12, 2008.

"level playing field" applies in the LCA discussion. If extraordinary periods and arbitrary amortization schedules are applied to mobile source projections, raises the prospect of reexamination of projected emissions from all sources, including stationary. Thus one could ask whether a reasonable corollary would be to project stationary source reductions today based on projected reductions from anticipated future commitments to install equipment that will reduce greenhouse gases at some future date. Of course, such an approach seems arbitrary and highly speculative.

Based on the uncertainties outlined above, NPRA recommends that the LCA methodology considered and ultimately used for EISA and related policy objectives in evaluating alternative fuels should be transparent, scientifically peer reviewed, and subject to an objective discussion by all stakeholders before the rules pursuant to the expansion of the RFS in EISA are adopted or implemented. NPRA believes the public should be able to understand the comparative differences in actual carbon impacts of alternative fuels and conventional motor fuels. A science-based examination should include a clear and objective examination of the practical limits on not only the nation's appetite for renewable fuels and the resulting implications that suggest that it will not be possible to meet EISA's requirement, but also on the overall achievability of any sort of carbon-based performance standard for the fuel supply.

These issues highlight the inherent contradictions in EISA and resulting control mechanisms to address the GHG reductions the law requires. They also raise questions over liability for emissions increases that may occur under a contradictory GHG control policy and could create significant supply problems in the future. Most importantly, all of the previously mentioned issues associated with the RFS will be present and must be addressed in any sort of LCFS construct and will be exacerbated by several other complicating factors. These realities cast reasonable doubt regarding the achievability of any type of performance standard and its effect on American fuel supplies and energy security.

B. An Additional Regulatory Program Aimed at Reducing GHG Emissions From the Use of Petroleum Fuels is not Feasible.

Despite the previously mentioned problems with the RFS program, there are several places in the ANPR where EPA requests comment on a GHG performance standard. The Agency suggests requiring refiners to "meet a GHG performance standard based on reducing their lifecycle GHG emissions of the fuel they import or produce. Refiners would comply with this performance standard by ensuring the use of alternative and/or renewable fuels that have lower lifecycle GHG emissions than the gasoline and diesel they displace and through selection of lower petroleum sources that also reduce the lifecycle GHG performance of petroleum-based fuels" (p. 381). The Agency references the California LCFS in this context. However, the fact is that the carbon content of petroleum based fuels cannot be lowered significantly. Therefore, the only compliance path available under a LCFS is fuel substitution with all of the associated problems and high costs. NPRA believe it is neither appropriate nor possible to consider additional GHG emissions reduction measures related to petroleum fuels. EPA is already facing immense challenges in trying to find a way to achieve the GHG emissions reductions in the RFS and the program will likely lead to significant cost increases for both the refining industry and consumers. Addressing issues posed by supplementing this program or replacing it with a LCFS would involve challenges and costs orders of magnitude greater.

First, if the previously mentioned LCA and implementation issues with the EISA RFS can be addressed and objectively resolved, Congress will have adopted and EPA will have issued regulations for a program aimed at reducing GHG emissions in the fuel supply. Refiners are responsible for turning in credits to show compliance with the volumetric standard in this program. Credits can be bought and sold on the market. The program mirrors programs like the cap-and-trade proposals EPA mentions in the ANPR, with a cost to both industry and consumers. To add any type of a LCFS on top of the RFS would be duplicative, amplifying costs and potentially leading to fuel availability and supply problems.

In addition, there are physical limits to reducing fossil carbon of refined transportation fuels. As an example, even if the previously mentioned facts are ignored and it was agreed that ethanol has a lower carbon footprint than conventional gasoline, blending 10% ethanol will only reduce the carbon content of the finished gasoline supplied to the consumer by possibly zero percent to two percent depending on the life cycle benefits associated with the ethanol supply chain. Depending on the results of EPA's GHG lifecycle analysis, it is possible that the ethanol blending will generate actual increases in greenhouse gases for many years. Therefore, any major reductions in fossil carbon used in transportation fuels will have to be almost wholly dependent on the consumers purchasing new types of vehicles with low carbon alternative fuel capabilities, and then purchasing and using these economical low-carbon alternative fuels in the vehicles. In addition to the issue of legacy vehicles discussed earlier in these comments, low-carbon alternative fuels or vehicles currently don't exist in anywhere near commercial quantities and would likely take decades to develop and deploy.

C. A Low Carbon Fuel Standard Would Have Significant Negative Impacts.

The previously mentioned factors regarding prior attempts to force fuels in the marketplace help highlight why imposing a LCFS would have significant adverse effects on consumers and our nation's fuel supply. However, there are several other factors that indicate such a standard would have negative consumer impacts as well.

There are many problems with simply defining an LCFS. How to define lifecycle and determine the points of measurement are questions critical to determining the effectiveness of any program. To date, policy makers wrestling with this issue have yet to develop any workable consensus on definitions. Such determinations would also create overly complex – and costly – regulations. Imposing such a standard on petroleum refiners places the compliance obligation squarely on an industry that has no ability to control the most critical factors necessary for the achievement of the program – alternative fuels, vehicle and infrastructure production. Petroleum refiners have no method of "ensuring the use of alternative and/or renewable fuels that have a lower lifecycle GHG emissions than gasoline and diesel" as EPA suggests. Gasoline is carbon by nature. The only way to significantly reduce carbon from gasoline use is to blend gasoline with another "low carbon" product that petroleum refiners don't produce or to have vehicles on the road capable of running on lower carbon sources of energy (*i.e.* alternative fuel vehicles).

Some observers have suggested hydrogen, electric or natural gas vehicles as options for meeting an LCFS, but even if those were widely available in the marketplace (which they are currently not), electric cars would have to run on electricity from low carbon sources, hydrogen

still would most likely be produced from fossil fuels or nuclear power and natural gas production would have to increase by opening up more areas to exploration and production. With significant opposition to both nuclear and expanded domestic energy production, it is unlikely the fuel sources needed to power alternative vehicles would be available to meet a LCFS along the lines of the proposals we've seen to date. Complicating the situation is the fact that over 50 percent of our nation's electricity is generated using coal, a substance that will make up significantly less of the electricity generation portfolio if GHGs are regulated either through the federal Clean Air Act or through other legislation yet to be enacted.

Several studies highlight why a LCFS faces overwhelming obstacles and create supplies shortages which lead to significant cost increases to consumers. While California originally looked to biofuels as a partial solution to their LCFS, the previously mentioned University of California, Berkeley memorandum to the California Air Resource Board concluded biofuels could actually *increase* GHG emissions. As referenced earlier, this memorandum essentially holds that estimates of GHG emissions from indirect land use changes are significant – much more so than the emissions associated with the fuel itself due to the tremendous amounts of carbon stored in ecosystems of all sorts.[95] In addition, the study conducted by Nobel Prize winner Paul Crutzen also mentioned previously in these comments concluded that increased biofuels production is accompanied with a dramatic increase of N_2O emissions, which has nearly 300 times greater warming potential than CO2.[96] This would offset all GHG emissions reductions from the displaced petroleum fuels and actually result in a net increase in total GHG emissions. These realities significantly complicate an LCFS, particularly given the previously mentioned grandfathering of existing crop based ethanol production in the expansion of the RFS under EISA, and limit the availability of biofuel blending as a LCFS compliance option.

When considering the level of the standard and the timeline for implementation, EPA should consider the potential costs. NERA Economic Consulting, in a study commissioned by NPRA in 2008, highlighted the obstacles facing and implications of reducing carbon emissions in the fuel supply through the cap-and-trade system contained in the Boxer-Lieberman-Warner Climate Security Act (S. 2191 & S. 3036). In order to simply attain the GHG emissions reductions in the bill, NERA concluded the most economical pathway would be to blend 68 billion gallons of ethanol into the fuel supply in 2030. The model assumes such a large quantity of ethanol – most of which would have to be cellulosic – could actually be produced. However, there is currently no commercial availability of cellulosic ethanol and numerous questions remain over the ability to meet the cellulosic requirements of the RFS2.

EIA concluded that a similar level of ethanol production – 66 billion gallons – with competition for biomass from the electric utility sector totally exhausts the U.S. biomass supply

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[95] Memo from Alex Farrell and Michael O'Hare (U. of California Berkeley professors) to the California Air Resources Board, "Greenhouse gas (GHG) emissions from indirect land use change (LUC)," January 12, 2008.

[96] P. J. Crutzen, A. R. Mosier, K. A. Smith, and W. Winiwarter, "N_2O Release from Agro-Biofuel Production Negates Global Warming Reduction by Replacing Fossil Fuels," Atmospheric Chemistry and Physics Discussions, August 1, 2007.

and places upward pressure on biomass prices.[97] Furthermore, such a quantity would require over 76 million flex fuel vehicles – a 590 percent increase over current levels. As with the RFS, projections from Detroit do not seem to indicate these vehicles will be produced in such quantities. In addition, the study's model took into account the ability of other alternatives like hydrogen and electric vehicles to come into the market and none were economical enough to make up a significant percentage of the fuel supply. These results held despite the fact NERA also assumed low carbon electricity sources would be available, but the results of the electric generation mix required to meet the legislation's carbon reductions and the feasibility of making such large quantities of ethanol highlight even more obstacles. NERA concluded the generation portfolio required to meet the carbon reductions in Boxer-Lieberman-Warner include 70 new nuclear units at 35 to 40 new sites, a seven fold increase in wind power on a potential land mass three times the size of Rhode Island, and a 33 fold increase in biomass driven electricity, which is currently almost nonexistent.

Although there has been much discussion over the concept of "clean coal" and the NERA model makes the assumption carbon capture and sequestration ("CCS") from coal will actually be developed (another questionable assumption), its expected high cost still leads to significant decreases in coal use – with the fuel making up only 3 percent of total generation in 2030 and no new coal plants built without CCS. The feasibility of developing such a generation mix raises numerous questions on whether or not there would even be enough low carbon electricity sources to make electric cars a viable option for meeting a LCFS – even if those cars are developed. While NERA didn't model an LCFS specifically, its results highlight the fact that the economics to develop the vehicles, fuels and infrastructure that would be necessary to meet an LCFS do not today exist. These issues are compounded when coupled with the previously mentioned problems associated with lifecycle carbon content of biofuels.

The one study to date that has developed economic impacts of an LCFS concluded the tools to meet such a standard do not exist and it could only be met by consumer price increases large enough to dramatically reduce demand. In this study, CRA International concluded: "Motor fuel prices increase to extraordinary levels in 2015 and 2020 due to the high price associated with low carbon fuel credits in response to the infeasibility of meeting near term LCFS requirements without large reductions in total fuel demand." Under their analysis of meeting a 5 percent and 8 percent GHG reduction through an LCFS by 2015 and 2020 respectively, gasoline prices would increase over 140 percent in 2015. Increases lower over time as lower carbon fuel sources become available, but still create price increases in excess of 80 percent by 2050.[98]

Finally, all of these factors might be compounded further due to the fact that a LCFS or GHG performance standard for fuels could be used to discriminate against Canadian crude produced from oil sands. Canada is currently the largest exporter of oil into the United States

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[97] EIA, "Energy and Economic Impacts of Implementing Both a 25-Percent Renewable Portfolio Standard and a 25-Percent Renewable Fuel Standard by 2025," SR/OIAF/2007-05, August 2007. Page xiv.

[98] *See* http://www.nma.org/pdf/040808_crai_presentation.pdf.

and serves most refineries in the northern part of this country. The use of Canadian oil sands has increased exponentially so that many refiners in the southern part of the United States are utilizing economical, heavier crudes to make their finished products. Several environmental groups have initiated efforts to block Canadian crude deliveries to the United States using arguments centered on "lifecycle" emissions. If a LCFS were used to discriminate against or otherwise impede Canadian crude imports into the United States, it would have several adverse impacts for American energy security and refinery production. Assuming the artificial unavailability of Canadian oil sands, American refiners would be forced to find crude supplies from other parts of the world – most likely from foreign, state-owned oil companies in unstable regions of the works. The shift in crude supply ("crude shuffle") would likely have additional unintended consequences by actually increasing GHG emissions globally due to incremental transportation of crudes into and out of the US. The proposed use of lifecycle analysis against Canadian oil sands does not take into account Canadian regulations and ongoing energy use reductions in oil sands production, nor the offsetting increases in CO_2 emissions that would occur due to shuffling if the oil sands destination were altered due to U.S. regulations. In addition, at a time when American refiners are already seeing huge margin decreases – and even posting losses in some cases – due to wildly fluctuating prices of crude oil supplies, forcing them to purchase more crude from unstable regions may have the effect of raising the price of such crude slates. High crude oil prices, combined with high LCFS credit prices, could have an adverse impact on refining capacity in the United States, likely increasing our reliance on finished petroleum products from overseas and creating supply problems for the driving and flying public.

The evolution of Canadian oil sands, both in terms of extraction, production, and ultimate use by U.S. refiners, is a tremendously huge net positive for the American consumer that contributes significantly to North American energy independence and security. From a societal, environmental and economic basis, Canadian oil sands are a sound component of an energy solution for the United States. For these and the reasons articulated previously, an ill-defined and crafted LCFS has the very real potential to inflict substantial harms on consumers and North American energy independence. Moreover, the lack of available tools to meet such a standard for a decade or more places the compliance burden on the domestic refining industry while doing nothing to incentivize the creation of the vehicles, fuels and infrastructure and other means that actually would be needed to meet such a regulation. Moving forward with an unrealistically stringent standard could prove devastating to the American economy.

NPRA believes the Government should provide pre-certification of alternative fuel/vehicle programs with lower carbon emissions that are <u>both</u> technically feasible and economically feasible for the ultimate fuel consumers before even considering any sort of LCFS program. Being economically feasible requires that the alternative fuels have favorable consumer economics and have addressed inconveniences that limit their appeal to consumers. Current and proposed LCFS structures are flawed in that they place the compliance obligation on only one party (the domestic refining industry) that does not have direct control over alternative fuels or alternative vehicles. In addition, the distribution issues and costs are not addressed. An LCFS is the highest cost regulatory option aimed at reducing GHG emissions and could have the opposite effect of its intended goal.

The Agency should also conduct an extensive cost analysis prior to considering the development of an LCFS. This cost analysis should follow the construct for similar analyses used in evaluating certain provisions of the federal Clean Air Act. This analysis should take into account the uncertainties due to proprietary information and innovation in low-carbon energy technologies. It should also include a discussion of non-climate related costs and benefits, as well as the implications for food availability[99] and impacts on the nation's groundwater supplies.

Given the scope of the challenges associated with developing an LCFS, NPRA questions an assumption that a new low carbon alternative fuel/vehicle system will become available for a mandated LCFS program without the new fuel/vehicle systems first being commercially proven. NPRA also believes the challenges facing any sort of LCFS program are so great that attempts to try and force the technology through a precipitous regulation of GHGs in the fuel supply would only lead to significantly higher industry and consumer costs, while possibly creating fuel supply shortages.

D. The Result of Any Regulations Should Augment, and Not Imperil, the Nation's Fuel Supply and the Distribution of Fuels.

Legislative and regulatory certainty is necessary to make reliable project feasibility analyses and to drive future investment opportunities. If Congress and the Administration fail to fully consider the fuel supply impacts of legislation and implementing regulations, then this situation will not improve. Refiners support and encourage continued environmental progress. However, if policymakers overlook and/or take for granted the supply side of the environmental-energy equation, then we are destined for more of the same. It is imperative, in our opinion, that determining the impact on supply must be fully embedded in the policy-making process. In working with policymakers on improvements to fuels and facilities, NPRA has often commented that industry needs time, flexibility or more realistic standards to minimize negative impacts on fuel supply. Policymakers, however, often opt to promulgate regulations that are technology forcing, constructed with limited and often theoretical margins of safety, and requiring implementation in the shortest time possible — all without adequate attention to fuel supply impacts. Congress and the Administration should make increasing the nation's supply of oil, oil products and natural gas a number one public policy priority.

Based on unfavorable past experiences with consumers, EPA should avoid considering the imposition of any fuel control program regulations that involve the consumers voluntarily making a purchase decision unless the fuel program design has been successfully used or demonstrated at a smaller scale for a considerable amount of time. Without such a successful program demonstration, the future uncertainty with consumer voluntary purchases will undermine the confidence of the fuel program being successful.

[99] Appendix C discusses the food versus fuel issue in more detail.

V. Technology and Timing

While throughout these comments we have highlighted the need for, and current lack of, adequate technology to regulate GHG emissions, it is critical that EPA focus on this element and consider what might happen if any attempt to force technology does not achieve its intended result, particularly given the enormous barriers facing the technologies needed for GHG controls. Failure to recognize such consequences could lead to regulation that would cripple the American economy.

In addition to motor fuel supply issues and impacts on the driving public mentioned above, inadequate technology development for controlling GHG emissions from stationary sources in any economic sector would likely result in massive fuel switching, predominantly in the power generation sector, which would put enormous strain on natural resources and send more businesses overseas. This would particularly be the case for any GHG controls calling for near-term reductions (*e.g.* next ten years). Enhanced national nuclear capabilities or widely commercially available carbon capture and sequestration programs are likely decades away at best. Thus, fuel switching can be an expected consequence of any climate change regulation, and natural gas would be the only viable option.

American industry has already been hurt by the high prices brought about by a tight natural gas supply, especially industries for which natural gas is an important feedstock. The chemical industry is a prime example: of the 120 major new chemical plants currently being planned worldwide, only one of them is being planned in the United States, while several are being built in Asia. Near-term GHG regulations would tighten natural gas supply even further. Resistance to expanding domestic exploration and production of oil and natural gas exacerbates this situation and would most likely lead to more American jobs being shipped overseas. **Natural gas supply must be expanded for any U.S. climate change policy to be economically viable.** It is important to recognize that any restriction on carbon emissions will likely lead to an increased demand for natural gas through fuel switching, particularly an approach with stringent early reduction targets.

A shrinking natural gas supply would have serious adverse consequences for many manufacturing sectors, especially petrochemicals, which rely upon natural gas as a feedstock. Without adequate supplies of affordable natural gas, these sectors will find it difficult to compete internationally, placing a large bloc of industrial and manufacturing jobs at risk. In fact, this "demand destruction" within the manufacturing sector, particularly among the petrochemical industry, has been ongoing for several years. Sending these businesses overseas would not only hurt American workers in our industry, but will create a situation where it is cheaper to import finished products Americans rely on every day than to make them domestically.

By way of example, such products include:

- Kevlar for bullet proof vests
- Computer casings
- Prescription drugs and over-the-counter medicines
- Protective coatings for computer chips

- Automobile bumpers
- Automobile seat cushions
- Airbags
- Seatbelts
- Automobile interior paneling
- Artificial knees and joints
- Paints Packaging
- Electronics Safety equipment

Simply stated, government must reconcile the variables of increased natural gas usage caused by climate change regulation in the short-term – before the development of adequate technology – with those of demand destruction and the need for enhanced production of natural gas from domestic sources. Failing to do so would essentially cause the American manufacturing sector to unilaterally disarm itself in the global marketplace.

The likelihood of fuel switching and its economic impacts are evident upon an honest assessment regarding the development stages of other low-carbon energy sources or carbon controls. As previously mentioned, NPRA commissioned NERA Economic Consulting to conduct a study of what it would take to meet the goals of the Lieberman-Warner Climate Security Act (S. 2191 and S. 3036). The bill called for a greater than 70 percent reduction in GHG emissions below 2005 levels by 2050. As discussed briefly above, achieving the electric generation mix required to meet the legislation's carbon reductions faces substantial obstacles.

NERA concluded the generation portfolio required to meet the carbon reductions in the Lieberman-Warner bill would include 70 new nuclear units at 35 to 40 new sites, a seven fold increase in wind power on a potential land mass three times the size of Rhode Island, and a 33-fold increase in biomass-driven electricity, which is currently almost nonexistent. There has been significant political resistance to any new nuclear plants, let alone the quantity required to meet large GHG reduction requirements. Escalating costs also bring substantial new nuclear build into question. For example, the cost of constructing two 1000-megawattt nuclear units, either at a new site or more likely an expansion at an existing site, can cost more than $15 billion. These costs represent more than 40 percent of an average investor-owned utility's market capitalization.[100] As the President of the Nuclear Energy Institute stated in June 2008 testimony before the House Energy & Commerce Committee, "These first [nuclear] projects must have financing support–either loan guarantees from the federal government or assurance of investment recovery from state governments, or both."[101] The credit crunch and a global concern over obtaining financing generally makes these financing concerns even more significant.

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[100] Grecheck, Eugene S., "Building New Nuclear Plants: The Utility Decision," EIA 2008 Energy Conference, April 8, 2008, slide 22.

[101] Bowman, Frank L., Nuclear Energy Institute Testimony before House Energy & Commerce Committee Energy & Air Quality Subcommittee, June 19, 2008, p. 3.

Biomass-driven electricity and other forms of renewable are also very costly and could take significant time to develop. According to the Department of Energy, generation costs for direct-fired biomass are double the generation costs of combined cycle units fired with natural gas (.09/kilowatt-hour for biomass compared to .04-05/kilowatt-hour for combined-cycle power plant). Additionally, transmission costs for wind energy can also increase the investment risk. Studies indicate that many of the prime locations for large-scale wind energy (West Texas, Wyoming, North Dakota and Montana to name a few) are located significant distances from population centers requiring large quantities of electric power, necessitating transmission over significant distances. Sending power over long distances results in line losses that reduce the overall efficiency of the power generating units. The Electric Reliability Council of Texas ("ERCOT") estimated in a 2008 report to state regulators that the cost of building power lines to bring wind power from West Texas to the state's largest cities could range from $3 billion to $9 billion.[102] In addition, there has also been political resistance to siting transmission lines in various parts of the country.

Finally, there is widespread acknowledgment that "clean coal" generation using CCS technology is necessary for achieving GHG reductions. However, there are several issues with CCS alone that may take several years to resolve. A New York Times article from earlier this year about the unresolved issues associated with CCS noted:

> "Yet, simple as the idea may sound, considerable research is still needed to be certain [CCS] would be safe, effective and affordable. Scientists need to figure out which kinds of rock and soil formations are best at holding carbon dioxide. They need to be sure the gas will not bubble back to the surface. They need to find optimal designs for new power plants so as to cut costs. And some complex legal questions need to be resolved, such as who would be liable if such a project polluted groundwater or caused other damage far from the power plant."[103]

The article goes on to highlight the cancellation or halting of many CCS projects, particularly FutureGen, from which the government withdrew its participation after costs almost doubled to nearly $2 billion. These cost concerns are amplified in today's environment of tight financing. In discussing prospects of future CCS projects, the article notes:

> "But no project is very far along, and it remains an open question whether techniques for capturing and storing carbon dioxide will be available by the time they are critically needed. The Electric Power Research Institute, a utility consortium, estimated that it would take as long as 15 years to go

[102] Electric Reliability Council of Texas (ERCOT), CREZ Transmission Optimization (CTO) Study pursuant to the Public Utility Commission's Interim Order issues on October 2, 2007 (Docket No. 33672), April 2, 2008.

[103] Wald, Matthew L., "Mounting Costs Slow the Push for Clean Coal," *The New York Times*, May 30, 2008.

> from starting a pilot plant to proving the technology will work. The institute has set a goal of having large-scale tests completed by 2020."[104]

Without rapid development of CCS, future coal-fired power plants would be in jeopardy under GHG regulation. This is particularly troubling given the fact that coal currently makes up roughly half of America's electricity generation portfolio.

Even if CCS were developed in a timely manner, it would still require the aforementioned investments in nuclear and other high-cost technologies on a scale that could be unachievable, or at the very least, hard to fund in a tight global credit market. The NERA study model makes the assumption that CCS technology will be developed, but its significantly high anticipated cost still leads to significant decreases in coal use – with the fuel making up only 3 percent of total generation in 2030 and no new coal plants built without CCS. It is important to note these numbers for CCS hold after it is assumed that the previously mentioned large-scale and costly development of nuclear and renewable electricity is achieved. An honest review of the sources of energy are needed to achieve the carbon reductions discussed in the ANPR and in recent legislative proposals highlights the need to overcome several very large obstacles on both technological and political fronts before any GHG control program could feasibly be achieved without crippling economic consequences.

When discussing the Technical Support Document for Stationary Sources earlier in these comments, we noted that attempts to control GHGs could create conflicting policies. We feel it is important to emphasize that the nation's fuel policy for the last decade has necessarily resulted in requiring the industry to adopt more energy intensive processes resulting in higher GHG emission levels. Many of the changes in refinery operations, and associated GHG emissions, are the direct result of the additional hydrotreating and processing necessary to meet federally mandated clean fuel obligations. Conversely, methods for achieving some climate goals may actually conflict with other air quality regulations. While not affecting the carbon content of the fuel itself, this situation illustrates how "clean fuel" policies can work against the desire to reduce GHG emissions. Examples of regulations having such an impact include:

- Industry has met regulations requiring ultra-low sulfur diesel ("ULSD"). However, creating this fuel requires more hydrogen and more fuel consumption, which in turn generates more CO_2.

- Reducing benzene levels in gasoline requires additional fuel consumption in equipment at refineries, which leads to higher CO_2 emissions.

- Even a cap-and-trade program could, either directly or indirectly, lead to proposals on LCFS that can only practically be met by blending more biofuels into the fuel supply. However, a higher concentration of biofuels will exacerbate smog problems and could come in conflict with the ozone NAAQS, which EPA recently tightened.

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[104] *Ibid.*

- In addition, a significant quantity of the current biofuel stock comes from coal-fired ethanol plants. Stringent carbon restrictions could affect production from these plants and hence the overall fuel supply.

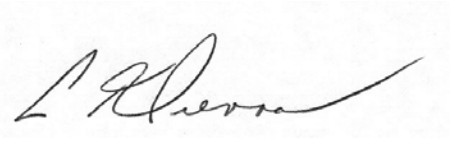
- On a lifecycle basis, several studies show biofuels use could result in increased CO_2 emissions, water quality and use, soil erosion and acidification, toxicity of pesticides, loss of biodiversity, and air pollution from "slash and burn" farming practices.

There are a number of other regulations that require control devices and systems for reduction of ozone forming compounds, criteria air pollutants, and hazardous air pollutants. The previously mentioned tightening of the NAAQS for ozone will mean hundreds of counties previously in attainment with the clean air act will now be non-attainment areas. These counties will have to spend significant dollars and resources implementing new emissions plans and businesses will have to spend significantly more money on stationary and mobile source controls. These control systems require substantial amounts of energy to operate, which could lead to an increase in CO_2 emissions.

It is imperative the EPA weigh the ongoing compliance obligations for refiners to produce clean fuels against the desire to lower GHG emissions. The refining industry should not be punished for retooling infrastructure to reformulate fuels, only to discover that the very initiatives to produce clean fuels may now penalize industry in meeting yet another fuel formulation obligation.

VI. Conclusion

For the reasons set forth above, NPRA does not believe that EPA should proceed with an endangerment finding at this time, nor should the agency begin the costly and fruitless process of subjecting sources to various provisions of the CAA in an attempt to effectuate GHG reductions. The Act was not designed to address a global pollutant like CO_2 and, thus, cannot be used to meaningfully alter its atmospheric concentration. Instead, EPA's suggested approaches for applying the CAA's provisions to GHG sources would impose severe costs on domestic industry, reduce our domestic energy security, and damage the national economy as businesses shift activities overseas to areas where they will not be subject to futile regulation. Discussion of these issues in the ANPR is woefully inadequate, and the public should be given the opportunity to consider them before EPA makes any further decisions under the CAA.



Charles T. Drevna
President
National Petrochemical & Refiners Association

APPENDIX A

RESPONSES TO SPECIFIC REQUESTS FOR COMMENTS IN EPA'S GREENHOUSE GAS ANPR

NPRA offers the following responses to some of the specific questions on which EPA requested input. However, the following comments should not be read in any way to change NPRA's fundamental views and concerns articulated in the main body of these comments and its opposition to regulation of GHGs via the CAA.

Title I Stationary Sources

We request comment on what CAA provisions, if any, would authorize emissions fees to control GHG emissions, and whether there are other approaches that could be taken under the CAA that would approximate a fee. We request comments on the use of emission fee programs under other sections of the Act. EPA seeks comment on how to adequately inform economic choices, as well as the broader policy choices, associated with GHG mitigation policies.

EPA requests comment on the effect of a positive finding of endangerment for GHGs under section 202(a) of the Act on potential listing of the pollutant(s) under section 108.

Comment: If EPA finds that GHGs pose a danger to public health or welfare under section 202(a), this finding could also form the basis for an endangerment finding under section 108. As explained above, EPA suggests that it may have discretion under section 108(a)(1)(C) to decline to list air pollutants that endanger public health or welfare if it does not "plan" to issue air quality criteria for such pollutants under the Act. However, it's not clear that a court would agree and, in fact, there is on-point precedent that is directly inapposite. *See NRDC v. Train*, 545 F.2d 320 (2nd Cir. 1978).

We are interested in commenters' views on whether and how developing air quality criteria for GHGs would differ from developing such criteria for other pollutants such as ozone and particulate matter, given the long-lived nature of GHGs and the breadth of impacts and other special issues involved with global climate change. EPA also invites comment on the extent to which it would be appropriate to use the most recent IPCC reports, including the chapters focusing on North America, and the U.S. government Climate Change Science Program synthesis reports as scientific assessments that could serve as an important source or as the primary basis for the Agency's issuance of "air quality criteria."

Comment: Section 108(a)(2) requires EPA to issue air quality criteria that "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air, in varying quantities." This includes "information on . . . variable factors . . . which of themselves . . . or in combination with other factors may alter the effects on public health or welfare . . . ; and . . . any known or anticipated adverse effects on welfare." Issuing air quality criteria for GHGs would probably be the most complicated task EPA has ever undertaken under section 108(a)(2), given the unique uncertainties and scope of potential impacts into the future.

Nonetheless, it appears that the Act requires at least the identification of effects which "may be expected," including information on "variable" factors that may impact expected effects. In the context of GHGs, "variable" factors should include political and international factors that could impact emissions trends, such as internationally agreed upon targets.

As required under Executive Order 12866, EPA must issue a Regulatory Impact Analysis (RIA) for major rulemaking actions, and it is in this context that EPA has previously described the scope and effectiveness of available pollution control techniques. EPA requests comment on whether this approach is appropriate in the case of GHGs.

Comment: Any RIA must be developed and outlined with as much detail as possible. The analysis should reflect costs to the entire economy as well as economic impacts to society in general.

GHGs are unlike other current NAAQS pollutants in that direct exposure to GHGs at current or projected ambient levels appears to have no known adverse effects on human health. Rather, the health impacts associated with ambient GHG concentrations are a result of the changes in climate at the global, regional, and local levels . . . EPA invites comment on whether and how these indirect human health impacts should be addressed in the context of setting a primary or a secondary NAAQS.

Comment: See Comments in Section II.C.

EPA requests comment on whether it would be necessary and/or appropriate for the Agency to establish both primary and secondary NAAQS for GHGs if those pollutants were listed under section 108. EPA requests comment on whether it would be appropriate, given the unique attributes of GHGs and the significant contribution to total atmospheric GHG contributions from emissions emanating outside the United States, to establish a level for a GHG NAAQS based on an internationally agreed-upon target GHG level, considering legal and policy factors.

Comment: Given that the only way to achieve true GHG reductions is through a concerted international effort, wise policy suggests using internationally agreed upon goals as the basis for a national GHG NAAQS. Unfortunately, the CAA does not appear to permit this approach, which serves to underline why the Act is ill-suited to effective GHG regulation. International targets often reflect ideologically driven political agendas that are not based on sound science and economic realities. The CAA, however, does not permit consideration of such factors in setting NAAQS, but rather requires EPA to establish a NAAQS "requisite" to protect public health and welfare.

EPA invites comment on whether it would be appropriate to consider adverse effects on human health and welfare occurring outside the U.S. Specifically, we invite comment on whether, and if so, on what legal basis, it would be appropriate for EPA to consider impacts occurring outside the U.S. when those impacts, either in the short or long term, may reasonably be anticipated to have an adverse effect on health or welfare in the U.S.

Comment: As discussed above in Section III.A.2 , EPA may consider health or welfare effects beyond United States borders only to the extent that the Administrator finds that other countries give essentially reciprocal rights to the nation with respect to air quality, as set forth in section 115 of the Act. Except in circumstances when the criteria under section 115 are met, the statute clearly limits an endangerment finding under any section of the Act to a consideration of effects on human health and welfare in the U.S.

In addition to submitting plans providing for attainment within the state, each state would be required to submit, within 3 years of NAAQS promulgation, a plan under section 110(a)(2)(D) prohibiting emissions that would significantly contribute to nonattainment in another state. EPA requests comments on what approaches could be utilized for purposes of addressing this requirement as well as the general matter of controlling GHGs to meet a NAAQS.

Comment: The scenario described by EPA here serves to underscore why it would be inappropriate for EPA to develop a primary NAAQS for GHGs. GHGs are a global issue and it is inappropriate to penalize the states, which have essentially no ability to affect global GHG atmospheric concentrations.

EPA requests comment on the practical effect of application of section 179B on the global problem of GHG emissions and on the potential for controls based on the attainment plan requirement and other requirements directly related to the attainment requirement, including the reasonable further progress requirement and the RACM requirement.

Comment: Section 179B authorizes EPA to approve a SIP for a nonattainment area only if the submitting state can show that "but for emissions emanating from outside the United States," the area would attain and maintain the applicable NAAQS. In the event of nonattainment, it is uncertain whether this provision would be of any relevance because a state may be unable to demonstrate that it could reach attainment, notwithstanding foreign emissions, given the continued emissions from every other state within the country.

EPA requests comment on how to interpret the requirement that state plans demonstrate that attainment will be achieved "as expeditiously as practicable" in the context of a secondary NAAQS for GHGs.

Comment: Given the characteristics of GHGs once released into the atmosphere, EPA should take into account global emissions trends when determining what is "practicable." States should not be penalized for ambient concentrations beyond their control. This issue further illustrates the inadequacy of NAAQS for GHG control. Global GHG reduction will likely take decades to achieve.

To the extent that EPA addresses GHGs through this [section 108] CAA mechanism, EPA requests comments on the issuance of "air quality criteria" following listing, as well as the adequacy of the available scientific literature.

Comment: If EPA develops GHG air quality criteria, it should clearly identify all health or welfare information gaps. It should also identify all "variable factors" that may alter expected

effects on public health or welfare, including international and political factors. For example, if the U.S. reaches an agreement with foreign nations to reduce GHG emissions to a specified goal, this would be a relevant factor that could alter the anticipated future scenario of GHG and climate change impacts on public health and welfare. In the case of public welfare, costs to the nation's economy and impacts on national competitiveness should also be considered.

We request comment on our assessment of NAAQS approaches, and on how the NAAQS approach compares to other potential CAA approaches in light of the policy principles enunciated in section III.F.1.

Comment: See discussion in Section III.B.1.b, above. In general, the NAAQS approach should not be favored because it may lead to a patchwork of inharmonious and ineffective state regulation.

Section 112(f)(2) of the CAA requires us to determine for each section 112(d) source category whether the MACT standards protect public health with an ample margin of safety. . . . EPA must also adopt more stringent standards if needed to prevent an adverse environmental effect, but must consider cost, energy, safety, and other relevant factors in doing so. EPA solicits comments on the extent to which these programs could apply with respect to the possible regulation of sources of GHG under section 112, including the relevance of any carcinogenic effects of individual GHG.

Comment: Section 112 is particularly inappropriate because of the critical nature of CO_2 to all life on the planet. Listing GHGs as air toxics would be tantamount to listing water vapor at STP as "toxic."

Because of the more detailed requirements for identifying appropriate levels of control to establish a level for MACT, significantly more information on the best performing sources is needed under section 112 than under section 111, making the development of such standards within 2 years after listing a source category difficult. We request comment on this and other approaches for addressing GHG under section 112, both for categories already listed for regulation and for any that might appropriately be added to the section 112 source category list if we were to elect to regulate GHGs under this section.

Comment: Section 112 is inappropriate for the reasons discussed in Section III.B.3.b.

Given the global nature of GHGs and the lack of direct health effects from such emissions at ambient levels, EPA requests comments on the extent to which the CAA could be interpreted to grant flexibility to consider such alternative implementation mechanisms, and what, if any, limitations should be considered appropriate in conjunction with them.

[I]f a pollutant were first listed under section 112 and then EPA decided to list and regulate it under section 108, the statute does not clearly say whether that is permissible, or whether EPA would then have to remove the pollutant from the section 112 pollutant list. We request comment on the extent to which this apparent ambiguity in the Act poses an issue regarding possible avenues for regulating GHG and if so, how it should be addressed.

Comment: The statutory ambiguity that EPA has identified means, at the very least, that if GHGs were listed as HAPs and, subsequently, EPA chose to list GHGs under section 108, the decision would be susceptible to legal challenge and possible rejection. As a result, this scenario underscores the significant problems with using the HAPs approach to regulating GHGs.

We ask for comment on the expected overall costs and benefits of running a Title V program for small GHG sources and for larger GHG sources (e.g., those emitting more than 10,000 tons per year).

Comment: It is too early in this process to make any recommendations on the sources that should or should not be included in any program. However, we believe it is also too early to exclude any sources from the program.

We seek comment on timing issues in general, and particularly on the coordination of the timing of Title V applicability with the timing of GHG regulation under other parts of the Act. We specifically request comment on the timing of the applicability of Title V permit requirements in relation to the applicability of GHG control requirements.

Comment: See comments in Section III.B.4.d.

General Mobile Sources

EPA seeks public comment on how a Title II regulatory program could serve as an approach for addressing GHG emissions from mobile sources. (What are the implications for developing Title II programs in view of the global and long-lived nature of GHGs?)

Comment: NPRA encourages EPA to continue to treat vehicles, engines and fuels as a system and supports the incorporation of the renewable fuels sector and consumers into that same system. Focusing on fuels to the exclusion, or reduced scrutiny of the other components of the system, is not appropriate in view of the history of extensive fuels regulatory requirements.

EPA also seeks comment on how best to balance factors such as the need to send effective long-term signals that stimulate technology innovation, the imprecision of predictions of future technology innovation, and the importance of lead-time to allow orderly investment cycles.

Comment**:** NPRA has previously discussed the need for "on ramps" which would assure certain technical and scientific analyses have been completed in advance of additional fuel changes. NPRA also supports periodic look backs to evaluate lessons learned and to assure the agency has sufficient flexibility to take policy in a different direction in responses to environmental and/or economic impacts not anticipated ("off ramps"). The engagement of the public and stakeholders in open, transparent review of the progress of these actions will benefit the long term objectives of the program.

EPA seeks comments on all possible GHG emissions leakage (to other domestic economic sectors or other countries) issues associated with mobile source GHG regulation, and in

particular on whether the theoretical concern with fungible transportation fuels is likely to be realized.

Comment: An LCFS has the potential to effectively cut off certain types of crude for domestic refiners. This same crude will then be bought by foreign producers, and fuels will in many cases be created in a less environmentally sound manner than were it processed by domestic producers. This fuel can come into the U.S., and the net result is destruction of domestic producers and negative environmental impacts. For example, can EPA do anything to stem leakage from point source emissions in India? Although fuels imported into U.S. would have to meet the same standards the foreign leakage would be analogous to emissions under Title I from US based facilities. Point source leakage equals job leakage. The balancing of free trade and the resulting impact of regulations limited to fuels that are domestically consumed should be carefully considered in order to avoid damage to the domestic refining sector.

Transportation Fuels

We request comment on what impacts other than GHG impacts should be considered as part of a potential fuels GHG regulation and how such other impacts should be reflected in any policy decisions associated with the rule. These impacts could include the potential impacts on food prices and supplies.

Comment: *See* comments in Section IV.A.2.

Comments are requested on the importance of lowering GHG emissions from transportation fuels via the inclusion of alternative, non-renewable fuels in a GHG regulatory program as well as the petroleum portion of the fuel pool, thus providing opportunity to reflect improvements in refinery practices.

Comment: NPRA is unaware of realistic alternative fuels that either represent accepted lower carbon impacts than conventional fuels, or are available in commercial quantities sufficient to provide short and mid-term reductions in the nation's fuel carbon footprint. A table outlining potential alternatives and comments on each follows. If the Agency has data to offer that contradicts NPRA's current position, we request that data be made available as the rule making process proceeds.

Fuel Type[105]	**Comment/Status**
Fossil Hydrocarbon Fuels	The fuels are all standardized products, with the GHGs associated with each very uniform.
Ethanol	Recent studies suggest that the carbon footprint from corn ethanol is substantially higher than gasoline. At this point, corn ethanol is not expected to be justified/credited as a low carbon fuel. As a result, further reliance on ethanol in regards to meeting new program requirements should be postponed until further studies and evaluations have been completed.
Cellulosic ethanol[106]	No commercial production exists; however considerable research is underway including several pilot plants funded by the Dept of Energy and scheduled for construction over the next 5 years. Cellulosic ethanol is not expected to be available in sufficient quantities to serve as a low carbon fuel alternative until after 2015 at the earliest. Cellulosic ethanol may also contribute to the food-versus-fuel conflict (See footnote 91 earlier in this document).
Transesterified biodiesel	Almost all biodiesel produced today is methyl ester, the result of reacting animal or vegetable esters with methanol in the presence of a catalyst and then removing alcohol and glycerin. The diesel fleet in the US is less than 3% of all on-road vehicles. The same life-cycle analysis of various biodiesel products is required to assure that the carbon impacts are actually improved.
Renewable diesel	This product is created by hydrogenating animal fats, vegetable oils, or biomass materials via a hydro-treater. Neste's NexBTL process is the best known of the methods and is in operation at one facility with two more under development. Alternative diesel products do not offer near term assistance in meeting the RFS2 requirements due to the nation's fleet composition.

[105] Proponents of an LCFS suggest a complete life-cycle analysis of the carbon footprint of each alternative fuel is required. This would include the direct and indirect carbon impacts of each product alternative. The scope of this work is substantial and is an essential early action to determine whether or not future policy directives on low carbon fuel will actually increase carbon emissions and that the US avoid policies that do not support required investments.

[106] "Cellulosic" is made up of cellulose, hemicellulose, and lignin. Cellulose and hemicellulose are polymers of various sugars, so processing cellulosic material requires breaking it apart. Unfortunately, cellulosic material makes up the cell walls and is resistant to attack, so considerable capital and energy must be expended to do so.

Fuel Type[105]	**Comment/Status**
Fischer-Tropsch Fuels	FT fuels are generated from the reformation of synthesis gas that has been produced from the gasification of solid materials such as biomass or other gases. Biomass Fischer-Tropsch technology is not yet commercialized.
Dimethyl Ester	DME is derived from gasified biomass thru a catalyst process similar to Fischer-Tropsch. Significant drawbacks are that it is more corrosive, flammable, and volatile than diesel. Using pure DME requires pressurization to levels similar to PPG. Product not expected to be a significant alternative.
Hydrogen[107], [108]	Hydrogen can be used in fuel cell vehicles with zero tailpipe emissions and high efficiency. However, cost-effective hydrogen production and delivery for transportation fuels use has not been developed. In addition, hydrogen production and commercially available hydrogen storage technologies are energy intensive, carrying associated GHG emissions depending on the energy source used. The production and storage process requires significant amounts of electricity, especially for liquification. Storing hydrogen is more expensive than storing liquid fuels."
Electricity	The first commercial electric vehicles (or more reliant on electric than today's hybrids) are expected in 2010. Assuming they are successful it will take at least 8 years to get a significant percentage of the nation's vehicles in this category.

[107] Large amounts of hydrogen are produced today for use in the oil refining and chemical industries, primarily from natural gas or other fossil sources. Syngas-based processes like steam methane reforming or coal gasification are well established, large-scale commercial methods for making hydrogen at relatively low costs of $1-1.5/kg (1 kg of hydrogen has about the same energy content as 1 gallon of gasoline). Water electrolysis is a commercial technology that is used where low cost electricity is available, or at small scale where reforming is expensive. Any source of electricity could be used to power an electrolyzer.

Fuel cell cars are about 2-2.5 times as efficient as a comparable gasoline internal combustion engine car, 30-50% more efficient than a gasoline hybrid, quiet and powerful. Hydrogen and fuel cells also offer the potential for innovation. Several auto companies are investigating fuel cells as a superior route to a viable electric car. About 1-2% of primary energy worldwide goes to hydrogen production. Current US industrial hydrogen production could fuel about 30 million fuel cell cars, and accounts for about 5% of annual natural gas consumption. Source: ("A Low Carbon Fuel Standard For California," Farrell, et al., 71).

[108] Some have suggested hydrogen, electric or natural gas vehicles as options for meeting an LCFS, but even if those were widely available in the marketplace (which they are currently not), electric cars would have to run on electricity from low carbon sources, hydrogen still would most likely be produced from fossil fuels or nuclear and natural gas production would have to increase by opening up more areas to exploration and production.

Fuel Type[105]	Comment/Status
	The other issue is the question of source of electricity and completion of LCA on the carbon footprints of these autos in order to understand their contribution to reducing carbon emissions. Complicating the situation is the fact that over 50 percent of our nation's electricity is generated using coal.
Nuclear	With significant opposition to nuclear production, it is unlikely the nuclear sector will be able to expand its percentage of the fuel sources needed to power alternative vehicles over the next ten years.

We request comment on setting a GHG control program covering all transportation fuels used in the United States which would also cap the total emissions from these transportation fuels.

Comment: Transportation fuels are part of a system that is intertwined with autos, consumers, alternative fuel producers and NPRA is opposed to carving out fuels.

APPENDIX B

E-85 CAPITAL REQUIREMENTS AT RETAIL STATIONS

Retail deployment of E-85 presents economic challenges. A member of the National Association of Convenience Stores ("NACS") and the Society of Independent Gasoline Marketers of America (SIGMA) testified on June 7, 2007 before the Subcommittee on Energy and Air Quality of the House Committee on Energy and Commerce:

> The primary impediment to retailers converting a dispenser to E-85 is equipment compatibility. Because E-85 is more corrosive than regular gasoline or E-10, it requires equipment that is certified compatible with the fuel. In preparation for this hearing, I inquired of my equipment supplier to determine what would be required to convert one of my newer stations to sell E-85. These stations have the newest equipment and, therefore, hold the best chance for existing equipment compatibility. I learned that my new steel tanks and my fiberglass tanks were certified compatible with E-85. Our automatic tank gauges were listed compatible as were our fiberglass piping systems. However, we would have to replace several of the ancillary fittings, including the submersible turbine pump, the overfill drop tube and others like flexible hoses, spill buckets, ball valves, etc. In addition, our hanging hardware, which includes conventional nozzles, swivels, breakaways and curb hoses would have to be replaced with nickel plated units at an increased cost. For all of these conversions, including tank cleaning, we estimated the cost to be between $6,000 and $7,000. However, this does not include the dispenser itself. The two dispenser manufacturers each charge an additional fee for a new E-85 compatible dispenser -- $8,000 for Dresser-Wayne and $7,300 for Gilbarco. Thus, a typical E-85 dispenser can cost upwards of $17,000 per unit. And this cost is for equipment that has not yet been certified compatible with E-85 by Underwriters Laboratories. . . . We have spoken with several retailers who lament their decision to install E-85 equipment because they have been unable to generate sufficient sales from these fueling positions to support their overall business model.

APPENDIX C

FOOD VERSUS FUEL

The Current Global Food Crisis Cannot Be Ignored

Governments, NGOs (*i.e.*, World Bank, IMF, the UN, and OECD), and federal agencies among others have highlighted the association between biofuels and the current concerns over global food supplies and prices.

- "Meanwhile, by diverting grain and oilseed crops from dinner plates to fuel tanks, biofuels are jacking up world food prices and endangering the hungry. The grain it takes to fill an SUV tank with ethanol could feed a person for a year."[109]
- "But now a reaction is building against policies in the United States and Europe to promote ethanol and similar fuels, with political leaders from poor countries contending that these fuels are driving up food prices and starving poor people. Biofuels are fast becoming a new flash point in global diplomacy, putting pressure on Western politicians to reconsider their policies, even as they argue that biofuels are only one factor in the seemingly inexorable rise in food prices. . . . Even if biofuels are not the primary reason for the increase in food costs, some experts say it is one area where a reversal of government policy could help take pressure off food prices."[110]

Impacts in Other Countries

- "Prices for basic food supplies such as rice, wheat and corn have skyrocketed in recent months, driven by a complex set of factors including sharply rising fuel prices, droughts in key food-producing countries, ballooning demand in emerging nations such as China and India, and the diversion of some crops to produce biofuels. . . . The increasing use of crops to produce biofuels has been criticized as contributing to food shortages."[111]
- "The leaders of Bolivia and Peru have attacked the use of biofuels, saying they have made food too expensive for the poor."[112]

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[109] "The Clean Energy Scam," March 27, 2008, http://www.time.com/time/magazine/article/0,9171,1725975,00.html.

[110] "Fuel Choices, Food Crises and Finger-Pointing," April 15, 2008, http://www.nytimes.com/2008/04/15/business/worldbusiness/15food.html?_r=2&adxnnl=1&oref=slogin&ref=washington&adxnnlx=1209484974-c9lIIHwmmXp0bPyZwzF15g.

[111] "Food Crisis Is Depicted As 'Silent Tsunami'," April 23, 2008, Page A01, http://www.washingtonpost.com/wp-dyn/content/article/2008/04/22/AR2008042201481.html.

[112] "Biofuels starving our people, leaders tell UN," April 22, 2008, http://www.guardian.co.uk/environment/2008/apr/22/biofuel.crisis.

- "Among other targets, they singled out U.S. policies pushing corn-based ethanol and other biofuels as deepening the woes. 'When millions of people are going hungry, it's a crime against humanity that food should be diverted to biofuels,' said India's finance minister, Palaniappan Chidambaram, in an interview. Turkey's finance minister, Mehmet Simsek, said the use of food for biofuels is 'appalling.'"[113]
- India and African nations are calling on the Western world to rethink the diversion of huge amounts of food for biofuel, which has created shortages and driven up prices in poorer countries."[114]
- "'Use crops as food for people, not fuel for engines,' Egyptian President Hosni Mubarak said at the summit."[115]

Statements from Non-governmental Organizations

- "Biofuels were developed as part of plans to limit and reduce greenhouse gas emissions, held responsible for global warming, but since they take up land that would otherwise be used for food production, they have been increasingly blamed for soaring food prices. The World Bank said earlier this month that increased biofuel production had contributed to the rise in food prices."[116]
- An article written by the Managing Director of the International Monetary Fund: "Higher food prices over the past few years in part reflect well-intentioned, yet misguided policies in advanced economies, which attempt to stimulate biofuels made from foodstuffs through subsidies and protectionist measures."[117]
- "Hailed until only months ago as a silver bullet in the fight against global warming, biofuels are now accused of snatching food out of the mouths of the poor. . . . But as soaring prices for staples bring more of the planet's most vulnerable people face-to-face with starvation, the image of biofuels has suddenly changed from climate saviour to a horribly misguided experiment. . . . the head of the International Monetary Fund

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[113] "Food Inflation, Riots Spark Worries for World Leaders," *The Wall Street Journal*, April 14, 2008, Page A1 (subscription required), http://online.wsj.com/article/SB120813134819111573.html?mod=hps_us_whats_news&mod=WSJBlog.

[114] "Stop using food for fuel, West told," April 10, 2008, http://www.nationalpost.com/news/story.html?id=434170.

[115] "World leaders urged to address food crisis," *Los Angeles Times*, June 4, 2008, http://www.latimes.com/news/nationworld/world/la-fg-food4-2008jun04,0,5532828.story.

[116] "Thai PM lashes out at World Bank over biofuel criticism – UPDATE," April 22, 2008, http://www.forbes.com/markets/feeds/afx/2008/04/22/afx4916972.html.

[117] "A Global Approach is Required to Tackle High Food Prices," April 21, 2008, http://www.imf.org/external/np/vc/2008/042108.htm.

("IMF") said biofuels 'posed a real moral problem' and called for a moratorium on using food crops to power cars, trucks and buses."[118]

- National Public Radio interviewed World Bank President Robert Zoellick who stated that biofuels are a major contributor to higher food prices.[119]
- Robert Zoellick, President of the World Bank, announced a 10-point plan for tackling the food situation. "Seventh, we need action in the US and Europe to ease subsidies, mandates and tariffs on biofuels that are derived from corn and oilseeds. The US's use of corn for ethanol has consumed more than 75 per cent of the increase in global corn production over the past three years. Policymakers should consider 'safety valves' that ease these policies when prices are high. The choice does not have to be food or fuel. Cutting tariffs on ethanol imported into the US and European Union markets would encourage the output of more efficient sugarcane biofuels that do not compete directly with food production and expand opportunities for poorer countries, including in Africa."[120]
- "Increased bio-fuel production has contributed to the rise in food prices. Concerns over oil prices, energy security and climate change have prompted governments to take a more proactive stance towards encouraging production and use of bio-fuels. This has led to increased demand for bio-fuel raw materials, such as wheat, soy, maize and palm oil, and increased competition for cropland. Almost all of the increase in global maize production from 2004 to 2007 (the period when grain prices rose sharply) went for bio-fuels production in the U.S., while existing stocks were depleted by an increase in global consumption for other uses."[121]
- "But no factor gets more consistent credit for food price turmoil than the international biofuels stampede. . . . Warnings that ethanol programs, brought on by absurd national energy policies and myths about reducing the risk of climate change, could severely disturb food production and prices, have been issued for years. . . . The United Nations, previously a big booster of biofuels, is now issuing warnings."[122]
- "The United States and Europe should cut back on production of biofuels because they are hurting food supply at a time of rising prices, an adviser to U.N. Secretary-General Ban Ki-moon said on Monday. Biofuels derived from crops have come under attack in

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[118] "Biofuels under attack as food prices soar," April 20, 2008: http://news.yahoo.com/s/afp/20080420/ts_afp/foodbiofuelsclimatewarming_080420093611;_ylt=AmNpNnkByd.unYnQSTZFIJVrAlMA.

[119] "World Bank Chief: Biofuels Boosting Food Prices," April 11, 2008, http://www.npr.org/templates/story/story.php?storyId=89545855.

[120] "A 10-point Plan for Tackling the Food Crisis," May 29, 2008, http://www.ft.com/cms/s/0/d1a2981c-2da7-11dd-b92a-000077b07658.html?nclick_check=1.

[121] "Rising food prices: Policy options and World Bank response," p. 1, http://siteresources.worldbank.org/NEWS/Resources/risingfoodprices_backgroundnote_apr08.pdf.

[122] "Who caused the world food crisis?," April 8, 2008, http://www.financialpost.com/analysis/columnists/story.html?id=75d38e8e-7d7e-440e-a318-9b60687e11a1&k=55279.

recent weeks on fears they compete with food for farming land and help to push up food prices, worsening a global crisis that is affecting millions of poor."[123]

- "Western farm lobbyists have embraced corn ethanol (and other biofuels such as rape-seed biodiesel) as a new way to gobble up excess production and justify lavish farm subsidies. The result has been a vast shift of land into energy crops (15 percent of arable land in Germany and France, and some 20 percent of America's corn production). [Rural Development Institute Chairman Emeritus Roy] Prosterman warns that 'we need to close the subsidy spigot, otherwise we won't be feeding 15 to 20 percent of our corn to cars, but two or three times that amount. I shudder to think what that would do to food availability worldwide.'"[124]
- The OECD has also expressed concern over the "food-vs-fuel" conflict that has arisen from biofuels mandates.[125]

The United Nations Secretary-General created a High-Level Task Force on the Global Food Security Crisis on April 28, 2008.[126] Therefore, there should not be any confusion about the current existence and significance of this problem.

A decision by the Administration to require or promote biofuels should be informed by an appropriate consideration of world food security.

IFPRI Calls for a Moratorium on Grain-based Biofuels

The International Food Policy Research Institute issued a press release on May 16, 2008 calling for a short term "emergency package." This included the following:

> Governments should revoke biofuel subsidies and excessive blending quotas (such as the requirement to use a certain percentage of ethanol in gasoline). Political leaders should consider a range of additional measures, including freezing biofuel production at current levels, reducing production, or enacting a moratorium on the use of grains and oil seeds for biofuels. At the same time, there needs to be support for development of bio-energy technologies that do not rely on food crops. A moratorium on grain-based biofuels would quickly unlock these commodities for use as food.[127]

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[123] "U.S., EU must cut back on biofuels: U.N. adviser," May 5, 2008, http://www.reuters.com/article/environmentNews/idUSL054703482008050 5?feedType=RSS&feedName=environmentNews.

[124] *Newsweek* Special Report, "It's the Stupid Politics, The world's poor are paying the price for years of bad government policy in agriculture," May 19, 2008, http://www.newsweek.com/id/136355.

[125] Richard Doornbosch and Ronald Steenblik, *Biofuels: Is The Cure Worse Than The Disease?*, Organisation for Economic Co-operation and Development, September 2007.

[126] For more information, *see* http://www.un.org/issues/food/taskforce/index.shtml.

[127] *See* http://www.ifpri.org/PRESSREL/2008/pressrel20080516.pdf.

The Agency and the Administration need to address this food-versus-fuel issue as a critical global concern that needs to be addressed urgently.

FAO Warns That Corn Prices Could Increase Next Year

The UN's Food and Agriculture Organization provides an informative explanation and warning:

> The issue is not limited to how much of each crop may be used for biofuels instead of food and feed, but how much planting area could be diverted from producing other crops to those used as feedstock for production of biofuels. To illustrate, high maize prices since mid-2006 encouraged farmers in the US to plant more maize in 2007. Maize plantings increased by nearly 18 percent in 2007. This increase was only possible because of reductions in soybeans and, to a lesser extent, in wheat areas. The expansion in maize plantings combined with favourable weather resulted in a bumper harvest in 2007 which made it possible for the US to meet domestic demand, including that from its growing ethanol sector, as well as exports. However, this apparent success in maize masked another important development – reduced wheat and soybean plantings and therefore their decreased production was one reason for their sharp price increases. This chain reaction may be repeated in 2008, but this time in reverse order. Farmers in the US are reported to be cutting back their maize plantings in favour of soybeans and wheat because of their higher relative prices. However, the demand for maize by the ethanol sector is expected to continue to rise and if production of maize declines in 2008, it is difficult to expect that the United States will be able to meet all demand (food, feed, fuel and exports) without a significant drawdown on its own maize stocks. Such an eventuality will be watched closely because, in these periods of tight markets, they could result in firmer prices for maize again next year. In future years, in view of the new US Energy Independence and Security Act (EISA), feedstock demand for maize is almost assured to grow considerably under mandates.[128]
>
> FAO is also concerned about the relationship of biofuels production and food security. Subsidies to and tariff protection of biofuel production may also need to be re-examined in light of their effects on food security. China and South Africa have already restricted the use of grains for ethanol production based on food security concerns, and some observers have called for other countries to also include food security considerations in the policymaking process.[129]

[128] Food and Agriculture Organization of the United Nations, "Soaring Food Prices: Facts, Perspectives, Impacts and Actions Required," April 2008, HLC/08/INF/1, pages 10 and 11.

[129] *Ibid.*, page 45.

Given the world food-versus-fuel issue and the competing crop demands for food, feed, fuel and exports, food security is paramount.

FAO is Concerned About Questionable Climate Change and Energy Security Benefits from Biofuels and Rising Food Prices

> There is also an urgent need to review current policies supporting, subsidising and mandating biofuel production and use. . . . Many of the assumptions underlying these policies regarding beneficial impacts on climate change and energy security are now being questioned, and unintended consequences of rising food prices for poor consumers are being recognized. . . . As the implications of biofuel development for developing countries are scrutinized more closely, one emerging concern is the negative impact of high food prices – which are partly a result of increased competition from biofuels for agricultural output and resources – on poverty and food security.[130]

With questionable climate change and energy security benefits and rising food prices, mandating additional biofuel production and use is inappropriate at this time.

We Have Not Yet Found a Food Versus Fuel Balance

Two professors in the Department of Agricultural Economics at Purdue University are concerned about increasing food prices.

> The massive increase in the use of some crops for fuel is expected to increase food costs for American consumers. Based on expected 2007 farm level crop prices, that additional food cost is estimated to be $22 billion for U.S. consumers compared to farm prices for the crops produced in 2005. A rough estimate is that about $15 billion of this increase is related to the recent surge in demand to use crops for fuel.
>
> While corn and soybean oil have been the primary ingredients used for biofuels in the U.S., as more land shifts towards those crops (especially corn), this will tend to increase the prices for other crops that compete for the same land. The rate and speed at which higher crop prices are translated to higher food prices will vary by food product. Higher farm prices may be quickly transmitted to consumers in some food products, but can take multiple years for the full impact to work through the food marketing system for products like pork and beef.

[130] Food and Agriculture Organization of the United Nations, "The State of Food and Agriculture 2008; Biofuels: prospects, risks and opportunities," pages viii and 7, available at http://www.fao.org/docrep/011/i0100e/i0100e00.htm.

> The sector that may bear the largest adverse impacts in the short run is the animal production sector if higher feed prices cannot be immediately passed to food consumers. Nearly one-half of the $22 billion annual impact may have to be absorbed by the animal sector in the short run. Over time, reductions in supply of some animal products may be needed, which will eventually result in higher farm and retail prices. Thus, the higher feed costs will ultimately pass on to consumers.
>
> In the longer run, food will be able to compete successfully with the use of crops for fuel, but probably with somewhat higher food prices and greater costs to food consumers. Not all food items will be affected in the same manner. Some adjustments are likely in where food is produced around the globe and even in the mix of foods consumers eat. The magnitude of these impacts will depend on a host of factors now unfolding, such as the ability of the world's crop producers to expand output, advances in energy and biofuels technology, energy policy around the globe, and the level of growth of the world economy. Policy makers examining various biofuels alternatives are encouraged to consider broader implications, including the impact on consumer food budgets.
>
> The ultimate goal for world agriculture is to find a balance between how much of our crop production can be used for fuels and how much is needed to maintain an adequate supply of food at acceptable prices.[131]

We are at a critical crossroads globally regarding use of food crops for fuel and have not yet found "a balance between how much of our crop production can be used for fuels and how much is needed to maintain an adequate supply of food at acceptable prices." New programs that require or promote additional biofuels should be deferred until the global food-versus-fuel issue is resolved and an appropriate balance is found.

Editorials and Op-eds Views in Which NPRA Concurs

The Salt Lake Tribune printed an editorial. "The food-versus-fuel debate is likely to get hotter, . . . The burning of corn for fuel is one culprit - one for which the United States is largely to blame. . . . But it's clear that continuing the current headlong rush to embrace all types of biofuels without considering the consequences of famine and economic and political upheaval is shortsighted indeed."[132]

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[131] Corrine Alexander and Chris Hurt, "Biofuels and Their Impact on Food Prices," ID-346-W, http://www.ces.purdue.edu/extmedia/ID/ID-346-W.pdf.

[132] "Food or fuel?: Corn ethanol a culprit in food price increase," May 6, 2008: http://www.sltrib.com/opinion/ci_9173152.

The Boston Globe printed an editorial. "CORN should be used for food, not motor fuel, and yet the United States is committed to a policy that encourages farmers to turn an increasing amount of their crop into ethanol. . . . Greater use of ethanol means more greenhouse gases and more expensive food for people and livestock, hardly a fair exchange."[133]

Three recent op-eds provide perspective:

> Agricultural crops like corn and soybeans can be used for making ethanol for motor fuel. So the stomachs of the hungry must also compete with fuel tanks. Misdirected government policy plays a part here, too. In 2005, the United States Congress began to require widespread use of ethanol in motor fuels. This law combined with a subsidy for this use has created a flourishing corn market in the United States, but has also diverted agricultural resources from food to fuel. This makes it even harder for the hungry stomachs to compete. Ethanol use does little to prevent global warming and environmental deterioration, and clear-headed policy reforms could be urgently carried out, if American politics would permit it. Ethanol use could be curtailed, rather than being subsidized and enforced.[134]
>
> Taking these together -- the environmental damage, the human pain of food price inflation, the failure to reduce our dependence on oil -- it is impossible to avoid the conclusion that food-to-fuel mandates have failed. Congress took a big chance on biofuels that, unfortunately, has not worked out. Now, in the spirit of progress, let us learn the appropriate lessons from this setback, and let us act quickly to mitigate the damage and set upon a new course that holds greater promise for meeting the challenges ahead.[135]
>
> Although several factors are contributing to the global increase in food prices, including escalating grain demand (especially in China and India), droughts (most notably in Australia) and rising energy costs, the conversion of corn, sugarcane, and other crops to biofuels is a significant variable, if not the key factor in the price-hike equation. . . . Keeping our gas tanks full at the cost of empty stomachs is an unnecessary, morally reprehensible solution to current energy problems.[136]

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[133] "Can't eat ethanol," April 13, 2008: http://www.boston.com/bostonglobe/editorial_opinion/editorials/articles/2008/04/13/cant_eat_ethanol/.

[134] "The Rich Get Hungrier," an op-ed in *The New York Times*, May 28, 2008.

[135] Lester Brown and Jonathan Lewis, "Ethanol's Failed Promise," April 22, 2008: http://www.washingtonpost.com/wp-dyn/content/article/2008/04/21/AR2008042102555.html.

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