Backgrounder
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The Ethanol Mandate Should Not Be Expanded

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The new ethanol mandate is perhaps the most disappointing program in the Energy Policy Act of 2005. Since taking effect in 2006, this measure has increased energy and food prices while doing little to reduce oil imports or improve the environment.

Based on this track record, the Administration and Congress should now be debating the repeal of this ill-advised and anti-consumer measure. Instead, in his State of the Union address, President George W. Bush proposed greatly expanding the mandate.[1] Regrettably, this may be one of the few energy policy ideas upon which he and Congress can agree.

Any effort to increase the ethanol mandate is misguided because it would exacerbate the problems created by the current requirements without appreciably reducing oil imports or protecting the environment.

Bad News for Consumers

The 2005 energy bill mandated that 4 billion gallons of renewable fuel (mostly corn-based ethanol) must be added to the gasoline supply in 2006. That amount rises to 4.7 billion gallons for 2007 and 7.5 billion in 2012. These targets represent a large percentage increase in ethanol use but are still only a small fraction of the 140 billion gallons of gasoline that the U.S. currently uses every year.[2]

This mandate comes on top of other pro-ethanol provisions, most notably a 51 cent per gallon tax credit. Other incentives include payments to corn farmers and subsidies for small ethanol producers. These add up to $5.1 billion to $6.8 billion per

Talking Points

- Since 2006, Congress has required that billions of gallons of ethanol must be added to the nation's gasoline supply.
- This mandate has done little to reduce our dependency on foreign oil or improve the environment.
- It has, however, significantly increased food and energy costs.
- Nevertheless, President Bush and many in Congress propose that even more ethanol use be required—something that would only exacerbate the problems caused by the current mandate.
- It would be far better to repeal the current mandate, eliminate existing tariffs and other restrictions on ethanol imports, and let market forces determine the appropriate price and level of ethanol use.

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year—roughly $1.00 per gallon of ethanol.[3] Thanks in part to these incentives, current ethanol use is above the mandated levels, but without any government interference, the ethanol market would be considerably smaller. The domestic ethanol industry also benefits from tariffs limiting ethanol imports, mostly of sugar-derived ethanol from Brazil, which is produced more efficiently than ethanol from corn.

While a boon to Midwestern corn farmers and big ethanol producers like Archer Daniels Midland, ethanol has been bad news for the driving public. Ethanol usually costs more than gasoline, so adding it to gasoline increases fuel prices at the pump.[4]

Ordinary vehicles can use gasoline blends containing up to 10 percent ethanol, and specially modified vehicles can use fuel that is up to 85 percent ethanol. However, ethanol lowers fuel economy because a gallon of ethanol has only two-thirds of the energy content of a gallon of gasoline.[5] Difficulties in transporting it to markets far from the Midwest and other logistical problems add further to the price of ethanol in several regions.

Ethanol use at current levels has also led to skyrocketing corn prices as the available supply is split between food and fuel uses. This has led to higher prices for corn products and things such as corn-fed meat.[6] The U.S. Department of Agriculture predicts that the ethanol mandate will continue to apply upward pressure on food prices in the coming years.[7] Even the price of tortillas, the dietary staple of many low-income Mexicans, has been affected.[8]

No Appreciable Improvement in Energy Security

Beyond costs, the claimed benefits of ethanol use have not materialized. For one thing, it does not reduce oil imports as much as promised, partially because a gallon of ethanol can do the work of (and therefore replace) only two-thirds of a gallon of gasoline. In addition:

- A significant amount of petroleum-based products is used in growing corn, such as the diesel fuel for tractors and harvesters;[9]
- Certain components of gasoline must be removed before adding ethanol to prevent the overall blend from violating environmental

1. The White House, "Twenty in Ten: Strengthening America's Energy Security," January 24, 2007, at *www.whitehouse.gov/stateoftheunion/2007/initiatives/energy.html* (March 26, 2007).
2. Brent D. Yacobucci, "Fuel Ethanol: Background and Public Policy Issues," Congressional Research Service *Report for Congress*, updated October 19, 2006, pp. 5–6, at *http://fpc.state.gov/documents/organization/76323.pdf* (March 26, 2007).
3. Doug Koplow, "Biofuels—At What Cost?" International Institute for Sustainable Development, October 2006, pp. 56–61, at *www.globalsubsidies.org/IMG/pdf/biofuels_subsidies_us.pdf* (March 26, 2007).
4. Yacobucci, "Fuel Ethanol: Background and Public Policy Issues," pp. 10–12.
5. U.S. Department of Energy, *Annual Energy Outlook 2007*, p. 59.
6. Keith Collins, Chief Economist, U.S. Department of Agriculture, statement before the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, January 10, 2007, pp. 10–11, at *www.usda.gov/oce/newsroom/congressional_testimony/Collins_011007.pdf* (March 26, 2007), and Ian Swanson, "Ethanol Divides Corn, Livestock Interests," *The Hill*, February 8, 2007, at *http://thehill.com/business--lobby/ethanol-divides-corn-livestock-interests-2007-02-08.html* (March 26, 2007).
7. U.S. Department of Agriculture, *Agricultural Projections to 2016*, February 2007, pp. 20–26, at *www.ers.usda.gov/publications/oce071/oce20071.pdf* (March 26, 2007).
8. Manuel Roig-Franzia, "A Culinary and Cultural Staple in Crisis: Mexico Grapples with Soaring Prices for Corn—and Tortillas," *The Washington Post*, January 27, 2007, p. A1, at *www.washingtonpost.com/wp-dyn/content/article/2007/01/26/AR2007012601896_pf.html* (March 26, 2007).
9. When non-petroleum energy inputs, especially the coal and natural gas used at ethanol production facilities, are also taken into account, the overall net energy balance for ethanol is only slightly positive. In other words, it takes nearly as much energy to make ethanol as it provides. See Global Insight, "Winners and Losers of Ethanol Mandates: Agricultural Producers, US Consumers, US Security," June 2005, pp. 20–34, and Dennis Avery, "Biofuels, Food, or Wildlife?—The Massive Land Costs of U.S. Ethanol," Competitive Enterprise Institute *Issue Analysis*, September 21, 2006, p. 6, at *www.cei.org/pdf/5532.pdf* (March 26, 2007). By some accounts, ethanol is a net energy loser. See David Pimentel, "Ethanol Fuels: Energy Balance, Economics, and Environmental Impacts Are Negative," *Natural Resources Research*, Vol. 12, No. 2 (June 2003), pp. 127–134.

requirements under Clean Air Act provisions, which are applicable in many parts of the country; and

- Transporting ethanol requires more energy than transporting gasoline because ethanol transported by pipeline (the most energy-efficient means of transport) becomes contaminated by moisture along the way. Instead, ethanol is shipped via petroleum-using trucks, barges, and railroads.

The current ethanol mandate will supplant only 1.1 percent of petroleum imports by 2012, without taking into account the petroleum inputs in ethanol production and use.[10] Once these inputs are taken into account, that figure falls by half to about 0.5 percent, according to one analysis.[11] Others suggest a somewhat higher percentage, but still in the very low single digits.[12] In any event, the energy security gains from ethanol use are minute, especially in relation to its costs.

Overrated Environmental Benefits

The claimed environmental benefits of ethanol are also suspect. Although promoted as a means of reducing vehicular emissions that contribute to smog, ethanol is a mixed bag. It lowers some types of pollutants, such as carbon monoxide, but increases others, such as the evaporative emissions that contribute to smog.[13] The fertilizer, pesticides, and irrigation required for corn farming in some areas also have negative environmental impacts.[14] These impacts will only worsen if forests are cleared or marginal lands are planted to expand corn acreage to meet increasing demand.[15]

The President has touted the benefits of ethanol in reducing carbon dioxide emissions, which are linked to global warming.[16] Carbon dioxide is a natural constituent of the atmosphere, but it is also the byproduct of the combustion of fossil fuels, including gasoline. By some measures, using ethanol in vehicles results in fewer carbon dioxide emissions than an equivalent amount of gasoline. However, after taking into account the carbon dioxide emitted from ethanol production, the reduction in emissions is modest.[17]

Overall, the costs of the ethanol mandate are substantial, while the benefits are small at best. The only real winners are the direct beneficiaries of this special-interest program, mainly corn farmers and ethanol producers.

Expanding the Mandate: Making a Bad Idea Worse

Despite the mandate's shortcomings, the President has announced that he wants to increase it nearly fivefold to 35 billion gallons by 2017.[18] Several bills in Congress would set similarly ambitious goals.[19]

10. Global Insight, "Winners and Losers of Ethanol Mandates," pp. 28–34, and U.S. Department of Energy, Energy Information Administration, "Renewable Fuels Legislation Impact Analysis," July 2005, pp. 4–5, at *http://tonto.eia.doe.gov/FTPROOT/service/s606_s650_analysis.pdf* (March 26, 2007).
11. Global Insight, "Winners and Losers of Ethanol Mandates," p. 29.
12. International Energy Agency, "Biofuels for Transport: An International Perspective," April 2004, pp. 51–66, at *www.iea.org/textbase/nppdf/free/2004/biofuels2004.pdf* (March 26, 2007), and Alexander E. Farrell, Richard J. Plevin, Brian T. Turner, Andrew D. Jones, Michael O'Hare, and Daniel M. Kammen, "Ethanol Can Contribute to Energy and Environmental Goals," *Science*, Vol. 311, No. 5760 (January 27, 2006), pp. 506–509.
13. National Research Council, *Ozone-Forming Potential of Reformulated Gasoline*, 1999, pp. 4–10.
14. Jason Hill, Erik Nelson, David Tilman, Stephen Polasky, and Douglas Tiffany, "Environmental, Economic, and Energetic Costs and Benefits of Biodiesel and Ethanol Biofuels," *Proceedings of the National Academy of Sciences*, Vol. 103, No. 30 (July 25, 2006), pp. 11206–11210, at *www.pnas.org/cgi/reprint/0604600103v1* (March 26, 2007).
15. Avery, "Biofuels, Food, or Wildlife?" pp. 10–11.
16. The White House, "Twenty in Ten."
17. Farrell *et al.*, "Ethanol Can Contribute to Energy and Environmental Goals," and Hill *et al.*, "Environmental, Economic, and Energetic Costs and Benefits of Biodiesel and Ethanol Biofuels."
18. The White House, "Fact Sheet: Strengthening America's Energy Security and Improving the Environment," January 24, 2007, at *www.whitehouse.gov/news/releases/2007/01/20070124-5.html* (March 26, 2007).

Of course, a higher ethanol mandate would supplant somewhat more than 1.1 percent of imported oil, but the current mandate is proving costly enough. Raising the targets would only intensify the problems. In fact, dedicating the entire U.S. corn crop to ethanol, which would be prohibitively costly, would probably not meet the expanded ethanol goals.[20] This means that substantial new sources of ethanol would be needed.

One free-market policy could increase ethanol supplies in the U.S.: Eliminating tariffs and regulatory barriers to ethanol imports would expand access to global sources, thereby lowering prices.[21] Predictably, such proposals have provoked strong opposition from the domestic corn lobby. In any event, the small volume of ethanol available on the global market would still leave the U.S. far short of the 35 billion gallon target.

For these reasons, the President has also promised more money for research into cellulosic ethanol, which is made from wood chips, grasses, agricultural waste, or other plant materials. The President has expressed confidence that these additional means of producing ethanol can supplement the corn-based variety and meet the 35 billion gallon target in a cost-effective manner.

However, cellulosic ethanol is far from economically viable at this point,[22] and this kind of federally directed alternative energy research program has a poor track record.[23] Usually, the money is wasted on boondoggles like the Carter-era Synfuels program—an expensive federal program to make motor fuels from coal and other sources that was a complete failure—while diverting resources away from more useful avenues of research and development. If past experience with Washington's attempts to choose alternative energy winners and losers is any guide, cellulosic ethanol will fall considerably short of the current hype.

What Congress and the Administration Should Do

Instead of trying to pick alternative energy winners and losers, Congress and the Administration should:

- **Seriously consider** repealing the ethanol mandate instead of expanding it, and
- **Eliminate** tariff and regulatory barriers to ethanol imports.

Creating a 35 billion gallon ethanol mandate in the hope that technological breakthroughs will help to meet it is not responsible policy. Given the serious problems with the much smaller current mandate, this is the last thing the federal government should be expanding.

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19. See Biofuels Security Act of 2007, S. 23, 110th Cong., 1st Sess., § 101.
20. Hill *et al.*, "Environmental, Economic, and Energetic Costs and Benefits of Biodiesel and Ethanol Biofuels," p. 11208.
21. Ben Lieberman, "Let the Ethanol Imports Flow," *Business Week*, June 5, 2006, p. 136, at *www.businessweek.com/magazine/content/06_23/b3987128.htm* (March 26, 2007).
22. Avery, "Biofuels, Food, or Wildlife?" pp. 14–17; Dave Juday, "Synfuels II: The Ethanol Numbers Don't Add Up," *The Weekly Standard*, November 13, 2006; Jerry Taylor and Peter Van Doren, "The Ethanol Boondoggle," *The Milken Institute Review*, 1st Quarter 2007, p. 27; and U.S. Department of Energy, *Annual Energy Outlook 2007*, p. 58.
23. Thomas H. Lee, Ben C. Ball, Jr., and Richard D. Tabors, *Energy Aftermath* (Boston: Harvard Business School Press, 1990), pp. 167: "In summary, the experience of the 1970s and 1980s taught us that if a technology is commercially viable, then government support is not needed; and if a technology is not commercially viable, no amount of government support will make it so." See also Jerry Taylor and Peter Van Doren, "Soft Energy Versus Hard Facts: Powering the 21st Century," in Ron Bailey, ed., *Earth Report 2000* (New York: McGraw-Hill, 1999), pp. 146–147.