

Learning about Legislation #47 - a closer look at Senator Toomey's crusade against ethanol

For some time MoCTrack has included quotes from Senator Toomey raging against the rules that force the inclusion of ethanol in our fuel mix. We often portrayed it as evidence of his pro-business/ anti-environmental stance. But when he introduced a bill this year to change the renewable fuel standard in partnership with Democrats, the technical aspects of this issue seemed ripe for a closer look. So MoCTrack turned to Andrea Wittchen, Partner at [iSpring](#) and our environmental contributor, to walk us through the details surrounding ethanol and Sen. Toomey's bill. It is fascinating, complex, and maybe Sen. Toomey wasn't as wrong (on this issue, anyway) as we thought!

[S. 2298](#) – Restore Environmental Sustainability to Our Renewable Energy (RESTORE) Act

Contributed by Andrea Wittchen, Partner, [iSpring](#)

This bill, co-sponsored by Pat Toomey (R-PA), Dianne Feinstein (D-CA) and Susan Collins (R-ME), is a straight-forward amendment to the Renewable Fuel Standard (RFS) that would abolish the corn ethanol mandate in the RFS. It would not affect the mandates for advanced biofuels. In order to understand the effects of this amendment, it's useful to consider some background and some science. The bill is pending in the Senate Environment and Public Works Committee.

Background

Ethanol, a clear, colorless alcohol, has been used as a fuel for a long time. In the 1850s, it was a major lighting fuel. However, it was taxed during the Civil War as alcohol, raising the price significantly above that of its competitor fuel, kerosene. It came back into use in 1906 when the tax was repealed, only to be banned again as alcohol during the Prohibition period from 1919-1933. During WWII it was sometimes used as an alternative fuel when gasoline was in short supply. Beginning with the fuel shortages in the 1970s, ethanol came into more regular use as a gasoline substitute or additive and has been used continuously since then. Fun Fact: the first Model T was designed to run on either gasoline or ethanol or a combination of the two.

In 2005, in response to growing concern about the carbon emissions associated with transportation, Congress created the Renewable Fuel Standard (RFS) which was then revised in 2007(RFS2). The RFS required that a renewable biofuel be added to regular gasoline in order to reduce carbon emissions. A renewable biofuel was defined as a fuel made from biomass that produced at least a 20% reduction in lifecycle greenhouse gas (GHG) emissions versus the "standard" gasoline of 2005. The majority of biofuel was and still is made from cornstarch – about 95%.

The standard specifies the number of gallons of renewable biofuel that must be used each year with the number increasing through 2022. Of that number (which is 30 billion gallons for 2020), a specific portion of it must be ethanol. For 2020, that amount is 15 billion gallons and it will remain at that level through 2022. The remainder can be of any other kind of renewable biofuel such as advanced biofuels that must have at least a 50% reduction in lifecycle GHG emissions over the 2005 baseline. This can include cellulosic ethanol which is made from plant fibers – trees, grasses and waste and must deliver at least 60% reduction in lifecycle GHG emissions. Practically, this has worked out that ethanol accounts for about 10% of each gallon of gasoline, hence the E10 designation (ethanol = 10%). There is also E15 fuel (15% ethanol) and E85 (85% ethanol) that can only be used in flex fuel-designed cars.

The Science

Here's where things get a little tricky. At first blush, ethanol looked like a good idea. It burns cleaner and at higher octane levels than gasoline, so that was good. But it also has more evaporative emissions that contribute to smog and ground-level ozone. That was bad. Also although ethanol does create GHG emissions when burned, the corn used to create it also absorbs CO₂ as it grows so the general supposition was that ethanol was carbon-neutral. However, the corn has to be fermented which requires a large amount of heat. Depending on how the electricity to create that heat is generated (oil, natural gas, coal, solar, wind), that can knock the ethanol to either side of the carbon-neutral line.

In addition, ethanol/gas mixtures deliver lower mileage rates than 100% gasoline, requiring more gas to go the same amount of miles. They also damage small engines. The complicated process of creating ethanol from cornstarch is also a more expensive process than gasoline refining.

There are now competing scientific views on the environmental impact of ethanol in gasoline. Most conservation groups and their scientists now argue that there is no discernible value to the environment to blending ethanol into gasoline and in fact that it does more harm than good. Farm groups and their scientists claim there is still an environmental advantage to ethanol. It's hard to discern what the correct answer is.

Unintended Consequences

The institution of ethanol subsidies distorted the corn industry. More and more corn production was directed toward ethanol production rather than towards food. Most of our corn crop is used to feed livestock, not humans. Farmers turned more fields into cornfields and also expanded the amount of corn that they planted, tilling previously unused grasslands and meadowlands to produce more corn. Today about 40% of the U.S. corn crop is used to produce ethanol. This artificially inflates food and feed prices by creating an artificial shortage of corn because of diversion to ethanol.

In addition, the carbon neutrality of corn as a fuel became distorted as the cost of turning untilled land into cornfields was calculated into the carbon cost of the corn. Those fields had served as carbon sinks and carbon storage. Once they were tilled, that value was lost. Also, since many of those fields were of inferior quality for corn production, they required more fertilization and irrigation, adding more to the carbon cost.

As automobile mileage standards have improved dramatically since 2005, cars are using less gasoline overall. The requirement that a fixed number of gallons of ethanol be added to gasoline each year becomes increasingly difficult to accomplish as the ethanol would now comprise more than 10% of the gasoline consumption. This is what is called the "blend wall". Above 10%, ethanol can cause damage to standard automobile engines.

The Politics

The farmers who produce the corn that makes the ethanol are a powerful political force, particularly in mid-western states like Iowa and Nebraska. They have seen a substantial boon from the subsidies that encourage them to plant more and more corn. Previous bills to eliminate the ethanol mandate have been introduced in both the House and the Senate as far back as 2013, some by Senator Toomey. None of them have progressed very far in either chamber.

The force of the farm lobby on this issue can be seen in the outcry that arose out of the recent decision by the current administration to grant waivers to certain refineries this year to not have to include ethanol in their gasoline mixtures. Apparently the fossil fuel lobby has more clout than the farmers. It seems unlikely that this new bill from Senators Toomey, Feinstein and Collins will have much more success than previous ones.

The Bottom Line

This has been a consistent position that Senator Toomey has espoused for quite some time. A case can be made that the ethanol mandate has outlived its usefulness, especially because of the unintended consequences that have warped the corn market, increased prices and had negative environmental impacts. Certainly a strong case can be made that those subsidy funds could be better directed to developing a more economically viable cellulosic ethanol which definitely has a lower impact on the environment and can be made from self-renewing biomass (rapidly growing trees and grasses as well as waste products). With the escalation in corn ethanol production, research and innovation on making economically viable cellulosic ethanol has lagged.

The bill is well-intentioned and can be scientifically and economically justified. In the current anti-environmental climate in the Senate and the administration, it is unlikely to develop much traction.