

In Regards to EPA Docket EPA-HQ-OAR-2016-0004:

The EPA can improve the quality of our air, water, and land by accepting the reality that the national policy to promote corn-based ethanol is a failure. This policy, initially well intended, is devastating to our environment and to our wildlife. It's distorting food quality and prices. And, our government is wasting taxpayers' money to further the damage caused by corn-based ethanol. It is time to stop and rethink ethanol.

In retrospect, the promise of corn ethanol was too good to believe: grow crops in our own soil to produce fuel that burned cleaner than gasoline, help the environment, and cure our dependency on foreign oil. And, corn-based ethanol promoters said, agricultural communities across the U.S. would be benefit by planting corn to be used for ethanol from fence post to fence post.

Eleven years after the Energy Policy Act of 2005 and seven after the Energy Independence and Security Act of 2007, it is apparent that corn ethanol was in fact too good to be true.

We have gained more energy independence through new oil drilling techniques, than the false market created for corn through the renewable fuel standard (RFS). These government incentives have also increased the costs of livestock feed and our own food, and the environmental impact of ethanol is an overall negative when the production and transportation cycle of the product is factored in, making it a dirtier fuel per gallon than the petroleum it replaced.

In its proposed rulemaking for 2017 ethanol volumes, the EPA has an opportunity to reduce some of these negative impacts. Requiring ethanol volumes at a level lower than originally set out in the RFS statute will put less of a strain on the environment and allow for a more realistic market for ethanol. We applaud the EPA for having already set the volume levels for 2017 below what was statutorily required in the RFS, however we encourage the EPA to consider setting the volume even lower.

## **ECONOMIC IMPACTS**

### **Ethanol and the Free Market**

Between 2005 and 2011, U.S. ethanol production nearly quadrupled from 3.9 billion gallons per year to 13.9 billion gallons per year and the number and capacity of U.S. ethanol plants more than doubled.<sup>1</sup> Considering the time period when these increases began, the passing of government mandates and subsidies propelled that market. Otherwise, projections for U.S. Corn prices from 2006 through 2011 were approximately 30 percent less than the corn prices inflated by the RFS.

However it is not just the price that is inflated, but also the production in general. Because the RFS requires an increasing amount of ethanol be produced year over year, the federal government not only creates an artificial growing market, but also puts more strain on a system that may not always produce high corn yields. Droughts and other catastrophic events could affect corn growth – as happened in 2012. This would mean that instead of ensuring corn crops

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<sup>1</sup> <http://www.ourenergypolicy.org/wp-content/uploads/2013/07/The-Effect-oftheUS-Ethanol-Mandate-on-Corn-Prices-.pdf>

were used for food when shortages happen, there is a statutory requirement that crops be used for fuel in the case of shortages.<sup>2</sup>

### Increased Food Costs

Though corn is renewable in the sense that it can be grown again-and-again, the amount grown each year is not limitless. Corn ethanol displaces corn that would normally be used as a food source and uses it instead to create fuel. As of 2011, roughly 40 percent of corn raised in the U.S. today goes to the production of biofuels.<sup>3</sup> Since the U.S. supplies most of the world's corn supply, this offset can be attributed to approximately 15 percent of the shortage of corn on the total global market.<sup>4</sup> From 2006 – 2011, U.S. ethanol expansion cost corn-importing countries \$11.6 billion in higher corn prices.

Many argue that the corn that ends up on plates is not the same as the corn used to produce ethanol. That is not entirely true. Ethanol producers use the same feed corn that dairy, chicken and cattle farmers use to feed their livestock. As prices for corn rise due to increased demands for ethanol production, the costs increase for livestock farmers and the meat and dairy products that end up on our plates.<sup>5</sup>

### Ethanol Affects Trade and Gasoline Prices

Because of the RFS, there is a statutory obligation to put a certain volume of ethanol into the fuel market. But what about when the demand for fuel is reduced? Even then a certain volume of ethanol must be used in fuel and risks pushing the amount above the 10 percent blend wall.

The blend wall is real and has real consequences. Oil companies will avoid blending more than 10 percent, trading fuel instead. Taking fuel out of the US market means that US gas prices spike.<sup>6</sup> Even without this effect on gas prices, many consumers avoid high blends of ethanol because they are more expensive than regular gasoline.

Ethanol above 10 percent does cause issues with fuel market and gas prices. It is well known that ethanol can cause engine damage because of its corrosive properties. If gasoline in the US exceeds the 10 percent blend wall, most cars will lose their warranties, meaning the costs of repairs for consumers could grow. Additionally, smaller engines – boats, trimmers and mowers – do not function well on ethanol.<sup>7</sup> This means more expenses for consumers in engine repairs and replacements.

Lower price per gallon for E-15 and E-85 at the pump confuses consumers because ethanol contains less energy than regular gasoline.<sup>8</sup> As a result more gallons are required to travel the

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<sup>2</sup> Id.

<sup>3</sup> <https://www.extension.iastate.edu/agdm/crops/outlook/cornbalancesheet.pdf>

<sup>4</sup> <http://www.ase.tufts.edu/gdae/Pubs/wp/12-02WiseGlobalBiofuels.pdf>

<sup>5</sup> [http://bush.tamu.edu/mosbacher/takeaway/TakeAwayVol3Iss1.pdf?\\_ga=1.115809606.1594525549.1466806007](http://bush.tamu.edu/mosbacher/takeaway/TakeAwayVol3Iss1.pdf?_ga=1.115809606.1594525549.1466806007)

<sup>6</sup> <http://www.forbes.com/sites/jeffmcmahon/2014/02/26/ethanolsvictory-could-be-ethanols-ruin/#1426a293200e>

<sup>7</sup> <http://www.consumerreports.org/cro/news/2013/03/gas-with-ethanol-can-make-small-engines-fail/index.htm>

<sup>8</sup> <http://www.eia.gov/tools/faqs/faq.cfm?id=27&t=4>

same distance as the more common E-10 mix. Ultimately, this is another fuel cost that hits consumers in the pocketbook.

### **Ethanol Makes Safety Expensive**

The same issues that arise from using ethanol in engines make it difficult to transport through pipelines. To distribute ethanol throughout the US, it must be taken by trucks and tankers on surface roads.<sup>9</sup>

This increases ethanol's exposure in traffic, and ethanol is an extremely volatile substance.<sup>10</sup> In the case that an accident happens, ethanol is not only difficult to clean up, but ethanol fires are difficult to control. Special equipment like alcohol resistant foams is necessary to contain and put out the fire. This means costly equipment for both large, well-funded fire departments and small and volunteer fire departments across the Midwest where the transport of ethanol usually begins.

## **ENVIRONMENTAL IMPACTS**

### **Ethanol Increases Air Pollution**

Corn-based ethanol does not improve air quality, though this is what was promised "big benefit". The farming, refining, and transportation of corn-based ethanol create more emissions than the production and use of regular gasoline.<sup>11</sup> Tractors give off emissions as they work the fields, refineries must use electricity to run the conversion process, and emissions in refining might run on coal, which makes even more of an impact on emissions from production. And again because ethanol must travel by vehicle rather than pipeline, it takes many fleets of vehicles to transport ethanol. At every point, more emissions are given off.

While it is true that non food-based sources of ethanol could be more beneficial for air quality and green house gas emissions, these types of biofuels are not at all ready to go into high production.

### **Ethanol Negatively Impacts Bio-Diversity**

The effects of corn-based ethanol go beyond air quality. Ninety million acres of corn are grown in the U.S. annually, with more than 40 percent of that devoted to corn-based ethanol. It has been found that the need for land to grow corn eliminates biologically diverse habitats on 35 million acres. The acreage used has increased yearly – and in that increase acreage is lost that used to be a natural habitat for plant, insect and animal species.<sup>12</sup>

Ethanol affects biodiversity in more ways than just taking land.<sup>13</sup> Without crop rotation, increased insecticides, herbicides, and fertilizer are used more and more to grow corn. The insecticides and herbicides are used year-after-year and continue to kill off insect species that may be friendly to other plants. As the fertilizer necessary for corn puts more nitrogen into the

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<sup>9</sup> <http://www.livablefutureblog.com/2011/10/transporting-corn-ethanol>

<sup>10</sup> <http://thebulletin.org/public-safety-and-transporting-ethanol>

<sup>11</sup> <http://www.pnas.org/content/111/52/18490.full.pdf>

<sup>12</sup> <https://www.cbd.int/doc/publications/cbd-ts-65-en.pdf>

<sup>13</sup> [http://www.arb.ca.gov/fuels/lcfs/workgroups/lcfssustain/03172011\\_freese.pdf](http://www.arb.ca.gov/fuels/lcfs/workgroups/lcfssustain/03172011_freese.pdf)

ground, it also puts more nitrogen in surface water runoff, contributing to the dead zone in the Gulf of Mexico. This affects untold fish and plant species in the ocean

A direct impact has been on the monarch butterfly population over the past decade. Monarch populations have dropped significantly, and much of the indicators point to the expansion of corn growth. One problem is Roundup-ready corn enables farmers to use herbicides to kill weeds instead of regular tilling. The plants that monarchs normally feed from – milkweed – can survive tilling and grow in fallow fields, allowing for a feeding reserve for monarchs. Milkweed, however, cannot survive strong herbicides used year-after-year.

Destruction of formerly fallow fields have destroyed habitat that the monarch could depend on for milkweed, grasses, and other naturally occurring plants – a 25.5 million acre increase in the land used to grow corn and soybeans since 2006. Ten million of these acres were land farmers once held in reserve through government programs. The other 15.5 million acres are now subpar farmland that had been natural habitat.<sup>14</sup>

### **Ethanol Wastes and Pollutes Water**

It was estimated that the amount of water needed to grow enough corn to meet the 2015 RFS goal for ethanol volumes would equal 2.9 trillion gallons. And much of this comes from aquifers like the Ogallala, which provides water to about 30 percent of the U.S.<sup>15</sup>

As mentioned above, ethanol also affects the environmental dead zone in the Gulf of Mexico. It is estimated that an additional 2.39 million tons nitrogen fertilizer was needed to grow the 2015 corn crop for ethanol. This not only affects the Gulf. The nitrogen in the water runoff encourages algae blooms in lakes and streams. These blooms deprive the water of oxygen and kill off fish and plants in those waterways. And if there is any doubt where the extra nitrogen comes from, one study estimates that 52 percent of the nitrogen pollution in the Gulf of Mexico can be attributed to corn and soybean crops alone.<sup>16</sup>

Ethanol was a good idea, and cellulosic and advanced ethanol and biofuels may still have a place in the environmentally and security focused future of the U.S. fuel industry. However, the realities of corn-based ethanol have raised too many questions to continue to increase its volumes to statutory levels. It's time to rethink corn-based ethanol, make it a non-subsidized product and allow it to stand on it's own in the marketplace.

### **HOW TO MOVE FORWARD**

I write all of this to encourage the EPA to take a hard look at the facts, and do what is right for our country. I implore you to rethink ethanol. Others around the world are beginning to consider the best way forward, and we can join them. The European Union placed a seven percent cap on the contribution of biofuels produced from food crops.<sup>17</sup> The EPA should consider a similar cap, limiting the damaging effect of corn-based ethanol. Lowering the cap will focus innovation on production of more advanced biofuels from non-food crops and waste.

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<sup>14</sup> [http://e360.yale.edu/feature/tracking\\_the\\_causes\\_of\\_sharp\\_decline\\_of\\_the\\_monarch\\_butterfly/2634/](http://e360.yale.edu/feature/tracking_the_causes_of_sharp_decline_of_the_monarch_butterfly/2634/)

<sup>15</sup> <http://blogs.ei.columbia.edu/2011/03/21/ethanol%E2%80%99s-impacts-on-our-water-resources/>

<sup>16</sup> <https://s3.amazonaws.com/ucs-documents/clean-vehicles/corn-ethanol-and-water-quality.pdf>

<sup>17</sup> <http://biofuelstp.eu/biofuels-legislation.html>

The damage caused from corn-based ethanol production is obvious. Continuing, or worse yet increasing the program, only serves to compound the damage. The first step is to collect all the facts, reassess the program and develop a path forward based on those facts.

We can start by addressing what we know to be damaging. Rethink Ethanol and find a better way.

Sincerely,  
Jerry Jung  
Birmingham, MI

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*Jerry Jung is a conservationist dedicated to preserving the environment and wildlife for future generations. A retired businessman, Jerry graduated from Tulane University with top honors and attended Harvard University Business School. He helped develop ticketing optimization software for the airline industry and is also the former CEO of Michigan CAT. Jerry brings his love of nature, his business acumen, and his solutions-oriented leadership to any endeavor. He is passionate about finding fuel alternatives that deliver what is necessary for the environment and the economy.*