2009 Ethanol Policy Briefing

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Introduction

President Obama has laid out a significant agenda to grow the economy and expand the use of renewable energy, while reducing dependence on foreign oil and addressing the serious challenge of climate change. The following briefing paper is designed to give an overview of the role ethanol plays in achieving these goals, including current ethanol policies and the critical issues facing the industry today. First, the paper will discuss information about ethanol and numerous benefits of investment in ethanol. From job creation to eliminating 13 million tons of greenhouse gas emissions and the need to import over 200 million barrels of oil annually, ethanol's positive impact on the United States (U.S.) is undeniable. Next, key policy issues facing the industry will be examined. Critical regulatory, financial and infrastructure policies must addressed if the full potential of ethanol is to be realized. Lastly, this paper will set the record straight regarding several key myths about ethanol that have received significant media attention, including environmental impacts, impact on food prices and energy benefits.

The Benefits of Investing in Ethanol

Investing in ethanol offers tremendous benefits to help grow the U.S. economy and those of developing nations, reduce dependence on foreign oil and green our environment. The investments made in ethanol today will help bring about a new, more affordable, cleaner and more secure energy future for the nation.

Economic Benefits

Clean, affordable domestically-produced ethanol enhances America's economic prosperity and competitiveness through job growth, lessened dependence on foreign oil and increased GDP and tax revenues. In 2007 alone, the ethanol industry created more than 200,000 new jobs across the country that cannot be exported or outsourced. In addition, ethanol production contributed $47.6 billion to the nation's GDP and generated $4.6 billion in federal tax revenues.[i] Further, America's increasing dependence on imported oil leaves the economy vulnerable to supply disruptions and price volatility. Energy price spikes have a devastating effect on consumers and the economy as a whole. In addition, the cost of importing oil results in hundreds of billions of American dollars being sent overseas rather than invested at home.

Ethanol production plays a critical role in revitalizing America's rural areas by creating high-paying jobs and stimulating economic growth. In 2007, an average 100 million gallon per year ethanol biorefinery provided the following economic benefits to the local economy:

- The goods and services bought and sold as a result of the operation of the ethanol facility added $367 million to the local GDP.[ii]
- The combination of increased GDP and higher household income generated an estimated nearly $3.6 billion of additional tax revenue for state and local governments.[iii]
- The economic activity resulting from the ethanol biorefinery helped create more than 2,400 new jobs across all sectors. Those include 50 at the biorefinery and more than 1,300 in the agricultural sector.[iv]
- The increase in good paying jobs as a result of the facility boosted local household incomes by more than $100 million.[v]

Addressing the Challenge of Global Climate Change: Reducing Greenouse Gases by 13 Million Tons Per Year

Today's ethanol offers a sustainable solution to powering our country while addressing the serious challenge of global climate change. Ethanol results in fewer greenhouse gas emissions than gasoline, is fully biodegradable and meets stringent tailpipe emission standards.[vi] The U.S. Department of Energy (DOE) estimates that 13 million tons of greenhouse gases were avoided in 2007 due to biofuels production and use.[vii] Researchers at the University of Nebraska-Lincoln have recently found that ethanol produced from corn can reduce GHG emissions by as much as 59 percent relative to gasoline.[viii] Continued innovation in the ethanol industry can further reduce emissions by as much as 67 percent.[ix] The commercialization of advanced biofuels such as cellulosic ethanol promises to reduce GHG by 86 percent relative to gasoline.[x]

Sustainable ethanol production remains a top priority of the ethanol industry. Agricultural and technical innovations are constantly increasing crop yields, reducing the intensity of pesticide and fertilizer use, improving water productivity, and promoting conservation tillage that reduces erosion and sequesters carbon. Precision agriculture techniques are utilized and farm machinery is integrated so only the amount of input necessary is applied. Since 2001, ethanol plants

have decreased energy use by 21.8 percent and reduced their use of water by 26.6 percent, despite a 6.4 percent increase in yield.[xi] In addition, while corn ethanol production increased almost 30-fold between 1980 and 2006, the number of farmed acres remained the same, due to steadily increasing corn yields per acre.

Reducing Dependence on Imported Oil

In 2007, the U.S. imported nearly 60 percent of the petroleum it consumed.[xii] As the U.S. confronts the current energy and climate crisis, ethanol offers a renewable, domestic energy alternative to meet our nation's growing energy needs today and reduces our dependence on oil from volatile and unfriendly regions. The domestic production of nearly 6.5 billion gallons of ethanol in 2007 eliminated the need to import at least 228.2 million barrels of oil to manufacture gasoline. The use of domestic ethanol enabled us to keep $16.5 billion in the U.S. economy rather than enriching friend and foe alike abroad.[xiii] Without ethanol, Americans would have used 7.2 billion more gallons of gasoline in 2007 in order to maintain our current level of travel.[xiv]

Beyond the cost paid at the pump, there are additional costs that can be attributed to every barrel of oil due to the inefficiencies of cartel pricing and oil shocks, and the military cost to ensure steady access to foreign oil. In January 2008, the Center for Forensic Economic Studies estimated this "import premium" at an additional $24 per barrel of imported oil.[xv] The economic loss to the U.S. when dollars are spent overseas, known as the "import multiplier," also places a significant strain on the U.S. economy. The Center for Forensic Economic Studies further estimates that for every dollar spent on foreign crude oil, an additional $1.55 is removed from the U.S. economy.[xvi]

Global Development

The development of a sustainable, global ethanol market will help the economies of developing nations, lifting communities and families out of poverty and hunger. By making corn and other grains a commodity that can sustain the world's growing population, we will encourage investment in developing agriculture and help the economies of developing nations and create better lives at home. Utilizing abundant idle farming land in combination with agricultural innovation to increase crop yields, countries around the world can benefit from both food and fuel production in a sustainable manner. For some countries, growing crops for biofuels means they will be diversifying their farms, which makes their farmers less risk adverse because the prices of ethanol are tied to the fuel market, rather than the food market.[i] In addition, in some cases farmers are able to grow energy crops on land that is not otherwise suitable for food production.

For some African countries, imports of oil and oil derivatives account for up to 80 percent of their foreign exchange expenditure.[ii] As countries develop, they can advance to use crop residuals, like leaves and stalks for cellulosic ethanol. By learning many of the agricultural innovations that the U.S. and Brazil use today for ethanol production, other countries can grow their own crops for ethanol, helping them to become more energy independent and even become energy exporters – growing their economy.

Biofuels Policy

Today's ethanol offers a sustainable solution to powering our country while addressing the serious challenge of global climate change. If the full potential of ethanol is to be realized, it is important that vital regulatory, infrastructure, financial and trade issues are addressed in the near term.

Intermediate Blends: Providing a Market for Cellulosic Biofuels

Today, the ethanol industry is in danger of hitting full market penetration that will hinder the commercialization of cellulosic ethanol and jeopardize meeting the Renewable Fuel Standard. Since current government regulations restrict the
ethanol blend to E-10, the country will hit a "blend wall" and will not be able to use a volume of ethanol greater than 10 percent of our fuel supply. Ethanol producers expect to hit that wall this year based on current supply projections. Adoption of higher, intermediate blends of ethanol in gasoline will enable the industry to "scale" the blend wall and provide numerous benefits to the U.S., including reducing our nation's dependence on foreign oil, creating jobs and growing the economy, and helping to improve the environment. Significant research exists on the ability of cars to use such intermediate blends with little to no impact on car performance or emissions.

Today's vehicles are designed to run on gasoline blended with small amounts of ethanol. Currently, the U.S. Environmental Protection Agency (EPA) caps the amount of ethanol that can be blended into gasoline at 10 percent, commonly referred to as "E-10". The 10 percent cap is an arbitrary number that dates back to 1978 when the EPA granted a waiver for the use of this fuel blend as substantially similar to gasoline. While higher blends like E-85 play a role in our renewable fuel supply, limited numbers of flex-fuel vehicles and lack of necessary infrastructure will continue to limit its impact in the near-term. In order for intermediate blends to be used in all cars on the road today, a waiver must be issued by the EPA or granted by Congress.

Intermediate blends such as E-15 and E-20 offer significant environmental and economic benefits. By using E-10 in much of its fuel today, the U.S. has reduced its dependence on foreign oil by billions of gallons each year. Based on 2007 U.S. gasoline consumption, increasing the blend level from E-10 to E-15 will avoid the importation of another seven billion gallons of gasoline.[xvii] According to DOE estimates, moving to E-15 can help create 70,000-140,000 new jobs.[xviii] Intermediate blends are also better for the environment because ethanol offers substantial reductions in greenhouse gas emissions. Currently, E-10 reduces greenhouse gas emissions by 59 percent compared to conventional gasoline.[xix]

Evidence is mounting that vehicles on the road today can run on higher blends without modifications. Numerous studies have shown that higher, intermediate blends of ethanol have no impact on the car's performance or maintenance and in fact, may improve fuel economy in some cases. A study by the State of Minnesota, in cooperation with academic and industry groups, compared the effects of E-0, E-10 and E-20 on several fuel system components (19 metals, eight elastomers and eight plastics) and conclusively found no significant differences between E-10 and E-20 use. The study also determined that a 20 percent ethanol blended fuel (E-20) proved effective at both powering the vehicles successfully and was also non-distinguishable in performance.[xx] In addition, a University of North Dakota study found that all four vehicles tested operated well on blends beyond 10 percent ethanol. Three of the four vehicles tested also obtained greater fuel economy at higher blends of ethanol than when running on unleaded gasoline.[xxi] Further, intermediate blends can utilize existing fuel infrastructure. The State of Minnesota concluded that the effects of E-20 do not present problems for current automotive or fuel dispensing equipment.[xxii]

Multiple peer-reviewed studies have found that higher blends of ethanol do not increase vehicle emissions. A recent study prepared by Oak Ridge National Laboratory for DOE, *Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines, Report 1*, concluded that when E-15 and E-20 were compared to traditional gasoline, there are no significant changes in vehicle tailpipe emissions, vehicle drivability, or small non-road engine emissions as ethanol content increased.[xxiii] Further, a report by the Energy & Environmental Research Center and Minnesota Center for Automotive Research found that exhaust emissions levels for all vehicles at all levels of ethanol blend were within the applicable Clean Air Act standards.[xxiv] In fact, the American Lung Association of the Upper Midwest has designated E85 as a "Clean Air Choice™" due to its prevention of lifecycle CO2 and other pollutants.[xxv]

Failure to act on removing the blend wall could also be disastrous for the rural economy. Already, the insecurity around the blend wall and oversupply of ethanol has resulted in the foreclosure of several ethanol plants in states like Kansas and Idaho. This economic ripple could turn into a tidal wave consuming ethanol producers and farmers across the country along with small businesses near ethanol plants if the blend wall is not dealt with immediately. Today, multiple small and commercial-scale cellulosic biorefineries are in various planning and production stages. In order to hasten the development of commercially viable cellulosic ethanol, a product market is necessary to encourage investment in these technologies. Failure to utilize existing ethanol supplies will cause investments in cellulosic ethanol to dry up and America will lose its competitive advantage on this new technology.

Flexible Fuel Vehicles

Today's vehicle fleet is designed to run on small amounts of ethanol blended into gasoline without modification. However, in order to run on both gasoline and higher blends of ethanol such as E-85 (85 percent ethanol, 15 percent gasoline), vehicles must be manufactured "fuel flexible." Other than fueling capability and ethanol compatible components, flexible fuel vehicles (FFVs) are similar to their conventional gasoline counterparts. Their power, acceleration, payload, and cruise speed are comparable whether running on ethanol or gasoline.[xxvi]

In order to fully utilize the significant benefits of ethanol, an increased number of FFVs are needed in the nation's vehicle fleet. Legislation requiring U.S. automakers to produce a target percentage of new automobiles as flex fuel capable will guarantee that the nation's FFV fleet grows. The extra cost of manufacturing a flex-fuel vehicle is a modest $50 to $100 compared to the expected cost of roughly $3,000 to $12,000 for a 40-mile plug-in hybrid vehicle battery, making FFVs affordable for auto manufacturers and consumers alike.[xxvii] Widespread adoption of FFVs will ensure maximum consumer fuel choice and mitigate the risk of energy supply disruptions from abroad.

Blender Pumps

While E-10 blends are sold in gas stations across the country, specialized infrastructure is necessary to dispense higher blends such as E-20, E-30, E-50 and E-85. Today, there are more than 1,700 retail stations (out of more than 170,000 stations nationwide), offering E-85 across the country.[xxviii] The expanded use of blender pumps will give consumers maximum fuel choice and flexibility. Blender pumps contain separate hoses for flex fuel blends and standard gasoline, and are clearly labled with instructions. By utilizing exisiting tanks and pipes, huge cost savings can be realized by retailers and the per-gallon mark-up passed along to consumers to pay for equipment is reduced. According to the American Coalition for Ethanol, the cost for a four-fueling position blender pump ranges from $60,000 to $100,000 compared to the cost of $60,000 for one E-85 pump and $250,000 for four pumps.[xxix]

Blender's Tax Credit

The ethanol industry is an important source of new jobs and economic growth for the American economy at a time when it is needed most. Government investment in ethanol is important to encourage the growth of "green jobs" and ensure that the promise of advanced biofuel is realized. The Volumetric Ethanol Excise Tax Credit, commonly referred to as the "blender's credit," was created to provide gasoline blenders with an economic incentive to blend ethanol with gasoline.

The blender's credit is needed to ensure market access for ethanol and spur the continued investment necessary to develop and deploy next generation biofuels. Ethanol competes with a heavily subsidized product in oil and depends on that competitor to get ethanol to the consumer. A recent study by the U.S. General Accounting Office found that, since 1968, the oil industry has received approximately $150 billion in tax incentives. By comparison, the ethanol industry has received a mere $11.2 billion, despite the fact that ethanol is an emerging technology.[xxx]

Further, government investment in ethanol results in significant contributions to the U.S. economy including federal and state tax revenue, increased GDP and reduced farm program and unemployment payments which more than offset initial government investment. An Iowa State research team recently investigated farm subsidies, farm income, and ethanol mandates, incentives and tariffs. The researchers concluded that ethanol policies saved the U.S. government $2.65 billion in 2007 because farmer support payments, that would have been due under other legislation, would have been higher than the ethanol supports received by farmers. [xxxi] The blender's credit is scheduled to be reduced in early 2009.

Tariff on Ethanol Imports

To prevent U.S. tax dollars from subsidizing foreign-produced ethanol there is a secondary duty in place on imported ethanol of 14.27 cents per liter or 54 cents per gallon. Because all ethanol, regardless of the country of origination, receives the benefit of the Volumetric Ethanol Excise Tax Credit (VEETC), the secondary duty was created to offset the value of this tax credit taken by the petroleum industry when ethanol is blended with gasoline. The ethanol tariff is important to encourage continued investment in the U.S. ethanol industry. Further, it would be irresponsible to offset our dependence on foreign oil by replacing it with dependence on yet another foreign source.

Next Generation Biofuels

Next generation biofuels, such as cellulosic ethanol, are liquid transportation fuels made from a wide variety of feedstocks including switchgrass, corn stover, citrus pulp, wood chips and even municipal waste. The geographic diversity of these feedstocks will enable cellulosic biofuels production throughout the U.S. While the commercialization of next generation biofuels offers tremendous promise in the near term, grain-based ethanol production is a vital foundation upon which scientists and producers have begun to build. As science moves

from making ethanol from corn to producing it from corn cobs and other plant materials, ethanol will continue to be a sustainable and effective energy solution for the world.

While significant milestones have occurred in the laboratory, cellulosic ethanol has yet to be produced on a commercial scale. However, several commercial cellulosic ethanol production plants are under construction, and intensive research and development is rapidly advancing the state of cellulosic ethanol technology. A key challenge to commercialization that remains is the complex and costly conversion process necessary to convert cellulosic feedstocks to fuel. Further, cellulosicbiorefineries are expected to be far more capital-intensive than grain-based plants. As with all emerging technologies, costs will come down as technology is scaled and efficiencies are improved over time.

According to DOE, cellulosic ethanol has the potential to reduce greenhouse gas emissions by more than 86 percent relative to gasoline.[xxxii] In addition, dedicated energy crops used in the production of advanced biofuels can be grown on marginal land not suited for traditional crops. The U.S. Departments of Energy and Agriculture's *Billion Ton Study* found that 1.3 billion tons of U.S. biomass feedstock are potentially available for the production of biofuels – more than enough biomass to meet the new renewable fuel standard mandated by the Energy Independence and Security Act of 2007.[xxxiii]

Today, ethanol producers are investing heavily in next generation biorefineries. The federal government, in partnership with leading companies and academic institutions, has invested significantly in the research, development and deployment of next generation biofuels technologies. In 2007, DOE announced that it would invest up to $385 million for six biorefinery projects over four years in an effort to make cellulosic ethanol cost-competitive by 2012, four of which have successfully met funding requirements and are on schedule to date. When fully operational, the biorefineries are expected to produce more than 130 million gallons of cellulosic ethanol per year. In 2008, DOE announced that it would invest in nine small-scale biorefinery projects from across the country that will utilize a diverse array of feedstocks. As of 2008, DOE had committed over $1 billion in federal funding to further next generation biofuels.[xxxiv]

As with other alternative energy technologies, continued investment is essential to commercializing cost-competitive advanced biofuels. Government funding, including full funding and implantation of the energy title of the 2008 Farm Bill, should continue. Ultimately, the success of today's ethanol industry is essential to spurring continued investment and ensuring a cleaner, more secure, affordable energy future for the U.S.

Setting the Record Straight

Despite ethanol's tremendous success in growing the U.S. economy, reducing dependence on foreign oil and greening the environment, misinformation exists about ethanol's impact on the environment, food prices and energy benefits. As a result of deceptive public relations campaigns and two controversial studies, these myths have garnered significant attention from the media, policy makers and the public at large. However, a wide body of scientific evidence affirms that ethanol is making positive contributions to ensuring a sustainable and secure energy future for the nation.

Food vs. Fuel

In early 2008, commodity prices reached record highs and ethanol was targeted as the primary cause for soaring food prices globally. As a result of a highly successful public relations campaign by the Grocery Manufacturers Association to blame ethanol for higher food prices, the true forces behind the rise were ignored.[xxxv] The truth is, biofuels production accounts for only a small percentage of the overall increase in global food prices. Global food prices have increased 45 percent over the past year, with increased production of corn-based biofuels accounting for an estimated 3 percent of the overall increase, according to the U.S. Department of Agriculture.[xxxvi] Increased global food prices are principally caused by other factors, the greatest of which were the high cost of oil and market speculation. Other factors contributing to rising global food prices include:

- Increased demand as emerging economies grow and their populations consume better diets and more meat.
- Higher oil and gas prices leading to increased fertilizer, harvesting and transportation costs.
- Two years of bad weather and drought leading to poor harvests in some parts of the world.

- Reduced global food supply and increased demand for U.S. agricultural exports.
- Hedge funds and index funds buying of grain and oilseed futures.
- Reduction in global agricultural R&D slowing pace of crop yield growth.

Study after study has shown that ethanol has minimal impact on food prices. According to University of Nebraska-Lincoln Economist Richard Perrin, today's ethanol production should have resulted in grain price increases of 15-30 percent, rather than the 100-200 percent we have observed in the past two years. In other words, his models suggest that ethanol is responsible for no more than 15-20 percent of the grain price increases of the past two years. For this reason Perrin concludes that ethanol is responsible for about one percent of the increases in U.S. food prices.[xxxvii] A study from the Agricultural and Food Policy Center at Texas A&M found, "The underlying force driving changes in the agricultural industry, along with the economy as a whole, is overall higher energy costs, evidenced by $100 per barrel oil."[xxxviii] Today, despite the fact that corn prices have dropped by 50 percent and oil prices continue to tumble, food prices remain high, proving what experts knew all along.

Land Use

Sustainable ethanol production remains a top priority of the ethanol industry. Agricultural and technical innovations are constantly increasing crop yields, reducing the intensity of pesticide and fertilizer use, improving water productivity, and promoting conservation tillage that reduces erosion and sequesters carbon. Between 1970 and 2005, corn yield increased by 90 percent, as the result of an increase in corn productivity through better seed variety, better farming practices, and other agricultural measures.[xxxix] Further, while corn ethanol production increased almost 30-fold between 1980 and 2006, the number of farming acres remained the same, due to steadily increasing corn yields per acre.[xl]

Despite ethanol's continued gains in emissions reductions and crop yields, some are proposing that ethanol's life-cycle greenhouse gas emissions be expanded to include emissions that are not directly caused by ethanol production. This is based on the theory of indirect land use change (ILUC), which claims that the use of crops for ethanol production causes deforestation in other parts of the world, releasing stored carbon. Greenhouse gas emissions are universally measured through a process called life-cycle analysis (LCA) whereby emissions can be tested and verified. In the case of ethanol, LCA takes into account the land used to grow the feedstocks for fuel. However, ILUC theory would assign the emissions from land use changes in other parts of the world to the indirect cause (biofuels) rather than the direct cause (deforestation, etc.).

The theory of ILUC gained notoriety as a result of a study by Tim Searchinger published in *Science* in February 2008. Searchinger, a lawyer with no scientific training or credentials, claimed that ethanol production created more greenhouse gas emissions than gasoline due to "indirect land use changes." Even though Searchinger lacked scientific credibility and academics across the board criticized his methodology and findings as "highly speculative" and "seriously flawed," the media widely covered Searchinger's findings prompting government and non-governmental organizations to take a closer look at these theories. Among the largest criticisms of Searchinger's study include a failure to adhere to internationally accepted methodology for LCA, a lack of accounting for the value of distillers dried grains and outdated information that resulted in poor assumptions.

ILUC is a flawed theory, dismissed by many in the academic life cycle analysis community because of its many ethical and intellectual weaknesses. Current theories of ILUC are based on worst-case scenarios that assume changes in land use always result in a large carbon debt. However, depending on what land is converted and how the land is managed during and after the change, it is possible for land use change to result in the emission of no additional carbon. Further, ILUC models do not take into account soil types, fertilizer practices, tillage, agricultural practices in different countries and other varying conditions.

Among the largest flaws of ILUC is that it assumes that biofuels production results in new land production in different parts of the world – a fact that is unknown at this point. According to LCA expert Dr. Michael Wang of DOE's Argonne National Laboratory, "There seems to be no indication that U.S. corn ethanol production so far has caused indirect land-use changes in other countries."[xli]

ILUC also fails to account for technological advancement in increasing corn crop yields and additional resources such as switch grass and corn stover used for next-generation cellulosic ethanol – feedstocks grown

on existing agricultural lands or on marginal soils not suited for traditional agriculture – further reducing the need for new cropland. Leading voices in the environmental community have noted that using indirect land use measures is flawed for this very reason: "The marginal impact of land use changes here in the United States on land use in the rest of the world is extremely hard to predict with economic equilibriums and agricultural and trade policies all interacting in complex ways," according to Nathanael Greene of the Natural Resources Defense Council.[xlii]

By adopting ILUC, ethanol producers, as well as many other industries, would be held accountable for the actions of people and businesses on the other side of the world over which they have no control. Such policies jeopardize U.S. competitiveness in the global marketplace and punish businesses who have made sustainability a top priority.

Biofuels and Energy Use

Today, each gallon of ethanol produced delivers one third or more energy than is used to produce and this positive energy balance is constantly increasing with new technologies.[xliii] According to the Congressional Research Service, ethanol produced from corn provides 67 percent more energy than is used during production compared to a net energy loss of 19 percent in the production of gasoline.[xliv] Over the last 20 years, the amount of energy needed to produce ethanol from corn has significantly decreased because of improved farming techniques, more efficient use of fertilizers and pesticides, higher-yielding crops, and more energy-efficient conversion technology.[xlv] Since 2001, ethanol plants have decreased energy use by 21.8 percent and reduced their use of water by 26.6 percent, despite a 6.4 percent increase in yield.[xlvi]

In 2005, a study conducted by David Pimentel, an insect ecologist at Cornell, and Tad Patzek, a former oil company employee who is now director of the University of California Oil Consortium, received significant media attention for its claims of a negative energy balance for ethanol. However, the study has been thoroughly discredited by the scientific community and a growing body of government and academic research, including studies by the Departments of Agriculture and Energy, the Colorado School of Mines, Michigan State University and Agri-Food Canada. At the time of its release, Dr. Robert McCormick of DOE's National Renewable Energy Laboratory stated, "At least eight other peer-reviewed studies that have been conducted over the past 12 years find exactly the opposite, that biodiesel has a highly positive energy balance."[xlvii] The most common criticism leveled is that the study relied on old data which resulted in an overestimation of energy use by not taking into account efficiency gains in agriculture, fertilizer production, ethanol production and in the transportation sector. In fact, more than 40 percent of the references listed in the 2005 report were from the 1980s and 1990s. In addition, scientists have criticized the study for failing to account for the value of co-products such as dried distillers grains and failing to meet internationally accepted standards for conducting life cycle studies.

The Gulf Dead Zone

The Dead Zone, also known as a hypoxia zone, is an annual phenomenon that lasts several months and usually peaks around late July. Discovered in the 1970s, it may have existed for a century. The "Dead Zone" is caused by nitrogen and phosphorus delivery to the Gulf of Mexico, but it is unfair to place the majority of the blame on ethanol. Nitrogen and phosphorus come from many sources other than crop fertilizer such as animal manure, crop cultivation, municipal and domestic waste from sewage treatment plants and storm water runoff, and atmospheric deposition from power plants and vehicles.[xlviii] According to a recent report by the U.S. Geological Survey, animal manure on pasture and range lands contribute nearly as much phosphorus as cultivated crops, 37 vs. 43 percent.[xlix]

Today, it is possible for farmers to grow corn in such a way that does not contribute to the "Dead Zone." According to Professor Don Scavia of the University of Michigan, the use of buffer strips between crops and the streams and precision farming could eliminate fertilizer contamination from corn farming. It is also possible to remove nitrogen and phosphorous from the water before it gets into the Gulf.[l] In addition, the latest advances in agriculture technology enable farmers to apply fertilizers with pinpoint accuracy which means less nutrients are lost to runoff and the impact to soil, water and air is minimized. Fertilizers per bushel of corn continue to decline. According to a 2007 study by Argonne National Laboratory, between 1970 and 2005, corn yield increased by 90 percent, while nitrogen fertilizer application increased by only 22 percent, phosphorus fertilizer application was reduced by 25 percent, and potash fertilizer application was reduced by six percent.[li]

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