Biodiesel Bonanza:

How Federal Subsidies Prop Up the Industry and Cost Taxpayers Billions

TAXPAYERS for COMMON SENSE
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The federal government has subsidized the mature U.S. biodiesel industry for more than a decade. In years when subsidies are larger and more predictable, the industry responds with higher production levels to take advantage of billions of dollars in federal tax credits and other incentives. The largest subsidy – the now $3-billion-per-year biodiesel tax credit – was created as a temporary measure in the American Jobs Creation Act of 2004 but has been subsequently extended seven times, most recently through the end of 2017.[1] Congress is currently considering proposals to extend the credit yet again. The industry's other main support is an annual biofuels mandate known as the Renewable Fuel Standard (RFS) that was established in 2005 and expanded in 2007. These and other subsidies discussed below distort markets and prop up biodiesel production at the expense of consumers, the environment, various industries that use biodiesel feedstocks, and taxpayers.

Overview

Biodiesel is derived from animal fats, used cooking oil, and vegetable oils derived from crops such as soybeans, corn, palm, and canola. More than half of U.S. biodiesel is derived from soybeans.[2] Like its sister fuel corn ethanol, biodiesel was expected to one day stand on its own two feet without taxpayer subsidies, market interventions, and government mandates. Unfortunately for taxpayers, biodiesel subsidies continue to hold on through an array of federal programs scattered across numerous government agencies. The government subsidizes biodiesel at nearly every point throughout its supply chain:

- **Feedstock production:** Farm Bill subsidies for the production of corn, soybeans, and other biodiesel feedstocks.
- **Production:** Primarily the $1-per-gallon Volumetric Biodiesel Excise Tax Credit,[3] but also subsidies for annual biodiesel production through the Farm Bill energy title's Bioenergy Program for Advanced Biofuels.
- **Education and market promotion:** Biodiesel education via the Farm Bill's Biodiesel Fuel Education Program.
- **Consumption mandate:** The federal RFS requires a certain level of biodiesel be blended into the U.S. diesel supply each year.
- **Infrastructure subsidies:** The Alternative Fuel Vehicle Refueling Property Credit subsidizes new fueling infrastructure for mixtures of biodiesel and regular diesel.[4]

The array of biodiesel subsidies has resulted in some working at cross-purposes with not only one another, but also other federal programs aimed at curbing air pollution, cleaning up fertilizer runoff from farming operations, etc. Biodiesel subsidies have allowed the federal government to pick winners and losers, distort energy and agriculture markets, and contribute to the expansion and overproduction of biodiesel, all at great cost to taxpayers.

The Biodiesel Tax Credit

Among the many subsidies for biodiesel, the most expensive are a set of tax credits for biodiesel production and mixtures collectively referred to as the biodiesel tax credit. In 2004, Congress created credits against fuel excise taxes and income tax for each gallon of biodiesel used in a fuel mixture through the American Jobs Creation Act (P.L. 108-357). Since the tax credit is tied to blending instead of production, both domestically-produced and imported biodiesel benefit from the credit. The biodiesel tax credit was originally set to expire at the end of 2006 with an estimated cost of $28 million. Since then, the $1-per-gallon credit has been expanded and extended seven times, most recently receiving a retroactive extension through the end of calendar year 2017.

In total, the biodiesel tax credit has cost taxpayers $12 billion. The annual cost of the tax credit has skyrocketed in recent years, as it is tied directly to increasing biodiesel use. In calendar year 2017, the credit cost taxpayers a record $3.25 billion, more than half the cost of the $6-billion-per-year ethanol tax credit (known as the Volumetric Ethanol Excise Tax Credit, or VEETC) which ended in 2011 due to bipartisan opposition. After the demise of VEETC, the biodiesel tax credit became the most expensive direct biofuel subsidy.

Table 1: Cost of Biodiesel Credit by Extension

Years in Effect	Cost ($, millions)
2005 - 2006	$28
2007 - 2008	$168
2009	$512
2010 - 2011	$1,977
2012 - 2013	$2,181
2014	$1,297
2015 - 2016	$2,563
2017	$3,250
Total	**$11,976**

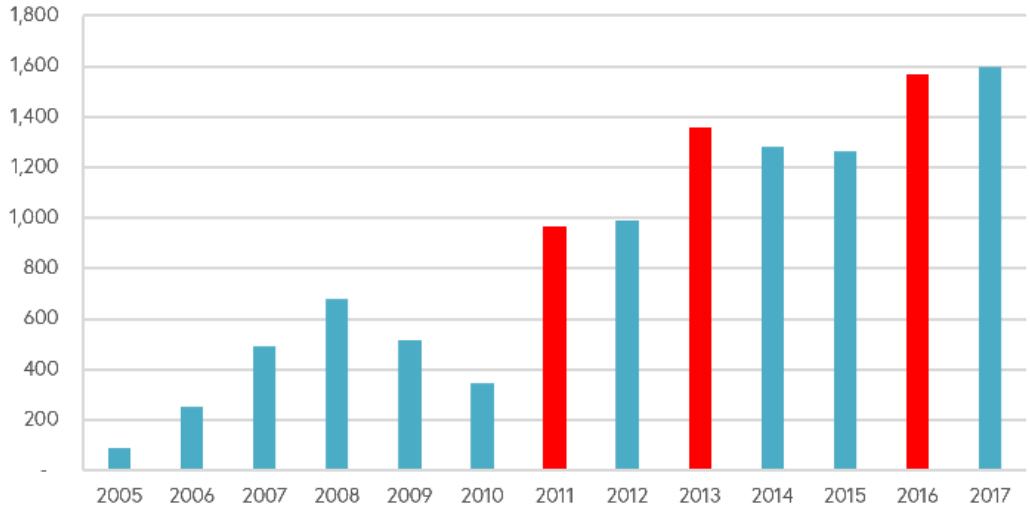
Source: Joint Committee on Taxation

In addition to its mounting cost, the biodiesel tax credit distorts fuel markets by incentivizing production that would not otherwise occur. As the Environmental Protection Agency (EPA) has stated (emphasis added),

> "**The historic data indicates that the biodiesel tax policy in the U.S. can have a significant impact on the volume of biodiesel and renewable diesel used in the U.S. in any given year [...] Each of the years in which the biodiesel blenders tax credit was in effect during the calendar year (2013 and 2016) resulted in significant increases in the volume of advanced biodiesel and renewable diesel used in the U.S. over the previous year (653 million gallons and 779 million gallons respectively).** However, following these large increases in 2013 and 2016, there was little to no growth in the use of advanced biodiesel and renewable diesel in the following years, only 33 million gallons from 2013 to 2015 and negative 127 million gallons from 2016 to 2017. This decrease from 2016 to 2017 happened despite the fact that the required volume of advanced biofuel increased from 3.61 in 2016 to 4.28 billion gallons in 2017. **This pattern is likely the result of both accelerated production and/or importation of biodiesel and renewable diesel in the final few months of years during which the tax credit was available to take advantage of the expiring tax credit...**"[5]

Figure 1 (see page 3) shows how the biodiesel industry significantly ramped up production[6] in years (2011, 2013, and 2016 shown in red) when it knew at the beginning of the year it could reap billions from the $1-per-gallon tax credit. This is a glaring example of the government distorting the marketplace and picking winners and losers. In other years, the credit was instated retroactively, leaving the industry uncertain whether it would benefit from the lucrative tax credit at the beginning of the calendar year; accordingly, biodiesel production in these years was stagnant or lower than in the previous year. Please note, Figure 1 does not include imported biodiesel that was also eligible for the $1-per-gallon tax credit. Annual production volumes in Figure 1 are from the Energy Information Administration (EIA).

Figure 1: Annual U.S. Biodiesel Production, EIA
(in Millions of Gallons)



Other Biodiesel Subsidies

In addition to the costly biodiesel tax credit, several other biodiesel subsidies are scattered across various federal agencies. These subsidies include:

- **Farm Bill commodity and energy title programs:** the Farm Bill energy title first subsidized biofuels in 2002. Subsequent bills in 2008, 2014, and 2018 reauthorized the energy title which funds grants, loans, annual payments, and other subsidies for the biofuels and biomass industries. The Farm Bill, renewed approximately every five years, is a wide-ranging piece of legislation that funds everything from nutrition assistance programs to broadband internet, not to mention agricultural subsidies for the production of biodiesel feedstocks such as corn and soybeans. Farm Bill programs are administered by the U.S. Department of Agriculture (USDA).

- **Renewable Fuel Standard (RFS):** the RFS mandates that 36 billion gallons of biofuels be blended into gasoline and diesel fuel by 2022, with 21 billion of these gallons intended to be "advanced biofuels," a category that includes certain types of biodiesel. Although these lofty government-mandated consumption volumes are unlikely to be fully met, the RFS still distorts markets by propping up biodiesel production. The RFS is administered by the EPA. (See the RFS section below for more details).

- **Department of Energy (DOE) Loan Guarantee Program:** DOE administers various research and development programs for bioenergy, in addition to its Title XVII Loan Guarantee Program. Created as part of the Energy Policy Act of 2005, the program has $34 billion in authority to provide loan guarantees to various technologies, including nuclear, coal, energy efficiency, and renewables (wind, solar, geothermal, or biofuels). Aside from this authority, a Stimulus add-on known as the 1705 program also had about $2.4 billion in American Reinvestment and Recovery Act funds to pay for credit subsidies for renewable and energy efficiency projects, but those funds expired on September 30, 2011.

  Only two companies, Abengoa Bioenergy U.S. Holding and POET, LLC, received the final go-ahead for a taxpayer-backed loan on a biofuels/biomass energy project although POET later withdrew from the program, and Abengoa went bankrupt. Companies producing "green diesel" and other biofuels have applied for federal loan guarantees.[7] Given the program's past defaults, taxpayers could stand to lose even more if additional DOE loan guarantees are granted to risky projects.

- **Other tax credits for biodiesel:** certain new biodiesel infrastructure projects are eligible for another tax credit entitled the Alternative Fuel Vehicle Refueling Property Credit, administered by the U.S. Department of Treasury. See Table 2 below for more details.

Table 2: Federal Biodiesel Subsidies

Federal Agency/ Farm Bill Title	Program/Tax Credit Name	Description	Types of Projects Receiving Subsidies	Estimated or Actual Costs
U.S. Department of Agriculture (USDA)				
Agriculture - Commodity Title	Commodity programs - Agriculture Risk Coverage (ARC), Price Loss Coverage (PLC), etc.	Farm programs that pay farmers for dips in crop prices or revenue (price x yield) over a certain time period	Subsidies for crops used in biodiesel production – such as corn and soybeans	Estimated cost of $3.8 billion in 2018 for all corn and soybeans.[8]
Agriculture – Crop Insurance Title	Federal Crop Insurance subsidies	Crop insurance premium subsidies for yield losses (due to natural disasters) or revenue losses (for dips in annual revenue as little as 15%)	Subsidies for crops used in biodiesel production – such as corn and soybeans	Estimated cost of $8-8.5 billion each year over the next 10 years for all commodities.[9]
Agriculture – Energy Title	Biodiesel Fuel Education Program	Biodiesel market promotion and education program	Nonprofits and universities/ colleges are eligible, but it is unknown which entities receive funding	Discretionary funding of $2 million annually for FY19-23.
	Bioenergy Program for Advanced Biofuels	Payments to advanced biofuels facilities to expand annual production	Over half of funding goes to mature corn ethanol and soy biodiesel facilities (even though corn ethanol is prohibited from receiving funding), with rest going to other types of biodiesel from animal fats, canola oil, used cooking oil, etc.	At least $205 million spent on biodiesel projects from 2009 – 2016.[10]
	Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program	Grants and loan guarantees for advanced biofuels and heat and power facilities	Most loan guarantees go to woody biomass, followed by MSW, ag residues, perennial grasses, algae, and corn or soybean oil.	At least $25 million for a loan to SoyMor, a MN biodiesel facility, in 2009.[11]
	Rural Energy for America Program	Grants and loan guarantees for rural energy efficiency and renewable energy projects, including solar, wind, hydropower, geothermal, and biomass (biodiesel, corn ethanol, and ethanol blender pumps have also received subsidies)	Projects receiving most subsidies include the following (ordered from most to least): solar, energy efficiency and energy audits, grain dryers, anaerobic digesters, wind, biomass, hydropower, irrigation, corn ethanol and blender pumps, "other," geothermal, biodiesel, and tobacco.	At least $9.4 million spent on biodiesel projects from Nov. 2010 to Oct. 2016.[12]

Agriculture – Research Title	Biomass Research and Development Initiative (joint program with DOE)	Grants for research, development, and demonstration projects for biofuels and biobased chemicals and products	Other than general R&D, feedstocks receiving the most funding include (ordered from most to least): woody biomass, sorghum, perennial grasses, vegetable oil, energy crops, algae, corn oil and corn starch, and MSW.	For program overall, discretionary funding of $20 million per year for FY19-23.
Department of Energy (DOE)				
DOE	Clean Cities Program	Provides "informational, technical, and financial resources to EPAct-regulated fleets and voluntary adopters of alternative fuels and vehicles" in nearly 100 U.S. cities.[13]	Works with national parks, municipalities, and state-based incentive programs to promote greater consumption of alternative fuels such as biodiesel and the installation of new fueling equipment, including 85 percent ethanol (E85) blender pumps.	At least $380 million spent on grants for infrastructure and alternatively fueled vehicles (ethanol and biodiesel), from 2009-17.[14]
DOE	Loan Guarantee Program - Title XVII	Provides loan guarantees to various energy projects, including nuclear, coal, energy efficiency, or renewables (wind, solar, geothermal, or biofuels).	While only one biofuels loan guarantee has been finalized, at least 8 other projects (ranging from those for corn stover cellulosic ethanol and woody biomass-based biofuels to green diesel) have been considered for taxpayer-backed loans.	No biodiesel projects have yet been finalized.
Department of the Treasury				
Treasury	Alternative Fuel Vehicle Refueling Property Credit	Facilities dispensing certain alternative fuels can receive a refueling property credit in the form of a 30% tax break	Eligible facilities include gasoline stations, those installing biodiesel or 85% ethanol (E85) blender pumps, or repowering sites for electric vehicles. Stations dispensing natural gas, liquefied natural gas (LNG), and liquefied petroleum gas (LPG) are also eligible.[15]	Estimated cost of $332 million if in effect for 2018-27.[16] (The credit last expired at the end of 2017, but has consistently been extended in the past.)

Importantly, of the subsidies listed above, only one – the RFS – requires biofuels to reduce greenhouse gas (GHG) emissions while the others require little to no sustainability criteria be met in exchange for taxpayer subsidies. In other words, in exchange for more than $3 billion per year in biodiesel tax credit subsidies, the biodiesel industry is not required to prove that its product meets any sustainability or GHG emission reduction criteria. The National Academies of Sciences found that biofuels tax credits actually *increase* – instead of decrease – GHG emissions.[17]

Renewable Fuel Standard Mandate

Biodiesel also benefits from a consumption mandate requiring a certain level of biodiesel be blended with diesel each year. Rather than directly supporting biodiesel through per-gallon payments, the federal RFS subsidizes biodiesel by artificially propping up demand. The costs of the market intervention are borne by consumers, taxpayers, and other industries that rely on corn and soybeans as inputs (such as the livestock industry).

While the RFS was intended to incentivize the production of biofuels from non-food feedstocks (such as forest and agricultural residues, perennial grasses, etc.), it has primarily been filled with first-generation, food-based biofuels such as corn ethanol and soy biodiesel.

The RFS is broken into two broad categories (see Table 3) – conventional ethanol and advanced biofuels – the latter of which biodiesel helps fill each year. The advanced biofuels mandate is further subdivided into three additional categories (see Table 4), one of which is biomass-based diesel (includes both biodiesel and renewable diesel). Biodiesel has historically also helped meet the "other advanced" RFS biofuels category since production of advanced biofuels other than biodiesel has fallen significantly behind Congressional mandates set forth in 2007. The final required volumes of biomass-based diesel for 2018, 2019, and 2020 were 2.1, 2.1, and 2.43 billion gallons, respectively.[18] Biodiesel also helps meet overall advanced biofuels mandates, which were 4.29 billion gallons in 2018 and 4.92 billion gallons in 2019.[19]

Table 3: Types of Biofuels Mandated in the RFS

Type of Biofuel	Annual Production Mandate by 2022	Definition of Biofuel	Examples	Minimum Reduction in Greenhouse Gas Emissions
Conventional ethanol	15 billion gallons/year	Ethanol derived from corn starch	- Mostly corn starch ethanol, with smaller amounts of other ethanol derived from sorghum	20%, but due to a grandfathering clause, nearly every ethanol facility was able to circumvent this minimal requirement
Advanced biofuels (subdivided into 3 other categories in Table 3)	21 billion gallons/year	"Renewable fuel, other than ethanol derived from corn starch"	- Cellulosic ethanol - Ethanol from non-corn feedstocks such as sugar - Biofuels from waste materials such as crop residues, food waste, animal waste, etc. - Biodiesel from soybeans, other vegetable oil, animal fats, etc. - Biogas from landfills - Butanol from renewable biomass such as corn (approved for a certain facility in MN - Gevo)	50%

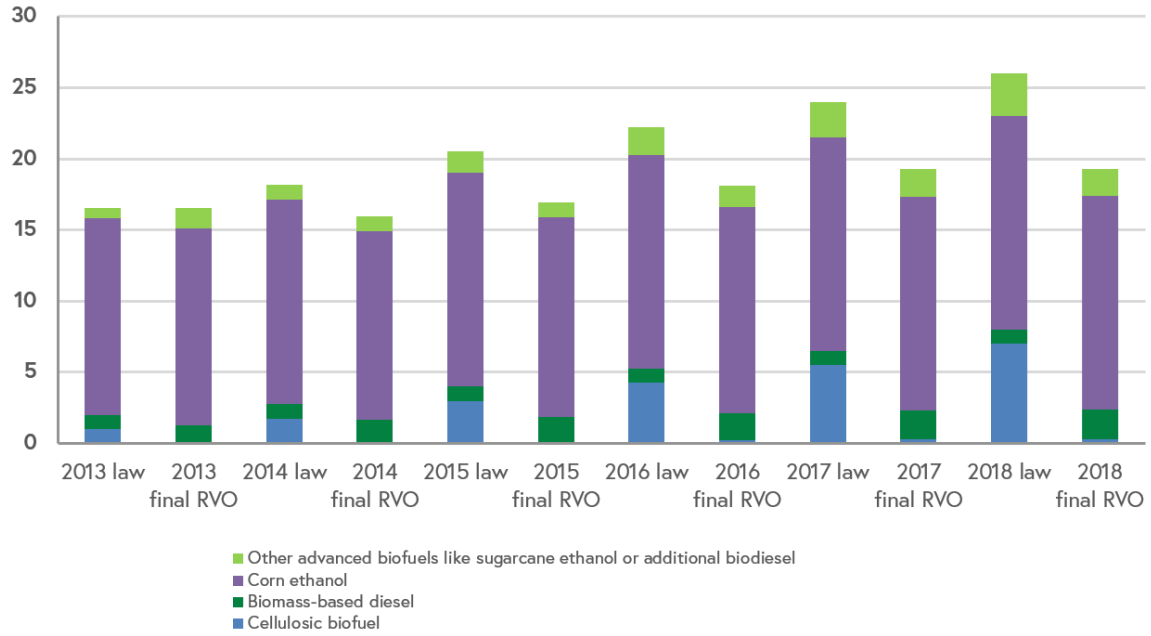
Biodiesel Refinery on the Passaic River

Table 4: Types of Advanced Biofuels Mandated in the RFS

Type of Biofuel	Annual Production Mandate by 2022	Definition of Biofuel	Examples	Minimum Reduction in Greenhouse Gas Emissions
Cellulosic ethanol	16 billion gallons/year	Renewable fuel derived from any cellulose, hemicellulose, or lignin	- Ethanol produced from agricultural residues (corn stover for instance), forest residues, food or municipal solid waste, perennial grasses, etc. Note that corn kernel fiber cellulosic ethanol was also approved by EPA.	60%
Biomass-based diesel	At least 1 billion gallons/year, set annually by EPA	Biodiesel produced from vegetable oil or "a diesel fuel substitute produced from nonpetroleum renewable resources [including] animal wastes, including poultry fats and poultry wastes, and other waste materials, or municipal solid waste and sludges and oils derived from wastewater"	**- Biodiesel produced from soybeans, other vegetable oil, algae, animal fats, used cooking oil, etc.** **- Other diesel fuel substitutes produced from municipal solid waste, animal wastes, etc.**	50%
"Other" advanced biofuels	4 billion gallons/year	Any other fuel that meets the definition of an "advanced biofuel"	- Ethanol from non-corn feedstocks such as sugar - Butanol from renewable biomass (including butanol derived from corn, which was recently approved by EPA for a certain facility – Gevo **- May also include biomass-based diesel (see above)**	50%

In the absence of significant production of other non-food-based advanced biofuels, soy biodiesel has made up a large part of the advanced biofuels mandate even though Congress envisioned it being met by non-food cellulosic sources (such as perennial grasses and agricultural residues) by now. Congress intended for 65% of the advanced biofuels mandate to be met with cellulosic biofuels in 2019 (8.5 out of 13 billion gallons), but cellulosic ethanol production has only reached a few *million* gallons per year. Meanwhile, first-generation biofuels (corn ethanol and biodiesel) have dominated the RFS. Figure 2 shows a comparison of RFS volumes required by law versus actual volumes finalized by EPA in the Agency's annual renewable volume obligations (RVOs).[20] (The law requires a minimum of 1 billion gallons of biomass-based diesel consumption each year, but EPA has the authority to increase this volume.)

Figure 2: Biodiesel & Corn Ethanol Dominate
RFS While Cellulosic Ethanol Fails to Meet Mandate Levels
(in Billions of Gallons)



While biodiesel was intended to significantly reduce GHG emissions and spur rural economic development, biodiesel derived from vegetable oils (such as soybean and palm) may actually *increase* GHG emissions.[21]

Experts have also questioned corn ethanol's ability to reduce GHG emissions. Several independent analysts, including the National Academy of Sciences, thus question the RFS' ability to achieve its goals of lower GHG emissions,[22] greater energy security, and a shift to non-food-based crops.[23]

Negative Impacts of Biodiesel, the RFS, and Other Biofuel Subsidies

Not only is the RFS failing to meet its goals, but it is also increasing costs for consumers and taxpayers, including but not limited to the following:

- **Higher food[24] and feed costs**, particularly for the poor in developing countries, since most RFS biofuel gallons are derived from food/feed crops such as corn, soybeans, and sugar.[25]

- **Higher fuel costs**, since EPA estimates billions of dollars in higher fuel costs for consumers each year due to higher biofuels mandates requiring the use of more expensive fuel.[26]

- **Higher – instead of lower - GHG emissions** since the mandate has primarily been filled with corn ethanol, a biofuel that was largely exempt from RFS requirements to reduce GHG emissions through a grandfathering provision, in addition to soy biodiesel which fails to significantly reduce GHG emissions.[27]

- **Loss of wildlife habitat**, **more water pollution**, **water treatment costs, and public health costs** as sensitive land – highly erodible acres, wetlands, and grasslands – are unlawfully converted into nitrogen- and pesticide-intensive corn and soybean production.[28] To date, EPA has failed to properly implement 2007 RFS protections aimed at preventing native grasslands and forests from being converted to biofuels feedstock production.[29]

- **The RFS undermines other federal policies** aimed at reducing environmental liabilities associated with climate change and water pollution, just to name a few. For example, mandates promoting soy biodiesel consumption encourage more soybean plantings on sensitive land while USDA conservation programs pay farmers to retire this same land. These types of programs work at odds with one another, wasting taxpayer dollars.

Biofuels Blender Pump

Current Status

Biodiesel subsidies are about to reach a tipping point. For the first time, EPA is expected to release a proposed rule in 2019 that will reduce biofuels mandates (compared to those set in law) for 2020-22. This "reset" is required because advanced biofuels other than biodiesel have failed to keep up with Congressional mandates set forth in the 2007 energy bill. In addition, legislation was passed in 2018 by the House Ways and Means Committee to phase out the biodiesel tax credit. The legislation, which did not become law, would have extended the $1-per-gallon credit for 2018-21 (retroactively for 2018) and then phased it out over the subsequent three years (2022-24).[30]

In February 2019, Senate Finance Chairman Chuck Grassley (R-IA) introduced legislation along with Ranking Member Ron Wyden (D-OR) to provide a two-year extension of the biodiesel tax credit (retroactively for 2018 and for calendar year 2019 as well), in addition to other tax extenders. While the status of the current tax extenders package is unclear, similar packages have often been enacted as add-ons to unrelated legislation moving through Congress in past years.

Conclusion

While proponents have attempted to sell the biodiesel industry as one that would increase U.S. energy independence and reduce GHG emissions, it has failed to meet these goals despite more than a decade of generous federal subsidies. The wide array of supports, spanning several government agencies, have done more harm than good and have spurred numerous unintended consequences and costs for both taxpayers and consumers. Biodiesel subsidies distort energy markets, raise fuel and food prices, pick winners and losers, and work at cross-purposes with one another. After billions in subsidies over nearly fifteen years, it is time for the biodiesel industry to survive on its own two feet without taxpayer support. All types of energy – including biofuels and biomass – should be allowed to compete on a level playing field. Otherwise, the very goals these industries set out to achieve will fail to be met while billions of taxpayer dollars are wasted each year.

For more information, contact Taxpayers for Common Sense at 202-546-8500

Endnotes

1 https://fas.org/sgp/crs/misc/R40110.pdf
2 http://unitedsoybean.org/media-center/issue-briefs/biodiesel/
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