

Federal Subsidies for Corn Ethanol and Other Corn-Based Biofuels

November 2017

Since the creation of the domestic market for corn ethanol after the energy crisis of the 1970s, the federal government has nurtured and maintained the ethanol industry with a steady stream of subsidies. Originally sold as a way to achieve energy independence and reduce greenhouse gas emissions, ethanol has been a favorite of many lawmakers: ethanol producers have received favorable treatment under the tax code, tariff protection from foreign competition, and even a government mandate for its use. As a result, taxpayers have spent tens of billions of dollars over the last 30 years subsidizing the production of corn ethanol, while at the same time creating unintended costs for consumers and the environment.

To start, the farm bill, a massive piece of legislation covering topics ranging from nutrition assistance to broadband internet, provides government subsidies for the now-mature ethanol industry, including corporate agribusiness giants such as Archer Daniels Midland. The majority of support for corn ethanol in the farm bill has come from energy title programs such as the Bioenergy Program for Advanced Biofuels, trade programs such as the Market Access Program, and other commodity and crop insurance supports for corn and ethanol blender pumps. While the Rural Energy for America Program also provided subsidies for ethanol blender pumps beginning in 2011, such support was prohibited in the 2014 farm bill. In May 2015, however, the U.S. Department of Agriculture (USDA) once again announced additional support for blender pumps through the Commodity Credit Corporation, a fund typically reserved for farm loans and other major farm subsidy programs.¹

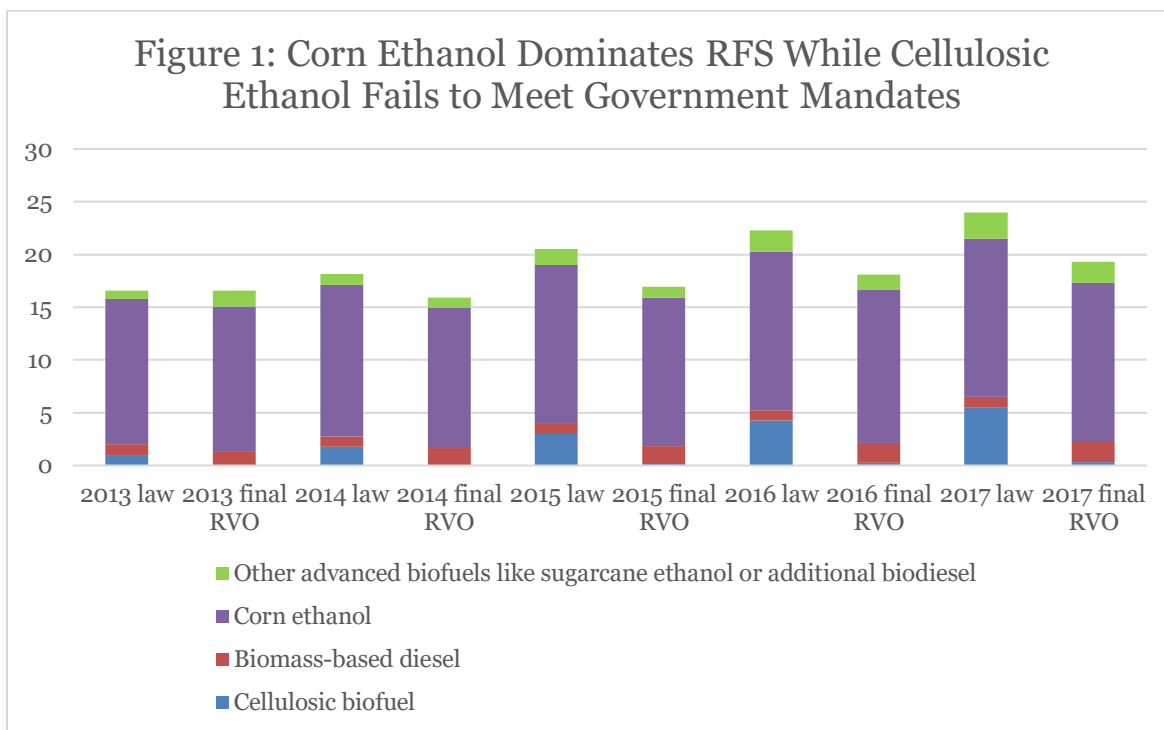
Subsidies for corn-based biofuels also litter the tax code – including tax breaks for biodiesel derived from corn oil and blender pumps which dispense higher blends of ethanol – in addition to Department of Energy programs and other subsidies scattered throughout the federal government such as the Renewable Fuel Standard (RFS) mandate for the use of corn ethanol administered by the Environmental Protection Agency (EPA). Later this year, Congress will consider whether to extend tax breaks including the Alternative Fuel Vehicle Refueling Property Credit, which provides a 30 percent tax break for gasoline stations or other facilities installing biodiesel or 85 percent ethanol (E85) blender pumps, in addition to others that prop up corn-based biofuels industries. While the credit expired at the end of 2016, Congress has routinely extended it retroactively. Time will tell to see if comprehensive tax reform efforts eliminate wasteful subsidies such as these that have propped up the mature corn ethanol industry for decades. It is time the industry stood on its two feet, particularly given our nation's \$20 trillion debt.

Other Federal Supports for Corn Ethanol

In addition to the numerous special-interest supports corn ethanol has received over the years, including tax breaks, an import tariff, and infrastructure subsidies, a federal production mandate - the RFS - also heavily benefits corn ethanol. The maze of historic subsidies for corn ethanol has allowed the federal government to pick winners and losers, distort energy and agriculture markets, and contributed to expansion and overproduction of corn and ethanol in the industry. Thankfully,

the tariff and \$6 billion-per-year tax credit (known as VEETC) were forced into retirement at the end of 2011.

However, the RFS mandate still requires oil and gas companies to blend increasing amounts of biofuels with gasoline each year through 2022, and corn ethanol comprises a majority (78 percent) of the mandate.² While the mandate was intended to significantly reduce GHG emissions and spur the development of biofuels derived from non-food crops (within the advanced and cellulosic biofuel categories), the RFS has failed to meet its goals. Mandates for cellulosic ethanol have been waived more than 90 percent due to low production levels (see Figure 1 for differences between levels set in law in 2007 vs. final renewable volume obligations – RVOs – set by EPA). While cellulosic biofuels were intended to be derived from non-food/feed crops, corn kernel fiber ethanol has recently qualified for the RFS as a cellulosic biofuel. Instead of using the inedible stalks or cobs for an ethanol feedstock, this pathway utilizes portions of the corn kernel that would otherwise be used as animal feed, again creating competition with food and feed crops. To make matters worse, EPA approved the use of a higher blend of ethanol (moving from E10 to E15) for vehicles manufactured after 2001 allowing more corn ethanol into the market despite concerns about damage to small engines, increased taxpayer costs for blender pumps to dispense these higher blends, etc. Coupled with EPA's recent approval of corn butanol from Gevo's Luverne, Minnesota, facility as an "advanced biofuel"³ (again which uses corn kernels), the RFS as a whole has primarily been a mandate for more corn-based biofuels. The mandate has therefore created numerous unintended consequences such as higher food prices and greater – instead of lower - GHG emissions.⁴ Unless Congress addresses the federal mandate, it will continue to burden taxpayers and do more harm than good.



Corn Ethanol Supports in the Farm Bill

Realizing that the corn ethanol industry had already received its fair share of federal handouts, Congress prohibited corn starch ethanol from qualifying for new energy title spending in the 2008 farm bill, which was reauthorized in 2014. The intent was to allow the next generation of biofuels (advanced fuels made from non-food sources like agricultural residues, wood waste, and perennial grasses) to receive a greater share of grants, loan guarantees, and other subsidies. But despite corn ethanol facilities being prohibited from receiving energy title funding, at least four of the 15 programs allowed nearly \$100 million dollars to be spent (or potentially promised as loan guarantees) for corn-based biofuels from 2009 to 2017.

As an example of the persistence of subsidies flowing to the industry, corn ethanol producers avoided the prohibitions on corn starch ethanol funding by convincing USDA to add ethanol blender pumps to its list of projects eligible for energy funding in the farm bill (specifically through the Rural Energy for America Program - REAP), even though Congress never authorized this controversial use of taxpayer dollars. Before this practice ended in Feb. 2014, millions of dollars were squandered on the mature corn ethanol industry. Nevertheless, in May 2015, USDA once again announced new funding for blender pumps through a different USDA spending account – the Commodity Credit Corporation.⁵ Recipients continue to circumvent other energy title program eligibility rules by refining biofuels from corn oil instead of corn starch, producing fuels like butanol and biodiesel instead of ethanol, and receiving energy efficiency upgrade subsidies to retrofit corn ethanol facilities (see Tables 2 and 3 in the next sections for more information).

Farm bill programs supporting corn-based biofuels, in addition to other forms of renewable energy, are listed in Table 1 below. Four programs subsidize corn-based biofuels in the farm bill's energy title, while other programs subsidize ethanol through the trade and commodity titles of the farm bill (more specifically, the promotion of ethanol exports through USDA's Market Access Program and the installation of ethanol blender pumps through USDA's Commodity Credit Corporation). As of 2014, USDA announced that ethanol exports may be promoted through MAP. According to the U.S. Grains Council, at least 3 recent trade missions to the Philippines, Latin America, Japan, and Korea promoted U.S. ethanol exports.⁶

Table 1: Corn Ethanol Subsidies in the Farm Bill Energy, Trade, and Commodity Titles

Farm Bill Section	Program/fund name	Description	Corn-based biofuels projects receiving funding	Funding for corn-based biofuels from 2009 to 2017
Energy Title	Bioenergy Program for Advanced Biofuels (more info in Table 3 below)	Payments to advanced biofuels facilities to expand annual production	1 corn oil biodiesel facility and several corn ethanol facilities, presumably because some also use milo (in addition to corn) as a feedstock in the refining process.	\$60 million (grants and loans)
	Biorefinery, Renewable Chemical, and Biobased Product	Grants and loan guarantees for advanced biofuels and heat and power facilities	SoyMor, a facility using corn and soybean oil for biodiesel production, received a conditional loan guarantee in 2009.	\$25 million (conditional loan guarantee)

	Manufacturing Assistance Program			
	Repowering Assistance Program	Reimbursements for biorefineries to replace fossil fuel power sources with biomass (like wood chips, municipal solid waste, or perennial grasses)	Two corn ethanol facilities received taxpayer funding to replace natural gas and fossil energy with a biomass boiler and a biogas digester.	\$6.9 million (reimbursement payments)
	Rural Energy for America Program (more info in Table 2 below)	Intended to subsidize solar, wind, hydropower, energy efficiency, and other renewable energy projects	10 corn ethanol facilities received grants/loans to install "energy efficiency" upgrades and retrofit equipment, in addition to 2011-2014 subsidies for new ethanol blender pumps and other special fueling infrastructure.	\$5.7 million spent on corn ethanol facilities and ethanol blender pumps
Trade Title	Market Access Program	Market trade promotion program designed to expand agricultural exports, including corn ethanol	In FY17, the U.S. Grains Council received \$6,670,888 for its overall trade missions, but the amount spent on ethanol specifically is unknown. ⁷ The Council notes that the Renewable Fuels Association and Growth Energy also accompanied it on ethanol trade missions, but these 2 organizations aren't direct recipients of MAP subsidies. ⁸	Unknown
Commodity Title	Commodity Credit Corporation	Traditionally a fund reserved to pay out farm subsidies and farm loans, USDA proposed also using CCC funds to subsidize ethanol	In May 2015, USDA announced CCC funding for ethanol blender pumps, which primarily benefit corn ethanol.	\$100 million allocated in 2015 ⁹

* Note that until enactment of the farm bill in Feb. 2014, the Rural Energy for America Program (REAP) also provided \$3.3 million in subsidies for fuel pumps dispensing corn ethanol even though the program was designed to fund grants and loan guarantees for rural energy efficiency and renewable energy projects, including solar, wind, hydropower, geothermal, and biomass.

Corn-Based Biofuel Subsidies in the Rural Energy for America (REAP) Program

Aside from blender pump subsidies that were funded through USDA's REAP program from 2011-2014, REAP also continues to subsidize corn ethanol facilities even though the farm bill energy title is meant to spur development of non-food-based bioenergy sources. Several subsidies were announced as recently as Oct. 2016 even though REAP was specifically designed to help rural small businesses install wind, solar, energy efficiency, and other renewable energy systems.¹⁰

Table 2: REAP Subsidies for Corn Ethanol Facilities, Nov. 2010 to Oct. 2016					
State	Recipient	Project Description (or none provided by USDA if blank)	Jan. 2011 Amount	Oct. 2015 Amount	Oct. 2016 Amount
MN	DENCO II, LLC	Ethanol production	\$50,000		
NJ	East Coast Energy Solutions	Ethanol biorefinery with 5 MW CHP using natural gas.	\$47,500		
NE	Mid America Agri Products/Wheatland LLC			\$500,000	
IA	Golden Grain Energy			\$250,000	
NE	Siouxland Ethanol LLC	To purchase and install the equipment for the retrofitting of an ethanol facility.			\$500,000
WI	Badger State Ethanol LLC	To purchase and install the equipment for the retrofitting of an ethanol facility.			\$492,327
MN	Chippewa Valley Ethanol Cooperative LLP	To make energy efficiency improvements with the evaporator of an ethanol refinery.			\$250,000
IA	Little Sioux Corn Processors LLC	To make energy efficiency improvements with the retrofitting of an ethanol refinery.			\$165,000
IA	Siouxland Energy Cooperative	To make energy efficiency improvements with the retrofitting of an ethanol refinery.			\$165,000
IL	Lincolnlnd Agri-Energy LLC	To purchase and install a fermenter for ethanol production.			\$77,984

Corn-Based Biofuel Subsidies in the Bioenergy Program for Advanced Biofuels

Similar to REAP, the Bioenergy Program for Advanced Biofuels (BPAB) has also subsidized the mature corn ethanol industry despite the program's title which implies support for advanced biofuels derived from non-food-based feedstocks, not to mention the energy title's prohibition on subsidies for corn-starch-based ethanol. Facilities are presumably applying for this program's payments since they may also produce ethanol from milo in addition to corn. Table 3 includes recent BPAB subsidy payments to corn-based biofuel facilities, primarily those producing corn ethanol.

Table 3: Corn-Based Biofuels Facilities Receiving Advanced Biofuels Payments, 2009-2016			
Facility Name (* facility produces biodiesel)	State	Feedstock	Total Payments
White Energy, Inc.	TX	corn/milo	\$10,623,924
Arkalon Ethanol, LLC	KS	corn/milo	\$10,015,914
Western Plains Energy LLC	KS	corn/milo	\$8,331,119
Kansas Ethanol, LLC	KS	corn/milo	\$5,949,346
Pinal Energy, LLC	AZ	corn	\$4,652,688
Prairie Horizon Agri-Energy, LLC	KS	corn/milo	\$4,446,288
Levelland/Hockley County Ethanol, LLC (renamed Diamond Ethanol)	TX	corn/milo	\$3,393,856
Bonanza Bioenergy, LLC	KS	corn/milo	\$3,131,689
Abengoa Bioenergy Corporation	MO	corn/milo	\$3,108,385

Chief Ethanol Fuel Inc	NE	corn/milo	\$2,308,795
Reeve Agri Energy Inc	KS	corn/milo	\$1,728,593
Nesika Energy, LLC	KS	corn	\$776,062
Central Indiana Ethanol, LLC.	IN	corn	\$506,369
Corn Plus LP	MN	corn	\$311,081
Walsh Bio Fuels, LLC	WI	corn	\$271,431
Trenton Agri Products LLC	KS	corn/milo	\$234,855
Pacific Ethanol Holding Co., LLC	CA	corn	\$165,043
Nugen Energy, LLC.	SD	corn	\$99,765
East Kansas Agri-Energy LLC	KS	corn	\$58,834
Pratt Energy LLC	KS	corn/milo	\$34,280
Aventine Renewable Energy	IL	corn	\$18,175
Cornhusker Energy Lexington, LLC	NE	corn	\$15,795
Chippewa Valley Ethanol Coop LLP	MN	corn	\$14,597
Best Biodiesel Cashton, LLC*	WI	corn/soy	\$10,487
Kaapa Ethanol, LLC.	NE	corn	\$8,693
Maple River Energy, LLC*	IA	corn/soy	\$7,845
Quad County Corn Processors Co-Op	IA	corn	\$2,011
TOTAL			\$60,225,920

Corn-Based Biofuel Supports in the Federal Tax Code

Some subsidies for corn ethanol are still scattered throughout the federal tax code as well. Four of the most prominent are listed in Table 4 below. Cost estimates are generally derived from the Joint Committee on Taxation, with specific references listed in the table. Please note that many of these tax credits expired in 2016, but they have routinely received short-term extensions in the past (including retroactive extensions).

Table 4: Corn-Based Biofuel Supports in Federal Tax Code		
Tax Credit Name	Description	Total One- or Ten-Year Costs (FY17-26)
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. ¹¹ The credit expired at the end of 2016, but it has survived on short-term extensions in the past.	Estimated cost of \$100 million per Fiscal Year (as projected by the Joint Committee on Taxation in 2016). ¹²
Master Limited Partnerships ¹³	"An MLP is typically a limited liability company (LLC) treated as a partnership for taxation purposes and traded on a public exchange... Investors are treated for tax purposes as if they directly earned the MLP's income. By avoiding double taxation, MLPs have access to lower cost of capital, which allows them to build and operate low-return assets to provide a sufficient rate of return to attract investors." ¹⁴ Of the 100 entities benefiting from the MLPs' special tax treatment, most are in the oil and gas	Total projected cost for all MLPs of \$9.8 billion (for FY16-25). ¹⁶

	industry, but in 2008, the transportation and storage of ethanol, biodiesel, and other alternative fuels also became eligible. ¹⁵	
Second generation biofuel (cellulosic) producer tax credit* (cellulosic producers also receive special tax depreciation allowances)	\$1.01 per gallon producer tax credit for "liquid fuel produced from any lignocellulosic or hemicellulosic matter that is available on a renewable basis or any cultivated algae, cyanobacteria, or lemna," such as cellulosic ethanol derived from corn kernel fiber, ag residues, perennial grasses, etc. ¹⁷	Estimated cost of \$487 million from 2017-26, given projected production levels from the Energy Information Administration (EIA) and assuming the tax credit is extended each year. ¹⁸
Volumetric Biodiesel Excise Tax Credit and Renewable Biodiesel Tax Credit	The biodiesel production tax credit of \$1 per gallon supports eligible feedstocks such as "virgin oils, esters derived from corn , soybeans, sunflower seeds, cottonseeds, canola, crambe, rapeseeds, safflowers, flaxseeds, rice bran, mustard seeds, and camelina, and from animal fats." ¹⁹ The credit expired at the end of 2016, but it has survived on short-term extensions in the past.	Estimated cost of \$21 billion from 2017-26, given projected production levels from EIA and assuming the tax credit is extended each year. ²⁰

Corn Ethanol Subsidies at the Departments of Energy & Transportation

As stated above, corn ethanol subsidies are also scattered throughout other government agencies, such as the Departments of Energy (DOE) and Transportation (DOT). Some of the most prominent subsidy programs are listed in Table 5 below.

Table 5: Corn Ethanol Subsidies at the Departments of Energy & Transportation		
Program Name	Description	Total Cost
DOE Clean Cities Program	The Clean Cities Program was created in 1993 after passage of the Energy Policy Act of 1992, which "required certain vehicle fleets to acquire alternatively-fueled vehicles"; the program provides "informational, technical, and financial resources to EPA-regulated fleets and voluntary adopters of alternative fuels and vehicles" in nearly 100 U.S. cities. ²¹ Clean Cities works with national parks, municipalities, and state-based incentive programs to promote greater consumption of alternative fuels and the installation of new fueling equipment, including 85 percent ethanol (E85) blender pumps. Many recent projects were funded through 2009 American Recovery and Reinvestment Act grants. ²² See a full list of recipients in Table 4 below.	Nearly \$300 million spent on 2009 Recovery Act (stimulus) grants for fueling infrastructure and alternatively fueled vehicles. ²³
DOE State Energy Programs (SEP)	State Energy Programs "provide financial and technical [energy] assistance to states through formula and competitive grants"; the program has been funded by the 2009 American Recovery and Reinvestment Act although additional grants are awarded annually depending on available funding. ²⁴ Grants have been awarded for the installation of E85 blender pumps, alternative power sources for ethanol biorefineries, and ethanol promotional events. Table 4 includes a list of recipients.	\$3.1 billion of total SEP funding to U.S. states under the 2009 Recovery (stimulus) legislation
DOT Congestion Mitigation and Air Quality (CMAQ) Improvement Program	The CMAQ program, authorized in 1991, "was implemented to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief"; it is jointly administered by the Federal Highway Administration and the Federal Transit Administration. ²⁵ The City of Hoover received funding through the Alabama Clean Fuels Coalition for a new E85 tank and dispenser at its Public Safety Center. ²⁶	\$4.4 billion in total for the program in 2013-14, funded by the Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21) ²⁷
DOT Biobased Transportation Research Program/Sun Grant Initiative	One of the 2007 Regional Competitive Grants was awarded to David Holland of Washington State University to examine "crop and fuel production for biodiesel, corn ethanol, and cellulosic ethanol in the Pacific Northwest using potential price and productivity scenarios"; the \$200,000 grant was entitled "Regional Economic Analysis of Feedstock Production and Processing in the Pacific Northwest." ²⁸	At least \$200,000 in 2007

Conclusion

It's time the mature corn ethanol industry survived on its own two feet without taxpayer support. After four decades of federal backing, corn ethanol subsidies scattered throughout the Renewable Fuel Standard, federal tax code, farm bill energy title, and elsewhere throughout the federal government should be eliminated once and for all. Economic, environmental, and public health costs would also decline if unintended consequences of ethanol production were ended, benefiting drivers, taxpayers, consumers, and the general public.

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

Sources for Table 2:

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¹ <https://www.fsa.usda.gov/programs-and-services/energy-programs/bip/index>

² <https://www.epa.gov/renewable-fuel-standard-program/final-renewable-fuel-standards-2017-and-biomass-based-diesel-volume>

³ <https://www.epa.gov/sites/production/files/2017-01/documents/gevo-butanol-deter-ltr-2016-12-22.pdf>

⁴ <https://www.cbo.gov/publication/45477>; <http://www.nap.edu/catalog/13105/renewable-fuel-standard-potential-economic-and-environmental-effects-of-us>

⁵ <https://www.usda.gov/media/press-releases/2015/05/29/usda-invest-100-million-boost-infrastructure-renewable-fuel-use>

⁶ <http://www.grains.org/news/20141014/discovering-market-potential-ethanol-exports>

⁷ <https://www.fas.usda.gov/programs/market-access-program-map/map-funding-allocations-fy-2017>

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¹⁰ <https://www.rd.usda.gov/files/RD-REAP AwardsOct2016.pdf>

¹¹ <http://www.law.cornell.edu/uscode/text/26/30C>

¹² https://www.jct.gov/publications.html?func=download&id=4860&chk=4860&no_html=1

¹³ In April 2013, Senator Coons (D-DE) introduced the Master Limited Partnerships Parity Act which would expand the number of activities in ethanol, biodiesel, and other alternative fuels production that can qualify for MLPs. Currently, only transportation and storage of these fuels qualify for MLPs, but Sen. Coon's legislation would also allow production of renewable fuels to qualify for MLPs.

¹⁴ <http://www.forbes.com/sites/williampentland/2013/06/10/mlp-parity-act-disrupting-distributed-energy/>

¹⁵ Kinder Morgan, one of the only owners of a short ethanol pipeline, uses an MLP to lower its tax liability, Valero is considering using one for its ten ethanol plants, and Buckeye Partners and Magellan Midstream Partners, L.P., both current users of MLPs, considered building an ethanol pipeline from IA to NJ.

<http://fuelfix.com/blog/2013/05/01/valero-might-form-an-mlp/>

¹⁶ <https://www.jct.gov/publications.html?func=startdown&id=4971>, <http://mlpguy.com/archives/1417>

¹⁷ https://www.afdc.energy.gov/laws/laws_expired?jurisdiction=US

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