

Chapter 8

Renewable Energy Policies

Interest in renewable energy has developed rapidly in the United States, largely due to a strong rise in domestic and international petroleum prices and a dramatic acceleration in the production of domestic biofuels. Many policy makers view agriculture-based biofuels as both a catalyst for rural economic development and a response to growing dependence in the US on imported energy. This chapter examines biofuels policies in the United States, including the specific provisions of the 2008 Farm Act.

8.1. Policy background

US biofuel production is dominated by ethanol, 98% of which is produced from maize; biodiesel comes primarily from soybean oil (around 60%). Ethanol production has been expanding rapidly in recent years, rising from about 3 billion gallons in 2003, to over 10 billion gallons in 2009. Biodiesel production is at a much smaller level, but has also shown growth. About a third of US maize production is devoted to ethanol production and the increase in maize used for US ethanol production exceeds the increase in maize produced for other uses over the past three years. In 2009-10, 112 million tonnes of US maize was used for ethanol production, which constitutes 34% of the total crop in that year.

Interest in renewable energy has developed rapidly, due in large part to a strong rise in domestic and international petroleum prices and a dramatic acceleration in the production of domestic biofuels (primarily maize-based ethanol). Many policy makers view agriculture-based biofuels as both a catalyst for rural economic development and a response to growing dependence in the US on imported energy.

Ethanol and biodiesel receive significant federal support in the form of tax incentives, loans and grants, and regulatory programmes. However, renewable energy production has been considered primarily a concern of energy, tax and environmental policy, rather than agricultural policy. As a result, most of the federal programmes that support renewable energy production in general, and agriculture-based energy production in particular, are outside the purview of the Farm Acts.

For example, the primary supply-side incentives for biofuels and wind-energy production are production tax credits, which are the domain of the Internal Revenue Service. The primary demand-side federal biofuel policy intervention is a national Renewable Fuels Standard (RFS), which is administered by the Environmental Protection Agency (EPA). The RFS requires the blending of biofuels in the nation's fuel supply and has its origins in the Energy Policy Act of 2005 – it was expanded more recently in the Energy Independence and Security Act (EISA) (Sissine, 2008). Similarly, the federal tax credits available to biofuels blenders were initially contained in the 2004 American Jobs Creation Act, but have since been incorporated into the Farm Act.

More specifically, major federal incentives before the enactment of the 2008 Farm Act included:

- A biofuel production excise tax credit of USD 0.51 per gallon of ethanol, USD 1 for every gallon of agri-biodiesel (*i.e.* virgin vegetable oil and animal fat), and USD 0.50 for every gallon of non-agri-biodiesel (*i.e.* recycled oils, such as yellow grease). The production tax credits were extended through to 2010 for ethanol and through to 2008 for biodiesel under the 2004 American Jobs Creation Act. The tax credit for biodiesel expired at the end of 2009 and has not yet been re-instated.

- A 2.5% *ad valorem* tariff on un-denatured (1.9% on denatured) ethanol (for any use) and a most-favoured-nation (mfn) duty of USD 0.54 per gallon of ethanol (for fuel-use) apply to US imports from most countries. Ethanol imports from Caribbean Basin Initiative countries entered duty-free, if the ethanol was produced from at least 50% agricultural feedstock grown in a Caribbean Basin Economic Recovery Act country (CBERA); if the ethanol was produced with less than 50% CBERA feedstock, it was restricted to 7% of the US domestic ethanol market.
- A wind-energy production tax credit that provides a USD 0.018 credit for each kilowatt-hour of electricity produced by approved turbines built by the end of 2007 for a 10-year period.
- An RFS under the 2007 EISA that mandates using 36 billion gallons of renewable fuels by 2022 (an almost five-fold increase over pre-legislation levels).¹ Beginning in 2015, 21 billion gallons are to be from cellulosic materials and feed stocks other than maize starch (i.e. advanced biofuels). Ethanol from maize is capped, rising to a maximum of 15 billion gallons, beginning in 2015.²
- The RFS also mandates maximum lifecycle GHG emissions from each type of biofuels contributing to the mandate. Lifecycle GHG emissions of qualifying renewable fuel must be less than the lifecycle GHG emissions of the 2005 baseline average gasoline or diesel fuel that it replaces. Provisions in EISA allow many existing ethanol refineries to be “grandfathered” under the mandate and these are exempt from GHG emissions restrictions.³
- A small producer income-tax credit of 10¢ per gallon for the first 15 million gallons of production for ethanol producers whose total output does not exceed 60 million gallons per year, through 31 December 2010.
- A small producer-income tax credit of 10¢ per gallon for the first 15 million gallons of production for biodiesel producers whose total output does not exceed 60 million gallons per year, through 31 December 2010.
- USDA’s Bioenergy Program, which provides incentive payments on year-to-year production increases of renewable energy during the FY2001-06 period.

Federal support for the development of agriculture-based renewable energy production systems is also provided in the form of loans, grants and loan guarantees; research, development and demonstration assistance; educational program assistance; and procurement preferences. Also, several states already have their own incentives, regulations, and programmes in support of renewable fuel research, production, and consumption that supplement (or exceed) federal incentives.

The RFS mandate, administered by the US Environmental Protection Agency, sets a minimum on the quantity of biofuel used in the United States. The mandate is enforced by a credit trading scheme tying together biofuel producers with refiners, exporters and blenders of oil-based gasoline (EPA, 2010). Biofuel producers and importers generate Renewable Identification Numbers (RINs) with each gallon of biofuel they produce. Fuel refiners, importers or blenders can choose to use less biofuel than the stipulated amount, and buy credits from others who use in excess of the required amount. For example, if the blend exceeds the RFS, blenders can sell their excess RINs to other obligated parties who can then blend biofuels at a rate below the RFS.

The previous RFS, implemented under the 2005 Energy Policy Act, was never binding due to a combination of factors, including high oil prices, biofuel tax credits and abundant biofuel supplies. However, the RFS under EISA could, in future, become binding due to the more ambitious targets being mandated – particularly if petroleum prices remain low. Binding mandates mean more consumption of biofuel in the US than would otherwise occur, leading to higher domestic production or imports. The outcome depends on how ably different biofuels meet the requirements of different mandates – as well as on how other uncertainties about the policies are resolved.⁴

If, for example, domestic ethanol production capacity is unable to meet the RFS mandate, then sources such as domestic sorghum-starch ethanol, or domestic sugar-beet ethanol or increased imports of Brazilian sugar-cane ethanol could be used to fill the mandate (Yacobucci and Capehart, 2009). Moreover, the EPA has the authority to waive the total volume of renewable fuel mandated by the RFS, as well as the specific requirements for cellulosic biofuel and biomass-based diesel fuel, should domestic supply be inadequate to meet the mandate, or were the implementation of the requirements deemed to have severe economic or environmental effects.

US policy to expand the production of agriculture-based renewable energy – especially biofuels and wind power – has significant implications for agriculture and resource use. The production of maize-based ethanol, and consequently production of maize has expanded dramatically over the past several years. The effect on agricultural commodity markets has been national, but commodity production adjustments and resulting environmental consequences, vary across regions (Malcolm, Aillery and Weinberg, 2009). Changes in the crop sector have also affected the cost of feed for livestock producers.

Most notably, the escalating demand for maize as a component of feed in ethanol production contributed to sharp increases in driven grain and oilseed prices since 2006. Record high commodity prices in 2007 and mid-2008, combined with high energy costs, have resulted in sharp increases in livestock feed costs, export prices and moderate growth in US retail food price inflation. As commodity price inflation accelerated both in the US and globally, the “food versus fuel” debate has come to the fore on the policy agenda.

There is recognition that a number of different factors contributed to increased commodity prices in 2007 and 2008, but little consensus on the exact role played by increased biofuel production. Reviewing several different studies and economic models, Collins (2008) concluded that implied changes in the price of maize due to its use in ethanol might range from 25% to 60%. The US Congressional Budget Office estimates that the increase use of ethanol accounted for about 10% to 15% of the rise in retail food prices between April 2007 and April 2008. The rise in food prices attributable to increased production of ethanol will, in turn, lead to higher spending for US domestic food assistance programmes by an estimated USD 600 million to USD 900 million in FY2009 (CBO, 2009).⁵

The AGLINK-COSIMO analysis of the impacts of the EISA biofuel consumption mandates on biofuels and crop markets (shown in Annex C) suggests that biofuel policies could, indirectly, provide price support to the feedstocks that are used to produce biofuels. An ERS study found that meeting EISA targets for ethanol production is estimated to expand US cropped acreage by nearly 5 million acres by 2015, an increase of 1.6% over what would otherwise be expected (Malcolm, Aillery and Weinberg, 2009). Much of the growth comes from maize acreage, which increases by 3.5% over baseline projections, with traditional maize-growing regions would likely witness the largest increases. Water quality

and soil carbon will also be affected, in some cases by greater percentages than suggested by changes in the amount of cropped land. The FAPRI 2010 projections for agricultural and biofuel markets suggest that the effects of changes in biofuel policies (i.e. expirations of biodiesel blender tax, ethanol import tariff, blender tax credit cellulosic ethanol producer credit) can vary substantially depending on whether mandates are binding or not (FAPRI, 2010).

8.2. Major provisions under the 2008 Farm Act

The 2002 Farm Act was the first omnibus Farm Act to explicitly include an energy title. Renewable energy policy under the 2008 Farm Act builds on 2002 Farm Act programmes as well as on the goals of EISA.⁶ The 2008 Farm Act significantly expands existing programmes to promote biofuels. Like the previous Farm Act, it contains a distinct energy title that covers a wide range of energy and agricultural topics with extensive attention to biofuels, including maize-starch-based ethanol, cellulosic ethanol, and biodiesel; it also includes research, tax and trade provisions relating to renewable energy (Capehart, 2009).

The 2008 Act also authorises USD 1.1 billion in mandatory funding for FY2008 through to FY2012, compared with USD 800 million in the 2002 Farm Act (FY2002-07), with most of the increase mandated for the Biorefinery Assistance Program, which aims at promoting the development of advanced biofuel refining capacity.

Biofuels-related provisions

Key biofuels-related provisions in the enacted 2008 Farm Act include:

- Emphasis on cellulosic ethanol production through new tax credits for blenders and promotion of the production of cellulosic feedstocks, feedstocks infrastructure and refinery development.
- Grants and loan guarantees for biofuels (especially cellulosic) research, development, deployment, and production.
- Studies of the market and environmental impacts of increased biofuel use; expansion of biofuel feedstock availability; expansion of the existing bio-based marketing programme to encourage federal procurement of bio-based products.
- Support for rural energy efficiency and self-sufficiency.
- Re-authorisation of biofuels research programmes within the USDA, the Department of Energy and the Environmental Protection Agency.
- An educational programme to promote the use and understanding of biodiesel.
- Reduction of the blenders' tax credit for ethanol.
- Continuation and expansion of the federal bio-products certification programme.
- Environmental safeguards through greenhouse gas emission requirements on new biofuel production.
- Extension of the import duty on ethanol.
- A temporary cellulosic biofuels production tax credit of up to USD 1.01 per gallon through 31 December 2012.
- The Biomass Crop Assistance Program which supports the development and marketing of renewable agricultural or forest-based biomass.

Tax credits and tariffs

The 2008 Farm Act extends and modifies tax credits and special import duties on ethanol. In keeping with the promotion of cellulosic ethanol, a blenders' credit of USD 1.01 per gallon applies to ethanol produced from qualifying cellulosic feedstocks. This tax credit is intended to spur investment in cellulosic ethanol production. The ethanol blender's tax credit (also known as the Volumetric Ethanol Excise Tax Credit) of USD 0.51 per gallon (which applies to all ethanol blended, including imports) was reduced to USD 0.45 per gallon by a 2008 Farm Act provision requiring the reduction starting in the first calendar year following the year in which 7.5 billion gallons of ethanol is produced. The reduction became effective on 1 January 2009.

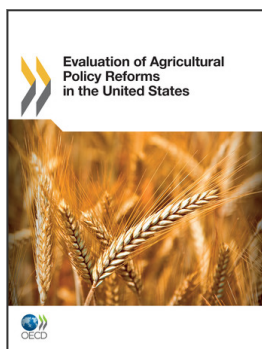
The import duty for ethanol benefits the US ethanol industry by protecting US ethanol from lower-cost imports, but denies US fuel users access to lower cost imported ethanol. The duty also more than offset the value of the blenders' tax credit for which imported ethanol is also eligible. The duty of USD 0.54 per gallon that was set to expire at the end of 2008 is now extended to the end of 2010.

Economic impact-assessment reports

In response to concerns raised on the impact of increased ethanol production on agricultural and rural economies, the 2008 Farm Act includes provisions requiring a series of reports to assess how ethanol production may be impacting the farm economy, the environment and consumer food prices.⁷ For example, the Biomass Crop Assistance Program requires an assessment of the economic impacts of expanded cellulosic biomass production on local economies and infrastructures. Likewise, the Biomass Research and Development Program requires an assessment of the economic impacts on rural economies of bio-refinery expansion and conversion by USDA.

Notes

1. The Energy Policy Act of 2005 required, starting in 2006, the use of 4 billion gallons of renewable fuels, increasing to 7.5 billion in 2012.
2. The EISA amendments to the RFS specifically mandate the use of cellulosic biofuel (16 billion by 2022) and biomass-based diesel fuel (1 billion gallons annually by 2012).
3. Cellulosic-based fuels must achieve at least a 60% lifecycle GHG reduction; maize starch-based fuel (produced by newer plants) 20% GHG emissions reduction; and advanced-based biodiesel 50% GHG emissions reduction.
4. The theoretical study by De Gorter and Just (2007) shows that implementation of biofuel mandates in conjunction with tax credits could have different effects, depending on whether the mandate is binding or not. When there is no binding mandate, the tax credit significantly affects the level of production of ethanol, its price, and the price and production of maize.
5. Includes the SNAP and selected Child Nutrition programmes, such as the National School Lunch Program, the School Breakfast Program, and other, smaller, programmes.
6. Until the new regulations under EISA are final, Section 80.1160 through 80.1163 of the Clean Air Act discuss the violations and penalties and under the Renewable Fuel Program as it is currently implemented (see <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>).
7. Among these are the Comprehensive Study of Biofuels (to be conducted by the USDA, the Environmental Protection Agency and the Department of Energy and the National Academy of Sciences).



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