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SHARED WINNER, CLIMATE CHANGE CATEGORY

Greener Biofuels Tax Credit: A Policy to Drive Multiple Goals

By Loni Kemp

ABSTRACT: Tax credits to reward the first generation of biofuels paid for simple volumes of biofuels produced, and failed to ensure that that multiple societal goals for environmental and climate performance were achieved. As the next generation of biofuels emerges, it is necessary to undertake a complete overhaul. All biofuels tax credits should be dropped and replaced with a unified and performance-based tax credit. The new system would be technology and feedstock neutral, and budget neutral using savings from elimination of current tax credits. The greener biofuels tax credit would shift from fuel blenders, who are already mandated by the Renewable Fuel Standard to buy and blend biofuels, to the biorefineries producing biofuels, who would earn their tax credits by improving their processes and feedstock purchases to meet performance measures. Half of the new tax credit would reward lower carbon fuels and half would reward other ecosystem services. Zero-carbon biofuels would be eligible for the full carbon portion of the tax credit per gallon, with less for higher climate changing emissions. Environmental performance of feedstock production, ignored by current biofuel policy, would be measured by a streamlined scoring system based on conservation measurement tools developed by the Natural Resources Conservation Service. Soil and water conservation would be scored for each farmer, and verified by independent third parties. Biorefineries would collect the certificate of score from each delivered volume of feedstock, and the IRS would average environmental scores over the total production of the plant to determine a graduated environmental portion of the tax credit. Rewarding environmental performance from the biorefinery down to the individual feedstock producer is the best way to steer development toward the best biofuels to achieve multiple goals.

Policies designed to encourage development of the first generation of biofuels—ethanol from corn and biodiesel from soybeans—were intended to reward societal benefits, including national energy security, jobs and rural economic development, improved air quality, and superior life-

cycle greenhouse gas (GHG) performance compared to gasoline. Yet actual delivery of those benefits has been vigorously debated. How much fossil energy has been replaced? Is air quality really better? Are GHG emissions significantly reduced? At the same time, unintended environmental effects of intensive corn and soybean production on polluted waters and degraded soils are well documented.

A growing consensus acknowledges that the next generation of biofuels—from cellulose and eventually from algae—has the potential to deliver higher levels of benefits. Expectations include better life-cycle GHG performance, improved fossil energy balance, expanded land areas to grow feedstocks within the United States, more sustainable farming practices leading to cleaner water and healthier soils, and less effect on food prices. However, these benefits are by no means guaranteed. Policies are needed to ensure that promised benefits materialize and to prevent unintended adverse environmental effects. Guiding the biofuels industry along a green path will ensure its economic and political survival.

Support for policies that gave biofuels a variety of tax credits has dwindled for a number of reasons including concerns that the promised climate benefits are not guaranteed, the recent irrational exuberance in corn ethanol expansion, and current tax credits duplicate the Renewable Fuel Standard, which mandates a minimum market for biofuels. The financial rewards flow, regardless of whether the industry accomplishes what was promised. At the same time, there is considerable support for tax incentives for perennial cellulosic biofuels, based on expectations of superior performance.

What is missing from current tax policy is a requirement for actual performance in delivering expected environment and climate benefits. To remedy this, the mix of existing federal biofuel tax credits—including the ethanol blender's tax credit—must be reformed into a unified performance-based tax credit. The actual level of payment per gallon would vary, according to the sustainability performance of the biorefinery.

This reformed biofuel tax credit would:

- Be technology neutral. It applies to all fuels (ethanol, biodiesel, butanol) and all feedstocks (corn, cellulose, algae, vegetable oils).
- Be performance based. It rewards better environmental performance with higher tax credit payments.
- Protect the climate. It rewards lifecycle carbon emission reductions beyond those required by the Renewable Fuel Standard.
- Protect the environment. It rewards soil and water conservation on farms where feedstocks are produced.
- Be streamlined. It uses workable reporting systems for farmers, biofuel refiners and the Internal Revenue Service.
- Be budget neutral. It uses savings from phasing out current production tax credits to fund the new, greener biofuels tax credit.

Existing biofuels tax credits are varied, and all are due to sunset soon, giving Congress an opportunity to rethink and streamline them into one universal tax credit policy.

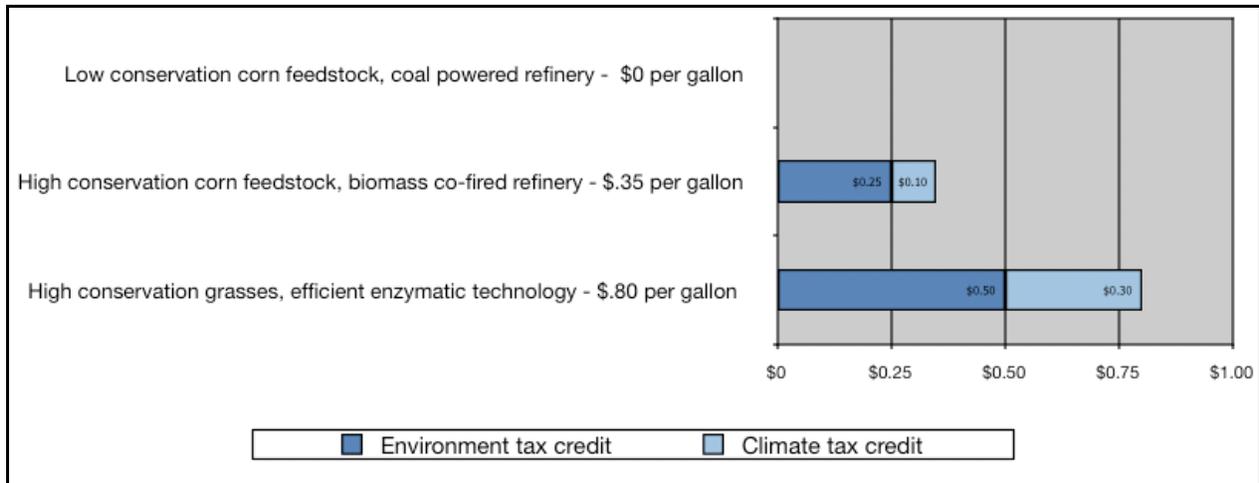
Tax Credit	Amount	Eligible Entity	Sunset
Alternative Fuel Tax Credit	\$.50 per gallon gasoline equivalent of alternative fuel	Retailer	12/31/09
Alternative Fuel Mixture Tax Credit	\$.50 per gallon of alternative fuels	Blenders	12/31/09
Straight Alcohol Tax Credit	\$.45 per gallon ethanol	Retailers	12/31/10
Alcohol Fuel Mixture Credit (Income)	\$.45 per gallon ethanol	Blenders	12/31/10
Cellulosic Biofuel Producer Credit	\$1.01 per gallon cellulosic biofuel	Producers	12/31/12

Small Ethanol Producer Credit	\$.10 per gallon ethanol for the first 15 million gallons per taxable year	Producers under 60 million gallons	12/31/10
Volumetric Ethanol Excise Tax Credit	\$.45 per gallon	Blenders	12/31/10
Biodiesel Mixture Credit (Income)	\$1 per gallon biodiesel	Blenders	12/31/09
Biodiesel Credit	\$1 per gallon biodiesel	Retailers	12/31/09
Small Agri-Biodiesel Producer Tax Credit	\$.10 per gallon agri-biodiesel for first 15 million gallons per taxable year	Producers under 60 million gallons	12/31/09
Biodiesel Mixture Credit (Excise)	\$1 per gallon biodiesel	Blenders	12/31/09

The new tax credit would shift from the blenders—the oil companies and refineries blending ethanol into gasoline—to the biorefineries producing biofuels. Assuming a new production tax credit of up to \$1.00 per 76,000 Btu (the energy content of one gallon of ethanol), half of the credit would reward lower carbon fuels, and half would reward other ecosystem services.

Existing corn ethanol and soy biodiesel producers would be eligible as long as they employ advanced processes, such as running systems with renewable power and using feedstocks from farmers who are building soil quality and minimizing polluted runoff. Next generation biofuels could earn even more if they vastly reduce GHG emissions and rely on perennial feedstocks that require little land disturbance, fertilizer or irrigation. Biofuels producers who power their facilities with coal or use conventional corn or soy feedstocks grown with heavy chemical inputs and no erosion prevention would not get any tax credit. Each biofuels producer would be scored on performance and earn a variable tax credit based on that performance score.

Three Hypothetical Biorefineries: Greener Biofuels Tax Credit per Gallon of Biofuels



Shifting the tax credit to the biorefinery would give the more responsible party the opportunity to take action in response to the performance incentive. Currently, biorefineries have to negotiate with oil companies to capture some of the value of the tax credits. With the tax credit shifted and its value linked in part to the environmental performance of the feedstock, the biorefinery would have to negotiate with feedstock producers, offering higher payments and/or longer contracts for better performing feedstocks. This would shift the tax credit benefit away from the oil companies, who, currently, are effectively being bribed to buy a fuel they are required to use under the Renewable Fuel Standard, to biofuel producers and farmers who have to do the heavy lifting if biofuels are to be sustainable.

Climate performance

The half of the new tax credit rewarding carbon performance would be paid in direct proportion to reductions in GHG gas emissions, based on the U.S. Environmental Protection Agency's calculation of lifecycle GHG emissions currently being developed for the Renewable Fuel Standard. The refinery's choice of feedstocks, technology and management of the refinery's direct emissions would determine their lifecycle emissions. A zero-carbon biofuel (100% reduction) would be eligible for the full carbon tax credit of \$.50 per gallon. Tax credits would decrease with lower carbon performance.

Environmental performance

Current national biofuels policies ignore environmental performance, beyond the minimum GHG metric in the Renewable Fuel Standard. What is missing is recognition of feedstock farming systems that are kinder to soil, water and wildlife. Policies are needed to encourage farmers and biorefineries to select processes, feedstocks and farming practices that maximize environmental benefits. The refinery would decide which feedstocks to buy, ranging from perennial grass mixes which build soil, to wheat residue, removal of which may deplete soil, to name two examples. The farmer would have an almost unlimited range of farming practices from which to choose and could make an enormous difference in environmental outcomes. For example, one farmer might over-apply chemical fertilizers in hopes of higher yields without using buffers, erosion prevention or conservation tillage. Another farmer might produce the same crop using cover crops instead of chemicals for fertility, and employ a full suite of runoff protections.

To earn the second half of the greener tax credit—up to \$0.50—refineries would want to optimize conservation on the land, and would buy more sustainable feedstocks. It is critical that the industry not be motivated solely by the lowest price feedstocks, forcing growers to cut corners and ignore conservation opportunities. A performance-based tax policy would telegraph incentives to minimize tillage, fertilizer and pesticide use, erosion and runoff throughout the system right down to the farmer.

A streamlined scoring system would be required for evaluating the key environmental elements on which producers have an effect when raising feedstocks—soil quality, water quality and wildlife habitat. Fortunately, a simple evaluation tool has been developed and verified by USDA. Developed for the 2008 Conservation Security Program, the Soil and Water Evaluation Tool is based on site-specific soils, climate, and crops, calculating an environmental performance score for a specific farm. Components include soil organic matter; nutrients in soil; erosion; soil habitat; and soil moisture. Water components are nitrogen, phosphorus and pesticides each related to groundwater and surface water, as well as sediment and salinity.

This evaluation tool could be streamlined to apply specifically to biofuels feedstocks. The tool is

fully transparent, letting farmers determine how different crop rotations and conservation practices change the performance score. USDA could develop certification criteria for independent, third-party professionals to assess and annually spot check scores, similar to the method USDA uses to verify performance for other programs. The refinery would be charged for scoring and verification costs. Similar evaluations would be developed for forests, wastes and algae feedstocks. Scores would have to be above a minimum stewardship threshold, and averaged for each biorefinery.

Refineries would either contract with farmers for feedstocks grown with specific production practices or minimum scores, or pay higher prices for better-scoring, more sustainable feedstocks. The refinery would collect the certificate of score from each delivery volume of feedstock. For feedstocks meeting the threshold environmental score, the IRS would compute the gallons of biofuels eligible for the tax credit, take the average environmental score of the refinery, and pay a graduated tax credit of up to \$0.50—the half of the tax credit related to environmental performance. The IRS would simply plug in the annual GHG score and the annual average feedstock environmental scores overseen by EPA and USDA, to determine a total tax credit rate per eligible gallon of annual production, up to the maximum of \$1.00 per gallon equivalent.

Convertible Tax Credits

Because many innovative biofuel technologies are being advanced by startup companies with limited revenues, allowing the conversion of production tax credits to investment tax credits or a direct grant would facilitate the rapid scale-up of this industry. This approach would also help with the difficult investment climate currently facing the fledgling industry.

Eligible Biofuel Production

To avoid unintended consequences, the new biofuels tax credit would only be available for biofuels that meet minimum standards. These include:

- Feedstocks contained in the definition of renewable biomass.

- Feedstocks produced on farms meeting USDA Conservation Compliance requirements for erosion, wetlands and grassland conversion.
- Feedstocks produced on lands not converted from perennial species to annual crops.
- Feedstocks not produced on land that is part of intact ecosystems like forests, wetlands and prairies.
- Feedstocks not produced using irrigation.
- No invasive or noxious species.
- Cop residue is removed at sustainable levels.
- Biorefineries meet GHG reduction threshold for the category of renewable fuel.
- Feedstocks meet the environmental performance threshold score.

Ecosystem services

The trend is for government to support the variety of environmental services that farmers provide for the nation, and to transition producers away from dependence on commodity production supports. Greener biomass tax credits could be combined with such other incentives as carbon credits, water quality credits, and USDA conservation assistance programs. As farmers stack payments for various ecosystem services, they could earn a share of their income from providing valuable public goods, as well as from market-based production of biomass.

Conclusion

U.S. biofuels policy must provide clear and strong incentives to bring advanced biofuel production on-line quickly. It must provide enough support to first-generation biofuels to stabilize the industry without supporting environmental harm. Policy should reward farmers who grow energy crops and encourage them to switch from corn and soybeans to perennial biomass. All of this must be done while also strongly steering the entire agriculture sector toward excellence in soil and water protection. A performance-based, universal Greener Biofuels Tax Credit policy is the policy needed to achieve these goals.

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national organizations and foundations on agriculture, renewable energy, conservation and climate change. The ideas presented in this essay develop from work Kemp did with the Natural Resources Defense Council.