

**Rural America’s Role in Expanding Energy Independence, Dominance, Innovation and Jobs:
Recommendations for the New Farm Bill
Written by the Agriculture Energy Coalition, June 2017**

Executive Summary

The Federal government has a mission to enhance economic growth and infrastructure, as well as national security. Agriculture-based energy, biobased manufacturing and clean technology programs and initiatives are vitally important ways for this to occur. Long-standing bi-partisan programs in the energy title and other provisions of the Farm Bill have leveraged billions of dollars of private investment, spurred economic development, created jobs, and spawned technological innovation throughout rural America with a strong and growing return on investment.

Secretary Perdue in his first public address highlighted the key role of innovation. Ag-based energy, manufacturing and clean technology is without question a leading area of meaningful current and future innovation for the Department and country.

The President’s Executive Order on Energy Independence and Economic Growth makes clear that energy is an excellent tool for creating new jobs, wealth, and of course rural prosperity.¹

As former President Bush made clear, clean technology should be a priority. Referring to our dependence on foreign oil, he said, “It creates a national security issue and we’re held hostage for energy by foreign nations that may not like us.”

This massive growth opportunity for rural America includes next-generation biofuels, renewable chemicals, and biobased products from feedstocks such as dedicated energy crops, cellulosic waste, municipal solid waste, and algae that provide new revenue streams and expand opportunities for value-added agriculture throughout the United States. It also means

¹ <https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economy-1>

new “cash crops” for rural communities via electricity generated from wind, solar, biomass, hydro, and geothermal resources. And smart energy efficiency measures save farmers, ranchers, and other citizens and rural small businesses money, improving their bottom lines.

The 2002, 2008 and 2014 Farm Bills all recognized Rural America’s potential to produce clean technology, domestic manufacturing, new domestic energy, renewable chemicals and biobased products, and improved energy efficiency, and Congress has consistently provided significant resources for their development across a broad spectrum of technologies and in all regions of the country. The U.S. Department of Agriculture (USDA) has a long and successful history of administering such programs and initiatives and with continued Congressional support and foresight they will continue to improve.

The 2008 and 2014 Farm Bills expanded programs and resources dedicated to energy and new “cash crops” in rural areas, and the next Farm Bill should continue this commitment. The foundational policies of those laws – and the programs implemented to accomplish them – have propelled the promise of a growing clean rural energy and biobased manufacturing sector into a reality. A continued and steady commitment to new technologies and energy efficiency in the 2018 Farm Bill will not only continue this growth, but also accelerate it.

The converse of this is true as well. Without stable policy and the funding that goes with it, progress will be fleeting and the U.S. will lose ground to its international competitors across Asia, Europe and South America, both in traditional agriculture and in the clean tech sector. Other countries will catapult ahead in the global clean technology and jobs race, which would decrease U.S. economic, energy, and national security.

We understand fully the current national budget situation is challenging. However, the recommendations in this paper are crucial for our nation and also represent the legitimate, balanced and smart agriculture energy and technology programs in which this nation should be investing. Continuing our commitment to these programs will help the U.S. remain on the cutting edge of innovation and reach its economic, energy, biobased manufacturing, and national security goals. And given how much agriculture and the Farm Bill have already saved the Federal Treasury in recent years, it’s time to commit to a baseline bill and “return the favor” to rural America.

The Agriculture Energy Coalition recommends continued, steady investment (i.e., reasonable mandatory spending) and improvements in a limited number of essential Farm Bill programs and missions for:

- Use of grants and loan guarantees to fund new biorefineries in every region of the country that utilize diverse local feedstocks, commercialize innovative technologies and create innovative new fuels, renewable chemicals, and biobased products;
- The broader development of a U.S. renewable chemicals and biobased products industry;
- Assistance in improving and growing the energy efficiency of farms and rural businesses;
- Incentives to deploy distributed energy capacity, including wind, solar, biopower and biogas;
- Research and development funding for innovative new biomass feedstocks and clean technologies;
- Incentives for producing next-generation renewable chemicals, biofuels and biobased products;
- Funding to promote biomass power while reducing dangerous forest fuel loads; and,
- Crop insurance and risk management tools that agricultural producers can use to mitigate the risks of growing new dedicated energy crops.

AgEC recommends a modest increase in mandatory funding from the 2014 bill for “core” energy title programs, 9002, 9003, 9005, 9006, 9007, 9008 and 9011. This funding is vital to protecting and growing the nation’s investment in rural jobs and prosperity. Policy reforms and modest outlays can effectively address urgent rural economic development and jobs goals as well as a looming crisis with hazardous fuels build-up across a large swatch of the country, which could lead to forest fires.

To reflect the broad set of technologies supported by the title, it should be renamed the “Rural Energy and Biobased Manufacturing Title” to better reflect varied program goals, from clean energy production to reducing agricultural input costs via proven energy efficiency measures, to building the “biobased economy,” and leading in the international race for additional manufacturing and exports.

We believe the crop insurance program must examine and determine a fair, innovative approach to providing insurance to non-food energy crops and their producers.

New funding should be extended to 9002, the “Biopreferred” program, with several necessary improvements.

REAP must be made even better by more fully supporting commercial but nascent “underserved technologies.” The statute should also make clear that there is flexibility to enable support of components of projects or ancillary infrastructure. REAP financing caps

should be loosened – for example by removing the 75% loan cap, which is inconsistent with similar programs and simply unnecessary; and financing should be explicitly allowed at the portfolio level, creating more flexibility, and innovation.

The Section 9003 Biorefinery Assistance Program must fully and unconditionally allow renewable chemicals and biobased products to be equal participants and include innovative health products. Renewable chemicals standalone manufacturing facilities should be provided the opportunity to receive loan guarantees without forcing the production of advanced biofuels and irrespective of advanced biofuels feedstocks. The program should also remove the limitation on sustainably sourced corn as a feedstock for nascent and innovative biofuels and renewable chemical development.

BCAP should be re-named the “Biomass Innovation and Forest Protection Program” to more properly reflect its multi-faceted mission and revised to better incent non-food biomass utilization and innovation. It should be modified to incent both annual and perennial energy crops, and at the same time efficiently and over time dramatically reduce dangerous forest residue loads across the U.S., particularly in the West.

The Rural Utilities Service (RUS) should be given greater flexibility to invest in new technology deployment and jobs creation.

Funding safeguards and accountability should be instituted to protect taxpayer investments, including annual or bi-annual reporting on program investments and a prohibition on use of Energy Title funds for purposes outside the scope of the program itself, ensuring that Congressional intent is fully achieved.

Additional background and specifics for these overarching policy recommendations is discussed in the following pages.

Resources Background

Rural America has already proven its tremendous capacity to contribute to the production of new energy, renewable materials and energy efficiency in this country. Farm Bill energy title projects big and small have been successfully completed *in every State*.² Many more are underway. It is on this strong foundation that our clean technology industries will build the

² <https://www.usda.gov/energy/maps/maps/Investment.htm>.

next generation of biofuels, renewable chemicals, biobased products, and power across the landscape.

There are many different agriculture and energy resources that we must harness to ensure continued and future economic prosperity, national security, and public health benefits.

Biofuels/Renewable Chemicals/ Biobased Products from Agricultural Feedstocks

Biofuels, Renewable Chemicals and Biobased products

Traditional biofuels have set the stage for next-generation biofuels like cellulosic ethanol, advanced biofuels, biobutanol, and other green hydrocarbons. Biobased products that are industrial (non-food), such as plastics and solvents made from renewable agricultural materials, are also a huge economic growth opportunity – for rural areas especially.

The jobs potential is enormous. Studies indicate that well over 200,000 new “biobased economy” jobs were created between 2013 and 2014 in this sector.³ Without question more will be generated if continued federal investments are made and as the economy rebounds. USDA has estimated that over 700,000 jobs could be created from continued implementation of BCAP alone.⁴

Biomass/Cellulose as a Feedstock

Biomass is simply biological material from living or recently living organisms such as wood, plant and animal waste. It is commonly plant matter that can be burned to create heat for electricity generation or broken down by physical and chemical processes to create liquid biofuels.

Biomass energy holds tremendous potential for U.S. agricultural and forest-product industries. Today, the main biomass feedstocks for power are paper mill residue, lumber mill scrap, and municipal waste.⁵ For the production of second- and third-generation biomass fuels, agricultural residues such as corn stover (stalks, leaves, and husks from the plant) show great promise, as do purpose-grown energy crops like sorghum perennial grasses and algae. BCAP is

³ Golden, J.S., Handfield, R.B., Daystar, J., Morrison, B., and McConnell, T.E. (2016) “An Economic Impact Analysis of the U.S. Biobased Products Industry: 2016 Update.” A Joint Publication of the Duke Center for Sustainability & Commerce and the Supply Chain Resource Cooperative at North Carolina State University.

⁴ https://www.fsa.usda.gov/Internet/FSA_File/bcap_update_may2011.pdf

⁵ <https://www.nrel.gov/workingwithus/re-biomass.html>

vital to the continued development of this technology by ensuring a diverse blend of biomass feedstocks are recovered or grown and harvested for the production of low-carbon, domestically-produced renewable energy.



Napier Grass

Switchgrass



Energy Sorghum

Purpose-Grown Energy Crops

One of the most promising avenues for advanced biofuels development in the coming years is the emergence of purpose-grown energy crops. Virtually every region and climate in the country has promising feedstocks, native and non-native, that can be used for biofuels, biopower and even renewable chemical production. These include energy sorghum, switchgrass, miscanthus, camelina, jatropha, napier grass, energy cane and many others.

Algae

According to the Algal Biomass Organization (ABO), algae is an emerging 21st century crop with the potential to expand the U.S. agricultural base, drive major gains in agricultural productivity, and serve as feedstock for a new wave of rural manufacturing and domestic job growth. Algae thrive under harsh conditions unsuitable to other crops and require little or no fresh water, making production possible from the deserts of Arizona to abandoned cotton plantations in Texas and degraded grazing pasture in Florida. Algae biomass yields can exceed 10 times those of terrestrial crops, meaning greatly increased revenue per acre. Algae also offer increasingly sought after attributes for human and animal nutrition, and have emerged as a leading alternative source of omega-3 oils, antioxidants and other components for food and feed, in addition to their potential as a drop-in replacement for military and civilian alternative aviation fuel.



Algae are also increasingly being deployed to capture and monetize carbon, nitrogen and other nutrients from agricultural, industrial and other waste streams, offering the potential to transform environmental mitigation challenges such as climate change and eutrophication from cost to economic opportunity, further enhancing rural economic opportunity.

New Electricity Sources

There are a host of commercial technologies for producing electricity in rural, urban and suburban areas across the country. The Farm Bill should do more to promote the continued development and installation of these energy sources in all areas of the U.S.



Wind

Rural America has a long and robust history of harnessing the energy of wind for electricity and mechanical purposes. The development of the commercial wind electricity industry in the U.S. began in the 1970s and has steadily grown from that time.

According to the Distributed Wind Energy Association there are small-scale “farm friendly” wind turbines in all 50 states, and this segment of the wind industry has the potential to produce tens of thousands of new jobs in rural areas over the next 20 years. Distributed wind electricity potential is similar to offshore (seabed based) wind power, with nearly 50 million sites deployable domestically, according to the National Renewable Energy Lab in Colorado. According to the American Wind Energy Association (AWEA), there is 84,143 MW of installed wind capacity in the United States, with more than 53,000 wind turbines operating across the U.S. plus Guam and Puerto Rico, as of the first quarter of 2017.⁶ As the industry has grown, the technology also has improved to meet increasing consumer demand for efficiency and reliability.

Today, there are three main types of wind energy generation: (1) large, commercial-scale projects; (2) community wind; and, (3) distributed or smaller-scale wind. All have an important role to play in U.S. efforts to produce clean electricity. As discussed below, the USDA has provided valuable assistance to home-grown wind power expansion through the Rural Energy for America Program (REAP), but more needs to be done, especially for distributed wind deployment.

⁶ Distributed Wind Energy Association, Wind Vision March 2015, www.distributedwind.org. NREL “Assessing the Future of Distributed Wind, Opportunities for Behind the Meter Projects,” November 2016. American Wind Energy Association. (2017) “U.S. Wind Industry First Quarter 2017 Market Report.” Washington, DC: AWEA Data Services, April 27, 2017. <http://www.awea.org/1Q2017>.

Solar

According to the Solar Energy Industries Association (SEIA), solar energy is among the cleanest and most abundant energy resources available, and the U.S. has some of the most abundant solar resources in the world.⁷

As with wind energy, solar energy can be produced on a distributed basis (distributed generation) with equipment located on rooftops or on ground-mounted fixtures close to where the energy is used. Alternatively, large-scale concentrating solar power systems can be constructed to produce energy at a central power plant.

The REAP program also assists in the installation of distributed solar projects.

Biogas

Biogas is another promising avenue for new ag-based energy generation. Biogas is produced when organic material is allowed to decompose in an anaerobic digester. Anaerobic digestion is the process by which naturally occurring microbes, which can only live in places where there is no air, break down organic, biodegradable material over time and convert it to biogas and an organic fertilizer. Because animal waste makes an excellent feedstock for these digesters, livestock producers from across the country are increasingly interested in installing anaerobic digesters to not only create valuable biogas, but also reduce the waste streams flowing from their operations and even reduce concomitant odors.

In the U.S., there are approximately 12,000 anaerobic digesters operating at wastewater treatment plants⁸ but only 242 livestock farms across the country. For comparison, there are approximately 64,000 dairy farms⁹ in the U.S., not to mention hundreds of thousands of other large animal feeding operations, so the potential for this technology is immense.

Through REAP, the USDA has assisted in the installation of anaerobic digesters. In order to enable this technology to continue to develop and further commercialize, it is vital that the next Farm Bill continue to improve support for digester installation.

⁷ <http://www.seia.org/about/solar-energy>

⁸ <https://www.epa.gov/anaerobic-digestion/types-anaerobic-digesters>

⁹ https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Dairy_Cattle_Milk_Prod/Dairy_Cattle_and_Milk_Production_Highlights.pdf

Biomass to Electricity

Biomass power is clean electricity generated from forest residues and/or organic waste that would otherwise be dumped in landfills, openly burned, or left as dangerous excess material for forest fires.

This waste can include scrap lumber, forest debris, agricultural harvest waste, and other industry byproducts that serve no other purpose. Biomass power uses these natural materials to generate clean, renewable electricity, while reducing greenhouse gas emissions.

Biomass power provides significant other environmental and consumer benefits, including improving forest health, protecting air quality, and offering a highly dependable renewable energy source, often for economically depressed communities.

Geothermal

In terms of total megawatts (MW) of production, the United States leads the world in geothermal electricity production with more than 3.7 GW of installed capacity from 104 power plants.¹⁰ Geothermal energy is eligible for support in REAP.

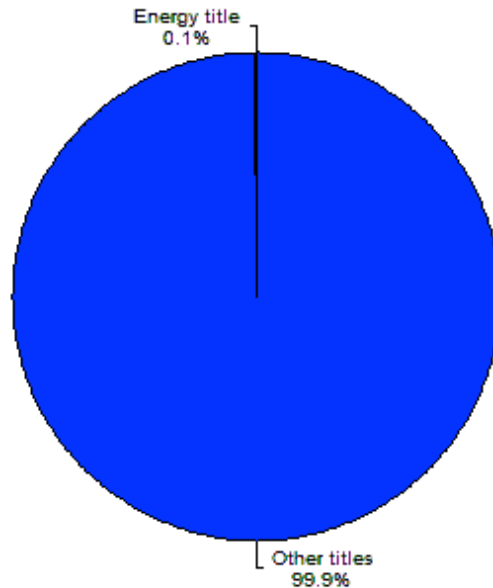
Other important renewable and energy efficiency technologies deployable and scalable include hydro, ocean and tidal energy, combined heat and power (CHP), gasification, and beyond.

USDA's Leading Role in Development of new "Cash Crops" and Abundant Energy

The 2014 Farm Bill authorized and funded several programs to provide support for the development, demonstration and commercialization of agriculture-based energy, energy efficiency, renewable chemicals, and biobased products produced from farms, forests, and ranchlands. This effort has been largely successful and should be maintained in the new Farm Bill. The "core" energy title programs laid out above and in the following pages are highly distinct, targeted, and innovative, and they should be kept as such.

¹⁰ <http://geo-energy.org/reports/2016/2016%20Annual%20US%20Global%20Geothermal%20Power%20Production.pdf>

Energy Title's Funding Share in Agricultural Act of 2014



Note: 5-year cost of \$489 billion as projected by CBO at time of passage.

It's worth noting that the 2014 Farm Bill provided only 0.1% of its total funding for energy.¹¹ That funding level is roughly a third of the funds dedicated to miscellaneous items. The federal commitment is vital, particularly at this time, when so many new feedstocks, processes, fuels and technologies are on the cusp of successful or more integrated commercialization and rural America is hurting. Federal support for these programs must be maintained, even in the current budget environment. Farmers, ranchers, and rural communities stand to benefit immensely, as they and clean technology companies (typically located in these rural areas) develop new income streams.

Moreover, the impact of these investments is outsized relative to the total dollar amount allocated. This is because the programs are targeted and leverage much more in state and private sector investments than would ever be possible without them. For example, the federal government is by far the nation's largest consumer. Federal purchasing of biobased products from renewable feedstocks has tremendous impact on the industry by driving construction of advanced biorefineries, job creation and innovation. The federal government is uniquely

¹¹ <https://fas.org/sgp/crs/misc/RS22131.pdf>

positioned to jump-start a nascent global industry such as renewable chemicals and the first commercial-scale energy crops for bioenergy production.

If the federal government doesn't invest in the Farm Bill and other clean energy programs, the U.S. will risk losing more ground to China, Germany, all of the other BRIC nations, and other proactive nations. The new manufacturing jobs, industries and revenue this sector is expected to generate in the coming decades will go to other nations. A clean technology future is necessary for domestic economic growth, national security, energy independence, and infrastructure development. Everyone stands to benefit if we maintain commitments to clean, domestic energy, even in lean times for the federal budget. It is a natural fit for the United States to be the home for manufacturing jobs, since we are rich in feedstocks, experts at innovation, and can capitalize on fundamental strengths in agriculture, industrial biotechnology, and biobased manufacturing.

Below is a summary of the “core” energy title programs that the Coalition supports and Agriculture Energy Coalition’s (AgEC’s) Policy Recommendations.

§ 9002 – Biobased Markets Program

This program continues the federal preference for procurement of biobased products and the biobased products labeling program. The program has grown since its inception in the 2002 Farm Bill, but now is facing limitations in its scope and stymied growth due to lack of funds. It is an international program that needs to be appropriately resourced. The increased development, purchase, and use of renewable chemicals and biobased products will continue to reduce our nation’s reliance on fossil fuels and product imports. It also will increase the use of homegrown renewable agricultural materials, which will in turn provide our farmers with opportunities to increase their revenue. Quinquennial reports from the U.S. Department of Energy have shown the United States has the potential to produce on an annual basis at least one billion dry tons of biomass resources, composed of agriculture, forestry, waste, and algal materials.¹²

The program positively impacts overarching sectors such as agriculture and forestry, biorefining, renewable chemicals, enzymes, bioplastics bottles, personal care, cosmetics, packaging materials, forest products, and textiles segments that represent a major contribution to the U.S. economy.¹³ As a result of the program, data for jobs and economic value can be calculated and will continue to be refined as the biobased economy’s contribution to U.S. gross domestic product increases. The BioPreferred® Program has certified more than 2,500

¹² <https://energy.gov/eere/bioenergy/2016-billion-ton-report>.

¹³ <https://www.biopreferred.gov/BPResources/files/BiobasedProductsEconomicAnalysis2016.pdf>

products in 100 different product categories. The most recent product to be certified by USDA's BioPreferred® Program is Procter & Gamble's Tide detergent. Brand owners such as General Mills, Unilever, and Coca-Cola have certified their products too.

Recommendations:

Establish a sub-program that offers the following: education, outreach, public awareness, implementation, market awareness and acceptance of renewable chemicals and biobased products in the voluntary labeling and procurement portion of the BioPreferred™ Program. Develop annual auditing and tracking in the USDA's voluntary "Certified Renewable Chemicals and Biobased Product" labeling program. Generate an annual report showing procurement and sales of biobased products by federal agencies and their contractor's through a transparent reporting structure. Jointly work with United States Department of Commerce in developing North American Industry Classification System (NAICS) codes for renewable chemicals and biobased products manufacturers. Develop a consumer product label or designation that combines USDA's certified renewable chemicals and biobased products with U.S. Environmental Protection Agency's Safer Choice label, providing purchasers the ability to identify products are both certified biobased and safer for human health and the environment. Increase the program's mandatory funding to \$10 million and additional discretionary funding to \$10 million annually through 2021. Annually report to Congress detailed expenditures for growing USDA's BioPreferred™ program. Provide explicit eligibility for products produced from biologically captured and reused carbon. Add baseline funding.

§ 9003 – Biorefinery Assistance

This program, among the most important in the entire Farm Bill energy title, provides loan guarantees to build biorefineries that produce advanced biofuels and renewable chemicals.

Demand for these fuels and chemicals has grown and will continue to grow.

However, the program has not realized its vision of encompassing all forms of advanced fuels, chemicals, and bio-products as of yet due to two primary challenges, each of which should be firmly addressed in the next Farm Bill via program improvements and reform.

First, there has been an unfortunate but narrow interpretation of the type of projects eligible (i.e., they must be or have biofuels production), leaving a variety of innovative projects "on the shelf."

In addition, there was a time lag in completing a new Final Rule for this program in 2014 and 2015 that slowed down the processing of loans through the USDA. However, we support the new 2-tiered system that has been created, and it is working well to move these projects through the rigorous review process and into loan closing. This is the only government loan program that can accomplish the goal of building first-of-a-kind technologies that support Rural America, offset imports through U.S. manufactured fuels, chemicals, and products, and leverage the significant and unique investments and technologies that have been created, both for the US and exporting these products and technologies globally. We feel it is vitally important to continue with this program. It is important to not presume that the slowness of success in recent years is based on any lack of opportunity.

Recommendations: Allow renewable chemicals, bioproducts and new, innovative food and feed ingredients (such as algae-based health products) to qualify on equal footing with advanced biofuels production, and make it clear that cutting-edge biofuels like biobutanol are eligible as well, even if produced from first-generation feedstocks. It makes no sense to exclude renewable chemicals, biobased products, or promising next-generation biofuels or other materials on the basis of current feedstock availability or limited notions of what a biorefinery will be in the future. The jump to cellulosic and other advanced feedstocks is happening, but Congress should not constrain development of new biofuels, renewable chemicals and biobased products as these sustainable feedstocks are developed. To ensure sustainability with innovative fuels from a mature feedstock such as corn, Congress should include basic and attainable sustainability requirements for those feedstocks alone, i.e., corn. Because §9003 is a transformational program and eligibility expanded to other innovative bioeconomy participants, current Farm Bill mandatory funding levels should be maintained.

§ 9004 – Repowering Assistance

This program encourages existing biorefineries to install new energy systems that use biomass for heat and power.

Recommendations: Sunset or incorporate into REAP.

§ 9005—Bioenergy Program for Advanced Biofuels

This program provides incentives for next-generation biofuel production.

Recommendations: Keep as is, programmatically and with level funding.

§ 9007—Rural Energy for America Program (REAP)

This program provides grants and loan guarantees for energy efficiency and renewable energy projects and support for feasibility studies and energy technical assistance. Of all the Farm Bill energy programs, REAP provides benefits to the broadest spectrum of energy technologies, including the installation of wind, solar and bioenergy, including power and biogas, biofuels infrastructure and energy efficiency initiatives throughout Rural America.

Recommendations: Increase funding levels by \$100 million annually to partially address overwhelming interest and long-standing demand and make the program even more nimble and innovative. The program has not been able to meet excess demand for project cost-share for many years now. This modest increase would go a long way toward making America more energy independent and improving rural economies, as well as domestic manufacturing.

Amend §9007 by explicitly adding language allowing components of projects (e.g., storage) to be supported, and/or ancillary infrastructure; and financing at the portfolio level. Lift the residential restriction on projects (otherwise known as the 2 meter rule). Place a cap on any one macro technology receiving more than 25 percent of the total awards each year, unless other viable projects do not apply or qualify to expend remaining program funding. Require an emphasis on “underserved technologies.” Follow existing federal law and Congressional intent to support “Buy American” based on reasonable domestic content standards (e.g., products with higher domestic biobased content are awarded more points in the scoring process).

Finally, to accelerate energy deployment and equity among distributed technologies, a categorical exclusion (CE) for solar ought to apply, or a new CE apply, to small-scale distributed wind, on already developed land.

§ 9008 – Biomass Research and Development

This program supports advanced research to improve the commercialization of biomass into fuels, renewable chemicals, bio-based products, and power.

Recommendation: Amend the Biomass Research and Development Program by adding the definition of renewable chemicals and include advanced biofuels and renewable chemical projects utilizing non-cellulosic feedstocks. Narrow and refine the focus of the program to ensure it does not overlap unnecessarily with other agriculture research programs such as the National Institute of Food and Agriculture (NIFA). At minimum maintain current funding levels.

§ 9011 – Biomass Crop Assistance Program (BCAP)

This program functions to assist agricultural producers to produce, harvest, store and deliver dedicated energy crops to eligible next-generation biorefineries. Specifically, it provides

matching payments to farmers for the delivery of eligible material to qualified biomass conversion facilities. Qualified biomass conversion facilities produce heat, power, renewable chemicals, biobased products, and advanced biofuels from biomass feedstocks.

It also provides “establishment” and annual payments to eligible agricultural producers who enter into contracts with the CCC to produce eligible biomass crops on contract acres within BCAP project areas.

BCAP’s payment programs are structured to fund perennial, rather than annual crops. However, some of the most promising biomass energy crops such as energy sorghum today are annual crops. Therefore a parallel incentive program structure should be created that gives growers who seek to apply to the BCAP program compensation that is appropriate for an annual crop. Specifically, such a structure would remunerate for annual planting and annual retrieval (rather than dividing payments into establishment, maintenance and retrieval, a structure appropriate for forestry and perennial crops)

In addition, BCAP is tackling pressing issues with hazardous fuels build-up. Many federal forests, particularly in the West, are in crisis. Some 102 million trees across California – many of which are located in the federally managed Sierra, Stanislaus and Sequoia National Forests – died between 2010 and 2016, due to a years-long drought and bark beetle infestation. More than 957,000 acres in the state qualify as “high hazard zones,” where trees could easily fall over or catch fire, posing significant risk to residents, tourists, homes and infrastructure.¹⁴ Some of the hardest-hit areas have as many as 14,000 dead trees per square mile.¹⁵

The Forest Service has already deemed these areas “NEPA ready,” meaning that the agency has completed an analysis and plan for management – it is only a lack of funding that stands in the way of completing the mission. Because wildfires increasingly threaten homes and recreational areas – and because conditions like drought and dry weather can increase the severity of wildfires – the Forest Service must often divert funds that could be used for forest management to fighting fires. To treat some of the highest risk areas, the State of California employed “air curtain burners” to simply burn as many trees as possible in a controlled way – releasing carbon into the atmosphere and wasting an energy resource.

¹⁴ Tree Mortality Task Force. “Tree Mortality: Facts and Figures.” April 2017.

http://www.fire.ca.gov/treetaskforce/downloads/TMTFMaterials/Facts_and_Figures_April_2017.pdf.

¹⁵ U.S. Forest Service. 2017 Bark Beetle Forecast for California.

<https://usfs.maps.arcgis.com/home/item.html?id=7b78c5c7a67748808ce298efefceaa46>.

Biomass power facilities use low-value organic materials like forest residues – including high hazard fuels – and agricultural byproducts as fuel to generate electricity. The State of California is home to 21 currently active biomass power facilities, with another 13 that have been idled in recent years due to economic conditions.¹⁶ In 2016, the California Legislature decreed that a number of facilities be awarded utility “BioRAM” contracts, essentially providing the facilities with a market-based incentive in exchange for the requirement that they help remove the millions of tons of biomass that currently pose a dangerous threat of wildfire and threaten rural communities. These same facilities accept agricultural biomass like orchard prunings from the Central Valley, improving air quality by reducing the traditional practice of open-air burning agricultural byproducts. Without a favorable power contract premised on accepting high hazard fuels, many California facilities will likely close, thereby shutting off a disposal option for farmers.



Photo credit: U.S. Forest Service

¹⁶ California Biomass Energy Alliance. <http://www.calbiomass.org/facilities-map/>.

If fuel isn't used to generate electricity or for another purpose, the Forest Service often has no choice but to burn it in a slash pile, wasting a domestic energy resource and releasing carbon into the atmosphere.

The U.S. Forest Service budget that could contribute to clearing out lands in the highest risk areas is increasingly consumed by the cost of fighting fires. More than half the Forest Service's 2016 budget – well over \$1.6 billion – went toward fire suppression, a number that is projected to rise over the next decade.¹⁷ The urgency and frequency of fighting fires has created a difficult cycle for the Forest Service in which resources that could go toward management and prevention must be used for emergency purposes – reducing the ability of the agency to prevent the costly emergency to begin with.

It is expensive to treat forests and remove dead trees, but in the long run, doing so could help the Forest Service save money. The U.S. Forest Service and the biomass power industry have an existing, strong partnership in place through an MOU to promote the use of energy from wood. Together, they have identified more than 90,000 acres of high hazard trees that are “NEPA ready” for removal and use in biomass power facilities. This program can make the difference between simply getting rid of these materials and putting them to use while stimulating the local economy. The end result could be a “win/win” – the Forest Service has a strategy for its high hazard fuel crisis, and the private sector has a power contract and source of fuel that keeps rural power facilities economically viable while contributing to the local economy.

In short, BCAP is the only federal program of its kind and is pivotal not only to forest fire reduction, but also to the development of new agricultural crops that do not compete with food and are dedicated to the production of energy and/or sustainable industrial biomaterial.

There may of course be reluctance in some quarters of the agricultural community to embrace new energy crops due to the risk involved. Nevertheless, farmers have a very high level of interest in helping America become more energy independent. Numerous farm surveys show how excited farmers and others in rural areas are about energy development. But energy crops are still unfamiliar to producers, purchasers, lenders and insurers of these crops and they enjoy almost none of the safety net components of traditional “farm program” crops.

The reluctance stems from several factors:

¹⁷ https://www.nifc.gov/fireInfo/fireInfo_documents/SuppCosts.pdf. <https://www.pri.org/stories/2016-08-23/us-forest-service-being-overwhelmed-all-fires-it-must-fight>.

- Some farmers are leery of growing new crops that they are unfamiliar with and that have not been successfully grown commercially in the region before. The learning curve for these crops can be steep and the consequences of failure are potentially severe.
- With the exception of BCAP which has not had consistent support, new energy crops enjoy almost none of the farm support or safety net provisions provided to traditional crops, such as crop insurance.
- Like farmers, some agricultural lenders are unfamiliar with these new, sustainable crops and are reluctant to lend money.
- Unlike with traditional farm crops, the federal crop insurance program does not provide premium subsidies to promote the development of insurance products for these new crops, thereby making insurance coverage so cost-prohibitive that such insurance products do not even exist.
- Specialized farm equipment may be required to plant, maintain, harvest, transport and store the crop, creating significant up-front expenses prior to its first harvest.

We believe the program is on the proper footing and is poised to make a real difference if it receives stable, consistent funding and modest expansion to tackle pressing national challenges.

Recommendations: Rename the program as noted earlier. Improve the current structure of BCAP with a continuing emphasis on establishment of new energy crops. Ensure eligibility of energy sorghums (sweet sorghum, biogas and biomass sorghums) into BCAP program overall. Introduce a parallel payment structure for annual crops that remunerates for annual planting and annual retrieval (rather than dividing payments into establishment, maintenance and retrieval, a structure appropriate for forestry and perennial crops). Expand investment into hazardous fuels reduction efforts. Maintain ongoing support for the collection, harvest, storage and transportation (CHST) component of the program to help enable biomass energy development. Remove the algae biomass feedstock restriction. Increase the previous Farm Bill funding levels going forward by an *additional* \$60 million/year over 5 years to address hazardous fuels reductions – we believe such an increase should actually *lower* USDA and Forest Service emergency spending for forest fires over time through “preventive medicine.”

Crop Insurance and other Risk Management Products for Energy Crops

A prior farm bill directed USDA's Risk Management Agency (RMA) to assess the viability of insuring a dedicated energy crops. The final study applied the USDA Program Evaluation Framework on crop insurance to assess 3 energy crops: camelina, switchgrass and energy cane. The study concluded that only Camelina should be considered for developing an insurance product. The other two crops, switchgrass and energy cane did not merit the creation of crop insurance programs for the following reasons:

- 1) switch grass contracts at the time did not contain revenue risk
- 2) Energy cane was not planted in volumes large enough to justify creating an insurance product.

Our concerns are as follows:

Although initial switchgrass contracts did not contain revenue risk, in the future when mature biomass markets exist, they will contain revenue risk.

The USDA is creating a chicken and egg problem if they both want to develop a crop insurance product to help farmers plant new energy crops and are also unwilling to develop products for crops that are not already planted widely.

Recommendations: Congress should direct the USDA RMA to reassess what crops are viable candidates for dedicated energy crop insurance programs based on today's market conditions and today's contract structures (that do contain revenue risk). RMA should commission another feasibility assessment of what insurance could be developed to support the adoption of these crops. That assessment should not require a crop to be planted at large scale to justify the creation of a new product. Congress should allow RMA to collect data on *similar* crops, in addition to actual crops given how new some crops are in the commercial sector.

The assessment/study should be completed within 12 months. USDA should then be required to develop one or more risk management products, within another 12 months, in collaboration with the private sector to offer producers who undertake energy crop production. At minimum this could initially be implemented on a pilot-scale or trial basis, but these products are vital to the development of dedicated energy crop production on existing agricultural land.

The Rural Utilities Service

Recommendations: Congress should simply remove Section 317(c) "Rate" from the Rural Electrification Act to allow for greater flexibility in providing loans at appropriate rates for clean technology infrastructure deployment, including wind, solar, hydro, geothermal, etc.

Congress should explicitly allow RUS to provide financial support under Section 317 to suburban or urban areas as long as the energy originates in a rural community, supporting jobs and economic development. Just as rural America provides abundant food and fiber to the rest of the country, so too can it support abundant energy to the country and, indeed, the world.

Congress should strongly consider harmonizing the definition of “rural” across energy infrastructure programs and initiatives, expanding limits to more reasonable population levels. This would provide greater flexibility to the Department and improve investment opportunities, while still retaining a core rural focus/nexus.

A final note:

The AgEC is happy to work with any office on these issues, including aiding in the drafting of appropriate legislation to effectuate the policy recommendations herein.

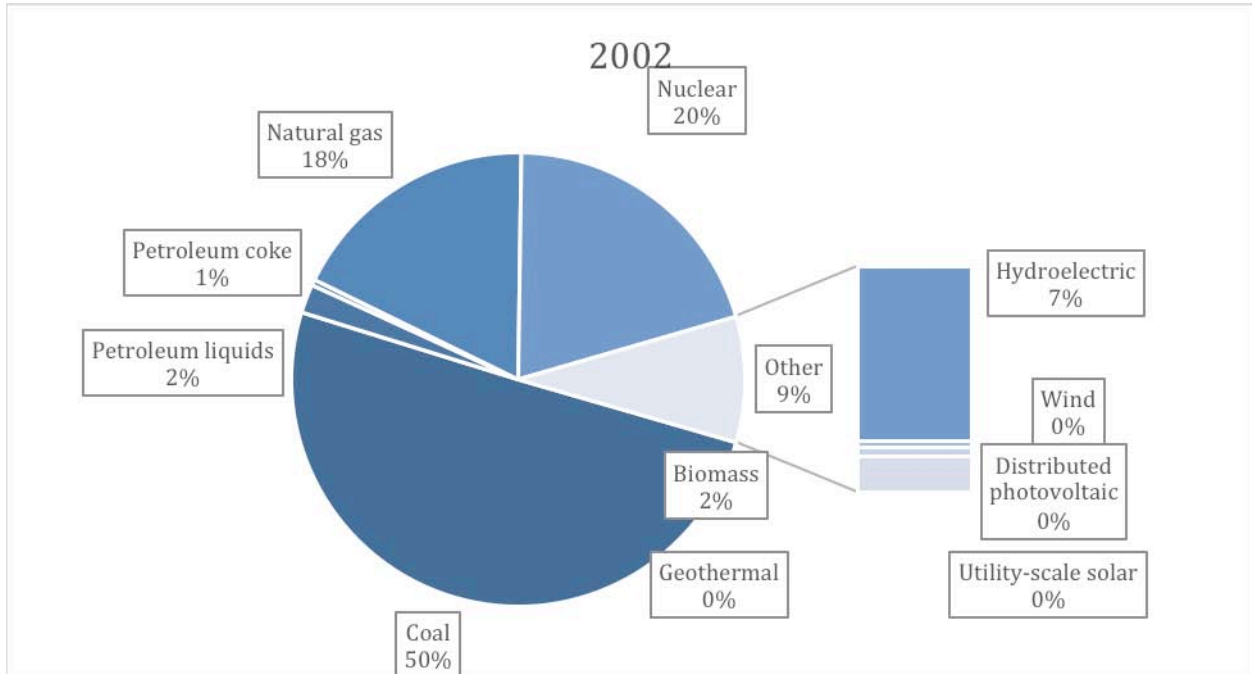
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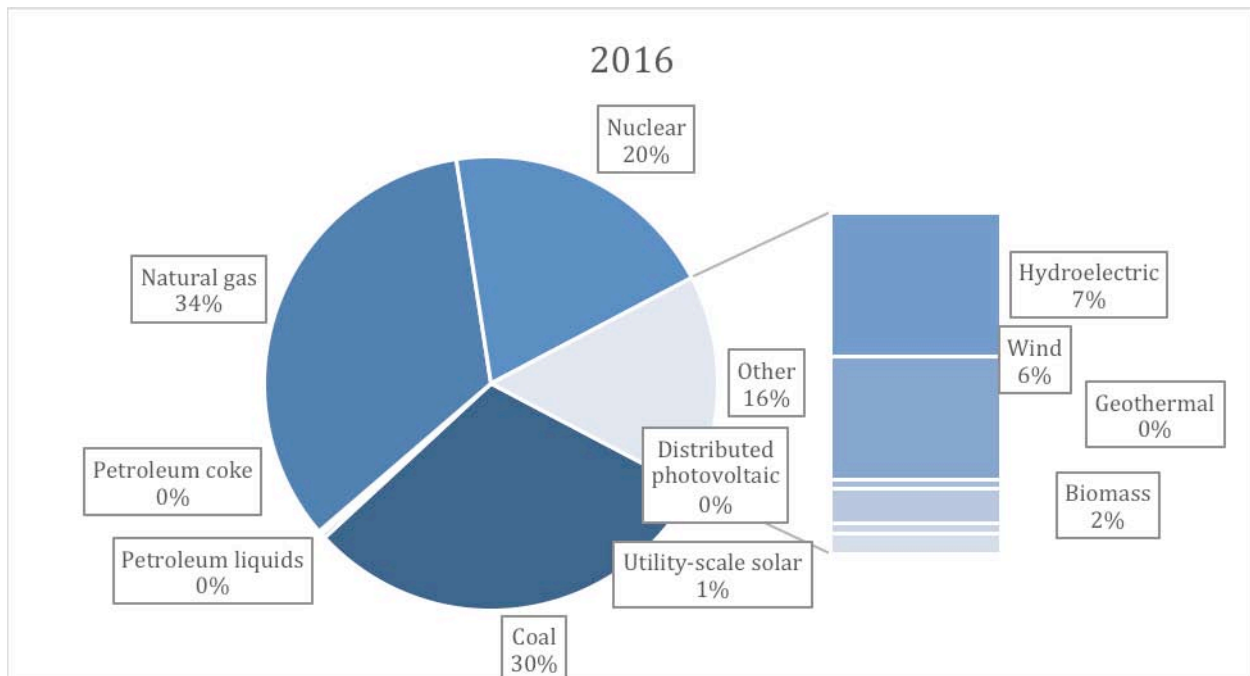
Note on contributions and the content of this paper: This is a consensus based document. Not all members support all of the recommendations. Everyone has a unique perspective but all agree the general thrust is correct – strongly support and improve “core” programs of the bi-partisan energy title, and expand clean technology access via RUS and the Federal crop insurance program. Ultimately the Coalition reserves the right to amend these recommendations going forward, as new ideas or information comes to light.

Appendix: Growth Indicators for Agricultural Energy

Between 2002 – when the first Energy Title programs were incorporated in the Farm Bill – and today, America’s pattern of energy consumption has changed. While use of natural gas has grown, displacing use of coal, use of renewable energy has also increased. The figures below show average shares of U.S. electricity generation for major fossil fuel, nuclear, and renewable energy sources in 2002 and 2016.



Source 1: U.S. Energy Information Administration. Electricity Data Browser. June 26, 2017.



Source 2: U.S. Energy Information Administration. Electricity Data Browser. June 26, 2017.

In 2016, solar and wind technologies generated 7 percent of U.S. electricity on average. In March 2017 they topped 10 percent for the first time.¹⁸ According to the Energy Information Administration, the United States added more than 26 GW of utility-scale electric generation capacity in 2016. Within that 26 GW, solar accounted for 9.5 GW and wind, 6.8 GW.¹⁹ Biomass technologies contributed an additional 2 percent of U.S. electricity on average in 2016, with 10.2 GW of wood and wood waste biomass capacity, 2.2 GW of municipal solid waste capacity, 2.1 GW of landfill gas capacity, and 0.8 GW from other waste biomass.²⁰

The rapid growth of renewable energy production has generated job growth, as measured in a recent Department of Energy report. Within electric power and fuels generation, the solar industry (including both photovoltaic and concentrating technologies) employs almost 374,000 workers, approximately 43 percent of the U.S. workforce employed in electric power generation. The solar industry workforce grew 25 percent in 2016, while wind employment

¹⁸ Owen Comstock. "Wind and Solar in March accounted for 10% of U.S. electricity generation for first time." U.S. Energy Information Administration, June 14, 2017. <https://www.eia.gov/todayinenergy/detail.php?id=31632>.

¹⁹ U.S. Energy Information Administration. *Solar, natural gas, wind make up most 2016 generation additions*. March 2016.

²⁰ Richard Bowers. "[Energy storage and renewables beyond wind, hydro, solar make up 4% of U.S. power capacity](https://www.eia.gov/todayinenergy/detail.php?id=31372)." U.S. Energy Information Administration, May 25, 2017. <https://www.eia.gov/todayinenergy/detail.php?id=31372>.

grew 32 percent. An estimated 32,000 agriculture and forestry employees work to support fuel production.²¹

The table below summarizes the numbers of direct jobs in the renewable sector as of 2016.

Table: Employment in Renewable Technologies for Electricity Generation and Fuels Production²²

| | Electricity Generation | Fuels | Total |
|---------------------------------|-------------------------------|--------------|--------------|
| Solar | 373,807 | | 373,807 |
| Wind | 101,738 | | 101,738 |
| Geothermal | 5,768 | | 5,768 |
| Bioenergy | 26,014 | 104,663 | 130,677 |
| Hydropower/Hydroelectric | 65,554 | | 65,554 |
| | | | 677,544 |

In addition to direct production of energy, the Department of Energy report measured jobs created by energy efficiency technologies. Within the nearly 2.2 million jobs related to energy efficiency, a small fraction – 116,445 – are from renewable (e.g., solar thermal) heating and cooling. Another 289,011 energy efficiency jobs are in manufacturing of appliances. The energy efficiency sector added 133,000 jobs in 2016.

²¹ From: <https://www.ers.usda.gov/data-products/us-bioenergy-statistics/>

²² BW Research Partnership (2017) "U.S. Energy and Employment Report." Washington, DC: Department of Energy, January 2017.