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Congressional Briefing: Support America's Circular Economy by Upcycling Bourbon & Brewing Wastes in reauthorizing the Farm Bill

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Commonwealth Policy Institute 2023 Congressional Summit
Center for Environmental & Sustainable Development

Support America's Circular Economy by Upcycling



Bourbon & Brewing Wastes in reauthorizing the Farm Bill

Enact a USDA Pilot Incentive on Spent Grain to Support Businesses Cooperating to Upcycle Organic Wastes into Bio-energy & Bio-products with reduced emission

By Samuel Kessler, Senior Fellow, Commonwealth Policy Institute Advisory Board, Kentucky.

Summit Background

This policy brief is derived from the 2022 and 2023 Congressional Summit meetings of the Commonwealth Policy Institute think tank. The Commonwealth Policy Institute is a nonpartisan, evidence-based policy think tank, founded with its first chapter at the University of Louisville and under bicameral [resolutions](#) of the KY General Assembly. CPI creates policy centers with its members and faculty, incorporates input of public stakeholder groups, businesses, and policymakers to create tailored policy solutions to specific challenges faced in the Commonwealth of Kentucky. Since many issues we address are common to other states, each year our organization conducts an annual Congressional Summit to rapidly “trickle up” ideas from new local and state level policy design into a federal context where possible. This generates dialogue¹ on new policy proposals with the Kentucky Delegation, other offices of Congress, committees, federal agencies, and national advocacy organizations typically within a two-week window. Referred to as “trickle up” policymaking, this approach entails synthesizing feedback between these groups and technical components of CPI’s state level work, and has resulted in communicating this briefing.

Introduction

Following state level development of a new spent grain incentive system, leading to KY House Bill 627 in 2022, CPI’s Congressional Summit dialogue considered initial components

¹ Note that details herein from communications are provided in such a way that any confidential or sensitive matters are omitted.



and possibilities for designing an incentive to upcycle “keystone” organic wastes in regional economies across the US. For member offices, a set of general recommendations (see page 6) are provided for a national spent-grain upcycling incentive pilot program. It is suggested that staff of the Bourbon caucus consult with the references in this briefing and USDA Rural Development to consider further development of an incentive program in the reauthorization of the Farm Bill.

It is further urged that Congress act within Farm Bill re-authorization with an amendment, to direct and budget the USDA to promulgate such a federal pilot incentive on spent grain. Such a pilot program may serve as a key step in optimizing a broader federal approach to support partnerships across the U.S. between businesses producing organic wastes, businesses upcycling those wastes, and those developing technology to transfer for the same ends.

A pilot program with spent grain would offer more direct benefit to distillers, brewers, ethanol producers, and associated upcycling companies including renewable biogas producers, feed developers, and developers of bio-products and value-added products. Improved incentives would further bring these innovators together in Kentucky, and across the states, where current partnerships are demonstrating mutual gains that can be built upon more rapidly especially if greater support exists to overcome initial capital.

Background: Upcycling Spent Grain from Market Failure to New Market Opportunity

In 2022, a Kentucky bill was introduced followed by efforts of the Commonwealth Policy Institute to develop an optimized tax incentive program as positive intervention to address several market challenges:

- Free-market drivers that lean towards pollution and permit violation by third parties, where distilleries and spent grain sources unknowingly pay bad actors who can pollute stillage wastes at a lower cost than proper disposal or upcycling.
- GHG emissions² exist in the distilling sector but can be reduced from diverting stillage to upcycling. Emission sources apart from distilling include the use of high energy dryer systems to convert stillage waste into dried distillers’ grains, which are often exported as cattle feed and have been susceptible to tariffs from China in recent years.

² According to estimates by [the Beverage Industry Environmental Roundtable](#), roughly 0.8 tons of CO₂ equivalent per barrel of bourbon (53 proof gallons). From over 11.4 M barrels ageing in Kentucky, this equates to over \$465 million using the US EPA’s social cost of carbon in 2022, or \$971 million using the EU ETS. Highest emissions related to stillage management tend to occur from powering of dryer systems to produce dried distiller grain products, and from associated logistics of delivering DDGS for livestock feed. Incentivizing diversion of spent-grain from high energy dryer systems producing DDGS and diversion from cattle feed, towards upcycling sources, is incentivizing a diversion from GHG emission which can lead to accounted reduction. With the rise of voluntary carbon markets, distillers in the sector may consider how emissions reduced from upcycling could be monitored, reported, and verified those markets to be certified and sell carbon credits. Such an approach is also relevant for distilleries in states with carbon taxes seeking means for tax relief.



- There is difficulty for upcycling businesses external to the distilling sector to develop connections to the distilling sector and establish a regular flow of wastes for upcycling. Current incentive models which incentivize capital do not incentivize connections. Tax credits are ineffective if they fail to provide or incentivize actual revenue to the business conducting upcycling.
- Kentucky's small but growing renewable biogas sector, reliant on stillage spent grain as a key feedstock, perceive federal programs for principal capital as lacking support (i.e. lack of available federal grants to fund beyond pilot-scale projects, issue of incentive parity between new market entrants and those with more development who have not been previously subsidized, and/or difficulty in incentivizing connections for system-level upcycling).

Placing incentives behind upcycling can lower logistical cost to all businesses involved, verified to improve payoff timelines to an extent that may improve private loan eligibility for renewable biogas and other upcycling. Improved capacity to integrate product-extracting technologies on farms which generate new revenue streams was speculated by the Kentucky Dairy Development Council to potentially allow some margin of profit that may be passed to consumers - a scenario for potentially lowering the cost of milk. Upcycling of wastes could allow a new era of connection between the distilling, ethanol, and brewing industries with existing dairy industry and potential migration of dairy to the area where the incentive applies³, new innovative ventures including commercialized vermiculture and compost⁴, value added product extraction from stillage wastes⁵, and especially the renewable biogas sector⁶.

To connect waste producing businesses to waste upcycling businesses who often form contracts with one another to manage the waste and set the price of services, it was determined that providing grant or tax subsidies to biogas and upcycling businesses alone may not be sufficient to support more lasting contracts. Spent grain waste producers (distillers, ethanol, brewers, others) must also be incentivized to initiate collaboration with upcycling businesses, especially where initial revenue of upcycling businesses may not be

³ According to the director of the KY Dairy Development Council, an incentive for eco-friendly stillage waste feeding, and colocation of third-party biodigestion and product extraction on dairy farms sharing in blended finance and benefit, could substantially decrease cost of feed which could ultimately trickle-down to decrease the price of milk. Implementation in Kentucky could also pull migrating dairy farms into the state, as increased drought in the western U.S. has generated new interest in migration of cattle operations eastward.

⁴ EnviroFlight located in Maysville, KY is a successful producer of alternative protein sources from black soldier fly larvae. Studies have demonstrated that larvae can be reared on distiller's grain waste, however connections to the vermiculture industry are not yet present despite proximity.

⁵ BioProducts LLC located in Louisville, KY has developed licensable technology for extraction of xylose, protein, and activated carbon from stillage. Xylose has an estimated global market of \$4 billion. Use of this technology in distilleries, however, goes against status-quo of using dryer systems despite being a more cost-effective option.

⁶ Kentucky's renewable energy capacity has been underestimated from not accounting the renewable biogas potential of stillage. CPI's white-paper explores the case of MAC Farms as a case study of how biogas would benefit from this incentive. Similar legislation focused on incentivizing new directions for organic waste streams in Massachusetts incubated Vanguard renewables, now one of the largest renewable energy companies in the United States.



sufficient for lower more-competitive service fees than organic wastes outlets that result in no upcycling, emission, or third-party pollution unknown to the waste provider. In an ideal situation - after establishing cooperation and waste transfer which is supported by the subsidy, which then leads to an initial period of marginal profit where the upcycling business may also use a portion of profit to invest and compound, upcycling as a waste outlet may remain a competitive option even after the sunset of the subsidy.

The subsidy was also found to potentially support marginal gains from extracting value-added products from spent grain, given that any subsidy improving initial payoff could increase feasibility of profit sharing between a company operating bioproduct extraction, or feasibility of technology transfer to the waste producer for direct extraction. In the case of Brown Foreman distillery in Louisville, it was found that licensing technology to extract protein, sugar, and carbon from stillage waste within an agreement that the distillery develop a renewable biodigester and meet over 50% power demand of the University of Louisville would still result cost reduction of \$12 million per year to the distillery and over \$1 million for the university.

Based on observations and findings and bipartisan requests for a bill draft, CPI drafted [House Bill 627](#) directly with the KY Legislative Research Commission. The intention of the bill was to provide an “indirect subsidy” to renewable biogas producers and other innovators using stillage and brewers grain wastes to avoid providing a tax credit without direct revenue, while minimizing any rebate payments made from the state budget. An indirect subsidy was created by crediting distilleries, breweries, and ethanol producers providing spent grain waste, based on a multiplier of revenue paid to businesses upcycling the waste to an extent which exceeds the tax credited which would result in a rebate payment to the, and further, credit the upcycling businesses may claim the revenue received from spent grain producers without tax. Technical measures included three key components:

- Direct payment to approved upcycling users from spent grain producers. Producers could then claim credit larger than their payment provided to upcyclers, based on a tiered multiplier system dependent on the end-use of the material which was an approach advised by state officials
- Credit is then claimable by upcycling users, against the revenue received from spent grain sources. The credit amount is dependent on the type of upcycling use and amount of material managed.
- The amount of credit claimable by upcycling users, and the multiplier for spent grain providers, was to be calculated by an assigned multiplier factor dependent on both level of eco-friendly use and level of capital investment required for upcycling development.

A Federal Proposal: Trickling up the State-Level Solution

Since 2019, members and leaders of Kentucky’s Joint Committee on Agriculture from both houses suggested CPI engage at the national level to determine possibilities for new federal



policy regardless of what may be developed in Kentucky. This led to meeting USDA rural development in 2022, and suggesting the recommendations on page five in 2023.

A federal solution is considered ideal encouragement for state level legislation in the case of Kentucky, which may follow to matched support towards the pilot program by other states. Despite reaching bipartisan support needed to introduce the legislation, in 2022 the bill was not referred to committee, due to a variety of factors. Certain components were written for budget-balancing purposes - including the reallocation of ethanol tax credits, which was not filed in adequate time to allow calculations by the ethanol industry as to whether stillage-based tax credits on upcycling would still retain adequate support. Further one measure of tax credit to distilleries was towards Kentucky's unique ad-valorem "barrel tax", to such a degree that the liability could be eliminated by the credit, however it was a priority of industry to eliminate the tax entirely. Despite some mismatch in the initial bills design, following the 2022 Congressional Summit and discussions with the USDA, agriculture committee members verified the possibility that the state level proposal be modified to avoid tax credit reallocation, and given health of the state budget which had improved since the bill's drafting, that tax credits/higher rebates to distillers, brewers, and stillage providers could be possible - as well as direct rebates to biogas producers if necessary. Ultimately, as providing direct rebates increases budget burden, knowledge that more-direct federal support could be enacted with further encourage this innovative policy to carry forward at state level.

It was discussed in such a meeting that if Kentucky, or other states, were to introduce the tax credit program described that the USDA would also have an interest in observing its implementation for the design of federal proposals, which is a more-ideal case for policymaking. However, it was also noted that should Congress also direct the USDA rural development to develop it's own incentive it has the capacity to do so.

Discussion with national USDA RD: Considering a Pilot Program

In 2022, CPI was referred to USDA Rural Development by the Senior Trade Commissioner of the KY Department of Agriculture, to discuss CPI's initial proposal based on the state level model to create a national incentive program for upcycling not only spent grain, but a general class of "keystone" organic wastes into new value-added products. This led to broader discussion on federal-level policy to substantially increase organic waste upcycling across the United States with multiple key waste the USDA might identify, with the goal of aligning major circular economic growth with methane reduction. A critical question was whether the USDA would have capacity to administrate a new program designed after CPI's state level work - should Congress introduce such a program and provide substantial funding potentially exceeding that of programs like REAP. Across the U.S., even if implemented at pilot scale, it would be desirable that the federal program carry equal net impact to legislation by one or more states. Discussion in 2022 with USDA Rural Development determined that:

- a.) The USDA would prefer to study a state-level incentive system in Kentucky, prior to advocating a similar national program to Congress on behalf of USDA's own interests and current programs that involve organic wastes and renewable biogas.



- b.) However, should members of Congress direct USDA Rural Development to administer a circular economy incentive focused on upcycling a set of identified “keystone” organic wastes across the US, and reducing/repurposing their methane emissions, the USDA would be capable and ideal to direct such a program.
- c.) It was emphasized that in such case, an ideal approach to allow dynamic policymaking may be to limit the initial scope of the new policy incentive system so future expansion could be optimized, while still having a sufficient level of initial impact within that pilot-like scope.

In 2023, developing a similar program that is focused solely on spent grain per the growing interests of the Bourbon Caucus may offer an improved scope instead of designing the program for multiple wastes. From synthesis of state-level research and initial federal feedback, on page 6 are recommendations to interested Congress members for a national stillage upcycling incentive program with federal-level scope under the USDA.

Recommended Policy Components of Spent-Grain Pilot Incentive:

- o The spent grain upcycling program may occur within new economic development zones to benefit from organic waste upcycling, if it is desirable to limit the scale of new policy to observe effects before larger expansion. One example could be shifting a similar approach to federal Agricultural Economic Empowerment zones (see references) into Spent-Grain Upcycling Empowerment Zones, including added metrics such as proximity to a spent-grain source. A zoning approach to further restrict the pilot programme is possible if needed for passage and budget negotiation, though not necessary.
- o The program should provide more-substantial principal capital grant funding for project needs than prior incentive programs like REAP (for example up to \$5 million maximum funding for upcycling system grants, with eligible systems to be classified by the USDA including appropriate renewables, instead of \$1 million for renewable energy system grants)
- o The total budget per fiscal year allocated to direct grants to be awarded by the USDA under the program should aspire to a minimum of \$500 million (if including all areas of the United States) including administrative costs, approximating for example half the budgetary size of REAP and intention to expand from pilot focus on spent grain to upcycling of broader organic wastes. If a targeted zone approach is used, the budget may reduce in accordance with reduced area of service and expected reduced applicants.



- The program should include separate categories of applicants for separate pools of the total grant funding allocated. One category should be dedicated to new market entry or tech-transfer, another should be dedicated to applicants who already have a minimum footprint but desire expansion.
- Both rural and urban applicants should be considered, respectively with their own distinct channels for applications
- In rural settings and in the US Dairy Industry, spent grain upcycling should be considered as a possible component of broader regenerative agriculture land use strategies.
- Critically, the program may consider offering more exclusive low-interest federal loans (for example up to 75% of total project cost) to denied grant applicants. Or, should Congress fail to negotiate budget for a pilot project, consider the offering of low-interest mid-term federal loans to upcycling projects as its own policy.
- In addition, with any measures dealing with loans, consider measures to allow lower interest and longer-term loans when matched with other low interest loans from bank-like entities such as state infrastructure authorities
- The program should provide priority grant and especially loan awards in states identified by the USDA to have passed complementary incentive legislation related to the exchange of stillage waste for upcycling uses, by tax credit or grant programs.
- New resources should be allocated for the program's advertisement and administration coordinated with USDA state offices.
- In addition to providing an enhanced degree of principal capital funding, the program under the USDA's discretion should design an incentive to both the spent grain waste provider and registered upcycles (with or without principal capital funding) for exchange of the material, where value in the exchange may use a tiered approach similar to the state level proposal.
- Creative financing options should be considered for funding the waste exchange in addition to direct government funding. If a new upcycling development diverts stillage waste in a manner that reduces GHG's, the program may consider quantifying those GHG's to allow sale of carbon credits from the USDA where proceeds are used as a part of the programs' funding. ○ The incentive associated with the waste exchange should have a sunset of 5 years, or similar time determined by the USDA where it may be possible to remove or reduce funding but retain the new waste to resource pathway.



- The USDA may consider establishing upcycling commodity derivatives on the exchange of stillage within the upcycling program, adding to its eligibility upcycling and bioproduct development. ○ The Congress may consider leveraging funds from the Commodity Credit Corporation for this provision.
- The USDA should provide intermittent reports to Congress on the success of the program and additional needs, to allow adaptation. After a satisfactory number of operating years of the program and reporting as the USDA may determine appropriate, the USDA should provide a final report recommending whether the program should be expanded for spent grain wastes, and whether the program should be expanded to include other “keystone” organic wastes across the country as a national incentive to upcycle key organic waste while reducing methane emissions.

Associated Publications for Reference:

Kessler, Samuel C. , et. al (2022) "Supporting New Business to Solve Old Problems with Kentucky's Keystone Waste from Bourbon & Brewing," Commonwealth Policy Papers: Vol. 1: Iss. 1, Article 2. Available at: <https://ir.library.louisville.edu/cpp/vol1/iss1/2>

Kessler, Samuel C. (2022) "Draft State Legislation: A novel policy system of income & refundable property tax credits for sustainable use of “keystone” stillage and spent grain wastes to stop pollution and surge business growth," Commonwealth Policy Papers: Vol. 1: Iss. 1, Article 3. Available at: <https://ir.library.louisville.edu/cpp/vol1/iss1/3>

Kessler, Samuel C. (2022) "Draft Federal Legislation: Agricultural Economic Empowerment Zones," Commonwealth Policy Papers: Vol. 1: Iss. 1, Article 6. Available at: <https://ir.library.louisville.edu/cpp/vol1/iss1/6>