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Recommended Citation

Lamb, Jeni, Andrew Rogers and L. Leon Geyer "Adding Biofuel to the Fire: A Sustainability Perspective on Energy Policy in the 2008 Food, Conservation, and Energy Act." *Sustainable Development Law & Policy*, Fall 2008, 36-40, 72-74.

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ADDING BIOFUEL TO THE FIRE: A SUSTAINABILITY PERSPECTIVE ON ENERGY POLICY IN THE 2008 FOOD, CONSERVATION, AND ENERGY ACT

by Jeni Lamb, Andrew Rogers & L. Leon Geyer*

INTRODUCTION: POSITIONING BIOFUEL PRODUCTION IN THE LATTER HALF OF THE TWENTIETH CENTURY

There is little doubt that the world is in the midst of a food and fuel crisis. Among developed nations, the United States finds itself in the particularly precarious position of maintaining both a strong domestic economy and a positive reputation abroad. Domestically, 39.8% of total energy consumption comes from petroleum,¹ 22.8% from coal,² 23.6% from natural gas,³ 8.4% from nuclear power,⁴ and 6.8% from renewable energy (including conventional hydroelectric power, wood, alcohol, geothermal, solar, and wind).⁵ The frightening reality is that 98.4%⁶ of the world's oil is largely located in nations characterized by political instability and/or tense relations with the United States, such as Venezuela, Iran, Iraq, Saudi Arabia, and Nigeria.⁷ Some have characterized this geopolitical situation as allowing the above mentioned nations' political leaders to ensconce themselves from democratic reforms and "insulate themselves from international and domestic pressures."⁸ Many also allege that the United States' interest in oil has led to unnecessary engagement in foreign conflict. The current energy crisis has come with equally troublesome record-increases in the cost of agricultural products and foodstuffs. Rising food and fuel prices are driving record enrollment in food nutrition assistance programs in the United States⁹ and threatening to return some 100 million individuals to poverty abroad.¹⁰ This situation has left Americans searching for a means of securing energy independence and restoring affordability to the global and national food supply.

In this context, the rapid expansion of renewable biofuels has been simultaneously viewed as a culprit and solution. Biofuel production has been consistently indicted as a major contributor to increasing food prices in multiple dimensions. This includes the direct competition of food crops being diverted for production of biofuels, as well as the more indirect competition for land and resources to grow fuel versus food crops.¹¹ Alternatively, some stress that biofuels are not to blame for rising global food prices, adding that biofuels have had a greater impact in keeping transportation costs as low as they are.¹² As a substitute for gasoline, it is argued that biofuels have played a critical role

in adding stability to energy prices and assuring that they do not climb higher than their recent record levels.¹³

Before delving extensively into the role of biofuels in the modern food and fuel crisis, it is important to remember that the modern experience of "agflation"¹⁴ and energy dependence is not unlike other points in U.S. history. As Federal Reserve Chairman Ben Bernanke recently recalled, in the mid-seventies "oil price shocks" were also accompanied by "rapidly rising prices of agricultural products."¹⁵ Then, just as now, the United States turned to domestic avenues for diversifying the energy

economy. For example, in 1978, Congress passed its first version of the ethanol blenders' credit as an incentive to begin blending their gasoline with home grown ethanol.¹⁶ Powerful corn advocates were among the first to push for a corn ethanol industry, and this initial support secured their dominance in the U.S. biofuel industry.¹⁷ Interestingly enough, exactly thirty years later, another convergence

of food and fuel crises along with the dominance of the corn ethanol industry and its controversial environmental impacts, has placed the United States at a critical juncture in regards to future importance and sustainability of biofuels policy.

With the leg up in the seventies, corn ethanol was best situated to take advantage of a number of recent market and political trends. The widespread state bans on the gasoline additive MBTE created a significant opportunity for ethanol to be combined with gasoline in order to obtain a desired consistency and quality at the pump.¹⁸ More recently, record high and rapidly increasing oil prices have made corn-based ethanol competitive with gasoline.¹⁹ In recognition of the rapidly increasing importance of biofuels, an energy title was added to the Farm Security and Rural Investment Act²⁰ (the previous farm bill) for the first time in 2002. The passage and implementation of the first Renewable Fuels Standard ("RFS") in 2005²¹ provided the first mandated level of ethanol production as an opportunity for

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the United States to “grow its way” out of a dependence upon foreign oil.²² Between 2005 and November of 2007, production nearly doubled from four billion gallons to 7.6 billion gallons.²³ Moreover, it is estimated that another 4.9 billion gallons of production capacity is under construction.²⁴ This increase has not occurred without significant secondary impacts in agriculture and the greater environment. Increased ethanol production has substantially raised livestock feed prices,²⁵ eroding profit margins for poultry, swine, and cattle producers. Also, expanded production has brought increased inquiry into ethanol’s actual ability to deliver on its promise as a climate mitigating strategy. Current research is focusing on the secondary costs associated with biofuel expansion.²⁶ These costs include carbon deficits created by drawing new lands into production for biofuels in developing nations, the impacts of drawing down major aquifers for the planting of corn,²⁷ and, most importantly as of late, the cost of diverting land from the production of food crops to the production of fuel.²⁸

With production for 2008 expected to well out-pace the mandate of the 2005 Renewable Fuels Standard²⁹ and growing concern over corn ethanol’s impact on environmental and food policy, the 2007 Energy Independence and Security Act (“EISA”) both revised and expanded the standard in light of the modern food and fuel controversy.³⁰ Beginning in 2009, the EISA will require increasing portions of the renewable fuels mandate to be derived from “advanced biofuels,” or biofuels derived from sources other than corn.³¹ While the EISA outlines a skeletal framework for the future of domestic biofuel production, the recently passed 2008 Food, Conservation, and Energy Act (“2008 Farm Bill”)³² requires fleshing out the policy incentives to facilitate such a transition.

Through the lens of the most recent farm bill, this paper investigates the content and implications of a dramatically altered renewable fuel policy in the context of the modern food and fuel crisis. After establishing this basic understanding, we argue that the renewable biofuels industry is at an important juncture as the transition is made from corn ethanol towards advanced biofuels. We offer a preliminary assessment of the sustainability of biofuels as a component of the U.S. energy policy transition from “monosource” petroleum dependence to a “multisource” production scheme.

2008 FARM BILL ENERGY PROVISIONS

The 2008 Farm Bill occupies the unique position of generating active policies for energy production incentives and reactionary policies which must account for higher food costs and negative environmental impacts associated with biofuel

production. It also carries the responsibility for creating the programs that will make the goals set by the EISA attainable over the five-year horizon.

The 2008 Farm Bill marks a major transition in renewable biofuels policy by moving away from the dominant corn-based industry.³³ The Farm Bill’s programs are directed towards the development of “advanced biofuels.” The “advanced biofuels”

terminology was adapted by the Congress in the 2007 EISA, but loosely aligns with what the scientific community has termed “second generation” biofuels.³⁴ The primary emphasis is placed on cellulosic ethanol, which is derived from cellulose, hemicelluloses, or lignin,³⁵ and includes fuels that are produced primarily from a variety of crops, crop residues, forest sources, waste streams, and other cellulosic sources.³⁶

However, the term “advanced biofuels,” as utilized by the Congress in the 2007 EISA³⁷ and in the 2008 Farm Bill, covers a much broader range of technologies than solely cellulosic ethanol. These include commercially scaled technologies such as biodiesel and sugar ethanol. In reality, the modified definition of advanced biofuels can include any non-corn source.³⁸ Programs with specific reference to “advanced biofuels” terminology include the authorization and appropriation of mandatory funds for a loan guarantee program and an energy payments program.³⁹ General programs incorporating advanced biofuels promotion establish a controversial sugar-to-ethanol program and reauthorize federal programs to give preference to bio-based products.

The 2008 Farm Bill’s Energy Title addresses the concept of “advanced biofuels.” In § 9003, a \$320 million loan guarantee program offers up to a ninety percent guarantee on loans up to \$250 million for the construction of advanced biofuel infrastructure and demonstration scale projects.⁴⁰ The other major program addressing advanced biofuels, outlined in § 9005,⁴¹ builds off of the Commodity Credit Corporation bio-energy program, created by executive order of President Clinton in 1999.⁴² The program previously provided incentives and payments for biofuels producers.⁴³ Although the bioenergy program was extremely popular, no funding was appropriated in fiscal year 2007.⁴⁴ Now the second largest provision of the title in terms of mandatory money at \$300 million, the Farm Bill has revived the program with a focus on moving away from corn-based ethanol.⁴⁵ The program “directs the USDA to make payments to support and ensure an expanding production of advanced biofuels.”⁴⁶ In addition to these funding incentives, § 9002 commissions a biofuel infrastructure study that directs the Secretary of Agriculture to look into infrastructure needs associated with the expanding production and use of advanced biofuels.⁴⁷ The Department of Energy and the Transportation and the Environmental Protection Agency will also assist in the study.⁴⁸

The United States stands at a critical juncture in the implementation and acceptance of biofuels policy.

More targeted programs that begin to address the needs of cellulosic ethanol are also present in the energy provisions of Tax Title XV, § 15321. However, none of the programs likely to see the level of funding promised in the general advanced biofuels provisions.⁴⁹ The first targeted program is the Biomass Crops Assistance Program (“BCAP”).⁵⁰ According to the Statement of the Managers, the “primary focus of the BCAP will be promoting the cultivation of perennial and annual bioenergy crops that show exceptional promise for producing highly energy-efficient bioenergy or biofuels, that preserve natural resources, and that are not primarily grown for food or animal feed.”⁵¹ This program is granted no mandatory funding under the Energy Title, but the Congressional Budget Office (“CBO”) scores the program to cost some \$70 million.⁵²

Cellulosic ethanol production is also being supported through additional funding for research and development initiatives.⁵³ Tax Title XV creates a \$1.01 per gallon tax credit for producers of cellulosic ethanol.⁵⁴

The CBO scores the program at a cost of \$403 million over the ten-year budget window,⁵⁵ which is likely the single largest flow of funds to the commercialization of cellulosic ethanol.⁵⁶

Working from the opposite side of active advanced biofuels programming is the effort to reduce the incentive for corn ethanol production. Section 15331 of the Trade and Tax Title reduces the Volumetric Ethanol Excise Tax Credit (“VEETC”) for ethanol blended into gasoline from fifty-one cents per gallon to forty-five cents per gallon starting in 2009.⁵⁷ More popularly known as the ethanol blenders’ credit,⁵⁸ the tax credit is an incentive for blenders to purchase ethanol and has been a powerful tool for expanding the ethanol market since it was established in the 1978 Energy Tax Act.⁵⁹ The 2008 Farm Bill reduces the ethanol blenders’ credit in reference to projections that ethanol production will soon outpace the 2005 RFS mandate.⁶⁰

The sugar loan program appears in the Commodities Title and confronts increased competition from trade liberalization.⁶¹ The U.S. sugar loan policy consistently maintained sugar prices at levels two to four times higher than world markets through managed trade.⁶² These circumstances, which allowed the USDA to operate the sugar policy at “no cost,” are quickly eroding.⁶³ An increasing number of free trade agreements coming online and, most significantly, the phase-out of tariff quotas in the North American Free Trade Agreement,⁶⁴ will make it harder for the USDA to recoup all losses from sugar forfeitures. In light of the celebrated success of the Brazilian sugar ethanol program, the USDA began considering the possibilities of sugar-to-ethanol production. In 2006, the USDA released an economic analysis concluding that with high oil prices, it would be cost effective for the United States to produce sugar ethanol.⁶⁵ With the added

push of the U.S. market opening up to sugar inputs from Mexico, the sugar-to-ethanol program was added to both the House and Senate versions of the Farm Bill.⁶⁶ The final product is the establishment of the Farmer Feedstock Flexibility Program.⁶⁷ Building on the Commodities Title three quarters of a cent per pound raise of the loan rate for sugar, this Title IX program requires the USDA to buy up surplus sugar for sale to ethanol producers.⁶⁸ Additional sugar-related programs include the extension of the sugar ethanol tariff until 2011.⁶⁹

EVALUATING THE FUTURE OF BIOFUELS

We argue that the successful transition of U.S. biofuel production from corn to a broader-based system will require the convergence of a number of factors. First, the modern debate over the causes of the food and fuel crisis has significantly damaged the public perception of biofuels. While ethanol is most often recognized as a one element of a “perfect storm” of a number of

factors influencing prices of food and fuel, it has been consistently indicted as a primary contributor in analyses from politically powerful organizations,⁷⁰ with estimates ranging between ten and thirty percent regarding its role in driving record prices.⁷¹ The role of biofuels in driving agricultural prices needs to be clearly addressed through reforms that reduce the competition between uses of food crops and production lands.

Second, the corn ethanol industry has the advantage of already having advanced along a substantial commercial learning curve.⁷² Thus, policies must also address means to “level the playing field” by increasing the competitiveness of advanced biofuels along the production chain and reducing supports that encourage the dominance of corn in the industry. Recognizing that the United States stands at a critical juncture in the implementation and acceptance of biofuels policy, this section assesses the progress of the 2008 Farm Bill towards meeting these goals.⁷³

While the “advanced biofuels” terminology of the farm bill allows for a transition away from the corn based system, it fails to hold United States policy accountable to a food and fuel hypothesis. This is because sugar ethanol, biodiesel, and cellulosic ethanol present different obstacles to sustainability.⁷⁴ In particular, sugar and biodiesel face a similar problem as corn in requiring the diversion of a food crop to fuel production.⁷⁵ Furthermore, a scarcity of land resources available to be brought into production limits the potential of either biodiesel or sugar ethanol to expand to occupy a dominant position in the market relative to corn.⁷⁶

By contrast, cellulosic ethanol avoids many of the pitfalls associated with commercially available technologies. It can be produced from almost any plant source, including plant waste

Cellulosic ethanol avoids many of the pitfalls associated with commercially available technologies.

and dedicated energy crops that may not be as competitive for land and resources with food crops. By assessing the current level of existing activities, some studies estimate that the United States has the capacity to produce enough raw materials for cellulosic ethanol production to offset sixty percent of domestic oil consumption.⁷⁷ Cellulosic ethanol further promises to be more energy efficient in life cycle costing measures, and is more regionally diverse in its applicability when compared to corn ethanol.⁷⁸ However, because the technology has not been commercialized, there is no way to truly know what its actual potential is. Farmers do not want to grow dedicated energy crops that have never been grown on a commercial scale,⁷⁹ investors do not want to invest in cellulosic ethanol production plants until a crop is in the ground, and banks do not want to offer reasonable loan rates until the technology is proven.⁸⁰ Clearly the obstacles to cellulosic production are very distinct from the sugar or biodiesel industries. However, with cellulosic ethanol placed under the same umbrella as the previously mentioned problems with commercially available technologies, it is very possible that the infant industry's particular needs will be neglected as policy makers grasp for a short-term solution.

Despite its far less commercialized position, cellulosic ethanol is not given near the prioritization, in terms of overall funding or triangulation, as programs dedicated to other advanced biofuels. While the Bill earmarks substantial funding for research, the most actively praised program by farmers⁸¹—the BCAP program—receives no mandatory money.⁸² Yet this is the program most likely to begin solving the problem of “who goes first”⁸³ in terms of growing cellulosic ethanol production on a commercial scale. Cellulosic ethanol, clearly distinct from corn-based ethanol, sugar ethanol, and advanced biofuels, needs to be discussed as an alternative to those fuels. The current inclusion of cellulosic ethanol with advanced biofuels has great potential to be misleading in the context of the food and fuel debate.

In terms of leveling the commercial playing field, the 2008 Farm Bill does offer incentives to expand the commercialization of advanced biofuels. Existing ethanol plants or new plants looking to produce sugar ethanol can apply for a loan guarantee through the loan guarantee program. Those plants can expect a steady stream of supply as trade in sugar opens and the USDA has to both accept and sell more sugar forfeitures to ethanol processors.⁸⁴ Moreover, while small producers can take advantage of producer credits, distributors can take advantage of the now reduced, but still significant, ethanol blenders' credit.⁸⁵ All the while, the domestic production system is protected from direct competition against the more efficiently produced sugarcane ethanol from Brazil.⁸⁶

Regardless of these advancements, recent research suggests that the 2008 Farm Bill's ethanol blenders' credit reduction will not decrease the competitiveness of corn ethanol in the biofuels market. While the six cent reduction in the tax credit is certainly significant as the greatest reduction in the blenders' credit in nearly twenty years,⁸⁷ recent studies conclude that the reduction will have very little impact in the short run. Research from Iowa State University suggests that even the entire repeal

of the blenders' credit would not result in a major transition away from corn ethanol as ethanol plants will continue to operate in the short-run as long as production covers their variable cost.⁸⁸ If the price of gasoline remains high, there will be sufficient demand for corn ethanol even with higher costs of inputs and reductions in credit.⁸⁹

EXPANDING THE HORIZON: SUSTAINABILITY IMPACTS OF BIOFUELS IN THE CONSERVATION, NUTRITION, AND TRADE TITLES AND FOOD AID PROVISION

There is more to the sustainability of advanced biofuels than can be demonstrated through the specific energy provisions alone. Placed in the broader context of the 2008 Farm Bill, biofuels policy conflicts with the principles of environmental stewardship through land pressures in the Conservation Title,⁹⁰ and with social equity through disproportionate distribution of the burden of higher food costs compensated for in the Nutrition and Trade Titles and Food Aid Provision.⁹¹ Despite the fact that the energy and tax portions (discussed above) are the primary actors in shaping the active policies regarding the future of domestic biofuels, the funding priority overwhelmingly targets programs that must react to the secondary effects created by continued and increased ethanol production.⁹² Specifically, the Conservation Title takes a new direction based on increasing land availability, land values, and the drive to bring more acres under production due to greater aggregate demand for food and fuel production.⁹³ The Nutrition and Food Aid provisions work even further down the line, ultimately accounting for the increased end cost of food that has been linked to ethanol.⁹⁴ Figure 1 provides a rough picture of the distribution of funding in the 2008 Farm Bill based on the scores offered by the Congressional Budget Office.⁹⁵

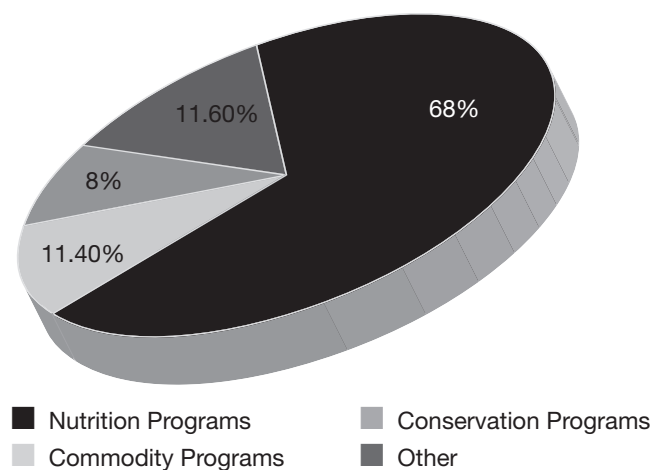


Figure 1: Farm Bill Spending 2008-2012

CONSERVATION

In the range of opinions on the role of ethanol in food to fuel policy, there is broad recognition of the fact that biofuel crop production creates significant pressure to bring more lands into production.⁹⁶ In the Farm Bill, this trend collides directly with the Conservation Title. Established in 1985 under the Conservation

Reserve Program,⁹⁷ the funding for the Conservation Title now feeds into a number of programs which promote environmental sustainability for both “retired” and working lands.⁹⁸

Concern in the 2008 Farm Bill focused on the original Conservation Reserve Program (“CRP”). CRP is a land retirement program that offers farmers a paid option to enter into a ten year contract to reduce environmental and income risk by removing highly erodible and marginal lands from production while encouraging environmental stewardship; CRP is popular with farmers, environmentalists, and the hunting community.⁹⁹ Despite its popularity, vast increases in crop prices have offered farmers a powerful incentive to not reenroll their lands in the program and to return many of these marginal lands to production.¹⁰⁰ These concerns elicited several proposals from academia, and even the Secretary of Agriculture, with the objective of making more effective use of the land.¹⁰¹ In response to these proposals, the CRP will gradually reduce its enrollable acreage from the current 36 million acre cap to a 32 million acre cap in 2010.¹⁰² Because of reduction in CRP acreage, funding increases in the Farm Bill will now go to programs focused on the regeneration and environmental sustainability of working lands.¹⁰³ This includes substantial increases for the Environmental Quality Incentives Program (“EQUIP”)¹⁰⁴ and the Conservation Security Program (“CSP”).¹⁰⁵ Managers announced in a May press conference that a funding agreement focusing on EQUIP and CSP would assure the sustainability of agriculture in light of increased land demand from biofuel producers and increases in crop production.¹⁰⁶

NUTRITION, TRADE, AND FOOD AID

Whatever the exact role of ethanol in the food and fuel crisis, its effects bear primarily on the poor—both in the United States and abroad. The poor spend the greatest proportion of their income on food and transportation.¹⁰⁷ The U.S. scenario, where the average American still spends less than ten percent¹⁰⁸ of his income on food, is a rosy one in the global context where the poor spend approximately seventy-five percent of their incomes on food.¹⁰⁹ The administration of the food stamp program, renamed the Supplemental Nutrition Assistance Program in the 2008 Farm Bill, and the delivery of international food aid are the government’s primary mechanisms for ensuring that hard economic times and high commodity prices do not translate to hunger at home and abroad.


In 1996, steep cuts made to the food stamp program meant a drastic decline in the purchasing power of food stamps.¹¹⁰ The 2008 Farm Bill sought to correct this by linking the asset deduction of the eligibility formula to inflation. Moreover, the minimum benefit had not been indexed in over thirty years, meaning that food stamp participants could only purchase one third of the amount purchased in 1979.¹¹¹ The 2008 Farm Bill raises the minimum benefit by almost one-third and then indexes the minimum benefit to future inflation in hopes of preventing this problem in the future.¹¹² In terms of more macro interventions, the Nutrition Title doubles assistance to food banks for a total of \$1.256 billion.¹¹³

Indeed, to some extent the funding dedicated to nutrition and food aid objectives in the Farm Bill can be seen as a transfer payment for the relative inefficiency of the U.S. government to ensure an affordable food supply. Although seventy percent of the Farm Bill spending (\$10.3 billion) goes towards nutrition programs,¹¹⁴ rising agricultural prices have eroded the strides made by the Farm Bill. Reflecting these concerns, the House Agriculture Committee held hearings this summer to review the extent of “hunger in America” and international development assistance in agriculture.¹¹⁵

CONCLUSION

Given the dualistic position of biofuels as both a potential mechanism for reducing energy dependence and a source of food and environmental stress, it is vitally important that the policy and scientific community “get it right” in order for biofuels to remain an important aspect of the domestic energy portfolio. In the recent example of the rise and decline of public favor for King Corn,¹¹⁶ “history tells us that public opinion will latch onto the first standard issued, and if the number is inaccurate, the public may . . . withdraw their support [from] renewable biofuels because of concerns about environmental impact.”¹¹⁷

In terms of offering a sustainable solution, cellulosic ethanol may present the greatest biomass opportunity for a mutually agreeable solution to the reduction of dependence on petroleum in our current energy crisis. The Senate Committee report recognizes this premise stating, “for bioenergy, the most important need is to support and accelerate the development and commercialization of technologies for producing biofuels and biobased products from cellulosic biomass feedstocks.”¹¹⁸ Yet, despite lip service to the importance of cellulosic ethanol, the 2008 Farm Bill obfuscates its definition through inclusion in the general category of advanced biofuels. It also fails to provide adequate incentives along the production chain for either commercialized cellulosic production to come to fruition or for adequate removal of support for corn ethanol production to promote the opening of an opportunity in the market.

This failure to deliver a systematic approach to bring a more sustainable biofuels production becomes all the more devastating when viewed in light of the downstream effects on the environment and the poor, most threatened by the rising cost of food. Such impacts come at great economic and moral expense. In the Nutrition and Trade Titles and the Food Aid Provision, rising food costs create a double bind in which more people are made food insecure while it costs substantially more to provide a safety net. As showcased in the section on Conservation, land pressures have forced the issue of increased conservation spending as more marginal lands are brought into production. Yet the moral implications of our failed biofuels policy are truly the most profound, illustrating that we have yet to find an engine to our modern way of life that does not thrive at the expense of our natural environment, food affordability, food availability, or common humanity. 

Endnotes: Adding Biofuel to the Fire
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³ *Id.*

⁴ *Id.*

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