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The Biomass Crop Assistance Program (BCAP): Some Implications for the Forest Industry

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Abstract: The Commodity Credit Corporation (CCC) of the Department of Agriculture has proposed regulations to implement the new Biomass Crop Assistance Program (BCAP). Authorized in the Food, Conservation, and Energy Act of 2008, BCAP is designed to ensure that a sufficiently large base of new nonfood, nonfeed biomass crops is established in anticipation of future demand for renewable energy consumption. BCAP "is intended to assist agricultural and forest land owners and operators with the establishment and production of eligible crops including wood biomass in selected project areas for conversion to bioenergy, and the collection, harvest, storage, and transportation of eligible material for use in a biomass conversion facility" (U.S. Department of Agriculture [USDA] 2010, 6266). The program is proposed for a limited period of time. This paper examines some of BCAP's implications for wood flows and for the various components of the forest industry, particularly wood growers and mill operators.

Introduction

The Commodity Credit Corporation (CCC) has proposed regulations to implement the new Biomass Crop Assistance Program (BCAP). Authorized in the Food, Conservation, and Energy Act of 2008, BCAP is designed to ensure that a sufficiently large base of new nonfood, nonfeed biomass crops is established in anticipation of future demand for renewable energy consumption. Also, in proposing these regulations, the "CCC seeks to avoid diverting any materials potentially eligible for BCAP matching payments from existing value added production processes already occurring in the marketplace" (USDA 2010, 6274). Providing subsidies for wood used for energy—but not for wood used for traditional products such as pulp, wood composites, and lumber mills—suggests that price distortions by use may occur.

Today, many materials potentially eligible for matching subsidy payments are already used in the marketplace. This suggests that avoiding the diversion of materials from existing production processes already occurring in the marketplace will be difficult. The conflict is likely to be greatest between traditional wood processors like pulp and composite mills, with the program creating winners and losers.

BCAP is authorized to fund two main types of activities. First, it provides funding for agricultural and forest land owners and operators to receive matching payments for eligible biomass materials sold to qualified biomass conversion facilities for the production of heat, power, bio-based products, or advanced biofuels. The payment rate is intended to assist producers with the cost of the collection, harvest, storage, and transportation of the biomass to the facilities for four years, but only up to two years per wood provider. This part of the program is covered by president Obama's presidential directive. Additionally, for producers of eligible renewable crops within a select geographic area, BCAP will provide funding for payments up to 75 percent of the cost of establishing the crop and annual payments for up to 15 years for crop production.

BCAP is expected to reduce the financial risk for farmers, ranchers, and forest land owners producing new energy crops that displace the hydrocarbon-based materials now used for heat, power, and vehicle fuel. The program "is intended to assist agricultural and forest land owners and operators with the establishment and production of eligible crops including wood biomass in selected project areas for conversion to bioenergy, and the collection, harvest, storage, and transportation of eligible material for use in a biomass conversion facility" (U.S. Department of Agriculture [USDA] 2010, 6266). Through these proposed regulations, however, "CCC seeks to avoid diverting any materials potentially eligible for BCAP matching payments from existing value added production processes already occurring in the marketplace" (USDA 2010, 6274).

Although funding began in fall 2009 and $517 million has been allocated to BCAP through March 31, 2010 the full regulatory details of the program are only now being worked out. Questions remain as to whether the program will be extended beyond the years initially proposed; which biomass categories, such as black liquor, will be eligible; and how wood costs for pulp and composite board mills are likely to be impacted (Wood Resources International [WRI] 2010). Additionally, although many mills have registered to become biomass conversion facilities and have benefited thus far from lower raw material

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prices resulting from matching payments, the future of this arrangement is unclear as it will be modified by some of the alternatives suggested in the proposed regulations.

Although BCAP is a small component of the overall evolution of energy sources and markets, it could be important to the forest industry, broadly defined to include both providers and industrial wood users. This paper examines the implications and difficulties of the proposed BCAP regulations while recognizing the dynamic environment in which they would be implemented. The subsidy is in the form of funds either to cover some of the costs of the collection, harvest, storage, and transportation of eligible materials to biomass conversion facilities or for the establishment and production of eligible crops, including woody biomass, in selected project areas. Issues regarding credits for black liquor residue of the pulping process remain to be resolved and receive no further discussion in this paper.

It is generally believed that the United States will increasingly rely on energy sources other than fossil fuels. In particular, renewable energy sources are being heavily promoted even in the absence of specific subsidies. In many states, renewable portfolio standards require power utilities to produce a significant portion of their power using renewable energy sources (see EIA 2007). Biomass is an attractive renewable alternative in many regions. Also, the Energy and Security Act of 2007 has mandated a substantial increase in the production of advanced biofuels (other than cornstarch). The change in energy mix will undoubtedly result in the restructuring of wood markets locally, nationally, and perhaps internationally. Directly or indirectly, traditional users of wood will be impacted by new sources of competition from energy producers desiring the wood resource. Thus, a continuing shift in the direction of using much greater amounts of renewables for energy, including biomass, appears inevitable. However, these changes will not be without consequences.

Background

BCAP provides a temporary subsidy for the provision of biomass to authorized conversion facilities, either for direct use in combustion for energy production or as a feedstock for the production of cellulosic biofuels, such as ethanol. A recent study estimated the effects of higher wood demand on wood prices and the competitive position of the U.S. forest industry (Sedjo and Sohngen 2009). The study concluded that wood prices would be higher if wood demand for cellulosic biofuels, at the levels mandated in the Energy Independence and Security Act of 2007, were added to traditional wood fiber demand. Although higher wood prices are advantageous to wood growers, and particularly so in periods of weak demand such as we have experienced recently, they also can seriously disadvantage the competitive position of the U.S. domestic wood processing industry. The study suggests that higher wood costs for the processing industry could help drive segments of the industry offshore with the associated net losses in domestic value added and employment.

Higher wood prices could be offset to some extent by the utilization of currently unused wood wastes and by the use of other cellulosic materials, such as grasses. Higher wood prices would be advantageous to wood growers and would be expected to stimulate increased forest management both generally and also specifically for energy production. Indeed, a component of BCAP is designed to encourage forest managers to promote the production of a dedicated wood energy crop. This could be done by introducing new species, increasing planting densities, and reducing rotation periods.

Recently, the traditional forest fiber market has been weak because of the severe economic downturn and the relatively reduced role of paper in some segments of the economy as electronic alternatives begin to replace paper in some traditional uses, e.g., newspapers (NCSSF 2005). In this context, the increased demand by energy producers for wood biomass is a bonus for wood producers, and fiber prices have begun to recover (WRI 2010). In any event, biomass energy is probably here to stay and will undoubtedly have major long-term effects on wood fiber markets.

Objectives and Potential

The desire to use more biomass for energy is driven by at least three objectives: (a) to reduce dependence on foreign energy sources, particularly oil; (b) to begin to substitute energy sources that have lower emissions of the greenhouse gases (GHGs) viewed as responsible for global warming; and (c) to promote the greater collection and constructive utilization of biomass "waste" that would otherwise decompose and release GHGs into the atmosphere. The temporary (at least two-year) subsidy arrangement provided by BCAP would presumably allow firms to develop systems for the low-cost collection of biomass wastes with the intention that these systems could be sustainable when the subsidy is withdrawn. A question arises as to what type of biomass fulfills the objective of the proposed regulations to ensure that it is produced "without overly impacting existing

forest industries or increasing harvest levels above 2006 estimates" USDA 2010 6266.

Although detailed data are missing for many states, a recent USDA Forest Service study (Connor et al. 2009) raises many of the relevant issues for BCAP regarding biomass supply and provides a useful case study that identifies the sources of biomass potentially available and estimates the prices necessary to draw those resources into the market. The potential sources identified in South Carolina, which are indeed relevant to much of the country, include (a) logging residuals and standing residual trees on acres with tree harvest, (b) biomass from commercial thinnings, or *poletimber*, (c) potential biomass from small-diameter trees in overstocked forest conditions, (d) mill residues, and (e) biomass from urban wood waste. According to the study, South Carolina currently uses about 7.7 million tons of wood biomass annually for energy. Using a survey approach, the study estimates that an additional 8.8 million annual tons of unused wood biomass could be available at modestly increased prices. This estimate of potential availability suggests a source of additional biomass that would not impact current harvest levels, as called for in the draft regulations.

An earlier report by the South Carolina Forestry Commission (SCFC; 2001) views commercial thinnings as a suitable source for energy biomass because of their physical availability. The 2009 Forest Service study, however, does not treat commercial thinnings as an available energy biomass source, arguing that the thinnings are not in surplus, have higher-value uses and thus the study treats this wood as unavailable for energy.

However, the question of available biomass is ambiguous and subject to definitional debate. The earlier SCFC (2001) report considered commercial thinnings as a potential biomass energy source based on its physical availability. The different treatment of commercial thinnings in the two studies identifies the potential for conflict between traditional wood processors and energy producers. Although the market would normally be expected to regulate the flows of wood to various uses, the application of a subsidy to some of those uses will surely change the nature of the flows. If commercial thinnings are treated as providing "existing value added" in the marketplace, making them ineligible for BCAP subsidies, the resultant wood flows would probably be quite different from those that would occur if such thinnings were eligible for the subsidy.

In the longer term, the higher anticipated prices should cause wood growers to adjust their forest management regimes to produce biomass as fuelwood rather than pulpwood. Also, grasses and agricultural residues may be added to the biomass mix. The expanded biomass production could take some of the pressure off of the demand and prices of traditional fiber used by the wood industry. Nevertheless, market wood prices would very likely be higher in the face of the probable large increases in energy biomass demand.

The Changing Industry Structure

The changing structure of the U.S. industrial wood sector has increased the potential for intra-industry conflict. Traditionally, large elements of the forestry sector have consisted of integrated firms that largely owned and controlled the resource and production process through several stages. For example, a firm would own and operate woodlands, wood yards, and mills (e.g., lumber, panel, pulp, and paper mills). Typically, the woodlands would be managed to provide the firm with a significant portion of the type of raw wood feedstock required by its mills. Firms that owned several forests and a number of mills in various locations may have had a surplus of certain tree types generally or in certain geographic regions. Such a firm could sell surplus wood—of one type or in one area—while simultaneously purchasing certain types of wood in regions where its own production was inadequate to meet its local mill requirements. This approach allows for the balancing of resources and resource needs across the firm. Under this arrangement, a firm's own wood would be transferred internally within the firm, whereas surplus production would be sold and deficit situations would be met by wood purchases.

Thus, a large integrated firm might be both a seller and a buyer of wood—a seller as a wood grower, and a buyer as a user of wood for processing. Under these circumstances, wood resource cost run-ups affect the various functions and firms quite differently. High wood prices tended to be associated with positive returns to a firm's forest assets and negative impacts on the mill's returns because such high prices drove wood costs upward. However, for the integrated firm, the benefits and costs of the higher wood prices tended to cancel out.

In recent decades, most firms have moved away from integrated ownership and operations because of a host of factors, such as tax rules and high capital costs of holding land (Seneca Creek Associates 2005). Large areas of forest land ownership have been transferred to different ownership types that do

not have large mill ownership responsibilities, such as timber investment management organizations and real estate investment trusts. Many firms (e.g., International Paper) divested themselves of all or most of their timber lands, whereas other firms (e.g., Plum Creek) developed a specialization in forest land holdings. In this context, the lack of integration has meant that the benefits of higher wood prices are largely captured by one set of forest firms, the wood growers, with disadvantages to the mill operators, which now face higher resource prices.

Finally, the creation of winners and losers is the basis for much of the conflict between growers and processors. The overall effect is that, although domestic wood growers are likely to receive benefits by virtue of higher prices for their product (wood), relative losses to the U.S. industrial wood processing industry are likely because of these higher input prices.

The Source of Market Price Restructuring

Forest products, like many agricultural outputs, can be viewed as having two components: a commodity component valued in the market and a waste component often unvalued in markets. Ideally, much of the biomass for energy would be drawn from the waste component that would otherwise go largely unused. Indeed, one of the major objectives of BCAP seems to be to try to tap into that largely unused waste component. Agricultural products provide good examples. Although grain (especially corn) has uses other than biofuels, as food and feed, agricultural residues that might ordinarily be left to decompose in the field, such as stover, can be used as a fuel. In countries where collection costs are small, such as China and India, grain residues often have been used as fuel.

Similarly, logs are traded in markets, whereas the harvest slash left in the forest is disregarded. In most developed countries, the costs of collection of agricultural residues and forest slash exceed their value in other uses, and the efficient approach is simply to let them remain in the field where they produce some value in recycling nutrients and limiting erosion as they decompose. However, where the costs of collection are low or are at least partly covered, directly or indirectly, by a subsidy, the collection of such waste for use as fuel is likely to occur.

In addition, processing logs often results in substantial biomass waste, either in the form of bark or as residues from mill processing activities (e.g., lumber production). In most cases, residues either become inputs into other processes—primarily pulp production—or are used for energy. However, for both grains and pulp logs, the primary outputs of the processes can be used either for producing traditional products, such as food and pulp, or redirected to produce biomass for energy or as biofuel feedstocks. This behavior, if unexpected, can generate major market disturbances, such as those that occurred in the U.S. agricultural sector with the high-volume use of corn for ethanol (Runge and Senauer 2007). To the traditional demand for corn for food and feed has been added its use as a biofuel feedstock. The production of ethanol is heavily subsidized and has disrupted the traditional corn market. In addition to the well-documented price disruptions that resulted, many are concerned that the reduction of U.S. corn available for export is causing developing countries to convert natural habitats to crops, releasing large volumes of carbon dioxide in the conversion process (Searchinger et al. 2007). This type of effect directly offsets part of a major purpose of using biofuels—to reduce fossil fuel GHG emissions.

Wood production has some issues similar to those experienced in grain agriculture. Some of the wood associated with harvests and production is residual and does not have traditional commercial uses. The use of this wood for bioenergy provides an opportunity similar to that of agricultural residues. However, collecting forest slash is expensive and the slash is of limited usefulness to many existing electrical power facilities. However, if converted to clean pellets, the material can be used by many existing power facilities. The waste wood residues from processing can also be used for energy but much of the material has already found uses by the various mills, often for energy. Finally, because wood is fungible, it can readily be shifted between traditional industrial purposes and energy purposes, which includes biofuels and combustion for energy both as raw wood and processed wood, such as wood pellets. To prevent the redirection of industrial wood, a substantial "wall" would have to be placed between the two wood uses to ensure that the subsidy is not used to redirect traditional commercial wood to energy uses.

BCAP: Some Issues

In providing an incentive to utilize submarginal biomass materials (waste), the BCAP subsidy approach will probably advantage wood producers but may inadvertently disadvantage traditional wood users that do not receive the subsidy. We already observe, even in the absence of the subsidy, high levels of entry into traditional wood markets by wood pellet producers. Also, electrical power producers in

the South anticipate meeting the region's biomass needs by drawing heavily from traditional industrial wood markets. Most existing electrical power plants find clean wood from recently harvested forests more suitable to their equipment that is designed for pulverized coal processing than the use of forest residues, which have often accumulated grime.

The advent of the subsidy has created additional problems. Wood markets cannot easily be separated, and wood suitable for industrial purposes will shift to energy uses based on price. As waste wood prices for providers increase as a result of the subsidy, pressure for spillovers of demand for energy biomass into traditional wood markets is likely. It remains to be seen whether, in the presence of a subsidy, a wall could be created between excess wood the collection of which the regulations are intended to subsidize and other traditionally "commercial" wood that the subsidy could divert from traditional forest industry uses to biomass energy uses. At subsidized levels, energy users would be able to successfully compete with traditional producers to obtain substantial wood volumes.

The failure to create a viable wall could result in higher prices and the diversion of wood from pulp and wood product production to energy uses. Higher prices would defeat the proposed regulation's objective not to excessively impact existing forest industries or increase harvest levels and would seriously disadvantage the domestic traditional wood processing industry. This would result in the decline of the industry and the substitution of imported paper and wood products for domestic production.

Over the longer run, however, given all of the concerns over fossil fuels and direct and indirect incentives to move to renewable energy sources, energy firms are likely to increase their use of wood biomass even when the subsidy is withdrawn when the program is completed. In such a case, wood prices will almost undoubtedly rise. Should BCAP continue without serious distortions for only the limited time period envisioned in the draft regulations, the near-tem effect could be to help develop systems for adding low value wood waste and residues to the biomass base available to the energy system. The longer-term post program effect, one would hope, should be to assist in the development of a sustainable system for the low cost collection of wood wastes and residues.

Although the details vary among the three options for a payment system as discussed in the CCC proposal, and the final outcomes are yet to be determined, all of the the proposed BCAP regulation options contain market-distorting provisions; these are found in the uneven treatment of some types of biomass. For example, elements in the proposal provide for a full subsidy for all biomass used by any eligible facility *other than a forest products mill*, which would receive the subsidy only for new energy production but not for levels at or below existing energy production as called for in Option 2 (7 CFR 1450.106, pp. 9091,75 FR at 6285). Thus, the same wood would be valued differently, even when used for energy production. Also, the wood types eligible for the subsidy have yet to be determined. For example, if pulpwood can be subsidized for pellet operations, can it be subsidized for power generation? Finally, a separate but relevant consideration is that energy production facilities tend to be *cost plus*, and hence have only limited incentives to control costs compared with wood processors.

The traditional forest industry is a major user of woody biomass for energy. *Wood Resources Quarterly* (2010) notes that the global pulp and paper industry has increased its energy from biomass by more than 50 percent between 2006 and 2009, accounting for 18 percent of total energy consumption by the sector. In addition, the amount of wood biomass purchased in the open market by the industry has increased to 69 percent in 2009. The proposed BCAP regulations call for a dollar-for-dollar payment (subsidy) of up to $45 by authorized biomass conversion facilities. For up to the first $90 per ton, one-half of the cost ($45) is to be covered by the biofuel subsidy. The implication is that a traditional wood producer would be required to pay twice the price paid by the biofuel user for the same wood if not covered by the subsidy. A potential unintended consequence of BCAP as now constituted could be that pulp mills might find it advantageous to sell their waste at the subsidized price and return to fossil fuel energy sources.

The notion of implementing an effective wall between energy and traditional wood markets is daunting. Separating markets for very similar products is very difficult and rarely successful. An alternative might be to allow equal subsidies for energy use of wood, thereby reducing the distortions in the energy wood market and allowing mills to capture some benefits. Nevertheless, operations like wood composite processing plants would still suffer from high raw wood prices and receive little or no benefit from a wood energy subsidy because they use little wood for energy.

Summary and Conclusions

This paper suggests that, although the CCC proposal (USDA 2010, 6274) states that it "seeks to avoid diverting any materials potentially eligible for BCAP matching payments from existing value added production processes already occurring in the marketplace," the proposed BCAP will have difficulty accomplishing this goal. The fungibility of wood will make the successful separation of markets difficult and probably requires the creation of a wall to separate markets for similar wood resources. The proposal is inconsistent in the treatment of some forms of biomass, particularly those with existing uses. In particular, new energy production is favored with subsidies, whereas existing energy capacity is not. Similarly, substantial energy production at forest products facilities does not receive equal treatment with energy facilities outside the forest industry. For example, the low wood costs resulting from the subsidy could provide major benefits to foreign wood energy users, such as European wood pellet users, which could be subsidized by the U.S. taxpayer while also receiving subsidies from their own countries and could simultaneously raise costs for some domestic users. Finally, in changing relative wood prices, BCAP could create domestic winners and losers among growers and traditional processors.

Over time, however, higher wood prices are likely to occur regardless of BCAP subsidies as the United States gradually transitions to greater use of renewable energy, an important component of which is wood biomass.

The development of low-cost systems for collecting low-value wood waste would provide useful additional supplies. In a post-BCAP world with the subsidies gone, the cost of residue wood to the buyer will almost inevitably rise, thereby encouraging the substitution of some commercial thinnings and other wood into the energy stream. Ultimately, higher wood prices should stimulate forest management oriented toward energy crop production.

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