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Biofuel and Biomass Subsidies in the U.S., EU and Brazil: Towards a Transparent System of Notification

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IPC finds practical solutions that support the more open and equitable trade of food & agricultural products to meet the worlds growing needs.

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Executive Summary

Support for the production and distribution of biofuels continues to expand in many countries. The magnitude and impact of these subsidies is imperfectly understood, as is their relation to the reporting and monitoring of subsidies in the WTO. This paper is intended to examine the way in which information on biofuels support is reported in the U.S., the EU and Brazil: the three major players in the biofuels market. It explores the relationship between these subsidies and the WTO monitoring of support under the Agreement on Agriculture (AOA) and the Agreement on Subsidies and Countervailing Measures (ASCM). Both supporters and critics of biofuels subsidies need to be aware of the relationship between national biofuel policies and international constraints, though the pressure for measuring the extent of support tends naturally to come from those who are not convinced of the benefits of biofuels.

Biofuels (principally ethanol and biodiesel) have made rapid inroads into the market for transportation fuel, rising to above 60 billion liters worldwide in recent years. The share of ethanol in gasoline-type fuels reached 5.5 percent in 2008, and biodiesel accounted for 1.5 percent of diesel use in that year. The U.S. and Brazil accounted for 88 percent of ethanol production and the EU produced 60 percent of the world's biodiesel. Trade has become more important in recent years as Brazil has re-emerged as an important exporter of ethanol. The main stimulus to growth in the use of biofuels has been the adoption of targets and blending mandates, typically requiring 5-10 percent of ethanol in gasoline and 2-5 percent of biodiesel in diesel. Many countries have offered subsidies or tax credits to blenders to defray some of the costs of biofuel incorporation.

The incidence of mandates and their accompanying subsidies is complicated both by the number of ways in which subsidies are paid and by the various stages involved in the production and distribution of biofuels. Support for the production of biomass (predominantly corn and sugar cane for ethanol and oilseeds and tree oils for biodiesel) is both through direct and indirect subsidies to producers. Trade policies sometimes increase availability of biomass, but more commonly make it more expensive by protecting local producers. Support for the production and distribution of the biofuels themselves includes cost-reducing measures, guaranteed prices and tariffs on imported biofuels. Support for the use of biofuels comes in the form of tax credits for blenders and blending requirements. In addition, subsidies are common for research, in particular into second and third generation biofuels (from plant waste, non-food crops and algae). Calculations of the level of support have been in the range of \$7 billion in the U.S., \$4 billion in the EU: Brazilian support has not been quantified, but investment subsidies and flexible mandates support the industry - though as the biomass used is produced at low cost, the need for subsidies is arguably less than in other countries.

The impact of the use of corn for ethanol on agricultural markets and world food prices became a matter of concern in 2007-08, when commodity prices surged. The OECD estimated the effect at an increase in prices of 10-17 percent: other estimates show somewhat higher impacts in the tight market situation of that period. This confirms the finding of several studies that price instability may have increased as a result of the ethanol boom: the price of gasoline is seen as an additional source of variation in demand for corn that may exacerbate price swings from income-related demand.

Biofuel subsidies are subject to the disciplines of the WTO Agreement on Subsidies and Countervailing Measures, and support for agricultural biomass producers is covered by the Agreement on Agriculture. Border policies that impact biofuel and biomass prices are subject to the main General Agreement on Tariff and Trade (GATT) provisions for non-discrimination and national-treatment. But the application of

the appropriate rules is complicated by the ambiguity of the classification of biofuels: ethanol is traded as an agricultural product (HS2207) whereas biodiesel is industrial (HS382490). The incidence of the subsidy is also complex: a subsidy to the blender can be effectively passed on to the biomass producer through a higher price, but a subsidy to the corn producer can be passed on to the blender through a lower corn price and more abundant supply. Economic models are now appearing that promise the ability to trace the impact of both mandates and corn subsidies.

Both the ASCM and the AoA have provisions for the notification of subsidies and other means of support. Unfortunately there is little coordination between these notification requirements, and neither has been comprehensive or transparent. The U.S. and the EU each include some of their biofuels policies in their ASCM notifications. The U.S. reports total subsidies for 2006 of \$2.7 billion, including the tax credit (at that time 51 cents per gallon) and a subsidy for cellulosic ethanol. The EU mentioned an Energy Crops Scheme (introduced in 2003 and later dropped) in its 2006 notification to the SCM Committee and also included that subsidy in its notification to the Agriculture Committee. The U.S. included some subsidies under a bioenergy and a biodiesel program in its notifications to the Agriculture Committee in the years 2000-2005, amounting to \$150 million. This compares with a possible figure of \$3 billion for the benefit to farmers from the ethanol and biodiesel mandates. That level of support would not have put the U.S. above the limit on its Total Aggregate Measure of Support (AMS) for those years, but the completion of the Doha Round (or an adverse ruling on the eligibility of direct payments as non-trade distorting in the current WTO Total AMS case) would change this picture.

Transparency in subsidies is both a prerequisite for wise expenditure of public funds and an aid to avoiding trade disputes. Subsidies to both biofuels and fossil fuels are of interest as they relate to the price of energy and the control of greenhouse gas emissions. Eventually there will have to be a proper accounting for such subsidies if carbon pricing is widely adopted. The time is ripe for an initiative to clarify both the status of biofuel subsidies in the WTO rules and the magnitude of such subsidies. The alternative is continued contention and confusion.

Introduction

Support for the biofuels sector is widespread and shows little sign of abating. Countries around the world have introduced policies that favor the production or use of non-fossil fuels, both to diversify their energy sources and to gain environmental benefits. Such policies often emphasize ambitious and extensive biofuel mandates, supported by programs that include government financing for biofuel project development, forgiveness of loans and favorable credit for biofuel production, tax credits for fuel blenders, and tax rebates for fuel suppliers. These policy instruments have resulted in high levels of support for producers of first-generation biofuels, and expanded the markets for agricultural feedstocks used in the production of biofuels.

This paper attempts to bring together recent studies and reports that examine the magnitude and impact of biofuel and biomass subsidies, relate these subsidies to WTO constraints, and suggest ways in which the reporting of subsidies to the WTO could be improved to enhance transparency and make it easier to identify any conflicts that might arise as trade in these products expands. The topic is the subject of some controversy, and that makes the synthesis of existing studies useful but hazardous. Much of the literature on the magnitude of subsidies to biofuels comes from groups that are not convinced that such subsidies are a sound way to achieve energy or environmental policy goals. Supporters of biofuels have little interest in quantifying the benefits they receive, and tend to emphasize the “obvious” advantages of less reliance on fossil fuels. But the issue of the place of biofuel policies in the trading system should be of interest to both camps. This paper attempts to clarify a murky area of trade policy rather than to join in the debate about the desirability of biofuel subsidies.

Subsidies to biofuels are a part of the larger issue of energy subsidies, which includes the desirability of extensive support for fossil fuel production and use. The Group of Twenty nations (G-20) recently pledged to eliminate subsidies for fossil fuels, but the implementation of that pledge has been held up by questions about what constitutes a subsidy. Hence, arguments made in this paper about the need for greater transparency in biofuels policy is equally valid for fossil fuel policies. The paper does not make recommendations about the continuance of policies that involve energy subsidies or their environmental success, but merely addresses the need for more transparency so that informed decisions can be made.

The paper opens with a brief overview of support for biofuels in the U.S., the EU and Brazil, three of the major players in the biofuels market. It continues with an exploration of the rules for notifying subsidies to the WTO (both the Committee on Agriculture and the Committee on Subsidies and Countervailing Measures) and discusses how biofuel support might be classified under these rules. The paper then examines whether and how the three regions (U.S., EU and Brazil) are currently choosing to notify support, and indicates the magnitude of the notifications. The biofuel subsidy notifications are then compared to the total notified support for agriculture. The paper concludes by addressing ways in which the transparency of biofuel notifications could be improved, and examining a number of conceptual and legal points that would need to be overcome.

1. Biofuels Policies in the U.S., EU and Brazil

Biofuels have made rapid inroads in recent years into the market for transportation fuel. According to the UN Environmental Program, world ethanol production for transport fuel tripled between 2000 and 2007 from 17 billion to more than 52 billion liters worldwide, while biodiesel production expanded eleven-fold from less than 1 billion to almost 11 billion liters (UNEP, 2009). A period of high oil prices further boosted production of ethanol and biodiesel in 2008. Although biofuels only provided 1.8 percent of the world’s transport fuel in 2007, the share of ethanol in gasoline-type fuel use reached 5.5 percent by 2008, and the share of biodiesel in diesel-

type fuel use reached 1.5 percent in that year. Ethanol use in the U.S. rose to 10.75 billion gallons in 2009 and accounted for the equivalent of 7 percent by volume of the total gasoline and blended fuel sold.¹

The main producing countries for transport biofuels are the U.S., Brazil and the EU. Brazil and the U.S. produced 55 and 35 percent, respectively, of the world's ethanol production in 2009. The EU produced 60 percent of the total biodiesel output. U.S. production consists mostly of ethanol from corn; in Brazil the main product is ethanol from sugar cane; and in the EU most of the biofuel is biodiesel from rapeseed (UNEP, 2009, page 15). Investment in biofuels production capacity reportedly exceeded \$4 billion worldwide in 2007 and continued to grow rapidly in 2008. Industry has also invested heavily in the development of advanced biofuels.²² Most biofuel is consumed domestically: international trade in ethanol and biodiesel has been small until recently (about 3 billion liters per year in 2006/07). However, it is expected to grow rapidly in countries like Brazil, which exported over 5 billion liters of ethanol fuel exports in 2008 (UNEP, 2009, page 16). Indeed, U.S. exports of ethanol have begun to rise in 2010 (RFA, 2010), as domestic demand runs up against a "blend wall" and international prices for ethanol are firm.³

The main stimulus to this extraordinary growth in the use of biofuels has been the introduction of policies to encourage a switch away from fossil fuels for road transportation. Government policies have essentially triggered the growth of biofuel demand by establishing targets and blending quotas. Mandates for blending biofuels into vehicle fuels have been enacted in at least 17 countries and many states and provinces within these countries. Typical mandates require blending 5–10 percent ethanol with gasoline or blending 2–5 percent biodiesel with diesel fuel. Recent targets have encouraged higher levels of biofuel use in various countries (UNEP, 2009, page 15-16). The range of policies that have stimulated biofuel demand by setting targets and blending quotas has been aided by supporting mechanisms, such as subsidies and tax exemptions, as discussed in more detail below.

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Biofuel policies in the U.S.

Government incentives for ethanol production date back some thirty years. In the Energy Policy Act of 1978, a subsidy of 4 cents per gallon of gasohol (E10), equivalent to 40 cents per gallon of pure ethanol, was introduced through a partial exemption of the federal gasoline excise tax. Tyner (2008) attributes the launch of

¹ The proportion is only 5 percent by energy content, as ethanol has less available energy per gallon (Thompson *et al.*, 2009).

² Biofuels are generally classified as "first generation" if they are made from corn, sugar or vegetable oils. Second generation fuels are from feedstock such as switchgrass, *miscanthus* or *jatropha* and from woody biomass that do not, or are less likely to, compete for land with food production. These fuels are close to commercialization (and have been for some time). Third generation biofuels, mostly in an experimental stage, use such substrates as algae and therefore have a less direct connection with agriculture.

³ A blend of 10 percent of ethanol in gasoline (E10) in the US is considered safe for use by most cars. The industry is currently asking the Environmental Protection Agency to increase the possible blend to 15 percent (E15), but the decision has been postponed until later in the year. In the absence of such an increase, the supply of ethanol could exceed the amount that can be used in domestic fuel blends.

the ethanol industry to this policy.⁴ The level of ethanol subsidy has varied over the years but presently stands at 45 cents per gallon, operated through a volumetric ethanol excise tax credit (VEETC). Biodiesel blenders receive a tax credit of \$1.00 per gallon.⁵ In addition to the federal tax credit, many states have tax exemptions and credits for the use of ethanol. The range of programs that exist for individual states is a testament to the strength of the lobbying effort of proponents of alternative fuels and vehicles that make use of those fuels. It also illustrates the difficulty of creating an effective notification mechanism for governmental assistance.⁶

The first mandate was established in 2005, under the Energy Policy Act of that year. This mandate is operated through the Renewable Fuel Standard (RFS) that sets a floor on the quantity of biofuel used in the U.S. (Thompson *et al.*, 2009). The original RFS was expanded in the 2007 Energy Independence and Security Act (EISA). The new U.S. RFS requires that some 36 billion gallons of biofuels be used in the U.S. for road transportation by 2022, an amount that could account for perhaps one quarter of all road transport fuel sales by that year (Earley, 2009). It contains annual volumetric minimum quotas, including the use of 22.5 billion gallons of renewable fuel by 2015, of which 5.5 billion is to be contributed by advanced biofuels (other than those produced from corn starch). The difference of 15 billion gallons will probably be made up by ethanol produced from corn, which is classified under EISA as 'conventional biofuel'. Ethanol produced from sugarcane is not viewed to be a conventional biofuel under the Act: it can be used to make up the advanced biofuel mandate and (if cost-competitive with other biofuels) the difference between the overall mandate and the advanced mandate (Echols, 2009).

The mandate for total renewable fuel is increased under EISA to 36 billion gallons by 2022. The mandated use of advanced biofuels increases to 21 billion gallons and there is a cellulosic biofuel requirement of 16 billion gallons. The cellulosic requirement counts against the advanced mandate such that the difference (5 billion gallons less any extension of the mandate on the use of biomass-based diesel) will probably be made up by imported ethanol from Brazil (Yano *et al.*, 2010b). The actual use of biofuels exceeded the mandated levels in 2008, as high oil prices made blending ethanol attractive (with the help of the tax credits). In future years one could see imports of ethanol from Brazil to meet the "advanced fuel" criteria, while U.S. ethanol is exported as demand reaches the blending wall (RFA, 2010).

Biofuel policies in the EU

EU biofuels policy has evolved over the years from modest support for ethanol production as an agricultural by-product to the elaboration of mandates for renewable fuels (Swinbank, 2009). Surplus wine was taken off the market for distillation for decades, and used mostly as bioethanol. There are additional national aids for the production of "ethyl alcohol of agricultural origin" and occasional tenders for surplus crops to be converted to bioethanol. By 1997, the EU Commission was contemplating the prospect of doubling the renewable energy contribution to 12 percent of domestic use (Swinbank, 2009a). An EU Biofuels Directive was proposed by the European Commission in 2003 and a European Strategy for Biofuels was adopted in that year (Banse *et al.*,

⁴ In addition to the favorable tax treatment, the development of the ethanol industry was stimulated by the high support price of sugar that led to the growth of corn wet-milling to produce high fructose corn syrup: the same plants were capable of producing ethanol.

⁵ The ethanol tax credit stood at 54 cents per gallon from 1990 to 2005, when it was reduced to 51 cents. The current rate of 45 cents came into effect in 2009. The biodiesel tax credit lapsed in January 2010, but may be restored retroactively in the coming weeks.

⁶ For example, California has 27 laws and regulations in the area of alternative fuels and vehicles, and 29 incentive programs that offer grants and tax credits for their use. The US Department of Energy maintains a database of both federal and state incentives for alternative fuels, including tax reductions and exemptions. See the Alternative Fuels and Advanced Vehicles Data Center website: www.afdc.energy.gov/afdc.

2008). A specific “energy crops scheme” was introduced in 2003 that provided per acre subsidies, though this was removed in 2010. Several member states began their own schemes for expanding biofuel use in the context of renewable energy programs.

The EU passed legislation in 2008 that mandated the use of biofuels in the transportation sector. As a part of its “Climate Change Package”, the EU adopted the Directive for Renewable Energy (DRE) in 2009, which established an EU-wide binding target of 10 percent of transport energy from renewable sources by 2020 (EU 2009) along with a requirement that 20 percent of all energy come from renewable sources (up from 8 percent in 2009).⁷ Implementation is in the hands of the Member States, many of which have legislation in place to achieve these levels. In the United Kingdom, for example, electricity suppliers must source a specified proportion of their supplies from renewable sources or pay a penalty (the “buy-out” price), creating a financial incentive (borne by the consumer) to generate electricity from renewable sources. For road transport, a lower road-fuel tax applies on biofuels in the UK, and in addition a Renewable Transport Fuel Obligation is implemented, so both users and taxpayers in effect support the uptake of biofuel.

Biofuel Policies in Brazil

Brazil has been the world leader in mandated blending of biofuels for over 30 years, primarily under its “Pro-Alcool” program.⁸ This program was introduced in the wake of the jump in oil prices in 1973: it satisfied both the need to lower dependence on imported oil and to create a new market for the country’s sugar crop (Sandalow, 2006). The government of the day stimulated the development of the industry through low-interest loans and enlisted a state-owned enterprise, Petrobras, to incorporate the product into gasoline. Through beneficial tax treatment, ethanol was available at a price that made it competitive with gasoline, and automobile manufacturers were persuaded to produce cars that were able to use the fuel at levels above traditional gasoline-powered vehicles. The enthusiasm for ethanol faltered in the 1990s, as price controls in an economy with extreme inflation reduced market incentives to sugar mills to produce ethanol. Demand outstripped supply for a time and led to a consumer reaction against cars designed to operate on hydrous ethanol (93-96 percent ethanol and 4-7 percent water). But the market for ethanol re-emerged when flex-fuel cars (those able to use gasoline or pure ethanol as well as variable gasoline-ethanol blends) were developed and were received favorably by consumers (Sandalow, 2006).

The current policy operates largely through the establishment of ethanol blending shares (which are obligatory and not minimum levels) and are adjusted occasionally, but have remained in the range of 20–25 percent of anhydrous ethanol in gasoline. All gas stations are required to sell both gasohol (E25) and pure ethanol (E100). The blending mandate has also been accompanied by a host of supporting policies, including retail distribution requirements, subsidized credit for ethanol storage and tax preferences for vehicles (Hebebrand and Laney, 2007). Biodiesel, though not a major product in Brazil, is also subject to mandates, with a minimum of 5 percent blended with regular diesel (B5) (Harmer, 2009).

2. Classifying Biofuel Policies

Any detailed consideration of biofuels policies requires a system of classification of instruments so as to make analytical sense out of the complexity of regulatory and financial interventions in the biofuels market. The

⁷ ‘Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC’, *Official Journal of the European Union*, L140, 5 June 2009.

⁸ As in other countries, the original interest was in the introduction of oxygenation additives to gasoline and the removal of lead.

classification of support into various categories is useful both to quantify the extent of the policies involved and to examine the way in which such support should be notified under WTO procedures for reporting and for monitoring consistency with trade rules. In addition, it provides a sound starting point for a discussion of the incidence of such support and hence its political implications. The issues of the WTO notification and the incidence will be explored in later sections of the paper.

Support for biofuels can be provided at different levels of the supply chain – from the production of biomass to the consumption of blended (or unblended) fuel. Table 1 shows one classification, based on OECD (2008), which emphasizes the up- and downstream nature of subsidies in this

area. Policies are divided into those operating at the input level, the biofuel production or distribution levels, and the consumer level. Production of biomass can be stimulated by subsidies either for the biomass itself or to reduce the costs of production. If an energy feedstock also goes to markets other than fuel (corn for ethanol or for feed), then support can either be limited to the biomass market or be applied to total production. Production of biofuels can be aided by a range of capital grants, guaranteed loans and tax credits. Biofuel revenues can be enhanced both by subsidies and by protection from foreign competition. There can also be fixed prices for biofuel sales. Subsidies to encourage the distribution of biofuels are paid in some cases: these can be in the form of tax credits or direct subsidies. They can entail obligations to aid biofuel distribution, such as the required introduction of pumps that can dispense biofuel; alternatively the development of new infra-

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Support for Biomass Production

This range of policy instruments is evident in the approach of the EU, the U.S. and Brazil. The EU experimented with the direct subsidization of “energy crops” in the 2003 Reform, but removed it in the 2009 Health Check. In addition, the EU allowed the cultivation of energy crops on set-aside land (thus letting a biomass crop be grown where others were not allowed (Swinbank, 2009a)). This indirect subsidy was also removed in the Health Check. The general system of farm support in the EU (known as Pillar 1, and now channeled mainly through the Single Farm Payment) does not particularly favor energy crops such as rapeseed.⁹ Rural development programs (Pillar 2) provide planting grants for second-generation biomass (such as *Miscanthus*), but the quantities involved are small. Indeed, one could argue that the Common Agricultural Policy (CAP) as a whole keeps the price of biomass within the EU at a higher level than in countries that do not support their agricultural sectors through tariffs.

The U.S. has a raft of farm programs that support the production of corn and soybeans, with direct payments based on historical entitlements, countercyclical payments that compensate for low prices,

⁹ One exception to this statement was the provision that allows sugar produced over quota to be used for ethanol production: it could not otherwise be sold on the domestic market.

and loan deficiency payments that give a measure of price support. Subsidized crop insurance is available, along with a new form of revenue insurance (Average Crop Revenue Election, also known as ACRE) introduced in the 2008 Farm Bill. However, these programs operate regardless of the final use of the crop – for food, feed or fuel.

Brazil has few programs presently that specifically subsidize the production of cane sugar, though the agricultural sector as a whole enjoys the benefit of certain credit programs (Nassar and Ures, 2009). These programs aim to offset the high cost of credit in Brazil, but the actual interest rate reduction is modest. The cost of producing sugar cane in Brazil is low, and the biofuel sector is therefore competitive without subsidizing feedstocks. However, when sugar prices are high, the profitability of processing sugar cane into ethanol can be reduced.

Support for Biofuel Production

At the level of the production of biofuels, incentives are mainly through tariffs. The EU maintains a tariff on ethanol of 10.2 euro per hectoliter (about 45 percent at current prices) and a somewhat lower tariff on biodiesel of 6.5 percent (Swinbank, 2009a). Biodiesel can contain up to one percent of mineral diesel, and a considerable amount of the product known as B99 was imported from the U.S.¹⁰ Countries with preferential access into the EU face a zero duty. Other production incentives include capital grants at the member state level.

U.S. tariffs on ethanol are also high: the regular tariff of 2.5 percent is supplemented by a tax classified as “other duties and charges” of 45 cents a gallon (about 35 percent at recent ethanol prices) to offset the effect of the tax credit to blenders (see below). Once again, preferential suppliers can avoid the duty, and this has encouraged shipments from countries in the Caribbean Basin. Brazil has been able to supply some ethanol despite the tariff and some Brazilian ethanol may arrive in the U.S. through countries that have preferences. Brazil, as a major exporter of ethanol, does not maintain high internal prices: indeed, ethanol prices are generally less than those of gasoline and are not supported by high tariffs (Nassar and Ures, 2009). Biodiesel is also protected by a tariff on imports into the U.S. of 4.5 percent *ad valorem*. Brazil until recently imposed a 20 percent tariff on imported ethanol, but this was removed in April 2010. Indeed, Brazil has been importing ethanol in recent months as high sugar prices make the processing into biofuels relatively less attractive.

Support for Biofuel Consumption

The most significant policies are those that influence the use of ethanol and biodiesel in blending for retail gasoline and diesel supplies. Blending is done by firms that deliver fuel to retail outlets and who are typically separate commercial entities from biofuel producers. The EU has established a mandate for at least 20 percent use of renewable energy by 2020, to be implemented through member state laws. This mandate also includes a target for 10 percent renewable energy for transportation. No EU subsidies are directly involved, though individual members are obliged to establish the conditions for the mandate to be realized. Subsidies in the form of tax incentives vary among member states.

The U.S. mandate for the use of biofuels is somewhat more complex but will undoubtedly continue to have a major role in the future of the biofuel sector. An overall mandate sets a target for the use of biofuels under the RFS and secondary targets are set for “advanced fuels” that offer to lower carbon emissions even further. The

¹⁰ The practice of shipping biodiesel from the U.S. to the EU was encouraged by the fact that U.S. biodiesel producers received a blending credit under the EISA (2007) even on exported fuel, and received tax credits in the EU as the product qualifies as biofuel. The European Commission imposed anti-dumping and countervailing duties on such imports in March 2009; in July 2009 it announced the imposition of a temporary tariff to be in effect for five years.

corn-based ethanol share of this market is effectively set by the difference between the overall mandate and that for advanced fuels.¹¹ Within the “advanced fuel” mandate, separate quantities are specified for cellulosic and biodiesel fuels. Automobile manufacturers are beginning to introduce cars that can run on various blends of gasoline and ethanol, and new pumps that allow consumers to choose are under development. But currently the support for biofuel consumption is limited by infrastructure and blending limits.

In the case of Brazil, the mandates take the form of compulsory blending of ethanol (between 20 and 25 percent of anhydrous ethanol) into transport fuel (biodiesel is not a significant factor in this market). In addition, increasing quantities of hydrous ethanol are being sold in direct competition with gasoline outside the mandate. The introduction of flex-fuel cars and their widespread adoption has left policy makers with options that the EU and the U.S. do not have: the biofuel market may be able to survive even in the absence of mandated use.

Support for Research and Development

In addition to support for current production, many countries have initiated programs for research into biofuels, particularly those produced from new forms of biomass, and ways to transform it into liquid fuels, that may be cheaper and do not compete with the food use of cereals and oilseeds (OECD, 2008). The two countries with the largest expenditures in this area in 2006 were the U.S. at roughly \$90 million and Japan with roughly \$60 million. In the U.S., public spending on biomass research and development totaled \$800 million over the period 1993-2004, more than eight times the amount spent by Japan, the Netherlands and Sweden, which were the next largest spenders in this area. In addition to EU member countries, the EU Commission provides funding for research into biofuels.

Table 1: Classification of Types of Government Incentive for the Biofuel Sector

Classification of program	Instruments used	Examples
Support for Production of Biomass	Direct Subsidies for biomass production	EU ECA introduced in 2003 (subsequently removed); eligibility of biomass for conservation payments
	Indirect subsidies for biomass production	Fuel, fertilizer and water subsidies; crop insurance and income subsidies to biomass producers
	Trade policies on biomass	Tariff concessions; export restrictions
Support for Biofuel Production and Distribution	Reduction of capital and infrastructure costs	Capital grants for biofuel plants; concessional loans for ethanol producers in U.S. under ESA (1980); “enhanced capital allowances” under the tax code
	Reduction of production costs	Income tax credit (U.S. Energy Policy Act (2005))
	Direct subsidies for production of biofuels	Subsidies per unit of production
	Guaranteed prices paid by distributor	Minimum price for biofuels; “feed-in tariff”; “green bonus” for biofuels
	Trade policies on biofuels	Tariffs on imported biofuels
	Reduction of distribution costs	Fuel excise tax credit to blenders as in U.S.; direct subsidies for distribution (Sweden)
	Quantitative promotion	Quota obligation schemes and infrastructure (e.g. fuel pump) mandates; subsidies for infrastructure
Support for Consumption of Biofuels	Price reductions for biofuels	Excise tax exemption, VAT exemption; income tax credit
	Quantitative requirements for blending	Quota obligation schemes; blending requirements
Support for Research and Development	Support for research into biofuels	Development of second and third generation biofuels

Source: Adapted from OECD (2008)

¹¹ Ethanol from sugar cane has been defined as an “advanced fuel” under US law: this would imply that imported cane-based ethanol can help to fulfill this RFS requirement.

3. Quantifying Biofuel Support

Quantification of the extent of the subsidies provided for the production and distribution of biofuels is a challenging task. There are many and varied incentives given to the biofuels sector, no doubt reflecting the emergence of new political coalitions with interests in the rapid growth of alternative energy sources. Moreover, the same policy instruments used can have markedly different impacts in different countries. Economists have pointed out that one should not need financial incentives to comply with a government mandate (de Gorter and Just, 2008, 2010). In fact, to pay a subsidy as well as mandating a particular blend of biofuel and fossil fuel could backfire and actually lead to more fossil fuel being consumed. But in political terms, the industry clearly supports the notion that the subsidy is the appropriate way of encouraging compliance with a mandate: the alternative of enforcement at the level of each firm would be too intrusive (Babcock, 2010).

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The Global Subsidies Initiative (GSI) has published estimates of the total support for biofuels provided by the policy measures in place in selected OECD countries in 2006 - Australia, Canada, the EU, Switzerland and the U.S. (Steenblik, 2007). These estimates are shown in Table 2. The total amount of support in these countries at that time was estimated to be roughly \$11-12 billion, 55-60 percent of which was provided by the U.S. and most of the rest by the EU. Roughly two thirds of the total support was directed towards ethanol production

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and the remainder to biodiesel, since the production of the former is greater.¹² The GSI has also produced more detailed estimates by country (Koplow, 2006, 2007; Kutas *et al.*, 2007; Laan *et al.*, 2009; Quirke *et al.*, 2008; Steenblik *et al.*, 2008). In 2006, the GSI estimated the extent of subsidies

in the U.S. at between \$5.5 and \$7.3 billion a year. Over the period from 2006 to 2012, the totals of such subsidies could be over \$92 billion (Koplow, 2007). The subsidies provided by the EU were calculated at 4.7 billion euro in 2006, equivalent to \$5.2 billion. Two thirds of that went to support biodiesel.

It is equally challenging to quantify the support provided globally to agriculture through the range of policy measures designed to promote the production and use of biofuels. The OECD does not provide such an estimate for its member countries as part of the Producer Support Equivalent (PSE) calculated annually, although the OECD (2008) has incorporated the major policy instruments into an empirical model of global agriculture in order to examine their impact on production and consumption.¹³

It is equally challenging to quantify the support provided globally to agriculture through the range of policy measures designed to promote the production and use of biofuels.

¹² By way of contrast, the total (commodity-specific) support to corn producers in the U.S. was estimated by the OECD to be \$727 million in 2008 (a year of high prices). The total Producer Support Estimate across commodities for the US was \$23.3 billion and for the EU was \$150.4 billion in that year (OECD, 2009).

¹³ The incorporation of the subsidy effect of biofuels mandates into the PSEs would create problems. The concept of the PSE is to measure the impact on producers in one country of the actions of their own government. A boost to corn demand

To the extent that biofuels policies can be considered as agricultural support, the major measures used are tax exemptions, credits or rebates for the use of biofuels in preference to fossil fuels and biofuel blending or consumption mandates. These instruments are frequently supported by border measures, in particular tariffs, to limit import competition in domestic biofuel markets.

Table 2: Estimates of the total support for ethanol and biodiesel in selected OECD countries in 2006 (billion dollars)

Country	Ethanol	Biodiesel	Total liquid biofuels
United States ¹	5.4-6.6	0.5-0.6	5.9-7.2
EU25	1.6	3.1	4.2
Canada	0.15	0.01	0.11
Australia	0.04	0.02	0.05
Switzerland	0	0.01	0.01
Total	7.2-8.4	3.6-3.7	10.8-12.1

¹ Range reflects alternative treatment of fuel-tax credits
Source: Steenblik, 2007.

Impact of Biofuels Policies

There have been some empirical studies that evaluate the impact of U.S. biofuels policy on international markets, although much of the focus has been on domestic implications. Since the U.S. is a major exporter of many of the agricultural commodities involved (e.g., corn and soybeans), some international impacts can be inferred from these studies.

In an early study, Elobeid and Tokgoz (2006) examined the impact of U.S. import duties on fuel ethanol and the tax credit provided to blenders. They estimate that the removal of the prohibitive U.S. tariff would increase world ethanol prices by roughly 24 percent relative to projected baseline values for 2006-2015. Brazilian ethanol exports increase by 64 percent. Expanded use of imported ethanol lowers the price of corn in the U.S. by roughly 2 percent. If the federal tax credit were also removed, the impact on the world ethanol market would be reduced, since it would be less profitable to blend ethanol with gasoline. As a result, Brazilian exports are estimated to increase by 44 percent and the world ethanol price by 17 percent. In some related analysis, Elobeid *et al.* (2006) suggest that the profitability of ethanol production under a continuation of existing policies could lead to much greater expansion of ethanol production than assumed in the earlier study. Using a crude oil price of \$60 per barrel and production costs for a representative ethanol plant of 50 million gallons, they estimate that ethanol production could continue to increase until corn prices reach \$4.05 per bushel, at which point roughly 32 billion gallons of ethanol would be produced. The \$4.05 corn price projected by 2015 is 58 percent higher than that in their earlier analysis.

The impact of biofuels policies on agriculture extends beyond corn. Tolkoz *et al.* (2007) updated and expanded the analysis in Elobeid *et al.* (2006), particularly in terms of assessing the impact of expanded ethanol production on other commodities. The increase in corn prices caused by ethanol demand reduces soybean production, raising the costs of corn-based and soybean-based feed for animal producers. The authors indicate that the rate of expansion in ethanol production is very sensitive to the crude oil price – higher petroleum prices lead to a faster expansion of the industry and lower prices slow the expansion. They also show that a short

that assists corn producers in various countries would be difficult to include, as that would imply that one would apportion the benefits beyond the border. Similarly, policies that restrict supply through such instruments as a conservation reserve also have benefits for other producers. The PSE calculations (intentionally) do not include the effects of support measures on the world price, since this would require a modeling approach that would raise its own problems.

corn crop due to drought could introduce considerable instability into the corn market – with a substantial fall in U.S. corn exports and a spike in corn prices as ethanol refiners and domestic livestock producers bid corn away from international markets. The impact of biofuel policy on the stability of food and agricultural prices is an important issue that is discussed further below.

Impacts on Agricultural Markets

The magnitude of the effect of the U.S. biofuels mandate on agriculture is examined by other studies. Hayes *et al.* (2009) examined the impact of the Renewable Fuels Standard of the 2007 Energy Independence and Security Act (EISA) and the biofuel tax credit. The baseline for their analysis, which focuses on the terminal year of 2022, assumes a petroleum price of \$75 per barrel. The increase in biofuel use under EISA and the ethanol tax credit result in a substantial expansion of corn and soybean production. In the absence of the support provided by biofuels policies, corn production would be roughly 9 percent lower and the farm price of corn would be 18 percent lower. The release of land from corn production would lead to higher production of soybeans (+4 percent) but lower soybean prices. Exports of corn are estimated to increase by 24 percent and soybeans by 10 percent. The lower price of feed leads to higher production of pork, poultry and dairy products and exports of most livestock products also increase, with the largest impact on pork exports (+66 percent).¹⁴ The price of petroleum is shown to be crucial in determining the impact of biofuels policy. Petroleum prices of \$105 per barrel lead to substantial additional expansion in the production of ethanol, with further upward pressure on corn prices. Even under such high oil prices, the removal of the biofuel tax credit would have a significant effect on production and prices since the credit makes ethanol a highly attractive alternative to fossil fuels. The removal of the credit lowers corn prices (by 16 percent). As might be expected, the price-enhancing impact of U.S. biofuel policies on corn and soybean prices leads to increased production of these crops in countries such as Argentina and Brazil, and the removal of the policies would have a corresponding production-depressing effect.

The impact of ethanol on the livestock sector is complicated by the production of by-products. Though corn for ethanol competes with corn for animal feed, the corn wet milling process that produces ethanol yields distillers dried grains (DDGs) as an important by-product that is used as cattle feed. Up to one third of the corn used in ethanol is in effect returned to the livestock industry through this feed source. While it is difficult to argue that this acts as a subsidy to livestock farmers, it does reduce to some extent the negative subsidy that is caused by the diversion of corn from animal feed to fuel uses.

Additional insight into the market effects of U.S. biofuel policies is provided by Westoff *et al.* (2008). They also demonstrate the price-enhancing effect of the combination of EISA mandates and the tax credit, and illustrate the supporting role played by the prohibitive import tariff on fuel ethanol. Their analysis indicates that the mandates have the greatest impact on feedstock prices: if these were not in place, corn and soybean prices at the farm level would be 6-7 percent lower than projected for 2011-2017.¹⁵ Tariff protection is the second most significant element in the policy mix: if the ethanol tariff were removed, it is estimated that corn prices would fall by an additional 2.5 percent. In total, the package of policy measures in place for biofuels adds 12 percent to the price of soybeans and 14 percent to the price of corn.¹⁶

¹⁴ The same direction, if not the magnitude, of price changes for crops and livestock products attributable to biofuels policies has been found by other analysts using different economic models, e.g., Peters *et al.* (2009); Rosegrant (2008).

¹⁵ The price-enhancing effect of a blending mandate for ethanol was identified by Schmitz *et al.* (2003) as a “hidden subsidy” to sugar producers in Brazil. Koizumi (2003) provided an early analysis of the impact of the development of ethanol production in Brazil on the world markets for sugar and ethanol. His analysis also indicates that Brazil’s blending mandate has a price-enhancing effect on world sugar markets.

¹⁶ This analysis supports the conclusions reached by de Gorter and Just (2007) that the tax credit has little impact on market

There has been less analysis of the impact of biofuel EU policies on international markets. Banse *et al.* (2008) evaluate the price effects of a 5.75 percent mandatory blending rate for biofuels by the end of 2010 under the EU Biofuels Directive (BFD) and the increase in the rate to 10 percent by 2020. They determine that this would lead to a reduction in a projected decline in real prices of cereals and sugar and a small increase in the real price of oilseeds. Higher global prices for these crops result in expanded production, particularly in South and Central America and increased exports of biofuel from these regions to the EU. Again, the price of petroleum is found to be an important determinant of future agricultural price effects. Higher prices for fossil fuels lead to increased demand for biofuels, with consequent upward price pressure on feedstocks such as corn and oilseeds.

A report from the OECD (2008) analyzes the impact of global biofuel policies using a baseline for 2009-2017.¹⁷ The impact of budgetary support policies (tax concession, tax credits and direct production subsidies), mandates and import tariffs is assessed. The elimination of these measures is projected to result in a reduction in world ethanol consumption of roughly 13 percent (average for 2013-2017). The reductions in use in the EU and the U.S. are projected to be roughly 40 percent and 20 percent, respectively. The impacts on biodiesel consumption are even more dramatic – world usage falls by roughly 65 percent and by 85 percent and 55 percent, respectively in the EU and the U.S. The change in policy is estimated to result in a 20 percent decline in the world price of biodiesel, but since import tariffs for ethanol depress existing world prices for this product, the international price increases by roughly 10 percent. As in other studies, the OECD analysis suggests that a reduction in biofuel use would lead to reduced global demand for grains and for vegetable oils. World prices of wheat and coarse grains are projected to decline by 3-5 percent and vegetable oil by more than 15 percent. The drop in oilseed production leads to higher prices for oilseed meal, hence the price of oilseeds only declines by around 3 percent. Sugar prices rise slightly as Brazilian ethanol producers take advantage of higher prices to switch some of their production into ethanol for export.

Changes in policy, in particular the increase in the mandated use of biofuels under the DRE in the EU and under EISA in the U.S. are projected to increase international prices for ethanol and biodiesel and to exert additional upward pressure on international prices for crops. World biodiesel and ethanol prices are projected to increase by an average of roughly 10 and 20 percent, respectively above those in the OECD baseline for 2013-17. Wheat, coarse grain and oilseed prices are 3-5 percent higher. The price of vegetable oils is affected strongly by the increased use of biodiesel – with average prices roughly 14 percent higher.

If all biofuel policies are taken into account, including those implied by DRE and EISA, the OECD estimates that their total effect on coarse grain prices ranges from an increase of 10-17 percent and 6-9 percent for wheat and oilseeds. The higher figure corresponds to a situation in which the production of second-generation biofuels competes (at least partially) with existing crops for land, particularly in the EU and U.S. Such competition would exert additional upward pressure on crop prices.¹⁸

prices for ethanol and (by extension for corn) if the mandate is binding.

¹⁷ The baseline does not take into account recent policy developments in Brazil (the 2008 blending mandate for biodiesel), the EU (the 2009 DRE) and US (the 2007 EISA); assumes that petroleum prices will be in the range \$90-104 per barrel; assumes that there will be continued high international prices for agricultural commodities due to demand growth for food and other non-food uses; and assumes that second generation biofuels will not become commercially viable during the period considered.

¹⁸ Assumptions about future petroleum prices are crucial for the analysis of future trends in prices for agricultural commodities in the OECD study. A sustained reduction in oil prices to \$72 per barrel (similar to that observed recently) from the roughly \$100 assumed in the OECD's projections would lead to crop prices that are 6-12 percent lower than in their baseline.

Biofuels Policy and Market Instability

Most of the empirical analysis of the impact of biofuel policies on agricultural markets focuses on price levels or trends; relatively little attention has been paid to price variability. Arguably this is an important issue, particularly given concerns about global food security. McPhail and Babcock (2008) use a partial equilibrium analysis of the corn market to determine the impact of EISA on the variance of corn prices in the presence of random shifts in acreage, yield, export demand, gasoline prices, and the refining capacity of the ethanol industry. Using the 2008/09 marketing year as a point of reference, they calculate that without the EISA mandate (but with the tax credit) the expected average price of corn would be roughly \$5 and price variability would average 17.5 percent. The imposition of the mandate increases the expected price by roughly \$0.35 and raises the variance of prices to roughly 20 percent.

More recent work has elaborated on the link between biofuels policy and price variability. Yano *et al.* (2010a) analyze the impact of the tax credit and the mandate for ethanol on domestic corn prices in the face of random fluctuations in petroleum prices and corn supply. They show that the blending mandate can be expected to reduce variation in corn prices due to fluctuations in petroleum prices, but will have the opposite effect if the variation in corn supply is high. The elimination of the tax credit will reduce variation in corn prices, if the source of instability is in the petroleum market, but will have the opposite effect if the source is in corn supply. This is because the elimination of the tax credit makes it more likely that the mandate will be binding (i.e., the use of ethanol will exactly equal the mandated level) rather than stimulating additional use of corn for ethanol when supplies are short. Yano *et al.* (2009) examine changes in the U.S. tariff on fuel ethanol. The possibility that ethanol can be obtained from abroad exerts a stabilizing effect on corn prices, since it reduces the impact of a binding ethanol mandate on the corn market. However, if fluctuations in petroleum prices are the principal source of instability, lowering the tariff on ethanol can add to the instability in corn prices since it will accentuate variations in the use of corn to produce ethanol in response to changes in the price of ethanol. Although the analysis performed so far on the impact of biofuel policies on market variability is limited, results indicate that existing policies are likely to accentuate the effects of the complex interaction between energy and agricultural markets in terms of both the level and the stability of international prices.

These studies all agree on one issue: biofuel mandates, tax concession and supporting border measures intensify the linkage between markets for agricultural

products and energy. By creating additional demand, policy measures increase the price of feedstocks such as corn and soybeans. Blending and consumption mandates appear to have particularly strong effects on crop prices. Since the crops used to produce biofuel are important sources of livestock feed, this also exerts upward pressure on prices of meat of animal products. Biofuel policies may also increase agricultural price variability. Studies suggest that future impact of biofuel policies on agricultural markets will be crucially

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dependent on both the level and stability of petroleum prices. The interrelationship between the markets for energy and agricultural markets is complex and linkages between the two seem destined to become increasingly significant for global food security.

4. WTO rules on Biofuel Subsidies

The various aspects of WTO provisions that are of particular relevance to biofuel policy are summarized in Table 3. These include the articles of the General Agreement on Tariffs and Trade (GATT), the Agreement on Technical Barriers to Trade (TBT Agreement), the Agreement on Subsidies and Countervailing Measures (ASCM), and the Agreement on Agriculture (AoA). The application of these rules depends in part on the way in which biofuels are classified. Several of these aspects are currently under discussion in the Doha Round of trade negotiations. The implications of a successful Doha Round are mentioned below.

General Agreement on Tariffs and Trade Articles

Several provisions are embedded in the fundamental articles of the GATT.¹⁹ The basic principle of non-discrimination among foreign suppliers provides a standard by which to judge blending mandates and tariffs on biomass and biofuels. However, with the proliferation of bilateral, regional and preferential trade agreements, the practical effect of non-discrimination may be relatively small. Trade flows into (and through) countries with preferential access, and hence application of the full MFN tariff may be the exception rather than the rule in the case of biofuels. The principle of national treatment requires comparable treatment of domestic and imported biofuels when they reach the domestic market. Most countries have crafted their domestic tax and regulatory policies to conform, at least on the surface, to this GATT obligation.²⁰ Biofuels policies are likewise relatively source-neutral. But the temptation could always arise to make compliance with domestic regulations just a little more costly for foreign firms.

Technical Barriers to Trade Agreement

The treatment of foreign biomass and biofuels at the border (and on the domestic market) is also covered by the TBT Agreement. A technical standard must be in conformity with the TBT Agreement: it should not discriminate among foreign suppliers, it should not give more favorable treatment to domestic producers, and it should not be more disruptive of trade than necessary for the achievement of the objective of the standard. One way of viewing a mandate is to regard it as a technical standard. Thus the mandatory blending of biofuels with gasoline may not be materially different from a rule that cars must meet a target for fuel efficiency.²¹ More controversial would be a standard that identified biofuels on the basis of their feedstock, or even the method of production of that feedstock. Such sustainability standards are being introduced as a way of ensuring that biofuels are an improvement over fossil fuels in terms of emissions of greenhouse gasses and other pollutants. The operation of such standards could well impose costs on overseas suppliers and in effect discriminate in favor of domestic industries.

Biofuel Subsidies

The treatment of subsidies in the GATT has a complex political and legal history, and this is reflected in the somewhat convoluted provisions in WTO agreements. Subsidies are not in themselves necessarily inconsistent with the articles of these agreements, but they are closely circumscribed with regard to their effect on other producers. The main part of WTO provisions that deals with subsidies is the ASCM, negotiated in the

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¹⁹ GATT (94), agreed as part of the Uruguay Round, replaced the original GATT (47) with only minor changes.

²⁰ The combination of such policies with high tariffs in the U.S. case provides an overwhelming margin of preference for domestically-produced ethanol over imports, unless world ethanol prices are relatively high.

²¹ The US Reformulated Gasoline regulations were found to discriminate against imported petroleum in a WTO case brought by Venezuela.

Uruguay Round. For agricultural products there are further disciplines in the AoA. By contrast, biofuel subsidies are relatively new on the scene and their place in the WTO rulebook is untested and subject to debate.

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The biofuel subsidies discussed in earlier sections of this paper will clearly need to be in compliance with both the ASCM and the AoA (when appropriate) in order to avoid challenges from other WTO members. But the matching of subsidy policy

with the appropriate WTO discipline is not always easy. The first question that needs to be answered is, what type of product is the biofuel in question? Is ethanol an agricultural or an industrial product? (Howse *et al.*, 2006). The AoA (Annex 1) indicates that the Agreement covers HS Chapters 1 to 24 less fish and fish products, plus some other products. There is no specific entry for ethanol used for fuel under the harmonized system. However, ethanol is traded under HS 2207, which includes both undenatured (HS 220710) and denatured ethyl alcohol (HS 220720). Biodiesel is regarded as an industrial product (since it is produced through a chemical process called trans-esterification) and since 2005 has been classified under HS code 382490 (which includes products, preparations and residual products of the chemical or allied industries not elsewhere specified).²² Consequently there would seem to be a *prima facie* case that support benefitting the production of ethanol would affect a product covered by the AoA, whereas biodiesel support would not. Even if ethanol were not considered to be a basic agricultural product, the AoA would cover support that benefits producers of corn, sugar and oilseeds. And producers of biomass for biodiesel are still selling an agricultural product: there are many such cases of industrial uses of agricultural products and this has not excluded tariffs and subsidies for these products from being subject to the provisions of the AoA.

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The second question is who gets the benefit of the subsidy? Producers of biomass such as corn may receive a subsidy but pass the benefit on to the producers of ethanol through lower feedstock prices. In this case the corn price will be lower. Such “downstream subsidies” are common, and are covered by the ASCM. But a subsidy may also go to the ethanol producer who could pass it on to the biomass producer through a higher price for corn. In this case the subsidy could be covered by the AoA, as described below. Or the subsidy (as in the U.S. tax credit) could be given to the blender. The ethanol producer may benefit from the increased price of ethanol, and this may indeed also increase the corn price (as appeared to happen in 2008). An economic model with appropriate parameters would demonstrate these downstream impacts, but whether a WTO panel would feel able to sort out the ultimate recipient of the subsidy is less clear.²³

Complicating the issue somewhat is the related question of whether the benefits of the ethanol subsidy accrue to domestic producers or to all producers of the feedstock. The higher demand for corn in the U.S.

²² Until 2005, biodiesel was traded under HS 2207, the same classification as is used for ethanol (Swinbank, 2009b). The shift has implications both for subsidy rules and for tariff negotiations, as elaborated by Motaal (2008).

²³ Of course there could be both a subsidy to the corn producer and a tax credit to the blender. So the net impact on the corn price may be uncertain. The ethanol producer could gain from both the higher price for ethanol and the lower price for corn. A recent paper by de Gorter and Just (2010) attempts to quantify some of these effects.

may raise the price of corn on world markets. The Argentinean corn producer (for example) may reap some of the benefits. This makes ethanol subsidies and tax credits different from those in many other sectors, where competing producers will be disadvantaged: the negative impact of subsidies that raise the price of corn may fall on consumers rather than producers, as food costs rise throughout the world. Similarly, the Brazilian ethanol program has a tendency to raise world sugar prices, to the advantage of competing producers of sugar but at the cost of consumers.

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The biofuel mandates pose an even thornier problem for the identification of a subsidy.²⁴ As such, a mandate confers no benefit on the party subject to its provisions. Indeed the mandate itself is costly to the firms that have to abide by it. A national mandate, if it is effective, has to be administered through quantitative targets for individual firms.²⁵ No government funds need be involved, though in practice the firms concerned may be encouraged to fulfill the mandate by the offer of subsidies or tax credits. In such cases, it is the subsidy itself that would be disciplined by the WTO: the fact that the subsidy might be deemed necessary to achieve willing compliance should not shelter it from scrutiny under subsidy rules.²⁶ The economic analysis of a mandate backed by a subsidy has been mentioned above: in general only one of the two instruments will be effective at any particular time. The legal issue may be somewhat different. Would the subsidy be treated as if no mandate exists? Would the mandate be deemed to be the binding instrument or would a WTO panel treat the two as a part of the same policy and look at the instruments together? (Harmer, 2009).

If one considers a mandate to be a technical standard, there could still be a subsidy involved. Complying with a technical standard has a cost in most cases, but sometimes a subsidy or tax concession is granted to defray this cost. This would argue that the mandate itself is not a subsidy but that it is associated with a subsidy to encourage the realization of the mandate. One would expect that both the mandate and the subsidy would have to conform to the appropriate part of the WTO rules.

The Agreement on Subsidies and Countervailing Measures

The ASCM gives a legal definition of the term “subsidy”. According to that Agreement, a subsidy must have three basic elements:²⁷

- it must entail a financial contribution;
- it must be made by a government or a public body within the territory of a Member; and
- it must confer a benefit.

²⁴ One should distinguish between mandates that are political statements of intent and those that have been translated into regulations governing blending requirements. A political obligation would not generally translate into an actionable subsidy, unless it could be demonstrated that specific actions had been taken to translate intent into outcome.

²⁵ In the case of the RFS in the U.S., Renewable Identification Numbers (RINs) are the tracking instrument to ensure blender compliance (Thompson *et al.*, 2009).

²⁶ Many, if not all, subsidies are designed to elicit some desired response: the trade rules seek to ensure that this response is not at the expense of trading partners.

²⁷ Agreement on Subsidies and Countervailing Measures, Article 1.

However, even if a measure qualifies as a subsidy under the ASCM, it is not subject to the full disciplines of that Agreement unless it can be demonstrated to be a *specific* subsidy.²⁸ Specific subsidies are further divided into two categories: those that are prohibited and those that are allowed, subject to constraints. Two types of subsidies are prohibited: export incentive subsidies that are contingent on export performance, and local content subsidies granted for use of domestic inputs over imported goods. Other subsidies are deemed “actionable” in that they are potentially subject to challenge. The ASCM provides a clear process through which actionable subsidies are identified. A Member can initiate remedial measures if it can prove that non-prohibited actionable subsidies cause serious prejudice to its interests. Serious prejudice may arise when one or more of the following apply: imports into the market of the subsidizing country are displaced; exports to third country markets as a result of the subsidy are displaced; there is significant price suppression as a result of the subsidy; and there is an increase in world market share by the subsidizing country.²⁹

In addition to a challenge based on serious prejudice, a subsidy can also be countervailed if it causes injury to domestic producers. European biodiesel makers have for instance attempted to show that U.S. producers were causing them harm through subsidized “splash and dash” trade (see footnote 9). The European Commission responded with both anti-dumping duties and countervailing duties: the U.S. has subsequently modified its policy to make biodiesel produced and subsequently consumed outside the U.S. ineligible for the tax credit – even though the blending was done in the U.S. Material injury to an industry could also trigger other safeguard actions under Article XIX. Less likely, though still plausible, is the possibility of challenge under the “nullification or impairment” conditions (Article XXIII); a country could argue that ethanol subsidies were unexpected at the time when tariff schedules were agreed and that benefits accruing to it to it directly or indirectly under WTO agreements are being nullified or impaired.

The Agricultural Agreement

The treatment of ethanol subsidies and blending mandates under the AoA is more complex. The criteria for the notification of measures that benefit agricultural producers are different from that for “subsidies” in the ASCM. Indeed, the AoA disciplines “support” rather than subsidies. The definition of support is cast fairly wide. Article 6:1 of the AoA indicates that domestic support commitments apply to “all domestic support measures in favor of agricultural producers” other than support provided under programs that qualify as exempt from reduction under Annex 2 (the green box). Within Article 6, other categories of support are exempt from reduction, including direct payments under production-limiting programs (blue box). This leaves market price support, non-exempt direct payments (i.e. those not eligible for the blue and green boxes) and “any other subsidy not exempted from the reduction commitment”. The level of support is quantified in the Aggregate Measurement of Support (AMS). The AMS is compared with each country’s commitment on the final bound total AMS agreed in the Uruguay Round.

The definition of the AMS is given in Article 1a of the AoA, and limits support to that which benefits producers of “basic agricultural products”. A basic agricultural product in relation to domestic support commitments is further defined as “the product as close as practicable to the point of first sale as specified in a Member’s Schedule and related supporting material” (Article 1b). Details of the calculations of the AMS are given in Annex 3 of the AoA. This raises the issue of whether ethanol is considered to be a basic agricultural product. If

²⁸ ASCM, Article 2. The definition of a specific subsidy is discussed in Howse *et al.*, 2006. Specificity could be an issue if both agricultural and non-agricultural feedstocks can be used to produce ethanol. This may become more common if processes for the production of cellulosic ethanol are developed and adopted. At the very least, the price-enhancing effects of policies to promote ethanol production would be diluted.

²⁹ ASCM, Article 6:3.

so, support for its production (by mandating its use in blended fuel) should arguably be included in the AMS. The notification by the EU of support for “ethyl alcohol from agricultural origins” as part of domestic support would seem to be consistent with this interpretation. And the fact that the U.S. has notified ethanol subsidies as falling under the ASCM does not seem to exclude them from inclusion as support for agricultural producers.

Determining the support for biomass associated with particular biofuels policies seems to be feasible, at least in principle. Certain direct support provided to U.S. producers for use of agricultural products in the production of bioenergy and biodiesel have already been notified to the WTO for 2002-2005 under the other product-specific category of support.³⁰ Beyond this, it might be argued that the blending requirement for ethanol, combined with protection from imported ethanol, serves to increase the domestic demand for ethanol feedstocks and hence their price. This provides support in favor of producers of basic agricultural products such as corn and sugar.³¹

The issue would be how to assess the magnitude of the subsidy for a particular basic product due to the fact that the subsidy accrues to the processor (blender) rather than directly to agricultural producers. Some part of the transfer is presumably retained by the processor, but the same issue applies to existing price support policies that are implemented through processors (e.g., U.S. dairy and sugar policies). If processors have the ability to substitute among agriculturally derived feedstocks, a non-product-specific estimate could be obtained. If

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measures used to promote domestic production of ethanol are judged to fall under the AoA, it would appear on the surface that they should be treated as amber box support (neither quantity constrained nor unrelated to production or price) and included in a country’s estimate of its current total AMS.

However, inclusion of the benefit that biomass producers get from biofuel subsidies and mandates in the AMS poses some difficulties. Annex 3 describes the calculations for price supports, non-exempt direct payments, and other non-exempt measures. To calculate the market price support, one calculates the difference between an administered price and a fixed reference price. No such administered price exists in the U.S. and the EU for biomass for biofuel.³² But there are also, in most cases (the payments for cellulosic biomass in the U.S. are the notable exception), no direct payments to the producer of the biomass. Under the heading of “other”

³⁰ The program concerned is the Bioenergy Program administered by the Commodity Credit Corporation of the US Department of Agriculture. This involved corn and sorghum (entire period) and wheat (2002-03 only) for bioenergy and livestock and soybeans for biodiesel. Note that this notification appears to accept a broad definition of biofuels as agricultural products.

³¹ If the price of petroleum is sufficiently high, it is possible that a blending or consumption mandate for biofuel would not be binding, i.e., blenders would voluntarily use an amount of ethanol above the mandated quantity on economic grounds (Yano *et al.* 2010a). In that case, the mandate would not technically provide any support to domestic producers of corn. However, there are cases in which other support measures are non-operative (e.g., government support purchases for dairy products in the U.S.), because prices are sufficiently high. Nevertheless, the ‘market price support’ provided in such instances is calculated and notified to the WTO. The economic logic in the dairy product case is that typically tariffs are providing price support rather than government purchases, but that argument breaks down in both the ethanol and dairy product cases if world prices are sufficiently high to make the tariff redundant.

³² Provision is made for cases (usually fruits and vegetables) where the calculation of the gap between the administered price and a reference price is not practicable. This is called the “equivalent measurement of support” and defined in Annex 4 of the AoA. This requires the calculation to be based on an “applied administered price” again appearing to exclude provided by increasing demand.

measures, the examples given (Paragraph 13 of Annex 4) are of a cost-reducing nature. Again, it is not clear how one would justify including price-stimulating ethanol programs as cost-reducing to biomass producers. So it would appear that the broad coverage of Article 6 is effectively narrowed by the specifics of Annex 3.

It is natural to think of ethanol subsidies as benefiting particular products. But under the AoA there is a place for non-product-specific support. So if it cannot be shown that the support is specific to a particular basic agricultural product (for example, due to the possibility of using various feedstocks to produce ethanol), it would still fall under the heading of non-product-specific support and as such also should be included in the calculation of the current AMS where appropriate (Josling and Blandford, 2009).

Is it possible that subsidies to ethanol feedstocks could be classified in the green box, and thus not be subject to disciplines? The criteria for classifying a subsidy in the green box are set out in Annex 2 of the AoA. General criteria are defined for payments that fall within the green box and specific criteria for individual payment types. These two components define the green box. All payments have to meet the general criteria, but in addition they must meet specific criteria for the category under which they are notified.³³

The fundamental requirement is that green box payments should have “no, or at most minimal trade-distorting effects or effects on production” (paragraph 1). Two criteria are specified to ensure that this requirement is met: support should be provided through a publicly-funded government program and should not involve transfers from consumers; and the measures should not provide price support to producers. In addition, specific criteria are given for eleven categories of payments, one of which is for payments that are part of an environmental program.

Given the current structure of Annex 2, two questions are relevant: do biofuel subsidies meet the fundamental requirement? And, if they do, is there an existing category of payment in Annex 2 under which they can be notified?

To answer these questions, one can use the classification of biofuel policies set out in Table 1. None of the measures in the table fits easily within the categories set out in Annex 2. With one exception, the three categories of subsidy listed (to biofuel producers, biofuel users, and subsidies on feedstocks) are all publicly funded mechanisms designed to subsidize the fixed costs (e.g., capital subsidies) or variable costs (e.g., per unit subsidy to biofuel producers) of production and use of biofuels. Some of the mechanisms involve direct public expenditures (e.g., subsidies on feedstock) or indirect transfers through tax revenue foregone (e.g., an excise tax exemption for biofuel). Consequently, all these measures would seem to satisfy the fundamental criterion that subsidies should be publically funded and not involve a transfer from consumers. However any benefits that producers receive from import restrictions (the value of the tax credit for ethanol is increased by restricting competing imports) are not likely to meet the criteria for the green box, as there is arguably a consumer transfer involved and the measures provide price support to producers.

How might one classify the easing of restrictions on the use of conservation or set-aside land for biomass production? Would this qualify as support or constitute a subsidy? Release of land from the conservation reserve for the production of biofuel feedstock would not seem to satisfy the fundamental criterion for a subsidy: in fact it removes a subsidy and provides additional market-generated income to producers. Allowing biomass production on land in the Change to Conservation Reserve Program (CRP) is more likely to risk the CRP itself running afoul of the green box criteria, as this would imply that such land was producing a marketable agri-

³³ See Josling and Blandford (2009) for a fuller discussion of the green box and its relevance to biofuel subsidies.

cultural crop. Indeed the whole CRP program could be deemed inconsistent with the green box criteria if any such use were allowed. Easing the restrictions on the use of set-aside or CRP land does not involve additional public funding, but the nature of the change could have implications for the correct notification of the CRP program. Moreover, if new land were put into the conservation reserve and used for producing feedstock, then the production of biofuel feedstock on such land could be held to benefit from a subsidy.³⁴

One further complication arises with respect to the treatment of ethanol tax credits as subsidies to biomass producers. The AoA (and the ASCM) is clear in including loss of government revenue through a tax credit or exemption as equivalent to a subsidy. But the negotiators in the Uruguay Round considered that to include tax measures related to agriculture as a subsidy to the sector would add a level of complexity to the AMS calculation that could be counterproductive. Indeed the practice has become established in the WTO to exclude tax measures when notifying agricultural subsidy programs.

5. WTO Notifications

To what extent have countries already notified biofuels subsidies to the WTO? Have the practices been consistent across countries? Do the magnitudes of the subsidies notified seem reasonable given the significance of the policies? Given the discussion above of quantification of subsidies and the question of subsidy notification rules, what would be the implication of alternative notifications? Would the notification of biofuels subsidies as agricultural support have implications in terms of current Total AMS commitments? What if the Doha Round changed those commitments?

The experience with such notifications is complicated by the fact that there are two separate obligations to notify subsidies: under the ASCM and under the AoA. Article 25 of the ASCM obliges members to notify to the SCM Committee no later than June 30 each year any subsidy that is “specific” within the meaning of the Agreement, and which is therefore actionable. The obligation to notify includes the requirement that enough information is given “to enable other Members to evaluate the trade effects and to understand the operation of notified subsidy programmes”. Considerable overlap exists in cases where ASCM notifications include agricultural subsidies. The AoA is much less demanding with respect to the notification of agricultural support (of which subsidies are a part): it sets up a Committee on Trade and Agriculture but is not explicit as to what that Committee should do. The procedures of the Committee were laid down soon after the WTO Treaty came into force, and the nature of the notification obligation was made clear at that time (Brink, forthcoming). Though

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WTO notifications provide little insight into the magnitude of biofuels subsidies. In both the agricultural support and the industrial subsidies contexts, U.S., EU and Brazilian WTO notifications of biofuel support have fallen far short of their potential in terms of coverage, timeliness and transparency. However, a considerable

³⁴ If the set-aside is linked to payments under environmental programs, the relaxation of the conditions upon which those payments are made could bring the green-box compatibility of such payments into question unless the production of biofuel feedstock is determined to constitute an environmental good (Josling and Blandford, 2009).

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amount of discretion is available to governments notifying subsidies under both the AoA and the ASCM. Given the difficulty of comparing biofuels-related support across both industrial and agricultural sectors, it is helpful that the U.S. notifies many agricultural programs under the ASCM as well as the AoA. However, the timeliness of all the notifications leaves much to be desired.

Notifications to the SCM Committee

The U.S. has notified some subsidies for biofuels to the Committee on Subsidies and Countervailing Measures. In its latest submission, it notified the USDA Direct Payments and Bioenergy program (G/SCM/N/155/USA, 20 May 2009) together with a number of energy and fuel-related programs as of 2005 and 2006 (before the subsequent increase in support to biofuels) (Annex B). The volumetric ethanol excise tax credit (VEETC) of 51 cents (as it was at that time) is notified, along with an additional 10 cents per gallon income tax credit for small producers. The \$1.01 per gallon federal production tax credit for cellulosic ethanol is notified, and the revenue foregone is shown as \$1,540 million for 2005 and \$2,620 million for 2006. For biodiesel, the U.S. notification mentions the \$1.00 per gallon tax credit and an additional 10 cents for small producers, and identifies the costs of these programs (revenue foregone) as \$30 million for 2005 and \$90 million for 2006. The 2006 total for biofuels is thus \$2.7 billion, or less than one-half of the \$5.9 - \$7.2 billion subsidy for liquid biofuels calculated by Koplow (2006, 2007) for the GSI, which also included subsidies provided by individual states and also subsidies to support the consumption of biofuels.

The latest EU subsidies notification (G/SCM/N/186/EEC) was submitted on 23 December 2009 and covered 2007-2008, with some additional coverage of programs not addressed in 2005 and 2006. The notification covers regional development and CAP programs: it presumably includes some elements of biofuel-related support under the CAP's Pillar II. However, the nature of the notification is not such as to make a full accounting possible. The only specific notification that relates to biofuel is the Energy Crops Scheme. Expenditure under the scheme was notified as €3.5 million in 2004 and €4 million in 2006. The subsequent notification mentions the amount (45 euro per hectare) in 2007 and 2008 but not the total cost. The payments under the energy crops scheme are also reported in the agricultural notification for those years.

No notifications under Article 25 ASCM have been received from Brazil. Given the relative absence of specific subsidies in that country, this is understandable. But it leaves open the question as to whether some producers of biomass and ethanol may benefit significantly from the range of measures taken to keep ethanol competitive with petroleum? A more complete framework for subsidy notification could help to allay concerns by competing biofuel producers.

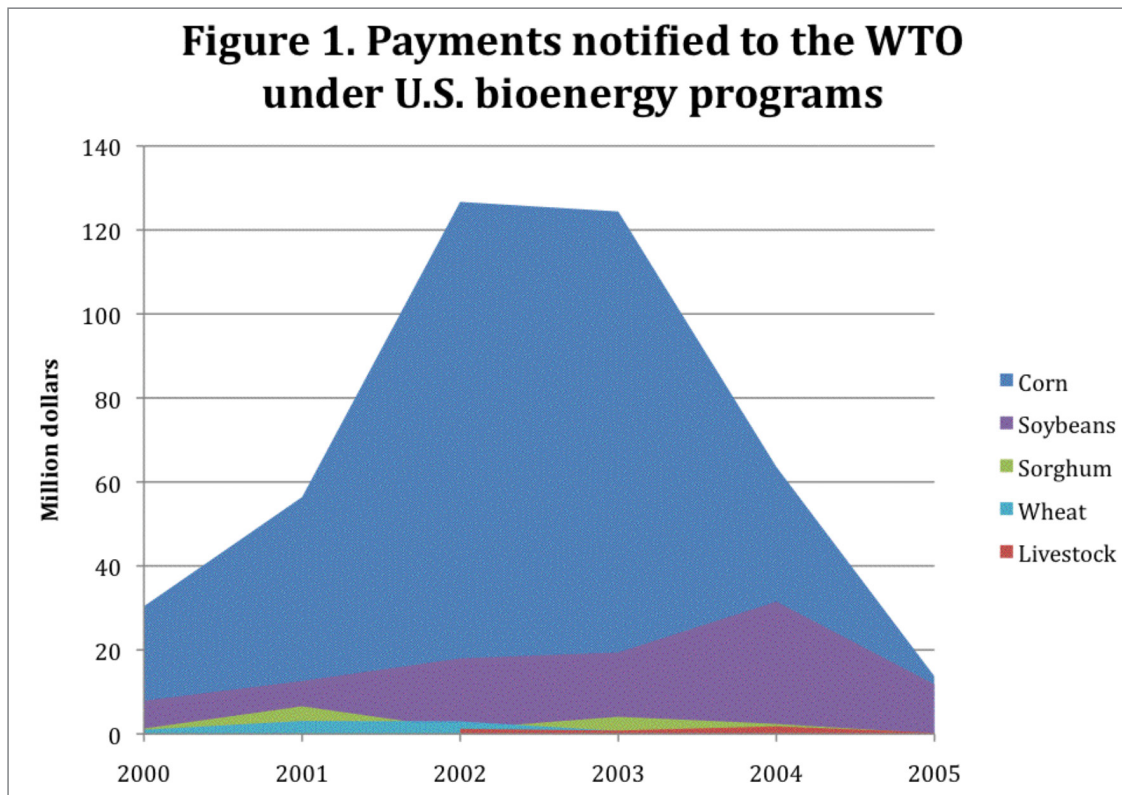
Notifications to the Committee on Agriculture

The U.S. notified non-exempt direct payments for corn, sorghum and wheat under a bioenergy program and for livestock and soybeans under a biodiesel program for 2000-2005 (Figure 1). The total was about \$150 million in 2002 and 2003, with payments for corn at \$125 million being the largest component.

Would this total have been significantly larger had the impact of all biofuel programs been included? Only a rough estimate can be derived of the impact that the notification of U.S. biofuel subsidies would have on the total AMS. As noted earlier, this would depend on how the price-enhancing effect of current policies (the

blending mandate, the tax concession and the tariff on imported fuel ethanol) on corn is estimated. To provide some illustrative calculations, the estimates in Westoff *et al.* (2008) are used as a starting point. These authors indicate that if U.S. ethanol policies were not in place, corn prices would be 6-7 percent lower on average for 2011-17. They also estimated that there would be price effects for other commodities, such as soybeans, but those additional effects are not taken into account in our calculations. Using projected corn production and prices from the USDA (2009) for the year 2015 and the lower figure of a 6 percent price enhancement for corn, this would translate into an addition to the notified total AMS of roughly \$3 billion.

Using a WTO notifications simulator developed by Blandford and Josling (2007), the IFPRI study of Domestic Support has projected the levels of domestic support for a number of countries (Orden, Blandford and Josling, forthcoming). In the case of the U.S., projected current total AMS for 2015 without ethanol subsidies ranges from roughly \$3.5 to \$7 billion, with the lower figure corresponding to a situation in which the U.S. uses the redefinition of its dairy support program in the 2008 Farm Act to reduce its notified AMS for dairy products.³⁵ Consequently, the additional \$3 billion in corn ethanol AMS would increase the notified total AMS to \$6.5-\$10 billion. The current Uruguay Round ceiling commitment on the total AMS is \$19.1 billion, such that if USDA production and price projections are realized, the increase in the notified AMS for corn would not have an impact on the ability of the U.S. to meet its obligations under the existing Agreement on Agriculture.



Source: WTO notifications of U.S. Domestic Support

³⁵ The U. S. changed the definition of its dairy program in the Act to one in which the prices of specific dairy products are supported, rather than the price of milk. This could reduce the notified AMS by roughly 65 percent.

The EU no longer gives specific aid for energy crops, as discussed above. Payments under this scheme were reported under the broad heading in the Blue Box (of quantity-limited subsidies) that included other cereal and oilseed payments. Support under the national aids for ethyl alcohol from agriculture has been consistently reported: the amount peaked at 155 million euro in 1995/96 and was notified as 80 million euro in 2006/07. No specific notifications were made relating to wine distillation subsidies.

As for the U.S., the full measure of support for biofuels is not reflected in these notifications. Some portion of the benefits of support for biofuels, particularly biodiesel, presumably finds its way to the producers of the biomass. If the volumetric support for biodiesel is about 0.5 euro per litre (or 0.55 euro per litre of diesel equivalent), as suggested by Kutas *et al.* (2007), then the producers of biomass for biodiesel certainly face a more lucrative market.

Though the EU has encouraged the use of biomass for renewable energy production, and the use of biofuel (liquid or gas) in transport, the implementation of these intentions is largely left to the member states. In 2009 the EU agreed that 10 percent of transport fuel in each member state should be derived from renewable energy (in practice this will largely be biofuel). Member states can grant investment subsidies for on-farm investments in bioenergy under the so-called Pillar 2 of the CAP (anaerobic digesters, establishment grants for planting *Miscanthus*, etc.), and these are notified to the WTO as green box payments. However, the main schemes to encourage the up-take of biomass for energy purposes are not reported by the EU as agricultural subsidies. Swinbank (2009b) argues that these schemes are *not* notifiable under the Agreement on Agriculture, but concluded that if the EU's biofuel support had to be declared as amber box support, then it could account for about 16 percent of the EU's ceiling on the Total AMS.

The last WTO notification made by Brazil with respect to domestic support measures was in May 2010 and covered the 2004/05 and 2005/06 years.³⁶ For the year 2004/05 Brazil records a payment in favor of sugar cane producers of \$8,242 million under the market credit equalization program for ethanol. This amounted to only 0.15 percent of the value of sugar cane production. The entry was dropped in the 2005/06 notification, presumably because the program itself was suspended. Brazil maintains to the WTO that it does not grant agricultural export credit programs, with the majority of lending to the sector coming from private non-bank sources such as domestic agribusiness and international lenders. The last notification with respect to (not granting) export subsidies was made in 2003 for the 1999-2001 period.³⁷

More information about Brazil's agricultural credit programs is given in the WTO Trade Policy Review (TPR) for that country. The 2009 TPR report lists several sources of credit to agriculture (reproduced in Annex A) that are potentially relevant to biofuels support (WTO, 2009). The WTO Secretariat in its section of the Report notes that "although the value of assistance to agriculture in Brazil is low compared with the average in OECD countries, the interventions in both the credit and agricultural domestic markets are distorting forms of support." However, it does not seem likely that alternative forms of notification would have a major impact on Brazil, as the level of support would not be greatly affected, even with the implementation of a successful Doha Round (Nassar and Ures, forthcoming).

The Doha Round Agricultural Talks

If the Doha Round is eventually completed, there will be some changes to the WTO rules that could have an influence on the treatment of ethanol and biodiesel subsidies. Several countries have suggested changes to the ASCM, and these are being discussed in the Rules negotiating committee. The propositions of those who want to see

³⁶ WTO document G/AG/N/BRA/26, 10 May 2010.

³⁷ WTO document G/AG/N/BRA/21, 6 June 2003.

changes and those who would prefer to keep the present ASCM text are still far apart, and the Chairman of the Rules committee has yet to produce a full modalities draft. Controversy still surrounds the issue of calculating the benefit of a subsidy. New text has been suggested that could be relevant to the biofuels issue: “where a subsidy is granted in respect of an input used to produce the product under consideration, and the producer of the product under consideration is unrelated to the producer of the input, no benefit from the subsidy in respect of the input shall be attributed to the product under consideration unless a determination has been made that the producer of the product under consideration obtained the input on terms more favorable than otherwise would have been commercially available to that producer in the market” (Annex D). This would suggest that the benefits that ethanol producers (in the U.S. and in Brazil) obtain from subsidies on biomass would not be actionable.

Changes in the AoA that have been discussed would only marginally impact the treatment of biomass and biofuel support in the WTO. But the reduction in the limits that countries have to respect on domestic support could have a direct effect on policy. The potential inclusion of (at least some) ethanol subsidies in the total AMS could be significant for the U.S. if agreement is finally reached in the Doha Development Round negotiations on the basis

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of the current draft modalities (WTO, 2008). The draft modalities would imply reductions of 70 percent and 60 percent, respectively, in the total AMS for the EU and U.S. The allowable *de minimis* would be cut from 5 percent and 2.5 percent; overall trade distorting support (OTDS - the sum of the total AMS, *de minimis* and blue box) would be

capped and reduced significantly (by 80 percent for the EU and 70 percent for the U.S.). Such reductions would constrain the room of maneuver in the provision of domestic support, as documented in the work undertaken by IFPRI (Orden, Blandford and Josling, forthcoming). The inclusion of additional components in the AMS, such as the impact on biomass of biofuel subsidies, would tighten that constraint.

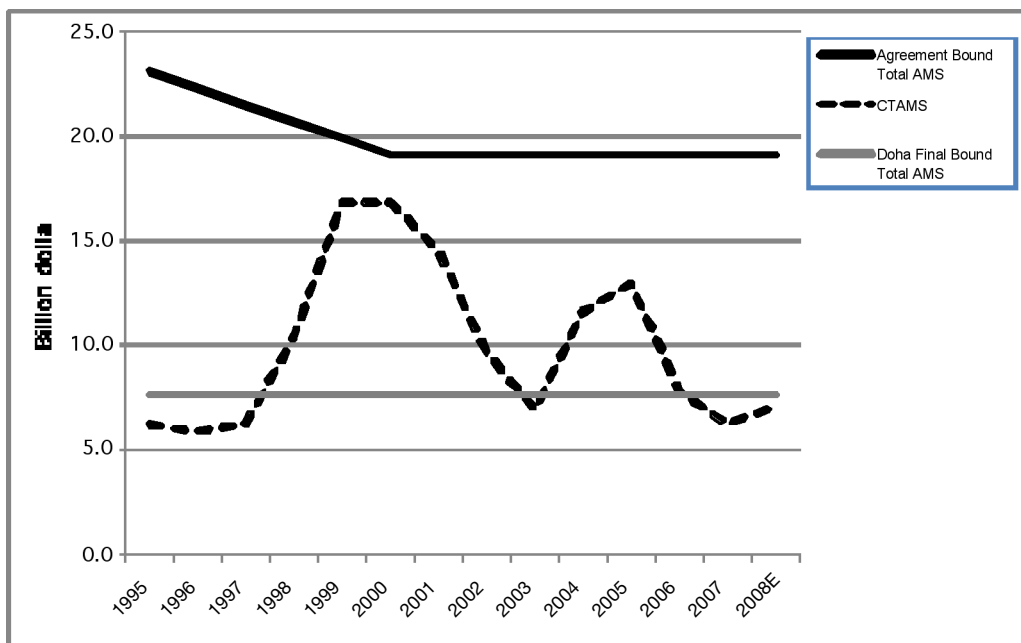
In the case of the U.S., the Doha limits on the AMS would have been binding in most of the past thirteen years (Figure 2), implying that the inclusion of biofuel subsidies in the future could exacerbate the problem of staying within the WTO limits. Under the Doha modalities, the ceiling on the total AMS would be reduced from \$19.1 billion to just over \$7.6 billion. There would also be a cap on OTDS of \$14.5 billion. A product-specific cap on the AMS for corn is also to be imposed, which will be just over \$1 billion. Our projected figures for the AMS for 2015 would imply that if the Doha modalities were fully implemented by that year, the U. S. would exceed the product-specific cap on corn if ethanol subsidies were included. The cap on the total AMS would be exceeded if notified support under the dairy program was not reduced. Given that projected *de minimis* and blue box payments are modest, the cap on the OTDS would not be exceeded.

The same is true for the EU in the future (Figure 3), though in this case the reduction of the actual (current total) AMS has been less influenced by world price movements and the Doha restrictions would have an immediate impact on the extent to which biofuels subsidies could be sheltered under the allowable (Doha Final Bound Total) AMS.

Clearly, if new Doha constraints were to apply, and the EU had to declare its support for biofuels, this could represent a serious challenge (Josling and Swinbank, forthcoming).

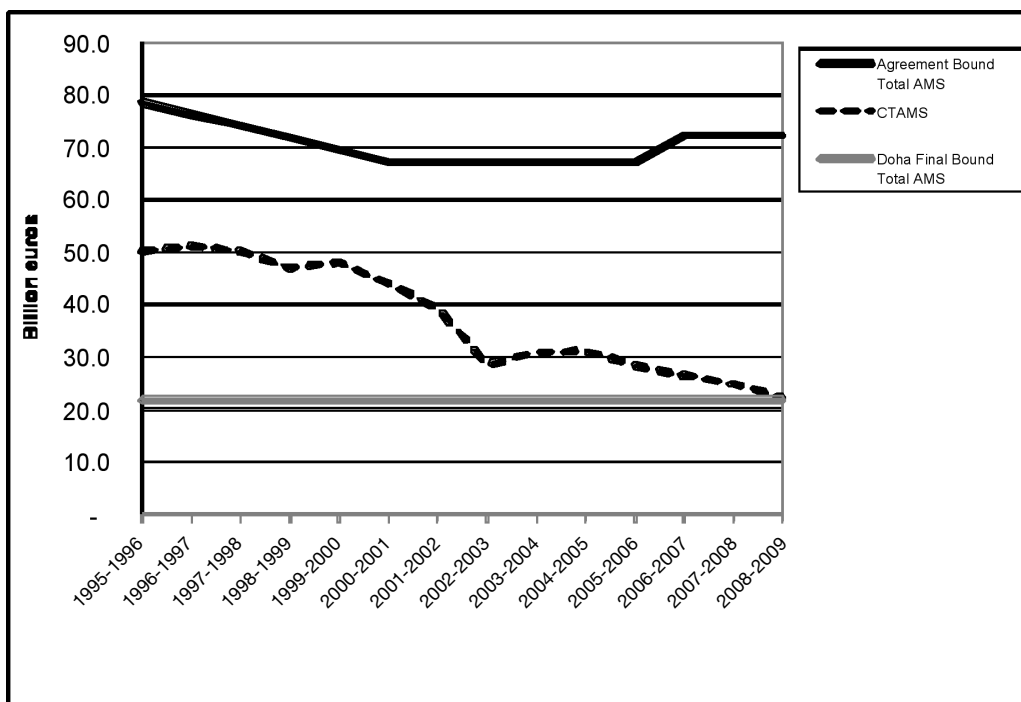
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Figure 2. U.S. notifications of Current Total AMS (CTAMS) and commitments agreed in the Uruguay Round and proposed in the Doha Round



Source: Orden, Blandford and Josling (forthcoming).

Figure 3: EU notifications of Current Total AMS (CTAMS) and commitments agreed in the Uruguay Round and proposed in the Doha Round



Source: Orden, Blandford and Josling, (forthcoming)

Doha Round Environmental Goods

The status of ethanol and other biofuels in the WTO could also be affected by negotiations on the list of so-called “environmental goods.” The Doha Ministerial Declaration calls for the “reduction or, as appropriate, elimination of tariffs and non-tariff barriers to environmental goods and services” (WTO, 2001; paragraph 31(iii)). Negotiations have centered on trying to reach agreement on a common definition of which “environmental goods and services” (EGS) should be included. Discussions have focused on two classes of goods: those relating to established environmental technologies (such as equipment used for reducing water and air pollution or for water purification) and “environmentally preferable products” (such as biodegradable materials or natural dyes and organic soaps) (Howse *et al.*, 2006). In 2007 Brazil proposed that ethanol and other biofuels should be classified as environmental goods (TN/TE/W/59) and should therefore be subject to deep tariff cuts. This proposal was opposed by the EU and the U.S. Any reduction commitments on tariffs and non-tariff measures for ethanol and biodiesel would need to reflect broader commitments in negotiations on agriculture and non-agricultural market access (NAMA). But if the Brazilian proposal were to be accepted, substantial and accelerated tariff reductions could severely constrain the ability of both the EU and the U.S. to promote the consumption of domestically-produced ethanol by protecting these from lower-priced imports.³⁸

Table 3: Applicability of WTO Provisions to Biofuel Policies and Main Issues Raised

WTO Provisions	Issue Raised	Biofuel Policy
GATT (Articles I, III, XX)	Non-discrimination National Treatment	Blending mandates Biomass tariffs Biofuels tariffs
TBT Agreement	Trade implications	Standards
ASCM (Articles 1, 5 and 6)	Financial Contribution Conferral of benefit Specific subsidy Adverse effects Nullification or impairment of benefits to trading partners Serious prejudice to another country	Capital grants Low-cost loans Tax treatment Ethanol subsidies Tax credits Research and Development grants
AoA (Annex 1, Annex 2)	Domestic Support AMS limit Domestic Support Green Box eligibility	Biomass production subsidies (direct and indirect)
Doha Round Modalities	Environmental goods definition Tariff cuts in industrial goods Agricultural tariff cuts Agricultural Subsidy cuts Changed definition of Green Box	Improved market access Biodiesel tariffs Ethanol tariffs Domestic support reductions

Source: Based on Howse, *et al.* (2006) and Table 1.

³⁸ It is notable that part of the U.S. argument against the Brazilian proposal was that the proposed liberalization was designed to apply to industrial products and that agricultural products were not covered. This seems to imply that the U.S. accepts that all biofuels should be treated as agricultural products.

6. Improvements in Transparency

Our exploration of the way in which biofuel subsidies are notified and treated in the WTO suggests a disturbing lack of transparency. There is at present no comprehensive notification procedure that enables a cross-time and cross-country comparison of policies. Nor is there any coherent way in which subsidies for biofuels can be assessed as to their impact on trade. In part this is a function of the range

of such policies and reflects the complex interactions among the instruments concerned. But the starting point for the evaluation of these policies is a transparent reporting requirement that would establish a comparable subsidy database. This section presents some suggestions for notification of biofuel subsidies that would improve transparency and allow discussion

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preventing damaging trade disputes (Wolfe and Collins-Williams, 2010). The WTO 2006 World Trade Report seemed to agree, pointing out that “the quantitative information provided in the notifications is characterized by a lack of clarity and consistency” (WTO, 2007). The most serious problem may not, however, be the opacity of the notifications but the fact that one cannot interpret the absence of a subsidy in the notification as an indication that no such subsidy exists. The original provisions of Article XVI of the GATT emphasized transparency and required notification of the extent and nature of such subsidies as were likely to impact trade. The more comprehensive approach of the ASCM kept the mandate for notification and required that members submit “a new and full notification” of all specific subsidies every three years, with updating notifications due in the intervening years.⁴⁰ The ASCM established the SCM Committee as a way to examine these notifications. The Committee designed a questionnaire for subsidy notifications (G/SCM/6 dated 9 August 1995) that has not been a great success, and even where notifications have been submitted, the information (perhaps inevitably) does not allow an assessment of the trade implications. The biofuel subsidies notified to the SCM Committee, as discussed above, do not give enough quantitative detail to facilitate the calculation of such effects.

One solution has been offered by the economists at GSI who have been constructing a new template for SCM notifications (Steenblik and Simon, 2006). This template represents a considerable simplification over the present format and presents subsidy data in a way that is easier to use for analysis. The template is based on

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at the multilateral level of the magnitude and impact of such policies.³⁹

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³⁹ The need for transparency permeates a number of areas of WTO activity. See Earley (2004) for an analytical study of collaboration between private and public sectors in the standard setting process that emphasizes the benefits of transparency.

⁴⁰ In 2001 the SCM Committee decided that it would be a better use of resources to have the “new and full” notifications every two years and to de-emphasize the annual updates.

a “comprehensive and hierarchical” industry or commodity classification. In this way, the country concerned would have to explicitly state that no subsidy exists in a particular sector.⁴¹ This would be helpful in the case of biofuel subsidies, where comparable cross-country information on such support is lacking.

The question of current and useful notifications is not confined to industrial subsidies. The notification of agricultural subsidies has also been inconsistent and tardy. Those that are notified under the ASCM (and that should include all domestic support and export aids that are considered specific) are done so in more written detail but with less quantification. The requirements are in some respects easier for reporting agricultural subsidies to the Committee on Agriculture. The completion of the Supporting Tables for the Domestic Support notifications and for export subsidies is routine and formulaic. Little detail is required of regulatory authorities on the measure or the reasons for a program. No obligation exists for the provision of enough information to allow others to understand the trade impacts. So the search for greater transparency and usefulness of notifications could start with a comparison of the ways in which subsidies and support are notified to the two WTO Committees.

Agricultural subsidies have not always been transparent in their extent and coverage. The introduction of the regular monitoring of support by the OECD in the mid-1980s appears to have improved the quality of knowledge and understanding of the agricultural policies of the major developed countries. A detailed database underpins the annual calculations of the PSEs, which are undertaken with the aid of government experts from OECD members.⁴² So the OECD is offering both the credibility of official statistics and the dispassionate reporting of a third-party notification agency. It is not clear why agricultural and non-agricultural subsidies should continue to be treated so differently by the OECD. Perhaps a joint WTO-OECD effort to monitor the subsidies of WTO members using OECD methods could be worth exploring. This would be particularly useful in the area of biofuels subsidies where the range of policies is wide and some form of rigorous quantification is necessary.⁴³

Less radical would be a course of action that would make more effective use of the present notifications. One such approach would be to incorporate the obligation to report in the TRP process. The WTO Secretariat is required to examine agricultural and industrial policies of the member countries as well as the trade policies. The data needed for this are not too different from that required by the SCM Committee.

Conclusion

Biofuel subsidies are likely to be with us for some time. Whether they are a good use of public funds is open to debate, but they have some benefits that make them politically popular. The prospect of reduced dependence on fossil fuels combined with a new use for agricultural crops has clearly proved attractive in many countries. If the current concerns that certain biofuels may not be quite so beneficial on environmental grounds can be overcome, the mandated use of biofuels could expand considerably over the next decade. And there is always the hope that second- and third-generation biomass sources could prove technically and economically feasible so as to reduce the pressure on food markets.

⁴¹ Some of the same issues of notification of subsidies arise in the related area of notification of technical barriers to trade and health and safety regulations. A recent IPC paper has addressed some of these problems (Roberts and Josling, 2010).

⁴² The OECD also calculates and reports the Consumer Support Estimates (CSEs) that aggregate the effect of farm policies on consumers or users of the products covered. In addition, an estimation of expenditure on general support services is presented.

⁴³ The OECD is undertaking studies on the use of PSE methodology for the broader category of energy subsidies (OECD, 2010).

If oil prices stay sufficiently high, the production of biofuels could one day be possible without a subsidy. In the meantime, the mandates for biofuel use are likely to remain elusive without public financial support. Trade conflicts over the impact of subsidies on trade are likely to increase. In the absence of agreement as to where the impacts of such subsidies fall and their effects on trade, such conflicts are probably going to be heated and disruptive.

It is important to cast the biofuels debate in the broader context of energy policy.

The search for alternative fuels for transportation impacts many sectors, including the oil and automobile industries as well as agricultural producers. Subsidies for alternative energy sources such as solar and wind power have been on the rise. But offsetting these to some extent has been, in many countries, a policy of subsidizing the production and use of fossil fuels. The International Energy Agency recently estimated the amount of such subsidies in 37 developed and emerging countries at about \$557 billion.⁴⁴ The OECD estimates that eliminating such subsidies would reduce greenhouse gas emissions by 10 percent. The G-20 has gone on record as encouraging governments to curb such subsidies, and the U.S. Administration has lent its support to such an initiative. But any move that would increase the price of energy is likely to face domestic opposition – particularly in the current economic climate.

Climate change policy is still bedeviled by disagreements between developed and developing countries, as well as controversy within developed countries. The slow march towards establishing a carbon price to control greenhouse gasses will over time help to promote alternative fuels that have smaller carbon footprints. But the future demand for ethanol may depend on the extent to which it is accepted as a viable alternative fuel and one that contributes to the goals of climate change mitigation. Coupled with the need for an up-front investment in infrastructure, the cost of a widespread adoption of ethanol will be high.

The need for greater transparency in both biofuel and fossil fuel subsidies is becoming more evident. For biofuels the transparency can start with the WTO notifications. Until now this has not been forthcoming from the system of notification to the WTO ASCM or the Agricultural committees. In both cases the information needed to estimate the trade impact of the subsidies has been lacking. The SCM Committee has not been able to persuade WTO members to report all subsidies in enough detail to allow analysis. The Agriculture Committee seems to have been content to ignore subsidies to biofuels through biofuel mandates even though a case can be made that these should have been reported.

Until the information is available on a comparable basis over time, the question of who benefits and who loses from biofuel support policies will remain unanswered. The appropriate place in which to notify the subsidies will in part be tied to the issue of benefit: the subsidies would only fit into the AoA if a recognizable stream of additional income is generated for the producers of the biomass. Then the question as to where in the AoA the subsidies

If oil prices stay sufficiently high, the production of biofuels could one day be possible without a subsidy. In the meantime, the mandates for biofuel use are likely to remain elusive without public financial support. So the likelihood of trade conflicts over the impact of subsidies on trade is likely to increase. In the absence of agreement as to where the impacts of such subsidies fall and their effects on trade, such conflicts are probably going to be heated and disruptive.

⁴⁴ “Energy Subsidies: Getting the Prices Right”, accessed at the IEA website, June 7, 2010. This amount is over twice the OECD estimates of support for agriculture (\$252.5 billion, for 2009) as reported in “Agricultural Policies in the OECD Countries: At a Glance 2010” accessed on the OECD website, July 8, 2010.

would be notified becomes relevant. In the end it may take a panel ruling to sort this out. The issue will become more urgent if there is a Doha Agreement, as the constraints on agricultural subsidies would be enhanced. The time is ripe for an initiative to clarify both the status of biofuel subsidies in the WTO rules and the magnitude of such subsidies. The alternative is continued contention and confusion.

The time is ripe for an initiative to clarify both the status of biofuel subsidies in the WTO rules and the magnitude of such subsidies. The alternative is continued contention and confusion.

Given the differing experience and competences of the WTO, the IEA and the OECD in this area, an inter-agency approach may be called for. Where appropriate, subsidy benefits could be monitored by the WTO under existing rules for subsidies. The framework exists for notification, but the response of governments needs to be more timely and more detailed. The IEA has attempted some quantification of subsidies but has no mandate to continue this on an ongoing basis. The OECD could add the monitoring of biofuels policies to its current PSE calculations, but would have difficulty incorporating policies that change market prices into the current PSE.⁴⁵ So a new framework may be needed that involves each of these agencies and others with an interest in the monitoring of policies.⁴⁶

⁴⁵ The incorporation of world market price changes would extend the PSE calculations from estimates based on available data to model-based estimates relying on parameters for producer and consumer behavior.

⁴⁶ In the area of Sanitary and Phytosanitary measures employed by governments, a multi-agency study team (MAST) has been assembled to coordinate and promote work on collecting information on non-tariff trade measures. See Josling and Roberts (forthcoming).

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Annex A: Agricultural credit programs in Brazil administered by the BNDES, early 2004

Programme/description	Financial conditions
General Credit Lines	
BNDES/FINAME Agricultural Credit	
Provides credit for the acquisition and maintenance of machinery and equipment, irrigation systems, and refrigeration equipment manufactured domestically. Finances up to 100% of investment. Different conditions apply to foreign-owned companies (see right). Micro, small, and medium-size enterprises are not charged the intermediation fee.	Interest rate: TJLP plus a BNDES fee of 0.9% plus a financial intermediation fee of 0.5% and a fee charged by the financial institution channelling the funds. Credit for up to 90 months. For credits destined to operations with Brazilian companies controlled by foreign capital and for acquisitions of goods with a domestic content of less than 60%, the BNDES Monetary Unit (UMBDES) plus Currency Basket charges are applied. ^a
BNDES Automatic	
Grants credits of up to R\$10 million to persons/companies to finance investment and the purchase of domestic machinery and equipment or imported capital goods, when no similar goods are produced domestically.	Financing can be up to 95% of value, at the TJLP (or the UMBDES) plus a BNDES fee and a fee charged by the financial institution channelling the funds. The credit period is defined by the financial agent.
Specific BNDES Agricultural Programmes	
Tractor Fleet Modernization Incentives Programme (MODERFROTA)	
Credits for up to 100% of the purchase value of tractors; 90% for farmers with gross annual agricultural revenue above R\$250,000. Coffee farmers can benefit if annual income is below R\$60,000.	Interest rate of 7.5% for farmers with gross annual agricultural revenue lower than R\$250,000; 9.5% for income above that threshold. Repayment period up to 6 years.
Incentives Programme for Irrigation and Storage (MODERINFRA)	
Finances irrigation and storage projects of up to R\$1 million per farmer or R\$3 million per cooperative	Interest rate: 6.75%. Repayment period: eight years.
Cooperative Development Programme for the Enhancement of Agricultural Value Added (PRODECOOP)	
Aimed at promoting efficiency gains in cooperatives by financing studies, projects, works, installation, machinery and equipment, and working capital for up to R\$35 million per cooperative.	Up to 90% of the project value is financed depending on turnover. Interest rate: 6.75% including 3% remuneration of the financial institution. Repayment period: 12 years, include three of grace.
Programme for the Modernization of Agriculture and the Conservation of Natural Resources (MODERAGRO)	
Provides credit for soil and pastures conservation and recuperation for up to R\$250,000 per producer, or R\$750,000 per cooperative. Up to 100% of the project value may be financed.	Annual interest rate: 6.75%, including remuneration to financial institution of 3%. Repayment period: 96 months, including a 36 month grace period.
Credit Cooperatives Capitalization Programme (PROCAPCRED)	
Acquisition of shares of single credit cooperatives with a functioning period of over a year. Up to R\$10,000 per client. Up to 100% of the project value may be financed.	Annual interest rate: TJLP plus remuneration to financial institution of 3%. plus BNDES remuneration of 1%. Repayment period of up to 72 months including 12 months grace period.
Incentive to Investment in Agribusiness Programme (INVESTIAGRO)	
Finances investment in agribusiness for rural producers negotiating to obtain credit from other financial institutions. Advance of up to 100% of the credit requested.	Annual interest rate: TJLP plus remuneration to financial institution of 3%. plus BNDES remuneration of 3%. Repayment period of up to 6 months.
Agriculture-Livestock Integration Programme (PROLAPEC).	
Credits to intensify the use of land and integrate agriculture and livestock. Up to 100% of the project value may be financed. The limit is R\$300,000 per farmer.	Annual interest rate: 6.75%, including remuneration to financial institution of 3%. Repayment period: 60 months, including a 24 month grace period.
Warehousing Incentive Programme for Domestic Cereal Producers	
Finances the acquisition by domestic cereal producers with annual revenue of up to R\$500 million of machinery and equipment for warehousing. Up to 100% of the project value may be financed.	Annual interest rate: TJLP plus remuneration to financial institution of 3%. plus BNDES remuneration of 1%. Repayment period of up to 96 months including a 36 months grace period.
Programme of Commercial Planting and Recovery Forest (PROPFLORA)	
Aimed at fostering tree planting and grants credits for up to 100% of the value of a project, with a limit of R\$200,000 per beneficiary.	Annual interest rate: 6.75%, including remuneration to financial institution of 3%. Repayment period: 12 years.

Source: Brazil, TPRM (2009).

Annex B: Excerpt from EU Notification of Subsidy for Energy Crops (2007 and 2008):

3.20 Aid for energy crops

An aid of _ 45 per hectare per year shall be granted for areas sown under energy crops. Energy crops shall mean crops supplied essentially for the production of the following energy products:

- products considered biofuels listed in Article 2, point 2 of Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport,
- electric and thermal energy produced from biomass.

A maximum guaranteed area of 2,000,000 ha for which the aid may be granted was established. Where the area for which aid is claimed exceeds the maximum guaranteed area, the area per farmer for which aid is claimed shall be reduced proportionately in that year. The aid shall be granted only in respect of areas whose production is covered by a contract between the farmer and the processing industry or by a contract between the farmer and the collector, except in case of processing undertaken by the farmer himself/herself on the holding. Member States shall be authorised to pay national aid up to 50 per cent of the costs associated with establishing permanent crops for the areas which have been subject to an application for the aid for energy crops. The new Member States grants this aid separately from SAPS since 2007.

As the maximum guaranteed area of 2 million ha for the EU had been overshoot in 2007, a reduction coefficient of 0,70337 was applied.

As a result of the Health Check, this regime is abolished from 1 January 2010.

Source: G/SCM/N/186/EEC, page 40.

Annex C: Excerpt from U.S. Subsidy Notification, G/SCM/N/155/USA (20 May 2009):

Title: Alcohol Fuel Credit

Period covered by the notification

The period covered is fiscal years 2005 and 2006.

Policy objective and/or purpose

To encourage the substitution of alcohol fuels produced from renewable sources for gasoline and diesel fuel.

Background and authority

There is a tax credit or payment for alcohol used as a fuel. This credit is equal to 51 cents per gallon for alcohol (60 cents for methanol) used as a fuel. In addition, small producers of ethanol are eligible for a 10 cent per gallon income tax credit. The credit is included in a taxpayer's income.

The alcohol fuel credits are authorized by sections 38, 40, 6426, and 6427 of the Internal Revenue Code. The alcohol fuel credits were enacted as part of the Crude Oil Windfall Profit Tax of 1980, at the rate of 40 cents per gallon for alcohol that was 190 proof or more, and 30 cents per gallon for alcohol between 150 and 190 proof. The credits were increased in 1982 and 1984. The Omnibus Reconciliation Act of 1990 reduced the credits to 54 cents and 40 cents for ethanol and ethanol blends and introduced the 10-cent-per-gallon income tax credit for small ethanol producers. In 1998, the Transportation and Equity Act for the 21st Century reduced the alcohol fuel credit, as described above. The American Jobs Creation Act of 2004 eliminated reduced rates of excise tax for most alcohol-blended fuels and substituted the current rules providing for income and excise tax credits or direct payments. The Heartland, Habitat, Harvest, and Horticulture Act of 2008 added a \$1.01-per-gallon credit for cellulosic biofuels.

Form

Income tax concession, excise tax concession, or direct payment for fuels containing alcohol.

To whom and how assistance is provided

The small ethanol producer credit reduces the income tax liability of qualifying producers. All other credits reduce federal income or excise tax of, or result in a direct payment to, qualifying producers, blenders, or users.

Amount

The revenue loss was \$1,540 million in fiscal year 2005 and \$2,620 million in fiscal year 2006.

Duration

The credit generally expires at the end of 2010. The cellulosic biofuels credit expires at the end of 2012.

Trade effects

It is not possible to estimate what, if any, trade effects may result from the use of this provision.

Title: Biodiesel Credit

Period covered by the notification

The period covered is fiscal years 2005 and 2006.

Policy objective and/or purpose

To encourage the substitution of biodiesel and renewable diesel for diesel fuel.

Background and authority

There is a tax credit or payment for biodiesel or renewable diesel used as a fuel. This credit is equal to \$1.00 per gallon for biodiesel produced from virgin vegetable oils or animal fats and for renewable diesel and is \$0.50 per gallon for other biodiesel. In addition, small producers of biodiesel are eligible for a 10 cent per gallon income tax credit. The credit is included in a taxpayer's income.

The biodiesel and renewable diesel credits are authorized by sections 38, 40A, 6426, and 6427 of the Internal Revenue Code. The biodiesel credit was enacted as part of the American Jobs Creation Act of 2004. The renewable diesel credit was enacted and the biodiesel credit was extended as part of the Energy Policy Act of 2005.

Form

Income tax concession, excise tax concession, or direct payment for fuels containing biodiesel.

To whom and how assistance is provided

The small biodiesel producer credit reduces the income tax liability of qualifying producers. All other credits reduce federal income or excise tax of, or result in a direct payment to, qualifying producers, blenders, or users.

Amount

The revenue loss was \$30 million in fiscal year 2005 and \$90 in fiscal year 2006.

Duration

The credit expires at the end of 2009.

Trade effects

It is not possible to estimate what, if any, trade effects may result from the use of this provision.

Annex D: Extracts from the December 2008 Report of the Chair of the Rules Group negotiating changes in the ASCM

Article 3

Prohibition

- 3.1 Except as provided in the Agreement on Agriculture, the following subsidies, within the meaning of Article 1, shall be prohibited:
- (a) subsidies contingent, in law or in fact⁴⁷, whether solely or as one of several other conditions, upon export performance, including those illustrated in Annex I⁴⁸;
 - (b) subsidies contingent, whether solely or as one of several other conditions, upon the use of domestic over imported goods.;
 - (c) subsidies referred to in Article I of Annex VIII.

Article 14

~~Calculation of the Amount of a Subsidy in Terms of the Benefit to the Recipient~~

- 14.1 For the purpose of Part V, any method used by the investigating authority to calculate the benefit to the recipient conferred pursuant to paragraph 1 of Article 1 shall be provided for in the national legislation or implementing regulations of the Member concerned and its application to each particular case shall be transparent and adequately explained. Furthermore, any such method shall be consistent with the following guidelines:
- (a) government provision of equity capital shall not be considered as conferring a benefit, unless the investment decision can be regarded as inconsistent with the usual investment practice (including for the provision of risk capital) of private investors in the territory of that Member;
 - (b) a loan by a government shall not be considered as conferring a benefit, unless there is a difference between the amount that the firm receiving the loan pays on the government loan and the amount the firm would pay on a comparable commercial loan which the firm could actually obtain on the market. In this case the benefit shall be the difference between these two amounts;

⁴⁷ This standard is met when the facts demonstrate that the granting of a subsidy, without having been made legally contingent upon export performance, is in fact tied to actual or anticipated exportation or export earnings. The mere fact that a subsidy is granted to enterprises which export shall not for that reason alone be considered to be an export subsidy within the meaning of this provision.

⁴⁸ The measures referred to in Annex I as export subsidies shall be deemed to fall within paragraph (a). The legal status of any measure not referred to in Annex I as an export subsidy shall be determined on the basis of paragraph (a), and Annex I shall not be used to establish by negative implication that a measure does not constitute an export subsidy within the meaning of that paragraph; provided, however, that measures explicitly referred to in Annex I as not constituting prohibited export subsidies shall not be prohibited under this or any other provision of this Agreement. This footnote is without prejudice to the operation of footnote 1.

- (c) a loan guarantee by a government shall not be considered as conferring a benefit, unless there is a difference between the amount that the firm receiving the guarantee pays on a loan guaranteed by the government and the amount that the firm would pay on a comparable commercial loan absent the government guarantee. In this case the benefit shall be the difference between these two amounts adjusted for any differences in fees;

[CERTAIN FINANCING BY LOSS-MAKING INSTITUTIONS: There are significant differences of view as to whether a new provision should be introduced that would establish a benchmark for determining the existence of a benefit in the case of government loans or guarantees provided by institutions incurring long-term operating losses, and/or financing to state-owned enterprises that are not creditworthy or equityworthy. Proponents consider that such a provision would clarify the Agreement's treatment of an important form of trade-distortive financing, some delegations are concerned over how the key concepts could be defined, and others are categorically opposed, including because they see such a provision as discriminating against state-owned enterprises.]

- (d) the provision of goods or services or purchase of goods by a government shall not be considered as conferring a benefit unless the provision is made for less than adequate remuneration, or the purchase is made for more than adequate remuneration. The adequacy of remuneration shall be determined in relation to prevailing market conditions for the good or service in question in the country of provision or purchase (including price, quality, availability, marketability, transportation and other conditions of purchase or sale). Where the price level of goods or services provided by a government is regulated, the adequacy of remuneration shall be determined in relation to prevailing market conditions for the goods or services in the country of provision when sold at unregulated prices, adjusting for quality, availability, marketability, transportation and other conditions of sale; provided that, when there is no unregulated price, or such unregulated price is distorted because of the predominant role of the government in the market as a provider of the same or similar goods or services, the adequacy of remuneration may be determined by reference to the export price for these goods or services, or to a market-determined price outside the country of provision, adjusting for quality, availability, marketability, transportation, and other conditions of sale.

14.2 For the purpose of Part V, where a subsidy is granted in respect of an input used to produce the product under consideration, and the producer of the product under consideration is unrelated to the producer of the input, no benefit from the subsidy in respect of the input shall be attributed to the product under consideration unless a determination has been made that the producer of the product under consideration obtained the input on terms more favourable than otherwise would have been commercially available to that producer in the market.⁴⁹

⁴⁹ Where, however, it has been established that the effect of the subsidy is so substantial that other relevant prices available to the producer of the product under consideration are distorted and do not reasonably reflect commercial prices that would prevail in the absence of the subsidization, other sources, such as world market prices, can be used as the basis for the determination in question.

14.3 For the purpose of Part V, the methods used by the investigating authority to attribute subsidy benefits to particular time periods shall be consistent with the following guidelines:⁵⁰

- (a) With the exception of benefits from loan subsidies and similar subsidized debt instruments, subsidy benefits shall either be expensed in full in the year of receipt (“expensed”) or allocated over a period of years (“allocated”). Expensed subsidies shall be deemed to benefit the recipient by the full amount of the benefit in the year in which they are expensed, whereas allocated subsidies shall be deemed to benefit the recipient throughout the allocation period. Loan subsidies, and similar subsidized debt instruments, shall be deemed to benefit the recipient throughout the period in which the loan or debt instrument remains outstanding.
- (b) Benefits from subsidies arising from the following types of measures normally shall be expensed: direct tax exemptions and deductions; exemptions from and excessive rebates of indirect taxes or import duties; provision of goods and services for less than adequate remuneration; price support payments; discounts on electricity, water, and other utilities; freight subsidies; export promotion assistance; early retirement payments; worker assistance; worker training; and wage subsidies.
- (c) Benefits from subsidies arising from the following types of measures normally shall be allocated: equity infusions; grants; plant closure assistance; debt forgiveness; coverage for an operating loss; debt-to-equity conversions; provision of non-general infrastructure; and provision of plant and equipment.
- (d) In determining whether a subsidy listed in paragraph 3(b) is more appropriately allocated, or whether a subsidy listed in paragraph 3(c) is more appropriately expensed, and in determining whether a subsidy of a type not listed in either paragraph 2(b) or 2(c) should be allocated or expensed, the following non-exhaustive list of factors shall be considered:
 - (i) whether the subsidy is non-recurring (e.g., one-time, exceptional, requiring express government approval) or recurring⁵¹
 - (ii) the purpose of the subsidy⁵²; and
 - (iii) the size of the subsidy.⁵³
- (e) The allocation period for allocated subsidies normally should correspond to the average useful life of the depreciable, physical assets of the relevant industry or firm.

⁵⁰ The reference in this paragraph to particular measures does not mean that those measures will necessarily constitute specific subsidies; rather, a determination regarding the existence of a specific subsidy shall be made pursuant to Part I of the Agreement in the light of the facts of a particular case.

⁵¹ The fact that a subsidy is non-recurring normally will be indicative of allocation. The fact that a subsidy is recurring normally will be indicative of expensing.

⁵² For example, the fact that a subsidy is tied to the capital assets or structure of the recipient normally will be indicative of allocation. The fact that a subsidy is tied to a firm’s regular, ongoing production and sales activities (e.g., wages) normally will be indicative of expensing.

⁵³ The fact that a subsidy is large normally will be indicative of allocation. The fact that a subsidy is small normally will be indicative of expensing.

- (f) Any method for measuring the amount of allocated subsidy benefits at a particular point in the allocation period may reflect a reasonable measure of the time value of money.
- (g) Any public notice issued pursuant to paragraph 3 of Article 22 shall include a full description and adequate explanation of the allocation and expensing methodologies used.

Article 26

Surveillance

- 26.1** The Committee shall examine the new and full notifications submitted under paragraph 1 of Article XVI of GATT 1994 and paragraph 1 of Article 25 of this Agreement at special sessions held every thirdsecond year. Notifications submitted in the intervening years (updating notifications) shall be examined at each regular meeting of the Committee.
- 26.2** The Committee shall examine reports submitted under paragraph 11 of Article 25 at each regular meeting of the Committee.

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The International Food & Agricultural Trade Policy Council (IPC) promotes a more open and equitable global food system by pursuing pragmatic trade and development policies in food and agriculture to meet the world's growing needs. IPC convenes influential policy makers, agribusiness executives, farm leaders, and academics from developed and developing countries to clarify complex issues, build consensus, and advocate policies to decision makers.

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