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WTO Disciplines and Biofuels: Opportunities and Constraints in the Creation of a Global Marketplace

BY IPC AND RENEWABLE ENERGY AND INTERNATIONAL LAW (REIL)*

*The team responsible for this paper includes the consultants, Robert Howse (Principal Trade Expert, REIL) and Petrus van Bork, and Charlotte Hebebrand (IPC). This paper was made possible by generous support from the United Nations Foundation and the German Marshall Fund.



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Renewable Energy and International Law (REIL) is an international partnership in association with the Renewable Energy and Energy Efficiency Partnership, Yale's Center for Environmental Law and Policy, and Baker and McKenzie's Global Clean Energy and Climate Change Practice.

Professor Howse is Alene and Allan F. Smith Professor of Law at the University of Michigan. He is a frequent consultant or adviser to government agencies and international organizations such as the OECD, UNCTAD, and the UN Office of the High Commissioner for Human Rights. He is a Reporter for the American Law Institute on WTO Law. He has acted as a consultant to the investor's counsel in several NAFTA investor-state arbitrations. He serves on the editorial advisory boards of the European Journal of International Law and Legal Issues in Economic Integration. He has also held a variety of posts with the Canadian Department of External Affairs, including as a member of the Policy Planning Secretariat and a diplomat at the Canadian Embassy in Belgrade.

Howse is the author, co-author, or editor of five books, including Trade and Transitions; Economic Union, Social Justice, and Constitutional Reform; The Regulation of International Trade; Yugoslavia the Former and Future; The World Trading System; and The Federal Vision: Legitimacy and Levels of Governance in the EU and the U.S. He is also the co-translator of Alexander Kojève's Outline for a Phenomenology of Right and the principal author of the interpretative commentary in that volume. Professor Howse's hobbies include Rottweilers, cooking, and writing fiction (a sample of his novel Mozart can be seen at www.mozartnovel.com).

Petrus van Bork is a consultant specializing in information technology, standards and innovation policy matters.

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EXECUTIVE SUMMARY*

Enthusiasm for biofuel as an alternative to fossil fuel has emerged from many corners. Interest groups, with causes as varied as national security, the environment, rural development, and poverty alleviation, have looked to this alternative energy source to address their concerns. However, biofuels' contribution to the world energy supply today is minuscule; in order for this alternative technology to address the above issues, production would have to scale up considerably.

Producing fuel from agricultural crops has already raised questions about the impacts on the supply of food and land. What has received less attention is the shift that would result in the location of feedstock and fuel production. Energy demand and land productivity are somewhat asymmetrical. OECD countries, which import most of their fossil fuel consume more than 49 million barrels of oil a day. While their demand for biofuels is therefore rising, the same industrialized countries do not have sufficient land availability to entirely meet that demand with domestic production; even if they could, this would not necessarily constitute the most cost-efficient or environmentally sustainable approach. The most ideal land for sugarcane and oil palm trees, currently the most energy efficient biofuel feedstocks, is primarily located in developing countries in tropical and sub-tropical climates. In addition to having land more suitable to efficient biofuel feedstocks, these countries also have longer growing seasons and lower labor costs than OECD countries.

To date, this asymmetry has not mattered greatly as the consumption of biofuels has been insignificant compared to fossil fuels. Most countries have been able to supply their markets with domestically produced biofuels; importing biofuel for transportation use has been minimal. However, as demand increases and as developing countries identify a market in which they may have a comparative advantage, international trade in biofuels may become more commonplace. While developing countries thus arguably have a comparative advantage, there are also concerns that increased production of feedstocks and biofuels in these countries might contribute to increased food insecurity and prove environmentally disruptive. Toward this end, import criteria are being considered.

Therefore, for a myriad of reasons, a look at how WTO rules might apply to this sector is to be recommended. Even if such trade does not materialize, an examination of WTO rules is timely, given uncertainties about subsidy notification requirements and the increase in biofuel by-products. As this is a topic that has not yet been addressed in great detail, the examination should be viewed as an exploratory one. As often happens when existing rules have to be applied to technologies that did not figure prominently when the rules were written, a debate needs to occur on how the rules apply to this technology and how or whether the rules need to be clarified or even changed. This paper sets forth the range of WTO issues that could usefully be clarified in a debate on how international trade rules apply to the biofuels sector as such:

- How should biofuels be classified in the WTO: as agricultural, industrial, or environmental goods? What are the implications of each for WTO members' obligations? What are the options for reaching a more uniform classification and for possible trade liberalization?
- How should subsidies to promote the production or consumption of biofuels be considered from the perspective of existing or any planned WTO rules? How should possible "cross-subsidization" (the increase in by-products as a result of subsidies to biofuel production or consumption) be evaluated?
- What is the consistency of domestic regulations and standards – for example, mandates requiring the use of biofuels, fuel content requirements, or environmental sustainability import criteria– with WTO rules on international regulations and technical barriers to trade? How do government procurement practices get evaluated?

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Introduction

This paper examines how the rules of the World Trade Organization (WTO) might apply to the biofuels sector. We emphasize “might,” because this is a topic that has not yet been addressed in great detail and our examination should therefore be viewed as an exploratory one. The fact that biofuels are not classified in a uniform fashion, and their unusual make-up – a fuel produced through the transformation of agricultural feedstocks – makes examining biofuels and trade regulations a rather complex undertaking. As often happens when existing rules have to be applied to technologies that did not figure prominently when the rules were written, a debate needs to occur on how the rules apply to this technology and how or whether the rules need to be clarified or even changed. As a general matter, energy trade has not been a focus of WTO law and policy, in part because until recently a number of key players in energy markets, particularly petroleum, such as Saudi Arabia, have not been WTO members. Moreover, due to certain exceptions in the GATT, the core agreement in the WTO on trade in goods, such as the national security exception and an exception that deals with scarce or potentially scarce commodities, it has sometimes been thought that energy policies are largely exempt from discipline, although this assumption, as the paper will show, does not bear close scrutiny.

We anticipate that if the demand and production of biofuels continues its upward trend of the last years, the need for such a conversation will become more pressing. This paper therefore sets forth the range of WTO issues that could usefully be clarified in a debate on how international trade rules apply to the biofuels sector.

It is legitimate to ask why this debate needs to be held when, in fact, most biofuels are produced and consumed on domestic markets, and there is only a small amount of trade in biofuels today. To date, only Brazil has enjoyed an exportable surplus in ethanol, and there has only been some limited intra-EU trade of biodiesel.¹ While there are several drivers behind the present push for greater biofuel production, some of them are clearly focused on domestic production and use. Foremost among these is the desire for greater energy security by becoming less reliant on fossil fuel imports from countries with unstable regimes and by producing more energy at home. Countries have also embraced biofuels because they provide another welcome market for their farmers’ agricultural commodities and hold the potential for furthering rural development.

Other drivers behind the push for increased biofuel production, however, are less focused on domestic production and use. Many countries, particularly those who are signatories to the Kyoto Protocol, are searching for more environmentally friendly transportation fuel. Governments are also looking to reduce their expenditure on oil. The desire for more cost-efficient or more environmentally sustainable biofuels is not necessarily tied to domestic production. Countries interested in using biofuels to meet these objectives may look for suppliers beyond their borders.

Moreover, assuming high prices of fossil fuel and interest in greater biofuel production by both governments and the private sector, the simple logic of demand and supply is likely to lead to increased trade flows of biofuels and their feedstocks. Ambitious biofuel mandates set by governments, particularly those of developed countries, point toward the likelihood of more trade in biofuels. In the US, for example, the Energy Policy Act of 2005 mandates a renewable fuel phase-in, starting at 4 billion gallons in 2006 and reaching 7.5 billion gallons in 2012. In the EU, a debate is underway on whether to turn a voluntary commitment to include a minimum 5.75 percent proportion of biofuels in transportation fuels by 2010 into a mandatory requirement. While proceeding cautiously, Japan is considering a blending mandate of 10 percent. It is quite likely that domestic production of biofuels in the US and EU will remain constrained by high costs and limited availability of suitable agricultural land, and as a consequence, trade in biofuels and biofuel feedstocks is likely to increase. Although ethanol accounted for only 3 percent of the US’ total annual gasoline consumption in 2005/06, 14.4 percent of the US corn crop – the primary feedstock used for US ethanol production - was converted into ethanol, with USDA projecting increases of up to 20 percent in 2006/07.² In the EU, biodiesel consumption already approached 35 percent share of total rapeseed oil consumption in 2004, rapeseed being the primary feedstock used in European biodiesel production.³ Although there will be other domestic feedstocks for biofuel production and

technology advances may well increase the yields of feedstocks, it does not seem implausible that the production of feedstocks in the US and EU will become constrained by a limited availability of agricultural land. As Japan already imports 60 percent of its food, the importation of biofuels or biomass for conversion to biofuels would be a must.⁴

Exacerbating the cultivation limitations of developed countries is their sheer level of demand for fuel. The US alone consumes 9.1 million barrels of oil a day in transportation fuel. Japan is the third largest oil consumer in the world. This insatiable demand for transportation energy in developed countries coupled with their inability to domestically meet this demand increases the likelihood of trade in biofuels.

There is thus a potential for trade in biofuels, particularly because the countries where biofuels can be produced most easily and cheaply and the countries with the greatest potential demand for biofuels are not one and the same. To the extent that tropical and sub-tropical developing nations may have a comparative advantage in producing biofuels due to their longer or year-round growing seasons, large areas of available arable land, and lower labor costs, the export of feedstocks or biofuels to temperate zone industrial countries could be a major potential opportunity. Several developing countries, quite aware of the demand in developed countries, sense that there are substantial export opportunities in this sector. For example, Malaysia, Thailand and Indonesia are planting large acreages of palm oil, the Philippines is expanding coconut oil production, and India is looking to produce significant quantities of biodiesel from jatropha amongst other crops. Thailand has also been developing ethanol capacity since the early 2000s and has exported at least some ethanol to the Japanese market.

Many developing countries are showing interest – or are already establishing programs – to develop local feedstocks and local production of biofuels, and the technology has been pointed to as a possible development tool for poor countries. Domestic production and use can – as in developed countries - lead to increased markets for agricultural commodities and aid rural development efforts and incur savings through reduced expenditures on imported fossil fuel, which make up a significant part of developing countries' budgetary outlays. Most developing countries are, however, not in a position to provide anywhere near the government support that the industry enjoys in developed countries and will need to rely heavily on private investment to foster the establishment of a biofuels industry. A transparent and global trading regime can serve to attract stable financing and investment capital.

Even though some developing countries may have a comparative advantage in the production of biofuels or biofuel feedstock, potential trade may be stifled by an overly exclusive focus on domestic production. Under these circumstances, biofuels will continue to be produced from feedstocks that are not necessarily cost-effective, and/or fare relatively poorly on a net-energy or sustainability basis. It is, for example, known that the production of ethanol from sugarcane is significantly more energy efficient and more environmentally sustainable than using corn as the feedstock and that rapeseed, while one of the best yielding⁵ temperate zone annual broadcrops for oil production, is not the optimal choice of feedstock for biodiesel as compared to palm oil or several other tropically grown current and potential feedstocks (e.g. Jatropha). Apart from comparisons of current temperate zone feedstock crops with their tropical counterparts is the fact that there is currently a strong vested interest in annual broadcrops, particularly in the U.S. and EU, despite the fact that the energy cost of production of the feedstock crop per hectare/per annum is significantly higher with annual crops than with perennial plantations of feedstock crops. Perennial crops have the advantage that they do not have to be replanted and grown from seed each year. The international trade in biofuels would enhance efficiency by directing production to the most cost-effective locations, and use of the highest yielding and lowest cost feedstocks. Additionally, so-called "next generation biofuels" produced from cellulosic materials are held out as the most promising in terms of net energy balance and environmental sustainability. To the extent that the biofuels industry will require and receive continuing government support measures, it is vital that they incur the least distortion of market signals and choices and thus allow the most cost efficient and environmentally sound biofuels to thrive in the market place.

Furthermore, given the large number of government support measures to the biofuels sector, a clarification of WTO rules on subsidies is desirable in order to increase certainty concerning WTO members' notification requirements and overall transparency in a sector that is heavily subsidized. Although some observers of the WTO Doha Development Round Negotiations have put biofuels forward as a possible solution to the Round's impasse over agricultural reforms, we urge a closer examination of this argument. The new markets and higher prices for agricultural feedstocks brought about by an increasing demand for biofuels are to be welcomed by the world's farmers and thus could play a role in weaning industrial farmers off of government subsidies to the agricultural sector. However, to the extent that a "solution" to the Doha Round quagmire is seen as a shift of government support from agricultural food production to agricultural energy production, it will only bring about another heavily distorted sector and decrease the potential for trade unless the kinds of acceptable support are carefully limited to measures properly targeted at public goods such as research and development, the creation of infrastructure, and the proper taking into account of environmental externalities.

Even supposing that future trade in biofuels remains limited, the considerable increase in by-products, whether livestock feed or biobased products, may lead to protectionist pressures, the distortion of world markets, and the need to consider appropriate WTO disciplines.

Before we enter into an analysis of the legal issues that require clarification, we provide a short primer on biofuels, a short overview of production, as well as an overview of the range of support measures in place. Biodiesel and ethanol are not the only biofuels, but we limit ourselves to these two for the purposes of highlighting the WTO issues that arise in this sector. While primary and secondary feedstocks (i.e. vegetable oils) can also be traded for the purpose of producing biofuels in the country of import, for the purpose of illustration, this paper's primary focus is on biofuels as such.

Short Primer on Biofuels

Biofuels are liquid, gaseous or solid hydro-carbon fuels derived from bio-mass.⁶ While fossil fuels are technically also derived from bio-mass, (the biomass from which they are derived is from earlier geologic eras in the Earth's history) these are not considered 'biofuels' within the common-use meaning of the term. All biofuels ultimately rely on the process of plant photosynthesis to store the sun's energy by binding hydrogen to carbon-backed long-chain molecules.⁷ The stored energy is then recovered by the process of oxidization — that is, the combination of oxygen with these carbohydrates in the process of plant or animal metabolism or by the act of combustion of carbohydrate based compounds (ie 'burning'). Metabolism or combustion recombines the hydrogen with oxygen to create water and carbon to oxygen to form carbon dioxide — a compound that is then available to be recycled by plants once again. The carbon cycle outlined above implies that the use of biofuels has no net carbon release impact on the ecology save insofar as fossil fuels are involved in the production of biomass and its conversion to biofuels.

First Generation Feedstocks

First generation feedstocks are biomass sources that can be divided into two classes: those which have high sugar or starch contents (starch can be relatively easily converted to sugar) or those which have high oil content. Examples of the first class are: sugar cane and beets and grains such as corn, cassava and wheat. Examples of the second class include rapeseed, soybeans, cotton seed, sunflower seed, palm, jatropha coconut and other tropical oils.

In the case of the sugar and starch crops (after the conversion of the starch to simple sugars), the sugars are converted into ethanol via either biologic (yeast or bacterial) means or chemical means. For oil crops, the oils are extracted generally by chemical means as mechanical pressing has proved too energy-intensive to be economical. Once the oils are extracted, they can be used directly as fuel, generally in stationary applications,⁸ or they can be further processed to produce biodiesel, which can be blended with fossil-derived diesel or used directly in diesel engines.

Second Generation Feedstocks

Second generation feedstocks are cellulose, hemi-cellulose and lignin — that is to say, the “woody” parts of grasses, bushes, trees and similar plants – which can be broken down into ethanol. These substances are difficult to break down into their component sugars and require extensive and expensive processing prior to being converted into biofuels. Much excitement is being generated by new technologies for the enzymatic breakdown of these substances into their component sugars. These technologies are not yet ready to be marketed given their prohibitive costs, but costs have recently begun to decline. The U.S. DOE estimates “that improvements to enzymatic hydrolysis could eventually bring the cost to less than 5¢ per gallon, but this may still be a decade or more away”.⁹ Other older approaches, both pyrolytic (heating biomass in low oxygen conditions to create liquid, gaseous or solid fuels) and chemical, such as the Fischer-Tropsche process, are also being revived and further developed.

Biofuel Production and Trade

Brazil, and now also the United States, are the world's leading producers and exporters of ethanol. Brazil produced 4 billion gallons of ethanol in 2004¹⁰ and 4.22 billion gallons in 2005,¹¹ while the United States produced 4.26 billion gallons of ethanol in 2005. Brazil also continues to build its sugar-ethanol sector, and Petrobras, the Brazilian national oil company, has suggested that the country could be exporting 8-10 billion litres/annum within a few years.¹² However, infrastructure constraints¹³ may hamper this as well as other factors that influence ethanol markets: the price of sugar, the price of crude oil, and the value of the U.S. dollar. Currently, Brazil's export capacity is on the rise, and ought to be more than 5.6 billion/litres per annum by the end of 2006.¹⁴ Brazil has also commenced with a biodiesel program.

As of September 2006, the United States had a reported plant ethanol-producing capacity of 4,930 million gallons a year (MGPY) of ethanol, with another 3,015.5 MGPY under construction. Taking into account current construction, the U.S. will possess a 7.95 billion gallons per annum capacity spread over 20 states.¹⁵ It is also a rapidly growing producer of bio-diesel¹⁶, having produced 33 million gallons in 2004 and 75 million in 2005.¹⁷ In 2004, U.S. biodiesel production represented 0.08 percent of diesel consumed for vehicular transportation.¹⁸ As of February 2006, the United States had 56 facilities producing biodiesel, with another 89 in development.¹⁹ Altogether, this capacity will translate, based on a 2005 estimate, to approximately 395 MGPY of total biofuel production capacity.²⁰ Thus, based on current trends in production and construction of new bio-ethanol and biodiesel plants, the U.S. is well on the way to meeting the U.S. Congress' 2005 Energy Policy Act (EPACT2005²¹) requirement of 7.5 billion U.S. gallons per annum of biofuel production for domestic consumption by 2012.

The European Union is a major producer of bio-diesel, with Germany producing over half and France and Italy also being significant producers. The EU also produces smaller quantities of bio-ethanol, particularly in Spain and to a lesser extent France. Biodiesel feedstocks in the EU are primarily rapeseed, sunflower seed and soybean, being 60 percent, 29 percent and 4 percent of total biodiesel production with most of the balance coming from waste oils. Most of the small production of ethanol is from sugar beets. The EU produced 768 million gallons of biofuels from all sources in 2004.²² (The U.S. produced 3.4 billion gallons in the same year.) In 2004, the EU imported 825 million gallons of bio-ethanol; however, there were apparently no imports of bio-diesel, which is subject to an ad valorem duty of 6.5 percent.²³

Besides Brazil, the US, and the EU, there is existing and future production planned in several Asian, other Latin American countries – especially Argentina - and some African countries are commencing programs for the production of biofuels.²⁴ Appendix A provides world ethanol production figures for key countries in 2005. Appendix B provides a more thorough look at current and future bio-diesel production throughout world regions.

Government Support Measures

Support for the biofuels sector has come in many forms, ranging from the voluntary directives of the supra-national European Union, through the national and sub-national level. Support can take many forms such as:

- Fuel excise tax exemptions and rebates, full or partial;
- Mandates for the production of specified levels of biofuels;
- Mandates for compulsory blending with fossil fuels to a certain percentage by federal and sub-national entities;
- Government-procurement preferences and purchase mandates;
- Local tax breaks on property taxes or and state/provincial taxes, either reductions or exemptions;
- Accelerated write-off schedules for eligible biofuels-related plant;
- Local, state (provincial) and federal fleet requirements specifying some level of required or subsidized usage of biofuels in the relevant government fleets.
- Tax exempt bonds for finance (typically in the U.S.);
- Subsidized loans, loan guarantees, and special capital gains exemptions or deferrals on sale of bio-fuel plant and infrastructure (deferrals on eligible transactions are available in the U.S.);
- State (provincial) sales and/or other tax exemptions for eligible biofuel production equipment;
- Regulatory exemptions and waivers including environmental impact waivers;
- State (Provincial) producer credits either for all producers or those below a certain size or having a certain organizational structure (e.g. farmers' cooperatives);
- State/Provincial/Federal subsidies towards purchase of vehicles and infrastructure that can utilize biofuels either by public organizations or as incentives for the consuming public;
- Environmental legislation mandating certain specific types of fuel additives (typically for fuel oxygenation) related to reducing vehicle exhausts. This has resulted in higher demand for ethanol either as a blending agent or for manufacture into ETBE as a substitute for the more environmentally hazardous MTBE;
- Government purchases of surplus agricultural stocks for conversion to bio-ethanol (particularly wine in the EU);
- Subsidies not normally associated directly with biofuels, such as agricultural farm supports in the U.S., EU and elsewhere; and
- Government supported R&D for biofuels ranging from basic research to technology demonstration plants.

Laws of the World Trade Organization Relevant to the Biofuels Industry

Within the emerging biofuels trade context, three crucial sets of issues concerning the law of the World Trade Organization (WTO) are relevant both for countries that are providing significant amounts of support to their bio-fuel industries as well as countries that would be interested in exporting bio-fuels. These are:

- How should bio-fuels be classified – are they agricultural, industrial or environmental goods, and what are the implications of each for WTO members' obligations? What are the options for reaching a more uniform classification and for possible trade liberalization?
- How should subsidies to promote the production or consumption of biofuels be considered from the perspective of existing or any planned WTO rules? How should possible "cross-subsidization" (the increase in by-products as a result of subsidies to biofuel production or consumption) be evaluated?

- What is the consistency of domestic regulations and standards—for example, mandates requiring the use of biofuels or fuel content requirements—with WTO rules on international regulations and technical barriers to trade? This section will also address how WTO rules apply to biofuels preferences and mandates in public procurement

Classification and WTO Law

Among the major functions of WTO law has been to provide structures and rules for the negotiated reduction of tariffs on goods. For purposes of achieving certainty, transparency, and non-discrimination in international trade WTO law, WTO Members are encouraged to express their commitments with respect to tariffs in terms of a “bound” rate, to be applied on an unconditional most favoured nation (MFN) basis. These bindings are contained in each Member’s “schedule” of tariff commitments. Pursuant to Article II of the GATT, the main WTO treaty that governs trade in goods generally (both industrial and agricultural) a WTO Member’s binding creates a legal obligation not to impose tariffs in excess of that rate on imports of the product in question from other WTO Members. Unconditional MFN treatment means that this legal obligation extends equally to imports from all WTO Members regardless of their own tariffs or other trade policies.

Neither Article II of the GATT nor any other provision of the WTO treaties prevents a WTO Member from applying a tariff that is lower than its MFN bound rate. In fact, for various policy reasons, WTO Members often do apply rates of tariff that are lower than the bound MFN rate. However, a WTO Member must do so on an unconditional MFN basis, by virtue of Article I of the GATT, except in the context of regional or bilateral free trade agreements that are consistent with WTO rules on such agreements (Article XXIV of the GATT) or of preferences for developing countries such as GSP that are operated consistent with WTO rules (these will be discussed below).²⁵ If the US MFN bound rate for widgets is 10%, it is free actually to apply a tariff of 3% to such imports but it is not free to apply 3% to imports from some WTO Members and a higher (or lower) rate to those from others.

Crucial to the operation of a system of bound tariffs has been classification of products, since countries set very different MFN bound rates for different kinds of products. Not every single product could possibly be listed in a Member’s schedule so in fact tariff rates are expressed in terms of categories of products, and these categories can be more or less specific. WTO law says nothing about what the categories should be; it remains the sovereign right of WTO Members to determine the way in which they classify products for purposes of binding tariffs. However, the vast majority of WTO Members are also members of the World Customs Organization (WCO) and in that capacity are bound by treaty to use the system of classifications evolved by the WCO, known as the Harmonized Commodity Description and Coding System, or “HS” for short. Consequently, WTO practice is to negotiate tariff bindings based on that system. The requirement to use the HS is limited to those classifications at the so-called six digit level; this means that WTO Members are free to introduce more specific sub-classifications that are not part of the HS.²⁶ However, by virtue of Article II of the GATT, the effect of such sub-classifications cannot be to increase the rate of tariff applied to that sub-set of goods beyond the bound rate for the more general HS category to which it belongs. As well, any such sub-classifications cannot violate the MFN obligation with respect to the treatment of “like products.” Thus, in the *Spanish Coffee*²⁷ case, Spain introduced in its domestic tariff nomenclature sub-classifications that distinguished between different types of “unroasted” coffee; Spain imposed a tariff of 7% on three of these types while allowing duty-free status to the types “Colombia mild” and “other mild.” Brazil complained that this was a denial of MFN treatment to its coffee exports, because they were “like products” to those being accorded duty-free status. The GATT dispute settlement panel upheld Brazil’s complaint, finding that all of the types of coffee in question were “like” since they were converted into blends before being marketed to the consumer, who could not distinguish them as separate commodities. The panel also placed some weight on the fact that no other GATT member had introduced sub-classifications of the kind employed by Spain in its domestic nomenclature.

The United States tariff treatment of fuel ethanol is an illustration of these principles. As will be discussed in more detail in the next section, the HS classification for ethanol does not distinguish between fuel and non

fuel uses of ethanol. In 1980, the United States introduced a “secondary” import tariff of 50 cent per gallon on fuel ethanol; i.e. this tariff was added, in the case of imports of fuel ethanol alone, to the applied rate as classified in the HS headings for all ethanol (whether for fuel or non-fuel use). At the time, this was clearly a violation of US obligations under Article II, since, with respect to some imports of ethanol at least, the US was applying a higher rate of tariff than the bound rate for the HS classification.²⁸ But what if the US had done the reverse, namely singled out fuel ethanol for a lower applied rate than the bound rate for the HS classification in question? This would not have run afoul of WTO rules: WTO Members are free to structure their actual applied tariffs on particular imports largely as they please, even based on considerations other than HS classification (*Chile Price Band*) provided that the result is that the applied rate of tariff is never above the bound rate for the HS classification in question, and there is no discrimination between imports based on their national origin (the MFN obligation). Moreover, the US - in singling out fuel ethanol for separate treatment - would not be violating its obligation to use any HS classifications that exist at the six-digit level and above. This obligation does not exclude making further sub-classifications below those that exist in the HS system. Under Article II of the GATT, WTO Members cannot introduce, beyond the tariffs they have bound in their schedules, additional duties and charges on imported products.

Classification and Tariff Treatment of Biofuels

Generally speaking, the tariff classifications applicable to biofuels have been based on conceptions of the substances in question as agricultural or chemical products, and are not specific to the use of the substances as fuels, biodiesel being an exception, as it now has its own HS classification. As we just saw, in the discussion of the US secondary tariff, ethanol is classified in the HS without regard to whether it is used for fuel or other purposes. Thus, ethanol is classified on the basis of its chemical composition as undenatured (220710) and denatured (220720) alcohol²⁹ in the Harmonized system, but these classifications go to its chemical composition, and there is no separate classification or sub-classification specific to fuel ethanol as opposed to ethanol used for other purposes. Since HS classifications are, as noted above, the basis for tariff bindings in WTO Member’s schedules, the lack of HS classifications more precisely targeted at the substances in question when used as fuels not only makes it difficult to get precise biofuel trade statistics, but may also impede efforts to liberalize tariffs on biofuels. WTO Members may have environmental and energy security reasons for wanting to reduce tariffs on these substances when used as fuels but may not wish to reduce tariffs on these substances when they are destined for other uses in competition with domestic products. The fact that tariff classifications are not consistently aligned with the actual consumer market in question (the biofuel market) not only makes it difficult to ascertain the actual trade flows of biofuels, but also leads to a number of problems with respect to consistency, certainty and non-discrimination in the application of existing WTO obligations. The European Union of Ethanol Producers claims for example that, because there is not a separate classification for fuel ethanol, Brazilian fuel ethanol has been entering Sweden not under the classification for denatured ethanol but under HS 3824.90.99 — a different classification that carries a much lower rate of duty.³⁰ The argument here is apparently that the degree of denaturing is higher than would be normal for HS 2207.20.

HS classifications also importantly determine whether or not a product is an agricultural product under WTO rules. Annex 1 of the WTO Agreement on Agriculture (AoA) states that the provisions of the Agreement apply to HS Chapters 1 to 24 (except for fish products) as well as to a specified list of products with other HS headings. We note that while ethanol, in HS Chapter 22, is considered an agricultural good, biodiesel falls under Chapter 38 and is thus considered an industrial good. The AoA not only has separate rules that affect tariff rates (tarification of certain kinds of quantitative restrictions) but also different rules with regard to subsidies and other domestic policies that affect trade, which will be addressed in Section II of this paper.

Further complicating the classification issue is the possibility (to the extent that the Doha Development Round may be revived) that some biofuels could be deemed as “environmental goods” and subject to special negotiations to reduce trade barriers with respect to “Environmental Goods and Services.” Paragraph 31(iii) of the Doha Ministerial Declaration calls for “the reduction or, as appropriate, elimination of tariffs and non-tariff barriers to environmental goods and services”. Negotiations pursuant to 31(iii) had been taking place in the Special Session of the WTO Committee on Trade and Environment (CTE-SS). When the Doha Round was

formally suspended, little progress had been made in these negotiations even in defining the parameters of what may be included as an “environmental good.” Around 10 WTO Members had submitted lists of products that they deemed to be “environmental goods,” and some of the lists included products that might have positive environmental properties in certain specific uses but not in others.³¹ Brazil proposed and India have suggested negotiations on EGS should include biofuels; the EC’s position is similar. Also unresolved was the issue of the relationship between the negotiations on environmental goods and services in the CTE to the general Non-Agricultural Market Access (NAMA) negotiations and to the agriculture negotiations in the Doha round. Although there is no basis for such as a position in paragraph 31(iii) of the Doha Declaration, which established the mandate for the EGS negotiations, some WTO Members had taken the position that only products subject to NAMA negotiations could be included in the EGS negotiations, thus excluding agricultural products. Thus, the United States has not listed ethanol in its initial list of environmental goods (at the same time, biodiesel is absent also, although not an agricultural product under the HS).³²

Potential Policy Responses to Classification Issues

There are a number of possible multilateral, plurilateral and unilateral policy responses to the issues raised by classification of biofuels. We begin by surveying the multilateral options:

Amendment of the Harmonized System

The most obvious or straightforward approach would be to introduce distinctive HS headings for biofuels, i.e. headings based both on the chemical and biological composition of the substance and on its use as fuel. In this respect, the HS classification of biodiesel in the WCO’s Explanatory Notes provides an obvious precedent. It reads as follows: “a mixture of mono-alkyl esters of long-chain [C16-18] fatty acids derived from vegetable oils or animal fats, which is a domestic renewable fuel for diesel engines and which meets the specifications of ASTM D 6751 [American Society for Testing and Materials “Standard Specification for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels].” It will be noted that the definition contains a *chemical description* (“mixture of mono-alkyl esters...”), a *process characteristic* (“derived from vegetable oils or animal fats”) and an *end-use* criterion (“...fuel for diesel engines”).

Amendment of the Harmonized System is, however, a complex process, which could take many years. As Steenblik explains, “The WCO’s Council generally considers amendments in four-year cycles, with implementation taking place from one to two years following notification to members.... The most recently completed review was approved by the WCO Council in June 2004 and will be implemented internationally on 1 January 2007. Amendments under the next review cycle are not scheduled to be implemented until 2012.”³³

It should be noted that HS classifications for biofuels will not automatically solve the problem of producers or customs authorities mischaracterizing imports to serve their particular interests (often respectively minimization and maximization of tariffs paid). Verifying the characterization of particular shipments of imports would be a significant challenge, especially given the close physical similarity or even identity of biofuels to substances with non-fuel uses.

It should also be understood that, as a policy matter, a particular HS classification for biofuels would not pre-judge the issue of whether all or some of these fuels should be considered to fall within the scope of the WTO Agreement on Agriculture.³⁴ It would be up to WTO Members, through amending Annex 1 of the Agreement on Agriculture, to either include or exclude whatever HS classification the WCO arrives at; such an amendment would, according to WTO practice, be by a consensus decision of the Membership, but there is no legal reason why it would need to occur as part of a “round” of negotiations, however. Already Annex 1 of the Agreement on Agriculture lists certain products that have non-agricultural HS headings but that are nevertheless specified to be within the ambit of the Agreement on Agriculture. Conversely, there would be nothing to prevent WTO Members from deciding that even if a particular product bears an agricultural HS heading it should be listed in the Annex as explicitly excluded from the Agreement on Agriculture. In sum, this is a policy judgment for WTO Members, and there are no constraints in legal architecture either in the WCO or the WTO that would

impede the Membership, if it reaches consensus, from amending the Agreement on Agriculture to reflect the preferred solution.

Negotiated Agreement in the WTO

In theory, WTO Members could negotiate the liberalization of tariffs on biofuels in a way that circumvented the HS classification problems. A precedent is the 1996 WTO Information Technology Agreement, where Members who adhered to that Agreement bound themselves to liberalize tariffs on two lists of products: an “A” list, based on HS classifications, and a “B” list, describing specific products, where the obligation to liberalize would apply regardless of how those products might fit within existing HS classifications. In effect, each participating WTO Member would decide how to reflect those liberalizing obligations on the B list in through its national nomenclature. Based on this precedent it would be possible to imagine an Agreement on Biofuels where WTO Members or some subset of them agreed to limit tariffs on biofuels or allow them entry tariff free regardless of the existing HS classification and existing domestic nomenclature. Depending on domestic implementation methods, such an agreement would likely not be a violation of obligations under the WCO; the Harmonized System for example allows so called “ex-outs” in WCO members’ schedules, which are classifications at a greater level of detail than the 6-digit HS. The negotiation of such an agreement would not need to take place within the existing negotiating structures for NAMA, agricultural goods, or EGS: if there were political will it would be a simple matter to launch a *sui generis* negotiation by a decision of the WTO Ministerial Council. In principle, as a matter of legal architecture, such a negotiating structure need not presuppose whether, for the purposes of the application of the Agreement on Agriculture some, all, or no biofuels would in the future be considered agricultural products. As a matter of negotiating interests as opposed to legal architecture, of course, assumptions about the applicability of background norms such as those in the Agreement on Agriculture will affect the positions negotiators take and the concessions they are prepared to offer or accept.

It should be emphasized that there is no intrinsic need to premise the negotiation of such an agreement on the positive environmental properties of biofuels. Indeed, the seemingly intractable controversy generated by the attempt to define an “environmental good” in the EGS negotiations suggests that linking multilateral biofuel trade liberalization to a specific set of environmental goals would be a mistake. Environmentalists are themselves divided on whether particular biofuels are an overall positive for the environment,³⁵ and their views depend significantly on whether the fuels are produced in a sustainable manner. The WTO is not a desirable forum for resolving such complexities. Further, an agreement to liberalize border barriers to trade in biofuels such as tariffs need not prevent any particular WTO Member, or indeed any sub-set of WTO Members (for example, pursuant to obligations under environmental treaties) from imposing sustainability requirements on domestic and imported biofuels in a non-discriminatory manner. This is a matter of domestic regulation and standards, to be discussed in the final section of this paper and such measures would be governed by provisions of the GATT on internal regulation and in some cases also by the WTO Technical Barriers to Trade (TBT) and SPS (Sanitary and Phytosanitary Measures) Agreement.

If an agreement on biofuels were negotiated on a plurilateral basis (i.e. by a subset of the WTO Membership) then the issue would arise as to whether unconditional MFN would also apply to non-signatory WTO Members regardless of whether the non-signatories were prepared to offer reciprocal concessions. If not, then some kind of carve-out from the application of GATT Article I would be required. More generally, so as to make the operation of the agreement clearer and more effective, a savings clause providing that to the extent of any inconsistency the agreement shall take precedence over other WTO treaties including the GATT and the Agreement on Agriculture would be needed.

One question in the design of any agreement on biofuels would be the extent to which issues of customs administration would be addressed explicitly as opposed to being left to normal dispute settlement mechanisms and background rules on customs administration in the WTO and the WCO. Some commentators express considerable concern that a classification that is in part end-use based is not easily administrable or enforceable by customs officers at the border, since in some instances there would be no obvious way to distinguish

through physical inspection between covered substances with fuel end-uses and non-covered substances with other end-uses. One suggestion for dealing with this is a possible requirement that the substance with the fuel end-use be dyed a distinctive color.³⁶ Another possibility would be to have a system of duty drawbacks. WTO Members currently operate duty drawback schemes, where duty collected at the border is refunded based on an application by the ultimate purchaser certifying a particular use for the goods. Under a biofuels agreement, Members could, for example, up to the existing MFN bound rate at the border levy duties while being obliged to remit the duty upon the presentation of a valid request by the end user, accompanied by certification that the product indeed had been used for fuel. This being said, one should not exaggerate the seriousness of the problem of administering an end-use based tariff relative to the general challenges of customs administration today. Most states already impose myriad requirements and regulations on imported goods—technical, health and safety, environmental, etc.—and compliance with most of these cannot be determined by a simple physical inspection of goods coming across the border and indeed would often require highly specialized testing in laboratory or other conditions not available on a routine basis at the border. In most instances, officials must rely on certification either by the exporter or importer themselves or by some independent testing and certification institution in the country of export or some third country. Random sampling, spot checks, post-entry surveillance and similar techniques are the main means of ensuring the integrity of such certifications.

Unilateral Options

It is possible that, as a matter of its own energy and environmental policy, an individual WTO Member would wish to encourage domestic consumption of biofuels by reducing tariffs on them, while retaining tariff protection for domestic products with non-fuel uses that were currently subject to the same HS classification, and thus the same tariff treatment, as biofuels. As suggested earlier in this paper, neither WCO or WTO obligations would prevent a WTO Member from applying a *lower* rate of tariff than that bound for a six digit or higher HS classification to some sub-set of goods within that classification, as long as it provided MFN treatment to “like products.” The WTO Member could do this through introducing a further sub-classification in its domestic nomenclature. Although such action would be subject to the normal transparency obligations of Article X of the GATT,³⁷ it would not require any permission from or negotiation with the WTO membership in general or trading partners with export interests in particular. In this sense, it can be correctly described as a legally possible unilateral option.

With respect to the requirement of MFN treatment of “like products” in Article I of the GATT, the *Spanish Coffee* case (discussed above; see Classification and WTO Law, p. 43 and accompanying text) suggests that end uses as perceived by consumers are a very important consideration in determining whether products are “like” for purposes of interpreting the MFN obligation; subsequent jurisprudence on “like products” in the WTO era has placed considerable emphasis on consumers’ tastes and perceptions of products, i.e. not distorting the competitive relationship where products are competitive in the same consumer market.³⁸ From this perspective, biofuels and physically similar products with non-fuel uses should be considered “unlike” as they are not competing in the same consumer marketplace.

If a WTO Member wished to reduce tariffs on imports of biofuels largely or entirely for environmental reasons, the Member might logically wish to limit such reductions to imports of biofuels that have net positive environmental impacts based on the entire lifecycle of the product. Would this kind of sub-classification be consistent with the obligation of MFN for “like products,” or could it be successfully challenged by a WTO Member whose biofuels exports’ failure to meet the importing Members environmental impact criteria is the only thing preventing them from qualifying for the tariff reduction? There is a line of thinking that suggests that, at least with respect to domestic regulations and requirements, environmental impacts that are related to processes or production methods cannot form a basis for considering products as “unlike” and treating them differently (the so-called PPM, or product-process distinction). This line of thinking is addressed in detail in the next section of the paper but it has never been adopted by any WTO dispute settlement panel in the context of a dispute concerning *tariffs*.

In the *Spanish Coffee* case, it is true that Spain had unsuccessfully pointed to differences in production method to justify assigning the types of coffee different tariff rates; however, the panel did not simply reject outright such differences as irrelevant; what was important was that they were irrelevant to consumer choice. It is quite possible that the environmental properties of biofuels are highly relevant to consumer choice. Moreover, as a general matter, Araya observes: “. . . the prevailing anti-PPM rationale in Geneva—and in the trade community more generally—has grown out of sync with market realities,” namely the interest of significant numbers of consumers in the environmental consequences of how a product is produced.³⁹

In a finding that was adopted without being appealed, a WTO panel held that the word “unconditionally” in the GATT Article I MFN obligation not to discriminate against imported “like” products permitted distinctions that did not discriminate against imports *on the basis of national origin*.⁴⁰ Neutral environmental criteria, supported by international standards and multilateral environmental treaties, would likely not be held to discriminate on the basis of national origin, either *de jure* (by distinguishing the national origin of the products on the face of the law) or *de facto* (where a facially neutral criterion nevertheless in its design appears to favor imports from some countries more than others).

Sometimes it is argued that the expression “ordinary customs duties” in the GATT, as well as GATT practice, does not permit a WTO member to consider factors beyond intrinsic considerations, such as the value or volume of the imports, in determining the actual applied rate of tariff for goods that have a bound rate for a given HS classification. Recent Appellate Body jurisprudence has, however, rejected that view, thereby implying that a wide range of considerations may inform the applied rate of a given WTO Member. What is crucial for purposes of compliance with GATT rules on tariffs is that an applied tariff never exceed the MFN bound rate for the classification in question, regardless of whatever factors or considerations are used to calculate the tariff.⁴¹

A Note on Tariff Preferences under WTO Law

The rate of tariff at which developing country-produced biofuels enter certain developed countries may be determined by certain preferential trading arrangements instead of by the MFN bound rate in the importing Member’s schedule.⁴² One kind of arrangement is a scheme of preferences that applies to some subset of developing countries based on agreement with those countries. EC preferences extended to the group of African, Caribbean and Pacific (ACP) countries, for example, provide duty free treatment of biofuels imports, as do the US preferences under its Caribbean Basin Initiative (CBI). The legal basis for arrangements like the EU-ACP arrangement and the CBI, which would otherwise violate the MFN obligation in the GATT because they give certain WTO Members better tariff treatment than others, is in waivers from MFN granted through agreement among the WTO Membership.

Apart from the above, both the EC and the US give preferences to developing countries on a general basis under a different scheme, known as the Generalized System of Preferences (GSP). At present, under the US GSP biofuels do not qualify for preferential treatment (ethanol was explicitly withdrawn from the US GSP in the 1980s) but the preferences are granted to biofuels under the enhanced EC GSP scheme, as well as the EC’s “Everything but Arms” scheme.

There are special rules for the operation of a GSP scheme, contained in a WTO instrument called the “Enabling Clause”. Among these is that such preferences should be non-discriminatory, generalized (i.e., available to all developing countries), and non-reciprocal (i.e., not given on the basis that the developing countries offer concessions in return). These requirements for the operation of GSP raise important issues concerning what conditions an importing developed WTO Member could put on the granting of preferences. For example, linking preferences, in the case of biofuels, to sustainability criteria would raise the question of possible discrimination between different developing countries. In the *EC-Tariff Preferences* case, the Appellate Body held that, under certain circumstances, the non-discrimination requirement in the Enabling Clause would in fact permit a developed country to treat different developing countries differently in its preference scheme. This

was permissible where the differences in treatment addressed in a positive manner the development needs of the countries in question. The Appellate Body suggested that the meaning of "development needs" could be determined based upon references to multilateral instruments related to sustainable development. The Appellate Body also held that such different treatment must be based on objective and transparent criteria, applied with due process. In the case of sustainability criteria for biofuels, this suggests the importance of developing international standards and where such standards do not yet exist, basing any domestic criteria on multilateral sustainable development instruments.

Although both waivers and the Enabling Clause entail a carve out from MFN, these instruments have their own conditions and rules, as we have seen with the example of the "non-discrimination" requirement in the Enabling Clause. In addition, GSP systems and other WTO-sanctioned preference schemes do not constitute self-contained regimes; they permit WTO Members to deviate from their other GATT and WTO obligations only to the extent explicitly provided for in the instrument in question (see on this score, the Appellate Body ruling in the *Bananas*⁴³ case).

Thus, in general, the measures discussed in this section of the paper would still be subject to the WTO disciplines we elaborate below, even if they allow biofuels from developing countries to enter the importing country under preferences.

Subsidies and WTO Law

Government subsidization has been crucial to the economic viability of the biofuels industry. Brazil's ethanol industry enjoyed significant government subsidies during its first twenty years commencing in 1975 after the inception of the first oil crisis. At that time, facing rapidly escalating oil import bills the military dictatorship governing Brazil launched the Brazilian National Ethanol Program (Proalcool). Key measures of this program included the building of a national distribution infrastructure for ethanol, low-interest loans to sugar companies for distillery construction, a mandatory blend of 20%⁴⁴ ethanol with all gasoline sold and subsidies at the fuel pump to ensure that ethanol blended fuels – and later all ethanol fuels – remained competitive with, or cheaper than, 100% gasoline at the retail pump. In the late 90s after the demise of the military dictatorship, rising domestic production of oil combined with the arrival of low international oil prices the demand for ethanol fell and the government of the day discontinued the traditional subsidy programs retaining only subsidized prices at the fuel pump.

Despite an industry shakeout after subsidies ceased, the Brazilian ethanol industry was able to survive until the return of higher international oil prices brought renewed demand and profitability⁴⁵. In the United States, federal government support for ethanol became established during the time of the second oil shock in the late 1970s, when price and energy security concerns were high⁴⁶ first with provisions in the Energy Security Act of 1978 providing for a \$.40/gallon exemption on the federal motor fuels tax (currently .51/gallon through 2010) and followed by the Energy Tax Act of 1980, which offered insured loans to small (under 1,000,000/gallon/annum) producers of ethanol (the original measures in these acts and others were extended in the decades since⁴⁷). Over time other measures have been added such as federal DOE funding for research in renewable fuels, usage mandates etc. An example of EU support is the energy crop premium it provides to EU farmers in addition to their single farm payments.⁴⁸ Due to the immature states of the technologies involved, and the often high cost of the relevant feedstocks, the biofuels industry throughout the world has had to rely on subsidies and other public support to grow.

Subsidization can have multiple purposes and these purposes may vary in their consistency with the underlying norms of world trade law. A government may, for environmental or energy security reasons, subsidize consumers so as to provide them with an incentive to switch from conventional fuel to biofuel (in whole or part) by compensating, or more than compensating, for the added cost. Or it may attempt to achieve the same objective by subsidizing research and development that can lead to more efficient technologies for the production of biofuels. Neither of these kinds of subsidies need affect the relative competitive position of domestic

and foreign producers (assuming the knowledge generated by subsidized R & D is not largely proprietary to domestic firms and leads to generalized innovation that foreign producers can also exploit — an assumption that is difficult to substantiate). On the other hand, a government may subsidize the domestic production of biofuels; this may not be a cost-efficient way of providing an incentive for consumers to switch from fossil fuels to biofuels, since the lowest-cost, most efficient producers of the biofuels in question may be foreign producers. Such subsidies are sometimes justified, as a policy matter, on “infant industry” grounds.

The way in which a biofuel is classified is not only important as far as tariffs are concerned (see Section I), but importantly also determines which set of WTO disciplines on domestic subsidies are applicable. Whether a given biofuel falls within the HS classifications listed in Annex 1 of the Agreement on Agriculture will determine if the rules of that Agreement apply in addition to those of the SCM Agreement. The Agreement on Agriculture contains disciplines on subsidies that are in addition to those that apply to all products under the WTO Subsidies and Countervailing Measures (SCM) Agreement. For instance, trade-distorting domestic subsidies that fall into the so-called “amber box,” i.e. that are not subject to the so-called “green box” carve-out, must be notified to the WTO and must fall within certain quantitative ceilings. Thus, whether a particular product falls within the AoA can have important implications for disciplines on government supports for that product.

The AoA imposes disciplines on domestic subsidies provided to agricultural products (and other products specifically listed in Annex 1), requiring their reduction over time at prescribed rates, with exceptions for certain defined categories of subsidies (including some environmental subsidies). During the first decade that the AoA was in effect, where such exceptions applied, agricultural subsidies could not be challenged either under the Subsidies and Countervailing Measures (SCM) Agreement (the so-called “peace clause”), or the AoA. Thus, during this period, a biofuel classified as an agricultural product under the HS meant it was subject to more lenient treatment under WTO rules than if it were classified as a non-agricultural product. With the expiration of the peace clause, some believe that more challenges on agricultural subsidies will be forthcoming.

The SCM Agreement

The SCM Agreement prohibits *export* subsidies and subsidies contingent upon the use of domestic products over imported products. Biofuels subsidies are generally not tied to export performance and therefore would not fall into this first category of prohibited subsidies. However, production subsidies contingent upon the use of domestic products, such as locally produced feedstock crops, are an issue in the biofuels area.

Other subsidies not prohibited explicitly by the SCM may nevertheless under WTO law be “actionable”⁴⁹ if they have certain kinds of adverse trade effects. Actionability means that an affected WTO Member can either make a complaint against the measure in question in WTO dispute settlement, or address the subsidy through the imposition of unilateral countervailing duties against the subsidized products in compliance with the procedures set out in the SCM Agreement and pursuant to its domestic law. WTO law permits countervailing duties to be imposed *only* where the country imposing the duties can show that the subsidy has caused or threatened injury to its domestic industry through the import of competing subsidized products.

First of all, in order to be actionable, the measure must conform to the definition of a subsidy in the SCM Agreement. Two essential components of this definition are that there is a *financial contribution* by government and a *benefit* received by the recipient. (SCM Article 1.1.) “Financial contribution” is itself a defined term in the SCM Agreement, and explicitly includes a range of situations other than direct cash payments, such as provision of goods and services or tax breaks where the government foregoes revenue “otherwise due.”

“Benefit” denotes the requirement that the subsidy must confer a competitive advantage on the recipient; the notion of advantage is understood by reference to the conditions the recipient would otherwise have to face in a competitive marketplace, absent the government intervention in question (*Canada-Aircraft*; *Canada-Lumber*). The benchmarking in question is assisted by Article 14 of the SCM Agreement, which provides a

non-exhaustive list of “market” benchmarks: for example, in the case of equity capital infusions by government, the infusion “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” (Article 14(a)). In the case of provision of goods or services or purchase of goods and services, a benefit only exists if the provision is made “for less than adequate remuneration” or the purchase is made “for more than adequate remuneration”, with regard 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 and sale).” (Article 14(d).)

As a general matter, the WTO Appellate Body has acknowledged that correctly identifying a “benefit” and whether it exists can be a complex matter in situations where the market conditions themselves have been pervasively influenced by government intervention, and therefore a meaningful “market” benchmark for “benefit” is elusive (see Canada-Lumber, US-Privatization CVDs).

In the case of biofuels, the market has been pervasively shaped in all the major producer nations by a variety of government interventions. In this context, the question raised by the Appellate Body, in the event of a case brought before it, would be whether there is a workable “market” benchmark against which one can isolate a given instance of financial support and determine whether a competitive benefit has been conferred; i.e., an advantage in relation to normal market conditions.

In addition to meeting the requirements of “financial contribution” and “benefit,” in order to be actionable, a subsidy must also be *specific*. That is, the terms of the government support program must target the subsidy to some specific or limited class of users (i.e., particular industries or firms are singled out as beneficiaries); a subsidy may be *de facto* specific, however, even when it does not single out certain industries or firms, in cases where a limited sub-set of industries or firms are the predominant or disproportionate users of the subsidy. It must be appreciated that the determination of specificity is a matter of locating a point along a spectrum. On the one end there are obviously specific subsidies such as the bailout of a single enterprise. At the other end there are obviously non-specific subsidies, such as government provision of universal health care, which are “used” throughout the entire economy.

Further, a subsidy must cause certain “adverse effects” in order to be successfully challenged as “actionable” in the WTO. These adverse effects are listed in Article 5 of the SCM Agreement, and include injury to domestic producers of a like product in competition with the imported subsidized product (injury in this sense must exist if countervailing duties are to be imposed); nullification or impairment of benefits accruing “directly or indirectly” under the GATT, in particular tariff concessions; or serious prejudice to the interests of another Member. “Serious prejudice” is further defined in Article 6.3. To show “serious prejudice” the complaining WTO Member must show that the effect of the subsidy is to displace imports of a “like” product into the market of the subsidizing Member or to displace exports of the complaining Member to a third country market; or significant price suppression or price undercutting in the same market with respect to like products; or finally “the effect of the subsidy is an increase in the world market share of the subsidizing Member in a particular subsidized primary product or commodity [footnote omitted] as compared to the average share it had during the previous period of three years and this increase follows as a consistent trend over a period when subsidies have been granted.”(SCM Agreement Article 6.3).

An additional issue that may be important in the biofuels context is that of upstream and downstream subsidies. One firm or industry may receive the financial contribution but it is the benefit that flows to an upstream or downstream industry that is the source of concern. For example, a subsidy paid to domestic feedstock producers might be challenged by foreign producers of biofuels on the grounds that the subsidy results in a lower price of feedstock to domestic producers of biofuels. In the Canada-Lumber case, the Appellate Body has held that while a subsidy may be actionable where the financial contribution and the competitive benefit are not received by the same entity or even the same industry, the Appellate Body suggested that it could not

be simply assumed that the reduction of costs to a downstream industry would result in a benefit in terms of lower prices of inputs to the upstream industry—in each case the existence of such a benefit would need to be shown on the facts.

The Agreement on Agriculture

In the Agreement on Agriculture, WTO Members have committed to reduce their overall annual financial support for agriculture programs (their “Total Aggregate Measurement of Support”) by a set percentage from a baseline amount that varies by WTO Member. Certain categories of non- or minimally trade distorting subsidies do not have to be counted against those totals. The rules on subsidies in the Agreement on Agriculture as they are relevant to biofuels have been summarized in a recent document of the United States Department of Agriculture. This description is accurate and clear and so we quote it at length:

“The Uruguay Round Agreement on Agriculture (URAA) of the WTO established criteria for classifying programs that provide benefits to agriculture by how much they distort production and trade. The classification is important because programs that are deemed to be minimally or non-trade distorting (so-called green box) are not subject to annual limits on support as are programs that are classified as trade-distorting (referred to as amber box). The classification of measures as “amber box” (in which case they must not have the effect of causing the Member’s total support to exceed certain specified ceilings in the AoA) is supposed to be in the first instance based on notification by the subsidizing WTO Member. This kind of notification requirement has proven problematic; a notification of “amber box” measures amounts to an admission that the measures are subject to “amber box” disciplines; thus Members have an incentive not to notify and wait and see whether in fact their measures are challenged in dispute settlement. There is thus considerable uncertainty as to whether particular WTO Members are actually operating their agricultural support programs within these aggregate ceilings. In the case of biofuels there is particular uncertainty, because many support programs are structured not as support for individual agricultural *products* that fall under the AoA but to the biofuels *industry*; the question then is whether given these latter programs nevertheless *operate, at least in part*⁵⁰, so as to confer support to agricultural products that are covered by the AoA such that they may fall into the amber box. The complexity of this issue will be illustrated by some of the examples we go through at the end of this section. The stakes are considerable, as if a large number of these measures were considered to be “amber box,” the aggregate ceilings to which Members have agreed to might well be broken in certain cases, included those of the US and the EC.

To be classified as green box support, a program must meet two sets of criteria. The first are fundamental requirements that the program must be publicly funded, not involve transfers from consumers, and not have the effect of providing price support to producers. In addition to these fundamental requirements, a program has to meet specific policy criteria, which are contained in Annex 2 to the URAA (the green box). If a program does not meet both sets of criteria, it must be reported to the WTO as amber box (or possible blue box, but that option is not considered here).⁵¹

Annex 2 provides, *inter alia*, for green box treatment of subsidies for research and development and general services and infrastructure as well as environmental subsidies, but in each case there are certain exceptions. Support for research and other general services or infrastructure cannot take the form of direct payments to producers or processors, among other conditions. In the case of environmental subsidies, to qualify for green box treatment, “The amount of the payment shall be limited to the extra costs or loss of income involved in complying with the government programme.” This condition clearly permits subsidies that merely compensate consumers or users for the additional cost of switching from conventional to biofuels. It is to be noted also that Annex 2, paragraph 12, “Payments under environmental programmes”, specifically envisages that the “green box” would include environmental subsidies based on fulfillment “of conditions related to production methods and inputs.”

Green Box Criteria

To be classified as green box support, a program must meet two sets of criteria. The first are fundamental requirements that the program must be publicly funded, not involve transfers from consumers, and not have the effect of providing price support to producers. In addition to these fundamental requirements, a program has to meet specific policy criteria, which are contained in Annex 2 to the URAA (the green box). If a program does not meet both sets of criteria, it must be reported to the WTO as amber box (or possible blue box, but that option is not considered here).⁵²

Annex 2 provides *inter alia* for green box treatment of subsidies for research and development and general services and infrastructure as well as environmental subsidies, but in case there are certain exceptions. Support for research and other general services or infrastructure cannot take the form of direct payments to producers or processors, among other conditions. In the case of environmental subsidies, to qualify for green box treatment, “The amount of the payment shall be limited to the extra costs or loss of income involved in complying with the government programme.” This condition clearly permits subsidies that merely compensate consumers or users for the additional cost of switching from conventional to biofuels. It is to be noted also that Annex 2, paragraph 12 “Payments under environmental programmes” specifically envisages that the “green box” would include environmental subsidies based on fulfillment “of conditions related to production methods and inputs.”

Some Examples

In order to provide a more concrete sense of the issues that arise for biofuels subsidies under the legal provisions just described, we now proceed to work through some examples of different kinds of subsidy programs. We stress that the purpose of working through the examples is *not* to make a judgment as to whether any existing government program is WTO-illegal, which would require a comprehensive analysis of the facts specific to that one program, but rather to illustrate that different kinds of legal issues raised by different kinds of biofuel subsidies.

Subsidies on Production of Biofuels

These subsidies can include recurring payments based on the quantity of production (for example, 50 cents per each gallon of fuel produced) or non-recurring subsidizing of capital costs (physical plant, etc.) The federal government in the United States, for example, provides a Volumetric Tax Credit for biodiesel in the amount \$1.00 per gallon of biodiesel produced from virgin oils or fats and 50% from recovered oils and fats. The UK subsidizes the production of biofuel including biodiesel in the amount of about 36 cents per liter. Whether a production subsidy is delivered as a tax credit or a cash payment, there is clearly a “financial contribution” within the meaning of the SCM Agreement. In the case of taxation-based measures, the key question is whether the government has “foregone revenue otherwise due.” A tax credit by its very structure seems to meet this criterion. However, in the US-FSC case, the Appellate Body stressed that the SCM Agreement allows each WTO Member autonomy to establish the general principles and policies underlying its taxation system. In this light, if for instance, the US federal government replaced the tax credit with an environmental tax the amount of which was based on the environmental characteristics of each particular fuel, but was applied in accordance with a *general principle* of internalizing the environmental externalities from fuel consumption,⁵³ there might no longer be a “financial contribution” within the meaning of the SCM Agreement, despite the effect of ethanol producers getting a favorably differential tax treatment in relation to producers of dirtier fuels.

The second issue would be whether such subsidies confer a “benefit” in the sense of a competitive advantage that would not exist in a normal, or undistorted market. This is not an easy question: demand, supply and price of biofuels in global markets have been pervasively influenced by government interventions of many kinds. (In fact, this is true of fuel energy markets generally). But here it may be worthwhile to make a more general point: precisely because of the pervasiveness of such interventions, resort to dispute settlement in relation to such subsidies may not be a realistic option. As the Brazil-Canada⁵⁴ dispute over export subsidies to civil aircraft demonstrates, in a situation where everyone is subsidizing, bringing a claim against one country’s subsidies

may well trigger a counter-claim against one's own or a challenge to other measures that support the industry in question in the country bringing the original complaint. Resort to WTO litigation in such circumstances can actually lead to spiraling trade tensions as was the case with Brazil-Canada, rather than "settling" the dispute. The danger is that WTO members may well prefer not to come into compliance with dispute settlement panel findings incur retaliation.

Subsidies on Consumption of Biofuels

A good example of subsidies to consumption are the various exemptions from gasoline tax that EU Member states have granted to purchasers of biofuels, pursuant to the 2003 EU biofuels directive. By the terms of the directive, these exemptions are to be no greater than required to offset the additional cost of using biofuels rather than gasoline.

Here there is obviously a financial contribution within the meaning of the SCM Agreement as the government is forgoing revenue "otherwise due" under gasoline taxation policies. There are serious issues about whether the subsidy confers a "benefit" and whether it is "specific." This kind of subsidy is available throughout the economy, i.e. to *any* user of fuel and in fact is used throughout the economy. Therefore it is almost by definition not specific as long as we regard the beneficiaries of the subsidy as the consumers of fuel. This brings us to the question of "benefit": it is unclear that the direct users of the subsidy receive any benefit as the subsidy merely, in the sense of competitive advantage as the subsidy merely reduces the price of alternative fuel to the price of gasoline, and so does not provide any possibility of the user lowering its fuel costs *per se*.

What, however, if we were to view the subsidy as an upstream subsidy to biofuels industry; in that instance, it might be possible to characterize it as specific, depending on how diverse we regard the biofuels sector and the number of firms participating. The question would be then whether any "benefit" is conferred on EC biofuels producers, in the sense of a competitive advantage. To the extent that the tax exemption does not require that the biofuel being purchased be produced within the EC, it is difficult to see how it would afford a competitive advantage to EC producers of biofuels over producers in other WTO Members.

Subsidies on Feedstocks for Use as Biofuels Inputs

It is important to distinguish between subsidies that are provided to feedstocks as part of general programs of agricultural support and those that are targeted to that part of the production intended for biofuels use. In both the US and EU, inputs to biofuels are often subsidized in the former context. Such subsidies must conform to both the rules in the SCM Agreement and those in the AoA. From the perspective of understanding trade in biofuels, the interesting questions are whether under the SCM Agreement they could be regarded as downstream subsidies to biofuels producers, and whether under the AoA they could be considered "green box" subsidies.

On the first issue, one would have to ask whether given the nature of the downstream users, the subsidy is "specific" and whether those users actually receive a "benefit" in the sense of a competitive advantage. In the case of corn, for instance, subsidies that are part of general agricultural support programs potentially benefit a wide and very diverse variety of industries that use corn as inputs including the processed food industry, the alcoholic beverages industry, and the animal feed industry. Thus, considered as a "downstream" subsidy it would be hard to view such support as "specific" within the meaning of the SCM Agreement. As regards "benefit," *de jure* such subsidies are typically not restricted to production that is destined for exclusively domestic downstream users and so it is unclear that it creates a competitive advantage for domestic downstream industries over foreign industries producing like products. In practical terms, however, transportation costs and logistics may mean that only domestic downstream industries can use the subsidy and in such a case it might be possible to show that they receive a competitive advantage; again, in the *US-Softwood Lumber*⁵⁵ ruling, the Appellate Body emphasized that whether there is a benefit upstream or downstream requires a careful analysis considering all the facts in the case at hand, and that it should not be assumed that a benefit flows upstream or downstream; this has to be proven.

With respect to the second issue, whether a subsidy on production of feedstocks destined for biofuel use could qualify as "green box" based on environmental benefits, the AoA appears to limit such "green box" environmental subsidies to those that are intended to compensate a producer for the costs of complying with government environmental programs. The amount of the subsidy cannot exceed what is required to comply. Straight payments on production of feedstocks not linked to the fulfillment of any environmental mandate by the recipient of the subsidy would appear to be outside this rubric. Such payments would qualify as amber box payments and be subject to the overall limit agreed on for individual WTO members, and be subject to further reduction in case a Doha Round is concluded.

A different example of a subsidy on feedstocks is illustrated by the trend in both the EU and the US to allow the production of inputs for biofuels such as biomass on "set-aside land" - land in respect of which farmers receive payments in compensation for removing the land from use for the production of agricultural crops. The question is whether the production of biofuel inputs falls outside of the meaning of "marketable agricultural production" in paragraph 10 of Annex 2 of the AoA. On the one hand, clearly, the products are not destined for use as food or animal feed and are not marketed as agricultural products. On the other hand, because these products have multiple uses including food and feedstuff uses, such programs will at the margin affect the supply and price of the commodities in question in general, and thus at the margin have an impact on competition in the food and feedstuff markets for those crops. This would not be the case if the land were used for productive activity of a kind that did not yield a product one of the uses of which is clearly as an agricultural product. The fact that ethanol is considered a processed agricultural product in the HS system cannot be dispositive of this issue, because the HS classification of ethanol, as we have seen, fails to reflect or distinguish its use as a biofuel.

The case of farmers being permitted to grow switchgrass for production of ethanol on set-aside land may be somewhat easier; as switchgrass is not generally regarded as a "marketable agricultural product" itself, this is very likely to be consistent with the AoA

Another kind of measure is represented by the EC energy crop payment, introduced with the 2003 Common Agricultural Policy (CAP) reform. This is a payment to farmers in addition to payments that are decoupled from production and thus clearly "green boxed" under the AoA. Since the additional payment is not "decoupled" but rather is based on the amount of land which is used to produce energy crops, the question arises how it should be notified to the AoA; i.e. whether it is green, blue or amber box support. Perhaps the EC might respond that the payment is intended not to increase the total amount of land in production but rather to encourage a shift in production to energy rather than food and feed uses and thus is in the spirit of "decoupling."

Subsidies to By-products Created in the Manufacturing of Biofuels

The biofuel production process results in the creation of by-products that are commercially valuable and in fact form an important component of a plant's income. The production of biodiesel for example yields significant quantities of glycerol. One question here is whether subsidies paid on the production of the fuel could be regarded as "passing through" to producers of glycerol. The Appellate Body has stressed that the meaning of "benefit" is a competitive advantage and not merely a financial advantage. Any competitive advantage in glycerol would flow from the inherent fact of producing ethanol; thus, a non-subsidized ethanol producer would enjoy the same advantage. Thus, there is a good argument for viewing the subsidy as fully "consumed" by the ethanol production itself; i.e. the benefit received is fully accounted for in terms of its competitive impact on the production of ethanol. This would be consistent with the position of the Appellate Body in *Softwood Lumber* that the benefit to the upstream or downstream industry must not be presumed and must be separate from the benefit provided to the product that is the target of the subsidy program. (It is to be noted that, in *Softwood Lumber* the US argued strenuously that the log processing and lumber industries in Canada were largely vertically integrated in the same enterprises but this did not deter the Appellate Body from requiring that a separate and distinct benefit to the lumber industry be demonstrated).

An increased production of biofuels leads to an increased production and possibly surplus of by-products. Rapeseed crushing results in 60 percent meal and 38 percent oil, and the EU has seen a tremendous growth of rapeseed meal as a result of its biodiesel production. Similarly, US ethanol production from corn has led to an increase of distillers dried grain and distillers dried solubles. While the expansion of the biofuels industry in both the EU and US is unlikely to be able to meet domestic demand, the increases in by-products, however may overtake domestic demand for such products. A sharp increase in rapeseed meal production, leading to a reduced price of rapeseed meal, may lead in turn to pressure on producers of soybean meal, even though rapeseed meal has a lower protein content. This could thus have a negative impact on the EU soybean crushing industry and lead to a reduction in meal imports. Moreover, such surpluses of what could arguably be considered “cross-subsidized” by-products could lead to increased exports and the displacing of other meal providers and possibly to queries about their WTO compatibility.

Domestic Regulations/Standards and WTO Law

The third set of WTO issues that arise in the biofuels sector pertain to domestic regulations and standards.

From the beginning of the post-war multilateral trading system, it was recognized that negotiated tariff reductions and disciplines on other “border” measures (such as quotas or bans on the import and export of particular products: GATT Article XI) could be undermined by internal policies of governments. As tariffs were progressively reduced over rounds of negotiations, increasingly trade disputes became focused on internal policies (technical regulations, subsidies, government procurement practices, etc.) that restricted market access or altered the competitive relationship between domestic and imported products in favor of the former. Many new legal disciplines were introduced to address these policies where they had trade effects.

But disciplining internal policies in a multilateral system to which states with many different political and social systems adhere is a complex and sensitive matter. Such policies usually serve legitimate governmental objectives. On the other hand, they may be more trade-restrictive than necessary to achieve those objectives, and in some cases are intentionally designed to advantage domestic interests. In legislating and regulating, governments, particularly in pluralist liberal democracies attempt to balance the interests of diverse constituencies. Often public policies serve multiple objectives and reflect compromises between different groups. In such circumstances, it is not simple to draw a line between internal policies that are legitimate exercises of domestic regulatory autonomy (even if they have some trade-restrictive effects) and those that can be considered a form of protectionism or “cheating” on the WTO bargain, in that they undermine the market access reasonably expected from commitments on liberalization of border measures in the multilateral trading system. The difficulty of such line drawing accounts for the complex and messy picture that we are about to paint.

A Roadmap to the Treatment of Non-Tariff Measures in WTO Law

The cornerstone of the WTO approach to internal policies is the principle of non-discrimination. This principle is embedded in Articles I and Article III of the GATT. We have already discussed the Most Favoured Nation obligation (MFN) in connection with tariffs. This obligation also applies with respect to internal policies and extends to all imports from WTO Members, regardless of whether there has been a tariff binding in the WTO on the product in question. Article III established the so-called *National Treatment* obligation of non-discrimination as between domestic and imported products. This obligation, as we shall see, is framed in somewhat different terms for fiscal (Article III:2) and non-fiscal (Article III:4) measures. Not all taxation measures are the subject of Article III:2, which deals with National Treatment in taxation of products. Tax breaks for research and development, for instance, might well constitute subsidies within the meaning of the WTO Subsidies and Countervailing Measures (SCM) Agreement, if these measures are based on the government forgoing revenue that is “otherwise due.” In addition, as is illustrated by the *US-FSC* case, income taxation rules may violate National Treatment with respect to non-fiscal internal measures (Article III:4) of GATT if those rules result in a denial of equal competitive opportunities to imported “like” products.

Subsidies paid to producers of a product and government procurement measures are exempted from the National Treatment obligation. Subsidies are the subject of complex disciplines set forth in the specialized WTO Agreement on *Subsidies and Countervailing Measures (SCM)*. In addition, subsidies on agricultural products (and certain other internal measures on these products) are addressed in the *Agreement on Agriculture* (we have above discussed the issue of which biofuels fall under the *Agreement on Agriculture*).

In addition, the *Technical Barriers to Trade (TBT)* Agreement applies to a wide range of internal regulations that stipulate legally required characteristics of products, including their related processing and production methods (PPMs). The TBT agreements supplement the non-discrimination obligations in the GATT by requiring that WTO Members use international standards as a basis for such internal regulations, where available, effective and appropriate; as well, this Agreement requires that such internal regulations be the least-trade-restrictive necessary to achieve their legitimate objectives. The *Sanitary and Phytosanitary Measures (SPS)* Agreement applies almost exclusively to regulations that address certain kinds of risks posed by the importation of food and agricultural products. This Agreement also places some emphasis on use of international standards but unlike the TBT it also requires that, except for certain provisional measures, SPS measures be based on scientific principles and evidence and be supported by risk assessment.

Government procurement is addressed in a rather different kind of treaty, the WTO *Government Procurement Agreement (GPA)*; the GPA does not bind all WTO Members but only those who choose to adhere to it, and individual signatories may take reservations, or limit their obligations exempting entire areas of procurement policy, which, for example the United States has done extensively.

Internal Taxation Measures

As noted in the Roadmap above, The GATT, in Articles I (MFN) and III (National Treatment) establishes the basic principle of non-discrimination with respect to internal regulations. Thus, Article I requires that internal regulations not provide less favorable treatment to imports from some WTO Members relative to “like products” of other Members, such that there is discrimination on the basis of which WTO Member the imports are coming from. Article III:2 of GATT governs the internal taxation of products by WTO Members; as interpreted judicially, it contains two distinct obligations: 1) the obligation to tax identically “like” imported and domestic products; 2) the obligation that taxation on “directly competitive or substitutable products” not be “dissimilar” in such a way as “to afford protection to domestic production.”⁵⁶ The assessment of whether two products are “like” or “directly competitive or substitutable” has been held judicially to be a matter of case-by-case examination of the facts, weighing all relevant evidence; the WTO Appellate Body has approved a technique of assessing both “likeness” and whether products are “directly competitive or substitutable” that consists in examining the factors enumerated in a GATT policy document, *Border Tax Adjustment* (Report of the Working Party, adopted on 2 December 1970) namely physical characteristics, end uses, and consumer habits. In addition, customs classifications may also be probative. The issue of whether two products are “directly competitive or substitutable” sounds like a matter of economic analysis, the Appellate Body (*Korea-Alcoholic Beverages*) held that the relevance of common-sense judgments about how consumers behave and about the end uses of the product as well as empirical economic studies concerning the willingness of consumers to switch from the one product to the other if the relative prices of the two products change (so-called cross-elasticity of demand). According to the Appellate Body, like products are a smaller sub-set of the universe of “directly competitive and substitutable products.” Thus for an imported and domestic product to be “like”, they must at a minimum be “directly competitive and substitutable” but have some particularly close affinity or similarity, judged on considerations such as physical characteristics.

While explicitly or facially discriminatory measures are almost certain to violate Article III:2, this provision also is generally understood to extend to de facto, or disparate impact, discrimination the meaning of which remains, however, not well defined and controversial in WTO law and policy.

Consider for example, mandates or differential taxation that do not explicitly favor domestic *producers* but rather *particular* biofuels or feedstocks in which domestic producers have a comparative advantage. An example is the US excise tax credit for fuel ethanol, which applies to both domestic and imported ethanol. Foreign producers of biofuels other than ethanol might argue that their own products are “like” or “directly competitive or substitutable.” However, there are significant differences in physical characteristics and uses and performance that distinguish ethanol from biodiesel, for example, making it improbable that the products in question would be found to be “like” or directly competitive or substitutable.” So at least in this kind of case, it may be possible to avoid controversies over the exact scope and meaning of de facto discrimination by simply applying to the particular facts about the products being considered the tests already developed by the Appellate Body for determining whether products are “like” or “directly competitive or substitutable.”

Non-Fiscal Internal Measures

Article III:4 of the GATT sets out the National Treatment obligation with respect to non-fiscal internal laws, regulations and requirements. Such non-fiscal measures must accord no less favorable treatment to imports than to “like” domestic products. The determination of whether a measure is in violation of Article III:4 entails two distinct steps. The first is to ascertain whether the imported product and the domestic product are “like.” The analysis of likeness under Article III:4 entails a weighing and evaluation of the same kinds of factors as is the case for fiscal measures—including physical characteristics, end uses, and consumer habits—with the possibility that other factors may, in certain cases, also be probative of likeness (*EC-Asbestos*). If indeed the domestic and the imported product are determined to be “like”, the adjudicator will proceed to the second step of determining whether the regulatory distinction between the two products results in less favorable treatment of imports (*EC-Asbestos; Korea-Beef*).

Since the relative cost of producing a product to a given regulatory requirement or standard will vary among producers from different WTO Members, there is a risk that regulations or standards could be intentionally or inadvertently formulated so as to discriminate against imports in favor of domestic products or in favor of imports from particular WTO Members. At the same time, any standard or regulation is likely to benefit some producers and burden others, an inevitable and innocent effect of the given relative costs of compliance among different producers.

In the case of biofuels, there is a wide range of internal regulations that may impact trade:

- mandates to use particular percentages or quantities of biofuel either in fuel blends or for specific purposes (such as bus or taxi fleets);
- restrictions or limits on the amount or kind of biofuel that can be contained in a blend with conventional fuel;
- specifications of the properties or performance characteristics of particular biofuels or the materials they must be derived from;
- labeling for consumer protection and information purposes;
- health and safety regulations concerning the handling and transportation of particular biofuels or inputs required for the processing of biofuels, and related specifications for processing plants; and
- broad environmental performance requirements related to the entire life-cycle of the product, including the sustainability of the agriculture used to produce the feedstock from which the biofuel is processed.

As the Appellate Body has emphasized, the fact that two products are “like” does not mean that governments are simply forbidden from making regulatory distinctions between them. The obligation in Article III:4 is not one of identical treatment of “like” domestic and imported products, but no less favourable treatment. Thus, the panel in the EC-Biotech case found that, even assuming that GMO products were like non-GMO products the distinctions in regulatory treatment between GMO and non-GMO products in

the European Community did not constitute “less favourable” treatment of imported products, since the distinctions were not biased against imports as opposed to domestic products (i.e. EC GMOs). According to the panel: “We note that Argentina does not assert that domestic biotech products have not been less favourably treated in the same way as imported biotech, or that the like domestic non-biotech varieties have been more favourably treated than the like imported nonbiotech varieties. In other words, Argentina is not alleging that the treatment of products has differed depending on their origin. In these circumstances, it is not self-evident that the alleged less favourable treatment of imported biotech products is explained by the foreign origin of these products rather than, for instance, a perceived difference between biotech products and non-biotech products in terms of their safety, etc. In our view, Argentina has not adduced arguments and evidence sufficient to raise a presumption that the alleged less favourable treatment is explained by the foreign origin of the relevant biotech products.”(Paragraph 7.2505)

Based on the case law on Article III of the GATT, there is little question but that mandates *that explicitly or facially discriminate* in favor of domestic products over imports, for instance through requiring that the mandate be fulfilled in whole or in part using domestically-sourced biofuels would violate Article III:4 of the GATT. Similarly, a tax concession with respect to biofuels either in general or a particular fuel or fuels would violate Article III:2 both the first and second sentences of Article: III:2 if the concession depended upon purchasing domestically-produced fuel. Similarly, mandates or tax concessions linked to the feedstock used in the production of biofuels being produced domestically would also violate respectively Article III:4 and Article III:2. In this latter case, the discrimination would exist both against foreign producers of biofuels (who may be forced to use either costly feedstock from the importing country for the fuel to qualify for the mandate or concession with the likely result that they cannot economically sell fuel into that market) as well as foreign producers of feedstock itself.

Environmental Sustainability Standards

A complex set of issues is also posed by mandatory or tax concession-linked conditions concerning the environmental performance of particular biofuels. To illustrate, we shall take three stylized or hypothetical examples of possible environmental performance conditions:

- conditions that address the environmental impact of biofuels in the country of import;
- conditions that seek to maximize the contribution of biofuels to reducing carbon emissions and thus look to the net effects of a particular fuel on carbon emissions throughout its entire life-cycle, including carbon emissions in the production or processing of the fuel and the feedstock inputs;
- conditions that go beyond carbon emissions to promoting sustainable agriculture in the country producing the feedstock for the biofuel.

The first kind of environmental measure is unlikely to violate the GATT National Treatment obligation, assuming that it is not drafted or structured in such a way as to be more burdensome on foreign than on domestic producers. The difference in environmental impacts in the importing country would normally be traceable to some physical difference in the products in question, could well affect end-uses, and may also be a concern to consumers. Thus, applying the approach of the WTO Appellate Body in the *Asbestos*⁵⁷ case, the product complying with conditions that relate to post-import environmental impacts may well be found “unlike” a non-compliant imported product. The second kind of measure, to the extent that it concerns itself with environmental impacts from the process of production in the exporting WTO Member of export or some third country WTO Member producing inputs, for example, raises the issue of the so-called product-process distinction — the notion, reflected in the infamous unadopted *Tuna/Dolphin*⁵⁸ GATT panel rulings, that the GATT does not permit differential treatment of products based on their method of *production* as opposed to their properties as products for *consumption*.⁵⁹ Without rehashing this controversy here, we note to begin with that the approach to “likeness” and “directly competitive and substitutable” articulated by the Appellate Body does not predetermine a conclusion one way or another concerning methods of production. The AB has emphasized (*Japan-Alcohol*⁶⁰ and *EC-Asbestos*) that factors *other* than those contained in *Border Tax Adjustment* may, in an appropriate case, be dispositive of whether two products are “like” or “unlike.” The Appellate Body has

also emphasized the need for the adjudicator to examine *all* relevant factors in a given case and context, and to consider *all* the evidence pointing either in the direction of a finding of “likeness” or otherwise.

Carbon emissions, given their greenhouse gas effects, are clearly a global environmental problem and to the extent that it is this global problem that a WTO Member is addressing in its environmental regulations on biofuels it would be illogical not to take into account the overall impact of a particular fuel throughout its lifecycle on global carbon emissions. This is not a matter of unilateralism or interference with the local or domestic policies of another WTO Member, concerns that motivated the idea of the product-process distinction. Moreover, there are international standards, promulgated in the International Organization for Standardization (ISO), for the life-cycle approach to environmental management. The focus is on an objective analysis of the product itself and its history not the policies, practices, and priorities of the Government of some other WTO Member.

A third type of environmental performance measure would impose conditions related to the sustainability of the production of the feedstock from which the biofuel is produced. This could range from labor and social effects to deforestation, fertilizer use and habitat protection.⁶¹

Mandatory sustainability criteria are under active policy discussion in many jurisdictions particularly in the EU. For example, in the Netherlands a new policy discussion document, downloadable (at: <http://www.vrom.nl/pagina.html?id=2706&sp=2&dn=w690>) from the Ministry of Housing and the Environment (VROM) “Criteria for duurzame biomassa productie” [Criteria for Sustainable Biomass Production] by the Projectgroep Duurzame productie van biomassa [Project Group for Sustainable Production from Biomass], August 2006, is circulating that deals with all of the measures in our hypothetical case. In the case of our first hypothetical example, the key question in terms of compliance with WTO regulation is whether or not the measure is drafted or structured in such a way as to be more burdensome on foreign than on domestic producers. In the case of the mandate of the Dutch Project Group for Sustainable Production of Biomass they state that the term “import” was specifically deleted from their mandate and that what is important is that the criteria will be applied equally to biomass “...of Dutch, EU or non-EU origin.⁶²”

In our second hypothetical example of possible performance conditions we look at those that seek to maximize the contribution of biofuels to reducing carbon emissions and thus look to the net effects of a particular fuel on carbon emissions throughout its entire life-cycle, including carbon emissions in the production or processing of the fuel and the feedstock inputs. Here the Dutch Project Group places greenhouse gas issues as the very first criterion and they recommend as the criterion, “Net emission reduction compared with fossil reference, inclusive of application, is at least 30%. Here a strong differentiation of policy instruments is assumed, in which for instance a better performance would lead to more financial support.” To support this criterion they suggest the use of testing using approved methods of calculation and standard values for the various steps in the production/supply chain.⁶³ Here again, we see that the Dutch are careful to emphasize the application of objectively verifiable standards, using stakeholder approved testing procedures. Insofar as the Dutch approach rests on applying these standards and tests to all parties equally based on a concern for the environment, the Dutch approach would seem to adhere closely to our hypothetical example.

Our third, and last hypothetical example concerns performance conditions that go beyond carbon emissions to promoting sustainable agriculture in the country producing the feedstock for the biofuel or the biofuel itself. As previously suggested, these performance conditions might include labor and social effects, deforestation, fertilizer use and habitat protection. Here we find that the Dutch report goes into considerable detail with all of the above issues. Labor and social effects are addressed in terms of minimum internationally acceptable labor standards, human rights issues (particularly those of the local population in the producing area(s)), the specific rights of local populations (including ongoing reporting on the social impact of biomass production) and property rights and rights of usage as well as addressing the need for companies involved in the supply chain to comply with international anti-bribery measures. Not only are deforestation and fertilizer use discussed but also surface and groundwater issues with an eye to sustainable water management practices.

Habitat issues, beyond fertilizer and water, in the Dutch report include erosion control, waste management and emissions, as well as the overall issue of all types of agro-chemicals beyond fertilizer use. Finally, the Dutch look at such criteria as:

- Biomass production as a competitor to the production of food, medicines and building materials;
- Biodiversity. The production of biomass should not reduce local and regional biodiversity; and
- Economic Prosperity – the production of biomass is not to adversely impact local and regional prosperity.⁶⁴

Based on the Dutch example it is clear that the hypothetical issues previously examined are rapidly transitioning to the domain of public debate and input into the policy process. A further current example can be found next door to the Netherlands in Germany, where there is, at the time of writing, active discussion as to the means by which various tropical oils are produced (especially palm oil) with particular concern expressed about de-forestation and carbon issues.

The question here may be to what extent are there objective norms, criteria and methods for evaluating the relationship of a particular product to sustainability as opposed to judging the policies of particular countries? The more remote the distinguishing conditions in the scheme are from features (albeit non-physical) that consumers can associate, if properly informed, with a particular product, the more probable the WTO adjudicator will find that the products themselves are “like.”

However, even if there is a finding of “likeness” this, of course, will not be dispositive of whether there is a violation of National Treatment; the complainant would also have to establish that the “like” imported product has been afforded less favorable *treatment* than the domestic product. As the Appellate Body has emphasized, not all differences in treatment lead to a conclusion of less favorable treatment of the group of imported like products as a whole when compared with the group of domestic products as a whole.

Where the differences in treatment derive from norms, criteria and methods widely accepted in the international community and which have been developed through broad consultation among diverse states, and take into account the variety of conditions in different countries, it should be considerably more difficult for the complainant to establish that there is an overall bias against imports as a group. This suggests that it may be worth giving serious consideration to the recommendation of the WorldWatch study that international sustainability criteria be developed, although given the many views on what such criteria should encompass, consensus would likely be difficult to reach. At the same time, an international consensus on core criteria might not preclude individual countries imposing additional criteria provided those are based upon established methodologies (such as life cycle product analysis) and on concerns that are supported by international norms such as those on sustainable development reflected in various international legal and policy instruments.

Exceptions from the Rules on Internal Policies

In the case of the GATT, the evaluation of the legality of an internal policy entails not only a consideration of whether the policy is consistent with the non-discrimination requirements in Articles I and III (MFN and National Treatment) but also whether, even if inconsistent, it can nevertheless be justified under the General Exceptions provision (Article XX). This provision “saves” measures that would otherwise be GATT-illegal if they serve certain defined public policy objectives, which include the protection of human life and health (XX(b)) and the “conservation of exhaustible natural resources.” (also XX(b)) As interpreted in WTO jurisprudence, the chapeau or preamble paragraph of Article XX requires that measures maintained under Article XX be applied in an objective, transparent, non-arbitrary and non-protectionist manner. Some of the other Agreements, such as the GPA also have exceptions like these; many have narrower or more specific exceptions for particular types of policies, for example some non-trade-distortive, or minimally distortive agricultural subsidies are carved out from the disciplines of the Agreement on Agriculture (the

so-called Green Box). As a general rule, the various WTO Agreements apply concurrently, so the same measure, or different aspects of it, may be subject to challenge under more than one Agreement at the same time.

There is a possibility that mandates that explicitly favor domestic producers of fuel and/or feedstocks could be justified under the General Exceptions in Article XX of the GATT or the National Security Exception in Article XXI. In the *S.D. Myers* case⁶⁵, an investment dispute under the North American Free Trade Agreement, Canada sought to justify a measure that prevented the processing of Canadian waste by US waste disposal companies on grounds that Canada needed to ensure the viability of a domestic industry for hazardous waste processing in order to fulfill its obligations under the *Basel Convention on the Transportation of Hazardous Wastes*. While the panel in that case did not accept Canada's argument on the facts of that particular dispute, this general kind of argument might well be made with respect to biofuels.

Under XX(b) it would be necessary to demonstrate that there is a real health risk and that the measures in question are either an indispensable means of addressing the risk or 1) that there is a close connection between the measure and solving the health risk and 2) the trade restrictive impact is not disproportionate to the contribution of the measure to addressing the risk (*EC-Asbestos, Korea-Beef*⁶⁶).

A condition of maintaining measures based on an Article XX justification is that they might be applied so as to constitute unjustifiable or arbitrary discrimination between countries where the same conditions prevail or a disguised restriction on international trade (this is based on the "chapeau" or preambular paragraph of Article XX). This condition, it must be emphasized, deals only with application through administrative or judicial action, not the scheme as such (*US-Shrimp*⁶⁷, *US-Shrimp 21.5*⁶⁸). Unjustifiable discrimination may result from the application of a scheme being rigid and unresponsive to *different* conditions in *different* countries. Arbitrary discrimination may occur if there is a lack of due process and transparency in the manner in which the criteria of the scheme are administered, and if there are discriminatory effects on foreign interests (*US-Shrimp*). There is a lack of clear judicial guidance so far on the meaning of "disguised restriction on international trade" (*US-Reformulated Gasoline*⁶⁹).

Article XX(g) permits otherwise GATT inconsistent measures that are "in relation to the conservation of exhaustible natural resources." A specific condition of Article XX(b) is that the trade measures to be justified must be taken in tandem with comparable measures on production or consumption that apply to the domestic market (even-handedness). The air is an exhaustible natural resource according to GATT/WTO jurisprudence. As a general matter, the meaning of "exhaustible natural resources" is to be guided by emerging legal and policy norms on sustainable development and biodiversity (*US-Shrimp*). Unlike with XX(b) where the connection between the measure and its aim is expressed by the term "necessary" leading to the requirement that the measure either be indispensable or have a close connection to its aim and a not disproportionate trade impact, the language "exhaustible natural resources" expresses the concept of a rational nexus between the measure and its aim, a "real" connection. (*US-Shrimp*) Additionally, the measure must not be disproportionately wide in reach or scope (*US-Shrimp*). To the extent that ensuring an adequate supply of biofuels is directly related to the "conservation of exhaustible natural resources," the language of XX(g) of the GATT, or necessary to the goal of protecting human life and health - XX(b), and to the extent that such a supply is not securely available from non-domestic sources, the argument has some plausibility. It would certainly be more debatable; however, whether discriminatory measures of this kind, as opposed to subsidies and non-discriminatory mandates, are really needed to create a viable domestic industry and even more debatable whether they could be justified once one is no longer dealing with an infant industry. Also, Article XX(j) of the GATT provides an exception for measures "essential to the acquisition or distribution of products in general or local short supply." Finally the National Security Exception in Article XXI of the GATT provides, in part that "Nothing in this Agreement shall be construed...to prevent any contracting party from taking any action which it considers necessary for the protection of its essential security interests ... taken in time of war or other emergency in international relations." It is not implausible to characterize the current global situation as one of a "time of war or other emergency in international relations." Many commentators from different countries and perspectives have

made such a characterization. Moreover, the United States has taken the position that the expression “considers” in Article XXI makes this exception largely self-judging and that the WTO dispute settlement organs do not have the jurisdiction to second-guess a WTO Member’s judgment about what it “considers necessary for the protection of its national security interests. It is widely acknowledged that energy security is a vital dimension of National Security generally.

While there is still considerable opinion—not well supported by the emerging Appellate Body jurisprudence, as we have argued above—that the product-process distinction would necessarily prevent a conclusion that products are “unlike” due to their production processes in the exporting WTO Member (a particularly important issue in the case of sustainability criteria for imports of biofuels as is being considered in some European countries), the outcome of the *US-Shrimp* case leaves no doubt that the PPM-based nature of an environmental measure is not a bar to its justification under Article XX; indeed, in this case the Appellate Body went so far as to hold that, in principle, Article XX allows WTO Members to condition imports on the actual policies of other WTO Members. Nevertheless, a measure that imposes purely domestic criteria on the importing state without consultation or consideration of the different conditions on the territory of that state, may well run afoul of the chapeau of Article XX, in particular the requiring that a measure not be applied so as to create arbitrary or unjustified discrimination.⁷⁰

The Technical Barriers to Trade Agreement (TBT)

The TBT goes beyond the non-discrimination norms of GATT Article I and III:4 in its discipline of internal regulations. Most notably, the Agreement admonishes WTO Members to use “international standards” as a basis for their technical regulations, where possible (2.4), and insists that such regulations not create unnecessary obstacles to international trade, meaning that they be more trade restrictive than necessary to fulfill a legitimate objective, which may include protection of human health or safety or the environment, *inter alia* (2.2). There is a rebuttable presumption (2.5) that a measure adopted or applied for one the explicitly mentioned legitimate objectives in 2.2 fulfills the “least trade restrictive” requirement of 2.2 where it is “in accordance with international standards.”

The TBT Agreement applies to mandatory measures that specify the characteristics of products and their “related processes and production methods (Annex 1:1).” The TBT Agreement also contains a code of good practice urging WTO Members to examine voluntary standards including those established by non-governmental bodies within their jurisdiction.

Generally speaking, international standards have not yet been developed for biofuels, although components of standards promulgated by domestic or European standards bodies or authorities may reference international standards, such as ISO standards in relation to testing of certain characteristics of substances. In the absence of such international standards, certain non-discriminatory domestic regulations (*i.e.* consistent with MFN and National Treatment obligations of the GATT) may be challengeable as creating unnecessary obstacles to trade in biofuels.

For example, Coehlo suggests that there are trade-restrictive effects to internal regulations that limit the percentage of biofuel in blends “often based on not entirely justifiable environmental reasons.”⁷¹ Significantly, as part of its proposed biofuels strategy, the European Commission will this year review the Fuel Quality Directive, which “establishes specifications for petrol and diesel, for environmental and health reasons, *e.g.* limits on the content of ethanol, ether and other oxygenates, as well as standards that limit the amount of biodiesel in diesel fuel to 5% in volume terms.⁷² The implication is that, perhaps particularly in light of changes in engine technology and the experience of other jurisdictions with higher limits for blends, the current EU limits may be more than what is strictly justified in order to address legitimate technical environmental or health concerns.

The EU biodiesel standard, while not premised on the use of rapeseed oil, might as well be premised on it – Biodiesel norm, EN 14214 ‘Automotive Fuels – Fatty Acid Methyl Esters (FAME) for Diesel Engines – Requirements and Test Methods,’ provides specifications for 100% biodiesel used as fuel in transport sector. See Rabobank, Biofuels in the EU: “There is no obligation to use rapeseed oil as the basis for biodiesel production. Since the specifications and test methods are based on its properties, however, that is what producers have done; using an alternative oil involves investing in R&D to create a biodiesel that would still qualify for the norm.” The EU norm does not specify the properties for blends with fossil diesel, but blends of up to 5% are permitted without special labeling. Rabobank states that, “This percentage was approved by the car industry as an acceptable limit for guaranteeing the quality of biodiesel and its use in normal car engines. Blends with a higher percentage of biodiesel must be clearly labeled since they might require modification of the car engine to ensure that their use does not interfere with the manufacturer’s engine warranty.” To avoid curtailing imports, the EU may need to rethink both the standard and the blending percentage, while ensuring that concerns over automotive engines are addressed.

The Sanitary and Phytosanitary Measures (SPS) Agreement

The SPS Agreement applies to internal regulations that address certain risks arising from trade in food and agricultural products. Where regulations are addressed to these risks the provisions of SPS apply in addition to the rules in the GATT, but the TBT Agreement does *not* apply. The recent WTO dispute between the EC and the United States on biotechnology (GMOs) raised the issue of whether both the SPS and TBT Agreements could apply to the extent that an internal regulatory scheme addressed itself both to the risks to which SPS applies as well as to other public policy goals. The leaked preliminary ruling of the panel in that the case gives a confused but largely affirmative answer: in effect, the same regulatory scheme may be viewed in different aspects as a TBT and an SPS measure. This is a not an unimportant legal question in the case of biofuels for regulations that deal with environmental, health and safety considerations concerning biofuels and their feedstocks may well address both SPS risks and non-SPS risks.

For instance, risks to which the SPS Agreement applies include “risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms” and “risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs.” (Annex A) Some of these risks could clearly arise from the international trade and transportation of feedstocks for biofuels, including biomass or biowaste. As a matter of internal regulation, some jurisdictions apply food safety regulations to the transportation of certain biofuels as the substances, despite their use as fuel, correspond to definitions of foodstuffs in domestic law. Biomass may fall within legal definitions of waste and therefore be regulated in those terms without regard to the different risk management issues that arise from the fact that the material is not entering the jurisdiction to be disposed of as waste but to be transformed into or used for fuel.

The SPS Agreement, like the TBT Agreement, contains a requirement that mandatory regulations be the least trade restrictive to achieve the legitimate risk management objectives in question. But the SPS Agreement goes beyond the TBT Agreement in requiring that where an SPS measure does not “conform” to international standards, regulations be based on sufficient scientific evidence and be rationally related to a risk assessment in accordance with scientific principles and methods.

To the extent to which certain WTO Members may wish to regulate or prohibit the use of genetically-modified feedstocks for the production of biofuels sold in their jurisdictions, the outcome of the current EC-US dispute over GMOs under, as mentioned, both SPS and TBT, may well be important. There are important issues in that dispute concerning the extent to which a WTO Member may nevertheless regulate in a precautionary fashion, where existing risk assessments have methodological limitations or defects that limit the value of their conclusions that risks are not present or are minimal.

Government Procurement

Government procurement regulations and policies exist at various levels of government and in a number of different countries that either mandate or permit government purchasing decision-makers to give preference to biofuels and biofuel-powered vehicles. For example, according to the CRS Report for Congress, Agriculture-Based Renewable Energy Production “Biodiesel is increasingly being adopted by major fleets nationwide. The U.S. Postal Service, the U.S. military, and many state governments are directing their bus and truck fleets to incorporate biodiesel fuels as part of their fuel base”⁷³ Many jurisdictions, including the US and the EC have general requirements that decisionmakers take into account environmental effects, energy efficiency or whether an energy source is renewable, in their purchasing decisions.⁷⁴

The following WTO Members adhere to the Government Procurement Agreement (GPA): Canada, European Communities (including its 25 member States: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom), Hong Kong China, Iceland, Israel, Japan, Korea, Liechtenstein, Netherlands with respect to Aruba, Norway, Singapore, Switzerland, and the United States. The extent to which national, sub-national and local procurement preferences related to biofuels are disciplined by the GPA in the case of WTO Members who adhere to it is determined by the coverage set out by each individual Member in its appendices to the GPA. In many instances, particular governmental authorities, or all governmental authorities at the sub-national or local level are included; for example, in the case of the United States, only a select sub-set of state governments are included in the coverage. Particular kinds of procurement or policies may be exempted or excluded entirely. Most relevant to the biofuels context is, for example, the EC exclusion of “for the purchase of water and for the supply of energy or of fuels for the production of energy” by a range of procurement entities, as well as the exclusion of “procurement of agricultural products made in furtherance of agricultural support programs and human feeding programs” and procurements by some procurement entities in connection with activities in the fields of drinking water, energy, transport or telecommunications.

Where the GPA does apply to a particular level of government as well as the particular entity engaged in acquiring fuel and vehicles, and where there is no fuel- or energy-related exclusion in the purchasing WTO Member's appendices, several of the GPA disciplines may be relevant to biofuel-related preferences. First of all, the GPA contains a National Treatment obligation, worded rather differently than that in Article III of the GATT, in that instead of referring to the concept of like or directly competitive or substitutable products, it requires instead “treatment no less favorable” to the products, services and suppliers of other Parties, than “that accorded to domestic products, services and suppliers.” There is no case-law so far applying the GPA and so it is impossible to say whether this wording difference would result in a different reading of National Treatment under the GPA than the GATT. But the absence of a comparator such as “likeness” would seem to place the focus more squarely on whether there is national-origin based discrimination-i.e. on whether the measure is directed to treating imports or foreign suppliers less favorably than domestic products or suppliers. Thus, as the EC-Biotech panel emphasized, as we noted in the discussion above of Article III:4 of the GATT, the issue would be whether the regulatory distinctions in question are based on non-national-origin related considerations or whether they directly or perhaps indirectly discriminate on the basis of national origin (again the issue here of indirect or de facto discrimination would be similar to that discussed above under Article III of the GATT). The GPA also contains provisions requiring that procurement specifications be based on international standards where available and if not on national technical regulations. There is also an obligation to prefer performance-based specifications as opposed to specifications of characteristics (such as chemical composition, for instance). However, this falls short of a requirement that all procurement specifications must be performance based.

A further provision of the GPA stipulates that “any conditions for participation in tendering procedures shall be limited to those which are essential to ensure the firm's capability to fulfill the contract in question.” This provision has been interpreted by some commentators to exclude non-economic (by which is often meant environmental and social) criteria as conditions for the award of procurement contracts.⁷⁵ However, it should

be first of all noted that this provision is about the qualifications of suppliers to fulfill a contract for certain goods and services; it is not about how the goods and services themselves are specified in the contract; this later issue is covered by a different provision of the GPA, to which we have already alluded, which allows the procuring authority to define the technical specifications of the contract, subject, as noted to the requirement to use international standards or national technical regulations, to prefer performance-based criteria, and further to the requirement that the specifications not constitute “an unnecessary obstacle to trade.” Thus, when a government in a tender for vehicles specifies that the vehicles must be equipped with engines that can run on biofuels, for example, it is giving a technical specification for the contract itself, it is not imposing a qualification on the supplier. Anyone who can supply such vehicles according to the contractual description is eligible to bid. Similarly, when a government contracts for transportation services (school bus services etc.) and specifies in the contract that the vehicles used by the service contractor in the performance of the contract must run on biofuels, it is stipulating a characteristic of the service being purchased and not imposing a qualification on a supplier; again, any service supplier who can meet that characteristic is eligible.

A rather different situation would exist if a government wanted to condition the award of the contract on the supplier’s overall performance with respect to use of biofuels, i.e. even outside the actions needed to perform the contract. Thus, to take a hypothetical case, let us say that a government limits bidding on courier services to companies that, in all their global operations, use only vehicles running on biofuels. This, arguably, goes beyond a technical specification of the actual good or service being contracted for. Nevertheless, as McCrudden points out, the GPA does not limit the terms of the contract to technical specifications; thus, the language “essential to ensure the firm’s capability to fulfill the contract in question” begs the question of what the “contract” is. For example, if the “contract” stipulates that a courier company supplying services to the procuring authority must use only biofuel-powered vehicles, then why could the procuring authority not exclude firms that either do not use only such vehicles and are not able to shift to using them exclusively as not capable of fulfilling the “contract”?⁷⁶

Moreover, as McCrudden also points out, Article XIII:4(b), which establishes on what grounds a procuring authority can award a contract, specifies that the authority must award the contract to the “tenderer who has been determined to be fully capable of undertaking the contract” and who makes the lowest bid or is the bid “which in terms of the specific evaluation criteria set forth in the notices or tender documentation” is the “most advantageous.” Thus, the only stipulation is that evaluation criteria be specific and transparent (i.e. evident from the information supplied by the procuring authority prior to the bidding process); there is no limitation to criteria of an economic nature or even to technical specifications as defined elsewhere in the GPA.

Conclusions and Recommendations

It is clear that there has been major growth in interest in biofuels over the last two years of high energy prices. This interest is being converted into concrete action at a rapid pace as witnessed by:

- Large new subsidy and mandate commitments in developed nations, particularly the United States and the European Union;
- Steep increases in private investment in biofuel production in the US, EU and other countries, partially due to the considerable government support measures to the sector;
- Major commitments to growing biofuels feedstock crops in much of Asia, including large commitments of hectarage for new palm oil plantation. This is particularly true in Indonesia and Malaysia, and to a lesser extent in Thailand, as well as coconut oil plantations in the Philippines, and Jatropha plantations in India;
- The emergence of government supported biofuels programs in the least developed countries, particularly in Africa (but also in Vietnam) for research into biofuels suited to local conditions, production of feedstocks and of biofuels.

High prices for fossil-based transport fuels make biofuels—formerly expensive in relation to fossil-fuels—more economically viable, and could lead to a decrease of government subsidies in the US and EU. Already, considerable and possibly further increased mandates, combined with the limited land availability in developed countries appear to be pointing toward the potential of a growing biofuels trade. Furthermore, large new commitments to plantations to grow feedstocks (in addition to the cumulative effect of a myriad of smaller ones) will bear fruit in the coming years in Brazil, South East Asia and elsewhere. Increased interest in biofuels resulting in enhanced funding for research and development will result in improved methods of production and more easily handled fuels.

However, as this paper suggests, for this potential growth in trade to occur, a clarification of how international trade rules apply to the sector is advisable. Uncertainty over biofuels classification, and the range of government measures to protect domestic biofuel production-- from tax incentives, high tariffs and subsidies--risk stunting growth in trade even as the global demand for biofuels is rising. A web of separate technical and environmental standards also risk interfering with the potential for greater trade in biofuels.

Even supposing that trade in biofuels remains limited, this paper recommends a closer look at WTO rules. A greater clarity about subsidy notification requirements and a closer look at potential cross-subsidization of by-products associated with biofuel production is useful, given the uncertainty of whether WTO rules for agricultural or industrial products are applicable. The purpose of this paper is to touch on those issues that could usefully be clarified in the quickly growing biofuels sector, and to facilitate a discussion on the future direction of government measures.

Appendix A

2005 World Ethanol Production

(in millions of gallons)

US	4,264		Australia	33
Brazil	4,227		Saudi Arabia	32
China	1,004		Japan	30
India	449		Pakistan	24
France	240		Sweden	29
Russia	198		Philippines	22
Germany	114		South Korea	17
South Africa	103		Guatemala	17
Spain	93		Cuba	12
UK	92		Ecuador	14
Thailand	79		Mexico	12
Ukraine	65		Nicaragua	7
Canada	61		Mauritius	3
Poland	58		Zimbabwe	5
Indonesia	45		Kenya	4
Argentina	44		Swaziland	3
Italy	40		Other	710
TOTAL		12,150		

Source: Renewable Fuels Association

Appendix B

World Biodiesel Production Capacity & Exports (2005-2006)
(1,000 metric tons) All Figures in '000 Metric Tons (MT) unless otherwise noted

Country	2005 ⁷⁷ Production	2006 Biodiesel Plant Capacity ⁷⁸	Primary Feedstock	Exports 2005	Projected Exports 2006
Americas					
Canada	30 million litres	90 million litres ⁷⁹ (23.9 million U.S. gallons)	Canola	0	0
US	75 million U.S. gallons ⁸⁰	580.5 ⁸¹ million U.S. gallons ⁸²	Soy	0	0
Mexico	0	0	n/a ⁸³	0	0
Brazil		800 million litres ⁸⁴ (211.6 million U.S. gallons)	Castor bean, Sunflower, Soy ⁸⁵	0	0 ⁸⁶
Argentina		60,000 MT ⁸⁷ (18 million U.S. gallons)	Soy	0	1000MT/month ⁸⁸
Europe, EU-25⁸⁹					
		As of July 1 st 2006 ⁹⁰	Rapeseed, Sunflower seed	No significant exports of biodiesel out of the EU. Limited intra-EU trade in feedstocks and biodiesel only. ⁹¹	
Austria	85	134			
Belgium	1	85			
Cyprus	1	2			
Czech Republic	133	203			
Denmark	71	81			
Estonia	7	20			
France	492	775			
Germany	1,669	2,681			
Greece	3	75			
Hungary	0	12			
Italy	396	857			
Latvia	5	8			
Lithuania	7	10			
Malta	2	3			
Netherlands		0			
Poland	100	150			
Portugal	1	146			
Slovakia	78	89			

Slovenia	8	17		
Spain	73	224		
Sweden	1	52		
UK	51	445		
EU25 Total:	3,184⁹²	6,069		
<i>Asia</i>				
Australia	3.7 million litres ⁹³	484 million litres ⁹⁴	0	0
China	100-200 ⁹⁵	300 ⁹⁶	Waste Oil, Rapeseed ⁹⁷ , Jatropha inter alia	0
India	Negligible ⁹⁸	Negligible ⁹⁹	Jatropha	0
Indonesia	0	29 million litres ¹⁰⁰	Palm Oil	0
Malaysia	0	60,000 U.S. Tons ¹⁰¹	Palm Oil	0
Philippines	>10 million litres	60 (110 million litres) ¹⁰²	Coconut Oil	0
Thailand	7.5 million litres	53 million litres (160,000 litres/day) ¹⁰⁴	Palm Oil	0

Source: van Bork, 2006

Endnotes

1 China is anticipated to export at least 500,000 tons of ethanol in 2006, mostly to the United States. However, in 2005 it had no exports, and many experts question where China can maintain high export levels, as China has to import much of its biofuel feedstock and the US is expanding ethanol production capacity. Nakanishi, Nao and Niu Shuping. China emerges as ethanol exporter amid high oil. Reuters, September 4, 2006. Available at: http://today.reuters.com/news/ArticleNews.aspx?type=reutersEdge&storyID=2006-09-04T130344Z_01_HKG352919_RTRUKOC_0_US-ENERGY-CHINA-ETHANOL.xml.

2 USDA 2007 Farm Bill Theme Paper Energy and Agriculture August 2006, p.5

3 Rabobank, Biofuels in the EU; Changing up gears, November 2005, p.24

4 Except in the case where Japan either was able to exploit “oil algae” or sea-grown biomass for conversion to biofuels.

5 Rapeseed crops can produce 110 U.S. gallons per annum, some high efficiency strains have been demonstrated to produce as much as 140-145 U.S. gallons per acre as compared to soy which currently yields about 40 U.S. gallons an acre of oil.

6 Here is a typical legal definition of biomass from The Biomass Research and Development Act of 2000 (P.L. 106-224; Title III), which defines biomass as “any organic matter that is available on a renewable or recurring basis, including agricultural crops and trees, wood and wood wastes and residues, plants (including aquatic plants), grasses, residues, fibers, and animal wastes, municipal wastes, and other waste materials.”

7 Carbon is nature’s preferred “tinkertoy.” While inert itself (think of soot...or diamonds!) it is uniquely able to bind to other atoms and molecules in a staggering array of molecular configurations — hence its ubiquity in our planet’s ecology as the true back-bone of life.

8 Their viscosity is too high for easy use in standard diesels and there are other chemical considerations as well. A good example of a jurisdiction where such oils are used in generation is the Netherlands.

9 Ibid, p. crs-13

10 Murray, Danielle, ETHANOL’S POTENTIAL: Looking Beyond Corn, June 29 2005-5, <http://www.earth-policy.org/Updates/2005/Update49.htm>

11 Tokgoz, Simla and Amani Elobeid, Policy and Competitiveness of U.S. and Brazilian Ethanol, Iowa Ag Review Online, Spring 2006, Vol. 12, No. 2.

12 Ewing, Reese, Brazil races to keep ahead of world ethanol demand, June 14, 2005, Reuters.

13 Primarily installed storage tank capacity

14 Ewing, Reese, Brazil Races to keep ahead of world ethanol demand, p. 2, June 14, 2005, <http://forests.org/articles/print.asp?linked=42929>

15 Ibid., p. crs-5

16 90% is from soyabean oil see: Supra 11, crs – 16.

17 Supra 11, crs-17

18 Ibid., crs-17

19 A Biodiesel Primer: Market & Public Policy Developments, Quality, Standards & Handling, p. 7 Prepared by Methanol Institute and International Fuel Quality Center, April 2006

20 National Biodiesel Board, Estimating US Biodiesel Production, 2005.

21 Energy Policy Act 2005, Title XV, at p.474, see <http://test.wbdg.org/pdfs/epact2005.pdf#search=%22EPACT2005%20biofuel%20mandate%22> for complete text

22 Schnepp, Randy, European Union Biofuels Policy and Agriculture: An Overview, p. crs-2, CRS Report to Congress, March 16, 2006

23 EC, An EU Strategy for Biofuels, COM(2006) 34, Annex V.

24 “*In Africa, efforts to expand biofuels production and use are being initiated or are under way in numerous countries, including Benin, Ethiopia, Ghana, Guinea Bissau, Kenya, Malawi, Mozambique, Nigeria, Senegal, South Africa, and Zimbabwe. See World Watch Institute website, Biofuels for Transportation: Selected Trends and Facts, June 7, 2006, <http://www.worldwatch.org/node/4081>, ongoing reporting of the pact between Europe and Africa in support of biofuels development can be found at: <http://biopact.com>. In SE Asia Thailand, Indonesia, Malaysia and Vietnam have active or nascent biofuels programs, current data on these programs is also reported on the biopact.com website as well as in many other venues. India and China are both significant, and expanding producers of biofuels primarily for domestic consumption.*

25 See P.C. Mavroidis, The General Agreement on Tariffs and Trade: A Commentary (Oxford: Oxford University Press, 2005), pp.57-59.

26 A clear and accessible explanation of the Harmonized System and the role of the WCO can be found in R. Steenblik, “Liberalising Trade in ‘Environmental Goods’: Some Practical Considerations,” OECD Trade and Environment Working Paper No. 2005-05, particularly annex A1.

27 *Spain-Tariff Treatment of Unroasted Coffee*, L/5135, adopted June 11 1981, BISD 28S/102.

The context of the introduction of this tariff was an excise tax credit introduced by Congress in 1978 for fuel ethanol via the Energy Tax Act of 1978. An IRS ruling

determined that both domestic and imported ethanol were eligible for the credit, an interpretation at odds with the interest of some in Congress in promoting a domestic US ethanol industry via the tax credit. Because of this ruling, not only domestic but also foreign producers of ethanol could benefit from the subsidy provided through the tax credit. In response, in order to avoid foreign producers benefiting from the subsidy afforded through the tax credit, the tariff was set at a rate intended to offset any benefit to foreign ethanol producers. The US claimed at the time that the secondary tariff taken along with the excise tax credit was not different than offering a subsidy exclusively to US producers of ethanol, which (under the GATT rules that existed then) would have been legal. We note that, as a legal argument, the notion of equivalence to a subsidy could not have excused the US from its GATT Article II obligations at the time. Regardless, in the Uruguay Round negotiations, however, the secondary tariff did become bound in the US schedule as a permitted “other duty or charge” (i.e. one that was accepted by the Membership of the WTO even though otherwise it would have been illegal under GATT Article II) and is thus now legal under WTO law.

29 Undenatured ethanol is the type of ethanol that is found in alcoholic beverages and foodstuffs. Denatured ethanol has had additives blended that make it unfit for human consumption.

30 European Union of Ethanol Producers, “Position Paper: How to achieve the objectives and benefits of the biofuel programme,” Brussels, 24 June 2005, pp. 2-3. . The Brazilian ethanol is imported under CN Code 3824 which bears a 6.5% ad valorem duty, as opposed to entering Sweden under CN 2207 at either .10 or .20, for undenatured or denatured ethanol, respectively. The Swedish government is apparently according to this paper looking into the matter with a view to limiting this import option.

31 For a detailed treatment of these negotiations, see R. Howse and P. B. van Bork, Options for the Liberalisation of Trade in Environmental Goods in the Doha Round, International Centre for Trade and Sustainable Development, Geneva, July 2006.

32 F. Bertho, C. Harmin and L. Isler, “The Potential for a Win-Win-Win Situation in Liberalizing the Fuel Ethanol Market,” Stockholm School of Economics, unpublished seminar paper, May 2006, pp. 12-13.

33 R. Steenblik, *supra* n.76, p. 16.

34 As will be discussed below in the subsidies section of this paper, The Agreement on Agriculture contains disciplines on subsidies that are in addition to those that apply to all products under the WTO Subsidies and Countervailing Measures (SCM) Agreement. For instance, trade-distorting domestic subsidies that fall into the so-called “amber box,” i.e. that are not subject to the so-called “green box” carve-out, must be notified to the WTO and must fall within certain quantitative ceilings. Thus, whether a particular product falls within the AoA can have important implications for disciplines on government supports for that product.

35 See the extensive and informative discussion of this issue in *Biofuels for Transportation: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century*, WorldWatch Institute, 2006.

36 Steenblik, 2005, *supra* n. 76, p. ; Bertho et al., *supra* n. ??, p. 14.

37 Article X of the GATT requires, inter alia, that “laws, regulations, judicial decisions and administrative rulings of general application” that affect trade “be published promptly in such a manner as to enable governments and traders to become acquainted with them as well as to administer the law in a “uniform, reasonable and impartial manner.”

38 See M.J. Trebilcock and R. Howse, *The Regulation of International Trade (Third Edition)* (Routledge: London and New York, 2005), ch. 2, “The Most-Favoured Nation Principle.”

39 Monica Araya, “WTO Negotiations on Environmental Goods and Services: Maximizing Opportunities?” Global Environmental and Trade Study, Yale Center for Environmental Law and Policy, June 2003, pp. 1-2.

40 *Canada-Certain Measures Affecting the Automotive Industry*, WT/DS139/R, WT/DS/42/R, adopted 19 June 2000 as modified by Appellate Body Report. Para. 10.23.

41 *Chile-Price Band System and Safeguard Measures relating to Certain Agricultural Products*, WT/DS207/AB/R, adopted 23 October 2002, para. 273. See also, *Argentina-Measures Affecting Imports of Footwear, Textile, Apparel and other Items*, WT/DS121AB/R, adopted 22 April, 1998, para. 55: “We conclude that the application of a type of duty different from the type provided for in a Member’s Schedule is inconsistent with Article II:1(b), first sentence, of the GATT 1994 to the extent that it results in ordinary customs duties being levied in excess of those provided for in that Member’s Schedule.”(Emphasis added)

42 In the case of the EC, a Congressional Research Report notes: “During the 2002-04 period, about 64% of EU ethanol imports entered under preferential trade arrangements including the Generalized System of Preferences (GSP), the Cotonou Agreement (ACP), Everything But Arms (EBA) initiative, and others. Pakistan, with a 20% share of EU ethanol imports, is the largest ethanol exporter under preferential trade arrangements. Other ethanol exporting countries that benefit from EU trade preferences include Guatemala, Peru, Bolivia, Ecuador, Nicaragua, and Panama (unlimited duty-free access accorded under special drug diversion programs); Ukraine and South Africa (GSP); the Democratic Republic of Congo (EBA); Swaziland and Zimbabwe (ACP); Egypt (Euro-Mediterranean Agreement); and Norway (special quota).” Congressional Research Service, “European Union Biofuels Policy and Agriculture: An Overview”, March 16, 2006.

43 *European Communities – Regime for the Importation, Sale and Distribution of Bananas*, AB-1997-3, Report of the Appellate Body, WT/DS27/AB/R

44 The current blending ratio in Brazil is 25% ethanol/75% gasoline.

45 This has no doubt been assisted by a 75% fall in the real cost of production over the last 25 years driven by economies of scale, active plant breeding of more efficient sugar cane varieties and progress down the learning curve. See: *Brazils Ethanol production costs declined 75% in 25 years*, BioPact, August 10, 2006, accessed at: <http://biopact.com/2006/08/brazils-ethanol-production-costs.html>

46 With the enthusiastic support of the U.S.'s powerful Farm-based lobbies, who also strongly supported these measures

47 Not counting various State level measures these acts were: The Alternative Motor Fuels Act of 1988, the Clean Air Act of 1990, the Energy Policy Act of 1992, the Biomass Research Act of 2002, the Farm Bill 2002 and the Energy Policy Act of 2005.

48 The energy crop premium consists of a payment of 45 Euros per hectare in addition to decoupled payments. Condition for payment is that there must be a contract with a processor, unless the crop is processed on the farm. Rabobank, Biofuels in the EU, Changing up Gears. November 2005

49 The text of the SCM Agreement also refers to some particular subsidies that are deemed "non-actionable." Including, notably some R & D and environmental subsidies (Article 8.2 (a) and (c)). However, this safe harbor for these classes of subsidies expired some years ago by virtue of Article 31, which envisaged negotiations that would review and perhaps modify these classes of "non-actionable" subsidies. These negotiations have not been brought to a successful conclusion.

50 A program may provide incentives with respect to more than one kind of biofuel; for example, ethanol and biodiesel; the former falls within the AoA and the latter does not, so the question then becomes even more complex. It is necessary to try and isolate the effects of the operation of the program on ethanol alone in order to determine if these incentives attract "amber box" notification requirements.

51 United States Department of Agriculture, "2007 Farm Bill Theme Paper: Energy and Agriculture", Washington D.C., August 2006, p. 18.

52 United States Department of Agriculture, "2007 Farm Bill Theme Paper: Energy and Agriculture", Washington D.C., August 2006, p. 18.

53 Thus a subsidy could result in the relative prices of various fuels corresponding more closely to their relative environmental friendliness, providing incentives to choose those fuels that create fewer negative environmental externalities.

54 *Canada – Measures Affecting the Export of Civilian Aircraft* WT/DS70/AB/RW, 21 July 2000

55 *United States – Final Dumping Determination on Softwood Lumber from Canada, Recourse to Article 21.5 of the DSU by Canada, AB-2006-3, Report of the Appellate Body*, WT/DS264/AB/RW, see: [http://www.worldtradelaw.net/reports/wtoab/us-lumberadfinal\(ab\)\(21.5\).pdf](http://www.worldtradelaw.net/reports/wtoab/us-lumberadfinal(ab)(21.5).pdf)

56 This second obligation is found by the Appellate Body through combining the language of Article III:2 itself with the language concerning "protection" in the preamble Article III:1 as referenced in an interpretative note to Article III. Such "interpretative notes" form an integral part of the treaty. See *Japan-Alcoholic Beverages*.

57 *European Communities – Measures Affecting Asbestos and Asbestos Containing Products*, AB-2000-11, Report of the Appellate Body, WT/DS135/AB/R

58 *United States – Restrictions on Imports of Tuna*, DS21/R – 39S/155, unadopted 3 September 1991 and

United States – Restrictions on Imports of Tuna, DS29/R, unadopted 16 June 1994

59 See for a discussion of the possible relevance of the product/process distinction in the Tuna cases in this context, C. Lancaster, "Biofuels assurance schemes and their compatibility with trade law," power point presentation, Piper Rudnick Gray Cary, Brussels, 7 June 2006.

60 *Japan – Taxes on Alcoholic Beverages*, WT/DS8/AB/R, WT/DS10/AB/R, WT/DS11/AB/R, 4 October 1996

61 See recommendation 2410 in *Biofuels for Transportation: Global Potential and Implications for Sustainable Agricultural and Energy in the 21st Century, Final Report*, Prepared by the Worldwatch Institute for the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), in cooperation with the Agency for Technical Cooperation (GTZ) and the Agency of Renewable Resources (FNR), Washington, D.C., August 2006 also see, Criteria voor duurzame biomassa productie, August 2006, <http://www.vrom.nl/pagina.html?id=7563>, for an extensive review of current Dutch thinking and proposals for Dutch regulation in this matter. It is also to be noted that as of September 2006 there is an ongoing discussion about the environmental dimension of palm oil (and similar oils) production, see: <http://www.rspo.org/>

62 "Criteria for duurzame biomassa productie"

(*Criteria for Sustainable Biomass Production*), Projectgroep Duurzame productie van biomassa [Project Group for Sustainable Production from Biomass], August 2006, p.9. Accessed at, the Ministry of Housing and the Environment (VROM): <http://www.vrom.nl/pagina.html?id=2706&sp=2&dn=w690>)

63 Ibid. p. 16, See Table 1.

64 Ibid. pp. 16-18, See tables 1 and 2.

65 S.D. Meyers v. Government of Canada, NAFTA Tribunal Award, October 21, 2002 see <http://www.international.gc.ca/tna-nac/SDM-en.asp> and press release, <http://www.appletonlaw.com/cases/S.D.%20Myers%20Press%20Release%20-%20Oct21-02.pdf#search=%22nafta%20tribunal%20s.d.%20meyers%22>

66 *Korea-Measures Affecting Imports of Fresh Chilled and Frozen Beef*, AB-2000-8, WT/DS161/AB/R, WT/DS169/AB/R, 11 December 2000

67 *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, AB-1998-4, WT/DS58/AB/R, 12 October 1998

68 *United States – Import Prohibition of Certain Shrimp and Shrimp Products, Recourse to Article 21.5 of the DSU by Malaysia*, AB-2001-04, WT/DS58/AB/RW, 22 October 2001

69 United States – Standards for Reformulated and Conventional Gasoline, AB-1996-1, WT/DS2/AB/R, 29 April 1996

70 These points are well illustrated in Lancaster, *supra* n. 100

71 S.T. Coehlo, “Biofuels-Advantages and Trade Barriers,” UNCTAD/DITC/TED/2005/1, UNCTAD, Geneva, 2005, p. 4.

72 Commission of the European Communities, “An EU Strategy for Biofuels”, COM (2006) 34 final, Brussels, 8 February 2006, p. 10.

73 CRS Report for Congress, Agriculture-Based Renewable Energy Production, Updated May 18, 2006, p. crs-17

74 For a survey, see P. Kunzlik, “National Procurement Regimes and the Scope for the Inclusion of Environmental Factors in Public Procurement,” in OECD, *The Environmental Performance of Public Procurement: Issues of Policy Coherence*, 2003. See also, *Buying Green: A handbook on environmental public procurement*, European Commission, 2004.

75 See for instance, H.-J. Priess and C. Pitschas, “Secondary Policy Criteria and Their Compatibility with EC and WTO Procurement Law”(2000) 9 Public Procurement Law Review 171.

76 C. McCrudden , “Buying Social Justice,” unpublished book manuscript, 2006, ch. 14..

77 All 2005 numbers from: European Biodiesel Board, <http://www.ebb-eu.org/stats.php>

78 Data is not yet widely available for 2006 biofuels production, however as crushing plant and refinery capacity constrain production of the actual fuel, available production capacity is a good indicator of how much biodiesel may be produced in 2006.

79 Canadian Renewable Fuels Association, <http://www.greenuel.org/biodiesel/production.htm>

80 Schnepf, Randy, *Agriculture-Based Renewable Energy Production*, Updated May 18 2006, CRS Report for Congress, p. crs-13

81 One estimate of actual U.S. consumption of biodiesel for 2006 is 300 million U.S. gallons with a projection of 750 million U.S. gallons for 2007, *Biodiesel 2020: A Global Market Survey*, p. ?, <http://www.emerging-markets.com/biodiesel/default.asp>

82 National Biodiesel Board, September 13, 2006, Commercial Biodiesel Production Plants, http://www.biodiesel.org/buyingbiodiesel/producers_marketers/ProducersMap-Existing.pdf#search=%22biodiesel%20plant%20capacity%20u.s.%202006%22

83 Mexico and Latin America are the original home of the Jatropha bush and Mexico may very well have large potential for Jatropha based biodiesel production.

84 Petrobras says given go-ahead to build first biodiesel plants, Platts, September 22, 2006, <http://www.platts.com/HOME/News/6297097.xml?sub=HOME&p=HOME/News&>, the capacity number cited is from the Ministry of Energy and refers to capacity ready by the end of 2006, effectively 2007 capacity.

85 Castor Bean is the Brazilian government’s feedstock crop of choice to help peasant farmers sell to the nascent biodiesel industry. Longer term more efficient tropical feedstocks such as palm oil may become significant but in the short term, large scale production of soy, and its attendant infrastructure will likely make it the lead choice of feedstock for large scale production.

86 Production through 2007/8 is primarily to ramp up to fulfill a domestic mandate of 2% blending to be followed by a 5% mandate.

87 *A Biodiesel Primer: Market & Public Policy Developments, Quality, Standards and Handling*, prepared by Methanol Institute and International Fuel Quality Center, p. 15, April 2006,

88 Exported to Germany by Argentinean Company, Oilfox, five year contract. The quantity is small but exports will grow as new production capacity is constructed such as the new REPSOL YF plant that will produce 100,000 MT/annum by 2007, Argentina the Environmental Costs of Biofuel, April 20, 2006, <http://ipsnews.net/news.asp?idnews=32959> and Argentina to Export Biodiesel to Germany, February 10, 2006, [http://www.checkbiotech.org\(blocks/dsp_document.cfm?doc_id=12224](http://www.checkbiotech.org(blocks/dsp_document.cfm?doc_id=12224)

89 Now a net importer of rapeseed from U.S. Canada and Ukraine, p. 10 Gain Report E36092, Rapeseed for biodiesel was less than half of crop used in 2004/5 and will be 60% in 2005/6 and projected 70% in 2006/7

90 Source: EBB, <http://www.ebb-eu.org/stats.php>

91 The EU is a large and growing importer of vegetable oils and starting to import biodiesel, primarily from S.E. Asian sources, a trade that appears likely to grow rapidly as capacity comes onstream in Asia and assuming environmental issues surrounding production, particularly of palm oil are answered. Intra EU, for instance, rapeseed grown in France goes to Germany for processing and the Netherlands is building biodiesel capacity to serve export markets in Germany.

92 Production EU wide up approximately 65% from 2004, European Biodiesel Board, <http://www.ebb-eu.org/stats.php>

93 ANZ Industry brief: automotive biofuels, 21 December 2005, accessed at: http://www.anz.com/Business/info_centre/economic_commentary/BiofuelsDec2005.pdf#search=%22biodiesel%20production%20australia%202005%22, estimated 2005-2006 production of biodiesel will be 6 million litres

94 By October 2006, Biodiesel Association of Australia, <http://www.biodiesel.org.au/>

95 China is a net importer of all major oils and the bulk of biodiesel production, in 2005 was from waste oil, Strict Government control characterizes, Latner Kevin, Caleb O’Kray and Junyang Jiang, Chinese Biofuel Development, USDA September 2006, <http://www.fas.usda.gov/info/fasworldwide/2006/09- 2006/ChinaBiofuels.htm>

96 Koh Chin Ling, *China Aims to Reduce Oil Imports*, The Age, September 24, 2005, <http://www.theage.com.au/news/business/china-aims-to-reduce-oil-im->

ports/2005/09/23/1126982227792.html

97 Austria's Biolux is commencing construction of a 1 million ton per annum biodiesel facility at Nantong City in Jiangsu province utilizing rapeseed as the feedstock., China News Summary October 11, 2006, <http://www.forbes.com/markets/feeds/afx/2006/10/11/afx3082137.html>

98 Planting of Jatropha is drastically behind plan. only 0.4 million hectares have actually been planted to date despite a requirement of 2.6 million hectares that ought to have been planted to date to meet fiscal year 2006/2007 plans for a 5% blend of biodiesel and diesel. Furthermore, the government mandated price in 2006 of US\$2.08/U.S. gallon (Rs. 25/litre) was 40%-80% under the estimated cost of production resulting in little if any biodiesel being sold to the oil companies. See: India Biofuels: *Biofuels Production Report 2006*, GAIN Report, 06/15/06, IN6047.

99 Ibid. There is no government support

100 Production from 11 plants scheduled to be opened by the end of 2006., *Indonesia: Energy Highlights 2006*, Embassy of the United States, Jakarta, accessed at: http://www.usembassyjakarta.org/econ/energy_highlight_jul06.html

101 *Opening of the World's First Integrated Palm Biodiesel Plant*, Office of the Prime Minister, 15/08/06, accessed at: <http://www.pmo.gov.my/WebNotesApp/PMMain.nsf/314edc1f96172e0a48256f240017b913/507070bd303ed098482571d10011cc92?OpenDocument>. Capacity figure from: USDA Oilseeds: World Markets and Trade, April 2006, accessed at: <http://www.fas.usda.gov/oilseeds/circular/2006/06-04/FULL06Apr.pdf>

102 *More coco-diesel exports eyed*, May 4, 2006, accessed at: <http://www.chemrez.com/news.asp?newsid=11>

103 Chotchanathawewong Qwanruedee, *2005 Top News on the Environment in Asia: Thailand*, p. 74, accessed at: http://www.iges.or.jp/en/pub/pdf/asia2005/24_thailand.pdf#search=%22thailand%20%20biodiesel%20production%202005%22

104 Energy Ministry quoted as giving this capacity for end of 2006 in, *The Energy Ministry Affirms No Raw Palm Will Be Imported to Protect Local Planters*, Thailand Official News and Information, 11/04/2006, accessed at: http://thailand.prd.go.th/the_news_update_view.php?id=1108

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