PART I

INTERNATIONAL LEGAL INSTRUMENTS RELATING TO BIOENERGY

Contents

1. INTRODUCTION

There are no intergovernmental mechanisms or international agreements specifically addressing bioenergy, although several multilateral instruments impose obligations with implications for the way in which bioenergy is regulated at national level. Some of the international legally-binding environmental agreements are relevant to bioenergy, for instance. They include the United Nations Framework Convention on Climate Change (UNFCCC) (1992) – which provides that precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects (such as bioenergy production) should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors (art. 4). More explicitly, the Kyoto Protocol recognizes the importance of renewable energy as a contributor to the mitigation of climate change, providing that all parties, taking into account their common but differentiated responsibilities and their specific development priorities, shall formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change in the energy, transport and industry sectors (art. 10).

The objectives of the Convention on Biological Diversity (1992) include biodiversity conservation and sustainable use of its components (art. 1). Bioenergy feedstocks can be considered both as a component of biodiversity as well as an element of habitat for biodiversity. Key national obligations that may be relevant for bioenergy production include: incorporating biodiversity-related concerns into plans, programmes and policies (art. 6); restoring or rehabilitating degraded ecosystems, and preventing the introduction of invasive alien species (art. 8); carrying out environmental impact assessments for projects likely to have adverse effects on biodiversity (art. 14); and involving local populations and the private sector in sustainable use of the components of biodiversity (art. 10).

Parties to the United Nations Convention to Combat Desertification (1992) are obligated to develop national plans and strategies to combat land degradation and desertification, including agricultural and forestry-related measures of relevance to the bioenergy sector. To this end, the Convention also calls upon parties to facilitate the participation of local populations (art. 5).

International trade law agreements under the auspices of the World Trade Organization (WTO) also affect, and are affected by, domestic regulation of bioenergy, and raise questions relating to classification of biofuels, subsidies and consistency between domestic regulatory measures and the WTO disciplines. Also, international human rights treaties may have implications for bioenergy production and its likely impacts on food security. The International Covenant on Economic, Social and Cultural Rights in article 11 establishes the legal obligation of member states to ensure the most efficient development and utilization of natural resources to ensure the fundamental right of everyone to be free from hunger. In addition, bioenergy initiatives and programmes must respect core labour standards and respective conventions of the International Labour Organization (ILO), and should not hinder the implementation of the Decent Work Agenda, which proposes an integrated approach to rights, employment, social protection and social dialogue, in accordance with the Fundamental Principles and Rights at Work. The latter entails freedom of association and the right to collective bargaining; elimination of forced and compulsory labour; abolition of child labour; and elimination of discrimination in the workplace. Of particular relevance for present purposes is also Convention No. 184 *Safety and Health in Agriculture* (2001), and No. 182 *Worst Forms of Child Labour* (1999). Finally, several global multi-stakeholder initiatives are gaining ground and influencing national bioenergy strategies such as the Global Bioenergy Partnership (GBEP), the Round Table on Sustainable Biofuels and the International Biofuels Forum.

Bioenergy production and use can have significant implications for the achievement of the Millennium Development Goals (MDGs), most notably Goal 1 (eradicate extreme poverty and hunger) and Goal 7 (ensure environmental sustainability). As stated in the Declaration of the High-Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy, convened by FAO in 2008, it is thus essential to address the challenges and opportunities posed by biofuels, in view of the world's food security, energy and sustainable development needs to ensure that production and use of biofuels is sustainable in accordance with the three pillars of sustainable development, and takes into account the need to achieve and maintain global food security.

Overall, none of the above-mentioned international instruments can of themselves provide systematic guidance or create specific obligations for

countries to incorporate the full interplay of connected aspects in the environmental, food, agricultural, trade and energy sectors when developing national policies and legislation on bioenergy. Integrated implementation of these different international instruments is thus necessary at the national level to ensure sustainability in the bioenergy sector. This section zeroes in on the relevance at national level of the international trade law agreements under the auspices of the WTO, the UNFCCC and the Kyoto Protocol, as well as the biodiversity-related conventions for the regulation of bioenergy. The themes highlighted in this section are further explored at national level in the subsequent case studies.

1.1 WTO Agreements and bioenergy

The obligations for member states created by the Agreements under the World Trade Organization (WTO) framework are broad-ranging and affect both international trade in bioenergy products (or feedstock materials such as agricultural crops) as well as domestic regulation of the bioenergy sector. Biofuels fall within the remit of a number of the WTO Agreements: the Agreement on Agriculture (AoA), the Agreement on Sanitary and Phytosanitary Standards (SPS), the Agreement on Technical Barriers to Trade (TBT) and the Agreement on Subsidies and Countervailing Measures (ASCM) all have relevance for bioenergy. Therefore with respect to domestic regulation of this sector, some of the key aspects of national bioenergy regulatory frameworks that are affected by the international trade disciplines include tariffs for end products or raw materials (discussed below), taxes and other regulatory exemption provisions, subsidies and other internal support mechanisms, sanitary and phytosanitary standards (as regards feedstock or raw material) and technical regulations which govern quality and blending.

The case studies highlight a number of these trade-related questions concerning sustainability criteria for imported biofuels, agricultural subsidies, market access and tariffs as well as product standards. The Thailand review, for instance, discusses the link between the production of energy crops and agricultural subsides. The Argentinean case study explains that national standards for certain biofuels were modified to

comply with the European Union (EU)[1] requirements in order to improve market access. It also draws attention to the restraining impact of tariffs imposed by the US and the EU on Argentina's ethanol exports. The Estonia, Tanzania and Argentina case studies all refer to plans by the EU to introduce sustainability criteria for biofuels and bioliquids used in the transport sector. These criteria apply to biofuels produced within the EU as well as imported ones, thus underscoring the links between international trade law and national legal frameworks for bioenergy.

For the purposes of putting the case studies in context, the following discussion on the relationship between international trade rules and bioenergy shall be primarily from the perspective of developing countries. In this regard, concerns have been raised on the way in which the comparative advantage of developing countries in terms of natural resources, labour and bioenergy production can be hampered by their ability to access foreign markets. This access may be restricted by import, production quality standards and sanitary and phytosanitary considerations, and more recently, environmental and social criteria that are injected as a pre-requisite to market access. In the absence of legally binding international criteria for the sustainable production of bioenergy, these social and environmental criteria may serve an important purpose to ensure that risks heightened by the production of biofuels are diminished. In this way, biofuels production that results in environmental degradation due to the clearing of biodiversity-rich areas such as forests or wetlands, or that leads to negative social impacts such as the diversion of crops from food towards fuel production can thus be curbed. It should be noted that EU sustainability criteria (see further below) for biofuels production, set out in article 17 of the EC Directive 2009/28/EC on the promotion of the use energy from renewable sources, applies "irrespective of whether the raw materials were cultivated inside or outside the territory of the Community."

International trade of biofuels has not been significant to date – limited in part by low production quantities intended to supply the local biofuels market. An increase in demand is likely to change this scenario, which

[1] It is difficult at this stage of European integration to distinguish the European Community (EC) from the European Union (EU). Should it enter into force, the Lisbon Treaty would, however, put an end to the above-mentioned EC/EU distinction, as a result of endowing the EU with a single legal personality.

would also lead to competition among producer countries to target export markets. The comparative advantage of developing countries in terms of feedstock production may see the rise of bioenergy feedstock exports to countries with significant biofuel consumption. This scenario is not without risks to developing countries who, without adequate policy and legal safeguards in place, may be more susceptible to food insecurity.

As noted above, a number of WTO Agreements impact trade in bioenergy feedstock (raw materials) and processed ethanol and biodiesel. In fact the distinction between trade in raw materials and the biofuel product is significant when considering that tariff escalation systems mean lower import tariffs for raw materials (bioenergy feedstocks) and higher ones for processed goods. This essentially pushes countries that do not have biofuels conversion or processing capacities towards exporting only feedstock thereby reducing their options for any value-added benefits of converting feedstock into biofuels.

The first sticking point of bioenergy and the WTO disciplines involves trade classification which affects tariff reduction commitments and national support schemes that are allowed under the WTO rules. Tariff commitments are expressed as 'bound rates' and are applied on a Most-Favoured-Nation basis (that is, according to the principle of equal treatment among different member state countries, under Article I of the General Agreement on Tariffs and Trade 1994 (GATT)) and are contingent on the Harmonized Commodity Description Coding System (HS) for product classifications. Currently, ethanol falls under the "agricultural goods" category (HS 2207 - ethyl alcohol) while biodiesel is considered an 'industrial good' (H38). This means that ethanol and biodiesel are therefore subject to different tariff rates and subsidies. Furthermore, the ethanol classification under the HS system does not differentiate between fuel and non-fuel uses. This is significant in view of the fact that WTO members may wish to reduce tariffs on ethanol used for environmental policy purposes, while wishing to maintain the tariffs on ethanol for other uses.

Any requirements imposed on imported goods (such as biofuels) must comply with the principle of "national treatment" enshrined in Article III of GATT: accordingly the treatment of imported products must be "no less favourable" than the treatment of domestically produced "like" products "in respect of all laws, regulations and requirements." This again

raises the issue as to whether different types of biofuels are "like" products. WTO member states are required to impose the same tariffs and duties to all imported products that are "like" domestic products regardless of where they originate. Tariff reductions for industrial goods are higher than for agricultural goods implying a more favourable regime for biodiesel products.

Box 1: Examples 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;
- labelling 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.

Source: ITFATPC/IPC. WTO Disciplines and Biofuels: Opportunities and Constraints in the Creation of a Global Marketplace (2006)

Ethanol on the other hand would be subject to the additional obligations espoused in the Agreement on Agriculture, which obligates member states to reduce or eliminate in certain cases domestic agricultural production support mechanisms such as taxes and loans that are actionable or trade distorting. The AoA disciplines subsidies and government support for agricultural products in addition to those contained in the Subsidies and Countervailing Measures Agreement (SCM). Broadly speaking, under the AoA members agree to phase-out non-tariff barriers, such as quotas by turning them into tariff equivalents ('tariffication'). Domestic support refers to subsidies provided to agricultural producers regardless of whether their products are exported, and the AoA structures domestic support into categories or 'boxes' which must be reduced over time. All domestic support measures fall under the 'amber box', as measures which are considered to be trade distorting and thus subject to limits, except those support measures that qualify for the

"green box" (i.e. measures that are permitted but must cause no or minimal distortion to trade) and 'blue box' (i.e. subsidies that are tied to schemes that limit production, and may be permitted if conditions designed to reduce distortion are met). Examples of amber box measures include price support or subsidies related to production support. These considerations are all therefore relevant to bioenergy feedstock production. Agricultural producers are given support in different ways, although common elements can be distilled. These elements comprise support designed to guarantee certain levels of income for agricultural producers (often implemented by setting minimum artificial prices that are higher than world market prices), or through direct financial transfers to producers. These support schemes have distorting effects on international trade patterns.

Both biodiesel and ethanol fall under the rules of the ASCM whose objective is to discipline the use of export subsidies and the actions countries can take to counter the effects of harmful subsidies. Relevant issues raised under the rubric of the ASCM revolve around determining the compatibility with the WTO system of different types of subsidies in the biofuels sector: subsidies for the production of biofuels from locally produced feedstock, consumption subsidies such as tax exemptions to biofuel purchasers, biofuel subsidies which may be contingent on export quantities and subsidies under general agricultural support initiatives. In situations where subsidized imports can be shown to have a detrimental impact on the corresponding domestic industry, member states may either seek recourse under the WTO's dispute settlement mechanism or initiate investigations unilaterally and impose an additional countervailing duty. The importance of subsidies for the economic viability of biofuels should nonetheless be borne in mind. This point is consistently illustrated in all of the case studies.

Countries may sometimes impose mandatory blending requirements or environmental and social sustainability criteria in a manner that is considered by some as ostensibly outside the permitted framework of the WTO rules. Here, again an analysis of what constitutes "like goods" is relevant. In the *Asbestos* case, the WTO Appellate Body (AB) set out elements for determining the 'likeness' of a product to include physical characteristics, end-uses, consumer preferences and tariff classification. In this particular case, the AB also accepted health risks as an additional determining factor. This rationale could arguably be extended to biofuels

and provide some justification for regulatory differences between consumer preferred and less health-risk products and those that are less so.

While the design of these policies taking into account social and environmental aspects may be geared towards legitimate sustainability objectives, certain measures may be deemed more trade-restrictive than others. Article XX of the GATT listing general exceptions could be relevant for assessing the compatibility of environmentally motivated trade restrictions on biofuels with international trade law. The WTO case *United States – Import Prohibition of Certain Shrimp and Shrimp Containing Products (US-Shrimp)* concerning the justifiability of environmentally motivated trade restrictions under the general exception of Article XX of the GATT is considered the landmark decision on trade restrictions based on environmental grounds. The US prohibited the importation of shrimp products that were harvested in a manner that would be detrimental to sea turtles, except if the exporting country was certified by the US government as having the necessary safeguards in place to avoid harm to sea turtles. It should be noted that, like the above-mentioned EC Directive, the measure applied equally to imports as well as to domestically harvested tuna. In response to allegations that this import prohibition was not compatible with the WTO rules, the US invoked GATT Article XX(b) and (g). These exceptions are also pertinent to bioenergy. Article XX lists a number of categories under which member states can impose trade restrictions provided that the "measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade." Article XX(b) permits measures "necessary to protect human, animal or plant life or health", while Article XX(g) permits measures "relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption." While the WTO Panel in the *US-Shrimp* case rejected the US defence on the grounds that Article XX could not be used to compel another member state to change its policies, the Appellate Body upheld the decision on different grounds and explicitly rejected the WTO Panel reasoning. In 2001, the Appellate Body clarified its legal reasoning following a challenge by Malaysia of the measures taken by the US to comply with this ruling. The reasoning of the WTO Panel and Appellate Body throughout the history of the case is quite lengthy and complex, as is a discussion as the scope of what is permissible as an environmentally-

based restriction on trade, and therefore for present purposes, it suffices to note that the second Appellate Body hearing found that the corrective measures taken by the US were in compliance with Article XX.

Paragraph 31(iii) of the Doha Ministerial Declaration, which was adopted on 14 November 2001, represents a move towards negotiations for the reduction or elimination of "tariff and non-tariff barriers to environmental goods and services". The question of including ethanol as an environmental good has proved to be a bone of contention among states who wish to see it benefit from accelerated tariff reduction and states who prefer its negotiations to remain under the market access negotiations for agricultural goods.

The productivity, product standards and export competitiveness of feedstocks are subject to hazards such as disease or pests. Sanitary and phytosanitary measures are applied in order to eliminate the risk posed to human plant or animal health by pests, diseases, various food additives or contaminants and would therefore be applicable to agricultural or forest feedstocks for biofuels, including biomass or biowaste. Phytosanitary standards (which would influence agricultural practices) and technical regulations (which shape industrial production) are covered by the SPS and TBT Agreements respectively, both of which seek to prevent technical trade barriers applied to restrict imports and protect local industries. The rules laid down in the SPS Agreement affect the way feedstock is produced and regulates legitimate measures for ensuring plant and plant products are not contaminated by pathogens or pests, and other health and safety considerations. Similarly, the TBT Agreement has implications for any national technical specifications for biofuel conversion processes and associated industries, labelling requirements and the way in which biofuel can be blended with conventional fuel. The most distortive trade measures are usually imposed on agricultural products, and can include certification procedures, quarantine regulations, labelling, setting guidelines on minimum pesticide residues, and requiring certain product or process criteria among others.

The SPS measures imposed by member states are allowed provided they are justified by scientific evidence, but not must not be any more trade restrictive than necessary to protect health. Furthermore such measures should not be arbitrary or discriminate unjustifiably between members where identical or similar conditions prevail. Harmonized standards

through technical regulations enable uniform designs, machinery and inputs are beneficial in terms of economy of production and quality assurance. Article 2 of the TBT Agreement stipulates that member states shall ensure that technical regulations are not written or enforced with the effect of creating unnecessary obstacles to international trade; and any restrictive practices therefore must fulfil a legitimate objective (this could be interpreted to mean the protection of human health or safety or the environment). The Agreement therefore has broad implications for national laws and regulations which define the requisite standards of biofuel products, including processing and production methods, such as blending requirements and bioenergy conversion machinery.

Overall, WTO Agreements must be implemented in a manner that ensures any negative effects on the comparative advantages of developing countries are minimized as are any adverse effects on poverty reduction, food security and environmental sustainability. As a concluding point, it will not only be WTO Agreements which will impact national bioenergy policies with respect to international trade. The legislation in major import markets can be expected to affect the national laws of exporting countries. The EU has recently set out sustainability requirements for imported products relating to the implementation of its 10 percent target for the use of biofuels and bioliquids in the transport sector by 2020. The criteria are contained in the recent EC Directive 2009/28 (23 April 2009) on the promotion of the use of energy from renewable sources, which forms part of a comprehensive post-2012 package on climate change and energy. The Directive sets out sustainability criteria for biofuels and bioliquids irrespective of whether the raw materials were cultivated in or outside the territory of the Community, thus highlighting the nexus with international trade. The Directive stipulates, for example, that biofuels and bioliquids must not be made from raw material obtained from land with recognized high biodiversity value (art. 17.3), or land with high carbon stock (art. 17.4).

The aim for present purposes is not to assess whether the European sustainability criteria is compatible with WTO law, but to highlight the need to design national legal frameworks for bioenergy in such a way that takes into account requirements deriving from international trade law. The case study on Argentina, for instance, stresses the desire to avoid costly bureaucratic procedures and certification schemes to implement the EU's planned sustainability scheme, and recommends addressing this

through consultations between the EU and Mercosur (the regional trade agreement between Argentina, Brazil, Paraguay and Uruguay). On the other hand, the European Commission recommends that the EU benefit from encouraging the development of bilateral and multilateral agreements and voluntary international and national schemes setting standards for the sustainable production of biofuels and certifying that the production of biofuels complies with such standards. The case study on Argentina also highlights the impact of European and American ethanol tariffs on Argentinean exports, and makes reference to proposals by Brazil at the WTO to reduce barriers on biofuels.

1.2 The Kyoto Protocol and national legal frameworks for bioenergy

Of the seven countries analyzed in this paper, Estonia, a country in transition to a market economy, is listed in Annex I of the UNFCCC and has a target to reduce its greenhouse gas emissions under Annex B of the Kyoto Protocol between 2008 and 2012. The five other case study countries are classified as non-Annex I countries under the UNFCCC and therefore qualify to host CDM projects in accordance with Article 12 of the Kyoto Protocol.

This section seeks to explain the influence of the international rules of the CDM on national legal frameworks for bioenergy in the countries under review in the study, and looks at the impact of the CDM on national bioenergy sectors.

1.2.1 General rules on the Clean Development Mechanism

The Clean Development Mechanism (CDM) is one of three market-based flexible mechanisms created under the Kyoto Protocol. Its dual objective is to assist developing countries in achieving sustainable development and to enable industrialised countries to comply with their quantitative emission reduction targets under the Kyoto Protocol (KP) Article 12(2). Generally, the sale of carbon credits under the CDM is possible for such projects that either reduce emissions of the six greenhouse gases covered by the Kyoto Protocol (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) or enhance their removal from the atmosphere by carbon sinks in non-Annex I countries (mostly developing countries). In

principle, it is thus possible for different types of bioenergy projects to benefit from carbon funding under the CDM. Several bioenergy projects have indeed taken advantage of this opportunity since the 'early launch' of the CDM in 2000 (art. 12(10)). Most of them involve methane recovery and electricity generation – which is also evident from the case studies contained in this report. The popularity of such projects can be explained by the fact that methane is a potent greenhouse gas and leads to cost effective emissions reductions. According to the Intergovernmental Panel on Climate Change, the global warming potential of methane is 21 while that of carbon dioxide is 1. The CDM is expected to generate some 2.7 billion Certified Emission Reductions (CERs) during the Kyoto Protocol's first commitment period from 2008 to 2012. Financial flows associated with the CDM are thus estimated to be rather significant and during the first half of 2007, trade in CERs was worth 4.1 billion euros.

The CDM market has been dominated by a few large and economically advanced host countries while smaller and poorer countries attract far less CDM financing. From a regional perspective, the Asia and Pacific region hosts 1289 (73.24 percent) of CDM projects, followed by Latin America and the Caribbean which hosts 429 (24.38 percent) and Africa 32 (1.8 percent).[2] Other regions account for 0.57 percent of the projects. China, India and Brazil have the greatest share of CDM projects 34.34 percent, 25.51 percent and 9.09 percent respectively. Of the countries reviewed in this study, Argentina currently hosts 15 registered CDM projects, Brazil has registered 160, Mexico 117, Thailand 18, the Philippines 39, and Tanzania 1.[3]

To be eligible to participate in the CDM, non-Annex I countries must appoint a Designated National Authority (DNA) responsible for the approval of CDM projects, who confirms that the projects contribute to sustainable development in the host country. The CDM project cycle is strictly regulated by the Modalities and Procedures for a Clean Development Mechanism adopted in 2005 (in accordance with art. 12 of the Kyoto Protocol). The objective of these rules is to ensure that CDM projects lead to real and verifiable emissions reductions, thereby safeguarding the environmental integrity of the Kyoto Protocol. The

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[2] See www.unfccc.int, as updated on 10 August 2009.
[3] *Ibid.*

project cycle entails independent validation of each project activity prior to its registration, regular monitoring of emission reductions as well as independent verification and certification of reduced emissions.

The CDM is administrated by the Executive Board for the Clean Development Mechanism (CDM Executive Board; Kyoto Protocol, Article 12(4)). It approves all CDM projects and issues CERs, which can be traded by state parties to the Protocol as well as by private entities authorized by their governments to participate in the CDM (Kyoto Protocol, Art. 12(9)).

1.2.2 "Additionality" criteria and baseline methodologies for bioenergy projects

One of the fundamental principles of the CDM is that each project must lead to emissions reductions that are additional to what would occur without the project (Kyoto Protocol, Article 5). This requirement is highly relevant for potential host countries and in this report, the case studies on Mexico and the Philippines address this question in relation to national legislation on biofuels. This section provides a brief overview of the influence of international CDM rules on questions concerning additionality.

In general, the additionality of each CDM project is demonstrated by describing the baseline scenario, in other words, by identifying the likely alternative for each project and estimating how much greenhouse gas emissions would have been generated in the absence of the project. In accordance with the CDM rules, the baseline and estimation of emissions reductions must be based on a baseline methodology approved by the CDM Executive Board. In the methodological work, the CDM Executive Board is assisted by the CDM Methodology Panel.

For determining additionality, the most important instrument is the "Additionality Tool" developed by the CDM Executive Board. It comprises a series of sequential tests designed to demonstrate that the project would not have taken place without the CDM. The first step is to identify alternatives for the project activity that are consistent with the host country's laws and regulations. Next, an investment analysis shows whether or not the proposed CDM project is economically and financially the most attractive alternative. Subsequently, an optional

barriers analysis will demonstrate whether there is at least one alternative for the project that is not prevented by identified barriers. The complementary fourth step is a common practice analysis to show that no similar project activities can be commonly observed or that there is an essential difference between the proposed CDM project and existing activities.

This raises the issue as to how the host country's mandatory legislation affects the additionality of CDM projects and whether this would be a disincentive for the development of national legal frameworks, for instance, on bioenergy. Thus, for some of the non-Annex I countries included in this study, the question emerges as to how the mandatory blending requirements for bioethanol and biodiesel affect countries' opportunities to benefit from CDM funding in this sector. In a proposed CDM project in Brazil, the CDM Methodology Panel stressed that mandatory blending requirements for biodiesel had to be taken into account in the estimation of baseline emissions and that emission reductions could be credited only based on the fraction of biodiesel above that required by the law. CDM projects were thus not excluded, but the mandatory blending requirements affected the availability of "additional" emission reductions.

Several baseline and monitoring methodologies have been approved by the CDM Executive Board for bioenergy projects, which can and have been used for the benefit of CDM projects in countries included in this report. Consolidated methodologies have been approved for landfill gas project activities (ACM0001), projects generating electricity from biomass residues (ACM0006) and projects leading to greenhouse gas emission reductions from manure management systems (ACM010). Methodologies focusing exclusively on bioenergy have also been approved, *inter alia*, for the following project types: avoided emissions from organic waste through alternative waste treatment processes (AM0025); fuel switch from fossil fuels to biomass residues in boilers for heat generation (AM0036); gird-connected electricity generation using biomass from newly developed dedicated plantations (AM0042); production of biodiesel based on waste oils and/or waste fats from biogenic origin for use as fuel (AM0047); biogenic methane injection to a natural gas distribution grid (AM0053); and avoided emissions from biomass wastes through use as feed stock in pulp and paper production or in bio-oil production (AM0057).

A proposal was considered for a methodology applicable to bio-ethanol facilities using starch as the main material (NM0253). Accordingly, bio-ethanol would be blended with gasoline and commercialized within the domestic market of the host country. In August 2008, the CDM Executive Board decided not to approve this proposal (ref. CDM-EB-41). Concerning bioethanol and biodiesel, one of the unanswered methodological issues is that the CDM Methodology Panel has not decided how to address the "shift of pre-project activities" associated with biofuel projects. In other words, it has not decided how to calculate greenhouse gas emissions reductions in cases where biofuels are produced in dedicated plantations on existing agricultural land or sourced from the general market where their origin can be identified.

Overall, while some concerns have been associated with the CDM, especially concerning the geographical and sectoral distribution of CDM projects, there seems to be a broad consensus among the parties to the Kyoto Protocol that the CDM should continue in the post-2012 period and that it should possibly be expanded from project activities to sectoral activities. What this means for bioenergy activities is that this funding window for developing countries could remain in place for years to come and could possibly be expanded in the post-2012 period. However, additional efforts would seem to be necessary to ensure that smaller developing countries as well as renewable energy projects can take full advantage of this international funding instrument.

1.3 Biodiversity-related conventions

In 2008, the parties to the Convention on Biological Diversity (CBD) and to the Ramsar Convention on Wetlands of International Importance specifically addressed bioenergy and its impacts on biological diversity in general, and on wetlands specifically. The decisions that have been adopted in the framework of the two conventions provide useful elements for national legislators and policy-makers to apply at national level in seeking to ensure the environmental sustainability of bioenergy production and use.

The CBD Conference of the Parties (COP), in its decision *Agricultural biodiversity: biofuels and biodiversity* (Decision IX/2), recognized the need to promote the positive, and minimize the negative, impacts of biofuel production and use on biodiversity and the livelihoods of local and

indigenous communities. To this end, it supports the full and effective participation of indigenous and local communities in the implementation of activities relevant to the sustainable production and use of biofuels. With particular regard to the need to adopt appropriate policy frameworks to ensure the sustainability of biofuels production and use, the COP identified a series of relevant international standards that should be taken into account, namely:

- the precautionary principle, as defined in the CBD Preamble (that is, "where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat");
- the Addis Ababa Principles and Guidelines on Sustainable Use (Decision VII/12);
- the application of the ecosystem approach, as defined in Decision V/6;
- the voluntary guidelines on biodiversity-inclusive impact assessment (Decision VIII/28);
- the work programme on protected areas (Decision VII/30);
- the work programme on traditional knowledge (CBD, Art. 8.(j) and Decision V/16);
- The Akwé: Kon Voluntary Guidelines for the conduct of cultural, environmental and social impact assessment regarding developments proposed to take place, or which are likely to impact on sacred sites, and lands, and waters traditionally occupied or used by indigenous people and local communities (Decision VII/16F);
- the Global Strategy for Plant Conservation (Decision VI/9):
- the guiding principles on alien invasive species (Decision VI/23);
- the application of sustainable forest management and best agricultural practices in relation to biodiversity;
- national biodiversity strategies and action plans; and
- relevant guidance developed under the Cartagena Protocol on Biosafety.

Sustainable use emerges as the most significant concept in the CBD with regards to bioenergy. It is defined by the Convention as using biodiversity components in a way and at a rate that does not lead to the long-term decline of biological diversity, thus meeting the needs and aspirations of present and future generations (Art. 2). Bioenergy production should thus aim at ensuring the sustainable use of feedstocks. The Addis Ababa Principles and Guidelines provide specific guidance in

this respect, stressing the need to consider local customs and traditions and to develop supportive incentive measures when drafting new legislation and regulations. The Principles, moreover, underline the need to resolve any overlaps, omissions and contradictions in existing laws and policies; and highlight the benefits of creating cooperative and supportive linkages between all levels of governance in order to avoid duplication of efforts or inconsistencies. Other relevant tenets in the Addis Ababa Principles that can be applicable to bioenergy production refer to the need to: undertake adaptive management informed by iterative, timely and transparent feedback concerning the use, environmental and socio-economic impacts, and the status of the resource being used; avoid or minimize adverse impacts on ecosystem services; minimize waste; and reflect the needs of indigenous and local communities who live with, and are affected by the use and conservation of, biological diversity in the equitable distribution of its benefits.

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Given that bioenergy production cuts across different sectors, this approach is particularly important at the planning stage. It entails a social process – different interested communities must be involved through the development of effective structures and processes for decision-making and management of natural resources. Guiding principles for its implementation include decentralization, consideration of adjacent and other ecosystems, long-term objectives and integration of use and conservation of biodiversity.

The CBD Voluntary Guidelines on Biodiversity-inclusive Impact Assessment aim at ensuring the incorporation of biodiversity considerations into the environmental impact assessment (EIA) procedure, as this may not necessarily result from the general requirement to take environmental issues into account. Therefore, according to these Guidelines, new criteria should be incorporated into the screening process, to include the categories of activities that may specifically affect biological diversity. Activities taking place in legally protected areas or their vicinity may fall under mandatory EIA, as could the base for bioenergy production. An activity that does not fall under mandatory EIA but is suspected to significantly impact biodiversity should also be assessed: this is the case with the introduction of invasive alien species, activities which directly or indirectly affect species that are

not yet legally protected but are threatened or sensitive, and activities in biologically important areas. Once again, bioenergy production could fall into one of these categories. On the same issue, the Akwé: Kon Voluntary Guidelines provide guidance to parties and governments on the incorporation of cultural, environmental, and social considerations of indigenous and local communities into new or existing impact assessment procedures. The guidelines may, therefore, be particularly relevant to the proponents of bioenergy production developments in the vicinity of sacred sites or traditionally occupied lands.

With regards to sustainable forest management, national legislators and policy-makers may make reference to the Forest Principles, which were adopted in 1992 at the Rio Conference on the Environment and Development and epitomized international consensus on the holistic nature of forest resource management and conservation. These Principles enshrine globally accepted concepts such as the need for forest management planning, environmental impact assessment, information disclosure, public participation and protection of traditional knowledge. Woodfuel production should therefore observe these minimum requirements.

The CBD work programme on Protected Areas may have significant implications for bioenergy production that is to be undertaken in the proximity of these areas, or that may otherwise impact them. It focuses on series of key elements that countries usually incorporate in their national policies and legislation, such as the integration of protected areas into the larger landscape and other sectoral planning; the prevention of the negative impacts of key threats to protected areas; the harmonization of sectoral policies and laws to ensure that they support the conservation and effective management of the protected area system; the removal of perverse incentives and inconsistencies in sectoral policies that increase pressure on protected areas, or action to mitigate any perverse effects.

The CBD work programme on Traditional Knowledge provides guidance on how to achieve the commitments in Article 8(j) of the CBD to respect, preserve and maintain the knowledge, innovations and practices of indigenous and local communities which embody traditional lifestyles relevant for the conservation and sustainable use of biological diversity; to promote their wider application with the approval and involvement of the holders of such knowledge; and to encourage the equitable sharing of

the benefits arising from the utilization of such knowledge. Bioenergy projects may entail negative impacts on traditional practices relevant for biodiversity conservation and sustainable use, for example by displacing indigenous and local communities or impeding their practices. These considerations should therefore be taken into account in the planning of bioenergy production activities, and opportunities for consultation with local and indigenous communities should be provided to this effect.

Article 8(h) of the CBD calls upon parties to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species. Bioenergy production may entail the (intentional or unintentional) introduction of alien species into the environment. Thus, the guiding principles on invasive alien species are relevant to reinforce the need to adopt a precautionary and ecosystem-based approach, assign priority to preventing the introduction of invasive alien species and base decisions of intentional introductions of these species on prior risk analysis.

In 2008, the Conference of the Parties to the Ramsar Convention followed up on the CBD COP Decision on biofuels, to provide specific guidance with respect to the possible negative impacts of bioenergy on wetlands. The Convention calls upon parties to designate wetlands in their territory for inclusion in a List of Wetlands of International Importance. The Convention further requires parties to promote the conservation and "wise use" of the designated wetlands, for example by establishing nature reserves. In its resolution on biofuels, the COP recognized that biofuel crops vary with regard to their water demands; some crops may be grown on degraded land which could assist in the rehabilitation of wetlands, with associated benefits for human use. It noted that potential competing demands upon agricultural land for food and biofuel production may lead to pressures for the conservation of wetlands and other threatened ecosystems, taking into account that the conversion of wetlands risks releasing high levels of greenhouse gases from the carbon stored by wetlands. The COP recommended taking into account the full range of ecosystem services provided by wetlands (which includes carbon storage, flood protection, food and fibre production, and groundwater recharge). In situations where proposed biofuels crop production activities may affect Ramsar sites and other wetlands, the COP recommends an environmental impact assessment and a strategic impact assessment, and where damage avoidance is not possible, the

application of appropriate mitigation measures, compensation and/or offset actions. It finally stressed the importance of adopting appropriate land-use policies, promoting sustainable forest and agricultural practices, and applying the precautionary principle (Resolution X.25).

Overall, biodiversity-related conventions highlight a host of considerations and legal tools that policy-makers and legislators should integrate in developing policies, legislation and projects for the bioenergy sector.

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