RECENT TRENDS IN THE LAW AND POLICY OF BIOENERGY PRODUCTION, PROMOTION AND USE

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ABBREVIATIONS

AoA	WTO Agreement on Agriculture
ASEAN	Association of Southeast Asian Nations
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism of the Kyoto Protocol
CRS	US Congressional Research Service
CSD	Commission on Sustainable Development
DOE	Department of Energy (Philippines)
EBA initiative	Everything But Arms initiative of the GSP
ESMAP	Energy Sector Management Assistance Program
EU	European Union
FAO	United Nations Food and Agriculture Organization
FAOLEX	Legislation database of FAO Legal Office
GBEP	Global Bioenergy Partnership
GMOs	Genetically modified organisms
GSP	Generalised System of Preferences of the EU
HS	Harmonized Standard
IAP	International Action Programme of the ICRE
ICRE	International Conference on Renewable Energy
ICTSD	International Centre for Trade and Sustainable Development
IFPRI	International Food Policy Research Institute
LEGN	Development Law Service of the FAO Legal Office
MAF	Ministry of Agriculture and Farming (Panama)
MDGs	Millennium Development Goals
MFPPIS	Ministry of Federal Planning, Public Investment and Services (Argentina)
MIEM	Ministry of Industry, Energy and Mines (Uruguay)
MOCI	Ministry of Commerce and Industry (Panama)
NEMB	National Energy Management Blueprint (Indonesia)
NBP	National Biofuels Programme (Philippines)
NEP	National Energy Policy (Indonesia)
NGOs	Non-governmental organizations
NPBB	National Programme on Biofuels and Bioenergy (Nicaragua)
OECD	Organization for Economic Co-operation and Development
SCM	WTO Agreement on Subsidies and Countervailing Measures
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States of America
WSSD	World Conference on Sustainable Development
WTO	World Trade Organization
WWF	World Wide Fund for Nature, or World Wildlife Fund (US)

EXECUTIVE SUMMARY

This paper aims to stimulate discussion on the elements of appropriate national legal frameworks for bioenergy, particularly in developing countries. It provides legislators and policy-makers with a tool to assist in identifying areas of law which may affect bioenergy regulation, and in designing key elements of national bioenergy laws.

In recent years, the need for sound regulatory frameworks for bioenergy at both the national and international levels has gained importance. Driven by the effects of high petroleum and natural gas prices, many countries are implementing national policies and legislation to encourage bioenergy production as a means to achieve energy security and self-sufficiency and to reduce reliance on foreign fossil fuel reserves. In addition, regulatory measures to encourage bioenergy are inspired by the need to provide increased opportunities for agricultural trade. However, bioenergy policy and legislation may have an impact on environmental protection goals set out in various international instruments, and this must be taken into account. These are the key issues linked to efforts to regulate and promote bioenergy.

The growing international demand for bioenergy is of particular interest to developing countries seeking opportunities for economic growth and trade. Developing countries have a comparative advantage for bioenergy production because of greater availability of land, favourable climatic conditions for agriculture and lower labour costs. However, there may be other socio-economic and environmental implications affecting the potential for developing countries to benefit from the increased global demand for bioenergy. The interrelationship between land uses and the competing needs of energy and food security is a key issue in the bioenergy debate. In addition, the effects of large-scale bioenergy production on global commodity prices are a significant trade concern. Bioenergy production may also entail harmful environmental effects such as deforestation and loss of biodiversity. Regulation is required to reduce the negative impacts of large-scale production, as well as to ensure that the most cost-effective and highest-energy conversion technologies are used.

Given the opportunities and risks, criteria for the sustainable development of the bioenergy industry should be clearly established in both international and national regulatory frameworks. Bioenergy regulation should not exclusively be an energy issue because it has important implications for other sectors such as agriculture, environment and trade. An interdisciplinary and cross-sectoral approach to bioenergy regulation is needed, taking into consideration the many areas of law affecting the regulation of natural resources and socio-economic development.

Part I of the paper provides an overview of bioenergy in the international regulatory context, including binding international agreements and non-binding principles for sustainable development. It then highlights the main features of existing national bioenergy laws and reviews the legal issues to be considered when developing national legal frameworks for bioenergy. This Part should assist countries in assessing their national legal frameworks for bioenergy, and in developing specific national bioenergy legislation and policies.

Part II of the paper examines the main features of existing bioenergy legislation and policies in a number of developing countries. The countries examined in the study were selected after a survey carried out by the Development Law Service of the FAO Legal Office. The survey on national legislation and policies on bioenergy in emerging biofuels markets was circulated among FAO country representatives around the world and yielded results mostly from Latin

America, Africa and Southeast Asia. The legislation collected has subsequently been included in FAOLEX, an online database providing public access to national legislation and international agreements affecting food and agriculture, faolex.fao.org/faolex/index.htm.

Part III contains a brief conclusion, while Appendix I contains a graphic representation of the main elements of national legal frameworks on bioenergy in the countries examined in the study.

PART I – INTRODUCTION

1. OVERVIEW

Many factors account for the increased focus on bioenergy[5] policy and law. These include the recent political prominence of the long-term effects of climate change and their related impact on global energy consumption and the world economy.[6] In addition, rising oil and gas prices and the desire for energy security have driven countries to start actively looking for alternatives to fossil fuels.[7] Another factor has been the farm sector crisis, especially in developed countries, characterized by large surpluses of agricultural produce and declining global market opportunities. It is therefore not surprising that biofuels have been proposed as having the potential to rescue the failed Doha Round of agricultural trade negotiations at the World Trade Organization.[8] With such important political, economic and environmental issues as a backdrop, many countries are actively looking for innovative tools for regulating and promoting the bioenergy sector. In encouraging the production and use of bioenergy alternatives to fossil fuels, both developed and developing countries alike are seeking to reduce their reliance on imported oil, mitigate the effects of climate change and promote rural development. To date, much of the regulatory emphasis has been on promoting the production and use of "first generation" biofuels[9] as a promising and more environmentally friendly energy alternative to fossil fuels.

Legislative and policy initiatives are often combined in regulating this new sector. In recent years some countries have opted to create a regulatory framework for bioenergy or biofuels by passing legislation specifically on the subject. In other cases, governments have expressed their commitment to the promotion of bioenergy by formulating policies which are not legally binding but are designed to complement existing

[5] "Bioenergy" has been defined simply as "energy generated from biofuels" while "biofuels" have been defined as "fuels of renewable and biological origin, including woodfuel, charcoal, livestock manure, biogas, biohydrogen, bioalcohol, microbial biomass, agricultural wastes and by-products, and energy crops." *See* FAO 2000.

[6] *See generally* Stern 2007. This 700-page report, released on 30 October 2006 by economist Sir Nicholas Stern for the British Government, discusses the effects of climate change and global warming on the world economy. Although the report was not the first on the subject, it has been widely cited and hailed as a landmark contribution discussing the politics of climate change and its effects on the global economy. It is also the most comprehensive and most widely known and discussed report of its kind.

[7] See, for instance, the famous "addicted to oil" 2006 State of the Union Speech by George W. Bush, President of the United States, in which he remarked, "Keeping America competitive requires affordable energy. And here we have a serious problem: America is addicted to oil, which is often imported from unstable parts of the world. The best way to break this addiction is through technology. Since 2001, we have spent nearly $10 billion to develop cleaner, cheaper, and more reliable alternative energy sources – and we are on the threshold of incredible advances." www.usatoday.com/news/washington/2006-01-31-sotu-text_x.htm.

[8] *See* Turner 2006, at 16 ("understanding ... the role biofuels will play[] offers a basis for ending the Doha stalemate"). *See also* Caldwell 2007. The latter article recommends, among other things, "green payments" to farmers who grow energy crops, and increased funding for renewable energy and climate change mitigation programmes.

[9] "First generation" biofuels are produced from biomass derived from traditional feedstocks such as ethanol and biodiesel. Ethanol is typically made from sugar cane, sugar beet or maize, while biodiesel is produced using canola or rapeseed, palm, sunflower or jatropha plants, and sometimes even animal fats. "Second generation" biofuels, on the other hand, may be obtained from wood fibre and grasses, although the technology to produce these is not yet widely available or commercially viable.

national legislative frameworks. It is important to note that most of the legislation and policies reviewed refer specifically to biofuels rather than to the broader context of bioenergy. It should also be noted that national policies and legislative provisions generally refer to first generation biofuels that are currently in commercial use and do not address second generation technologies.

This study first provides an overview of the international regulatory background for bioenergy, with a particular focus on the implications for first generation biofuels. It discusses binding and non-binding international instruments applicable to the bioenergy sector. Second, the study reviews the areas of law that are implicated in the analysis of bioenergy, establishing an analytical framework designed to assist countries in designing relevant laws and policies. Finally, the study provides a description of elements which are typically found in national bioenergy legislation and policies on biofuels, with some recommendations on how to improve their effectiveness.

2. THE INTERNATIONAL CONTEXT

National policy and legislative initiatives to encourage bioenergy production are being driven by the growing international market for biofuels. More than 30 countries worldwide have already introduced, or are actively pursuing, fuel ethanol programmes. Brazil and the United States are the world leaders in ethanol production, although many other countries are also becoming active producers. These include Argentina and Chile in Latin America, as well as China, Pakistan, Philippines and South Africa. The international market for biodiesel is at a much earlier stage than the market for ethanol, with European countries the global leaders for biodiesel production. However, with large investments in the biodiesel industry currently under way in Australia, Brazil, India, Indonesia, Malaysia and the United States, these countries are also poised to become major producers. There are a number of countries in Africa and Asia investing in biodiesel production mainly from the jatropha plant, a drought-resistant perennial particularly suitable for growing on land too poor and arid to support food crops. Projects to demonstrate the possibilities of producing biodiesel from jatropha have been launched or are being planned in at least ten developing countries, including Burkina Faso, China, Ghana, India, Lesotho, Madagascar, Malawi, Namibia, South Africa, Swaziland and Zambia.

This global picture of increased production and increased demand has been shaped by a number of international concerns. These include the need to ensure sustainability in the production process, the role of bioenergy in climate change mitigation and the upsurge of interest in international trade and development. Some of the most important legal developments at the international level in these areas and their regulatory impact on the bioenergy sector are outlined below.

2.1 Climate Change Mitigation

The implications of climate change on developing countries are profound. The world's poor are likely to suffer most from the impacts of global warming as they remain the most vulnerable to natural disasters, drought and disease. Volatile weather patterns and the unpredictable consequences of global warming are expected to exacerbate risks to agricultural production al over the world, and yet the risks are particularly acute in developing countries reliant on small-scale and subsistence agriculture. For example, recent studies suggest that crop yields in sub-Saharan Africa may fall by 20 percent and climate change-induced famine may displace more than

250 million people worldwide by 2050.[10] Such predictions are driving renewed international efforts to enforce laws designed to protect the atmosphere. They are also motivating policy and legislative initiatives to shift away from reliance on fossil fuels and towards greenhouse gas-reducing sources of bioenergy.

Although international agreements specifically addressing bioenergy have yet to be developed, several existing international environmental conventions and protocols impose obligations on member states to take regulatory measures to address climate change and encourage the promotion of legal frameworks for bioenergy. The Vienna Convention for the Protection of the Ozone Layer,[11] for example, requires member states to:

> adopt appropriate legislative or administrative measures and co-operate in harmonizing appropriate policies to control, limit, reduce or prevent human activities under their jurisdiction or control should it be found that these activities have or are likely to have adverse effects resulting from modification or likely modification of the ozone layer (art. 2.2(b).

The Montreal Protocol[12] also has provisions for countries to reduce their annual consumption and production of ozone-depleting substances (art. 2). In addition, the United Nations Framework Convention on Climate Change[13] (UNFCC) commits parties to:

> formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change (art. 3).

The particular circumstances of countries of different economic levels must be taken into consideration. For example, the UNFCC provides that:

> precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects … 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).

All of these legal instruments require member states to take measures to reduce the levels of greenhouse gas concentration in the atmosphere, and to encourage sustainable economic development by reducing the harmful effects of climate change. Given the potential greenhouse gas reduction benefits of using biofuel alternatives to ozone-depleting fossil fuels, these instruments are increasingly being used to encourage countries to develop national frameworks for bioenergy.

Of all of these international agreements, the Kyoto Protocol provides the most detailed and modern framework for the promotion of renewable energy, including fuels derived from biomass. 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

[10] Elasha, et al. 2006.
[11] Vienna Convention for the Protection of the Ozone Layer (1985).
[12] Montreal Protocol on Substances that Deplete the Ozone Layer (1987).
[13] United Nations Framework Convention on Climate Change (1992).

> national and regional development priorities, objectives and circumstances … shall … formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change … [including] the energy, transport and industry sectors … (art. 10).

Under this framework, industrialized country parties (Annex I parties) agree to binding emission reduction targets during the first Kyoto Protocol commitment period which will run from 2008-2012. While the Kyoto Protocol does not require developing countries to make commitments to reduce emission targets, the Clean Development Mechanism (CDM) was designed to assist developing countries in reducing their emissions and encourage investments in renewable energy projects. CDM emissions reduction projects in developing countries are used to create credits (Certified Emission Reductions or CERs) which can be purchased and used by Annex I parties to meet their Kyoto Protocol emission reduction obligations. It also enables them to achieve their mitigation targets at a lower overall cost.

The CDM also encourages sustainable development and technology transfer by encouraging investments in renewable energy capacity-building projects in developing countries. Nonetheless, since the inception of the CDM in 2005, developing countries have encountered obstacles in the implementation of renewable energy projects, particularly in the bioenergy sector, where the equipment costs are often higher per emission than other potential CDM projects. In addition, developing countries often suffer from political and economic instability and lack a clear regulatory framework needed to attract project financing. The lack of familiarity with and less comfort within local and international banking institutions may also be an obstacle for developing countries.

Given the current limitations of the CDM and the short-term target requirements under the Kyoto Protocol, other incentives are needed to ensure long-term investments and benefits for developing countries. To ensure that environmental concerns concerning bioenergy resource extraction are addressed, broader international strategies should be used, including research and development of clearer and safer technologies and enforceable standards to measure the carbon intensity of energy technologies. Finally, the imposition of a progressive carbon price to be applied to fuels and technologies could also help to encourage the bioenergy sector in developed and developing countries alike. Such initiatives are likely to continue to drive international environmental regulation in the coming years and have an important impact on the development of the bioenergy industry.

2.2 Sustainable Development

The production and use of renewable energy sources such as bioenergy are increasingly being promoted as an important means of reducing negative environmental impacts as well as promoting rural development and eradicating poverty, particularly in developing countries. Three key international conferences with important implications for bioenergy regulation have furthered this agenda:

- the United Nations Conference on Environment and Development, Rio de Janeiro, 1992;
- the World Summit on Sustainable Development, Johannesburg, 2002; and
- the International Conference for Renewable Energies, Bonn, 2004.

Through these conferences, an international consensus has emerged over the potential for renewable sources

of energy such as bioenergy to contribute to sustainable development. These conferences have also motivated international action on bioenergy through the adoption of principles and other "soft law" measures as well as the implementation of binding international agreements stating environmental and sustainable development commitments.

Several international environmental agreements impose binding commitments which must be taken into account by signatory countries seeking to promote the bioenergy sector. Two of the most relevant are the Convention on Biological Diversity[14] (CBD) and the UN Convention to Combat Desertification (UNCCD),[15] which address international environmental concerns over the production of bioenergy feedstocks in sensitive ecological areas.

The CBD, adopted at the United Nations Conference on Environment and Development (UNCED), commits parties to biodiversity conservation, the sustainable use of its components and fair and equitable sharing of the benefits arising from the use of genetic resources. Key national obligations include:

- developing national strategies and plans for the conservation and sustainable use of biological resources (art. 6);
- establishing protected areas, restoring or rehabilitating degraded ecosystems, and preventing the introduction of invasive alien species (art. 8);
- introducing environmental impact assessment for projects likely to have adverse effects on biodiversity (art. 14); and
- involving local populations and the private sector in sustainable use (art. 10).

Thus the CBD will be relevant to bioenergy in that it addresses feedstocks both as a component of biodiversity and as a habitat for terrestrial biodiversity.

The UNCCD requires parties to develop national plans and strategies to combat land degradation and desertification, including agricultural and forestry-related measures of relevance to the bioenergy sector. Implementing the UNCCD contributes to supporting an ecosystem approach to sustainable natural resource management for the prevention of drought and desertification from bioenergy production areas.

Non-binding international principles also provide important guidelines for countries seeking to develop national bioenergy regulatory frameworks. Agenda 21, adopted at UNCED, emphasizes the role of bioenergy in chapters dealing with protecting the atmosphere, combating deforestation and promoting sustainable agriculture and rural development. Other relevant provisions of Agenda 21 for a sustainable development approach to the development of the bioenergy sector include:

- combating poverty
- changing consumption patterns;
- promoting sustainable human settlement development;
- integrating environment and development in decision-making;
- developing an integrated approach to the planning and management of land resources;
- transferring environmentally sound technology;
- cooperating and building capacity;
- promoting education, public awareness and training; and
- establishing national mechanisms and international cooperation for capacity-building in developing countries.

Although it is a non-binding international instrument, Agenda 21 provides

[14] Convention on Biological Diversity (1992).
[15] United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (1996).

authoritative guidance for the implementation of sustainable policies and legislation to promote the use of bioenergy and other renewable energies at the national level. For example, Chapter 14 encourages policy and agrarian reform to ensure income diversification, land conservation and improved management of inputs. These guidelines may be used to ensure that bioenergy production processes do not compete with other land, agricultural and forestry uses needed to ensure economic development and environmental protection.

In addition to Agenda 21, two other influential international instruments were adopted at UNCED: the Rio Declaration on Environment and Development and the Non-binding Forest Principles. Again, although neither imposes binding legal obligations on signatory countries, both have important implications for the sustainable development of the bioenergy sector as they reflect the international consensus on appropriate measures for natural resource management. The Rio Declaration consists of 27 principles intended to guide the world into a sustainable future. The Forest Principles epitomized international consensus on the holistic nature of forest resource management and conservation, including the need for management planning, environmental impact assessment, information disclosure, public participation and protection of traditional knowledge. Both the Rio Declaration and the Forest Principles are relevant to biofuel production from wood-derived sources from forestry operations. The Rio Declaration also has important applications for biofuels derived from agro-energy resources.

Ten years after UNCED, at the World Summit on Sustainable Development (WSSD) in 2002, the Millennium Development Goals (MDGs) were adopted. Although they do not directly address energy, it has been widely recognized that the MDGs could not be achieved without adequate and affordable energy services. For example, there are important implications for national and international energy policies under the following MDGs: Goal 1 (eradicate extreme poverty and hunger) and Goal 7 (ensure environmental sustainability). The most prevalent energy-related topics emerging from recent country progress reports on the MDGs are energy efficiency (or lack thereof), carbon dioxide emissions, solid fuel use as well as the need for expansion of energy access and infrastructure for economic development.[16]

The Johannesburg Declaration adopted at the WSSD considers energy a basic human need along with clean water, sanitation, shelter, health care, food security and biodiversity. In addition, several chapters of the adopted Plan of Implementation[17] call for action on bioenergy and other renewable forms of energy. Some of the relevant provisions refer to the need to:

- improve access to reliable, affordable, economically viable, socially acceptable and environmentally sound energy services (para. 9(a));
- recognize that energy services have positive impacts on poverty eradication and the improvement of standards of living (para. 9(g));
- develop and disseminate alternative energy technologies with the aim of giving a greater share of the energy mix to renewable energy and, with a sense of urgency, substantially increase the global share of renewable energy sources (para. 20(c));
- combine a range of energy technologies, including advanced and cleaner fossil fuel technologies, to meet the

[16] *See* Takada & Fracchia 2007.
[17] Plan of Implementation of the World Summit on Sustainable Development.

growing need for energy services (para. 20(d));
- diversify the energy supply by developing advanced, cleaner, more efficient and cost-effective energy technologies (para 20(e));
- accelerate the development, dissemination and deployment of affordable and cleaner energy efficiency and energy conservation technologies (para. 20(i)); and
- take action, where appropriate, to phase out subsidies in this area that inhibits sustainable development (para. 20(p)).

At the International Conference for Renewable Energies (ICRE) held in Bonn in June 2004, bioenergy was highlighted as one of the most promising energy sources of the future. The conference adopted a Political Declaration and an International Action Programme (IAP), both of which are considered important contributions to the work of the Commission for Sustainable Development (CSD). The CSD has focused on energy during its 2006 and 2007 sessions, and the IAP has established specific targets and goals for countries to encourage the use and production of renewable energy, including bioenergy.

In addition to UNCED, WSSD and the ICRE, there are many other public and private sector organizations committed to promoting bioenergy through international cooperation. The Global Bioenergy Partnership (GBEP), which was launched at the 14th session of the CSD in New York in May 2006, promotes global high-level policy dialogue on bioenergy; supports national and regional bioenergy policy-making and market development; favours efficient and sustainable uses of biomass; develops project activities in bioenergy; fosters bilateral and multilateral exchange of information, skills and technology; and facilitates bioenergy integration into energy markets by tackling specific barriers in the supply chain. GBEP cooperates with FAO's International Bioenergy Platform, the International Partnership for the Hydrogen Economy, the Mediterranean Renewable Energy Programme, the Methane to Markets Initiative, the Renewable Energy Policy Network for the 21st Century, the Renewable Energy and Energy Efficiency Partnership, the UNCTAD Biofuels Initiative and the Bioenergy Implementing Agreements and related tasks of the International Energy Agency, among others. All of these initiatives provide important avenues to assist developing and developed countries in building national regulatory frameworks for bioenergy.

2.3 International Trade

For developing countries, there are many challenges associated with producing bioenergy for the international market. Tariff settings and production quality standards could affect the fortunes of developing countries in the international bioenergy export market. Potential trade opportunities may be reduced by measures which focus exclusively on enhancing production in developed countries, or by protectionist measures designed to limit market access. For example, there are concerns that tariff escalation on biofuels in developed country markets pushes developing countries to export feedstock, such as unprocessed molasses and crude oils, while the actual conversion into biofuels, with its associated value-added benefits, often takes place elsewhere. In addition, tariff barriers such as the ad valorem duty of 6.5 per cent on imports of biodiesel to the European Union and the 54-cent-per-gallon tariff on most imported ethanol to the United States restrict trade from developing countries to some of the most important consumer markets for bioenergy.

To address these concerns, a number of EU and US preferential trade promotion initiatives and agreements have been developed in recent years, offering new opportunities for developing countries to

benefit from the increasing global demand for bioenergy. Preferential trade with the EU for developing countries falls under the EU's Generalised System of Preferences (GSP).[18] For instance, there are provisions in the Everything But Arms (EBA) initiative and the Cotonou Agreement which would affect the bioenergy sector. Under the current GSP in effect until 31 December 2008, duty-free access to the EU is provided to denatured and un-denatured alcohol. The GSP also has an incentive programme for ethanol producers and exporters who adhere to sustainable development principles and good governance.[19] The EBA initiative provides least developed countries with duty free and quota-free access to ethanol exports, while the Cotonou Agreement provides duty free access to certain imports from African, Caribbean and Pacific Countries. The Euro-Mediterranean Agreement also has provisions for preferential trade in biofuels for certain countries in the Middle East and North Africa. In the US, ethanol may be imported duty free for certain Caribbean countries under the Caribbean Basin Initiative, although there are specific quantitative and qualitative restrictions depending on the country of origin of the feedstocks. Provisions for duty-free ethanol imports have also been proposed in the US-Central America Free Trade Negotiations.[20]

These arrangements would violate World Trade Organization (WTO) obligations which require member countries to impose tariffs on an unconditional Most Favoured Nation basis. However, the enabling clause provides for special rules to permit these and other preferential trading arrangements to operate, with strict requirements. Preferential treatment towards developing countries must be generalized, non-discriminatory and non-reciprocal, meaning that developed countries may provide incentives such as duty-free access for biofuels to developing countries so long as they do not impose requirements for concessions to be offered in return. In the EC-Tariff Preference Case,[21] the WTO Appellate Body interpreted these conditions to allow preferential tariff treatment to operate for developing countries if applied on the basis of objective and transparent criteria to address development needs, although such standards have yet to be developed.

The WTO allows such preferential schemes to carve out exemptions for obligations only to the extent explicitly provided for in the instrument in question. They do not exempt member states from other important obligations under other WTO Agreements that are applicable to trade in bioenergy, including the Agreement on Agriculture, the Agreement on Subsidies and Countervailing Measures, the Agreement on Technical Barriers to Trade and the Agreement on the Application of Sanitary and Phytosanitary Measures. The key trade-related issues for bioenergy include the classification for tariff purposes of biofuel products as agricultural, industrial or environmental goods, the role of subsidies in increasing production and the consistency between various domestic measures and WTO standards.

As a taste of the legal controversies over bioenergy that are likely to proliferate in the next few years, the European Union, Argentina, Australia and Brazil have joined Canada in a WTO complaint against the US over allegedly illegal subsidies to American corn growers.[22] Although corn is clearly an agricultural product, the Brazilian WTO Ambassador was quoted as saying that the dispute was "not just about corn. Brazil is the world's largest ethanol exporter, so this is an important issue for us."[23] If Brazil raises the ethanol issue in any way during the dispute, the panel may be faced with new and interesting

[18] Council Regulation (EC) No. 980/2005, art. 1.
[19] *Id.* art. 26(e).
[20] *See* Yacobucci 2006.
[21] WTO 2004.
[22] WTO 2007.
[23] *See* Associated Press 2007.

controversies. This is because the biofuels industry did not exist when the current WTO rules were written. Hence, biofuels are not subject to the Harmonized Standard (HS) classification system and this leaves much uncertainty about how they should be dealt with.

HS classification affects how products are characterized under specific WTO agreements. For example, ethanol is considered an agricultural product and is therefore subject to Annex 1 of the WTO Agreement on Agriculture (AoA). Biodiesel, on the other hand, is considered an industrial product and is therefore not subject to the disciplines of the AoA. Some WTO members have suggested that renewable energy products, including ethanol and biodiesel, should be classified as "environmental goods" and therefore subject to negotiations under the "Environmental Goods and Services" cluster.[24] However, so far there has been little progress on establishing the criteria to define and identify these goods and services in the Doha negotiations.

The WTO Agreement on Subsidies and Countervailing Measures (SCM) prohibits all export subsidies and all specific subsidies that favour the use of domestic products over imported products. All other subsidies are permissible under the SCM so long as they do not have adverse trade effects causing "injury" or "serious prejudice" to another member, as these terms are defined under the SCM. If biofuels were considered environmental goods, biofuel subsidies could be covered by the exception in the WTO rules against subsidies for environmental protection measures. However, given the pervasive use of subsidies and the difficulty of determining whether a subsidy is a production subsidy, a consumption subsidy or a subsidy designed to protect the environment, resolving the issue of subsidies at the WTO level will be a challenge. Regardless of how the classification issues are addressed, disputes may still arise over which subsidy rules should apply to biofuels.

While internationally agreed-upon standards for biofuels have yet to be established, many private and public stakeholders are in the process of developing different sets of criteria and indicators to "measure" compliance. These are being implemented in voluntary or mandatory systems such as product labeling and certification schemes for bioenergy production. Most of the criteria are currently being developed in industrialized countries such as those in the EU and are geared towards ensuring that biofuels are produced, distributed and used in ways that are environmentally sustainable before they are traded in local or regional markets.[25] However, these criteria or indicators may not be WTO-compatible when used in government support schemes such as subsidies or when designated for preferential treatment under international trade agreements.

The impact of international trade rules on domestic policies and legislation also needs to be carefully assessed. Not only do international rules have the potential to undermine the potential comparative advantage of developing countries in this sector, but they may also affect poverty reduction and environmental sustainability goals. There is therefore the need for a thorough study and assessment of the linkages of the bioenergy sector with the broader goals of development, food security and environmental sustainability, in view of bioenergy's importance as an emerging sector and issue of global concern. The next section will discuss how national legislation to promote bioenergy in

[24] *See* Steenblik 2005.

[25] Standards and other environmental assurance schemes that have been developed for biofuels include the Assured Combinable Crops Scheme, EurepGAP LEAF Assurance Scheme, Rainforest Alliance/Sustainable Agricultural Network Farm Assurance Standard, the Roundtable on Responsible Palm Oil Standard and the Basel Criteria (draft standards for soybean cultivation).

developing countries may be assessed for compliance with international commitments on sustainable development, environment and trade.

3. NATIONAL POLICIES AND LEGISLATION

It is important for government officials to understand what regulatory tools national governments have to promote bioenergy. Such tools could be policies, legislation or, as is usually the case, a mix of both. Policy and legislative initiatives include measures to encourage private investment in bioenergy industries and financial assistance to public or private investors from national, bilateral or multilateral sources for capital-intensive bioenergy projects. The choice of the instruments is usually informed by the bioenergy sector's relative importance to the country's overall energy security, the level of technological advancement and the level of organization or influence of the players in the sector.

Of all of the countries involved in such initiatives, Brazil has been a pioneer in national regulatory efforts for the bioenergy sector. In 1975, Brazil launched the world's first major government-backed ethanol programme, Proalcool, under Decree No. 76953. Proalcool was designed to promote the production of ethanol from sugar cane to meet rising energy needs in transport sector fuels at a time when global energy commodity prices were very high. The programme was therefore designed to reduce the national energy bill, increase hard currency revenues and foster energy independence. Since then, Brazil has been promoting the use of ethanol and has become a major ethanol producer and exporter. In 2002, Brazil launched a biodiesel programme and in December 2004 Law No. 11097 was passed, authorizing a 2% biodiesel blending with conventional diesel. In Brazil's current biofuels policy, state intervention is limited to three areas: ethanol-petrol blending provisions, minor tax reductions for blended fuels and tax incentives to encourage the use of ethanol-powered vehicles.

In the United States, the desire to promote the production and use of biofuels, particularly ethanol produced from maize, started in the early 1980s, largely to revitalize the farming sector at a time of oversupply of agricultural produce. Policy interventions were supported by passage of the Clean Air Act and the Reformulated Gasoline Programme in the early 1990s. As now stated in the Energy Policy Act of 2005,[26] US policy now includes tax reductions for fuel-ethanol and biodiesel at state and federal levels, as well as a federal tax credit for fuel-ethanol which is valid until 2010. Through the Federal Bioenergy Programme, loans, loan guarantees and grants are provided to farmers and biofuel producers. State governments have in many ways gone far beyond the federal government in their support to biofuels. Such support includes direct payments to fuel ethanol producers, direct grants or low interest loans to assist in ethanol production facilities, credits against ethanol producers' tax liability, additional fuel tax exemptions and many others.

In the EU, the Biofuels Strategy was motivated by the need to diversify fuel supply sources, to address the implications of climate change and to increase trade opportunities for agricultural products. The European Commission has taken a leading role in encouraging the use of bioenergy, through its various directives, guidelines and policy papers. The Biofuels Use

[26] The US Energy Policy Act, 42 U.S.C. 15801, was adopted in August 2005 after many years of debate. It amends the Clean Air Act to establish a Renewable Fuel Standard Program, which will increase the volume of renewable fuel required for blending into gasoline. The programme started with a requirement of 2.78 percent of the gasoline sold or dispensed in calendar year 2006 be renewable fuel, and will extend to 2012 and beyond.

Directive[27] set a 5.75% target of ethanol and biodiesel to be blended to gasoline and diesel, respectively. This directive is being revised by the European Commission as its target is inconsistent with the Fuel Quality Directive[28] which set limits on biodiesel blending to no more than a 5% share by volume. However, these blendings are not mandatory and country members of the EU are free to establish higher standards.

Regional commitments to promote the production and use of biofuels have also encouraged the development of national policy frameworks. For example, the UN Economic Commission for Latin America and the Caribbean has implemented a project to promote the use of bioethanol for the promotion of sustainable development in Central America. Under the auspices of this project, there is an Action Plan for the Introduction of Ethanol (*Plan de Acción para la Introducción de Bioethanol en la Region Centroamericana*), which establishes a series of measures to encourage bioenergy, including the creation of an appropriate legal framework. **See Box 1.**

[27] Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport.
[28] Directive 2003/17/EC of the European Parliament and of the Council of 3 March 2003 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels.

Box 1: Example of a multilateral initiative to promote the regional use of biofuels

ACTION PLAN FOR THE INTRODUCTION OF ETHANOL IN CENTRAL AMERICA
Developed by the United Nations Economic Commission for Latin America and the Caribbean, with the support of the Italian Government

OBJECTIVE:

To promote the use of ethanol with the aim of having an alternative fuel which may reduce the dependence on imported fossil fuels, promoting the activation of the agricultural and industrial sector and improve the environment.

INSTITUTIONAL FRAMEWORK

Local level:
a) Multi-institutional commission comprised of principal public and private sector stakeholders
b) Implementing agencies

Regional level:
a) Biofuels working group

ACTIONS
- Policy formulation to launch a national programme on ethanol
- Elaboration of an implementation strategy
- Coordination with sugar industry representatives
- Formulation of an integrated Action Plan for public and private sector involvement
- Presentation of the Action Plan to the automotive, academic, transport sector, among others
- Approval of the Action Plan by national governments
- Implementation

STRATEGY
- Establish mandatory blending percentages per country
- Create an appropriate legal framework
- Implementation timeframe
- Technical specifications for the ethanol
- Quality control along the production and commercialization chains
- Monitoring of supply
- Establish tariff policies for ethanol
- Develop a public awareness campaign on ethanol use
- Design a plan to receive and manage users complaints
- Design a parallel plan to monitor the first phase of implementation
- Revise and control storage and transport infrastructure
- Oversee the logistics of ethanol production
- Discuss the role of ethanol trade within regional free trade agreements

Experiences from developed countries have also been driving initiatives in developing countries. For example, in March 2007, a memorandum was signed between Brazil and the United States to promote and transfer technology to other countries interested in producing biofuels in Central America and the Caribbean. Such initiatives may encourage other countries to review their policy and legislative frameworks for compatibility.

In many developing countries, recent policy interventions appear to be driven to a large extent by the increased economic importance of biofuel crops and potentially large export market revenues. However, to ensure the sustainable development of the bioenergy industry, new policy initiatives to encourage economic growth through biofuel production must be analysed within the context of the existing national legal frameworks and adherence to international commitments.

3.1 Assessing National Legal Frameworks for Bioenergy

Legislative and institutional weaknesses can create barriers to the development of bioenergy and act as a disincentive for private investors or entrepreneurs wishing to be involved in bioenergy markets. An FAO study exploring the link between bioenergy and agriculture pointed out that bioenergy projects can only be sustainable and therefore have long-term impact if governments are able to tackle the "social, cultural, institutional, legal and financial barriers" to their implementation.[29] Law is an important tool for mediating otherwise intractable regulatory problems, including tensions between development of the fledgling sector and other issues such as environmental management, economic development and food security.

Before a country develops new legislation relating to bioenergy it should ideally have a well-considered and clear policy on the subject. Next, the existing legal framework should be analysed, the gaps and weaknesses identified and the challenges, threats and opportunities examined. There may be no law or regulations on bioenergy, requiring that entirely new legislation be drafted. But even where legislation exists, it may need to be refined. For example, there may be provisions that exceed the national capacity for implementation, such as in countries that have established emissions reduction targets within a given time-frame but which may not be met due to political, economic or social conditions. There may be other provisions requiring unnecessary or duplicative permits, licensing or approval requirements for bioenergy production, use and trade.

Legislative and policy initiatives for bioenergy may also be ineffective due to weak institutional capacities, poor enforcement mechanisms, corruption and a lack of transparency. There may also be a lack of public participation in the decision-making and legislative processes for the sustainable management of natural resources, including the agriculture and forestry sectors involved in bioenergy production. All these weaknesses may reduce the effectiveness of bioenergy legislation and its potential to contribute to sustainable development.

Before turning to the recommended elements of a national legal framework for bioenergy, it is important to define what we mean by this phrase. On the one hand, it may refer narrowly to national legislation on the production, trade, distribution and use of biofuels such as ethanol and biodiesel. It may also focus on laws and regulations that promote renewable energy in general. On the other hand, a broader approach would consider the wide variety of fields that must actually be regulated in order to ensure sustainable production, trade, distribution and use of bioenergy

[29] FAO 2000, at 81.

alternatives to fossil fuels. In this sense, the national legal framework for bioenergy would consist of the many legislative provisions, wherever they may be found, which are relevant to the production, distribution and use of energy derived from biomass. Falling into this category would be environmental regulations, land tenure provisions, waste management regulations and laws on the use of pesticides and fertilizers used in producing feedstocks. It would also include labour, health and safety laws governing workers involved in the cultivation, production and distribution of bioenergy products. In addition, the effect of laws on tax, credit financing, customs, import and export, would be considered.

Thus the first step to ensuring that a country has a comprehensive legal framework for bioenergy is a detailed examination of the many relevant sectoral areas of legislation, with a view to determining how they may affect, positively or negatively, the implementation of a country's policies on bioenergy. The review would be followed by the development of a legislative strategy to amend certain existing legislative provisions to eliminate overlaps or gaps, as well as to draft and enact new laws or regulations to cover the bioenergy field.

The identification of the universe of legal subject matters which may have some relevance to bioenergy regulation is too large a task for this brief paper. Nonetheless, the next section begins this task, by examining legal provisions in two areas – environmental protection, and economic and social development – and indicating points of intersection with the bioenergy area. This is followed by a close examination of legislation specifically regulating bioenergy, identifying the signal features of national bioenergy laws in emerging markets for bioenergy.

3.2 Areas of Regulation Relevant to Bioenergy

Countries seeking to establish comprehensive regulatory frameworks for bioenergy should ensure that regulatory measures are linked with wider environmental protection and development goals. The next sections provide an overview of some of the key legal issues arising in these areas, as they affect bioenergy. Box 2 lists these and other areas of law which will require government attention in developing a comprehensive national legal framework for bioenergy.

3.2.1 Environmental Protection Measures

The relationship between the production and use of bioenergy is central to the debate over environmental sustainability, especially as it has long-term implications, opportunities and risks. The harvesting, conversion and end uses of biomass derived from agricultural residues and waste have the potential to address many of the environmental hazards involved in fossil fuel extraction, production, distribution and use. Yet bioenergy production without due regard for sustainable agricultural practices can also lead to land degradation, including soil erosion, depletion of vegetation cover and biodiversity loss.

Fertilizers, pesticides and chemicals used to produce and convert feedstocks may increase the risk of water, ground, surface and air pollution. New conversion plants for feedstocks may offer options for controlling pollution, but processing facilities may cause discharges of organically contaminated effluent and other harmful wastes. Developing countries are particularly vulnerable to these negative impacts, as they may not have the means to ensure that cleaner technologies and the most environmentally sustainable processes are used.

To avoid harmful environmental impacts from bioenergy production, governments must regulate the siting of facilities near environmentally sensitive areas and consider broader legal protection of forests as well as broader protection of biodiversity. In addition, protection should be extended to water and soil and governments must improve air quality standards and waste disposal systems. For all these, countries should refer to their international obligations for sustainable natural resource management as established under the Kyoto Protocol, the principles of Agenda 21, the Rio Declaration on Environment and Development and the Forest Principles.

Legislation, practices and enforcement mechanisms for environmental impact assessments are essential components of an effective framework for the bioenergy sector. A framework to promote environmental protection and conservation should also include provisions for agricultural and forestry harvesting plans and permits; seed, plant and tree breeding; and cropping regulations under basic land and forest laws.

Bioenergy policies and legislation may also encourage the production of dual-use feedstocks to provide for both food and energy needs simultaneously without requiring the conversion of new lands or forests into energy crop-growing areas. Laws could encourage the planting of perennial bioenergy crops which may have a lower impact on biodiversity than an intensively managed annual farming system. Non-native species used in bioenergy production might only be cultivated under carefully regulated systems of control and monitoring. The extent of deforestation from bioenergy harvesting should be minimized by regulating the use of different cultivation methods. This may include combining crop types and rotation schemes, small-scale cultivation structures and the creation of ecological “steppingstones” and migration corridors in farming and forest areas to alleviate negative impacts. In addition, given potential environmental risks involved with the use of Genetically Modified Organisms (GMOs) for feedstocks and enzymes used in bioenergy production, regulatory provisions should address the use of GMOs in the feedstock production process.

Water laws should establish effective planning mechanisms and provisions for use and enforcement instruments applicable to the bioenergy sector. Water laws should regulate water resource allocation and sharing by establishing minimum flow requirements and reserve volumes and flows where needed to ensure that bioenergy production does not compete with water needed for other purposes. For example, under South Africa’s 1998 National Water Act,[30] there is a statutory duty to reserve water resources for ecological purposes and for the purposes of supplying water to satisfy human needs. This duty may affect the amount of water that is available for bioenergy production and require an appropriate balancing of priorities where there is competition between water used for agricultural crops and for bioenergy feedstocks. There should also be provisions for prior authorization for all bioenergy crop siting areas and subsequent licensing requirements for water abstraction.

To ensure adequate food supplies in countries where the scarcity of agricultural land and of water is an issue, it may be necessary to encourage, through regulation, the planting of biofuel crops in marginal areas of agricultural land where there is less competition between land used to grow food crops and land used to grow energy crops. Food security and competitiveness issues may also be alleviated by ensuring that the most appropriate feedstocks are chosen according to prevailing climatic and soil conditions. For example, drought-resistant jatropha

[30] Act No. 36 of 1998.

may be encouraged through regulatory incentives as a more suitable crop for developing countries facing land, water and food scarcity.

3.2.2 Measures for Economic and Social Development

Potential benefits associated with bioenergy production include increased employment opportunities and related improvement in livelihoods. Bioenergy may contribute to job creation and higher wages in agricultural communities by diversifying rural economies. Developing countries in particular have much to gain from increased global demand for biofuels if they can diversify their agricultural output with energy crops, especially if they can grow feedstocks that may be used for both food and fuel markets.

However, the cultivation of bioenergy feedstocks is often associated with large-scale production methods, which may have very little positive impact on rural labour and the poor. Farmers in developing countries may face difficulties in diversifying their traditional crops without experience in the latest technological and energy cropping practices. The poorest farmers may not be able to risk planting new crops for an untested market. In addition, potential conflicts may surface regarding the amount of land and water available for cultivation and irrigation. If the land required for industrialized bioenergy crop cultivation is controlled by large land owners or companies, small landowners, cooperatives and rural communities may face obstacles to increasing their food supply and income at the local level. The likely expansion of private agricultural land for bioenergy production may marginalize disadvantaged groups, especially women and the poor who may depend on shared access to land, water and forest resources.

To address some of these issues, land ownership and property use rights must be clearly defined to avoid the exclusion of local populations from areas devoted to bioenergy crops. For example, in Bolivia, legal reforms in 1996 led to the recognition of ancestral rights of community groups as having precedence over forest concessions holders where such rights overlap.[31] When incorporated into the broader legal framework for bioenergy, these and other related laws may improve local livelihoods by recognizing legitimate local claims to land rights, and by preventing any potential negative impacts on the enjoyment of other rights, such as the right to adequate food. Zoning, urban and rural planning regulations may also be used to ensure that a greater share of the proceeds of bioenergy production is allocated to the poor.

There is concern that large-scale biofuel production may result in, or encourage, poor labour practices in countries where labour standards are weak. In some developing countries, certain feedstocks such as sugar cane and palm oil are produced under poor working conditions with health and safety risks. In some cases, child labour or forced labour may be involved. The legal framework for bioenergy should be broad enough to ensure adequate protection of basic workers' rights, such as those related to minimum wage, job stability and the prohibition of child labour. Working conditions must also be enforced through compliance with workers' health and safety legislation, as well as those involving health conditions and the safety of operations. The provisions of the International Labour Organization Safety and Health in Agriculture Convention[32] will provide useful guidance to countries seeking to address the protection of agricultural workers, whether or not the convention has been adhered to. Finally, laws should maximize opportunities for

[31] *Ley No. 1.715 - Servicio Nacional de Reforma Agraria* (1996).
[32] C184 (2001).

community participation in the bioenergy sector, by protecting local communities and other marginalized groups, including indigenous peoples, women and the poor.

Regulatory measures may be used to encourage cooperatives of small producers and contract farming arrangements for bioenergy feedstocks. This might involve the provision of additional incentives to small producers of biofuel crops to supply local markets and generate employment while allowing larger bioethanol producing operations with greater potential to generate income rather than employment in providing for the international market.

To develop successful economies of scale for bioenergy production, governments may also encourage greater coordination in the sector by implementing policies and legislation that foster strategic alliances among industries. For example, regulatory measures may ensure that agro-industrial companies and oil companies guarantee the supply of biofuels in domestic markets, ensure distribution within existing networks and encourage the development of new technologies and engines adapted for biofuels. Industry-developed assurance and certification measures may also be effective at ensuring that bioenergy products are sourced from landholdings where responsible agricultural or forest management practices are employed in bioenergy production, thereby reducing the risk of harm to ecosystems and natural resources. While environmental assurance schemes developed by industry may not substitute for government regulation, they should be used to complement these systems, in light of the level of participation and consultation employed in the development and testing of industry standards.

Several organizations are working with FAO to develop standards to ensure sustainability of future bioenergy supplies. Such standards could be incorporated into voluntary or binding product labeling or certification schemes or could be enfolded in government support initiatives such as subsidies or preferential treatment of some products.[33] As these standards proliferate, policy-makers will need to consider whether regulations to implement them should be legally binding, or whether they should have only a limited legal effect.

[33] See, for example, Fritsche, et al. 2006.

Box 2: Selected areas of law relevant to bioenergy

- land and water ownership, tenure and use rights;
- land, forest and water management plans: harvesting plans and permits, plant breeding and cropping regulations, water resource allocation and abstraction laws;
- air, ground and water pollution: greenhouse gas mitigation measures, compliance with pesticide and fertilizer use restrictions, waste management and disposal provisions;
- environmental conservation: conformity with protected area and deforestation legislation;
- protected species and habitats;
- provisions on the use of genetically modified organisms;
- environmental impact assessments;
- social impact assessments: zoning, urban and rural planning considerations;
- community participation: protection of indigenous peoples, local communities and women;
- labour rights: minimum wage, job stability and the prohibition of child labour;
- worker health and safety, in agriculture and in production facilities;
- import and export laws;
- price regulation of feedstock;
- credit financing;
- tax laws and other industry fee regulations;
- product marketing and certification regulations; and
- processing, sales, transportation and shipping laws.

3.3 Features of National Bioenergy Laws

Having now explored some of the areas of law which should be taken into account in any review and revision of the regulatory framework for bioenergy, this section now turns to the key elements of national legal instruments specifically addressing bioenergy. These include legislation establishing institutional structures, regulating the biofuels market and establishing standards, creating incentives, regulating trade and fostering research and development.[34] This section reviews some of these areas with examples from developing countries and provides recommendations for more effective regulation.

3.3.1 Institutional Structure

National bioenergy legislation typically designates a state agency to be responsible for promoting the necessary investments in biofuels and steering national bioenergy programmes. In some jurisdictions this includes technical committees that are responsible for setting standards. For example, in Peru, there is a "statutory technical committee" whose mandate is formulate the technical specifications for biofuels and environmental safeguards, and to promote use of such fuels by the public.[35] In Argentina, the "implementing authority" has a wider mandate, which includes setting prices of biofuels, managing the grant of subsidies and other incentive schemes for biofuels promotion and auditing and inspecting

[34] Some of these topics will first be captured in national bioenergy policies and then later in laws, regulations or other legal instruments.

[35] *Ley No. 28054/03 de Promoción del Mercado de los Biocombustibles.*

production standards.[36] It is important to designate an agency for the oversight of national programmes with sufficient technical expertise to ensure bioenergy promotion measures are targeted towards the most efficient standards of production, distribution and use. To ensure effectiveness, the institutional framework in legislation to promote bioenergy should contain provisions for enforcement mechanisms, such as penalties for non-compliance with inspections and audits of bioenergy production sites.

National bioenergy legislation also usually provides for coordination mechanisms with other relevant state agencies, to ensure that bioenergy policies and legislation are effectively implemented and regulation is consistent with international commitments and other government policies. In the Philippines, for instance, the Department of Energy retains primary responsibility for the implementation of the law but is required to work with the Sugar Authority Administration to ensure that the supply of sugar is sufficient to meet domestic demand for ethanol production, even if this means importing.[37] Governments should also consider establishing mechanisms for broader cooperation with civil society. Coordination among government institutions, non-governmental organizations and the private sector to ensure the widest participation and transparency in decision-making.

3.3.2 Biofuels Market Regulation and Standards

Bioenergy laws also contain provisions on market regulation and marketing standards. Virtually all existing laws to promote the production and use of biofuels set blending requirements, meaning the percentages of biofuels that should be mixed with conventional fuels. For instance, the percentages of ethanol to be blended with gasoline are 5% in Argentina, 7.8% in Peru and 10% in Ecuador. Some countries have established specific mandatory blending requirements for use in densely populated areas. For example, in Colombia, a 10% ethanol-to-gasoline blending requirement is regulated in cities with over 500 000 inhabitants.[38] Other countries have imposed different blending percentages for ethanol and for biodiesel. In the Philippines, the law requires that at least 5% percent of locally sourced ethanol be blended for use in gasoline fuels, while a minimum 1.0% biodiesel blend must be used in diesel fuels sold in the country.[39] The regulation of blending requirements should take into consideration local market conditions, as well as opportunities for growth in the biofuels trade, by providing that the blending targets shall increase over time.

Countries have a range of legislative options in this area. Some countries may consider requiring all government vehicles to run on biofuels, requiring new vehicles sold to be able to run on multiple fuels (including fuels with high percentages of ethanol) or requiring fuel sellers to offer customers the option of pure biofuels or high-percentage blends alongside conventional fuels. Other governments might oblige owners of large fleets of vehicles to have biofuels make up a minimum percentage of fuel purchases, the rationale being that fleet owners have more financial and technical capacity to adopt new technologies, and their demand for biofuels can be key in building up the industry. Fleet owners or other large industrial users may also be

[36] *Ley 26.093/06 de régimen de regulación y promoción para la producción y uso sustentables de biocombustibles.*
[37] Republic Act No. 9367, An Act to direct the use of biofuels, establishing for this purpose the biofuel program, appropriating funds therefore, and for other purposes (Biofuels Act of 2006).
[38] *Decreto 3862 de 28 de octubre de 2005 por el cual se reglamenta la Ley 693 de 2001 relativa a normas sobre el uso de alcoholes carburantes.*
[39] Republic Act No. 9367, *supra* note 37.

required to offset their carbon emissions from fossil fuel use.[40]

In addition to marketing standards, the laws may also contain provisions stating which regions in the country can grow which biofuel crops and when, as in the case of the 2005 decree passed in Peru.[41] While the establishment of such requirements may not be required for developing countries to meet their environmental obligations under the Kyoto Protocol, they should nonetheless be encouraged, in order to develop local markets and increase access to environmentally friendly alternative sources of fuels. Such standards may also encourage investments in the bioenergy sector in developing countries under the Kyoto Protocol's Clean Development Mechanism (CDM).

3.3.3 Incentives

Incentives are an essential component of regulatory measures to encourage the production, use and trade of biofuels in domestic energy frameworks. In Argentina, legislation grants exemptions "to promote investments" in bioenergy, including exemptions from value added taxes, corporate tax for three years and excise tax.[42] In the Philippines, water effluents from the production of biofuels are exempt from wastewater charges, and government financial institutions are required to provide financial services and benefits to local companies engaged in the bioenergy sector.[43] Bioenergy laws also usually require governments to actively promote small and medium-size enterprises especially through preferential procurement policies. In Paraguay, legislation provides that biofuels projects by small enterprises are specifically eligible for benefits deriving from the CDM.[44] Incentives should be carefully considered to ensure that socio-economic and environmental goals are met. For example, permits, licensing or approval requirements for new bioenergy production facilities should be streamlined to encourage investment but should not be designed to circumvent compliance with environmental and labour standards.

Other potential incentives could include the lease or sale of public lands and other resources at lower rates if they will be used for biofuels production. They could also include the sale of forest products from public lands and the use of public lands in agroforestry programmes, as well as leases of land for annual biofuel crops. Other incentive schemes could focus on the provision of micro-credit facilities or low-interest loans and loan guarantees to farmers for the cultivation of biofuel crops or to build their own processing facilities.

3.3.4 Trade Regulation

Trade regulation is another important area of national bioenergy legislation. In Paraguay, a 2006 law provides a trade incentive to farmers by making it mandatory for biofuel producers to purchase feedstock from local farmers, thereby protecting them from foreign competition.[45] Looked at broadly, such provisions may be problematic because they could distort trade, and also because of the well-acknowledged fact that only very few countries have enough raw materials available at present to produce biofuels that can, without government intervention, compete on price with fossil fuels.[46]

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[40] The authors gratefully acknowledge the contributions of Ken Rosenbaum to this paragraph.
[41] *Decreto Supremo No. 013-2005-EM Reglamento de la Ley de Promoción del Mercado de los Biocombustibles* (2005).
[42] *Ley 26.093/06*, *supra* note 36.
[43] Republic Act No. 9367, *supra* note 37.
[44] Ley No. 2.748/05 de fomento de los biocombustibles (2005).
[45] *Decreto No. 7.412/06 por el que se reglamenta la Ley No. 2.748/05 de fomento de los biocombustibles* (2006).
[46] See OECD/FAO 2006, at 28 ("Indeed, in only very few countries is the required feedstock available at prices that would presently allow ethanol and bio-diesel production to be competitive with transport fuels from crude oil

Some laws also require that any feedstock purchased by biofuel producers be accompanied by a certificate of origin as a way of further tracking compliance with the local purchase requirement. In the Philippines, for example, the law makes it mandatory to use locally sourced bioethanol and biodiesel, and requires the Department of Trade to create and classify a tariff scheme for biofuels.[47] Such measures must be reviewed carefully to ensure compliance with WTO and other regional and international trade commitments.

Another key trade regulation aspect of bioenergy is product labelling. One of the options is for legislation to require labelling not just with respect to the contents but also to their net greenhouse gas emission impact. This could be technical, to facilitate compliance with offset requirements, or it could just be a simple colour code system to show high, reduced or very low emissions.

3.3.5 Bioenergy Research and Development

Bioenergy laws also typically contain provisions for the promotion of research and development, especially in production methods and use. In some countries the government has an explicit obligation to assign resources for bioenergy research and development activities. In Peru, for example, the government is required to promote scientific research in the development and use of renewable energy, and to allocate funding for this purpose.[48] The imposition of a binding obligation to secure funding for bioenergy research and development may create more favourable conditions for investment.

without government support. But such support can also create market distortions, the nature and level of which need to be well understood before policies are put in place.").

[47] Republic Act No. 9367, *supra* note 37.

[48] *Decreto Supremo No. 013-2005-EM*, *supra* note 41.

PART II – SUMMARY OF LEGAL AND POLICY INITIATIVES

1. OVERVIEW

This part of the study provides a brief overview of existing or proposed legislation on biofuels in selected developing countries in Latin America, Africa and Asia, as well as policy initiatives. The countries chosen for analysis were the result of a survey sent to FAO country representatives by the Development Law Service (LEGN) of the FAO Legal Office. FAO country representatives were invited to provide information on existing or proposed legislation, policies and programmes to promote the production and use of bioenergy and biofuels in their respective countries. The information received is summarized in this part. Although it is far from exhaustive, the summaries do identify a broad range of legislative initiatives and policies on bioenergy in developing countries which will merit further study.

Many developing countries have been actively involved in legislating measures to promote biofuels based on approaches that parallel those of the three leading biofuels producers: Brazil, the European Union and the United States. In Latin America, Colombia, Costa Rica, Ecuador, Honduras, Mexico, Nicaragua, Paraguay, Peru and Uruguay have recently enacted legislation toward these ends, while Chile and El Salvador have drafted legislation which is expected to be passed in the near future. In Southeast Asia, Indonesia and the Philippines have also recently enacted laws to regulate the production and use of biofuels.

The long experience of Brazil in ethanol production over the last three decades has served as a model for many other South American countries which have been particularly active in recent years in promoting the production and use of biofuels through new legislative initiatives. In Southeast Asia, several initiatives and pilot projects are being developed to encourage ethanol and biodiesel production from palm oil. However, with the exception of a few countries, such as the Philippines and Indonesia, there appear to be fewer regulatory frameworks in place for bioenergy in Asia. Africa appears to have the least regulation and policies for bioenergy which may slow the development of the sector.

In addition to legislation, most of the countries surveyed have established national programmes to promote the production and use of biofuels. Some of these programmes were designed before the development of a specific law promoting biofuels, such as was the case in Argentina or Peru. Some countries, such as Chile, El Salvador and Panama, have established a national policy on biofuels but have not yet enacted accompanying legislation. In other countries, such as Ecuador and Nicaragua, legislative initiatives have preceded the formulation of a national programme on biofuels. In these cases, the legislation mandates the development of a national programme and establishes guidelines for its implementation.

As seen in the preceding Part, one of the key features of legislation to promote biofuels is the creation of an institutional framework and the designation of an authority responsible for implementation. As biofuels are regarded as substitutes to conventional transport fuels and part of the national energy matrix, they usually fall under the scope of national energy ministries. There may already be an institution in place, depending on the country, or it may be explicitly created by the law. The choice of which ministry to designate as the implementing authority varies by country, depending on the local context. For example, in the Mexican and

Nicaraguan legislation, the ministry responsible for agriculture is designated as the implementing authority. In Colombia and Paraguay, the legislation allocates a more limited role to the agriculture ministry. In other jurisdictions, the ministry of the environment may be the implementing authority, while the national ministry of commerce and finance has the responsibility for overseeing tax incentives and other financial provisions related to biofuel production, use and trade.

The degree of detail of the legislation also varies from one country to another. Some countries, such as Ecuador, Nicaragua and Uruguay, have passed laws or government decrees that declare the production and use of biofuels in the country to be of national interest but do not regulate related activities in detail. Such basic laws generally provide for the designation of an implementing authority and, in some cases, they outline the basis of a national biofuels policy or programme. Other countries, including Argentina, Paraguay, Peru and the Philippines, have opted to enact national laws which regulate many aspects of biofuel production and use in much greater detail.

Most of the laws surveyed contain the following provisions:

- purpose of the law;
- definitions of bioenergy and biofuels;
- institutional framework;
- licensing requirements for biofuel producers;
- requirements for technical specifications for biofuel production;
- mandatory blending targets;
- tax incentives for the production of biofuels; and
- sanctions or penalties for non-compliance with the law.

Very few of the laws surveyed address broader environmental or socio-economic goals. However, such goals may be outlined at the project implementation level. For example, Namibia's Kavango Biofuel Project makes clear reference to the international environmental requirements established under the Kyoto Protocol to qualify for carbon credits and has provisions to encourage employment and the distribution of other economic benefits to farmers the local level. Other examples will be explored below.

2. REVIEW OF SELECTED NATIONAL POLICIES AND LAWS

2.1 Argentina

In Argentina, there have been several legislative initiatives related to biofuels in recent years. Resolution 1.156/2004[49] of the Secretariat of Agriculture, Livestock, Fisheries and Food established the National Biofuels Programme *(Programa Nacional de Biocombustibles)*, whose principal objectives are to:

- promote the production and sustainable use of biofuels as a renewable source of energy alternative to fossil fuels, with special attention to biodiesel from vegetable and animal oils and ethanol from sugar cane, maize and sorghum;
- support and advise rural sectors on the development of facilities used in the production of biofuels as an opportunity for local and regional development;
- cooperate with public institutions devoted to research into and expansion of the use of biofuels; and
- promote public and private investment.

[49] *Resolución 1156/2004 de la Secretaría de Agricultura, Ganadería, Pesca y Alimentos por la que se crea el Programa Nacional de Biocombustibles* (2004).

To complement the National Biofuels Programme, Law No. 26.093[50] was enacted in April 2006 to establish measures to promote the production and sustainable use of biofuels over a 15-year period. It mandates a minimum 5% blending requirement both for ethanol and biodiesel with gasoline and diesel, respectively, effective 1 January 2010. It also establishes requirements for the mandatory use of biofuels in government vehicles and public transportation. Finally, it provides for the following investment incentives for the biofuels industry in Argentina:

- VAT exemption;
- corporate tax exemption for three years; and
- excise tax exemption on biofuels.

The law creates a National Advisory Board for the Promotion of Production and Sustainable Use of Biofuels *(Asesora Nacional para la Promoción de la Producción y Uso Sustentables de los Biocombustibles)* which is comprised of a representative from each of the following bodies:

- Secretariat of Energy;
- Secretariat of Agriculture;
- Secretariat of Livestock, Fisheries and Food;
- Secretariat of Environment and Sustainable Development;
- Secretariat of the Treasury;
- Secretariat of Economic Policy;
- Secretariat of Commerce and Industry;
- Secretariat of Science and Technology;
- any other public or private institutions which may contribute to the fulfilment of the tasks allocated to the implementing authority.

The board serves in an advisory role and is to be convened when necessary to provide assistance to the implementing authority in legal, technical and administrative aspects of the biofuel industry.

Under Law No. 26.093, qualified companies and projects are eligible for the benefits deriving from the Kyoto Protocol Clean Development Mechanism (CDM) which was implemented in Argentina in 2001 under Law No. 25.438.[51] Finally, Law No. 26.093 includes provisions for offences and sanctions.

Law No. 26.093 was recently further regulated by Decree No. 109/2007,[52]. According to this decree, all activities related to the production, blending, distribution, sale, consumption and sustainable use of biofuels shall be regulated under articles 2, 3 and 6 of Law No. 17.319 of 1967[53] to the extent they are not specifically regulated by Law No. 26.093 and its implementing Decree No. 109/2007.

Decree No. 109 establishes restrictions on the tax benefits applicable to biofuel production under Law No. 26.093. If the total number of projects exceeds the annual estimated volume of biofuels needed for the domestic market, the criteria set out in article 14 of the law shall be used to prioritize projects. Projects beyond the set annual volume are permitted to sell biofuels both in the domestic and international markets but they do not enjoy the same tax benefits.

Decree No. 109 designates the Secretariat of Energy, under the Ministry of Federal Planning, Public Investment and Services (MFPPIS), as the primary implementing authority, although the

[50] *Ley 26.093/06 de régimen de regulación y promoción para la producción y uso sustentables de biocombustibles* (2006).

[51] *Ley 254383/01 de aprobación del Protocolo de Kyoto de la Convención marco del las Naciones Unidas sobre cambio climático* (2001).

[52] *Decreto 109/2007 sobre actividades alcanzadas por los términos de la Ley 26.093, autoridad de aplicación, funciones, Comisión Nacional Asesora, habilitación de plantas productoras y Régimen promocional.*

[53] *Ley 17.319 de Hidrocarburos* (1967).

Ministry of Economy and Production is the implementing authority for tax issues related to biofuels. The MFPPIS is responsible, among other tasks, for:

- setting technical specifications for biofuels;
- monitoring biofuel activities in the country;
- setting the criteria that biofuel facilities must meet and certifying biofuel projects and facilities;
- applying sanctions in the event of non-compliance with the law;
- creating and updating a registry of biofuel producers;
- periodically publishing reference prices for all biofuels to be sold in the country; and
- providing an annual estimate of the total volume of biofuels required to meet domestic market needs.

Decree No. 109 provides for the Secretariat of Environment and Sustainable Development to adopt necessary measures in support of article 17 of Law No. 26.093, whereby qualified companies and projects are eligible for benefits deriving from the CDM.

2.2 Chile

In May 2006, a working group was created with the aim of formulating a national policy for biofuels and an appropriate legal framework to promote its development in the country. This working group was composed of the National Energy Commission *(Comisión Nacional de Energía)*, the National Environment Commission *(Comisión Nacional de Medio Ambiente)*, the Electricity and Fuels Agency *(Superintendencia de Electricidad y Combustibles)* and the Ministries of Agriculture and Transport, among others. In November 2006, the government formulated a National Energy Security Policy with a National Policy for the Promotion of Biofuels *(Política de Estado para desarrollo de biocombustibles)*.

The working group submitted a proposed Law on Biofuels at the end of 2006 which is expected to be passed in the coming months. The stated purpose of the law is to reduce Chile's dependency on imported oil and to contribute to the development of the agricultural sector. In order to achieve these goals, the proposed law provides for a 5% biofuel blend requirement in gasoline and diesel and provides for incentives that include tax exemptions on biofuels. An ad hoc working group has been created to define national quality standards for ethanol and biodiesel for sale in Chile.

Along with these initiatives, the country has also expressed its commitment to promote biofuels under the National Agricultural and Forest Policy, which contains five Strategic Points. Under Point No. 3, the policy provides that national agriculture shall contribute to the development of renewable energies through the supply of feedstock devoted to the production of biofuels. This policy lists the promotion of biofuels as one of the priority actions for 2007.

2.3 Colombia

Colombia has pursued several legislative initiatives in recent years to promote the production and use of renewable energy and bioenergy, including specific legislation on bioethanol and biodiesel, as well as technical specifications and blending requirements.

In 2001, Colombia passed Law No. 697[54] to promote the use of alternative energy sources by establishing the Programme for the Rational and Efficient Use of Energy *(Programa de Uso Racional y Eficiente de la Energía y demás formas de energía no convencionales)*. The law designated the Ministry of Mines and Energy as the implementing authority for policies and legal instruments to promote

[54] *Ley 697 de 2001 mediante la cual se fomenta el uso racional y eficiente de la energía, se promueve la utilización de energías alternativas y se dictan otras disposiciones. Diario Oficial No. 44.573, de 5 de octubre de 2001.*

the use of alternative sources of energy to fossil fuels. The same year, Law No. 693[55] was passed to mandate the use of ethanol fuel. It requires the addition of 10% ethanol to gasoline beginning in 2006 in Colombian cities with populations exceeding 500 000 while in cities with fewer than 500 000 inhabitants, the government may authorize a lower ethanol blend. Decree No. 3862 of 2005[56] provides further details to Law No. 693, by establishing that blending ethanol with gasoline is not an industrial or productive process, meaning that it is therefore exempt from the taxes that would otherwise apply to these processes.

In 2004, Law No. 939[57] was enacted to encourage the production of biofuels through additional incentives. The law exempts the production of new biofuels crops, including palm, from taxes for the ten years from 2005 to 2015, and provides for the Ministry of Mines and Energy and the Ministry of Environment, Housing and Land Use and Planning to determine a fixed percentage of biodiesel to be blended with conventional diesel and to be exempt from taxes. In addition, it requires the Ministry of Agriculture and Rural Development to direct a portion of the domestic oleaginous plants used as feedstock toward the production of biofuels. Decree No. 1970 of 2005[58] establishes a number of requirements that biofuels producers must meet to obtain tax exemptions under Law No. 939.

In 2003, the Ministry of Mines and Energy issued Resolution No. 180687[59] establishing technical specifications for ethanol fuel. The resolution provides that technical specifications should be in accordance with the quality standards and environmental specifications set for the sale of fuel alcohol in Colombia under Resolution No. 447[60] issued by the Ministry of Mines and Energy and the Ministry of Environment, Housing and Land Use and Planning. Resolution No. 180687 also requires producers to obtain a quality certificate so as to be able to sell ethanol in the country and allows them to export ethanol only after national needs are met.[61] Further legislation to promote the production and use of biodiesel is also currently under preparation.

2.4 Costa Rica

In September 2006, the Ministry of Agriculture and the Ministry of Environment and Energy of Costa Rica established a unified National Commission on Biofuels (*Comisión Nacional de Biocombustibles*) under Decree No. 33357.[62] The decree repealed Decree No. 31087 of 2003 and Decree No. 31818 of 2004 which had

[55] *Ley 693 de 2001 por la cual se dictan normas sobre el uso de alcoholes carburantes, se crean estímulos para su producción, comercialización y consumo, y se dictan otras disposiciones. Diario Oficial No. 44.564, de 27 de septiembre de 2001.*

[56] *Decreto 3862 de 28 de octubre de 2005 por el cual se reglamenta la Ley 693 de 2001 relativa a normas sobre el uso de alcoholes carburantes.*

[57] *Ley 939 de 2004 por medio de la cual se subsanan los vicios de procedimiento en que incurrió en el trámite de la Ley 818 de 2003 y se estimula la producción y comercialización de biocombustibles de origen vegetal o animal para uso en Motores diesel y se dictan otras disposiciones. Diario Oficial No. 45.778 de 31 de diciembre de 2004.*

[58] *Ley 1970 del Ministero de Agricultura y Desarrollo Rural por la cual se reglamenta parcialmente la Ley 939 de 2004.*

[59] *Resolución 180687 de 2003 del Ministero de Minas y Energía por la cual se expide la regulación técnica prevista en la Ley 693 de 2001, en relación con la producción, acopio, distribución y puntos de mezcla de los alcoholes carburantes y su uso en los combustibles nacionales e importados.*

[60] *Resolución 447 del Ministerio de Ambiente Vivienda y Desarrollo Territorial y Ministerio de Minas y Energía por la cual se modifica parcialmente la Resolución 898 del 23 de agosto de 1995, que regula los criterios ambientales de calidad de los combustibles líquidos y sólidos utilizados en hornos y calderas de uso comercial e industrial y en motores de combustión interna.*

[61] *Resolución 180687 de 2003,* artículo 16.

[62] *Derogación de los Decretos Ejecutivos 31087 MAG MINAE y 31818-MAG-MINAE y Creación de la Comisión Nacional de Biocombustibles* (2006).

previously established two separate Commissions, the Technical Commission on Ethanol and the Technical Commission on Biodiesel.

Under Decree No. 33357, the commission is composed of representatives from various ministries and other public and private institutions involved in the production of biofuels. It is responsible for proposing an action plan containing strategies over the short and long term to encourage the use of biofuels in Costa Rica in cooperation with the Ministry of Environment and Energy and the Ministry of Agriculture and Livestock. The commission is also mandated to carry out monitoring activities. Finally, it is responsible for proposing any reforms needed to ensure an appropriate legal framework to promote biofuels in the country.

2.5 Ecuador

In December 2004, the Ecuadorean Government passed Decree No. 2332[63] which established a Consultative Council for Biofuels *(Consejo Consultivo de Biocombustibles)* which would have three main responsibilities: formulating general policies related to the production and use of biofuels and the agricultural production of energy crops in the country, designing appropriate mechanisms to support agricultural and industrial sectors involved in biofuel production and ensuring that the consumer price of biofuels does not exceed that of conventional fuels.

A National Programme on Biofuels *(Programa de Biocombustibles)* was developed in 2005 for implementation by the Ministry of Energy and Mines. This programme comprises two phases, first the introduction of biofuels at local level through two pilot projects (one for ethanol and another for biodiesel) and later the introduction of biofuels at the national level. Under the first phase, an ethanol pilot project planned for a 5% ethanol blend with gasoline requirement for sale and use in the city of Guayaquil, a percentage that would be increased up to 10% in the second phase at the national level. The biodiesel pilot project required a 5% biodiesel blend within the Metropolitan District of Quito, with the same percentage to be implemented at the national level in the second phase. Since January 2007, after a change in government, the National Programme on Biofuels has been under review. [64]

2.6 El Salvador

El Salvador has a National Policy for the Promotion of Renewable Energies and Alternative Fuels *(Política del Fomento de las Energías Renovables o Combustibles Alternos para el Sector Transporte)*. Under this policy, there is a programme to promote the use of alternative fuels in the transport sector which aims to reduce by 10% the use of gasoline and by 15% the use of diesel by incorporating ethanol and biodiesel, respectively. This measure seeks to improve vehicle emissions while creating a potential export source and reducing oil imports.

To implement the policy, the government is currently developing the legal framework, several studies are currently under preparation and the government is executing pilot projects with a focus on domestic biodiesel production. A draft Law on Incentives and Promotion of Biodiesel *(Anteproyecto de Ley de incentivos y fomento del uso del Biodiesel)* and the biodiesel technical specification are currently under review.

2.7 Guatemala

In the 1980s, due to an increase in the price of oil and a crisis caused by a fall in sugar prices, Guatemala passed Decree-

[63] *Decreto Ejecutivo 2332 de 2004 por el que se declara de interés nacional la producción, comercialización y uso de biocarburantes así como la producción agrícola destinada a la preparación de biocarburantes. Publicado en el Registro Oficial No. 482.*

[64] Rothkopf 2007, at 92.

Law No. 17-85[65] on fuel alcohol. The decree-law established that ethanol should be blended with conventional gasoline in a percentage not to exceed 20%, with a view to secure a domestic market for ethanol at set prices and quotas. The Ministry of Energy and Mines was responsible for monitoring the production, distribution, blending and quality of ethanol sold in the country. The decree-law established some incentives, including import tariff exemptions for machinery and equipment used to produce ethanol. In addition, ethanol producers were obliged to pay an anticipated 2.5% tax on production.

In the 1990s, a draft Law on Gasoline Oxygenation *(Propuesta de Ley de oxigenación de las gasolinas)* sought to require a certain percentage of ethanol in gasoline sold in the country. However, this draft law was never passed because it prohibited the importation of ethanol although the domestic industry could not guarantee sufficient ethanol production to meet domestic needs.

Apart from these initiatives directly targeted towards biofuels, in 2003 Guatemala passed Decree-Law No. 52-03[66] on incentives to promote the development of renewable energy projects. The decree-law provides for the following incentives, applicable for a period of ten years from the start date of a commercially operative project:

- VAT exemption and excise tax exemption on imports of equipment and machinery used in renewable energy projects;
- personal income tax exemption;
- corporate tax exemption; and
- emission reduction certification for renewable energy projects.

Under the decree-law, the Ministry of Energy and Mines implemented Regulation No. 211 of 2005[67] which establishes a set of definitions, administrative requirements and procedures in order for projects to qualify for incentives.

2.8 Honduras

In 1988, the Government of Honduras enacted Decree No. 79.88, containing the Law on Alcohol Fuel *(Ley de Alcohol Carburante)*.[68] More recently, it has introduced legislative initiatives to promote the production and use of biofuels to increase employment, improve energy self-sufficiency and contribute to pollution reduction at the global and local level.

In September 2006, a draft Law on the Production and Use of Biofuels *(Proyecto de Ley para la Producción y Consumo de Biocombustibles)* was submitted to the National Congress to create an appropriate legal framework to encourage biofuels production and use in Honduras. This draft law would establish a Technical Unit of Biofuels under the Secretariat of Industry and Commerce as the authority responsible for the implementation of the law. The draft law provides for the unit to establish the percentage of biofuels to be blended with conventional fuels as well as their technical specifications, and to formulate appropriate policies to produce biofuels from domestic feedstock. The draft legislation establishes requirements for biofuel producers to meet in order to benefit from tax exemptions set out in the draft law. For instance, biofuel producers must purchase at least 51% of feedstock from domestic farmers.

For those meeting the established requirements, the tax benefits include:

[65] *Decreto Ley No. 17-85 – Ley del alcohol carburante* (1985).
[66] *Decreto No. 52/03 – Ley de incentivos para el desarrollo de proyectos de energía renovable Diario de Centro América No. 91, 10 de noviembre de 2003.*
[67] *Acuerdo Gubernativo No. 211-2005, Reglamento de la Ley de incentivos para el Desarrollo de Proyectos de Energía Renovable.*
[68] *Decreto No. 79.88 del 12 de julio de 1988 que contiene la Ley del Alcohol Carburante.*

- exemption from tax on the purchase of any equipment related to the production of biofuels for 15 years;
- corporate tax exemption for 10 years; and
- excise tax exemptions for import of machinery and equipment.

The draft law also mandates the Secretariat of Agriculture and Livestock to promote research into the sustainable production of biofuel feedstocks and to establish incentive mechanisms to promote biofuels in the agricultural sector. In addition, it sets out legal enforcement mechanisms including criminal and civil sanctions if biofuels are produced without meeting technical and administrative requirements. Upon enactment, the legislation will repeal Decree No. 79.88.

2.9 Indonesia

Indonesia is the world's second largest palm oil producer after Malaysia, but it was not until after global fuel prices soared and Indonesia became a net fuel importer that the Indonesian Government began to actively pursue alternative energy industries, including biofuels produced from palm oil. The government reduced and then eliminated fuel price subsidies in 2005, allowing the biofuel industry to become economically viable. Since then, the government has enacted legislation to encourage the use of biofuels, including Presidential Regulation No. 5/2006[69], Presidential Instruction No. 1/2006[70] and Presidential Decree No. 10/2006.[71]

In 2005, the Minister of Energy and Mineral Resources issued a National Energy Management Blueprint (NEMB) in support of the National Energy Policy (NEP). Article 4 of the NEMB establishes national strategies for the management and use of energy resources including a roadmap for each alternative energy sector. It provides a target for biodiesel use of 1.5 million kilolitres in 2010 (10% of national transportation diesel oil consumption) and targets an increase of up to 6.4 million kilolitres in 2025 (20% of national transportation diesel oil consumption, or 5% of total national diesel oil).

Presidential Regulation No. 5/2006 implements the NEMB. It states that the purpose of the NEP is to ensure a secure domestic energy supply and to encourage sustainable development. Article 2 establishes a target for biofuels to contribute at least 5% of the total national energy consumption by 2025. Presidential Instruction No. 1/2006 establishes the framework for coordination among ministries to promote the supply and use of biofuels. It designates ministries responsible for formulating and implementing policies, including incentives, tariffs and trading systems, as well as standards and procedures for cultivation methods, processing, quality testing, the supply and distribution of biofuels, the provision of land and the development of research and technology. Specific to agricultural production, articles 3 and 4 provide that the Ministry of Agriculture shall encourage the provision and development of bio-fuel plants including seeds and seedlings, whereas the Ministry of Forestry shall provide licences regulating the use of unproductive lands for biofuel plantations.

Indonesia established biodiesel standard SNI 04-7182-2006 which was approved by the National Standardization Agency under on 22 February 2006.[72] The biodiesel standard was formulated by taking into account similar standards already applied in other countries such as ASTM D6751 in the US and EN

[69] Presidential Regulation No. 5/2006 on National Energy Policy.
[70] Presidential Instruction No. 1/2006 on Supply and Utilization of Biofuels as Alternative Energy.
[71] Presidential Decree No. 10/2006 on Establishment of National Team for Biofuel Development.

[72] Decree No. 73/KEP/BSN/2006 (22 February 2006)..

14214:2002 in the EU. On 17 March 2006, the Oil and Gas Directorate-General of the Department of Energy and Mineral Resources issued a decree regarding the quality and specification of two types of diesel oil.[73] This decree regulates the use of fatty acid methyl ester up to the maximum of 10 percent of the volume of automotive diesel fuel with which it is to be blended. The biodiesel to be mixed has to meet the biodiesel standard SNI 04-7182-2006.

2.10 Mexico

In April 2007, Mexico passed the Law on the Promotion and Development of Bioenergy *(Ley de Promoción y Desarrollo de los Bioenergéticos)*.[74] Its purpose is to encourage the use and production of bioenergy as a key step to achieving national energy self-sufficiency and sustainable development; to provide support to the agricultural sector; and to contribute to pollution reduction. The preamble refers to the goal of improving the air quality of metropolitan areas in Mexico.

The 2007 law mandates a minimum 10% ethanol blended with gasoline in the major urban areas of the country, with maize and sugar cane as the primary domestic feedstocks used for biofuel production. While the law does not specify the criteria for determining which urban areas are subject to the biofuels blend requirement, it provides for the government to prioritize projects to promote bioenergy production in economically disadvantaged areas. It also has provisions to uphold indigenous community rights. In cooperation with the competent regional governments, the Secretariat of Agriculture, Livestock, Sustainable Development, Fisheries and Food is given authority to:

- promote research and development activities related to bioenergy;
- advise farmers on any issues related to the production of bioenergy feedstocks;
- determine the date of entry into force of mandatory biofuel blendings in the main urban areas of the country; and
- formulate and implement economic incentive programmes to build biofuel facilities.

The law specifically mandates that qualified projects are eligible for benefits deriving from the Kyoto Protocol Clean Development Mechanism. However, the law is subject to the provisions of the General Law for Ecological Balance and Environment Protection *(Ley General del Equilibrio Ecológico y la Protección al Ambiente)*[75] as well as other environmental laws. All activities related to the production, distribution and use of bioenergy must comply with regulations issued by the Secretariat of Environment and Natural Resources in coordination with the Secretariat of Health. The law also provides a list of offences and states that, in addition to criminal and civil sanctions, violations of the law may lead to the removal of any public financial support for qualified projects.

The Inter-secretarial Commission for Sustainable Rural Development *(Comisión Intersecretarial para el Desarollo Rural Sustentable)*, established under article 10 of the Law of Sustainable Rural Development of 2001,[76] is responsible for programmes at the national, regional and local level to manage maize and sugar cane plantations for ethanol production as well as oilseeds for biodiesel production. The commission serves as an advisory body for the development of national strategies to encourage the promotion of bioenergy

[73] Decree No. 3675K/24/DJM/2006 (17 March 2006).
[74] *Ley de Promoción y Desarrollo de los Bioenergéticos de 27 de abril de 2007*.
[75] Ley General del Equilibrio Ecológico y la Protección al Ambiente. *Publicada en el Diario Oficial de la Federación el 28 de enero 1988.*
[76] *Ley de Desarrollo Rural Sustentable* (2001).

and is the central coordinating body for policies, programmes, projects and instruments that support, regulate and monitor the bioenergy industry.

2.11 Namibia

Although Namibia has yet to enact official legislation on biofuels, the government has shown its interest in the production of biodiesel obtained from domestic planted jatropha trees, mainly in the Kavango and Caprivi Regions. See Box 3. Policy measures to promote this industry are currently in development.

In August 2006, the government issued the National Bio-Oil Energy Roadmap, a strategy document which aims to achieve the desired contribution of a bio-oil energy industry into Namibia's Vision 2030. The roadmap seeks to integrate development goals, existing policy and government, NGO, aid agency and private sector resources to mobilize technology and resources and benefit from market opportunities for biofuels in Namibia. Under the roadmap, the planting of jatropha crops in certain areas of the country is encouraged in order to promote economic development. Among others, the roadmap establishes the following short-term objectives:

- biofuel blending requirements of up to 5% with commercial diesel;
- decentralized on-farm/village-level blending into agricultural diesel;
- exports to specialized niche markets; and
- developing small power stations in Namibia, which would attract carbon credits under the Kyoto Protocol's CDM.

The roadmap also outlines long-term objectives, such as:

- the establishment of bilateral and multilateral agreements and arrangements to promote the exchange of scientific know-how as well as to facilitate trade in carbon credits and other environmental goods and services;
- the establishment of a policy environment and a portfolio of policy instruments which support the development of a sustainable bio-oil energy industry in the country, especially to manage risks external to the project or the operator; and
- the proper and effective management of biofuels processes, products and market risks.

A National Bio-Oil Energy Committee has been established to implement the roadmap, chaired by the Namibian Agronomic Board and comprising the Ministry of Agriculture, Water and Forestry, the Ministry of Environment and Tourism and the Ministry of Mines and Energy, in addition to public and private stakeholders.

The roadmap requires jatropha *curcas* and any other plant used as an energy crop to be published in the official gazette in terms of section 2(a) of the Agronomic Industry Act of 1992.[77] This section establishes an in-principle agreement for biofuel producers and processors to pay fees to cover administration costs, once sizable crops have been harvested after three years of growth. The roadmap also states that appropriate liquid-fuel standards under the Petroleum (Exploration and Production) Act of 1991[78] should be published in the official gazette.

In addition, the roadmap provides for a designated national authority to be established to allow project proponents to register CDM projects under the Kyoto Protocol. For this authority to be operative, a draft Environmental Management Bill has to be passed by

[77] Agronomic Industry Act (1992).
[78] Petroleum (Exploration and Production) Act (1991).

Parliament. This bill will require the Minister of Environment and Tourism to publish regulations in support of activities related to the implementation of the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

Box 3: Example of a national project to promote biofuels

NAMIBIA'S KAVANGO BIOFUEL PROJECT

Namibia is currently providing incentives for investments in jatropha plantations to encourage biodiesel production among farmers on communal land in Kavango. The purpose of the project is to involve local communities in growing plantations of jatropha *curcas*, and establishing factories to produce bio-diesel and seed cake.

The project was started in 2006 with the establishment of five nurseries expected to grow over 200 million jatropha seedlings. Starting in 2008, a factory will be built to extract the oil from the seed, and another to process it into bio-diesel. It will take three years to be fully operational.

Under the provisions of the Kyoto Protocol, only land that was cleared prior to 1990 may be used if the project is to qualify for carbon credits. The Kavango Biofuel Project, in compliance with the Kyoto Protocol, shall only use land that was cleared prior to 1990 for purposes of growing jatropha. The process of identifying and mapping the land is currently in progress, based on satellite images. Fieldwork and a flight over the study area showed that vast areas have been cleared in the past, and much of that land is no longer cultivated. It is expected that the land cleared prior to 1990 will form a patchwork of fields, so that extensive continuous tracts of jatropha plantations are not envisaged.

There are about 24 000 rural families in the Kavango Region, and the project is expected to provide considerable economic benefits for local communities and the investors. If participating families use an average of 10 hectares for jatropha, then an estimated 8 000 to 13 000 families could participate in growing jatropha plantations.

Families who choose to become jatropha farmers will be contracted to grow on land that was cleared prior to 1990. As not all of the inhabitants have access to such land, there are concerns about inequalities. The project envisions that those people who do not have access to qualified land would be considered first for other project-related opportunities such as work as tractor drivers, administrators and factory employees if the factory is located in Kavango.

For the first six years the Namibian company running the project, Prime Investment (Pty) Ltd will subsidize the participating farmers with food and payments as compensation for the maize and pearl millet that were previously grown. The farmers will contribute their land and labour, while all the capital costs will be met by the company. Farmers are expected to benefit through:

- initial monthly compensation for six years while the trees are maturing;
- the sale of the seed they produce;
- tradeable shares in the Farming Company and in the Industrial Company – Prime Investment (Pty) Ltd will initially hold a 60% share in both companies, while the Kavango Jatropha Farmers Association, a legally constituted body to be run by the growers and represent their interests, will hold the other 40% in both companies;
- security of land tenure under a long lease;
- training so that by 2012, each farmer will have a sufficient income and obtain a regular salary to allow for contractual lending from banks;
- products with a certain asset value; and
- enhanced skills in farming and business.

2.12 Nicaragua

In July 2006, Nicaragua passed Decree No. 42-2006,[79] aimed at reducing dependence on imported oil, encouraging reforestation efforts and achieving environment protection goals. It also provides for the application of the carbon credit system under the Kyoto Protocol and is designed to contribute to the economic and social development of rural areas.

The decree authorizes the Ministry of Agriculture and Forests to formulate a National Programme on Biofuels and Bioenergy (NPBB) to promote investments and to support private initiatives in the sector. Under the decree, the NPBB must incorporate small, medium and large producers through strategic alliances. It must also encourage production by small family farms to reduce poverty in rural areas. The NPBB must establish favourable conditions to plant 200 000 hectares of African palm in specific areas on the Atlantic coast as well as maize and other ethanol feedstock on the Pacific coast.

The decree mandates the development of an appropriate legal framework and requires that a committee coordinated by the Ministry of Agriculture and Forests be constituted for this purpose. In addition to the development of a legal framework for biofuels, in January 2007 the government authorized the Ministry of Energy and Mines to formulate, coordinate and implement a Strategic Plan and Policy for the energy sector as well as to promote the use of renewable sources of energy in the country.

2.13 Panama

In Panama, a draft law has proposed a National Policy to Promote the Production and Use of Biofuels *(Política Nacional de promoción, fomento y desarrollo de la producción y uso de biocombustibles en el territorio nacional)*. This policy aims at contributing to the improvement of the environment and human health as well as increasing energy self-sufficiency and encouraging growth and employment in the agriculture sector. Under the policy, Panama declares of national interest the domestic production of alternative renewable fuels produced from domestic feedstock of plant or animal origin as a substitute for conventional fuels.

Under the draft law, the Ministry of Commerce and Industry (MOCI) is designated as implementing authority of the policy through a National Administration of Hydrocarbons and Alternative Energies *(Dirección Nacional de Hidrocarburos y Energías Alternativas)*. The administration will:

- determine the percentage of biofuels to be blended with conventional fuels;
- recommend and promote the enactment of appropriate legal instruments to facilitate the production and use of biofuels;
- recommend, in coordination with the Ministry of Agriculture and Farming (MAF) and the Ministry of Economy and Treasury, tax legislation and economic incentives as necessary to stimulate the production of biofuels in the country;
- determine the technical specifications for biofuels in coordination with the General Directorate of Standards and Technology *(Dirección General de Normas y Tecnología)*;
- establish reference prices for biofuels;
- promote local and foreign investments aimed at the production, sale and use of biofuels;

[79] *Decreto No. 42-2006 por el que se declara de interés nacional la producción de biocombustible y bioenergía.* Publicado en el Diario Oficial No. 133 el 10 de julio de 2006.

- design action plans, pilot projects and mechanisms together with other government institutions so as to promote biofuels in the country;
- elaborate a programme to raise awareness on the use of biofuels among users and public institutions; and
- issue licences for the production, blending, transport, sale and import of biofuels.

The MAF is mandated to develop supporting mechanisms to stimulate the production of any kind of feedstock of plant or animal origin which may be used as raw material for biofuels. The MOCI, in coordination with other institutions, shall establish the safety conditions for the proper handling of biofuels.

The draft law provides that companies investing in the production, sale and use of biofuels within the country are exempt from import tariffs on any machinery or equipment used in the production and storage of biofuels made from national feedstock. However, ethanol is not exempt from taxes. Under the draft law, the provisions of article 1057-G of the Tax Code[80] establishing a tax for ethanol from 2008 may only be suspended in the event of ethanol supply scarcity.

The draft law refers to Decree No. 36 of 2003[81] which lists the facilities which are authorized to blend ethanol with conventional gasoline. The draft law also has enforcement provisions through the imposition of fines that vary according to the nature of the violation.

2.14 Paraguay

Law No. 2.748 on the Promotion of Biofuels *(Ley de fomento de los biocombustibles)*[82] was passed in October 2005, and was followed in 2006 by Decree No. 7.412[83] which provides for the implementation of regulations under the law. Law No. 2.748 declares the industrial production of biofuel and its feedstock as well as its use within the national territory to be matters "of national interest." It aims to contribute to the sustainable development of the country as well as to the implementation of projects under the Clean Development Mechanism (CDM) of the Kyoto Protocol. The law states that biofuel industry projects are eligible for CDM credits. Article 15 of also provides that any person or company eligible to pursue biofuel-related activities will benefit from biofuel production incentives provided under Law No. 60/90[84] and Law No. 2421/04.[85]

To contribute to the development of the domestic agricultural sector, article 12 of the law requires producers of biofuel to purchase feedstock from domestic farmers. Biofuels may only be imported under situations of scarce domestic supply as declared by the Ministry of Agriculture and Livestock. In addition, article 13 requires distributors to sell biofuels at petrol stations. The ministry is mandated to promote programmes to ensure domestic production of biofuel feedstocks. The ministry is also responsible for issuing certificates of origin of feedstocks purchased by biofuel producers.

Under Decree No. 7.412, the Ministry of Industry and Commerce is responsible for determining the technical specifications for biofuels as well as for approving projects related to the production of biofuels.[86] The decree also

[80] *Código fiscal de Panama*.
[81] *Decreto de Gabinete No. 36 de 27 de septiembre de 2003*.
[82] *Ley No. 2.748/05 de fomento de los biocombustibles* (2005).
[83] *Decreto No. 7.412/06 por el que se reglamenta la Ley No. 2.748/05 de fomento de los biocombustibles* (2006).
[84] *Ley No. 60/90 de inversiones* (1990).
[85] *Ley No. 2421/04 de reordenamiento administrativo y de adecuación fiscal* (2004).
[86] The technical specifications are set out under Paraguayan Rule PNA 16 018 05 for biodiesel (approved by Decree No. 7.412) and

outlines a set of administrative measures to be followed for new biofuel production sites and requires an environmental impact assessment of production areas. The ministry may set the specific blending percentage of biofuels and is also responsible for establishing the administrative and economic sanctions applicable in the event of non-compliance.

2.15 Peru

Law No. 28054[87] was enacted in August 2003 to encourage the development of the biofuel market in Peru. It also mandates the creation of a Technical Committee *(Comisión Técnica)*, which makes proposals and recommendations to achieve the goals of the law. Among its duties, this committee is responsible for:

- designing an implementation schedule and defining the percentages of ethanol and biodiesel to be blended with gasoline and diesel, respectively; and
- proposing a programme to raise awareness among consumers and public institutions of the advantages of biofuels.

The law mandates the formulation and implementation of general policies to promote biofuels, such as:

- developing and strengthening the technological and scientific framework for biofuel research;
- fostering the creation of a corps of highly qualified professionals specialized in biofuels;
- promoting technology transfer;
- promoting private stakeholder investments in the production of biofuels;
- encouraging biofuel marketing and consumption; and
- promoting the production of biofuels in rainforests.

The National Environment Board *(Consejo Nacional del Ambiente)* was established in 1994 under Law No. 26410 as the governing authority responsible for the national environment policy. Along with other national environment policy programmes, it has formulated a Biofuel Programme supported by the following legislative tools:

- Law No. 28054; and
- Decree No. 013-2005 EM[88] published in March 2005 regulating the provisions of that law.

The National Environment Agenda for 2005-2007,[89] launched in 2004, is now a compulsory instrument that establishes national priorities and informs citizens regarding public environmental management commitments at the national, regional and local levels. The 2007 priority is to design the necessary incentives to promote the use of ethanol as an additive to gasoline. The National Environment Board and the Ministry of Energy and Mines are the institutions responsible for the development and implementation of these incentives.

Paraguayan Rule PNA 025 for ethanol (approved by Decree No. 20.842/80).

[87] *Ley No. 28054/03 de Promoción del Mercado de los Biocombustibles* (2003).

[88] *Decreto Supremo No. 013-2005-EM Reglamento de la Ley de Promoción del Mercado de los Biocombustibles* (2005).

[89] The 19th heading of Peru's national policy is entitled "Sustainable Development and Environment Management." Peru is firmly committed to the national environment policy as an integral part of its economic, social and cultural national policies to overcome poverty and promote sustainable development for the country. The government aims to establish the necessary institutions and measures to promote public and private partnerships so as to ensure biodiversity, sustainable use of natural resources and environmental protection and to promote sustainable growth in urban and rural communities.

Several programmes in Peru aim at promoting biofuels at the national level. The main instrument for biofuel promotion is the Programme for the Promotion of the Use of Biofuels *(Programa de Promoción del Uso de Biocombustibles)*, whose primary objective is to encourage investments in biofuel production and marketing and to expand the economic, social and environmental advantages of its use. Other programmes include those under the umbrella of the fight against illegal drugs. The Programme on Alternative Development *(Programa Nacional de Desarrollo Alternativo)* is aimed at promoting private investment and attracting international cooperation funds to promote biofuels. Government authorities will ensure the purchase of biofuels produced within programmes linked to the fight against drugs.

2.16 Philippines

In January 2007, the Philippines passed Republic Act No. 9367[90] which promotes the use of alternative transport fuels in accordance with the Cebu Declaration on East Asian Energy Security.[91] The act seeks to reduce the dependence on imported fuels with due regard to the protection of public health and environment. This is consistent with sustainable development goals and mandates the use of biofuels as a measure to develop indigenous renewable and sustainably sourced clean energy sources without harm to the natural ecosystems, biodiversity and food reserves of the country.

The act creates a set of incentives to promote the production and use of biofuels in Philippines:

- a zero-rated specific tax on the biofuel component of blended gasoline and diesel;
- VAT exemption;
- exemptions from wastewater charges for water effluents from the production of biofuels; and
- state-provided financial services and benefits to local companies engaged in activities related to the manufacture of biofuels, such as production, storage, handling and blending.

In addition to these provisions and in conjunction with the preparation of implementing rules and regulations, the act requires the Department of Energy (DOE) to ensure that the preparation of a National Biofuels Programme (NBP) is consistent with the Philippines Energy Plan and takes into consideration DOE's existing biofuels programme. Among other things, the NBP must include the establishment of support facilities to ensure security of feedstock supply; investments in supply infrastructure; guidelines on the availability of alternative fuel technologies for vehicles, engines and parts; as well as identification of other viable feedstock for the production of biofuels.

The act creates the National Biofuel Board, which is responsible for monitoring the supply and use of biofuels and recommending appropriate measures in the area of feedstock shortages. To encourage biodiesel use, the act requires that at least 5% of locally source ethanol be blended with gasoline within two years of the act entering into force and that at least 1% of biodiesel be blended with conventional diesel within three months of the act entering into force. The board may recommend an increase to a minimum 10% ethanol blend within four years of entry into force of the act and a minimum 2% biodiesel blend within two years of entry into force.

[90] Republic Act No. 9367 (2007).
[91] This declaration, adopted by the 16 heads of state of the Association of Southeast Asian Nations (ASEAN) and its dialogue partners during the 12th ASEAN Summit held in the Philippine city of Cebu on 15 January 2007, recognized that while fossil fuels will continue to be used, greater energy security could be attained by promoting energy efficiency, conservation and cleaner technologies; increasing capacity and reducing costs of alternative energy resources; and encouraging the use of biofuels through trade and harmonized biofuel standards.

The act explicitly states that oil companies should be allowed to import bioethanol from foreign countries only in the event of a supply shortage of locally produced bioethanol. The act aims at ensuring that domestic supply of raw material used to produce biofuels in the Philippines will be enough to meet demand. The Sugar Regulatory Administration is required to monitor and regulate imports and exports of these goods as well as monitor stability in sugar prices.

2.17 South Africa

In recent years, South Africa has been actively promoting the use of biofuels in the country and has taken several steps to introduce them into its energy matrix. In 2003, South Africa issued a White Paper on Renewable Energy, urging the government to develop the infrastructure and institutional capacity to promote the domestic biofuel market.

Under the White Paper, the government declared its intent to satisfy 4% of the total national energy needs with renewable resources by 2013. Technical specifications for biofuels are also being developed. Measures under the White Paper will focus on four strategic areas:

- financial instruments;
- legal instruments;
- deployment of technology; and
- education and awareness programmes.

In South Africa, the Department of Minerals and Energy is responsible for the renewable energy policy in the country. This authority has established a joint implementation committee of stakeholders for biodiesel and is currently preparing a similar one for ethanol.

2.18 Thailand

The Thai Government is pursuing the production and use of biofuels to meet the country's growing demand for energy and to reduce reliance on imported oil. To achieve these goals, several ethanol and biodiesel programmes are being developed by the National Biofuels Committee in coordination with the Ministries of Agriculture, Energy, Industry and Science. Thailand is also actively pursuing project investments that may qualify for credits under the CDM.

In 2004, Thailand initiated a Programme on Gasohol which set a target of increasing production and use to obtain a 10% ethanol blend with conventional gasoline by 2012. To assist in meeting this blending target, the programme requires that government vehicle fleets run on gasohol. In addition, ethanol from domestic feedstock is being prioritized by national plans both to ensure domestic supply as well as to encourage Thailand to become a major exporter of ethanol to other Asian markets.

2.19 Uruguay

In October 2002, Uruguay passed Law No. 17.567,[92] which declared the production of alternative renewable fuels obtained from domestic feedstock of animal or plant origin to be an issue of national interest. In July 2006, the government submitted a draft Law on the Regulation, Production, Marketing and Use of Biofuels *(Proyecto de Ley referente a la regulación de la producción, la comercialización y la utilización de agrocombustibles)*. The purpose of the draft law is to develop a more comprehensive legal framework for biofuels by establishing the mechanisms to incorporate their use and production into the national energy matrix. This draft law, which is currently under review by the Congress, provides for the following elements:

- incentives to promote the production of biofuels from domestic feedstock;

[92] *Ley No. 17.567 sobre combustibles alternativos, renovables y sustitutivos de los derivados del petróleo, elaborados con materia nacional de origen animal o vegetal* (2002).

- the establishment of a 5% mandatory blending of ethanol by 2015 while authorizing a 2% biodiesel blending between 2006 and 2008, which shall become mandatory between 2009 and 2011 and will increase to 5% in 2012; and
- methods and economic incentives to promote biofuel production.

According to the draft law, the activities of production and export of biofuels are not subject to Law No. 8764 of 1931[93] which established a national monopoly on fuels. Biofuel producers are required to obtain an environmental authorization from the Ministry of Housing, Planning and Environment as well as an authorization from the Ministry of Industry, Energy and Mines (MIEM). Exports of biofuels are restricted and only allowed upon special permission granted by government decree. A registry of biofuel producers is created under the MIEM.

Under the law, registered biofuel producers will benefit from the following incentives:

- corporate tax exemption for a period of five years; and
- tax exemption on goods purchased to produce biofuels.

In addition, according to article 17, the government may declare partially or totally tax exempt domestic biofuels while article 18 explicitly declares that domestic biodiesel shall be exempt from the fuel tax levy for a period of five years starting on the date of the law's entry into force.

Articles 22 and 23 of the draft law also incorporate amendments to Law No. 17.598 of 2002, [94] which created the Regulatory Unit for Energy and Water Services *(Unidad reguladora de servicios de energía y agua)*. With these amendments, biofuel-related activities now fall under the scope of Law No. 17.598. Technical specifications for biodiesel were approved in December 2005 under the denomination UNIT 1100.[95]

[93] *Ley de creación de ANCAP* (1931).

[94] *Ley No. 17.598 relativa a la Unidad Reguladora de Servicios de Energía y Agua* (2002).

[95] *Instituto Uruguayo de Normas Técnicas, norma UNIT sobre biodiesel.*

PART III – CONCLUSION

Legislation on the commercial production and trade of bioenergy on international markets cannot be examined in isolation. Only through the identification and assessment of the many activities, institutions, policies and legislative provisions related directly or indirectly to bioenergy at the national level can governments identify strengths, weaknesses, overlaps and gaps. A firm legal basis is fundamental to properly regulate and support the development of bioenergy. Countries that have sound policies to promote the production and use of bioenergy will be at the forefront of realizing the economic and environmental benefits of this sector.

The relationships between bioenergy and sustainable development are complex, and depend on several factors, including the energy crop, method of cultivation, conversion technology and the conditions and alternatives in the specific country. The impacts of policy and legislation in related sectors, such as agriculture, forestry, environment and trade can have a profound effect on the development of effective bioenergy programmes.

To achieve an interdisciplinary approach to bioenergy, governments must promote institutional capacity building at the national level so as to ensure coordination among key stakeholders. Governments should encourage cooperation between ministries responsible for energy, agriculture, environment, industry and trade and the private sector. One way to do so is to establish national commissions or boards on bioenergy in which all concerned ministries and outside organizations, industry groups and NGOs are represented.

A better understanding of the linkages between different areas of law and a coherent approach to bioenergy would reduce legal uncertainties and encourage the optimal development of the sector. Coordination in this area may be intersectoral, intrasectoral or cross-sectoral, aligning international and national efforts. In any case, strong political will and commitment are required at all levels of government. In order to streamline bioenergy policies and laws, the underlying social, economic, cultural and political causes of non-compliance must be reviewed, as well as the impact of the energy policy and legal framework on the environment, rural development and the poor.

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Agronomic Industry Act (1992).

Petroleum (Exploration and Production) Act (1991).

Nicaragua

Decreto No. 42-2006 por el que se declara de interés nacional la producción de biocombustible y bioenergía (2006).

Panama

Decreto de Gabinete No. 36 de 27 de septiembre de 2003 (2003).

Paraguay

Decreto No. 7.412/06 por el que se reglamenta la Ley No. 2.748/05 de fomento de los biocombustibles (2006).

Ley No. 2.748/05 de fomento de los biocombustibles (2005).

Ley No. 2421/04 de reordenamiento administrativo y de adecuación fiscal (2004).

Ley No. 60/90 de inversiones (1990).

Decreto No. 20.9842/80 por el cual se homologa y declara obligatoria la norma técnica paraguaya elaborada por el Instituto Nacional de Tecnología y Normalización (1980).

Peru

Decreto Supremo No. 013-2005-EM Reglamento de la Ley de Promoción del Mercado de los Biocombustibles (2005).

Ley No. 28054/03 de Promoción del Mercado de los Biocombustibles (2003).

Philippines

Republic Act No. 9367, An Act to direct the use of biofuels, establishing for this purpose the biofuel program, appropriating funds therefore, and for other purposes (Biofuels Act of 2006).

South Africa

National Water Act [No. 36 of 1998], available at www.elaw.org/resources/text.asp?id=1153 (1998).

United States of America

U.S. Energy Policy Act, 42 U.S.C. 15801 (2005).

Uruguay

Ley No. 17.567 sobre combustibles alternativos, renovables y sustitutivos de los derivados del petróleo, elaborados con materia nacional de origen animal o vegetal (2002).

Ley No. 17.598 relativa a la Unidad Reguladora de Servicios de Energía y Agua (2002).

Ley de creación de ANCAP (1931).

APPENDIX – SUMMARY OF COUNTRY-SPECIFIC LEGISLATION

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
ARGENTINA	Law No. 26.093 of May 2006 on the Regime of Regulation and Promotion for the Production and Sustainable Use of Biofuels Decree No. 109/2007 on Biofuels which regulates Law No. 26.093 Law No. 17.319 of 1967 which established the regime for hydrocarbons in Argentina	National Programme on Biofuels	5.0% ethanol to be blended with gasoline 5.0% biodiesel to be blended with diesel (In both cases blending will be mandatory from 1 Jan 2010)	VAT exemption Corporate tax exemption for three years Excise tax exemption on biofuels	Secretariat of Energy (Ministry of Federal Planning, Public Investment and Services) Ministry of Economy and Production Secretariat of Environment and Sustainable Development National Advisory Board for the Promotion of Production and Sustainable Use of Biofuels (Secretariat of Energy)	To be set by the Secretariat of Energy
COLOMBIA	Law No. 693 of 2001 on the Use of Ethanol Fuel Law No. 939 of 2004 on Provisions Concerning Biofuels Decree No. 3862 of 2005 which regulates Law No. 693 Decree No. 1970 of 2005 which partially regulates Law No. 939 Resolution 180687 of 2003 which establishes technical specifications for ethanol fuel	Programme for the Rational and Efficient Use of Energy	10.0% ethanol to gasoline in cities with populations exceeding 500 000 (beginning in 2006) In cities not exceeding 500 000 the government may authorize a percentage of ethanol blending	Blending ethanol with gasoline is not considered an industrial or productive process and is thus exempt from applicable taxes Incomes from energy crops will be exempt for 10 years starting in 2005	Ministry of Mines and Energy Ministry of Environment, Housing and Land Use and Planning Ministry of Agriculture and Rural Development	Technical specification ASTM D 4377:00 Technical specification ASTM D 1744:02

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
COSTA RICA	Decree No. 33357 of 2006 which created the National Commission of Biofuels	No	No	No	Ministry of Agriculture Ministry of Environment and Energy National Commission of Biofuels	No
ECUADOR	Decree No. 2332 of 2004 which declared of national interest the production and use of biofuels and the production of energy crops in Ecuador	National Programme on Biofuels of 2005 (under revision)	10.0% ethanol to gasoline and 5.0% biodiesel to diesel (set by the National Programme on Biofuels)	No	Ministry of Energy and Mines Ministry of Agriculture and Livestock Ministry of Environment Advisory Council on Biofuels	No
HONDURAS	Draft Law on the Production and Use of Biofuels (2006)* *Once this Law comes into force it shall repeal Decree No. 79-88 of 1988 which created the Law on Alcohol Fuel	No	To be set by the Technical Unit of Biofuels (UTB)	Exemption for purchase of equipment for production of biofuels (for 15 years) Corporate tax exemption (for 10 years) Other excise tax exemptions (i.e. import of equipment)	Secretariat of Industry and Commerce UTB Secretariat of Agriculture and Livestock Secretariat of Natural Resources and Environment	To be set by the UTB

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
INDONESIA	Presidential Instruction No. 1/2006 on the provision and use of biofuels as an alternative source of energy Presidential Regulation No.5/2006 on national policies for optimizing energy use Decree of the Oil and Gas Directorate General No.3675K/24/DJM/2006, establishing standards and specifications for solar oil for domestic markets Decree of the Oil and Gas Directorate General No. 13483K / 24 / DJM / 2006 26 September 2006, establishing the standards and specifications of biodiesel as an alternative source of energy for the domestic market Oil and Gas Law (No. 22/2001)	National Energy Policy	10.0% biodiesel to be blended with gasoline by 2010	To be determined by the Ministry of Energy and Mineral Resources	Ministry of Energy and Mineral Resources The framework for coordination between ministries to promote the supply and use of biofuels is established under Presidential Instruction No. 1/2006	Biodiesel Standard SNI 04-7182-2006, formulated on the basis of ASTM D6751 in the US and EN 14214:2002 in the EU

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
MEXICO	Law on the Promotion and Development of Bioenergy (2006)	National Policy on Renewable Energy	Minimum 10.0% ethanol blended to gasoline to be applicable in the country's main urban centres	To be determined by the Secretariat of Agriculture, Livestock, Sustainable Development, Fisheries and Food	Secretariat of Agriculture, Livestock, Sustainable Development, Fisheries and Food Intersecretarial Commission for Sustainable Rural Development	No
NICARAGUA	Decree No. 42-2006 which declares of national interest the production of biofuels and bioenergy	National Programme on Biofuels and Bioenergy	No	No	Special Committee coordinated by the Ministry of Agriculture and Forests	No
PARAGUAY	Law No. 2.748 of 2005 on the Promotion of Biofuels Decree No. 7.412 of 2006 which regulates Law No. 2.748	No	To be determined by Resolution of the Ministry of Industry and Commerce	All activities related to the production and sale of biofuels will be exempt Law No. 2.748 refers to the tax benefits established in Law No. 60/90 and Law No. 2421/04	Ministry of Industry and Commerce Ministry of Agriculture	Paraguayan Rule PNA 16 018 05 on biodiesel specifications (Decree 7.412/06) Paraguayan Rule PNA 025 on ethanol specifications (Decree 20.842/80)

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
PERU	Law. No. 28054 of 2003 on the Promotion of the Biofuel Market Decree No. 013-2005 EM which regulates Law. No. 28054	National Programme for the Promotion of Biofuels National Policy on Sustainable Development and Environment Management National Environment Agenda 2005-2007	7.8% ethanol to gasoline (to be named “ecological gasoline”) 5.0% of biodiesel to diesel (to be named ecologic diesel)	No	Technical Committee on Biofuels National Environment Board Ministry of Energy and Mines Agency for the Promotion of Investment National Board for the Development and a Life without Drugs	Peruvian Technical Rule approved by the National Institute of Competence, Defence and Intellectual Property Protection

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
PHILIPPINES	Republic Act No. 9360 known as "Biofuels Act of 2006" (passed in January 2007)	Philippine Biofuel Programme (to be formulated)	At least 5.0 % of locally sourced bioethanol (within two years of the effective date of the Act). The National Biofuel Board may recommend a minimum 10% blend (within four years from the effective date of the Act). At least 1.0 % biodiesel (within three months of the effective date of the Act). The National Biofuel Board may recommend a minimum 2.0% blend within two years of the effective date of the Act).	Zero-rated specific tax on the biofuel component of blended gasoline and diesel VAT exemption Water effluents from the production of biofuels are exempt from wastewater charges Government financial institutions are committed to provide financial services and benefits to local companies engaged in any activities related to the manufacture of biofuels	National Biofuel Board Department of Energy Department of Finance Department of Science and Technology Department of Agriculture Department of Environment and Natural Resources Department of Labour and Employment Department of Trade and Industry	To be determined by the Department of Energy

COUNTRY	LEGAL FRAMEWORK	POLICY AND PRO-GRAMMES	MANDATORY BLENDING	TAX INCENTIVES	INSTITUTIONAL FRAMEWORK	TECHNICAL SPECIFICA-TIONS
URUGUAY	Law No. 17.567 which declared of national interest the production of biofuels (2002) Draft Law on Biofuels (2006)	No	Minimum 5.0% blending of domestic produced ethanol until 31 December 2014 (from which date this blending percentage will be mandatory) Minimum 2.0% blending of domestic produced biodiesel until 31 December 2008 (from that date to 31 December 2011 this percentage becomes mandatory and by 1 January it will increase to 5.0%)	Biodiesel tax levy exemption Corporate tax exemption for a period of five years Tax exemption on goods purchased to produce biofuels	National Administration of Fuels, Alcohol and Portland	UNIT 1100 technical specification for biodiesel