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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	Generalized 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)

PREFACE

In recent years, there has been increasing recognition of the need for sound regulatory frameworks for bioenergy. 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 and climate change-related goals set out in various international instruments, and on food security, 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. These 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. Land use and the competing needs of energy and food security are key issues 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.

This study 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 methodology to assist in

identifying areas of law which may affect bioenergy regulation, and in designing key elements of national bioenergy laws.

Part I 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 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. Part III contains a brief conclusion.

The authors of this study were Charlotta Jull, International Legal Consultant, Patricia Carmona Redondo, Spanish Government ICEX (*Instituto de Comercio Exterior*) Fellow, Victor Mosoti, FAO Legal Officer and Jessica Vapnek, FAO Legal Officer. The authors would like to thank Jennifer Nyberg for encouragement and intellectual support, and Gustavo Best, Marta Pardo Leal, Ken Rosenbaum and George Sarpong for their review of the paper. It is hoped that the resulting study will prove useful to governments and researchers alike and provide a solid basis for further research and study.

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PART I – INTRODUCTION

1. OVERVIEW

Many factors account for the increased focus on bioenergy[1] 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.[2] 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.[3] 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.[4] 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

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1 "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.

2 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.

3 See, for instance, the famous "addicted to oil" 2006 State of the Union Speech by George W. Bush, President of the United States of America, 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

4 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.

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 of America, 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.[6] 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

6 Elasha, *et al.* 2006.

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[7], 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[8] 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[9] (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

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7 Vienna Convention for the Protection of the Ozone Layer (1985).

8 Montreal Protocol on Substances that Deplete the Ozone Layer (1987).

9 United Nations Framework Convention on Climate Change (1992).

> 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 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[10] (CBD) and the UN Convention to Combat Desertification (UNCCD),[11] 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.

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[10] Convention on Biological Diversity (1992).

[11] United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (1996).

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 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.[12]

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[13] 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));

12 See Takada and Fracchia, 2007.

13 Plan of Implementation of the World Summit on Sustainable Development.

- 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 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 percent 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 Generalized System of Preferences (GSP).[14] 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.[15] 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

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14 Council Regulation (EC) No. 980/2005, article 1.

15 *Id.* article 26(e).

promoting the production and use of "first generation" biofuels[5] 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 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

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5 "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.

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.[16]

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,[17] 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

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16 See Yacobucci, 2006.

17 WTO, 2004.

and Brazil have joined Canada in a WTO complaint against the US over allegedly illegal subsidies to American corn growers.[18] 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."[19] If Brazil raises the ethanol issue in any way during the dispute, the panel may be faced with new and interesting 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.[20] 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.

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18 WTO, 2007.

19 See Associated Press, 2007.

20 See Steenblik, 2005.

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.[21] 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 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

[21] 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).

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 percent 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,[22] 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

[22] 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.

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 Directive[23] set a 5.75 percent 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[24] which set limits on biodiesel blending to no more than a 5 percent 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.

[23] 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.

[24] 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:

- Multi-institutional commission comprised of principal public and private sector stakeholders
- Implementing agencies

Regional level:

- Biofuels working group

ACTIONS

- Policy formulation to launch a national programme on ethanol
- Elaboration of an implementation strategy
- Coordination with sugar industry representatives
- 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 analyzed 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.[25] 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 analyzed, 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

25 FAO 2000, p. 81.

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 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,[26] 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 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

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[26] Act No. 36 of 1998.

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.[27] 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[28] 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 community participation in the bioenergy sector, by protecting local communities and other marginalized groups, including indigenous peoples, women and the poor.

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27 *Ley N° 1.715 - Servicio Nacional de Reforma Agraria* (*1996*).

28 C184 (2001).

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.[29] 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.

[29] 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.[30] 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.[31] 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 production standards.[32] 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

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

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

[32] *Ley 26.093/06 de régimen de regulación y promoción para la producción y uso sustentables de biocombustibles.*

means importing.[33] 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 percent in Argentina, 7.8 percent in Peru and 10 percent in Ecuador. Some countries have established specific mandatory blending requirements for use in densely populated areas. For example, in Colombia, a 10 percent ethanol-to-gasoline blending requirement is regulated in cities with over 500 000 inhabitants.[34] 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 percent biodiesel blend must be used in diesel fuels sold in the country.[35] 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

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[33] 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).

[34] *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.*

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

the industry. Fleet owners or other large industrial users may also be required to offset their carbon emissions from fossil fuel use.[36]

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.[37] 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.[38] 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.[39] 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.[40] 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.

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[36] The authors gratefully acknowledge the contributions of Ken Rosenbaum to this paragraph.

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

[38] *Ley 26.093/06, supra,* note 36.

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

[40] *Ley Nº 2.748/05 de fomento de los biocombustibles* (*2005*).

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.[41] 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.[42]

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.[43] 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

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

42 See OECD/FAO 2006, p. 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 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.").

43 Republic Act No. 9367, *supra* note 37.

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.[44] The imposition of a binding obligation to secure funding for bioenergy research and development may create more favourable conditions for investment.

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

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44 *Decreto Supremo Nº 013-2005-EM*, *supra* note 41.