PART II
COUNTRY CASE STUDIES

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A. ARGENTINA

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1. INTRODUCTION

This chapter starts by looking at pertinent international legal instruments to Argentina's bioenergy framework. It then illustrates national general and specific fuel legislation, institutional structure and interagency coordination, blending and procurement requirements, fiscal incentives, quality standards, promotion of small and medium-sized enterprises and agricultural development, public information and stakeholder participation, international trade issues including export taxes, environmental rules and labour and social guarantees. The broader policy objectives contained in national programmes and initiatives are also addressed. The final section summarizes key features of the regulatory framework and outlines possible options to improve Argentina's legislation.

1.1 Argentina's energy balance

According to official data, Argentina's energy balance for 2005 (comprising all primary energy sources), indicates that renewable energy accounts for around six percent of overall consumption. The country relies mostly on fossil fuels (natural gas at 49 percent and oil at 41 percent) with a three percent consumption of nuclear energy. Renewable sources of energy are divided between hydropower at four percent, bagasse at one percent and woodfuel at one percent. Nevertheless, Argentina is a net energy exporter (oil and derivatives) but experts foresee a change from surplus to deficit in the short term, as investments lag behind an increasing demand fostered by artificially low domestic energy prices and a fast-growing economy (growth averaged nine percent in 2003–2007). Energy availability will be a constraint for economic growth in Argentina in the next few years, unless investments, and the regulatory changes needed to channel more resources to the energy sector, are made.

The attention currently placed on Argentina's energy sector by national authorities focuses on the need to ensure enough supply of imported fuel (mostly natural gas and fuel oil) to protect the domestic consumers from the effects of gas shortages in winter. National legislation is oriented towards keeping domestic prices isolated from rising international fossil fuel prices, in order to prevent inflation, preserving the national industry's competitiveness, and protecting consumers. The current regulatory scheme is oriented towards short-term goals, without being necessarily consistent with the need to attract long-term investments to the energy sector. For example, representatives of the oil and gas sector claim that as part of negotiations

with the government to allow the export of gasoline, they have been selling diesel at a loss in the domestic market.

1.2 Agricultural production and bioenergy

Argentina's agricultural sector focuses on the production of soy and its derivatives for export. The use of soy and other crops for biofuel production thus offers attractive prospects in a country with 31.2 million hectares of cultivated land (an area the size of Poland), producing 95 million tonnes of agricultural crops.

The soy conglomerate and favourable international market prices are driving the biodiesel sector in Argentina. Soy is the most important crop exported by the country (47.5 million tonnes in 2007–2008), it occupies more than half the land devoted to agriculture (16.1 million hectares), and constitutes an important source of fiscal revenue through a 35 percent export tax placed on soybean exports.[1] Notwithstanding the positive development effect that having a high-value crop generates on the surrounding communities, serious concerns have been raised about the total area devoted to soy monoculture in Argentina with genetically modified seeds. This area has quadrupled since the 1990s and moved into lands previously unsuitable for agricultural activities, altering valuable ecosystems like forests and wetlands.

As the third largest producer of soybeans and largest exporter of soybean oil, Argentina has the capacity to develop a robust biodiesel industry. The country has a modern and efficient production chain, with infrastructure to produce, transport, store and export biodiesel, as well as a milling capacity of 150 000 tonnes per day, thus presenting an optimal situation for the addition of biofuel production to the vegetable oil sector. The oilseed industry is fully export-oriented (90 percent of the overall production is exported) and vegetable oil presses are strategically located in coastal areas.[2] Biofuel plants under construction are following the same pattern, most being located around ports in the Province of Santa Fe.

[1] Secretary of Agriculture, 2007.
[2] FAO, 2007.

Bioethanol, on the other hand, has not attracted export-oriented investment, and research reveals that the domestic market and government promotional policies are likely to be the main drivers for investments. The sugar industry in Argentina already has a modern industrial infrastructure producing alcohol from sugar cane (mostly for medicinal purposes), with the possibility of upgrade existing facilities for bioethanol production to satisfy the domestic regulatory demand. Costs of production, however, would not allow competition in domestic or international markets as both are highly distorted. For instance, gasoline in Argentina is subject to price controls, and international prices for ethanol are determined by subsidies in industrialized nations. The industry is therefore geared towards options created by a new biofuels promotional regime, and assessing the price formula to be established by the government, in order to determine whether the approximately 200 000 tonnes of ethanol needed to satisfy domestic regulatory requirements by 2010 will be economically viable and justify investments in this field.

In the case of biogas, small projects exist mostly for self-consumption (examples of which will be provided in section 2.4.3 on the Clean Development Mechanism). Therefore, government policies do not target this sector as the production of biogas on a commercial scale is not competitive as compared with compressed natural gas.[3]

Bioenergy contributes a negligible amount of energy to the national market, although it is expected that it will increase its share in the transport sector after 2010. Currently, the production of biodiesel in Argentina is for export, with international market prices as the main drivers behind investments in this field.

2. LEGAL FRAMEWORK FOR BIOENERGY

Argentina is a federal state. Its national Constitution (1853, as amended in 1994) distributes responsibilities among federal and provincial authorities and determines whether laws and regulations will be uniform at the national level or vary among the different provinces.[4] As a general rule, the use of natural resources is under provincial jurisdiction (art. 124), and the federal government may only issue minimum standards for environmental

[3] Lamers, P. 2006.

[4] For an English translation of the Argentine National Constitution see www.senado.gov.ar.

protection (art. 41). The federal government has therefore only a limited jurisdiction to legislate on issues such as land use and agricultural production methods. On the other hand, commerce and international trade fall under federal jurisdiction (arts. 75 and 126) and are thus regulated uniformly across the country. Legal mechanisms used by the federal government to promote the production and consumption of bioenergy thus focus on the regulation of international and inter-provincial trade in fuels, or on the promotion of certain activities by granting federal tax exemptions.

Legislation affecting the production and consumption of bioenergy may originate from different areas of law, such as international rules emanating from trade and environment multilateral treaties, national legislation applicable to the energy sector regulating fuels and biofuels, as well as investment promotion regimes, environmental legislation and social guarantees and labour legislation at the national level. These will be examined in turn in the following subsections.

2.1 International law relevant to the biofuels sector

Argentina is a member of the World Trade Organization and Mercosur (a customs union including Brazil, Uruguay, Paraguay and Argentina), and a party to several environmental conventions. The main international agreements with relevance to the biofuels sector, to which Argentina is a party, include: the Mercosur customs union approved by Law 23.981 (1991); the Convention on Biological Diversity, approved by Law 24.375 (1994); the United Nations Framework Convention on Climate Change, approved by Law 24.295 (1994) and its Kyoto Protocol approved by Law 25.438 (2001); and the United Nations Convention on the Combat of Desertification, approved by Law 24.701 (1996).

2.2 Legislation governing the energy sector

The primary energy sector legislation applicable to bioenergy is Law 26.093 (2006) on a promotion and regulation regime for biofuel production and sustainable use (*Régimen de Regulación y Promoción para la Producción y Uso Sustentables de Biocombustibles*), hereafter referred to as the Biofuels Law (2006), and Law 17.319 (1967) on Fossil Fuels (*Ley de hidrocarburos*) – which is an umbrella law applying to all fuels – as well as related regulations containing restrictions or incentives for the establishment of a biofuels market. As subsequent sections will show, the energy sector in Argentina is highly

regulated, with few participants and a high degree of government intervention to control or influence fuel prices.

Laws applicable to the fuels sector are highly complex as they reflect ongoing negotiations between the government and the private sector to maintain domestic price levels isolated from rising international prices. This is reflected in several resolutions by the Secretary of Energy such as Resolution 715/2007 on compensation of diesel volumes; Resolution 1834/2005 on ensuring domestic supply of liquid fuels (particularly diesel oil); Secretary of Energy Resolution 265/2004 on preventive measures to ensure the supply of natural gas in the domestic market; and Secretary of Domestic Commerce (SECI) Resolution 25/2006 on the regulation of gas oil commercialization.

2.2.1 Fossil Fuels Law (1967)

The framework law for the regulation of fuels in Argentina is Law 17.319 (1967) on Fossil Fuels, which notwithstanding its title, has three articles applying *mutatis mutandis* to biofuels. Decree 109/2007 on the Regulation of the Biofuels Law (hereinafter referred to as the Biofuels Decree) confirms that all activities related to the production, blending, distribution, sale, consumption and sustainable use of biofuels shall be governed by articles 2, 3 and 6 of the Fossil Fuels Law to the extent that they are not specifically regulated by the Biofuels Law and Biofuels Decree. The same articles state that the federal government will determine the national policy for activities related to the exploitation, industrialization, transport, and commercialization of fuels (art. 2), with the overarching objective of satisfying national fuel needs with domestic production (art. 3).

The Fossil Fuels law enables enterprises with permits for biofuel production to transport, commercialize, and industrialize the fuel, as long as they remain in compliance with the regulations dictated by the Executive Power, which should be based on reasonable technical and economic criteria, contemplate the needs of the internal market and stimulate the production of these fuels. The law specifically provides that when national demand for liquid fuels is not met by national production, all fuels must be sold in the domestic market, except if justified technical reasons require otherwise. It also enables the Executive Power to determine the criteria to allow the export of fuels and their derivatives, and to regulate operations in the internal market to allow a rational and equitable participation by all producers in the country (art. 6).

The Fossil Fuels Law is supplemented by 165 laws and regulations, which, since the year 1967, have defined the legal framework applicable to the fuels sector. Those that are the most relevant to biofuels will be described next.

2.2.2 Biofuels Law (2006) and related regulations

The Biofuels Law and Biofuels Decree set out the institutions that will regulate the biofuels industry in Argentina and establish a fifteen-year regime to promote liquid biofuels. The Biofuels Law establishes an institutional architecture for the implementation of biofuel legislation; assigns tasks to government agencies; establishes a regime to promote biofuels through fiscal benefits granted to specific projects; and sets a mandatory blending requirement of 5 percent of bioethanol or biodiesel in gasoline and diesel oil, respectively, as from 1 January 2010.

The Biofuels Law defines biofuels as "bioethanol, biodiesel and biogas that are produced from agricultural or agroindustrial inputs, or organic waste" and which comply with the quality standards adopted by the law's implementing authority (art. 5). The activities addressed by the law are the production, blending, commercialization, distribution, consumption and sustainable use of biofuels, although the main focus is on the institutional framework and the supportive fiscal regime (art. 1). The production of sugar cane for the bioethanol production chain has also been added to the activities eligible for fiscal benefits by Law 26.334 (2007) on the promotion of bioethanol production (*Régimen de Promoción de la Producción de Bioetanol)*. This is because, pre-existing sugar mills and facilities that already produced alcohol and with a potential for bioethanol production, had been excluded from the remit of the Biofuels Law.

The limited jurisdiction of the federal government over natural resource management explains the Biofuels Law's focus on matters that are under the federal jurisdiction, such as fiscal benefits. The law also urges provinces and the City of Buenos Aires to adhere to the principles contained therein, and to adopt similar promotional regimes within their jurisdictions (art. 20). The Province of Santa Fe, where most biodiesel plants are located, for example, has complied with the Biofuels Law through the Province of Santa Fe Law 12.691 (2006) and adopted its own fiscal benefit programme for bioenergy production facilities (Province of Santa Fe Law 12.692 (2006) on a promotional regime for non-conventional renewable energies).

The following subsections will review the main aspects of the Biofuels Law and related regulations, while issues relating to environmental protection in the Biofuels Law will be addressed in subsection 2.4.

Institutional structure and interagency coordination

The Biofuels Decree designates the Ministry of Federal Planning, Public Investment and Services (Ministry of Federal Planning) through its Secretary of Energy, as the primary Implementing Authority for the Biofuels Law. The Ministry of Economy and Production (the Ministry of Economy) is the implementing authority regarding the determination of the fiscal quota for benefits applicable to biofuels (arts. 2–4). The tasks allocated by the Biofuels Law (art. 4) and Biofuels Decree (arts. 3 and 10) to the implementing authority for the promotional regime refer mostly to authorizations, control and administration of biofuel fiscal benefits and include the following functions: promote and regulate the production and sustainable use of biofuels; authorize the activities of firms engaged in the production, blending and commercialization of biofuels; authorize the export of biofuel products by registered entities; establish quality standards for biofuels; set criteria and requirements to be met by biofuel facilities; issue permits for biofuel projects and facilities; establish selection criteria and requirements to determine which projects will receive benefits created by the Biofuels Law, and decide on their approval and duration; perform audits and inspections to production plants to control their compliance with existing regulations; control all activities related to the exploitation, industrialization, transport and commerce of biofuels; apply sanctions, including fines and permit cancellations, to facilities and beneficiaries that fail to comply with regulations; request estimations on biofuel demand from all firms required to use biofuels, including oil refineries, blenders, wholesale distributors and fuel retailers; administer subsidies determined by Congress; modify blending requirements; allocate fiscal benefits among small and medium-sized enterprises to promote regional development; determine a monitoring and control fee; maintain an updated public registry of permits awarded to biofuel production and processing plants, as well as an online list of those firms that receive the promotional benefits; publish reference prices for biofuels and provide an annual estimate of the total volume of biofuels required to meet domestic market needs; publish the requirements applying to permits, regarding process, safety and environmental protection; authorize all new fuels (or fuel blends); and ensure that a product's quality is checked prior to final approval.

Through Secretary of Agriculture Resolution 35/2009, a new Agroenergy Division within the Secretary of Agriculture was created to promote the production of biofuels that favour the diversification of agricultural production, and perform studies on biofuels energy and greenhouse gas emission balance.

A National Advisory Board for the Promotion of Production and Sustainable Use of Biofuels (*Comisión Asesora Nacional para la Promoción de la Producción y Uso Sustentables de los Biocombustibles*) was also created by the Biofuels Law to provide assistance to the Secretary of Energy in the legal, technical and administrative aspects of the biofuels regulation. The Advisory Board is presided by a representative of the Secretary of Energy and includes a representative from each of the following government agencies: Secretary of Agriculture Livestock, Fisheries and Food (Secretary of Agriculture); Secretary of Environment and Sustainable Development (Secretary of Environment); Secretary of the Treasury; Secretary of Economic Policy; Secretary of Trade and Industry; Ministry of Science, Technology and Productive Innovation (Ministry of Science); and the Federal Public Revenue Administration; as well as by any other public or private institution which may contribute to the fulfilment of the tasks allocated to the Implementing Authority (Biofuels Law, art. 3 and Biofuels Decree, art. 6). In practice, the National Advisory Board serves as a mechanism for interagency information sharing, but does not participate in the final stages of policy-making, which are usually defined by the Secretary of Energy.

Other government agencies have been assigned tasks to be developed through specific programmes and under their own budgets (arts. 15.5–15.7). For example, the Secretary of Agriculture is tasked with promoting crops for biofuel production that favour the diversification of the agricultural sector. The Under-Secretary of Small and Medium-sized Enterprises (*PyMES*) is tasked with promoting the acquisition of capital goods by small and medium-sized enterprises to produce biofuels. The Ministry of Science is tasked with promoting the research, cooperation and transfer of technology among small and medium-sized enterprises and relevant institutions. The Biofuels Decree also requests the Secretary of Environment to adopt necessary measures to support the application of the Kyoto Protocol's Clean Development Mechanism (CDM) to projects which benefit from the Biofuels Law.

Blending and procurement requirements for bioethanol and biodiesel

The Biofuels Law sets out a 5 percent minimum mandatory blending requirement for all diesel and gasoline sold within the domestic market with biodiesel or bioethanol, respectively, as from 1 January 2010. It allows the Secretary of Energy to alter these blending percentages and set the price for the biofuels. The Secretary of Energy may increase the percentage according to the growth of the domestic market or decrease them upon situations of proven shortages (art. 7). It also sets out government procurement requirements for biofuels in quantities to be determined by the Secretary of Energy as from 2010 (art. 14). It states that blending facilities selling gasoline and diesel will have to purchase fuel from biofuel plants that are beneficiaries of fiscal incentives, at prices defined by the Secretary of Energy. The same facilities may only purchase fuel from other plants when the beneficiaries' supply is exhausted (Biofuels Law arts. 9 and 15.4, and Biofuels Decree art. 12). Government agencies estimate that the biofuels supply likely to be needed in 2010 to satisfy the mandatory blending requirement will be around 625 000 tonnes of biodiesel and 200 million litres (160 000 tonnes) of bioethanol, per year.[5]

In 2008 a price formula was adopted to indicate how the price of bioethanol would be determined in the domestic market once the mandatory blending requirement for biofuels enters into force in 2010. Secretary of Energy Resolution 1294/2008 (on the Bioethanol Purchase Price Determination Procedure) establishes: a formula to determine bioethanol reference prices (which will be mandatory to those projects receiving fiscal benefits as a result of the Biofuels Law); a reference price to be calculated monthly according to the formula adopted in the Annex and published online; and the price to be established based on the highest price resulting from two formulas detailed in the Annex minus 3 percent. The first formula considers costs plus earnings based on a reference project; and the second formula uses the average price of gasoline.

Existing biodiesel plants could cover this estimated domestic demand, but as they are export-oriented and do not comprise agricultural producers (as required by article 13) they are not eligible to benefit from the fiscal benefits of the Biofuels Law. New biodiesel plants focusing on domestic supply will thus need to be built before 2010 and bioethanol plants built or upgraded

[5] FAO, 2007.

by 2010. It is difficult to say whether or not the needed infrastructure will be operational in time. In addition, procurement rules require blenders to buy first from Biofuels Law beneficiaries, which may not be the most convenient solution for distribution purposes and may create unnecessary barriers in the resulting market.

At the present rate, with no plants to supply the domestic market under construction, many stakeholders question the likelihood that in two years enough facilities will be ready to satisfy the five percent requirement and highlight the importance of a prompt price-setting of biofuels by the government. Industry participants express doubts over the setting of prices by the government, in light of a similar programme implemented in the 1970s to promote a 15 percent ethanol blend in 12 Argentine provinces. This earlier scheme was subsequently dismantled, with the consequent loss of investments due to the government's inability to keep prices adjusted during the hyperinflation that hit the country in 1989. Authorities, however, remain optimistic that the plants oriented at the domestic market will be built during the next two years and that the price set will be attractive for investments in the domestic market to cover the 5 percent blending requirement.[6]

Fiscal incentives

The Biofuels Law creates fiscal incentives, limited by an overall annual fiscal quota to be defined in the national budget and expected to provide benefits to facilities producing a volume of biofuels that is sufficient to supply the 5 percent mandatory biofuels blending requirement.[7] If demand for benefits exceeds the quota (i.e. if projects built to supply the domestic market exceed the 5 percent biofuel volume for any given year), fiscal benefits will be allocated by the Ministry of Federal Planning to eligible projects and firms according to criteria that should prioritize (i) the promotion of small and medium-sized enterprises (SMEs), (ii) agricultural production, and (iii) regional economies (Biofuels Law, art. 14; Biofuels Decree, art. 18).

Facilities that are built to supply the domestic market and that seek fiscal benefits will need to satisfy the requirements set out in the Biofuels Law, such as being constituted by national or provincial governments, or private

[6] Personal interview with Gustavo Bakovich (Director) Directorate of Biofuels – Secretary of Energy.
[7] Personal interview with Gustavo Bakovich (Director) Directorate of Biofuels – Secretary of Energy.

entities dedicated "primarily" to agricultural production in Argentina (Biofuels Law, art. 13; Biofuels Decree, art. 19). Those that are awarded fiscal benefits will be required to sell their total production within the domestic market. Upon the existence of an excess supply of biofuels, the Secretary of Energy may authorize its export, and such exports are not eligible to receive the fiscal benefits afforded by the Biofuels Law (Biofuels Decree, art. 19(h)).

The projects selected by the Ministry of Federal Planning will receive the fiscal benefits contemplated in the provisions of Law 25.924 (2004) on Capital Investment Promotion and its complementary regulations, as well as exemptions on fuel taxes and those taxes that may complement or replace these in the future (Biofuel Law, art. 15; Biofuels Decree, art. 20). Further, a recent Secretary of Energy Resolution 1293/2008 (on the mechanism for selection, approval and priorities for bioethanol production projects under the promotional regime), establishes that the Secretary of Energy will establish a list of projects to be beneficiaries of the fiscal promotion regulations, according to a set of priorities set out in this norm, *ad referendum* of the Minister of Federal Planning. The latter has the discretion to alter such list of projects. Twenty percent of demand will be reserved to projects that benefit regional economies, in accordance with the priorities listed under the resolution including granting preference to SMEs and agricultural producers.

The Capital Investments Promotion Law creates a temporary investment promotion regime, the duration of which is currently being extended by the National Congress, aimed to promote the acquisition of capital goods and private investment in infrastructure (art. 1). The Ministry of Economy is the authority that allocates fiscal benefits to beneficiaries pursuant to a public contest. The fiscal benefits provided by the Capital Investments Promotion Law are the following: (i) the anticipated devolution of Value Added Tax (VAT) (art. 4), which reimburses beneficiaries of the regime the VAT paid (mostly a 10.5 percent *ad valorem* rate) when buying or producing capital goods; and (ii) the accelerated amortization of capital goods (art. 5), which allows regime beneficiaries who bought capital goods or own new infrastructure to shorten the accounting maturity of the investments made (in the range of 30–50 percent) with the effect of reducing the income tax paid in the years after investing. Additional fiscal benefits awarded to project beneficiaries within the Biofuels Law include a three-year exception to the presumed minimum income tax, established by Law 25.063 (1998) on tributary reform, for goods affected to the project. This entails an exemption

from the one percent annual tax on assets that the law defines as presumed minimum income generated by firms.

The Biofuels Law also provides beneficiaries with: (i) an exemption from the tax on liquid and gas fuels (Law 23.966 (1991) on Liquid fuels and Natural Gas tax, and related norms), which imposes an *ad valorem* rate of 62 percent on sales of gasoline and 19 percent on sales of diesel; (ii) an exemption from the gasoil tax set out in Law 26.028 (2005), which imposes an *ad valorem* rate of 20.2 percent on the sale of diesel; and (iii) an exemption from the hydric tax set out in Law 26.181 (2006), which imposes an *ad valorem* rate of 5 percent on the sale of gasoline, and 9 percent on the sale of natural gas.

In addition, Decree 1396/2001 on a competitiveness plan for biodiesel (*Plan de competitividad para el combustible biodiesel*), which was adopted prior to the Biofuels Law, had established several fiscal benefits applicable to biofuel production and distribution in general (i.e. without restricting them to specific project beneficiaries as the Biofuels Law does). It is unclear how these benefits will function once biofuels start to be sold on the domestic market, as this decree – if implemented by authorities – would benefit those domestic biofuel suppliers that are not beneficiaries of the Biofuels Law. These benefits apply to biofuels (or the relevant percentage within a blend of fuels) sold in the domestic market, exempting them from: (i) the tax applicable to all liquid and gas fuels until the year 2011, and (ii) the presumed minimum income tax, as long as the provinces where the facilities producing the fuel are located adopt legislation exempting biodiesel firms from relevant provincial taxes, such as gross income or sales taxes, hallmarks tax, and real estate taxes for the location of the facilities. In this way, the law seeks to encourage provinces to adopt fiscal benefits for biodiesel plants. The Santa Fe Province, for example, has enacted the above-mentioned Law 12.692 (2006) on a Promotional Regime for Non-conventional Renewable Energies and its regulatory Decree 158/2007 exempting bioenergy facilities from provincial taxes (gross income, hallmarks tax, real estate taxes, and vehicle taxes) for fifteen years since the start up of the projects.

Finally, Law 26.190 (2007) establishing a Promotional Regime for Renewable Energy used for Electric Generation grants fiscal benefits until 2016 to power plants using renewable energy sources (including biomass and biogas from facilities that do not fall under the Biofuels Law) awarding them similar benefits to the Biofuels Law, namely: the benefits provided in Law 25.924 on Capital Investment Promotion and its complementary regulations, for the

acquisition of capital goods or investments in infrastructure; and a three-year exemption from the presumed minimum income tax for goods affected to the activities promoted in this law (art. 9). It also establishes that a specific Trust Fund for Renewable Energies (*Fondo Fiduciario de Energías Renovables*) to be managed by the Federal Council on Electric Energy, will receive levies of up to 0.3$/MWh collected by the Secretary of Energy to provide a subsidy of up to US$ 1.50[8] per kilowatt/hour to those plants that are not beneficiaries under the Biofuels Law and shall authorize the use of biofuels to supply the wholesale electricity market or public utilities.

One of the salient characteristics of the Biofuels Law is that it seeks to promote the development of the biofuel industry only for the purposes of domestic consumption. It also leaves a large margin of discretion to the Executive Power, as firms receiving benefits are selected by the government and are forced to sell their total production in the domestic market at a price set by the government.

Considering that the mandatory blending requirements will commence within two years but the government has not yet defined the price for the biodiesel, and also taking into account the significant oscillation in prices of commodities used to manufacture biofuels (such as soybean oil), it is practically impossible for a firm to prepare a business strategy based on the promotional regime established in the Biofuels Law. The production costs of biodiesel, for example, are in great measure determined by the international price of its main input, soybean oil, minus export taxes.

It thus seems that the Biofuels Law, in trying to create mechanisms to serve the domestic market, generates some uncertainties. Although flexibility is a crucial element of blending requirements and price-setting, the reverse side of the coin is that the Secretary of Energy's empowerment to change the required blending percentages without prior notice, as well as to fix the price of biofuels in the domestic market for those facilities taking advantage of fiscal benefits, may in fact create a barrier to investment in bioenergy for the domestic market by creating a sense of unpredictability or instability.

It is therefore likely that the Biofuels Law will promote some local projects, but fall short of its objective of promoting the creation of a sustainable domestic market for biofuels (with a reliable supply at competitive prices). In

[8] Equivalent to US$ 0.004 kW/h.

fact, the attempt to establish minimum blending requirements may fail if the fiscal incentives contained in the law do not achieve the objective of increasing domestic production oriented towards supplying the domestic market, as firms investing in this field may continue to choose export markets rather than participation in the domestic market. In this case, it is likely that the government may influence private sector decisions by increasing export taxes (which will be discussed in the next section) to make domestic biofuel market prices more attractive.

The fiscal benefits set up by the Biofuels Law also seem to contain a high degree of discretion. The example of the fiscal benefits provided by the 2007 Promotional Regime for Renewable Energy used for Electric Generation elucidates that a simpler design may result in a more effective approach, as it provides an equitable and predictable system that applies to all firms selling biofuels to the domestic electricity market without imposing fixed prices or mandatory procurement from specific beneficiaries unconnected with clear social or environmental objectives.

Promotion of small and medium-sized enterprises and agricultural development

According to the Biofuels Law, the Ministry of Federal Planning should prioritize the promotion of small and medium-sized enterprises, agricultural production and regional economies in allocating fiscal benefits. The Biofuels Decree also stipulates that benefits granted to SMEs should seek to ensure their participation in satisfying 20 percent of the total biofuel demand (art. 14). However, dependence on raw materials subject to international commodity prices (like soybean oil) as well as pending administrative decisions on the price for biodiesel in the domestic market and the allocation of fiscal incentives, place SMEs in a very weak position to enter the biofuels market.

The current, more favourable export tax treatment of biofuels (see section 2.3.1) also fails to benefit agricultural producers because price differentials (and therefore profits), are fully absorbed by the biodiesel and vegetable oil industry. At this stage the volume of biodiesel exports in Argentina is not large enough to affect domestic soybean prices, therefore the government promotion policy has no effect on the income of agricultural producers.

It is clear, however, that farmers do benefit from the high soy prices and the immense areas dedicated to soy production across the country provide evidence of this. But the structure of soy production (requiring comparatively minimal labour), tends to favour concentration of land into the hands of few landowners and minimize possible positive impacts for the rural poor. Moreover, even if the increasing demand for biofuels resulted in a rise in the prices for soybean, the Argentinean Government's export taxes are likely to be adjusted to capture the increased profit margins.

Even though it is too early to judge the impact of the Biofuels Law, given the fact that it has not yet been fully implemented, it is likely that its impact on the domestic market will be more limited than originally envisaged. As the promotional regime provides only fiscal benefits for biofuel production, SMEs may have trouble entering the market due to the fact that their primary need would be to access credit to build plants, and also because government allocation of fiscal benefits may prove to be quite unpredictable.

Quality standards

The Secretary of Energy approves and sets out the technical specifications for all new fuel blends (Biofuels Decree, art. 10), and for all biodiesel-related facilities (Biofuels Law, art. 6). Products currently approved for sale in the country include "B5" (diesel with 5 percent biodiesel), "B100" (100 percent biodiesel), "E5" (gasoline with 5 percent bioethanol) and "E100" (100 percent bioethanol). Quality requirements for fuels sold in the domestic market, including biodiesel, were adopted in Secretary of Energy Resolution 1283/2006 on specifications for fuels sold for consumption within the national territory. These specifications are similar to those adopted by countries in the European Union (standard EN 14214) except for the iodine value that is adapted to soy characteristics. In addition, a National Programme for Fuel Quality Control, Inspection and Research and Development, in charge of controlling the quality of fuel sold at pumps, was created by Secretary of Energy Resolution 217/2001 and placed under the aegis of the Subsecretary of Fuels. The most recent bioethanol quality requirements were established through Secretary of Energy Resolution 1295/2008.

Public information and stakeholder participation

The Biofuels Law states that the Secretary of Energy should maintain an updated public registry of permits awarded to biofuel production and

processing plants, as well as an online list of those firms that receive promotional benefits. In addition, reference prices for biofuels shall be published, providing an annual estimate of the total volume of biofuels required to meet domestic market needs (art. 4). As the fiscal promotion regime has not started yet, the information prescribed by the law is not yet available online. Regarding stakeholder participation, the Biofuels Law, in line with Argentina's energy legislation in general, does not contain any formalized procedures for stakeholder participation in decision-making processes. The Biofuels Advisory Board, for example, does not conduct public meetings, have a website, or publish minutes of its meetings. However, as both the agricultural and oil and gas lobbies are very strong in Argentina, stakeholders belonging to these sectors meet regularly with authorities and negotiate or present their views on issues such as export taxes and fuel prices.

Communities' participation in decision making at the local level varies throughout the country, as they depend on provincial regulations to provide such mechanisms. In general, participation in decision-making on issues such as land use choices and the building of industrial plants is weak, although legal recourses exist for citizens to appeal to decisions taken by authorities in order to defend environmental rights (see section 2.5 below).

2.3 Rules promoting international trade

As described in the previous section, the specific legislation on biofuels adopted in 2006 has focused on creating a domestic demand through regulation and promoting a domestic supply of biofuels through fiscal incentives. The legal framework, however, has been more effective in promoting biodiesel exports and the building of biodiesel facilities by setting lower export taxes for this product.

2.3.1 Export taxes

There are hardly any agricultural subsidies in Argentina. On the contrary, the federal government imposes export taxes (*retencione*) to agricultural exports with the objective of hedging the domestic food prices from increases in international commodity prices and obtaining fiscal revenues. In this sense, Argentina's position as a net food and oil exporter allows the government more flexibility in controlling consumer prices for food and oil. The government may guide exports towards different products also by

establishing different *ad valorem* export tax rates, promoting, for example, manufactured products rather than exports of primary products. A clear example of tariff differentials is found in the soybean chain, where, according to Decree 310/2002 on export taxes soybeans are subject to a 35 percent export tax, and soybean oil to a 32 percent export tax. Export taxes on sugar cane are 5 percent.[9] At the same time, Ministry of Economy Resolution 126/2008 sets a fixed biodiesel export tax at 20 percent. This differential compensates for the additional costs of producing biodiesel. Furthermore, considering that the international market prices for both soybean oil and biodiesel are similar, biodiesel production is more profitable than vegetable oil for exporting companies.[10]

Export taxes on regular gasoline and diesel, on the other hand, are regulated by Ministry of Economy Resolution 394/07 (Annex), which places a ceiling on the net income by oil companies at a maximum of US$ 42 per barrel, and awards price differentials to the government through export taxes. Export taxes, thus vary according to international oil prices (currently over 45 percent), and are likely to continue being incremented to isolate the local market from fuel price increases in the international market. Export tax for biodiesel was raised to 20 percent in 2008.

Favourable export tax rates and international prices for biodiesel are driving the current interest in the export of biodiesel from Argentina. However controversial and unpopular with the exporting sector, and farmers in general, export taxes have proven to be useful market instruments to prevent the rise in prices of certain commodities like soy or corn – and fuels – from impacting the domestic market and increasing local food prices. As Argentina is a net producer of food and fuels, export taxes allow the government to keep food prices and industrial costs at bay, albeit at the cost of discouraging investments and reducing growth perspectives for the energy and agricultural sectors.

2.3.2 Requirements by export markets

Argentina's prospects for exporting ethanol are not as good as those for biodiesel. One of the reasons for this is that ethanol exports are affected by

[9] For an updated list of tariffs see www.afip.gov.ar.
[10] Ibid.

import tariffs imposed by the United States and the European Union, who are the main buyers.[11]

Additionally, the biodiesel industry in Argentina is wary of new environmental requirements contemplated by the European Union for its member states to implement a 10 percent target for "sustainable" biofuels in overall petrol and diesel consumption by 2020. The details of the scheme are contained in the new European Directive on the promotion of the use of energy from renewable sources, adopted in 2009 as a part of a comprehensive post-2012 package on climate change and energy. In accordance with this EU Directive, sustainability will be defined according to minimum criteria, including that greenhouse gas emission savings from biofuels must be at least 35 percent, and that biofuels and bioliquids must not be made from raw material obtained from land with high biodiversity value or high carbon stock.[12] Most of Argentina's production should be in line with these requirements, and may in fact benefit from a shift away from palm oil.

Biodiesel is also affected by a non-tariff barrier stemming from a technical requirement by the European Union concerning the maximum iodine content in the fuel (contained in standard EN 14214), which is defined according to the iodine content of biofuel produced from rapeseed (*colza*) against that produced from soybeans. Biodiesel from soy is thus blended with that from rapeseed or palm (usually in the US) to reduce the iodine content prior to re-export to most countries in Europe. Spain, on the other hand, has increased the level of allowed iodine content to facilitate the import of soybean biodiesel (maximum iodine value for soy is 135 in Spain compared with 120 in the European standard).

It will thus be important for Argentinean authorities to maintain active participation in relevant international negotiations, including through consultations between Mercosur and the EU, to prevent the establishment of costly bureaucratic procedures or certification schemes that may violate WTO rules. A Mercosur group on biofuels was created in December 2006 to present a common regional strategy towards export markets regarding tariff and non-tariff barriers to trade. Participation in WTO meetings on environmental goods and services (where the issue of reducing tariffs for biofuels was presented by Brazil) has, however, not yet been approached as a regional strategy.

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[11] Both the EU and the US place a tariff of over US$ 0.50 per gallon (3.78 litres) of ethanol.
[12] See www.ec.europa.eu.

2.4 Environmental legislation

Legislation related to environmental requirements and standards emanates from different legal instruments, and applies both to facilities that produce biofuels and to agricultural producers growing biofuel crops. As the regulation and management of natural resources is a competence that falls primarily upon provincial governments, legislation in this regard is not uniform throughout the country. The following sections will address those regulations that are of a federal nature, including: the environmental requirements in the Biofuels Law; the minimum standards of environmental protection adopted by the federal government; and regulations related to CDM projects.

2.4.1 Environmental requirements in the Biofuels Law

Facilities producing biofuels are subject to similar environmental requirements as any industrial production facility in Argentina, namely obtaining a permit by the relevant provincial authority in accordance with provincial legislation. Prior to awarding permits to biofuel production facilities, the Biofuels Law requires the Secretary of Energy to ensure compliance with relevant quality standards for biofuels and its sustainable production. Each facility is requested to present an environmental impact assessment including information on the treatment of effluents and waste management (art. 6). In practice, however, the Secretary of Energy requires projects and facilities to present the permits awarded by provinces where facilities will be located. Such permits are considered proof of compliance with environmental norms. Therefore, as this regulation occurs on a province level there is currently no overall evaluation at national level of compliance with specific environmental standards.

2.4.2 Environmental requirements concerning agricultural production

Argentina's environmental legislation applicable to the agricultural sector (water and soil protection, environmental impact assessment and biodiversity protection) is under provincial jurisdiction, thus varying throughout the country. As a general rule, agricultural production is mostly an unregulated sector with respect to environmental protection. An environmental impact assessment is not required for regular agricultural activities, although some provinces have specific requirements to issue deforestation permits that include environmental impact assessments and public participation instances.

Even though some legislation, such as the preambular paragraphs to the Biofuels Decree, make reference to the positive impact of biofuels on the environment, no specific standards to evaluate the environmental sustainability of this industry have been designed in Argentina. Research on the sustainability of biofuels produced in Argentina, taking into account the local conditions for their production and their environmental impacts, is still ongoing. In addition, international studies on the impacts of biofuels on greenhouse gas emissions may not necessarily reflect the situation in Argentina, as soy cultivation in the country has specific characteristics: for example, it generates additional emissions from nitrous oxide, while simultaneously reducing other greenhouse gas emissions through the use of no-tillage farming methods.

In the case of agriculture and specifically on issues related to land use and land use change, including forestry, national environmental legislation tends to be limited to the adoption of international treaties and programmes to further their objectives, and the adoption of general environmental legal principles, such as those included in Law 25.675 of 2002 on general environmental criteria (*Ley General del Ambiente*).[13] These laws and regulations do not have a direct impact, however, on land use choices and therefore on the production of crops for biofuels.

Provinces do not normally have land use planning strategies but leave it to the landowners to decide whether to maintain forest cover or deforest the land. The absence of a serious land use planning strategy, coupled with ongoing agricultural development, has led, during the past 17 years, to the loss of 5 million hectares of native forests and the degradation of many areas.[14] The increase in the area dedicated to the cultivation of soy has also raised serious concerns over the loss of biodiversity in some areas through the conversion of natural pastures previously devoted to livestock raising, the draining of wetlands for agricultural production and the destruction of native forests.[15]

In response to these concerns, and to an active civil society campaign led by Greenpeace, the National Congress started discussing minimum environmental standards for the protection of native forests, which led to the adoption in November 2007 of Law 26.331 on Minimum Standards of Protection for Native Forests (the Native Forests Law). The Native Forests

[13] See www.ambiente.gov.ar.
[14] Ministry of Environment, Sustainable Development Indicators System, December 2006.
[15] Greenpeace, 2007

Law introduced a novel approach towards federal regulation of natural resources, by requesting all provinces to adopt a land use planning strategy for native forests during 2008, through a participatory process and considering sustainability criteria included in the law's Annex in order to establish different zones where native forest cover should be kept intact. Provinces that fail to adopt such strategies should refrain from issuing any further deforestation permits (arts. 6 and 7). The Native Forests Law also establishes that all deforestation of native forests will require a permit by local authorities, granted in addition to an environmental impact assessment and following public participation procedures (arts. 13, 22 and 26). It further establishes the minimum requirements that such environmental impact assessments and public participation procedures should incorporate. Decree 91/2009 (on the regulation to the Native Forests Law No. 26.331) is the implementing instrument of this law and creates a National Fund for the Conservation and Enrichment of Native Forests.

2.4.3 CDM in Argentina

According to the Biofuels Law, projects receiving fiscal benefits may also qualify for the Clean Development Mechanism under the Kyoto Protocol's CDM (art. 17). The Secretary of Environment should advise potential beneficiaries on the conditions, programmes and benefits that may be obtained through biofuel activities in the CDM (Biofuels Decree, art. 21).

The Secretary of Environment was designated in Decree 2213/2002 as the implementing authority for the UN Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol. Secretary of Environment Resolution 240/2005 then replaced the former Argentine Office for Joint Implementation created by Decree 822/1998 with the Argentine Office for the Clean Development Mechanism (*Oficina Argentina del Mecanismo para un Desarrollo Limpio*), which is the Designated National Authority for the CDM. As such, it is in charge of evaluating CDM projects prior to their submission to the UNFCCC. The Argentine CDM Office is comprised of: a Permanent Secretary; an Executive Committee with representatives from the Secretary of Energy, Secretary of Agriculture, Secretary of Industry, Commerce and Mining, Secretary of Transport, Ministry of Economy, Ministry of Foreign Relations, International Trade and Worship, and Ministry of Science; and an Advisory Committee. The procedures for the evaluation of projects presented to the Argentine Office for the CDM for approval are set out in the Annex to Secretary of Environment Resolution 825/2004 on procedures

for the national evaluation of projects presented to the Argentine CDM Office. A voluntary mechanism for prior consultation is set out in Secretary of Environment Resolution 239/2004.

A project's approval by the Argentine CDM office follows an evaluation of compliance of project documentation with CDM requirements and national legislation, performed by the Permanent Secretary (Annex clauses 4 and 6), and a technical evaluation performed by the Executive Committee, considering relevant opinions presented by provincial authorities and a technical assessment institution (Annex clause 7). Projects that are approved by the Secretary of Environment, upon consideration of the decision by the Executive Committee, are issued a Designated National Authority Approval Letter that confirms that the project contributes to the country's sustainable development and the UNFCCC objectives (Annex clause 10). This enables project proponents to present their projects for validation and further registration by the CDM.

These resolutions do not set fixed priorities for determining a project's contribution to sustainable development, although these are under consideration by the Argentine CDM Office. A reader-friendly description of the prior consultation mechanism, including relevant documents is available on the Argentine CDM Office's website. The Secretary of Environment has also published a Manual for the development of CDM projects[16] that provides additional details about methodologies and requirements for project presentations. Annex 2 to the Manual is updated regularly to include new CDM methodologies, and currently includes electricity generation projects from biomass waste. Another relevant publication by the Secretary of Environment is a paper on financial and legal issues to consider in the development of CDM projects.[17]

A list of all projects presented for consideration by the Argentine CDM Office, including project design documents (PDDs) and their current status is available online.[18] Argentina has ten projects registered by the CDM Executive Board, three of which relate to bioenergy:

- Project 0876: Partial substitution of fossil fuels with biomass in cement manufacture (registered on 14 September 2007);

[16] See www.ambiente.gov.ar.
[17] See www.aplicaciones.medioambiente.gov.ar.
[18] See www.ambiente.gov.ar.

- Project 0928: Methane recovery and effective use of power generation project Norte III-B Landfill (registered on 27 April 2007); and
- Project 0950: Bioenergy in General Deheza –Electricity generation based on peanut hull and sunflower husk (registered on 9 April 2007).

According to online information provided by the UNFCCC, the expected average annual certified emission reductions (CERs) that will be contributed by projects in Argentina amount to 2.04 percent of the total contribution by all CDM registered projects (calculated to reduce 189 201 382 tonnes of carbon dioxide equivalent per year through 901 projects). Argentina's participation in the CDM is still limited, when compared with the whole of Latin America and the Caribbean region that has registered 301 projects (most are located in Brazil and Mexico).

2.5 Labour laws and social guarantees

Most of the population involved in bioenergy production in Argentina is rural, as both agricultural inputs and main biofuel facilities are located in rural areas. Argentina's rural population is characterized by its difficulty to access health services, lack of adequate housing or sanitation and low awareness of occupational health risks, as well as by the use of inadequate equipment and safety procedures. It is not unusual for families to participate in agricultural activities, and thus for women and children to be exposed to pesticides and other agriculture-related risks. These risks vary according to agricultural practices used and chemical products applied to crops. Glyphosate, the main herbicide applied to soybean production in Argentina, is classified by the World Health Organization as Class U (unlikely to present acute hazard in normal use), therefore the persons interviewed for the purposes of this study did not see bioenergy production as creating additional occupational health risks compared with agricultural production in general, but rather, minimizing them. However, that conclusion is a broad generalisation and an analysis of risks will necessarily need to consider products being used, the capacity of the workers to understand and incorporate safety procedures and the provision of adequate training and equipment by employers.

The main legislation applicable to agricultural worker's safety in Argentina can be considered adequate to protect workers if its provisions are complied with. It includes: Law 19.587 (1972) on Hygiene and Safety at Work, Law 24.557 on Labour Risks (1995), Law 22.248 (1980) on Agricultural

Work, and Decree 617/1997 on hygiene and safety in agricultural activities. Argentina's legislation on worker's safety is set as a federal standard requiring the use of appropriate equipment, and provision of training and medical advice for workers engaged in the handling of toxic substances. The competent authorities for regulation and control are the Ministry of Labour and the Superintendent for Labour Risks, in addition to relevant provincial authorities.

Regarding the impact of biodiesel promotion policy on rural development, studies are not available, but most experts contend that biodiesel production is unlikely to alter or produce any significant impact on existing patterns of agricultural production. In any case, in a country as vast as Argentina, the social effects are to be studied at the local level as regional realities vary widely, and will mostly depend on whether the local population is engaged within the soy production chain. Negative impacts may be found in regions where soy monoculture displaces traditional livestock farming practices, for example, in cases where local populations, or indigenous communities, depend on cattle grazing land that falls under the legal title of other people. The effect of biofuels on global market prices for commodities like soy may increase landowners' incomes and reduce farmers' market risks. Given Argentina's land tenure structure for soy production (composed mainly by large mechanized farms), biofuels are unlikely to alter rural poverty levels or farm workers' livelihoods. However, positive impacts could result from alternative crops (such as jatropha) being grown for biofuel production in current dryland areas with high levels of poverty.[19]

Regarding the possibility for communities to have a say in the approval of bioenergy projects that may affect the environment, local legislation may provide for public participation (as is the case concerning the consideration of deforestation permits). In all cases, however, affected parties and community representatives may present an *amparo* procedure to protect their constitutional right to a healthy environment. The 1994 reform to the Argentine Constitution in fact empowered local communities and non-governmental organizations to request a preliminary measure to stop any project, which violates or threatens to violate collective environmental rights (art. 43), including the right to a "healthy and balanced environment" (art. 41).

[19] FAO, 2007.

This summary *amparo* procedure against "any form of discrimination and about rights protecting the environment, competition, users and consumers, as well as about rights of general public interest," may be filed by the affected party, the ombudsman and the associations that foster such interests (art. 43).[20] The 1994 constitutional reform has thus allowed affected parties, environmental associations and the ombudsman to have standing in court to represent environmental interests, and provides them with a powerful legal instrument to protect environmental rights. The *amparo* procedure works in a similar way to a *habeas corpus*, which is a summary procedure to protect the right to freedom used to prevent illegal detentions. Instead of guaranteeing solely individual freedom, the *amparo* procedure is geared towards guaranteeing the exercise of constitutional rights in general. This allows judges to expeditiously examine the constitutionality of decisions, regulations or acts of public or private parties that affect constitutional rights and ensure that decisions are not delayed by bureaucratic or judicial barriers.[21]

3. NATIONAL BIOENERGY POLICY AND ITS IMPACT

Argentina incorporated policy goals in several laws and regulations that provide insight into decision-makers' expectations on the future of the bioenergy sector, although it does not yet have a unified instrument spelling out bioenergy policy at the national level.

The guiding principle for the approach of the federal government towards fuel production is related to energy security, and is described in the Fossil Fuels Law (art. 2.2.1), which states that the federal government will determine the national policy for activities related to the exploitation, industrialization, transport, and commercialization of fuels, *with the overarching objective of satisfying national fuel needs with domestic production* (emphasis added) in articles 2 and 3.

The guiding principle regarding agricultural production is not as clearly stated in a legal instrument, although agricultural policy in Argentina tends to follow market opportunities and promote research in products considered to have international trade or value-added potential. Along these lines, Argentina is focusing on promoting the production of biodiesel from soy and ethanol from sugar cane, with research being carried out on alternative biofuel crops.

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[20] An English translation of the Argentine National Constitution can be found at www.senado.gov.ar.
[21] Aguilar, S. 2002.

Bioenergy policy in Argentina therefore shifts between these two overarching policy objectives: satisfying domestic fuel needs and promoting an export-oriented agricultural industry. The Preamble to the Biodiesels Decree, one of the sole instruments stating bioenergy policy objectives, stipulates that: the diversification of the fuel offer constitutes one of the pillars of national fuel policy; the incorporation of biofuels in the national energy matrix is based on the need to promote the use of fuels with the least compromise on the environment, in accordance to Article 41 of the National Constitution (right to a healthy and balanced environment); the development of the biofuels business chain must be promoted; and the promotion of biofuels is an adequate policy to confront the challenges of preventing shortages in a growing economy. The only quantitative policy goal adopted at the national level related to bioenergy is the target to achieve a 8 percent share of renewable energy in the national energy consumption matrix by 2018, included in Law 26.190 of 2007 on a Promotion Regime for the Use of Renewable Sources of Energy for Electricity Generation (art. 2) and is based on the target for renewable sources of energy adopted at the 2004 Bonn Conference on Renewable Energies. Currently the only concrete measures to achieve this goal are those deriving from the mandatory 5 percent blending requirement for biofuels in the transport sector from 2010 onwards.

At the regional level, the Regional Conference on Renewable Energies for Latin America and the Caribbean (Brasilia, October 2003), adopted in 2003 the "Brasilia Platform on Renewable Energies" to reach by 2010 an average of at least 10 percent share of renewable energy sources in the region. Within Mercosur, Decision CMC 49/07 and its Annex establish a working group on biofuels and adopt an action plan that aims to exchange information, foster cooperation, and coordinate positions of the member states on negotiations regarding the adoption of global quality standards for biofuels.

Several policy initiatives have also been launched at the ministerial level. The Secretary of Agriculture under the Ministry of Economy was the first to address biofuels with a National Programme on Biofuels adopted through Secretary of Agriculture Resolution 1156/2004 that focuses on crop diversification (looking for alternative crops with better energy balance than soy) and promoting regional development. The programme evaluates crops like jatropha, rapeseed (*colza*) and castor oil plant (*ricino*) and has yielded good preliminary results. The research of the National Institute of Agricultural Technology (INTA), with the support of the Food and Agriculture

Organization of the United Nations (FAO) is also mapping Argentina's biofuel potential for domestic consumption by identifying the richest biomass-resource sites and main energy consumption centres.[22] Funds for the biofuels programme are however limited, thus the capacity to implement the programme beyond pilot projects is constrained.

In the Secretary of Environment, the focus of policy-making is on promoting CDM projects under the Kyoto Protocol. Thus, a National Programme on Energy and Fuels was created through Secretary of Environmental Policy and Planning Disposition 166/2001, and a specific National Biofuel Programme created through Secretary of Environment Resolution 1076/2001. Both are mainly tasked with coordinating research programmes and studies to enhance the use of international climate policy instruments in the promotion of sustainable energy sources. The biofuels programme, adopted by the Secretary of Environment, also contemplated the development of environmental and sustainable development indicators for biofuels use in the country, although these have not been developed. Most sources consulted agree that the Secretary of Environment has an active CDM office, but has not made a substantive contribution to the development of national bioenergy policy.

Regarding environmental objectives, policy measures and their implementation through legislation have not been preceded by a study on Argentina's agricultural production scheme and ecosystems, to compare crops according to their energy and greenhouse gas balance, in order to ensure an efficient approach to crop promotion in environmental terms. Experts coincide, for example, in pointing out that Argentina is reaching its maximum capacity in terms of lands devoted to soy production (more than 16 million hectares), thereby possibly creating environmental risks if the agricultural frontier continues to expand into native forests and other sensitive ecosystems like wetlands.

Regarding research and development policy, the Ministry of Science and research institutes have public and private-funded research programmes focusing on bioenergy inputs. Private firms, especially vegetable oil conglomerates and the oil and gas industry maintain research groups on key areas of biofuel production. On biofuel inputs, public institutions working on biofuel research and development include the development of biogas

[22] The project uses FAO's Woodfuel Integrated Supply-demand Overview Mapping (WISDOM) system.

digesters by INTA and lignin biodegradation by the National University of Tucuman. On processes, Salta University is conducting research and development on processes for biodiesel production with enzymes and the University of Buenos Aires is working on the design, modelling and optimization of chemical processes for biofuel production. In terms of applications, the *Universidad Nacional del Litoral* is evaluating quality control for fuels according to national and international standards, and the National Technological University on emissions by alternative fuels in combustion engines.[23]

At the policy level, Argentina's current focus on short-term energy security lacks a strategic approach to reliable and sustainable energy sources of the future, such as wind-power, tidal or biofuel sources. The country's institutions and private sector lack clear policy guidance on the path to be followed in terms of bioenergy production, or renewable energy as a whole, and one effect of this is that investment is curtailed in this field. Argentina's energy policy thus seems to be reactive rather than proactive. Unlike its neighbour, Brazil, which has implemented a decades-long programme on ethanol and invested in off-shore explorations that resulted in the discovery of large reserves of oil and gas, Argentina does not currently have a long-term perspective in its energy policy.

4. CONCLUSIONS

Argentina's main legal instrument affecting the development of the biofuels industry is at present an export tax differential favouring biodiesel against the export of the main alternative inputs (soybeans and soybean oil). The country's low production costs coupled with the tax differential have allowed the development of a new industry with the capacity to export 1.5 million tonnes of biodiesel per year. Export taxes are also used as a means to control domestic food and fuel prices from increasing, as Argentina is a net food and fuel exporter. Although export taxes in general are controversial as they tend to discourage investment in exporting industries, and 2008 increases in such taxes have led to a major farmers' strike, the establishment of differential export taxes have promoted an export-oriented biofuel industry and protect consumer prices (especially of food) from rising.

[23] FAO, 2007.

As yet, some of the gains envisaged in the Biofuels Law and several other promotional regimes, geared towards the creation of a domestic biofuels market through the provision of fiscal incentives, are yet to materialize. Investors and stakeholders await with mixed predictions the entry into force of a 5 percent mandatory blending requirement for diesel and gasoline in the domestic market by 2010.

The legal regime applying to biofuels production for the domestic market is characterized by the promotional nature of its provisions for this sector. The very elaborate framework of fiscal incentives, this may lead to the danger of a lack of coherence among different laws establishing favourable financial benefits. Also, a marked focus is visible on the fuel (downstream) aspects of biofuel production rather than on its agricultural phases. While some social and environmental guarantees can be seen in the biofuels legislation, particularly with respect to small and medium-sized agricultural enterprises, it is likely that reliance will have to be placed on the broader legal framework for greater social and environmental protection. Land use planning falls under provincial jurisdiction but is not implemented, although a minimum standard of protection for native forests has recently been adopted at the national level. Its results and impacts on biofuels production are yet to be seen.

Key components in the Biofuels Law are still pending further elaboration. In particular, definitions on key issues such as the formula that will guide biofuel prices once the regime is put in place are still absent as is the criteria to allocate fiscal benefits. Concerns related to excessively broad discretion on both accounts have also been underscored. Currently, the Biofuels regime establishes that biofuel prices in the domestic market will be set by the Implementing Authority, but does not give any indication of the parameters that will be used to determine such a price.

Even though the biofuels regime presents an adequate institutional set up, clearly allocates tasks to different government agencies, and includes provisions on institutional coordination through the National Advisory Commission on Biofuels, a common concern expressed by different stakeholders is the lack of transparency in decision-making by authorities. This could be resolved within the existing legal framework by complying with the public information requirements set out in the Biofuels Law and improving the visibility and transparency of the work of the National Advisory Commission on Biofuels.

With reference to environmental aspects, even though the adoption of specific legislation on environmental impact assessment is under the jurisdiction of the different provinces, relevant national coordinating bodies may consider formulating minimum criteria for the sustainable production of biofuels (including the treatment of effluent and waste management), that facilities should satisfy when seeking fiscal benefits through the Biofuels Law.

In its current form, Argentina's bioenergy regime places a significant emphasis on fiscal benefits so it is necessary to rely on its broader network of social and environmental laws to ensure that the sustainability of bioenergy sector.

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