
10. Argentina, an alternative to produce biofuels

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10.1. Introduction

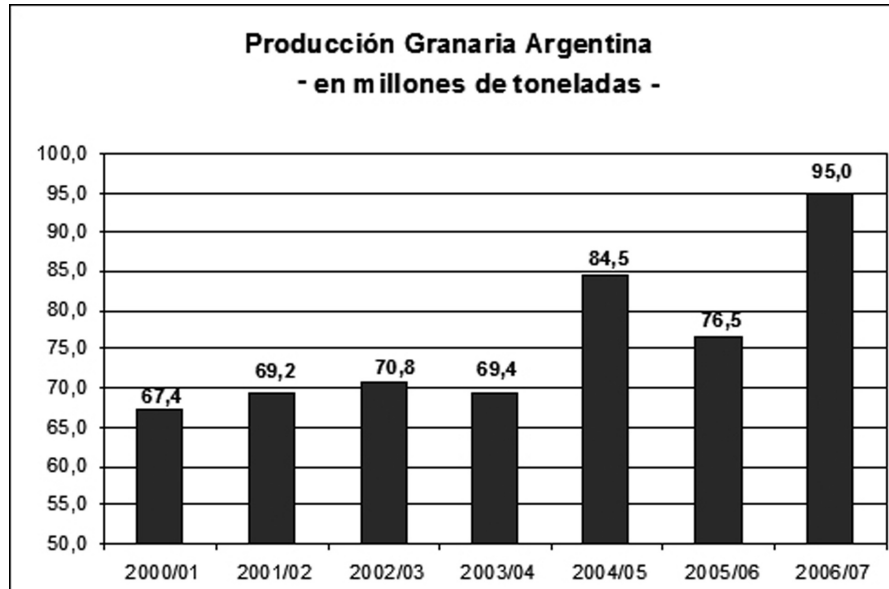
In recent years biofuels have arrived as a new actor in international agricultural markets. Their growth is linked to the increasing awareness of the environmental damage caused by the current fossil fuel-based energy system and rising fossil fuel prices. Governments in the whole world have taken several actions to promote production, and the enforcement of mixtures etc. Biomass-based energy is a promising alternative to fossil fuels because of the versatility of its use (e.g., heating, electricity production, and transportation), and its potential for greatly decreasing greenhouse gas emissions

In this context Argentina has an important role to play, since while some of the biomass in demand to fulfil the new needs of the US and the EU can be made available locally, in developed countries competition for land puts additional pressure on their already very high prices, causing the production cost of bio-energy to be too high to be competitive with fossil fuels or other renewables. In Argentina on the other hand, due primarily to lower land and labor costs, and a highly efficient and low energy intensive agriculture, bio-energy production costs are lower, with a substantial bio-energy potential. Environmental impacts of long distance bio-energy transportation are relatively small because transport-related energy consumption is small.

Located in the southern cone of Latin America, Argentina is the second largest country in Latin America with a total land area of 273 million hectares, stretching from the Tropic of Capricorn in the north to the southern tip of the continent. The country is divided into 23 provinces. Agriculture plays an important and increasing role in the economy, representing more than 50% of all export income. The fertile plains of the center and the northeast of the country, including the humid pampas along the coast and the dry pampas in the west and south, represent the core of Argentina's agricultural production (80% of all agricultural crop production and 75% of the national livestock production takes place in this region). In recent years however, agriculture (primarily soybean production) has extended into less fertile and more remote areas of the northeast and northwest of Argentina, and has also driven livestock production into less fertile lands, because soybean production has generated more income than other crops or livestock. The increase in international markets and competition for land has also pushed up land prices, an impact that will also have consequences for energy crop production.

Argentina's agricultural crop production is highly developed: genetically modified (GM) crops are common, especially for soybean production, where 90% of the total production comes from GM soybeans; application of direct seeding and no-till cropping systems has risen over the past 15 years to become the dominant production system for more than 70 %; fertilizer input has increased (although still significantly lower than in North America or Europe due to Argentina's very fertile agricultural land). Of the 273 million hectares of land, Argentina has 128 million hectares of agricultural land, of which 99 million are permanent pastures, 28 million are arable land, and 1 million are permanent crops.

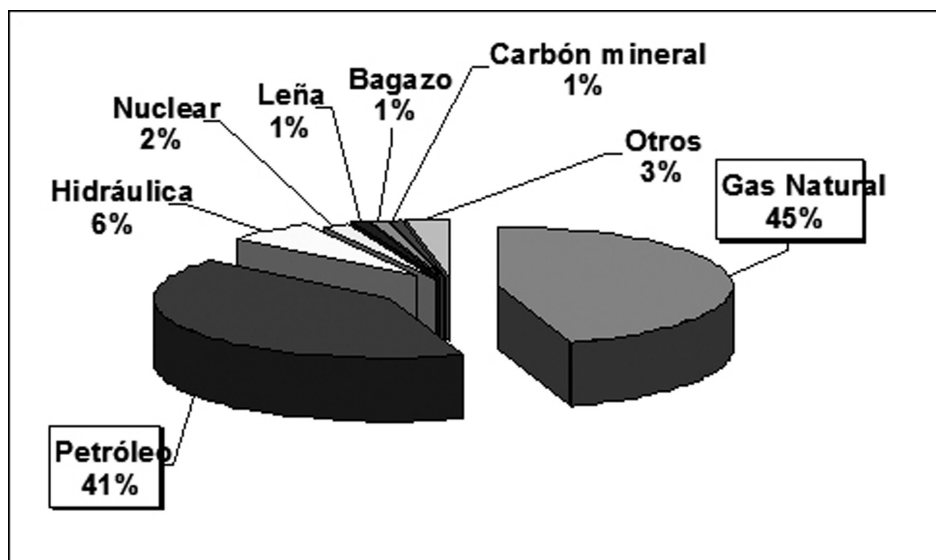
Given this situation, international trade of biomass and biomass-based energy carriers is an interesting option for Argentina, and big investments are under way to increase local biodiesel production to a high rate. In parallel with the growth of international trade in bio-energy, associated points of concern are also being studied. In particular, the sustainability of internationally traded bio-energy is being widely discussed, including the economic viability, environmental friendliness, and social adequacy of each part of the bio-energy chain: production, distribution and consumption. In Argentina an increase in the international commodity prices associated with this new demand is imposing great pressure on agricultural frontier expansion, especially in the northern part of the country, together with an intensification of agriculture in the central farming area of the country. This is increasing food production efficiency so that less land is needed to produce the same amount of food. This is possible through the application of more efficient agricultural production systems, as new genetics, precision farming with high tech farm machinery, and no till among others. Yields and overall grain production have been increasing steadily, reaching 95 million tons, reaching 95 million tons.



10.2. Energy sector

Looking at the energy sector, Argentina is heavily dependent on petrol derived products, at 86 %. In regards to the local transport sector around 55 % of the total vehicle consumption is diesel, while only 20 % is petrol. Although refineries in Argentina currently operate at full capacity and are trying to maximize diesel output, around 3 % of the annual consumption has to be imported. This number is increasing in order to cope with the high rate of growth of the economy, which is bringing more pressure onto the system. Reserves estimates for gas and petrol range from between 12 and 15 years. The diesel market will remain strong as the country traffic network relies heavily on diesel powered long distance truck transport, passenger transport and also agricultural farming equipment. This entire situation compels the growth of local biodiesel production. With the domination of oil crops in the country, Argentina is one of the top three producers and exporters of vegetable oil, and the strong industry network linked to this production favours biodiesel production.

Diesel prices in Argentina (like other fossil-fuel prices) are abnormally low. Indeed the domestic prices are not aligned to the international prices, because of Argentina's auto-supply capacity and the tax that applies to exports. Low internal prices are not a desirable situation for the promotion of new fuels, and do not internalize the externalities that fossil fuels generate throughout their life cycle. In the near future this government policy to decrease the pressure of internal inflation has to change in order to increase investments in new wells and comply with an increasing proportion of imported energy purchased at international market prices.



10.3. Legislation

There are two federal laws that promote alternative fuels. The first one promotes and regulates the biofuels production in the country. This law establishes a mandatory blending in petrol and diesel with ethanol and biodiesel in 2010 (of 5 %). This production will be strongly regulated by the federal government in order to promote small and medium scale facilities, owned primarily by farmers or regional governments, that need development. There are several incentives to be implemented but there is no certainty on the final price at which biofuels will be purchased for blending needs. This aspect is delaying new investments oriented towards the internal market, and the incentive mechanism currently appears too weak to strengthen the role of small and medium sized enterprises. High investment costs and perceived risk prevail in Argentina. People also still have a significant mistrust and disbelief in politics.

Federal law 26190 stipulates for 2010 a participation in electricity production of 8 % from renewable sources. Biofuels could have a share in this production. In this case again, purchasing prices of electric energy produced is the principal factor to be considered in the different available alternatives.

In regards to quality standards, there is a new norm from the secretary of energy that includes diesel, petrol and biodiesel, which states a few important parameters to be fulfilled by biodiesel producers. The national standard organization IRAM has also worked on a local version of the international biodiesel standard, with a mixture of American and European parameters.

10.4. Present situation

There are very big export oriented plants already in construction and operation. These facilities will increase the local capacity of production and exports in the next year with conservative numbers stating a total capacity of 1.5 million tons per year. If all investments under study are considered, this capacity could nearly double. The production is concentrated mainly near Rosario city over the Parana highway, where the major Argentinean soybean processing capacity is concentrated (150.000 Tons per day). Investments for local supply are slower due to more uncertainties in this market.

There are research projects on biofuels launched by INTA and universities that are looking for alternative crops to be promoted and established in different regions of the country. In regards to local capacity, there is experience in small and medium scale biodiesel plants with a great dispersion between technology forwarders. In large scale plants there is an integration between international providers and local contractors.

In regards to ethanol, there are plans to improve the already established capacity and increase its capability in order to process local corn production (Province of Tucuman). Other plans are being studied in different parts of the country with little practical progress of implementation. All cases are considering vertical integration and intensive use of coproducts.

10.5. Conclusions

Argentina is becoming an important player in international biofuels markets and has significant capacity to increase production in the near future. The extent of the participation and expansion of this new market is not clear, since it depends on several governmental actions throughout the world. The final balance and behaviour of agricultural and energy markets is also a mystery, since there is no literature or economic history to study.

Looking at small and medium scale production, there is a need to address this new activity by looking at the several products to be produced, such as protein concentrates, and their potential role in generating animal protein of high value, as the country needs to improve its capacity of local conversion of agricultural products in order to export products of higher prices.