

# Biomass Utilization, a New Business Opportunity for the Colombian Oil Palm Sector

The oil palm agribusiness in Colombia faces major challenges in terms of competitiveness, not only for the internationalization of our economy, but for the growth of the sector itself, which implies that an increasing part of the production is destined for international markets. In this regard, the best use made of the products and by-products derived from this productive activity is, undoubtedly, of great importance for business sustainability.

Currently, around two million tons of solid biomass and three million cubic meters of liquid effluents are produced every year in the palm oil extraction process in the country's palm oil mills. Likewise, our agribusiness has a power generation and cogeneration potential of 340 megawatts. This means that Colombian palm growing has, in the best use of its biomass, the opportunity to develop an electric power business that, on the one hand, contributes to reduce its production costs and, on the other, reports additional income, as well as an impact on the environmental conditions of the production process with more efficient management.

Solid and liquid biomass utilization is the beginning of agribusiness developments that in other regions of the world already report the production of second generation fuels, such as cellulosic alcohol, special sugars such as xylose, and biofuels from pyrolysis processes. The biological, thermal, and physical processes that can be carried out with solid and liquid biomass lead

to the production of biochar and bioplastics, among others; at the same time as physical processes, everyday products such as particleboard to replace wood are obtained. This is then the concept commonly known as biorefinery, which seeks the productive use of the total biomass contained in oil palm fresh fruit bunches entering the extraction process.

The initiative to generate electric power with biomass from the extraction process in Colombia is the result of implementing the Clean Development Mechanism (CDM) Umbrella Project, which uses only the liquid effluent for biogas production with 55-65% methane content, which is then taken to electric motor generators, producing electricity at a cost that can be only one fifth the current cost of electric power purchased from the grid. This generation enables palm oil mills to replace all the energy purchased and to have surpluses of almost 30% of the total generated, which can be used for internal improvements to replace fossil energies in applications on crops or in administrative areas of the plantation or, in the best case, because of its low cost, allow implementation of new industrial processes and initiate a chain value that reports very important synergies in costs and logistics.

After almost five years of having United Nations approval of the CDM project, only recently have eight plants, in addition to the two pioneers in implementing it, decided to make investments

and build the infrastructure required to capture biogas and generate electric power. In this regard, it is important to note that the slow development of this initiative in the country contrasts with the development of many other palm growers in countries of the Latin American and Asian region, where the decisive initiative of palm growers around palm oil mills has made electricity generation viable at low cost obtained from oil palm biomass utilization. These producers in some countries are not only an example of this new business, but also of initiatives to gather, under one commercialization company, the energy available for sale to the national electric power system.

As mentioned above, power generation in palm oil mills is based on the use of liquid effluents as biomass, and on solid by-products, solid biomass, resulting from the extraction of oil, which is exploited by implementing commercially available technologies to generate electricity in a similar way as sugar cane mills now do in the country. In this regard, the opportunities in the case of oil palm growing make it possible to estimate that the generation can reach up to seven megawatts in higher capacity plants and four megawatts in medium capacity ones, thus representing a potential greater than the one currently developed from solid biomass by the Colombian sugar sector.

Having low cost electric power also facilitates the operation of additional processes on by-products in a more advanced way and the implementation of the biorefinery concept. As an example, the use of rachis fibers and the fiber itself as input for the paper industry and the manufacture of paperboard, as wood substitutes, or bagasse fiber; the pretreatment and compression of the rachis and part of the shell or the fiber, for the production of fuel pellets or briquettes, highly appreciated for their renewable nature in European markets are, among others, part of the multiple products that can be obtained and that are, at present, technologically and economically viable, and therefore, represent for our agribusiness the possibility to have a chain that adds value to it.

In that respect, with the increased use of biomass, the Colombian oil palm sector has great opportunities to generate income and improve its competitiveness. For this reason, the trade association is committed to directing all its efforts to create the conditions that, from the sectoral point of view, are required to turn power generation and the production of new by-products from the utilization of biomass in palm oil mills into reality. But it is also necessary for producers to have clarity on how important this is for their activity and to make the business decisions these production processes require.