

The sustainability of ethanol production from sugarcane

José Goldemberg ^{*}, Suani Teixeira Coelho, Patrícia Guardabassi

CENBIO-The Brazilian *Reference Center* on Biomass, IEE-Institute of *Eletrotechnics and Energy*, USP-
University of São Paulo, São Paulo, Brazil

ABSTRACT:

The rapid expansion of ethanol production from sugarcane in Brazil has raised a number of questions regarding its negative consequences and sustainability. Positive impacts are the elimination of lead compounds from gasoline and the reduction of noxious emissions. There is also the reduction of CO₂ emissions, since sugarcane ethanol requires only a small amount of fossil fuels for its production, being thus a renewable fuel. These positive impacts are particularly noticeable in the air quality improvement of metropolitan areas but also in rural areas where mechanized harvesting of green cane is being introduced, eliminating the burning of sugarcane. Negative impacts such as future large-scale ethanol production from sugarcane might lead to the destruction or damage of high-biodiversity areas, deforestation, degradation or damaging of soils through the use of chemicals and soil decarbonization, water resources contamination or depletion, competition between food and fuel production decreasing food security and a worsening of labor conditions on the fields. These questions are discussed here, with the purpose of clarifying the sustainability aspects of ethanol production from sugarcane mainly in São Paulo State, where more than 60% of Brazil's sugarcane plantations are located and are responsible for 62% of ethanol production.