

## **Biofuels versus electricity: Impact of their increased production on household welfare, sectoral and overall output**

Topic: (1.4) CGE Modelling (1)

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For many decades, Uganda's energy challenges remain unresolved. Yet, a country's economic growth is essentially driven by energy accessibility and affordability. Uganda's case is quite interesting because electricity is not only limited in supply and access, prices have also soared. How a developing country like Uganda can attain a middle income status amidst unresolved energy constraints is an interesting and important research issue. Moreover, environmentally-unfriendly biofuels continue to dominate the country's total energy consumption although it is hoped that initiatives that convert waste resources to environmentally-friendly biofuels will not only replace their use but will also augment overall energy needs. Whereas the former guarantees increased energy security, this is only true in the short run. This raises sustainability concerns due to obvious challenges ranging from tradeoffs between food and biofuels production to accelerated deforestation and desertification aggravated by high population growth rate, increased urbanization and industrialization.

Using Uganda's SAM 2009/2010, we aggregate wood charcoal and firewood sectors into broad biofuels sector and then employ a CGE model to evaluate the economic impacts of increased environmentally-friendly biofuels and electricity. We extend this analysis to consider potential inefficiencies associated with increased electricity prices. The analysis reflects one important reality; biofuels link multiple sectors of the economy due to the use of agricultural land resources for biofuels production, and potential substitutability among alternative sources of energy.

Relative to the baseline, both cases of increased biofuels production and electricity supply yield significantly higher GDP with growth in the latter case being the highest. Household welfare improves in both cases but the overall increase in household income is higher in former case. Agricultural employment shrinks and so is value-added. Although the biofuels policy more than offsets most negative effects of increased electricity prices, joint implementation is more beneficial if coupled policies are expansionary in nature.