Life Cycle Cost Analysis

Life Cycle Costs

Conventional LCC	Environmental LCC	Societal LCC
❖ Economic assessment of the life cycle of a product, often excluding one or more life cycle phases, like the disposal phase	❖ Economic assessment of the entire life cycle of a product, performed in parallel with an LCA study applying the same system boundaries but without monetization of environmental impacts in order to avoid double counting with LCC results	❖ Economic assessment of the entire life cycle of a product including external costs for society, like, for instance, through the monetization of environmental impacts.

Scenario 1

- Agricultural, industrial, distillation and cogeneration phases for Jamaican bioethanol production with molasses locally produced (15%) and imported (85%).
- Imported gasoline from Trinidad & Tobago, distribution and use phases.

Scenario 1

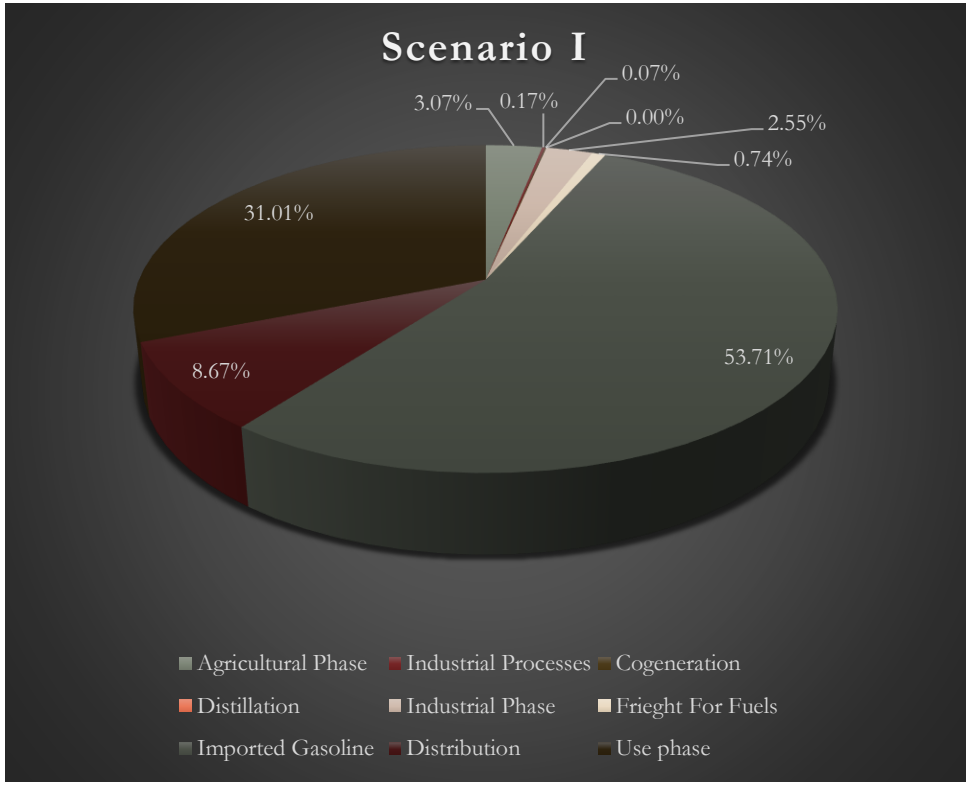
Agricultural Phase	Industrial Phase	Distillation & Cogeneration
▪ The unit processes in the agricultural phase are soil correction, land preparation, planting, plantation management, and hand cut harvesting, and all of them consider labor, materials, machinery, diesel, energy, and material costs in Jamaica dollar (J$) per sugarcane metric ton	▪ The costs of the industrial stage are those relate to industrial activities, distillation, and cogeneration processes. The amount of molasses necessary for driving 6.67×10^7 km is 4000 t molasses. Eighty-fve percentage of this molasses is imported and 15% is produced in Everglades.	▪ Distillation and cogeneration phases were modeled according to technical literature and adapted to the Jamaican context.

Baseline Scenario

- The Baseline Scenario economic LCI gathers Brazilian bioethanol, transports, imported gasoline from Trinidad & Tobago, distribution and use phases.
- Information for imported gasoline, imported ethanol, distribution and use phases are based on Petrojam data and U.S EIA information.

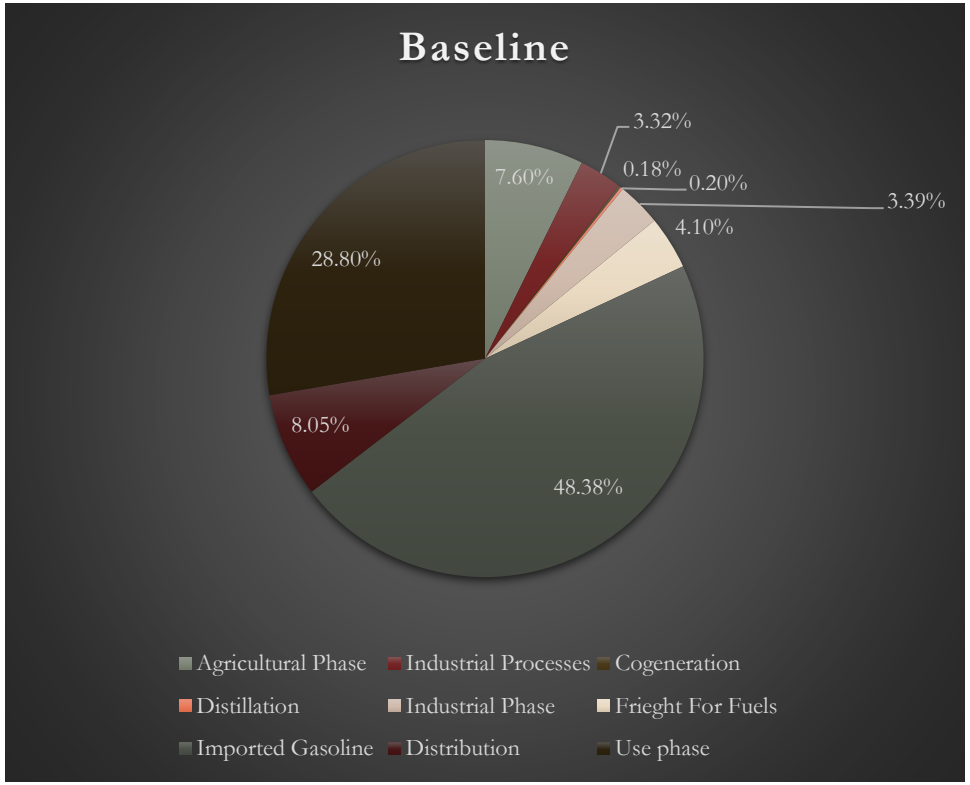
Scenario I

Processes	Price (J$/FU)	Percentage	Article
Agricultural Phase	7.77E+07	3.07%	3.13%
Industrial Processes	3.15E+07	0.17%	1.79%
Cogeneration	1.70E+06	0.07%	0.27%
Distillation	1.40E+05	0.00%	0.01%
Industrial Phase	3.19E+07	2.55%	2.06%
Frieght For Fuels	3.91E+06	0.74%	0.74%
Imported Gasoline	4.81E+08	53.71%	52.23%
Distribution	7.77E+07	8.67%	8.69%
Use phase	2.78E+08	31.01%	31.09%



Baseline

Processes	Price (J$/FU)	Percentage	Article
Agricultural Phase	2.75E+07	7.90%	7.60%
Industrial Processes	1.50E+06	3.20%	3.32%
Cogeneration	6.16E+05	0.17%	0.18%
Distillation	1.15E+04	0.01%	0.20%
Industrial Phase	2.28E+07	3.24%	3.39%
Frieght For Fuels	6.65E+06	0.40%	4.10%
Imported Gasoline	4.81E+08	48.92%	48.38%
Distribution	7.77E+07	7.90%	8.05%
Use phase	2.78E+08	28.25%	28.80%



Conclusions