BioGrace Sensitivity Analysis

Ethanol from Sugarcane

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BioGrace Project

Heat and power Technology

Energy Department

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Methodology

- Pathway assessment
- Collect the information
- Limitation and challenges
- Chose the pathway
- sensitivity analysis !
  - Why?
  - How?

Cultivation and Processing

- Parameter importance
  - Yield
  - Energy consumption
  - Agro chemicals
  - Seeding material
  - Feild N_2O emissions
  - CH_4 from trash burning
- Target parameter
  - GHG emission reduction

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Transportaion

- Parameter importance
  - Distance to proccessing plant
  - Distance to the port
  - Shipping distance
  - Distance to the station
- Target parameter
  - GHG emission reduction

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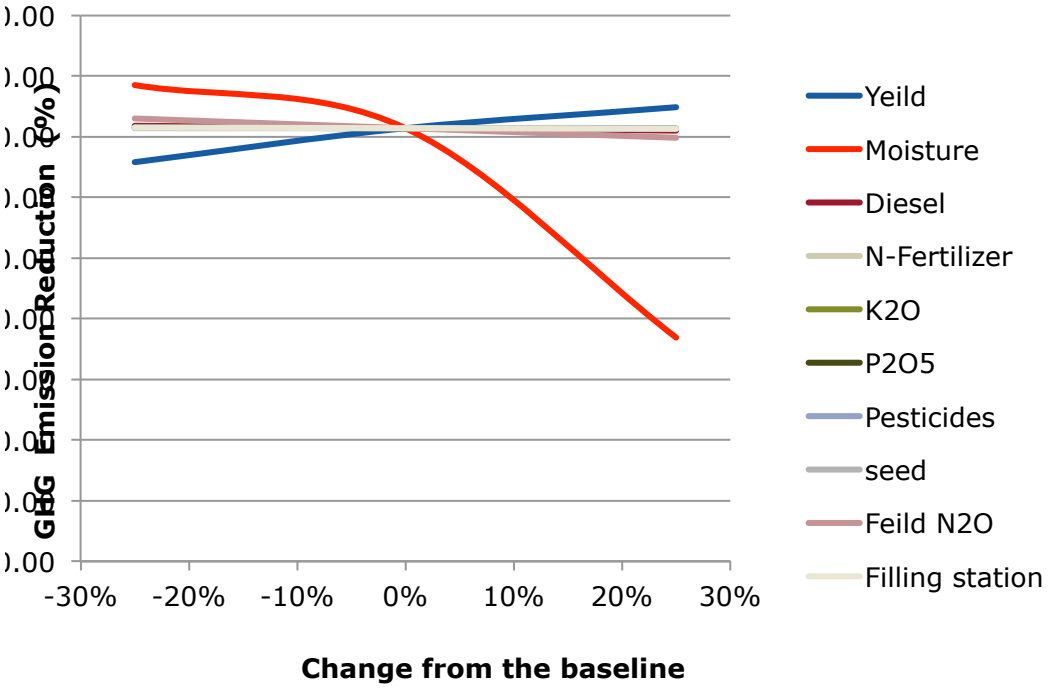
Ethanol plant

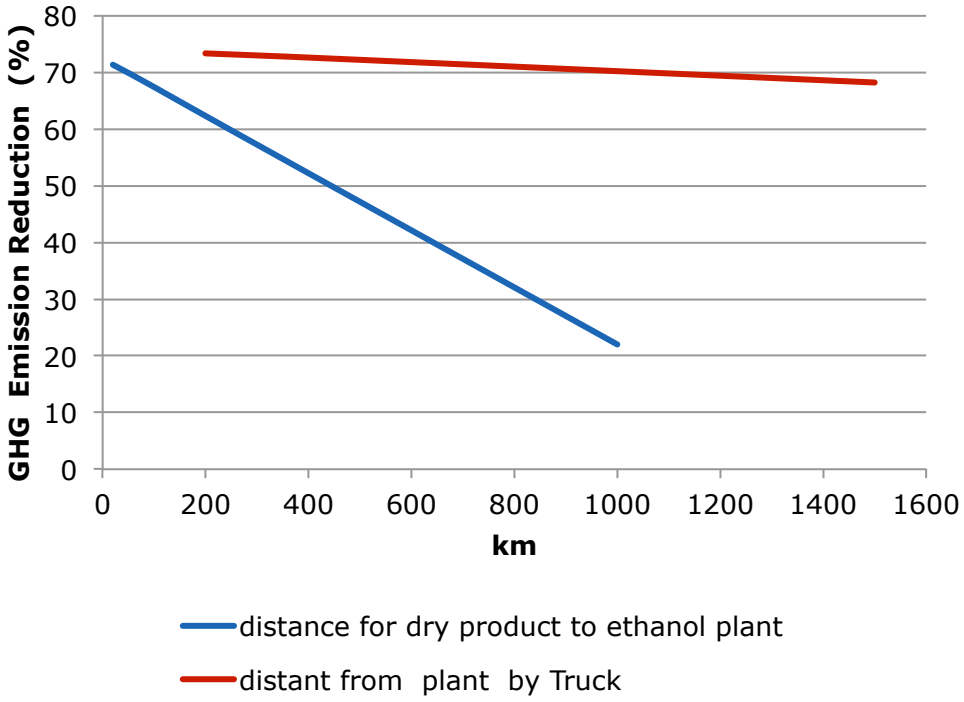
- Yeild
- Energy Consumption
  - Electricity surplus

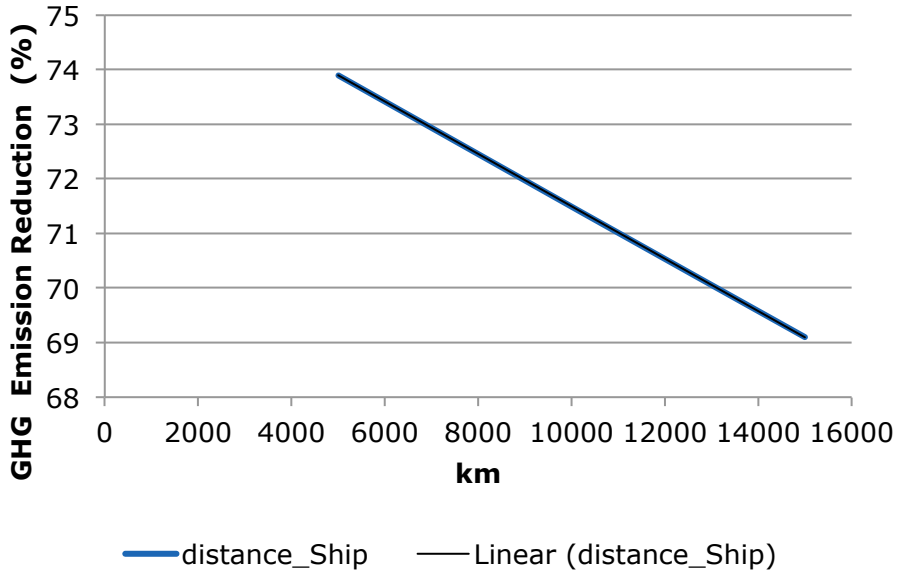
Neglected parameters

- Parameters with very low (or zero) impact on GHG emission
  - Manure
  - Filter mudcake
  - Transport of vinasse and mudcake
- Land use change
- Improved agricultural managment
- CO_2 capture and replacment
- CO_2 capture and geological storage

Results

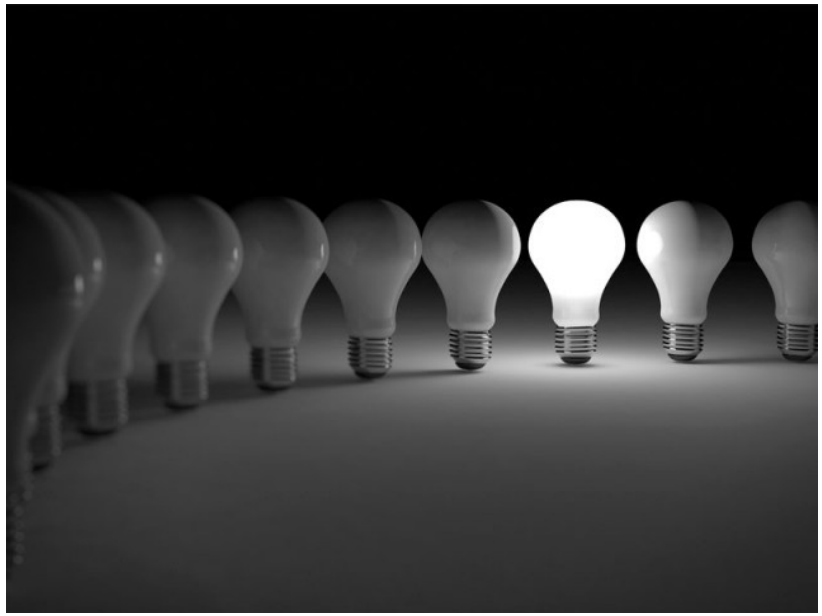

GHG Emission Reduction (%)
-30%
-20%
-10%
0%
10%
20%
30%
Change from the baseline
Yeild
Moisture
Diesel
N-Fertilizer
K2O
P2O5
Pesticides
seed
Feild N2O
Filling station


GHG Emission Reduction (%)
0
10
20
30
40
50
60
70
80
0
200
400
600
800
1000
1200
1400
1600
km
distance for dry product to ethanol plant
distant from plant by Truck


GHG Emission Reduction (%)
68
69
70
71
72
73
74
75
0
2000
4000
6000
8000
10000
12000
14000
16000
km
distance_Ship
Linear (distance_Ship)

Surplus Electiricity

- Considering the usual electricity producion in Brazil
  - Replace the coal source electricity with surplus electricity
  - 13 g CO2 /MJ ethanol reduction
  - 25 kWh/tone cane
  - Emission reduction increased to 89%



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