CJ SELECTA
CARBON FOOT PRINT PROJECT

Life Cycle Assessment (LCA) is a technique for assessing and quantifying possible environmental impacts associated with a product (good or service) or process. According to ISO 14040 ACV it is the "compilation of assessments of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle". The Carbon Footprint is part of the Life Cycle Analysis (ACV) as it considers only the emission of greenhouse gases expressed in $KgCO_2$ equivalent. The present work was carried out with the objective of calculating the Carbon footprint of the Non-GMO Soy Protein Concentrate (SPC NGMO) product produced in Brazil and exported to Norway (used in the feeding of captive salmon). The study considered in the process all phases of the "Cradle to Port", that is, from the production and use of agricultural inputs for the production of soybeans to the delivery of the finished product at the Port of Bracke in Germany. Thus, the process was divided into 3 stages:

1 AGRICULTURAL STAGE

2 INDUSTRIAL PROCESSING

3 STORAGE AND DISTRIBUTION

SCOPE

Functional unit: 1Kg SPC

Geographic Coverage: Soy produced in the states of MG, MT and GO. SPC produced in Araguari/MG transported to Bracke.

Temporal Coverage: April/2018 to March/2019 (year/crop)

Technological Coverage: Direct Planting (soy production) and Alcohol and Solvent Extraction (SPC – industrial stage).

1 AGRICULTURAL STAGE

The following were considered (separated by state MG, MT and GO):

- Productivity
- Use of fertilizers (Nitrogen, Potassium, Phosphorus, etc.)
- Use of pesticides (fungicides, herbicides and insecticides)
- Use of correctives (dolomitic limestone, limestone and plaster)
- Use of fuels
- Road logistics

2 INDUSTRIAL STAGE

Were considered:

- SPC yield
- Production input
- Energy input

3 LOGISTICS STAGE

Were considered:

- Railway section (Araguari – Porto of Santos)
- Maritime Section (Port of Santos – Port of Bracke)

The results were obtained in the economic allocation and mass allocation calculations. The results are also divided into agricultural, industrial and logistical stages, in addition to the total result. For better understanding, the results were segregated using or not the Land Use Change (LUC) in order to identify how much this aspect impacts the final result.

RESULTS (KG CO_2EQ)

ECONOMIC ALLOCATION

With LUC: **1,93**

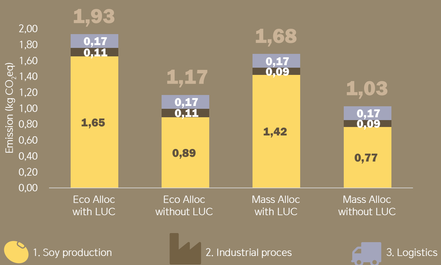
Without LUC: **1,17**

MASS ALLOCATION

With LUC: **1,68**

Without LUC: **1,03**

EMISSION AT EACH STAGE OF THE LIFE CYCLE



INDUSTRIAL PROCESS

CJ Selecta has a differentiated manufacturing process.

REUSE OF EFFLUENT

All the effluent generated at the industrial unit of CJ Selecta S / A is sent to the Effluent Treatment Station (ETE). The ETE was designed using the most modern technology on the market and consists of: Flotation System, Anaerobic Treatment System and Aerobic Treatment System, with final polishing of activated sludge type, extended aeration version.

Thanks to the high efficiency of the treatment system, we can reuse all the effluent generated by the plant. This allows us to save a very significant volume of water and reduce significantly the environmental impact of our industrial activity.

CLEAN ENERGY

CJ Selecta has system for energy cogeneration. It allows it to run its entire industrial park autonomously. This cogeneration is done with the burning of biomass (woodchips), and this fuel is 100% renewable. With a modern particulate capture and combustion control system, CJ Selecta is proud to have excellent results in environmental indicators related to atmospheric emissions.

CONCLUSION

The results obtained are extremely favorable to the sector, since in the highest value obtained, which is the Economic Allocation considering Land Use Change (LUC), the Carbon Footprint for 1kg of SPC NoGMO is 1.93KgCO2eq. This number is considerably less than the number currently used by Norway: 5$KgCO_2$ for 1 Kg of Soy from Brazil.

Looking at the graphic above, it is possible to see that the industrial impact is the smallest of all stages, following the logistics stage and then the agricultural stage, and within the agricultural stage, Land Use Change (LUC).

Learn more about the project, please email:
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