



Cosun Beet
COMPANY

Environmental impact of sugar



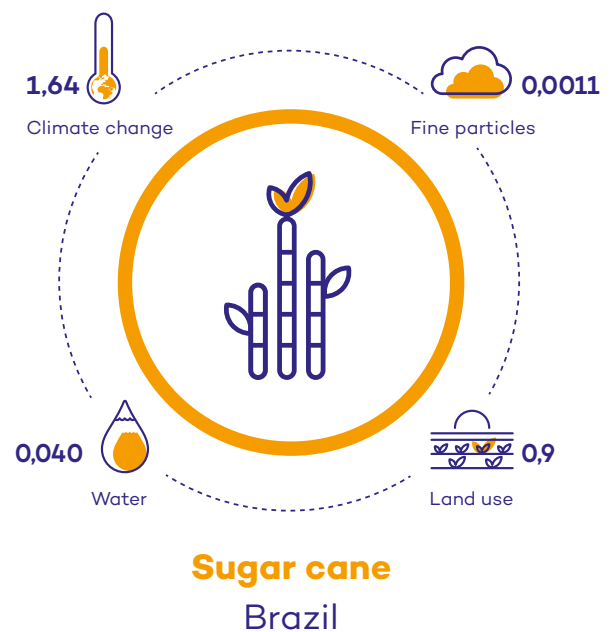
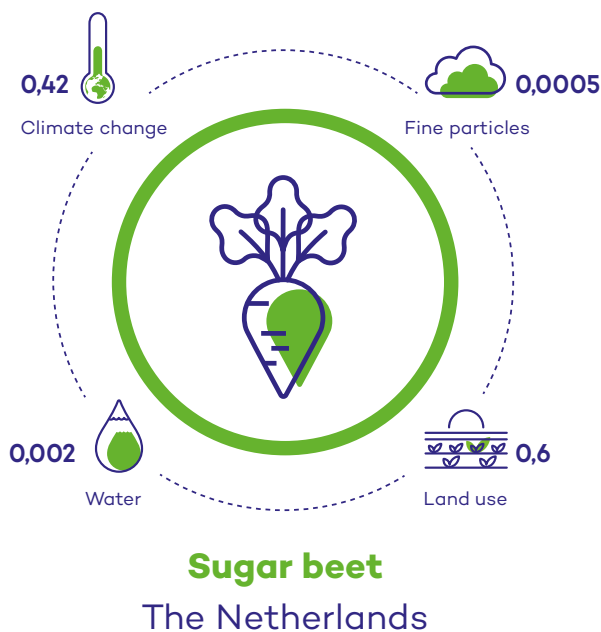
Comparative study 2019

Bright Beet Solutions

Life Cycle Assessment (LCA) of sugar

reveals lowest impact for beet sugar on relevant aspects

Manufacturers and consumers can reduce their carbon footprint by using Dutch beet sugar instead of cane sugar. Cosun Beet Company commissioned a study to determine as objectively as possible how beet sugar scored against cane sugar on relevant aspects of life cycle assessment (LCA). Blonk Consultants, Dutch based knowledge authority on environment, sustainability & food conducted in 2019 this comparative study according to ISO14044 standards. The study has been peer reviewed by three independent organisations.



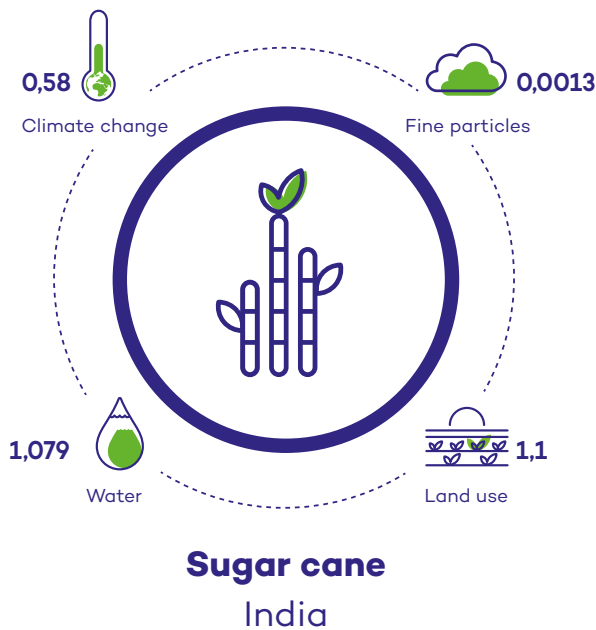
The scope of the study was a comparison of beet sugar produced in the Netherlands at Cosun Beet Company versus cane sugar produced in Brazil respectively India, supplied in the Netherlands.

The results are compared in 3 scenarios:

1. Production of the sugar only
2. Production of the sugar including electricity production
3. Production of the sugar including pre harvest burning.

Results are compared on 4 most relevant LCA aspects: Climate change, air quality, land use and water use. Overall conclusion of the study is that beet sugar has a better LCA performance on all 4 aspects taking the primary sugar production into account as is shown in the figure. Climate change is expressed as carbon footprint in CO₂ emissions per kg of sugar. This emission is for beet sugar 0,42 and the footprint from cane sugar in India is 0,58. The cane sugar footprint from Brazil is with 1,64 four times higher than beet sugar. The difference is caused by the high land use change effect in Brazil and for both Brazil & India by higher transport effect.





| | | |
|-------------------|---------------------------------|--|
| Climate change | Kg CO ₂ -eq/kg Sugar | |
| Fine particles | Kg PM2.5-Eq /Kg Sugar | |
| Land use | m ² a/kg sugar | |
| Water consumption | m ³ / kg sugar | |

Particulate matter refers to solid and liquid particles suspended in air, causing a negative impact on air quality. It is expressed in kilogram particles of midpoint 2,5 pm per kilogram sugar. Fine particles from beet sugar (0,0005) is less than half of that from Brazil (0,0011) and almost a third of the fine particles effect in India (0,0013). For beet sugar the effect is mainly caused by the application of manure in cultivation.



For cane sugar it derives from all stages in the value chain, cultivation, transport and processing.

Land use is measured as the number of square meters used to produce 1 kilogram of sugar. This figure is for beet sugar (0,6) 33% lower compared to cane sugar from Brazil (0,9) and even 55% lower compared to cane sugar from India (1,1). The production per square meter is much more efficient for beet sugar than for cane sugar.

The last environmental aspect is water use expressed in the consumption of water to produce 1 kilogram of sugar in cubic meters. This water consumption originates from irrigation of the acres as well as water used in processing. The effect on water consumption of beet sugar production in the Netherlands and cane sugar in Brazil is low (respectively 0,002 and 0,040) but extremely high in India due to high irrigation effects: 1,079. This is over 500 times the value for Cosun Beet Company beet sugar!

MORE INFORMATION

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