



CO2 Balance Shopping Simulator

(Resource ID: 184)

Franz Michalke

Franz Michalke

franz.michalke(at)boku.ac.at

This teaching resource is allocated to following University:

BOKU - University of Natural Resources and Life Sciences Vienna

Institution:

Institute of Safety and Risk Sciences (BOKU Wien)

<http://www.sustainicum.at/en/modules/view/184.CO2-Balance-Shopping-Simulator>



Individual work

Work in pairs

Group work



Less than 5

students



Up to 3 lecture

units



**Internet
connection
necessary**



English, German

CO2 balances are a simple and quick way to express the environmental impacts of products and services. Simulations of shopping scenarios offer the possibility to gather experience with CO2 balances.

This Sustainicum building block should help familiarize students with the term CO₂ balance. Three scenarios have been developed based on daily student life. The challenge is to stay within pre-determined CO₂ and financial budgets of 100 or more satisfaction points. The budgets are designed to be relatively small so as to represent the economic reality of students, as well as a desirable reduction in greenhouse gas emissions through private consumption.

Greenhouse gas emissions are presented as CO₂ equivalents. Aside from CO₂ emissions, methane (CH₄) output and nitrous oxides (NO_x) are

considered. Corresponding specifically to climate impacts, methane is weighted with a factor of 23 and nitrous oxide with a factor of 127. Together, these three gases are responsible for most of the agricultural emissions.

The data was extracted from freely accessible Internet sources. Geographic proximity to Austria was considered a selection criterion. Where available Austrian data was given priority. No data was personally surveyed by the author. The data used is sufficient to suit the purpose of the building block but is not suitable for further academic uses.

The data used does not reflect the product's entire life cycle assessment, rather only the emissions between production and seller (cradle to gate). This focus was chosen, as there is more available data to use as a foundation, allowing better comparability of the data and avoiding unnecessarily complicated scenarios. In the process of storing and preparing foodstuffs, further greenhouse gasses are emitted, which are not considered in the data. Responsible and conscientious use of resources in this area can help to decrease greenhouse gas emissions.

The goal of this building block is to give young people a feeling for how their every-day consumption choices contribute to greenhouse gas emissions and which alternatives can be taken to reduce these emissions.

This simulator only illustrates a small portion of the greenhouse gas emissions caused by consumer behavior in the broader picture. The emissions from mobility (individual traffic, long distance travel...) and housing are purposefully left out. In using this building block, the course leader should mention that a great deal of potential to save on greenhouse gas emissions exist in this area and behavior that doesn't pay attention to conserving resources is absurd.

The shopping simulator can be found at:
<http://pmig.github.io/Sustainicum/#/>

Aha Effects

Average, prevailing nutritional patterns (large amounts of meat and animal products) are not possible from the perspective of reducing greenhouse gas emissions

Certain types of meat are considerably worse for the climate than others. Certain types of plant-based foods are relatively climate damaging.

Packaging represents a large share of the emissions, particularly in the case of beverages

The type of storage (fresh vs. frozen foods) contributes considerably to emissions

Teaching Tools & Methods



Game

Learning Outcomes

Recognize which every-day things (for example shopping for beverages) have impacts on resource use and how simple behavioral changes can contribute to more sustainability.

Relevance for Sustainability

The term LCA should be possible to experience.
Raising awareness on CO2 emissions and engendering behavioral changes.

Related Teaching Resources

No specific previous knowledge / related resources required

Preparation Efforts

Low

Access

Free

Sources and Links

<http://pmig.github.io/Sustainicum/#/>

Funded by

Funded by the Austrian Federal Ministry of Science and Research within the framework of the call "Projekt MINT-Massenfächer" (2011/12)