

An Uncertain World

Being certain of your knowledge and data uncertainties

| | Value | | Data Certainty |
|--------------------------|-------|---------|----------------|
| Global Warming Potential | 12 | TeCO2eq | Inhouse Data |
| Human Toxicity | | | Unknown |
| Marine Ecotoxicity | | | |
| Water footprint | | Te/Te | |
| Cost per kg | 350 | € | |

The dropdown menu for Data Certainty includes: Inhouse Data, External Database, Estimate, Unknown, and Unimportant.

Context and Issues

All process design has to be done against a backdrop of data uncertainty; real world plant operations rarely live up precisely to the theory or lab scale approximations. The data involved in sustainability evaluations can often be even more uncertain or not available at all. As well as requiring material and energy flows, tens of indicator properties can be needed for each component and geographical variances can become significant (e.g. if the embedded water in the manufacture of a resource was from a water scarce region). Uncertainty in *input* data can be amplified through a tool calculations, resulting in an *output* with even greater levels of uncertainty. Consequently, a challenge exists to make sustainability evaluation tools relevant to the *STYLE scenario** useable and useful when quality input data is lacking.

Recommendations

- At a basic level, it is useful if tools allow *meta data* to be input alongside data values. This can allow the user to record whether the data is high quality measured data, from an external database, an estimate, unknown or unimportant. Some databases have a simple high, medium, low quality rating system.

- Enhanced tools can use methods to score these quality attributes, resulting in an overall confidence rating for the calculation (e.g. *Bristest's Process Complexity and Understanding Methodology*).
- Learning could be taken from the nanotechnology sector, where some tools use a *worst case* value if data is missing. The user then only needs to source more data if the worst case is not good enough for the project to proceed.
- Tools could be improved by allowing range input values, whereby the user may have higher confidence in specifying a minimum and maximum, rather than an absolute value (e.g. *RDC Environment's RangeLCA tool*).
- Sensitivity analysis techniques can be used in tools to inform the user of the impact of uncertainty.
- An increase of quality, open access databases are essential to improve data uncertainty. There is a particular lack of good social and economic impact factors data available, which could be compiled at a sector level.

For more information see www.spire2030.eu/style

***STYLE Scenario:** A project team is evaluating options for a resource or energy improvement for their process or product and they need a pragmatic tool to check the broader sustainability implications of each technological solution



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STYLE

SUSTAINABILITY TOOLKIT FOR EASY LIFE-CYCLE EVALUATION

