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Update of the Si-Chemistry Carbon Balance

Project SILICAB 2 F.A.Q.

Report 18/07/2024

Client Global Silicone Council (GSC)

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Frequently Asked Questions

1.1. Why did we conduct this study?

This study was conducted to gather objective data on our products' carbon footprint throughout their full life cycle reflecting technological changes on GHG emissions of silicon applications in comparison to the 2012 study. This will help customers, consumers and policy makers – as well as silicone producers – design carbon strategies according to their individual needs and ambitions.

1.2. What did the study measure?

The study looked at the greenhouse-gas emissions during the entire life cycle - manufacture, usage and disposal or end of life - of a wide range of important silicon-chemistry products and applications in the three regions covered by the GSC: North America, Europe and Japan.

1.3. How was the study conducted?

We commissioned the study from denkstatt, an experienced and internationally respected consultancy firm based in Vienna. The results were reviewed independently by Dr. Roland Hischier, a respected expert in LCA research, based at EMPA, Swiss Federal Laboratories for Materials Science and Technology. Only the main study was reviewed, the document at hand was not part of the review.

1.4. What methodology was used?

The study is a life-cycle assessment, which is limited to greenhouse gas emissions. denkstatt has considerable experience in the field and its guidelines are based on ISO 14040/44, which spells out internationally recognized standards for such assessments. In addition, any extrapolations made have been purposely chosen to be particularly conservative to avoid overestimating any benefits of silicon applications.

1.5. What did we find?

The study, covering Central Europe, North America, and Japan, highlights 26 applications contributing positively to greenhouse gas reduction across industries. Key aspects include reduced fossil fuel consumption and extended material lifetimes due to silicon applications. The study emphasizes that GHG benefits of silicone products are 14 times greater than production and end-of-life impacts. The total GHG benefit for the studied regions is comparable to emissions from countries like the Czech Republic or the Philippines, representing 11% of Japan's and 2.7% of the US annual GHG emissions.

1.6. How will the results be used?

We will share these results with our customers, to help them assess the GHG balance of their products and services. Our member companies are expected to conduct their own assessments independently.

1.7. What are the study's limitations?

The calculation is limited to fossil GHG emissions without recognizing any other environmental impacts. The chosen approach is a streamlined LCA methodology mainly focusing on emission hotspots which is not in full compliance with ISO 14040/14044.

1.8. What are the main learnings of the study?

A major prerequisite of the study was to ensure the comparability of the results with the first exercise of this kind in 2012. It turned out that remaining with the given methodologies from 2012 was a challenging restriction and caused difficulties in reaching a quality standard which is expected from PCFs nowadays. Reflecting the recent developments in LCA- and modeling guidelines it is suggested for future studies to adjust the selection of baseline applications without silicone (the "alternatives"), and to adapt the calculation models – at the expense of losing comparability with former values.

1.9. Who funded the study?

The study was funded by the Global Silicones Council (GSC), a not-for-profit, international organization representing companies that produce and sell silicone products around the world. Among the GSC's objectives are to promote the safe use and stewardship of silicones globally.

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