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Zero Carbon Tool Report
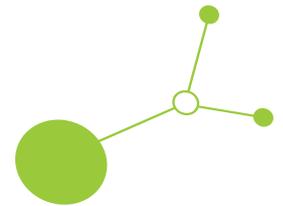
December 2025

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1. Background and Objectives

The Zero Carbon Tool is a simplified Life Cycle Assessment (LCA) instrument developed to support mechanical and manufacturing companies in evaluating the environmental impacts of their products. The tool focuses specifically on enabling SMEs to make more informed decisions regarding product design, material selection, and production optimisation, using carbon footprint results as the core decision-support metric. By translating complex LCA concepts into an accessible and structured workflow, the tool aims to lower the entry barrier for companies that lack specialised sustainability expertise.

The present report summarises the results of the tool's initial testing phase, during which 82 companies were invited to evaluate the tool's usability, functional adequacy, and practical relevance. The collected feedback, obtained through a structured Microsoft Forms questionnaire, reflects real-world user experiences from across Central Europe and serves as the primary evidence base for improving the tool before wider deployment.

The objective of this evaluation is twofold. First, it aims to assess whether the Zero Carbon Tool meets the expectations and operational needs of its target group, particularly SMEs with limited prior experience in carbon footprint calculation. Second, it provides clear guidance for the refinement of the tool's interface, parameters, datasets, and output functionalities to ensure that the next development iteration supports robust, user-oriented decision-making within mechanical companies. Through this testing cycle, REUSE2030 ensures that the tool evolves in alignment with industry needs and remains fit for purpose for broader adoption in WP3.

2. Methodology

The evaluation of the Zero Carbon Tool was carried out through a structured, questionnaire-based testing process designed to capture user experiences from mechanical and manufacturing companies across Central Europe. The objective of the methodology was to generate comparable, quantifiable insights while also allowing respondents to provide qualitative feedback for tool refinement.

The testing was conducted using an online Microsoft Form, accessible through the following link: https://forms.cloud.microsoft/e/twWMWtHK1h

This digital format ensured low entry barriers, easy distribution through project partners, and consistent data collection across all participating companies.

Participants completed the questionnaire after independently exploring and testing the Zero Carbon Tool. No moderated testing sessions were conducted, allowing companies to evaluate the tool under realistic working conditions. The form captured a wide range of feedback, including:

- overall satisfaction with the tool
- ease of understanding and user-friendliness
- clarity of instructions and workflow
- relevance of the included parameters and default emission factors
- flexibility to add own data
- clarity and usefulness of the output visualisation
- technical issues encountered
- suitability for supporting sustainability and design decisions
- open suggestions for improvement
- company background, including country, size, sector (NACE), and previous experience with LCA tools

Data collection took place over several weeks in November and December 2025 and resulted in a consolidated dataset of 82 complete responses. The analysis combined descriptive statistics for all

quantitative questions (using a 1–5 rating scale) with thematic coding of qualitative comments to identify recurring strengths, weaknesses, and development needs.

This structured methodology ensures that the evaluation results are representative, comparable, and methodologically robust, providing a solid foundation for guiding the next development steps of the Zero Carbon Tool.

3. Profile of Respondents

A total of 82 companies participated in the testing of the Zero Carbon Tool. The respondents represent a diverse range of mechanical and manufacturing enterprises across Central Europe, reflecting the project's target group and ensuring that the feedback collected is relevant for real industrial use cases.

3.1. Country Distribution

Participating companies came from nine Central European countries. A corresponding graph illustrates the number of respondents per country.

Country	Respondents
Italy	5
Germany	10
Austria	10
Hungary	5
Slovenia	18
Slovakia	9
Croatia	4
Czech Republic	11
Poland	10
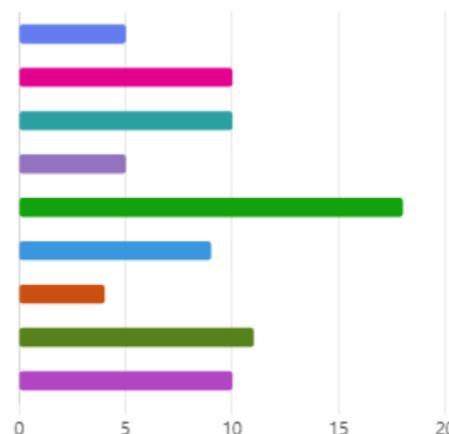
3.2. Size of the Company

Most testers were micro, small, and medium-sized enterprises (SMEs), which form the primary target group for the tool. SMEs accounted for the majority of responses, while a smaller number of large enterprises also contributed to the evaluation. A corresponding graph visualises the distribution across Micro, Small, Medium, and Large companies.

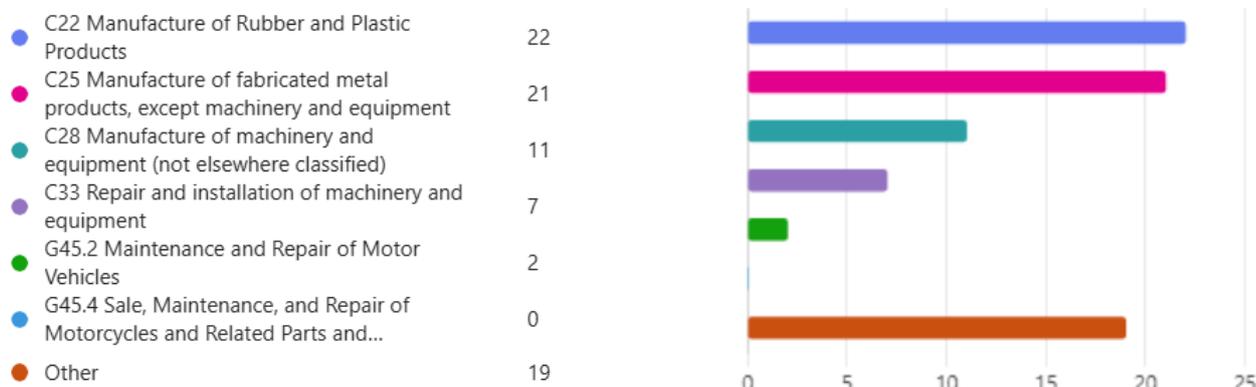| Size	Count
Micro	31
Small	19
Medium	24
Large	8

10%
38%
29%
23%
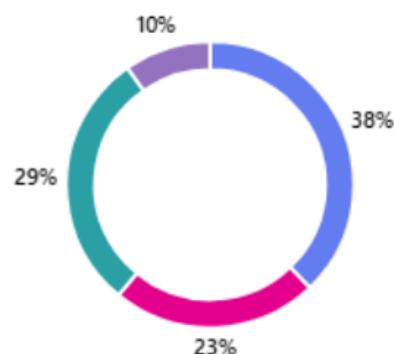
3.3. Main Business Activity (NACE Classification)

Respondents indicated a range of business activities according to the NACE classification, covering mechanical engineering, equipment manufacturing, metalworking, plastics processing, and related industrial sectors. This variety ensures that the evaluation reflects different production processes and

material flows typical for mechanical SMEs. The corresponding graph display the number of companies per NACE category.

- ● C22 Manufacture of Rubber and Plastic Products — 22
- ● C25 Manufacture of fabricated metal products, except machinery and equipment — 21
- ● C28 Manufacture of machinery and equipment (not elsewhere classified) — 11
- ● C33 Repair and installation of machinery and equipment — 7
- ● G45.2 Maintenance and Repair of Motor Vehicles — 2
- ● G45.4 Sale, Maintenance, and Repair of Motorcycles and Related Parts and... — 0
- ● Other — 19

4. Quantitative Results by Evaluation Dimension

The quantitative assessment is based on 82 completed responses, each providing structured ratings across several evaluation dimensions. All rating questions used a standard 1–5 scale, where 1 indicates a very poor assessment and 5 represents excellent performance. The results reflect users' perceptions of the tool's usability, input relevance, data confidence, output clarity, and decision-support capability.

4.1 Overall Satisfaction

Respondents rated their general impression of the Zero Carbon Tool with an average score of **3.66 / 5**, indicating a broadly positive perception of the tool's purpose, structure, and applicability. This score shows that the tool is considered useful by most testers, while also signalling clear expectations for further development.

3.66
Average Rating
① ② ③ ④ ⑤

Level	
Level 5	10
Level 4	39
Level 3	29
Level 2	3
Level 1	1

4.2 Usability and Learnability

Usability was evaluated through three indicators. The average scores are:

Indicator	Average Score
Ease of understanding the tool's purpose	3.77
User-friendliness of the interface	3.62
Clarity of instructions and guidance	3.23

These results show that users generally understand the intent and workflow of the tool, but find the instructional guidance less clear. Many respondents—particularly those without LCA experience—reported that certain terms or steps required additional explanation.

4.3 Functional Adequacy of Inputs

The ability of the tool to represent real industrial processes was evaluated through three criteria:

Indicator	Average Score
Relevance of the parameters (materials, manufacturing steps)	3.11
Appropriateness of default emission factors	3.15
Flexibility to modify or add own data	2.84

These scores indicate that while the existing structure is usable, companies expect broader datasets, more sector-specific values, and greater flexibility in adapting inputs to their production realities. The relatively lower rating for flexibility highlights the strongest current development need.

4.4 Output Quality and Decision-Support Value

Respondents were asked about the clarity and usefulness of the tool's results. The averages are:

Indicator	Average Score
Clarity of output visualisation	**3.74**
Usefulness for sustainability work	**3.32**

Users clearly appreciate the visual representation of results, and many noted that the graphs and outputs are understandable and helpful. However, they also suggested that more detailed breakdowns—such as per process step, per material, or per life-cycle stage—would enable more precise internal decision-making.

4.5 Decision-Support Capability

The question *"Can this tool support your company's sustainability or design decisions?"* also uses descriptor-based scale values and will be quantified once the dataset is cleaned for numeric mapping. Preliminary review suggests moderate confidence in the tool's strategic usefulness, with the score expected to align closely with the 3.2–3.4 range of related indicators.

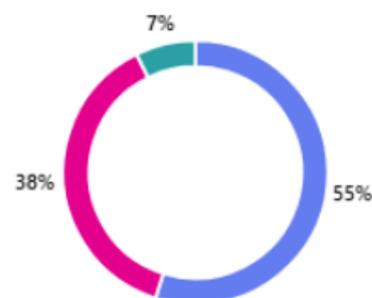|	
Yes	29
Maybe	44
No	9

11%

35%

54%
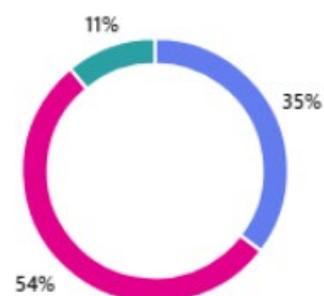
5.6 Technical Reliability

A minority of respondents indicated technical issues. These included loading delays and isolated calculation inconsistencies. Although not widespread, the occurrence of such issues indicates the need for further optimisation before large-scale deployment.

|	
● No	45
● Minor issues	31
● Major issues	6

Across all indicators, the Zero Carbon Tool demonstrates:
- strong conceptual clarity,
- acceptable usability for a first prototype,
- meaningful visual outputs, and
- moderate confidence in the accuracy of parameters and datasets.

The highest-rated aspects are understanding the tool's purpose (3.77) and output visualisation (3.74), while the lowest-rated aspect is flexibility to modify or add data (2.84), highlighting a critical area for improvement.

Together, the quantitative results provide a clear roadmap for refinement and confirm that the tool offers substantial value while still requiring targeted development to fully meet the needs of mechanical SMEs.
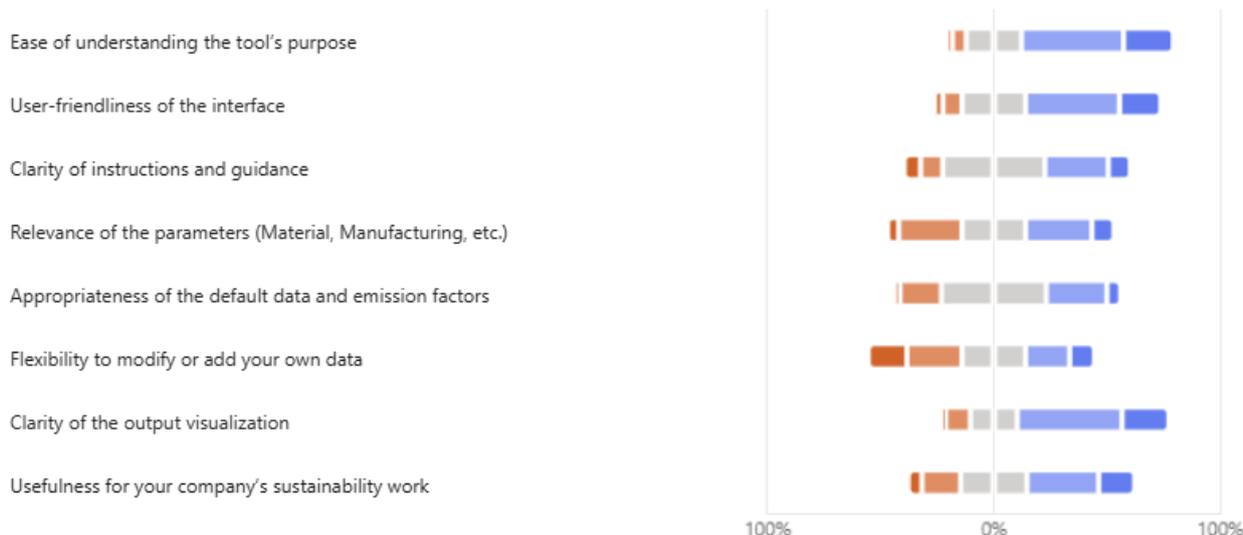
5. Recommendations for Further Development

Based on the collected feedback, the following recommendations can be summarised:

5.1 Short-term recommendations

- Strengthen onboarding through clearer user guidance (simplified field descriptions, definitions, step-by-step explanations).

- Add quick-start materials such as a short tutorial video, workflow examples, and beginner-friendly guidance.
- Improve workflow clarity to reduce uncertainty for users without LCA experience.
- Fix technical issues (loading delays, occasional calculation inconsistencies) and optimise performance.

5.2 Medium-term recommendations

- Expand and refine datasets with more sector-specific materials, industrial processes, and emission factors.
- Add optional country-specific default values to increase accuracy and relevance.
- Improve output clarity with more detailed breakdowns (per process step, material group).
- Enhance report structure and explanations of graphs to support internal communication and decision-making.

5.3 Long-term recommendations

- Further develop visualisation features and create more intuitive graphical result formats.
- Integrate additional datasets tailored to mechanical engineering and related sectors.

Overall, the enriched qualitative feedback provides clear, actionable direction for further development. It confirms strong user interest and illustrates how targeted improvements can enhance the Zero Carbon Tool's usability, accuracy, and strategic value for mechanical companies across Central Europe.

6. Limitations of the Test

While the testing process generated valuable insights from 82 participating companies, several methodological limitations should be acknowledged to ensure transparency and accurate interpretation of the results.

First, the sample composition reflects the networks of REUSE2030 partners, which means that participation was influenced by existing project contacts. As a result, some regions are more strongly represented than others, and the number of fully external SMEs—those with no prior interaction with partners—remains limited. Although the geographical spread is broad, it is not fully balanced across Central Europe.

Second, the evaluation relied on remote, self-administered testing using an online Microsoft Form. Respondents interacted with the tool independently, without moderation or guided walkthroughs. This approach mirrors real-world usage but also limits the ability to observe user behaviour directly or to clarify misunderstandings during the testing process. Feedback therefore reflects individual interpretations of the tool rather than observed usability patterns.

Finally, the time available for testing varied considerably across companies. Several respondents indicated that they did not explore all functionalities of the tool in depth, which may influence the accuracy of certain ratings. Some features may not have been used by all testers.

Despite these limitations, the results provide a solid foundation for identifying improvement needs and guiding the next development steps within WP2 and WP3.