

# FLASH

Flexible Laser-Based Manufacturing

## NEWSLETTER 4

HORIZON-CL4-2023-TWIN-TRANSITION-01-02.



Co-funded by  
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## Environmental impacts of the FLASH laser system

One of the key objectives of the FLASH project is to replace conventional mechanical and chemical manufacturing processes, reducing energy consumption, material waste, and reliance on consumables.

As part of these goals, 3drivers' challenge is to assess the environmental benefits of the FLASH system, when compared to conventional manufacturing practices. To do that, 3DRIVERS is applying Life Cycle Assessment.

Life Cycle Assessment (LCA), as defined by ISO 14040:2008, evaluates the inputs, outputs, and potential environmental impacts of a product throughout its entire life cycle, from raw material extraction to end-of-life. By compiling inventories for the five industrial case studies, including energy, material, and water inputs as well as process outputs, it is possible to model each life-cycle stage and calculate environmental impact indicators (Figure 1).

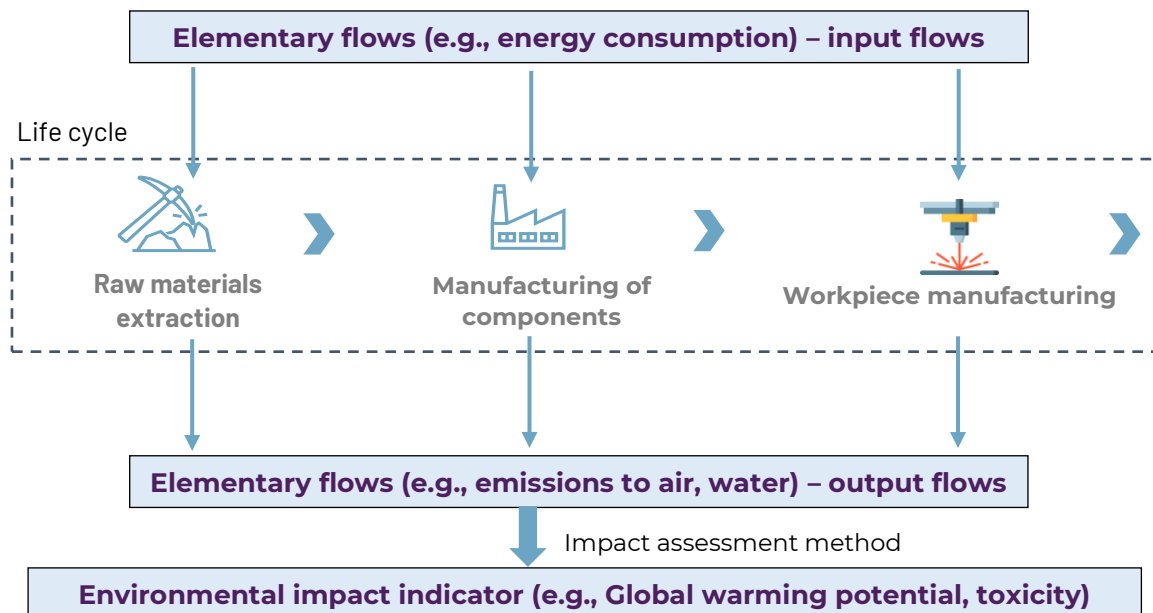


Figure 1

Preliminary results obtained by 3drivers indicate that, for the grinding wheel manufactured using the FLASH laser process, global warming potential could be reduced by about 40% and toxicity decreased by roughly 15%, when compared with the conventional scenario.

Future work will focus on refining the LCA methodology and inventories, incorporating real-world industrial data as laser techniques continue to be tested and optimised.