



# R3-MYDAS

## Newsletter 3

**R3-Mydas addresses Safe and Sustainability by Design (SSbD) for new circular value chains**



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

## R3-Mydas new sustainable and circular value chains

R3-Mydas facilitates and speeds up the manufacturing industry's shift toward more sustainable and circular value chains. To ensure lasting impact, a Safe and Sustainability by Design (SSbD) assessment will be conducted on the new circular value chains in the project's three demo cases: oil and gas, electric vehicles, and the wind energy sector. Figure 1 shows the new circular value chain for the wind energy sector. Instead of considering a linear value chain (in black), where when a component of a wind turbine fails, the only option is disposal, R3-Mydas will allow the component to be repaired at the end of the turbine's life, but also during maintenance operations during the use phase. This remanufacturing process will reintroduce the component into the value chain during the assembly or manufacturing phase of the turbine. In this way, it is possible to achieve a more circular scheme (in green).

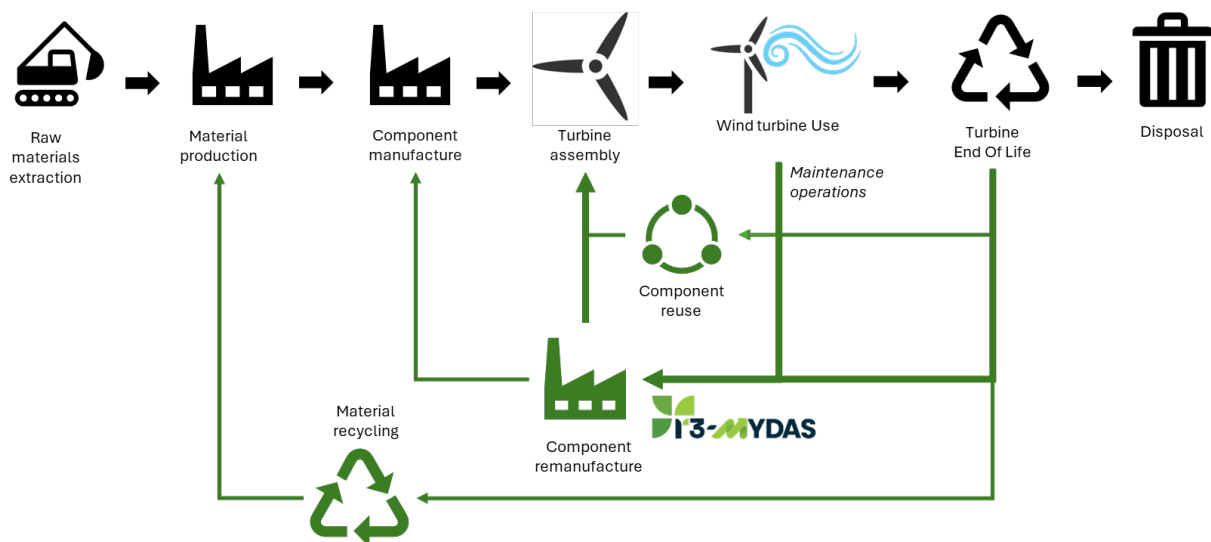


Figure 1. R3-Mydas new circular value chains for the wind energy sector

During R3-Mydas project, a Sustainability by Design (SustbD) assessment is carried out for Demo-case 1 relating to the gas-oil industry and Demo-case 3 relating to the wind energy industry. This assessment includes:

- Environmental dimension: It will consist of a Life Cycle Assessment (LCA) of the proposed remanufacturing process for both demo cases, including the Carbon Footprint as one of the environmental impact outcomes. The ISO 14040<sup>1</sup> series of guidelines for LCA will be followed, Figure 2.

<sup>1</sup> ISO 14040:2006. Environmental management — Life cycle assessment — Principles and framework

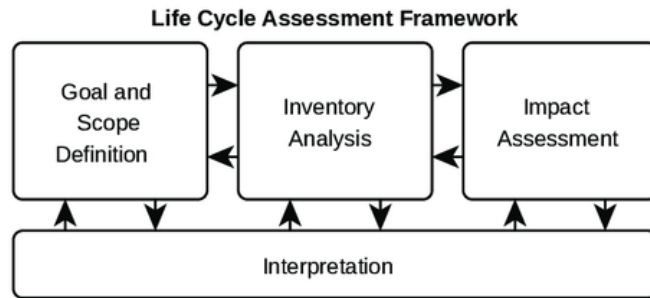


Figure 2. ISO14040 scheme for LCA.

- Socio-economic dimensions: This consists of a Life Cycle Cost (LCC) assessment to ensure that new remanufacturing processes are economically viable, but also a Social Life Cycle Assessment (s-LCA) to identify potential social issues of the new circular value chains.

In the case of Demo Case 2, EV batteries, in addition to the sustainability assessment, the safety dimension is also considered to ensure that hazardous substances and situations are identified and minimised/avoided. The three-step methodology considered in the JRC-EC SSbD framework is followed. A hazard assessment of the materials used and a risk assessment of all stages in the life cycle of the batteries are being performed.

## What is SSbD framework?

The SSbD framework aims to support decision-making during the innovation process towards safer and more sustainable chemicals and materials over their life cycles. As such, the SSbD framework provides a set of assessments and indications aiming at this goal. The SSbD Framework has been developed by JRC and EC<sup>2</sup>, to promote the design, development, production and use of completely new safer and more sustainable chemicals and materials considering their entire life cycle, steering the substitution of hazardous and less sustainable chemicals and materials. The overall goal is to help in preventing pollution whilst also reducing society's environmental footprint. SSbD is organized into 5 steps: the first 3 ones are devoted to safety; step 4 considers environmental sustainability and step 5 (optional) economic and social aspects<sup>3</sup>.

<sup>2</sup> Abbate, E., Garmendia Aguirre, I., Bracalente, G., Mancini, L., Tosches, D., Rasmussen, K., Bennett, M.J., Rauscher, H. and Sala, S., Safe and Sustainable by Design chemicals and materials - Methodological Guidance, Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/28450, JRC138035.

<sup>3</sup> Caldeira, C., Garmendia Aguirre, I., Tosches, D., Mancini, L., Abbate, E., Farcas, R., Lipsa, D., Rasmussen, K., Rauscher, H., Riego Sintés, J. and Sala, S., Safe and Sustainable by Design chemicals and materials - Application of the SSbD framework to case studies, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/329423, JRC131878.

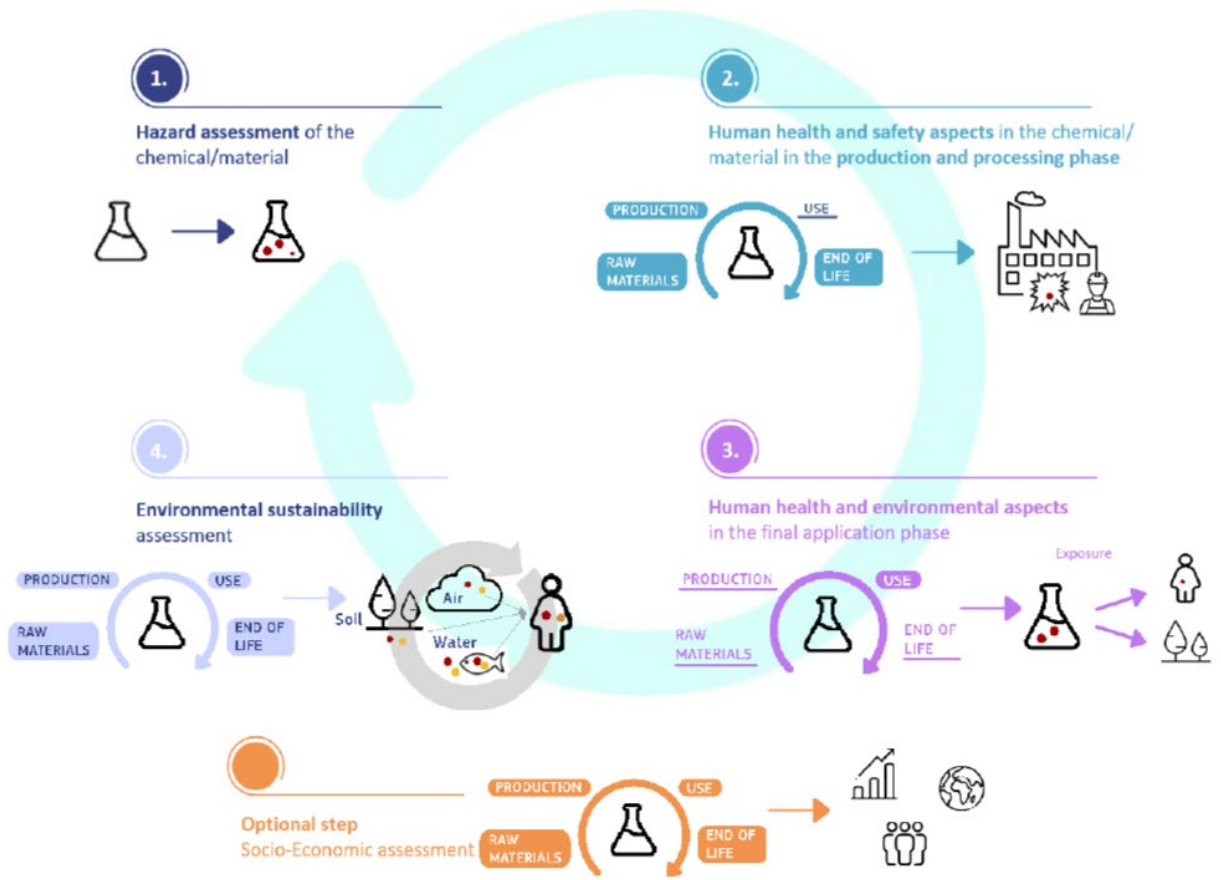


Figure 3. SSbD framework by JRC-EC.