

Sustainability by design of new circular value chains based in new remanufacturing processes.

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R3-MYDAS is a Horizon Europe project with the main aim to facilitate and speed up the manufacturing industry's shift toward more sustainable and circular value chains. To ensure lasting impact, a Sustainability by Design (SbD) assessment is conducted on the new circular value chains in the project's demo-cases: oil and gas, electric vehicles, and the wind energy sector.

Rather than relying on traditional linear value chains, where a failed component typically leads to disposal, R3-MYDAS enables components to be repaired not only at the end-of-life cycle, but also during maintenance operations throughout its use phase. This remanufacturing process will reintroduce the component into the value chain during the assembly or manufacturing phase of the product. This approach facilitates the transition to a more circular value chain.

Some of the new technologies proposed in the project for remanufacturing include automated component disassembly processes, metal additive manufacturing or digital tools for advanced process monitoring. A first iteration of the SbD assessment has been performed and includes:

- **Environmental dimension:** It will consist of a Life Cycle Assessment (LCA) of the proposed remanufacturing process for the three demo cases, including the Carbon Footprint as one of the environmental impact outcomes. The ISO 14040 series of guidelines for LCA are followed.
- **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.

The initial results indicate that remanufacturing processes proposed for the three demo-cases are viable from a sustainability point of view; however, enhancing their efficiency is essential to secure market acceptance.