

What is the role of BOKU in ENGINE?

BOKU's expertise in high and very high cycle fatigue of metallic materials, with special focus on infinite lifetimes and defect tolerant design, will contribute to understand the damage mechanisms of technical components under cyclic loading. More specific, relevant parameters determining the fatigue strength will be identified that shall serve as input parameters for physics-based models and AI. The applied high-precision ultrasonic-fatigue testing technique developed at BOKU will be employed to conduct comprehensive fatigue experiments up to extremely long lifetimes within reasonable time.

Visit BOKU's website to learn more about the team and their work: www.boku.ac.at/en/research



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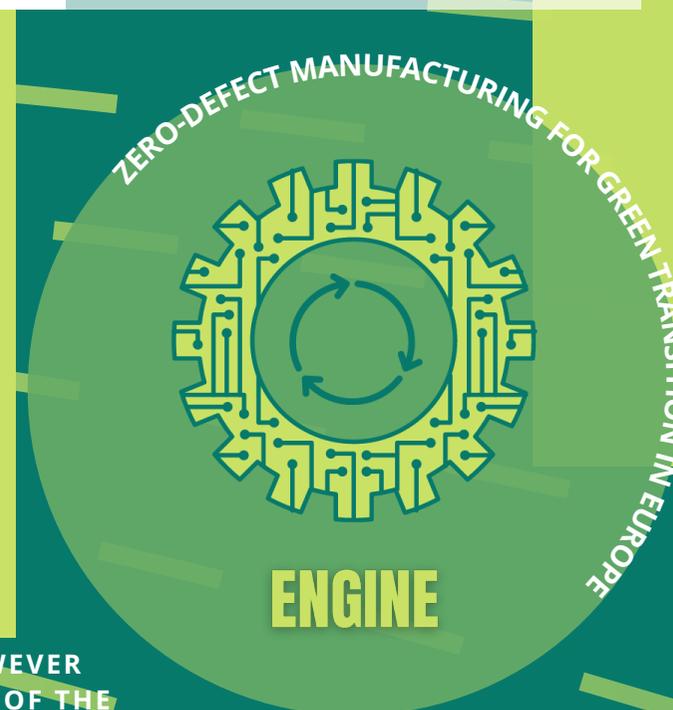


How will the ENGINE project make Europe more sustainable?

Nowadays, we are faced with the problem of operating, for example, wind or steam turbines that have already reached their end-of-life based on their original design. In this regard, material fatigue – which is the most common reason for failure of technical components – is the greatest looming risk. One of ENGINE's goals is to enable manufacturing steel products that can be used for extremely long lifetimes without failure. The most sustainable components are those who will never fail!

What will the ENGINE project contribute to the current scientific state-of-the-art?

First-time-right and zero-defect product design of load bearing components requires a basic understanding of the relevant failure mechanisms. The complexity of physics-based models, however, complicates the forecast of bearable stresses, and laboratory experiments often yield highly divergent results. Machine Learning is a promising new tool to derive accurate predictions based on comprehensive data. From this perspective, the ENGINE consortium combines unique expertise in the field of materials testing, physics-based modelling, simulation and AI – promoting the development of high-accuracy prediction methods.



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