Master Thesis - "Data base for LCA and sustainability prediction of manufacturing processes"
(30 credits/20 weeks – 2 students)

Project Background

GKN has a clear vision and commitment about sustainability as a basis for long-term development and growth. The commitments and targets are related to both the design of new products used in future aircrafts, as well as the GKN business footprint and emissions. The manufacturing of jet engine components includes various materials and processes that uses different kinds of raw materials and different consumables for the manufacturing processes. GKN is already using Life Cycle Assessments and are actively working to improve in different areas of the business. In the manufacturing operations the energy usage is of special interest, as the use of different equipment, the processes and consumables requires a substantial amount of energy. There is also big differences in energy efficiency for the different types of machines and the types of manufacturing processes. To take the next steps in measuring and analyzing the different sources and contributors to environmental impact, more detailed data need to be collected and made available to compare different solutions and make predictions.

The task for the thesis work is to contribute to the development of data driven analysis and decision support for making more sustainable manufacturing and repair solutions. The plan at GKN is to collect data from our machines in different states of operation and different types of processing to see how much tools, coolant, pneumatic air, etc. that is consumed. With the additional information from LCI data bases (Life Cycle Inventory) the goal is to build and implement an information model and data base solution. This will serve as a knowledge base for analytical tools and simulations. It is also part of the task to consider the interfaces in the form of APIs / HMIs / Dash Boards used to access, use and visualize the data.

Further, the assignment offers a unique opportunity to work in a creative environment, supervised by the Global Technology Centre at GKN Aerospace in Trollhättan. The work will be done as part of a European research project - DaCapo.

Assignment Description

- Familiarize with the topic and make a detailed plan of the project
- Current state analysis of literature and standards for energy measurements and related data bases for LCA/LCI
- Identify gaps and stake holder interests in the solution to be developed
- Requirements specification
- Selection of methods and tools to use, and develop the solution
- Test and analyze different scenarios
- Identify gaps and opportunities for future implementation and technical development
- Document and present results

Qualifications

Student in the final year of their M.Sc. studies in the field of Production Systems, Robotics, Automation, Mechatronics, Computer Science or similar with a strong interest in sustainability and data science.

Contact

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Last date for application: 2023-11-30. Interviews will be held continuously and the position could be filled prior to the last application date.