At the Chair of Logistics and Supply Chain Management of TUM School of Management, we are looking for an interested and qualified student to conduct his/her

**Master thesis**

on the topic

**Production planning for manufacturing/remanufacturing system under carbon emission constraint**

Remanufacturing is recognized as an effective measure to achieve the goal of sustainable development. As a crucial component of reverse logistics, remanufacturing can reduce the production of greenhouse gases by limiting the use of raw materials and subsequent shaping and machining. More companies now view reverse logistics and remanufacturing not only as green initiatives but also as strategic activities. Compared to the manufacturing process, the remanufacturing process is considered to have lower carbon emission intensity (fewer emissions per unit of product) but entails higher production costs. This introduces new challenges for companies to adjust their production planning to comply with carbon emission regulations while maintaining or improving their competitiveness. The goal of this thesis is to develop an optimization model that aids in determining the optimal production policies within a manufacturing/remanufacturing system under carbon emission constraints.

**Key project tasks:**

- Literature review on relevant fields of study
- Develop an optimization model for the problem
- Implementation and testing of the model
- Analysis of results and implications

**Requirements:**

The thesis is suitable for Master in Management and Technology students with a major in operations and supply chain management. The ability to work independently as well as analytical skills are required. Knowledge of mathematical programming and optimization is required. Knowledge of one general-purpose programming language (e.g., Python, C++) is preferred.

**Earliest begin:** as soon as possible

**Supervisor:** Chunting Liu

**Application:** Email with curriculum vitae and transcript of records to logtheses.log@mgt.tum.de