

## Dissertation Projects

**Group A: Material sciences – the classification and modification of renewable resources and their by-products for use in industrial networks**

- A.2: Characterization of by-products from forestry: Shahriil Bin Bahari, M.Sc.; Yağmur Bütün, M.Sc.; Willy Hesselbach, M.Sc.; Tim Koddenberg, M.Sc.; Laura Teuber, M.Eng.
- A.5: Extraction of chemical raw materials: Dipl.-Holzwirt Felix Haiduk
- A.7: Generation of energy: Tim Schröder, M.Sc.

**Group B: Planning of production and supply chains for renewable resources**

- B.1: Modelling of selected logistic networks: Mohammad Sadegh Taskhiri, M.Sc.; Dr. Ingo Karschin
- B.2: Multi criteria decision support: Matthias Garbs, M.Sc.; Fabian Renuus, M.Sc.
- B.3: Robust multicriteria optimization: Dr. Jonas Ide; Corinna Krüger, M.Sc.; Lisa Thom, M.Sc.
- B.4: Online-optimization: Dr. Marco Bender; Dr. Morten Tiedemann
- B.5: Tracking- & tracing-systems: Shanna Appelhanz, M.Sc.
- B.7: Life cycle assessment: Francesco Castellani, M.Sc.; Nils Thonemann, M.A.

**Group C: Governance, coordination and distribution**

- C.2: Information management and it-governance: Markus Mandrella, M.Sc.; Dr. Simon Trang
- C.3: B2B-Business relations: Annette Becker, M.A.; Dr. Sebastian Ludorf
- C.4: Acceptance of products: Dr. Victoria-Sophie Osburg
- C.5: Relationship Management: Patrick Urbanke, M.Sc.; Sebastian Zander, M.Sc.; Muhammad Rachel, MBA

## Principal Investigators

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**Prof. Dr. Matthias Schumann (vice-speaker)**

Chair of Application Systems and E-Business

**Jun.-Prof. Dr. Anja Fischer**

Research Group Optimization

**Prof. Dr. Lutz Kolbe**

Chair of Information Management

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**Prof. Dr. Anita Schöbel**

Research Group Optimization

**Prof. Dr. Waldemar Toporowski**

Chair of Marketing and Retailing

**Jun.-Prof. Dr. Kai Zhang**

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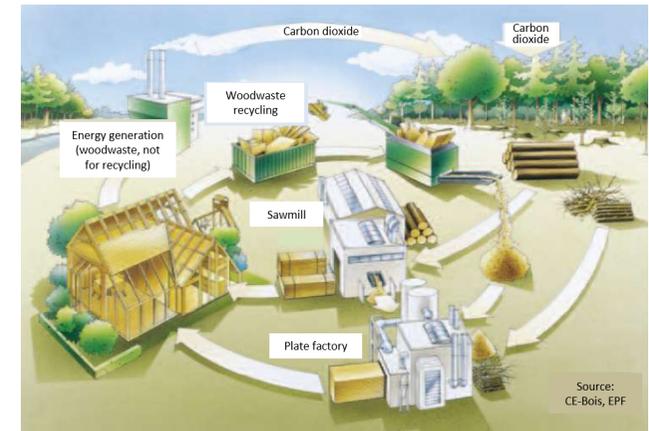
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## DFG Research Training Group 1703

“Resource Efficiency in Interorganizational Networks”

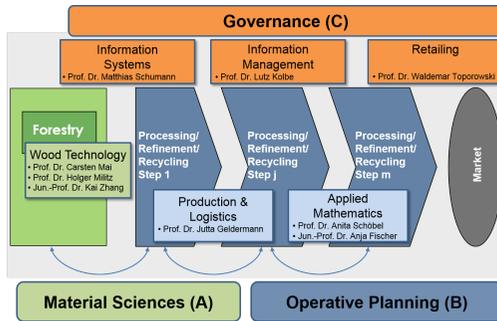
Planning Methods to Utilize Renewable Resources



**DFG** Deutsche  
Forschungsgemeinschaft

## About the RTG 1703

The overall aim of the research training group (RTG), “Resource Efficiency in Interorganizational Networks - Methods for Enterprise and Interorganizational Level Planning to Utilize Renewable Resources”, is the development and application of methods to improve resource efficiency in interorganizational networks. The RTG focuses on the efficient utilization of renewable resources in combined production processes with multiple outputs. The ultimate goal is the cascading utilization of renewable resources through multiple sequential processing of the same input, occurring prior to energetic utilization. The aspiration toward efficiency aims is seen as a contribution to sustainability management, in that it changes the course of action across all areas of the network - in-plant and interorganizational; on the operative, tactical and strategic levels; and with respect to systems and processes, material suppliers, manufacturers, retailers and consumers. Lignocellulosic materials are selected as the common starting point. From a business administration perspective, lignocellulosics are suitable for manufacturing as well as for the processing industry and require appropriate planning methods.

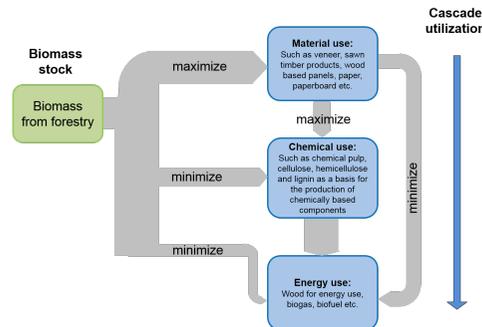


To identify economic incentives, models and methods of operations research have been used to provide decision support. Issues requiring additional research center on uncertainties in the quality and quantity of renewable resources, as well as in the handling of multiple, sometimes conflicting, goal functions, and the requirements of data processing. In addition to the requirements of single enterprises, the consequences on a corporate level also must be investigated — e.g., the configuring of information management and data interchange, the business relations, and the organizational structures. Consideration of the selling markets completes the analysis and allows conclusions concerning the requirements of product design. The common access to resource efficiency as a research topic by the participating faculties in the fields of forestry, mathematics and economic sciences facilitates a broad understanding of the current issues. Synergistic effects and knowledge transfer are conveyed purposefully through the qualification program. Initiative and personal responsibility are emphasized.

## Research Focus

The production of renewable resources has seen a significant increase in recent years. Although the acreage devoted to such ends has remained virtually identical, subsidies have pushed production toward energy crops that can be used to generate power. One essential question remains, however: Would it not be better to strive for an increase in the cascade utilization of renewable resources? Cascade utilization works to extract the most from a raw material – including the chemical (multiple) use of the resource – before it is used to generate power at the end of its life cycle. Fluctuations in the quantity and quality of harvested plants, as well as changes and the variability that arises from multiple uses, are just a few of the challenges to be faced in creating a value chain; all of these challenges require careful planning if they are to be effectively addressed. The needs of the involved companies also must be considered, which requires multi-criteria analysis of the varying preferences of those involved in the network.

Three levels of the value chain and two steering cross-divisional functions are taken into consideration: On the first level, the producers of products containing renewable resources must decide which product combinations they can offer based on both price and intended use, which in turn enables the definition of the quality and availability of the products. On the second level, customers and refiners focus on planning efficient production. The products’ acceptance and sales potential as well as hybrid services offered by wholesalers and end users constitute the third level. A network perspective should be used to find an efficient solution for recurrent planning and distribution problems for all participants as part of efforts to find the best possible solution for the network as a whole. Adopting an information management perspective raises the question of how best to provide individual members, as well as the network as a whole, with crucial information using established and enhanced methods of business information systems.



## Course Description

The study program consists of a broad selection of lectures, seminars, and colloquia. It comprises 28 credit points (CP), corresponding to the European Credit Transfer and Accumulation System (ECTS). All doctoral researchers must register for courses from each of the six modules, as follows:

**Interdisciplinary introduction to resource efficiency:** This module consists of a two-day seminar and a lecture series.

**Contemplation and optimization of the research:** Each year, a doctoral workshop will be conducted in which the doctoral researchers will present and discuss their current state of progress, with the goal of obtaining stimulation for further research. In addition, a weekly research colloquium for doctoral researchers will take place, during which visiting scholars as well as doctoral researchers will present and discuss relevant topics from their research.

**Networking research internationally:** The doctoral researchers will participate in national and international conferences and summer study programs. They will organize a biannual international conference with the theme, “Resource efficiency in interorganizational networks”, in Göttingen. Established researchers will present and discuss topics related to their research. This is a unique opportunity to bring together experts from material sciences, operations research and other disciplines of business sciences.

**In-depth specialization:** Each doctoral researcher, with the aid of supervisors, will select two or three courses that will address the gaps in his/her educational background and the topic’s basic methodological requirement - e.g., “Production and Environment”, “Corporate Planning”, “Logistic and Supply Chain Management”, “Information Management”, “Applied Empirical Research”, “Wood and Paper Industry”, “Wood Biology and Wood Technology”, etc.

**Acquiring interdisciplinary expert knowledge:** Each doctoral researcher will participate in three of the four newly designed courses: “Cultivation and Use of Biomass and Dendromass”, “Production Planning and Supply Chain Management”, “Relation Management and Incentive Systems” and “Network Analysis, Optimization and Multi-Criteria Decision Support”.

**Improving competences in methodologies:** The doctoral researchers will expand their core competences and improve their capabilities, which will aid their career development. The Göttingen Graduate School of Social Sciences (GGG), the Central Installation for Languages and Key Skills (ZESS), and the Department of Didactics in Higher Education at the University of Göttingen offer a number of courses.

Visiting guest scientists and lecturers are important in fostering international collaboration and promoting the open exchange of ideas. Guest scientists will be invited for short-term stays, during which they will deliver talks in the research colloquium. Longer stays with the aim of research collaborations are possible, as well. The RTG supports internships for doctoral researchers, in Germany or abroad, during which students may have the opportunity to conduct case studies and to learn more about the practical aspects of their research.