

ALL - IUFRO Conference, 21 – 23 September 2022, Vienna, Austria

# **BOOK OF ABSTRACTS**

## **ALL-IUFRO CONFERENCE 2022**

**Forests in a Volatile World –  
Global Collaboration to Sustain Forests and Their Societal Benefits**



**INTERNATIONAL UNION OF FOREST RESEARCH ORGANIZATIONS**

**HEADQUARTERS, VIENNA, AUSTRIA**

**University of Applied Arts ("Die Angewandte")  
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### **Forest Bioeconomy in China: Policies and Markets**

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China by far is the largest producing and consuming country on concrete and steel, coal, paper and paper board, fossil-based products like polyester fiber and plastic (PVC). Since 2000, by recognizing the importance of sustainable development and pollution control, China shifted to green economy development model with increased demand on bio-based technologies, materials and products. In 2007 first National Bioeconomy Strategy was published by Ministry of Science and Technology since then China kept exploring the bioeconomy development potentials in various areas include energy, medical etc. In May 2022, National Development and Reform Committee published the 14th Five Year Bioeconomy Development Plan reconfirmed the importance of bioeconomy in national development. Forest, as one of important renewable nature resource, can play crucial role to replace fossil fuel based raw materials, and provide more climate friendly constructions, also was part of renewable energy solution. We first reviewed the policy evolution related to forest bioeconomy in China, and the forest bioeconomy market development in China both in traditional forest sector like wood manufacture, wood construction and new novel market like wood fiber-based textile and plastic, then use SWOT model analyze the strengths, weaknesses, opportunities, and challenges to unlock the roles of forest sector in bioeconomy development in China. Based on SWOT analysis result, in the end, we provided the recommendations both from policy and market angles about how to better leverage forest bioeconomy development in China in next decade.

### **Collective action in Germany's forestry sector illustrating the potential impact of the transformation towards a forest-based circular economy**

**Nele Schmitz**, *Thünen Institute of Wood Research, (Hamburg), Germany*; **Jan Lüdtkke**, *Thünen Institute of Wood Research, (Hamburg), Germany*

The Charter for Wood 2.0 is a unique dialogue setting, involving the various stakeholders of the German forestry sector. Representatives are included from government, industry, diverse science disciplines, and civil society associations. The goal of this broad scale collaboration is to valorise forests and their multiple services (economic, environmental, social) in times of complex environmental and societal challenges. The initiative is working to create resilient forest eco- and economic systems, using forest resources sustainably, fostering forests' contribution to climate change mitigation. This boundary spanning initiative enables insights in the forestry sector across disciplines (forest management, wood use, social aspects, governance). To monitor progress, indicators were developed that broadly cover the three major aims of the charter: climate change mitigation, resource efficiency and value creation. So far, two indicator evaluations have taken place, one in 2019 and one in 2021. To support the

charter, a literature review on forest-based circular economy was performed with the scope of, focusing on review papers and excluding papers that were sector, product or country specific. The aim was to create a common understanding among all charter participants of the term's bioeconomy and circular economy in a forestry context. Comparing indicator values of the years 2017 and 2019 (common data years of the two evaluation reports) showed that the forestry sector in Germany suffered from climate change effects. Resource efficient value creation was challenged by high volumes of calamity wood. Using these indicators of the forestry sector in Germany, we illustrate how the transition towards a sustainable forest-based circular economy can create economic, social and environmental value by sustainable wood use. Fostering the transformation towards a sustainable forest-based circular economy will require system wide thinking crossing boundaries. This national initiative has the potential to find global resonance and to be replicated worldwide.

### **Towards monitoring and evaluation of a sustainable and circular forest-based bioeconomy: A material flow and life cycle assessment approach**

**Paola Pozo Inofuentes**, *Thünen Institute of Forestry, (Hamburg), Germany*; **Jörg Schweinle**, *Thünen Institute of Forestry, (Hamburg), Germany*

Shifting the existing fossil-based economy towards a more sustainable bioeconomy is considered, together with the concept of circular bioeconomy, an important part of the transformation of the economy. While bioeconomy is often associated with a range of benefits, the transition implies trade-offs as well as risks and opportunities. Whereas trade-offs and synergies between different sustainability objectives are unavoidable, it is important to identify them in order to be reduced or maximized. Therefore, the goal of evaluation should be to measure the development of bioeconomy per se and its sustainability. This includes the use of biomass in a sustainable way and the valorization of biomass resources efficiently. In this study we present a combined holistic Material Flow and Life Cycle Assessment approach to assess and monitor the sustainability and circularity of the forest-based bioeconomy. This approach provides information about the total amount of bio-based materials produced, used, and recycled as well as associated sustainability effects. As prove of applicability we use the example of Uruguay, one of the few countries in the world that has its forestry development exclusively on the production of forestry plantations. Particularly Eucalyptus pulp is the second most exported product of the country and is expected to consolidate Uruguay as the second world largest producer of short-fiber pulp in the near future. We provide the first systematic assessment of the forest biomass flows in Uruguay and assess sustainability and circularity using a comprehensive set of indicators (e.g. cascading use, GHG emissions and substitution effects, biodiversity conservation, employment, value added, among others) at the country and value chain level. Our results highlight the need to include additional sustainability impacts beyond economy to capture the overall picture of the system. Based on our results recommendations are drawn on how to enhance forest statistics, having monitoring and evaluation of the bioeconomy as a goal.