

Can Austria „feed“ itself in a post-fossil world? Supplying Austria autonomously with food, energy, wood materials and substitutes for synthetic materials on a regenerative basis

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Topic

Resources

Title of the Paper

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Form of Presentation

Presentation

Short Description (maximum 2500 characters)

It is widely assumed that bioenergy will be of growing importance in the future. While the conflict between bioenergy and food is extensively discussed and recognized, the aspect that this conflict is further exacerbated by the fact, that in a post-fossil world biogenic raw materials will also be used for the production of synthetic materials, is not yet sufficiently addressed.

It is a shortcoming of many existing studies on biomass potentials, that they are limited to the use of biomass for food and energy, without taking a potential material use of biomass into account. We address this shortcoming, presenting integrated scenarios of potential biomass requirements which take into account all major current and potential future biomass usages (the production of food, energy, wood materials and synthetic materials for the case of Austria in 2050). For all scenarios, it is assumed that Austria is no net importer of biomass.

We calculated the total biomass demand for all combinations resulting out of different assumptions on diets (“trend”, “health”, “vegan”), the biogenic production of synthetic materials (differing in consumption levels, recycling ratios, main source of raw materials), the production of bioenergy (energy demand, energy efficiency, technology choice) and wood materials (consumption levels and recycling ratios). Combined with different assumptions on average crop and pasture yields, we derived according potential agricultural area demands. We finally identified feasible scenarios by matching these area demands with areas assumed to be available in 2050. The wood demand is matched accordingly with wood production potentials in 2050.

Our results show, that the use of biomass for the biogenic production of synthetic materials adds a significant amount of biomass to the total biomass demand. In addition to the total biomass demand, we explore feasible and non-feasible combinations of assumptions (e.g. yields, consumption levels, recycling ratios, etc.) with respect to available land and forest products in the form of a “biophysical option space”. This allows us to explore the factors that are crucial to fulfill the goal of an autonomous supply with biogenic resources in a post-fossil world.