FUTURE PERSPECTIVES OF BIOENERGY TRADE IN MODEL BASED SCENARIOS

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Overview

Global bioenergy use is expected to undergo major changes in the coming years and decades. Factors such as biomass availability and prices, conversion technologies, sustainability requirements and energy demand. will develop differently in various regions around the world. These factors will have strong impacts on bioenergy trade on local, regional and global levels. The evolution of future bioenergy trade is highly dependent on various influencing factors, including economic growth, population growth, the associated demand for biomass, biomass supply potentials and the future cost and performance of biomass supply and end-use technologies as pointed out bythe IPCC's Special Report on Renewable Energy Sources. The objective of this paper is (1) to assess to which extent bioenergy trade is explicitely investitaged by different energy sector models covering bioenergy, (2) to derive the implications of different energy scenarios on bioenergy trade and (3) discuss perspectives of international bioenergy trade in various scenarios.

Methods

A review of 28 trade models where conducted and methods, assumptions and scenarios regarding bioenergy trade were specified in a database. A detailed literature review on the key global energy models, reports and publications will be carried out. Out of 28 considered trade models we selected specific models to be analysed and investigated in particular scenarios from the IEA WEO, IMAGE TIMER, MESSAGE, GLOBIOM, Global energy assessment. Further models may be added in the full paper.

Based on this review, we investigated, to which extent different global energy models take into account bioenergy trade explicitely and which implicit or explicit assumptions regarding bioenergy trade are made.

Based on this scenario database we compare regional demand with potential supply and discuss corresponding perspectives of net bioenergy trade from the specified region, as well as the implications and perspectives on international bioenergy trade.

Results and conclusions

A compredensive overview of biomass trade in the specified models will be given in the full paper. As an example in the baseline szenarios (A2r, B1, B2) of the IIASA GGI Scenariobase the biomass demand for primary energy production rises by 392% - 625% between 2000 and 2100 on a world level compared to 234% - 2526% on a regional level (11 regions specified), which will affect interregional trade.

We will further identify and discuss key drivers in the selected models with special emphasis on bioenergy trade. One of the key conclusions will refer to the relevance of bioenergy trade for different regions (supply vs. demand regions) and for different biomass fractions.

The work of this paper has been carried out in the frame of IEA Bioenergy Task 40.

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