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Opportunities and barriers for international bioenergy trade

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ABSTRACT

Recently, the international trade of various bioenergy commodities has grown rapidly, yet this growth is also hampered by some barriers. The aim of this paper is to obtain an overview of what market actors currently perceive as major opportunities and barriers for the development of international bioenergy trade. The work focuses on three bioenergy commodities: bioethanol, biodiesel and wood pellets. Data were collected through an internet-based questionnaire. The majority of the 141 respondents had an industrial background. Geographically, two-thirds were from (mainly Western) Europe, with other minor contributions from all other continents. Results show that import tariffs and the implementation of sustainability certification systems are perceived as (potentially) major barriers for the trade of bioethanol and biodiesel, while logistics are seen mainly as an obstacle for wood pellets. Development of technical standards was deemed more as an opportunity than a barrier for all commodities. Most important drivers were high fossil fuel prices and climate change mitigation policies. Concluding, to overcome some of the barriers, specific actions will be required by market parties and policy makers. Import tariffs for biofuels could be reduced or abolished, linked to multinational trade agreements and harmonization (including provisions on technical standards and sustainability requirements).

1. Introduction

In the past years, the international trade of various bioenergy commodities has grown rapidly, yet this growth is also hampered by a number of barriers. For example, the export of palm oil from South East Asian countries for the production of renewable electricity or biodiesel in Western Europe has been heavily criticized by NGOs (see e.g. Zakaria et al., 2009). Also the possible impacts of other internationally traded liquid biofuels (such as soy-based biodiesel and ethanol from sugarcane) have received increasing public (and largely negative) attention. On the other hand, international bioenergy trade can also offer opportunities for economic growth and socio-economic development for exporting countries, and may enable countries with few domestic biomass resources to meet their renewable energy targets, gain more fuel diversity and improve security of supply. The role of international trade in (especially liquid) biofuels has been discussed by several authors (see e.g. Dufey, 2007; EurActiv, 2009; Heinimö and Junginger, 2009; Junginger et al., 2006; Londo et al., 2010; Murphy, 2008; Oosterveer and Mol, 2010; Steenblik, 2007; De la Torre Ugarte, 2008; Zarrilli, 2008). However, to our knowledge no quantitative inventory of barriers and opportunities for bioenergy trade has been established so far based on stakeholder input. Also, these studies focus (almost) solely on liquid biofuels for transportation, neglecting a similarly rapidly growing international solid biomass fuel market. IEA Bioenergy Task 40[1] made an overview of barriers and opportunities for bioenergy trade in 2006 (Junginger et al., 2006), but given the rapid developments in this field, Task 40 decided to update this overview, of which this paper is the result.

The aim of this paper is to obtain an up-to-date overview of what market actors currently perceive as major opportunities and barriers for the current and future development of international bioenergy trade. The work focuses on three internationally-traded bioenergy commodities: bioethanol, biodiesel and wood pellets. The choice for these commodities is motivated by (a) a strong growth of trade in the past decade and (b) the expected further growth in coming years, due to current high and volatile fossil fuel prices and due to commitments to reduce GHG emissions and

[1] IEA Bioenergy Task 40 was established under the International Energy Agency (IEA) Bioenergy Implementing Agreement in December 2003, and focuses on international bioenergy trade and its wider implications. It currently has 14 member countries. See for more information www.ieabioenergy.com and www.bioenergytrade.org.

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ambitious targets for biofuels and renewable electricity in e.g. the EU (EC, 2009).

For this paper, we do define 'barriers for international bioenergy trade' vary widely, mainly determined by what various stakeholders may perceive as a barrier to bioenergy trade. Principally, we define a bioenergy trade barrier as *any issue that either directly or indirectly hinders the growth of international trade of biomass commodities for energy end-use*. It is difficult to draw a clear line what (indirect) *trade* barriers are, and what *general* barriers hamper the use of biomass (irrespective of being traded or used domestically). For example, the current food-vs.-fuel debate (e.g. should vegetable oils be used as feedstock for biodiesel) affects biomass use in general, and is not discussed here as specific barrier to trade. Yet, this debate and resulting policy measures is likely to have direct impacts on the amount of ethanol, vegetable oils and biodiesel traded globally in the coming years. Also the global economic crisis is affecting bioenergy trade, but as it also affects biomass production, consumption, oil prices, etc., we do not list it as a 'trade barrier'. In the expert literature, 'trade barriers' are typically classified as tariff, para- and non-tariff barriers (UNCTAD, 2008). However, these definitions have neither been used for this paper nor for the questionnaire, as many of the market actors we target in the questionnaire may not be familiar with it, and such a detailed classification may deter participants from fully completing the questionnaire.

Describing barriers and opportunities is politically sensitive. An issue that market actors in one world region may see as a barrier to bioenergy, may be regarded as an opportunity by market actors in another region. Our aim is to make an overview of these different views, identify common viewpoints, and, where different views exist, thrive to describe these equally.

This paper is organized as follows: Section 2 describes the methodology and data collection. In Section 3, a brief overview of the production and trade of the biomass commodities investigated is presented. Next, an overview of the bioenergy trade barriers and opportunities is given in Section 4, subdivided for each topic into a general review of the literature and an overview of the survey results. These are summarized and discussed in Section 5.

2. Methodology and data collection

To obtain input from market actors, an online questionnaire was designed. Based on a literature survey, a number of categories of trade barriers were defined and used in the questionnaire. These categories are presented and described further in Sections 4.2–4.7, along with concrete examples. They focus on three selected bioenergy commodities: bioethanol, biodiesel and wood pellets. For each category, a number of questions (with a number of predefined possible answers) were asked. The questionnaire also contained two free sections: one where stakeholders could indicate what additional barriers they had encountered in bioenergy trade, and a second section where they could highlight the opportunities they saw for the future. These are discussed in Sections 4.8 and 4.9, respectively. The original questionnaire and all answers to open questions can be found in a background report (Junginger et al., 2010).

The questionnaire was designed and tested internally with the members of IEA Bioenergy Task 40 until the end of 2008. After this, the questionnaire was open and openly advertised on the Task 40 homepage between February 12th and July 24th 2009. It was mainly aimed at industry actors (e.g. producers, traders, consumers and industry associations) and their view on opportunities and barriers for bioenergy trade. To a lesser extent, the questionnaire was also sent to policy makers, NGOs and other experts from academia and other institutions. To obtain a comprehensive market overview, the questionnaire was sent to all contacts of the Task 40 national team members. Many of the major bioethanol producers and consumers (Brazil, US, and many EU countries) are all members of Task 40. In addition, the invitation was sent to market actors outside the Task 40 member countries, which have considerable trade volumes, e.g. Malaysia, Indonesia, Argentina, etc. for biodiesel and several Eastern European countries for wood pellet production. Furthermore, several bioenergy/industry associations in these regions were contacted and asked to distribute the questionnaire to their members. In addition, to reach a large amount of stakeholders, cooperation was sought with UNCTAD and the United Nations Industrial Development Organization (UNIDO). UNIDO was able to send out the questionnaire to almost 1000 biomass producers and traders across the world.

3. Overview of the commodities investigated: bioethanol, biodiesel and wood pellets

In this section, a brief overview of the production and trade of the biomass commodities investigated is presented. In Table 1, a summary is shown for bioethanol, biodiesel and wood pellets. In this section all data on production, consumption and trade refer to the year 2008 unless stated otherwise.

3.1. Bioethanol

Bioethanol (ethyl alcohol) is a liquid biofuel which is currently mainly produced from organic feedstocks containing sugars—such as sugarcane, corn, wheat, sugar beet or molasses. Fuel bioethanol is traded under HS code 2207, which covers denatured and undenatured alcohol. Both can be used as fuel ethanol, but denatured ethanol is often used as solvent (UNCTAD, 2008). The term 'bioethanol' is used to indicate that ethanol was produced from organic feedstocks. Bioethanol can also be processed further to ETBE, which can be blended with gasoline as a biofuel. However, within the frame of this study we only analyze the trade of bioethanol. In 2008, world

Table 1
Overview of global production and trade of the major biomass commodities in 2008.

	Bioethanol[a]	Biodiesel[a]	Wood pellets[b]
Global production in 2008 (million tonnes)	52.4	13.1	11.5
Global net trade in 2008 (million tonnes)	2.8 (min) – 3.1 (max)	2.4	Approx. 4
Main exporters	Brazil	United States, Argentina, Indonesia and Malaysia	Canada, USA, Baltic countries, Russia
Main importers	USA, Japan, European Union	European Union	Belgium, Netherlands, Sweden, Italy

[a] Based on Lamers et al. (submitted for publication).
[b] Based on Sikkema et al. (submitted for publication), Bradley et al. (2009) and Spelter and Toth (2009).