Global Assessment of Biomass and Bioproduct Impacts on Socio-economics and Sustainability

Arnaldo Walter
NIPE-FEM / Unicamp & CTBE
awalter@fem.unicamp.br

Future Trading of Biomass

Arnaldo Walter
NIPE-FEM / Unicamp & CTBE
awalter@fem.unicamp.br

The partners

- Unicamp (Brazil)
- Uthrect University (The Netherlands)
- TATEDO (Tanzania)
- WIP, IC, MFC, GBI, INTA and CATIE.

Outline

- Aims.
- Deliverables.
- Current regimes.
- The assessment considering 2020.
- Importance of certification schemes.
- Conclusions.

Aims

- The identification of future trends of global biomass/biofuels/bioproducts trade and its impacts.
- Future trade of bioproducts depends on legislation, trade barriers as well as on the demand and supply of different countries.
- A tendency is increasing export from developing countries to emerging economies and industrialised countries. These future trends may have positive and negative, social and environmental impacts.

Methodology/steps

- Literature review.
- Information gathered from key researchers and stakeholders (both on trade and certification).
- Data from the six country-studies (obviously, focus on them).
- Critical analysis of information and data.
- Focus on liquid biofuels, pellets, and new bioproducts.

Deliverables

- Overview of current and future trading regimes for biomass/biofuels/bioproducts.
- Report on impacts of biofuels/bioproducts trade and certification schemes on economies in Africa, LA, Asia.
- Report on impacts of biofuels/bioproducts trade and new legislation on economies in Europe.
- Workshop on “Sustainability issues in global biofuels/bioproducts trade”.

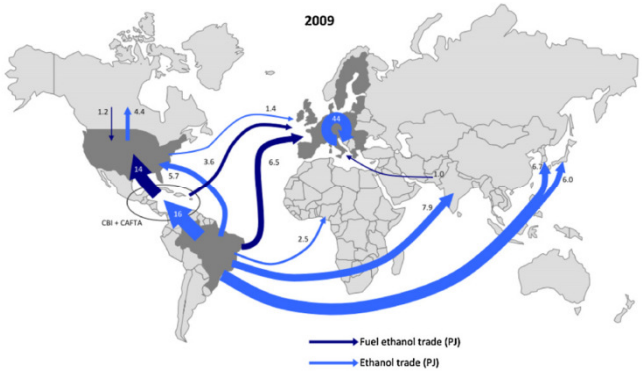
Current trade schemes (1)

- Trade of ethanol, biodiesel and wood pellets are growing, but the volumes traded are still low regarding other energy and agriculture commodities.
- Mainly regarding liquid biofuels, international trade has been strongly influenced by trade regimes imposed by US and EU, that are by far the main markets for ethanol and biodiesel, respectively.
- There was an important change on trade regimes for biofuels in early 2012 (US) but, so far the information available is not enough for an analysis of the impacts.

Current trade schemes (2)

- In the case of pellets, the main consumer market has been EU and the main exporters have been US and Canada. Trade regimes have been much less restricted for pellets regarding liquid biofuels.
- Sustainability requirements and certification schemes will have a strong influence on trade regimes both for liquid biofuels and pellets.
- In case of liquid biofuels, sustainability requirements have already been imposed by EU and US; in the case of pellets is the consumer market that has been imposing sustainability requirements.

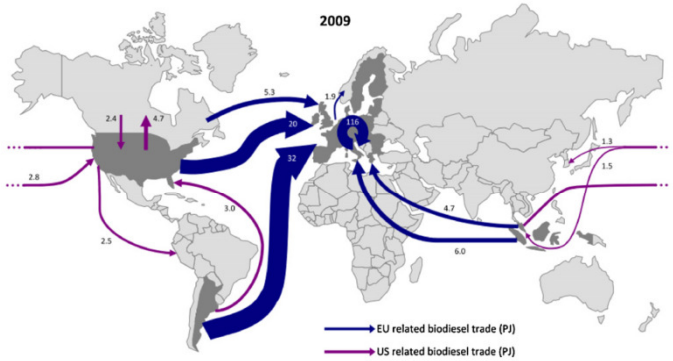
Current trade flows (1)



Source: Lamers et al. (2011)

- Main ethanol trade streams in 2009. It can be seen the importance of Brazil's (up to 2009) in the international ethanol trade and the relevance of the trade within Europe, partially because most of the imports reach specific harbours, such as Rotterdam.

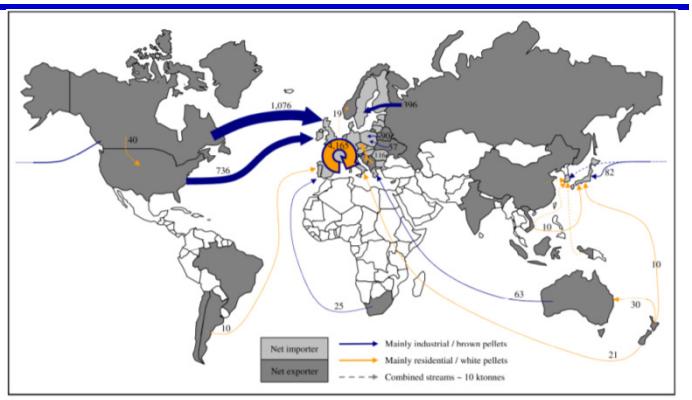
Current trade flows (2)



Source: Lamers et al. (2011)

- Main biodiesel trade streams in 2009. The authors of these figures have considered that exports from Argentina, Malaysia, and Indonesia are exclusively dedicated to markets in the EU and the US. It can be seen that EU is by far the main final destination of all biodiesel exports in recent years.

Current trade flows (3)



Source: Lamers et al. (2012)

- Main world trade routes of wood pellets in 2010. It can be seen that the main flows to Europe are from Canada and US (and in this case large-scale exports started just in 2008). The flow from Australia and South Africa to Europe is still relatively small.

Future demand and trade schemes – liquid biofuels

- In 2020 almost 50% of the biofuels demand would be in EU and North America and almost 30% in Latin America. The balance of the demand would be in China and other Asian countries.
- Biofuels trade will become increasingly important.
- However, as long as the technologies of 2nd generation biofuels develop, the production of liquid biofuels would be more concentrate in industrialised countries.
- A very recent proposal at the EU would completely change the current picture (and tendencies) (limits on the use of first-generation biofuels).

Future demand and trade schemes – pellets

- Markets of industrial pellets depend on the import from outside the EU. The market for pellets is growing rapidly mainly in Europe and in a smaller extent in North America and in Asia.
- The European market will require a significant share of imports, mainly of industrial pellets; so far the main suppliers are Canada and US, but there are good opportunities for new players.
- Sustainability requirements have been demanded by the main consumers and the tendency in short-term is the harmonization of certification schemes.

Future demand and trade schemes – bio-products

- There is a growing interest regarding bio-products (chemicals, plastics, pharmaceuticals), despite the fact the current market is more characterised by niches.
- The main appeal is the sustainability of such products and certainly certification will be required in short-term.
- The first initiatives regarding certification are based on the existing schemes for biofuels.
- A clear tendency seems to be the production of advanced bio-products (and also advanced biofuels) in the developed countries, in the so-called hub-harbours, using feedstock imported from developing countries.

Results of the six case studies

- The countries with large potential for the production of biofuels (and also with potential for bio-products production) are Argentina and Brazil: land availability, the existing infra-structure, the tradition on the production of agricultural goods, and the production stage regarding sustainability.
- Indonesia has also reasonable potential, but at this moment sustainability has been a constraint for a reasonable share of the production (palm oil).
- Costa Rica and Tanzania have constrains due to small land availability and the lack of infra-structure, respectively.
- Finally, Mali, is the country with lower possibilities of becoming an exporter of biofuels/bio-products.

Certification schemes

- Certified production of liquid biofuels is a reality. What can be additional is the explicit consideration of socio-economic impacts.
- Certified pellets is also a clear tendency.
- From the production point of view, the tendency is the production in Europe, from imported raw materials. In this sense, certified raw biomass would be required.
- In the future, the production of new bioproducts must be certified (regarding sustainability) as well. The initiatives for biofuels shall be a guideline.

Conclusions (1)

- Considering short- to mid-term (2020) no big changes are expected regarding the main producers and main consumer markets.
- What can impact are the developments of 2nd second generation biofuels, the new regulations in EU and US and the developments of the bio-products industry (new technologies, quality and costs).
- Sustainability will be required and certification schemes will disseminate.
- Socio-economics aspects might be incorporated.

Conclusions (2)

- The potential for large-scale production of biofuels is limited to few countries: land availability, lack of infra-structure, lack of capacity skills, risks, etc.
- The development of new producer countries is a challenge.
- The accomplishment with sustainability criteria will also be a constrain for some producers/countries.
- Is good option for developing countries being suppliers of feedstocks?