

Overview of global solid and liquid biomass trade for energy

Martin Junginger

Copernicus Institute, Utrecht University
IEA Bioenergy Task 40

**13 November 2012, IEA Bioenergy Conference 2012,
Vienna, Austria**

core objective IEA Task 40: *“to support the development of a sustainable international, bioenergy market”*

Key working fields

- Securing sustainable biomass supplies
- Sustainability & certification
- Trade, market and demand dynamics
- Transport, logistics and trade
- Outreach and dissemination

Current Member Countries IEA

Task 40

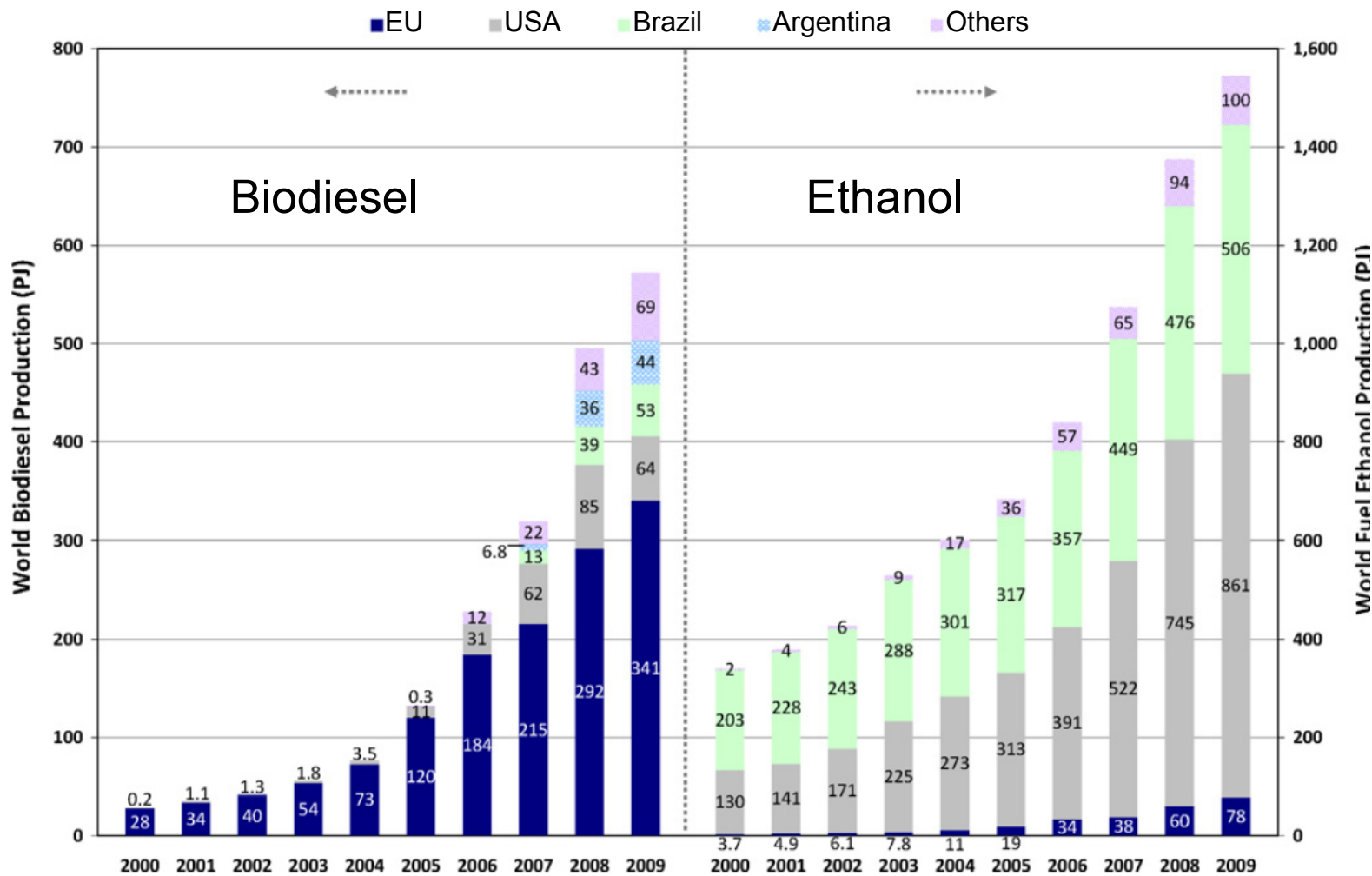
- Netherlands (Task leader)
- Austria
- Belgium
- Brazil
- Canada
- Denmark
- Finland
- Germany
- Italy
- Japan
- Norway
- Sweden
- UK
- USA

Possibly 2013:

- S. Korea
- South Africa

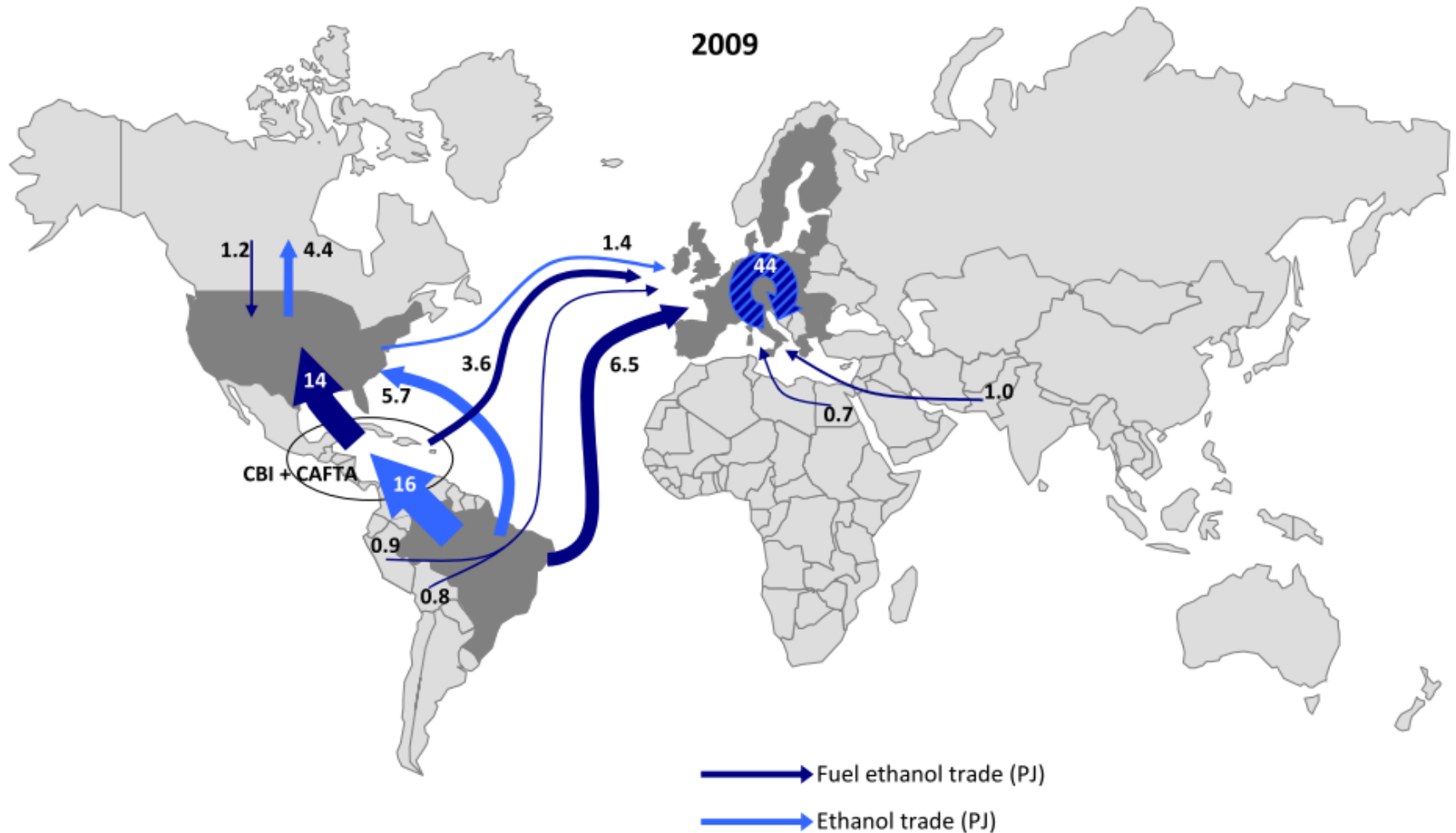
Good involvement of market parties!

Global biodiesel & fuel ethanol production 2000-2009



(Source: Lamers et al., RSER, 15 (2011) 2655– 2676)

Global (fuel) ethanol trade streams of minimum 1 PJ in 2009.

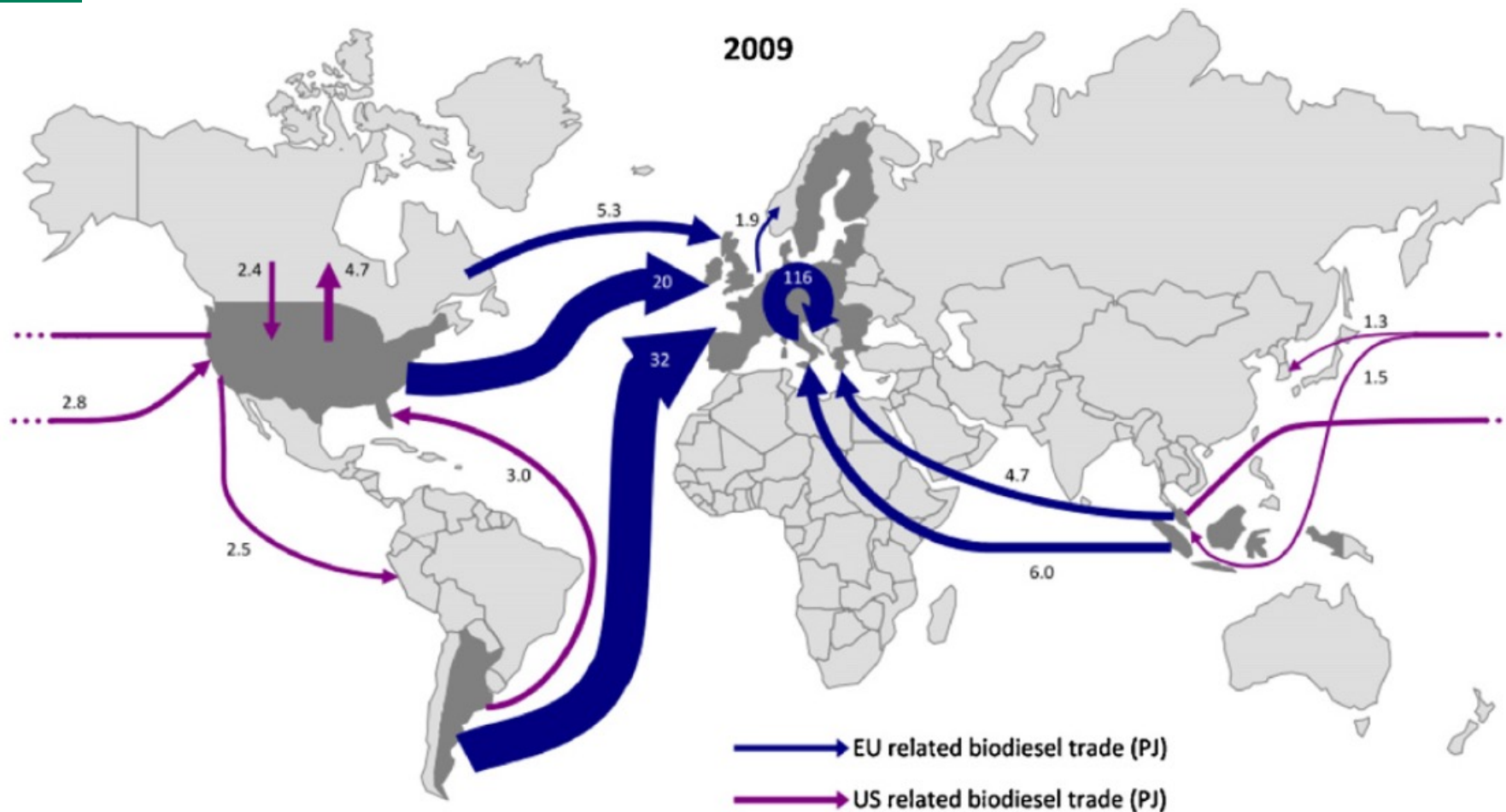


(Source: Lamers et al., RSER, 15 (2011) 2655– 2676)

Trends in global (fuel) ethanol trade

- Main drivers for trade are renewable transport policy targets in the EU and the US
- Import tariffs in US and EU has led to blending with a.o. gasoline to avoid tariffs
- Shift from Brazil as main exporter to USA due to ethanol shortages in Brazil
- Future: possible impact of EC iLUC legislation / max 5% biofuels from food crops unclear on trade patterns

Global biodiesel trade streams of minimum 1 PJ in 2009.

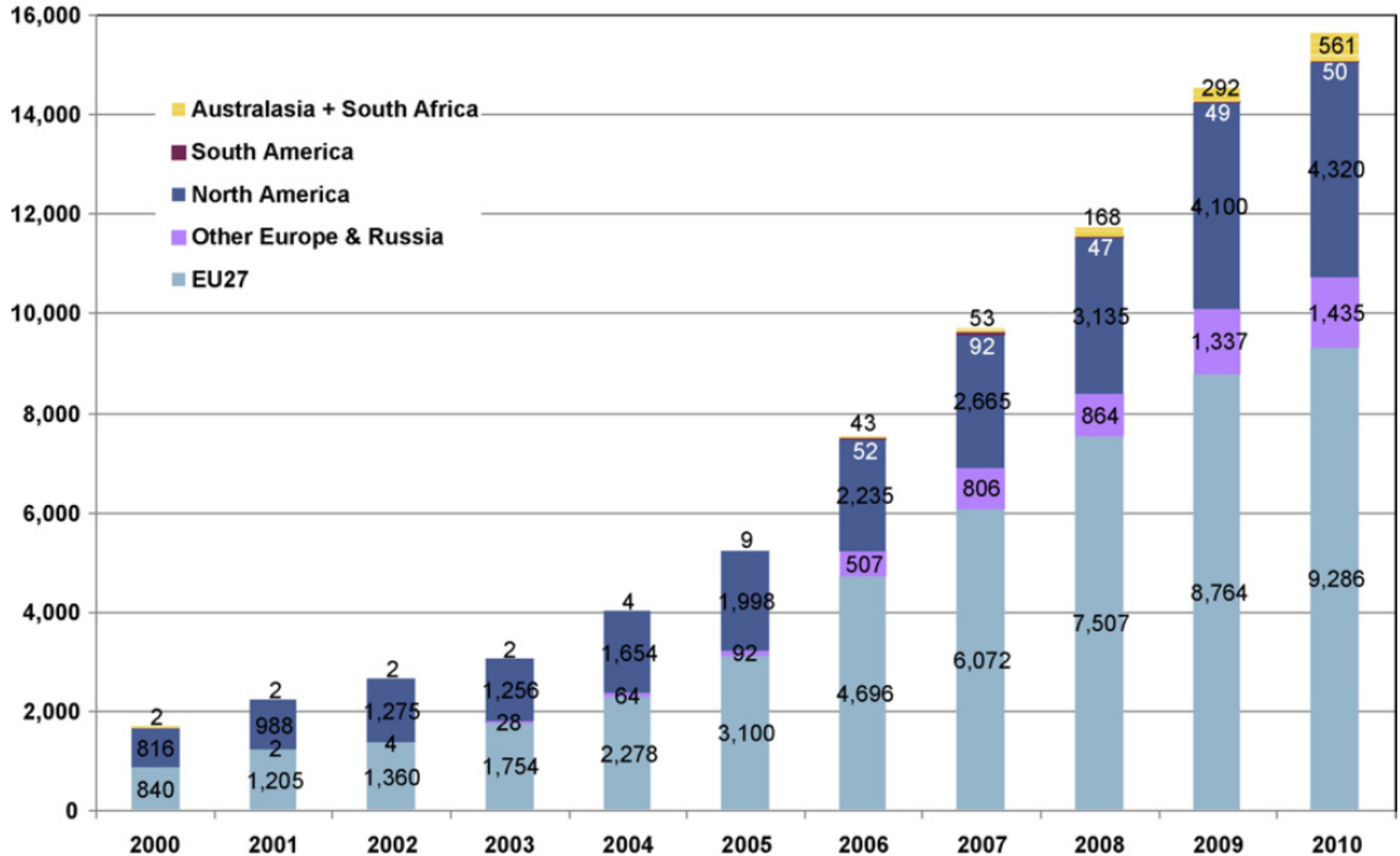


(Source: Lamers et al., RSER, 15 (2011) 2655– 2676)

Trends in global biodiesel trade

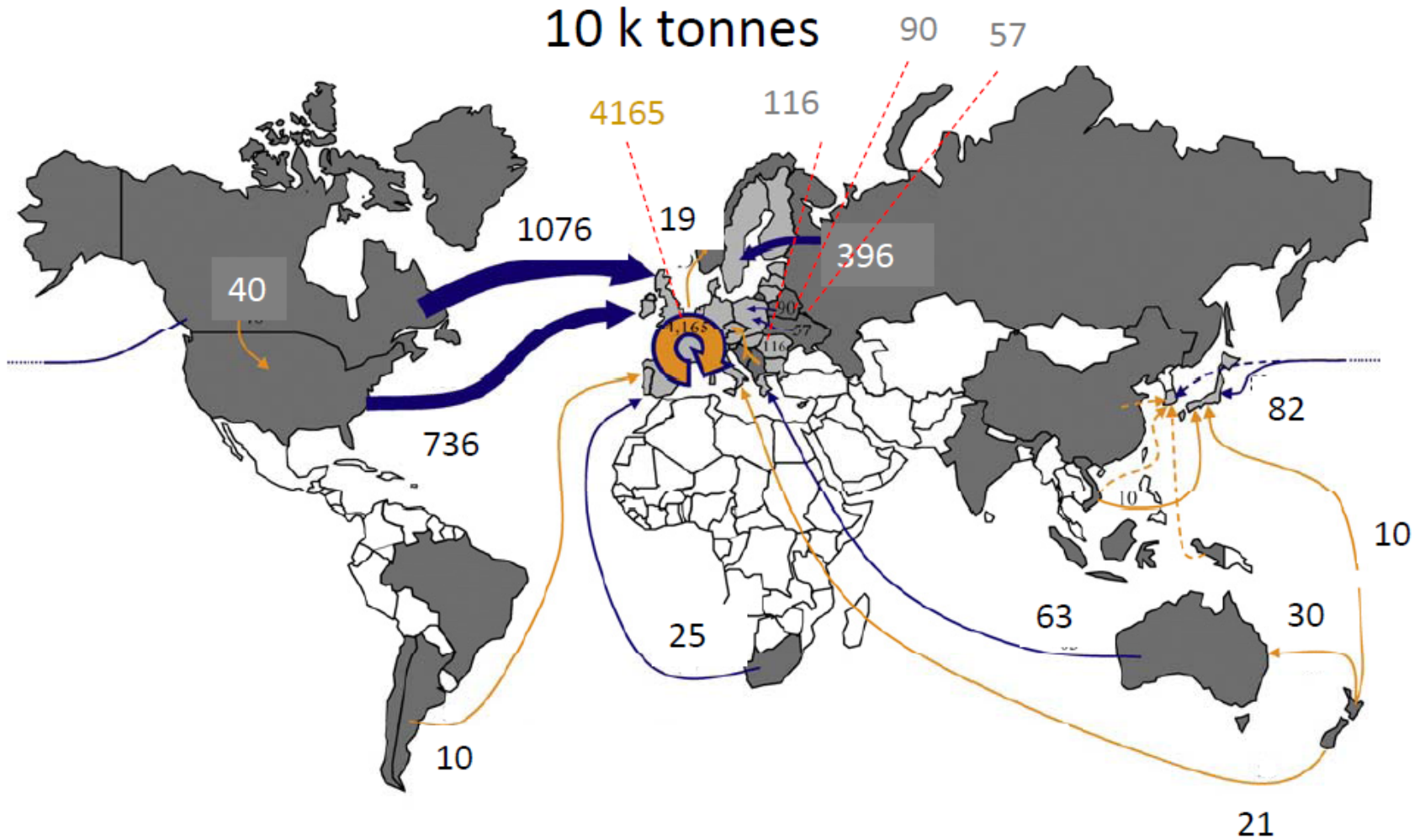
- Main drivers for trade is the renewable transport policy target in the EU
- Subject to import tariffs/ and (indirect) export subsidies in recent years
- Next to tariffs also technical barriers for import of soy and palm oil based biodiesel
- Future: possible impact of EC iLUC legislation / max 5% biofuels from food crops unclear on trade patterns, but very likely significant



Global wood pellet production 2000 - 2010



(Source: Lamers et al. RSER, 16(2012) 3176-3199)

Global wood pellet trade 2010



-  Mainly industrial / brown pellets
-  Mainly residential / white pellets

Source: Lamers et al., RSER, 16(2012) 3176-3199

Global Wood Pellet Market Study

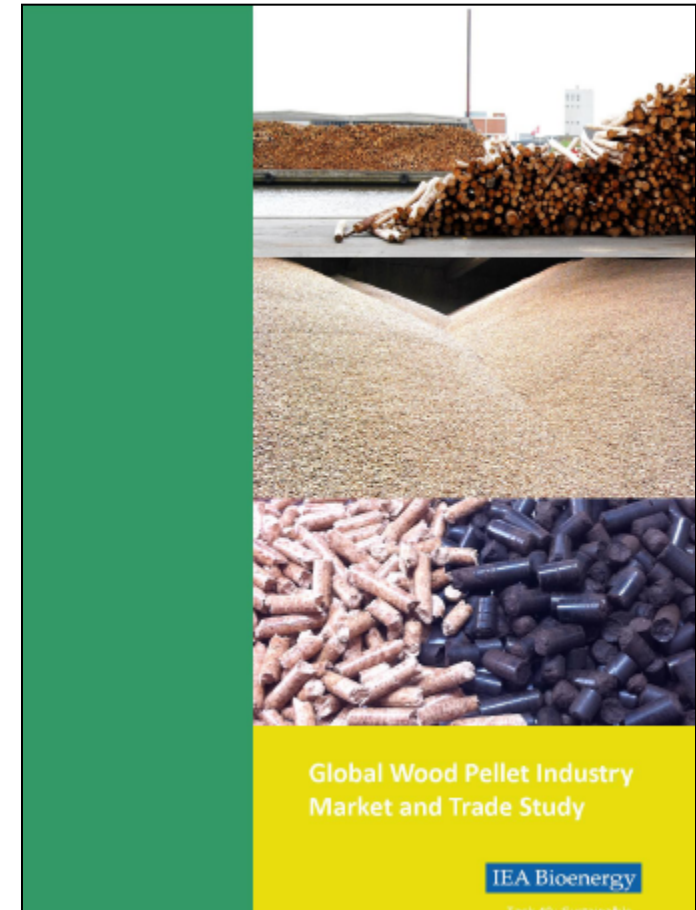
Published December 2011

Chapters

- Executive summary
- European Markets
- North American Markets
- Asian- Australian L.A. Markets
- Challenges to Ensure Sustainable Pellet Trade

190 pages

- Trade and market statistics updated to 2010 for most countries, some forecasts available for 2011
- Based on sound verifiable literature search
- Dispersed public data now collected into a single comprehensive document



Demand Forecasts

EU

EU demand between 20-50 million tons by 2020, depending on:

- the policies on co-firing in the UK, Netherlands, Belgium, Germany, Poland, as well as the combination of market dynamics for coal plus CO₂ emission allowances;
- the continuity of support measures for the uptake of the market for pellet stoves and boilers, as well as the price of fossil fuels for heating and the related attractiveness to switch to wood pellets for small-scale users.

Demand Forecasts

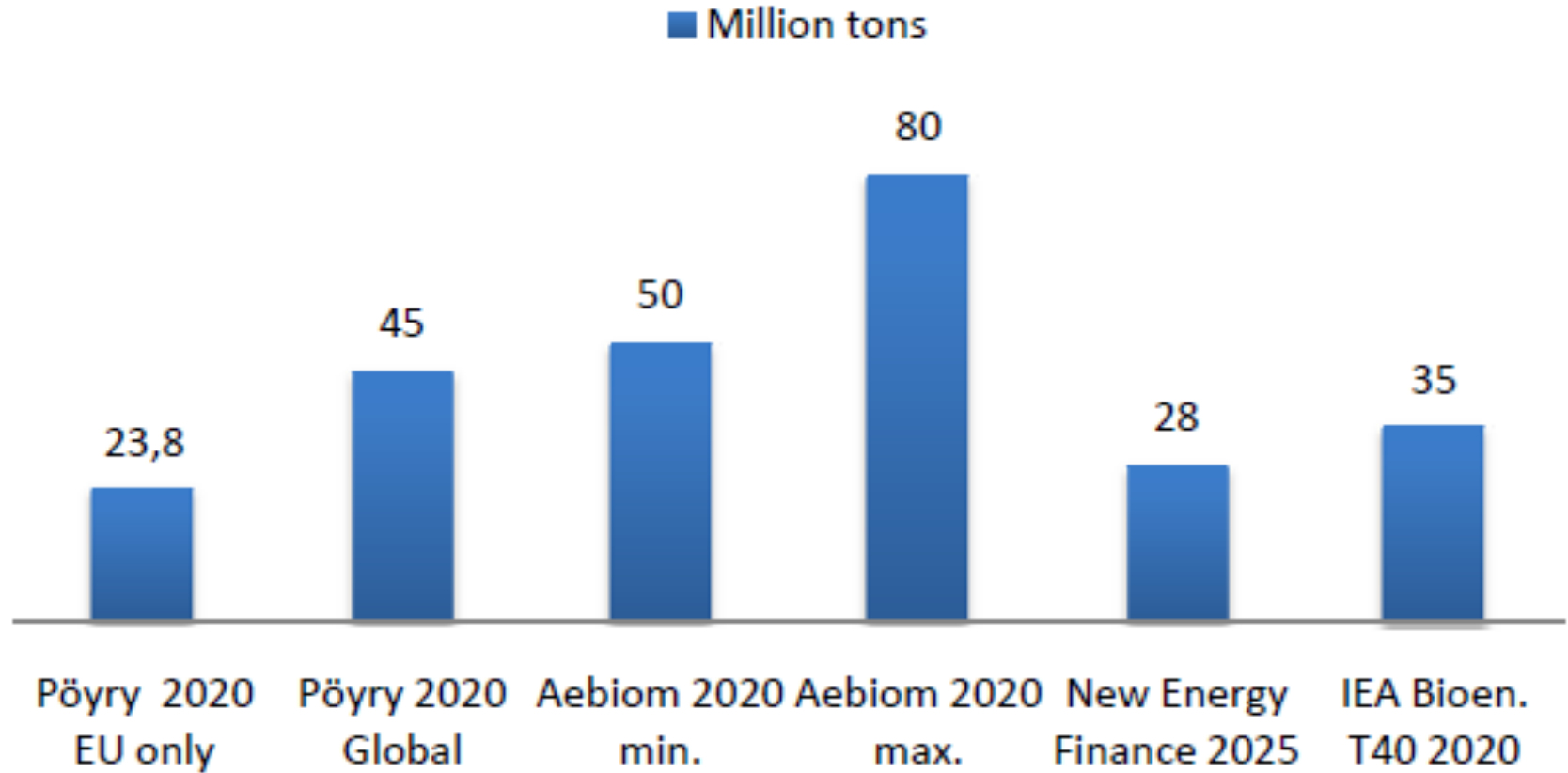
The demand in East Asia will depend on developments in Japan, South Korea and China, between 5-10 million tons by 2020.

The demand in the U.S. will be probably limited to small-scale use in households and main imports will come from Central and Eastern Canada.

The demand in Canada will be correlated to the actual implementation of co-firing plans

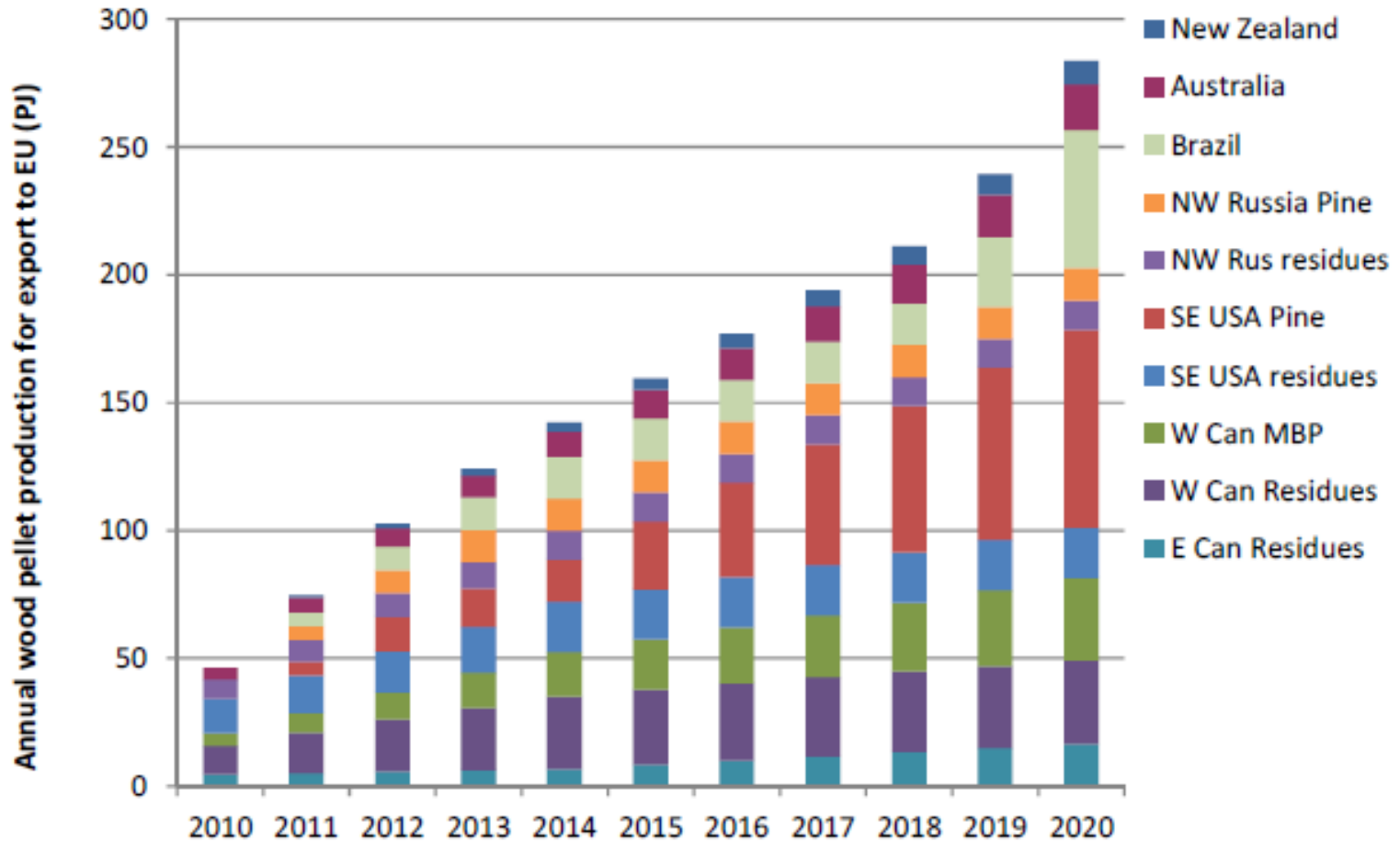
Market Forecasts

Expected Wood Pellet Demand



Potential Biomass Supply

Business as Usual Scenario



Potential Biomass Supply

Business as Usual Scenario

- Total potential available for import to EU may increase drastically to almost **16 million tons.**
- Based on past and current import trends & industry expectations
- Sustainability considerations taken into account (mainly GHG balance and SFM)

Potential Biomass Supply

High Import Scenario

- Additional 17 million tons compared to the business as usual scenario.
- **Assuming** High imports in EU will stimulate new plants and energy plantations in e.g. Brazil / Uruguay & Mozambique and additional use of forest products in Russia
- Sustainability is explicitly **not** taken into account

The Challenges Ahead

Enlarging the feedstock base for wood pellets

Demand for wood pellets already outstripped the supply of sawmill residues. Large operators are looking for medium/long term supply agreements with well-defined volumes and prices. Trend towards verticalization of the sector with larger pellet manufacturers, even some energy producers (RWE & Vattenfall)

Exploiting the basin of agricultural feedstock with agropellets

Countries with significant developments and activities in this area so far are Denmark, Poland, the Czech Republic, Ukraine, and the United Kingdom. Used mainly for co-firing. Significant trade stream from Ukraine to Poland (approx. 150,000 tons in 2009).

The Challenges Ahead

Refining the quality of pellets: the promise of torrefaction

Most promising technological approaches are based on continuous processes such as vertical moving bed reactors, screw reactors, drum reactors, torbed reactors or fluidized bed reactors. Number of demonstration plants, but no clear winner yet.

Adapting logistics and transportation infrastructures

To accommodate the growing pellet markets new logistic infrastructures will be needed. Large investments will be required to achieve this. Many regions rich in biomass resources do not have the financial capability of developing the resource.

The Challenges Ahead

Transforming (wood) pellets into a global commodity

“IWPB” focusing on the legal framework, developing contractual and financial measures to increase market liquidity and price stability, technical specifications, sampling standards and common sustainability requirements.

World’s first biomass exchange launched in November 2011 by APX-ENDEX and the Port of Rotterdam. The new exchange will allow market participants to trade standard contracts in a transparent environment. Certification of sustainability mandatory for traded lots.

Thanks for your attention

For more information, see:

www.bioenergytrade.org

- **FREE T40 global wood pellet market study**
- Task 40 book on bioenergy trade expected autumn 2013
- Other public reports
- Information on workshops & events
- Subscribe to the newsletter (2x per year)

References:

- Lamers, P., Hamelinck, C., Junginger, M., Faaij, A., (2011) International bioenergy trade – a review of past developments in the liquid biofuels market. *Renewable and Sustainable Energy Reviews*, 15 (2011) 2655–2676.
- Lamers, P., Junginger, M., Hamelinck, C., Faaij, A. (2012) Developments in international solid biofuel trade - An analysis of volumes, policies, and market factors. *Renewable and Sustainable Energy Reviews* 16 (5), pp. 3176-3199
- Cocchi, M., et al. Global wood pellet market and trade study (2011) IEA Bioenergy Task 40 , available at: http://www.bioenergytrade.org/downloads/t40-global-wood-pellet-market-study_final.pdf