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Overview of solid and liquid biomass trade globally

Highlights of the global wood pellet study of Task 40

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History of bioenergy trade

- In the last century, practically all bioenergy use was a local or regional form of energy, especially for solid biomass
- Main reasons were (sufficient) local demand, but most importantly difficulties of transporting raw biomass over longer distances (due to high moisture content, difficulties with storage, no existing supply chains, etc. etc.)
- But…

- The first load of industrial pellets was shipped on the *Mandarin Moon* from Prince Rupert, Canada to Helsingborg, Sweden in 1998

(Source: J. Swaan, WPAC)

And in 2004, the first 25 kton load of palm kernel shells arrived in Italy from Indonesia

(Source: Michael Wild, W&P)

1. Two main drivers for increase in trade

1. Increasing policy support for liquid biofuels and solid biomass (e.g. blending mandates, tax exemptions, feed in tariffs etc.)
2. Technological progress in pretreatment technologies – especially wood pellets and biodiesel

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IEA Bioenergy Task 40

Sustainable biomass markets and
international bioenergy trade to support the biobased economy

Core objective:

‘to support the development of sustainable, international markets and international trade of biomass, recognizing the diversity in biomass resources and applications for bioenergy and bio-materials in the biobased economy’

IEA Bioenergy **TASK 40**

Sustainable International Bioenergy Trade - Securing Supply and Demand

Triennium 2016 – 2018

Task members:

Task Leaders

Martin Junginger
(Academic)

Peter-Paul
Schouwenberg
(Industry)

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Work programme

1. **Dedicated market studies**, both focusing on existing markets (e.g. **pellets**, wood chips, **waste streams**) and markets for new bioenergy products (e.g. torrefied material & pyrolysis oil etc.), but also on regions which have not been charted before (e.g. the **Pacific rim**).

-> first workshop ever on bioenergy trade 2008 in Japan

2. Continued (case) studies on **how to mobilize *sustainable* biomass for trade** and demonstrate benefits (of bioenergy) in the biobased economy (a.o. **critically assess the role of sustainability certification vs. risk-based approaches, binding legislation vs. BMPs etc**) – what can the BBE learn from bioenergy?

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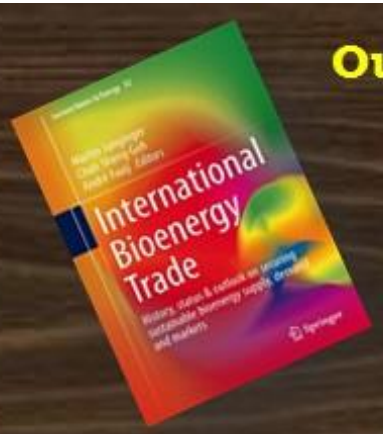
Work programme

3. **Making things happen / stimulate (investments in) trade** – needs to increase dramatically over the next decade. Investigating the requirements for **commoditization of biomass** and biofuels will play a central role; next to the technical aspects, it also important to analyse the **necessary conditions for the development and successful market penetration of key biobased commodity**.

4. Need for **high-quality bio-fuels/feedstocks and advanced/smart logistics (dedicated infrastructure**) to achieve **cost price reductions**. Logistics typically are 30-50% of final costs of bioenergy. While advanced logistics and better feedstock may even increase cost at first, they are likely to reduce cost once deployed on a larger scale, and allow for system cost reductions

IEA Bioenergy **TASK 40**

Sustainable International Bioenergy Trade - Securing Supply and Demand



Our book

International Bioenergy Trade

History, status & outlook on securing sustainable bioenergy supply, demand and markets

is now available!

Free Preview

- 10 chapters
- Summarizing the lessons of 10 years Task 40
- Solid & liquid biomass trade, logistics, sustainability, country case studies, barriers & opportunities for trade, outlook on future trade flows & required investments, and more…
- With contributions from all Task 40 member countries
- Available both as hardcopy and as e-book
- www.bioenergytrade.org

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From 2019 onwards

- Task 40 will be transformed into a task on DEPLOYMENT
- Lead Germany (Uwe Fritsche) and Sweden (Olle Olsson)
- Topics for the work program will include deployment of…
  - Bioenergy Carbon, Capture & Storage (BECCS)
  - Renewable gas
  - Biomass for high temperature heat in industry
  - Biofuels for the marine and aviation sector
  - Bioenergy in upcoming markets such as East and South East Asia

Interested? Contact Uwe Fritsche, uf@iinas.org

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On the Map

Biofpr
Biofuels Bioproducts & Biorefining

The dynamics of the global wood pellet markets and trade – key regions, developments and impact factors

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DOI: 10.1002/bbb.1910; *Biofuels, Bioprod. Bioref.* (2018)

Perspective

Biofpr
Biofuels Bioproducts & Biorefining

Global biomass trade for energy—Part 2: Production and trade streams of wood pellets, liquid biofuels, charcoal, industrial roundwood and emerging energy biomass

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Martin Junginger, Copernicus Institute of Sustainable Development, Utrecht, The Netherlands
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View online at Wiley Online Library (wileyonlinelibrary.com);
DOI: 10.1002/bbb.1858; *Biofuels, Bioprod. Bioref.* (2018)

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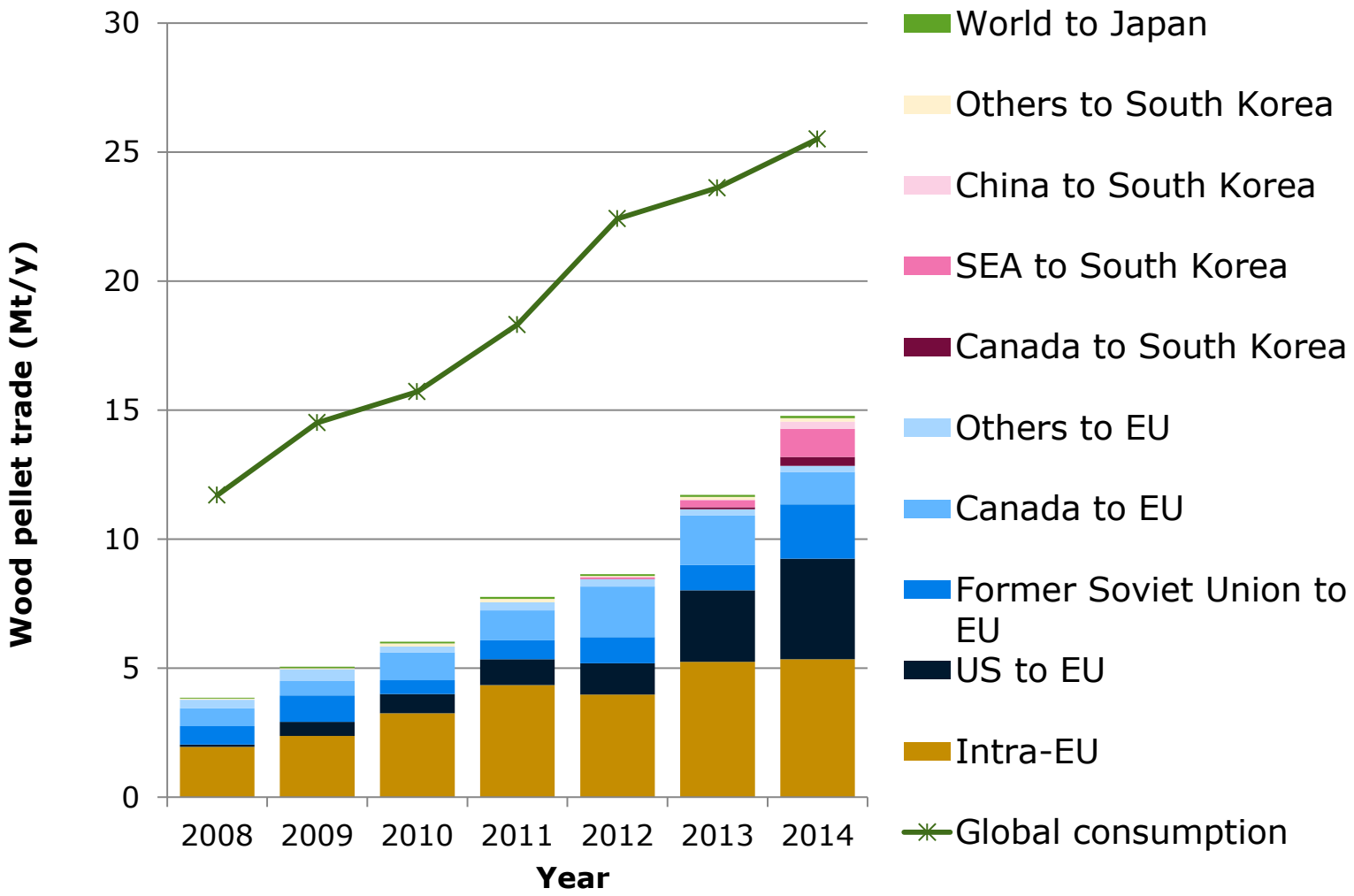
The role of biomass trade, wood pellets



Based on Lamers *et al.*, 2012; EUROSTAT, 2015; Goetzl, 2015; Junginger *et al.*, 2015

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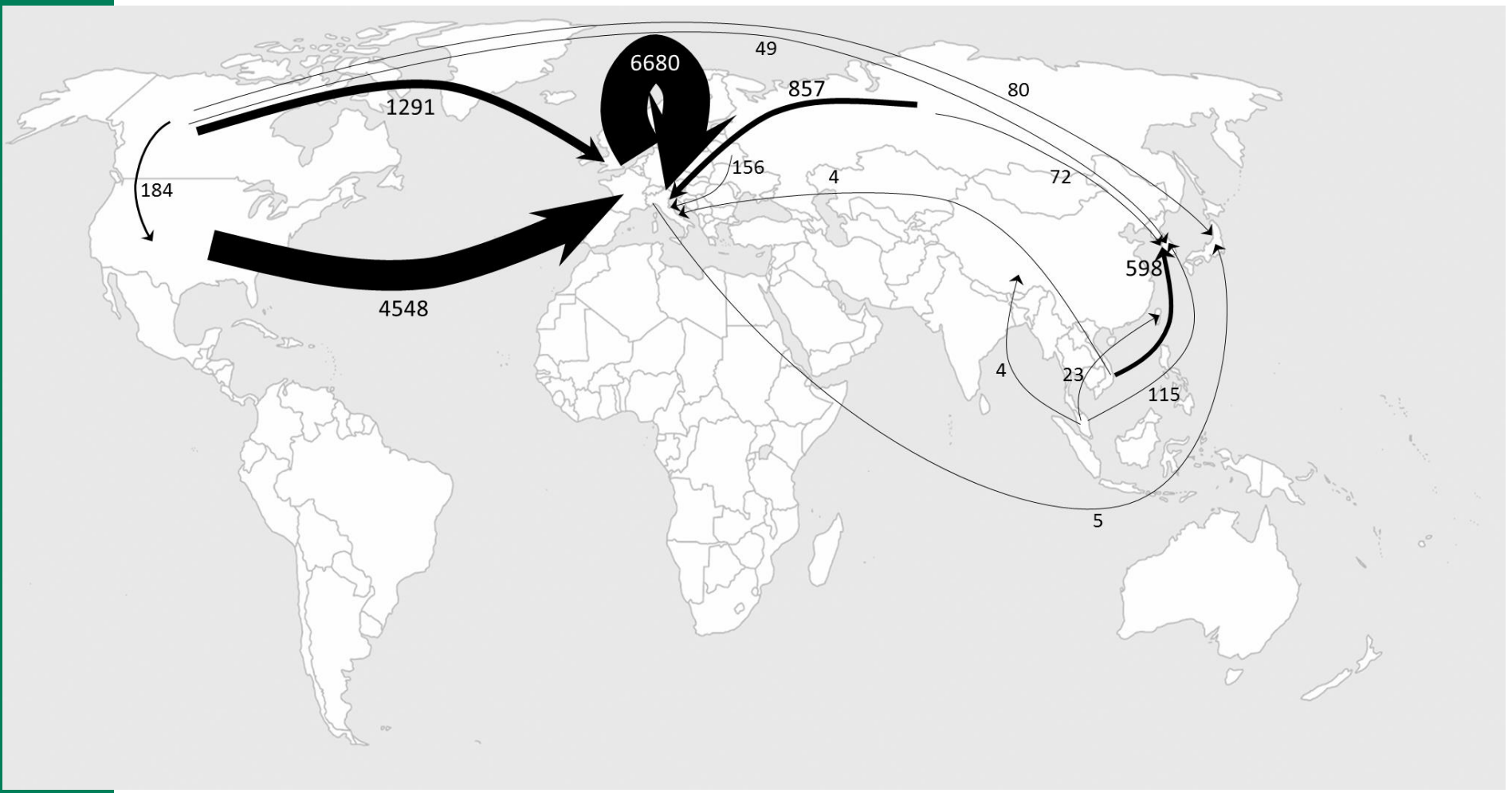
International wood pellet trade 2015



Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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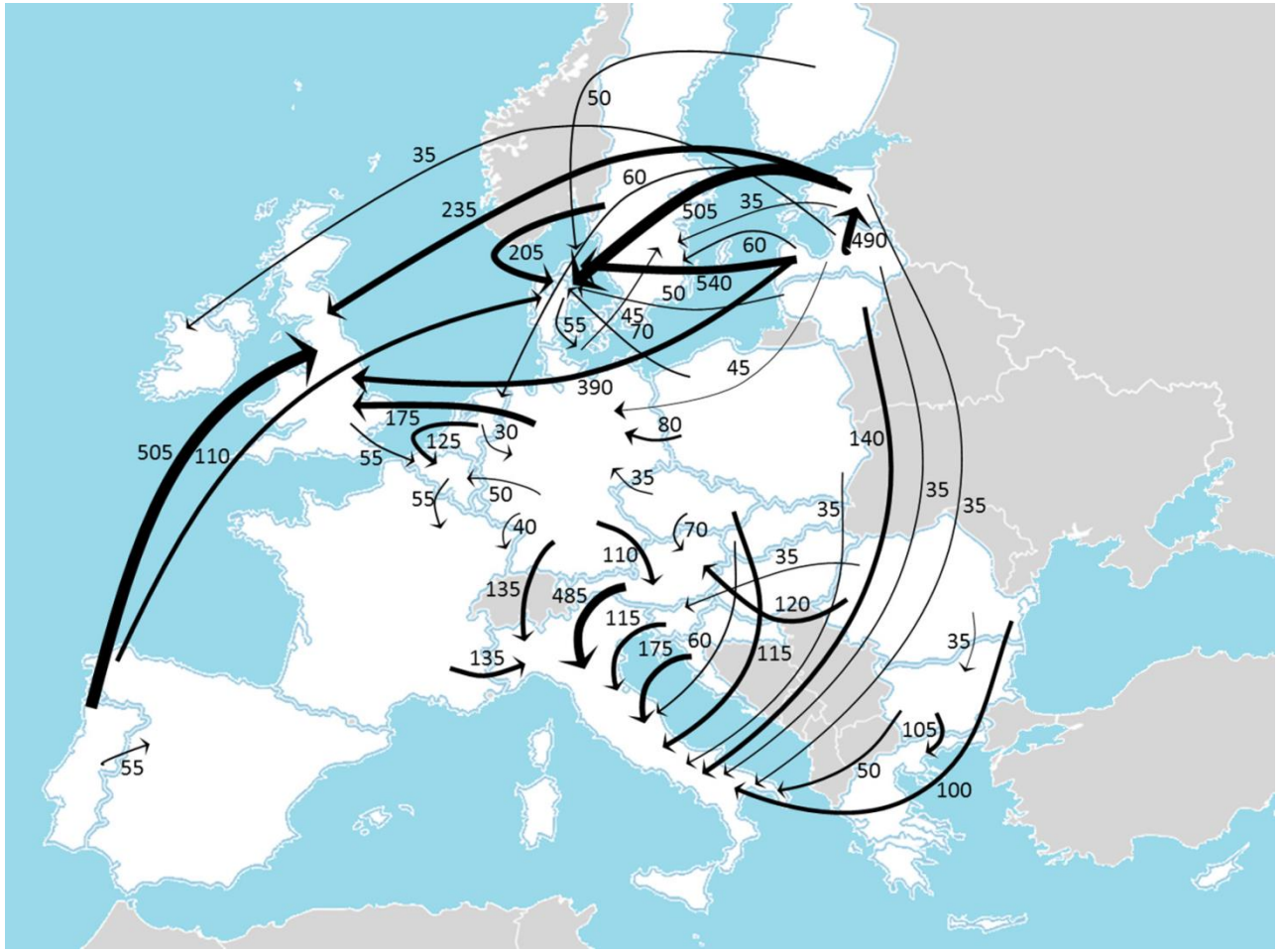
European wood pellet trade 2015



Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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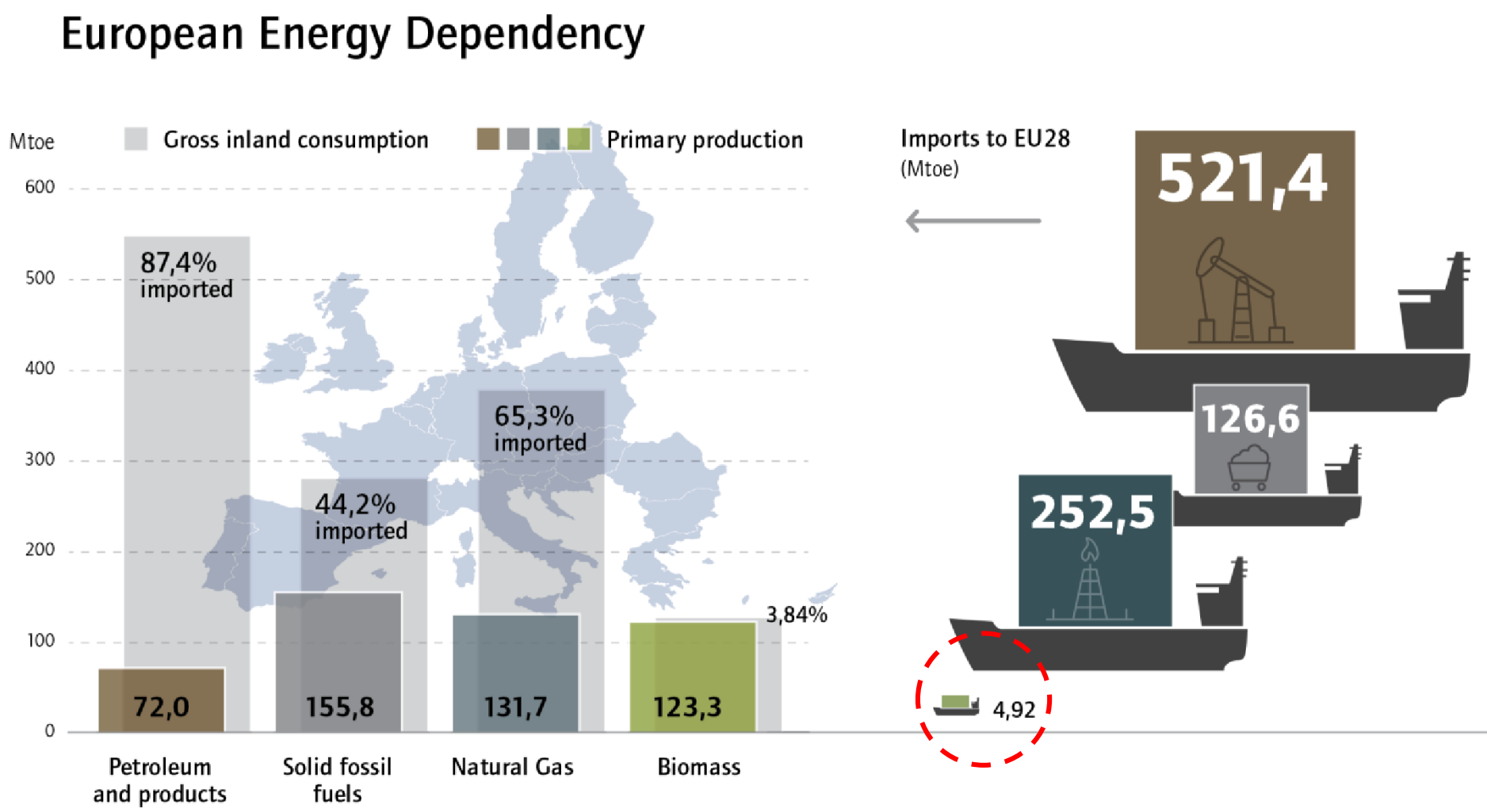
Current EU (bio)energy imports



Source: AEBIOM, 2015

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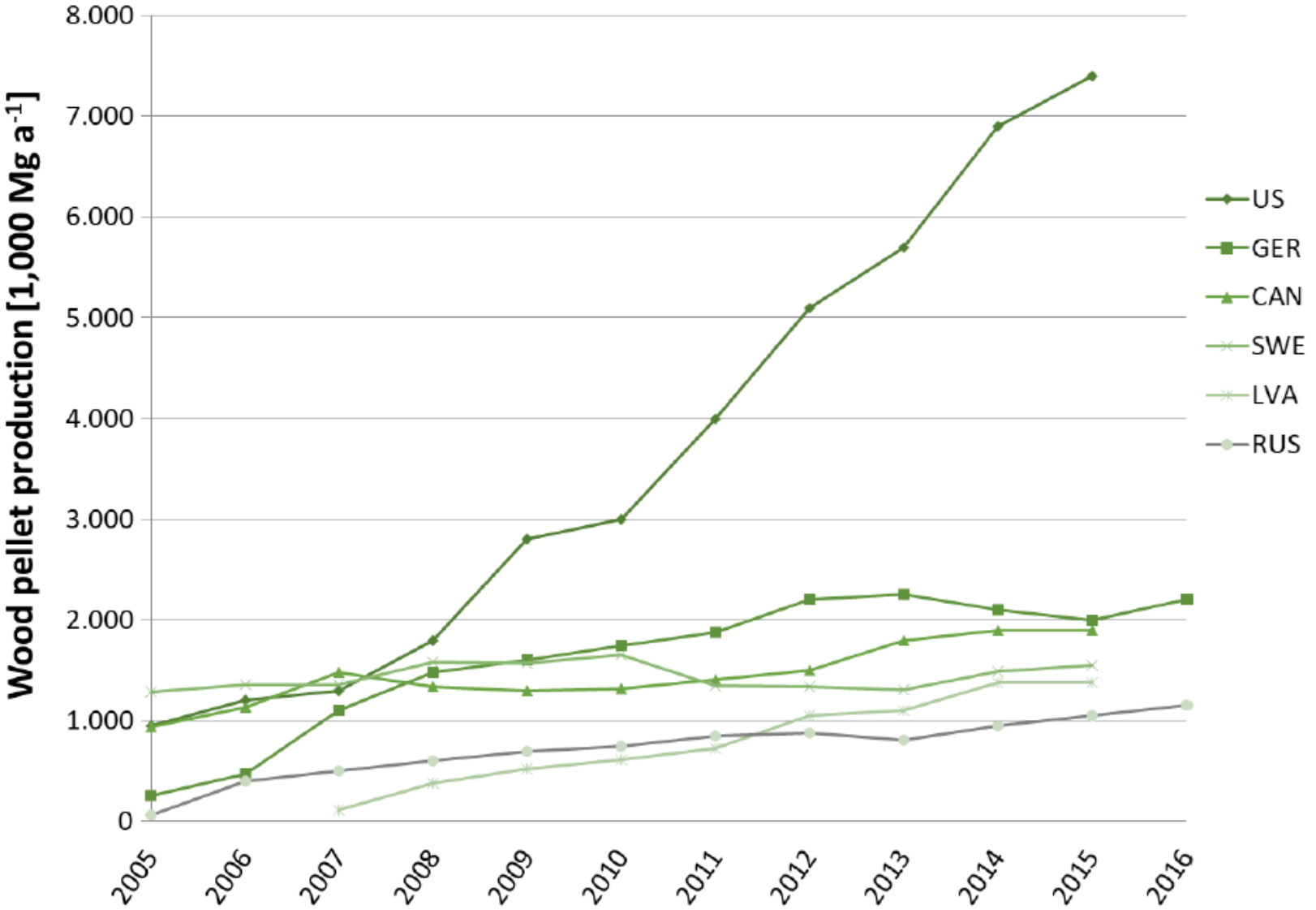
Top 5 global producers



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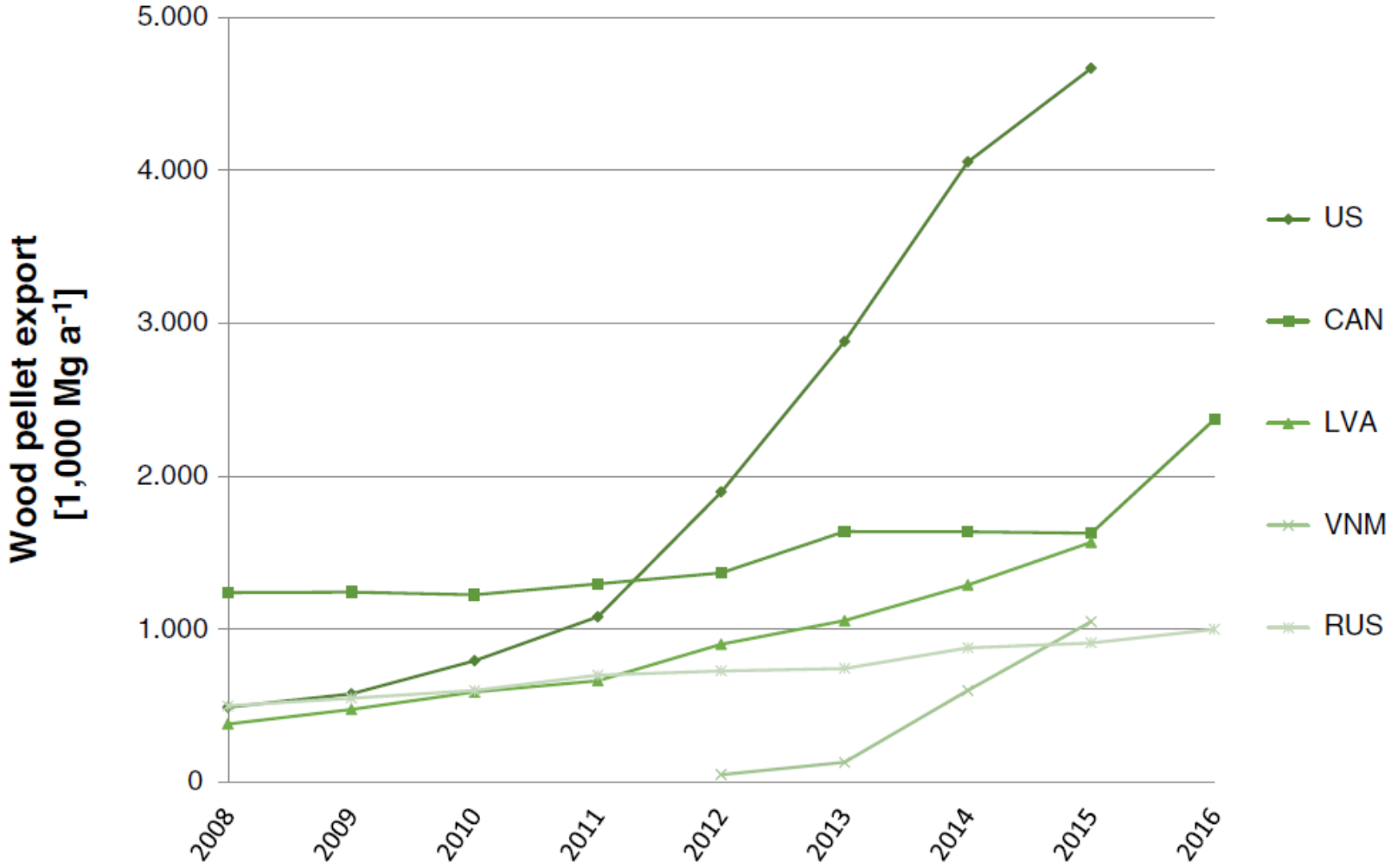
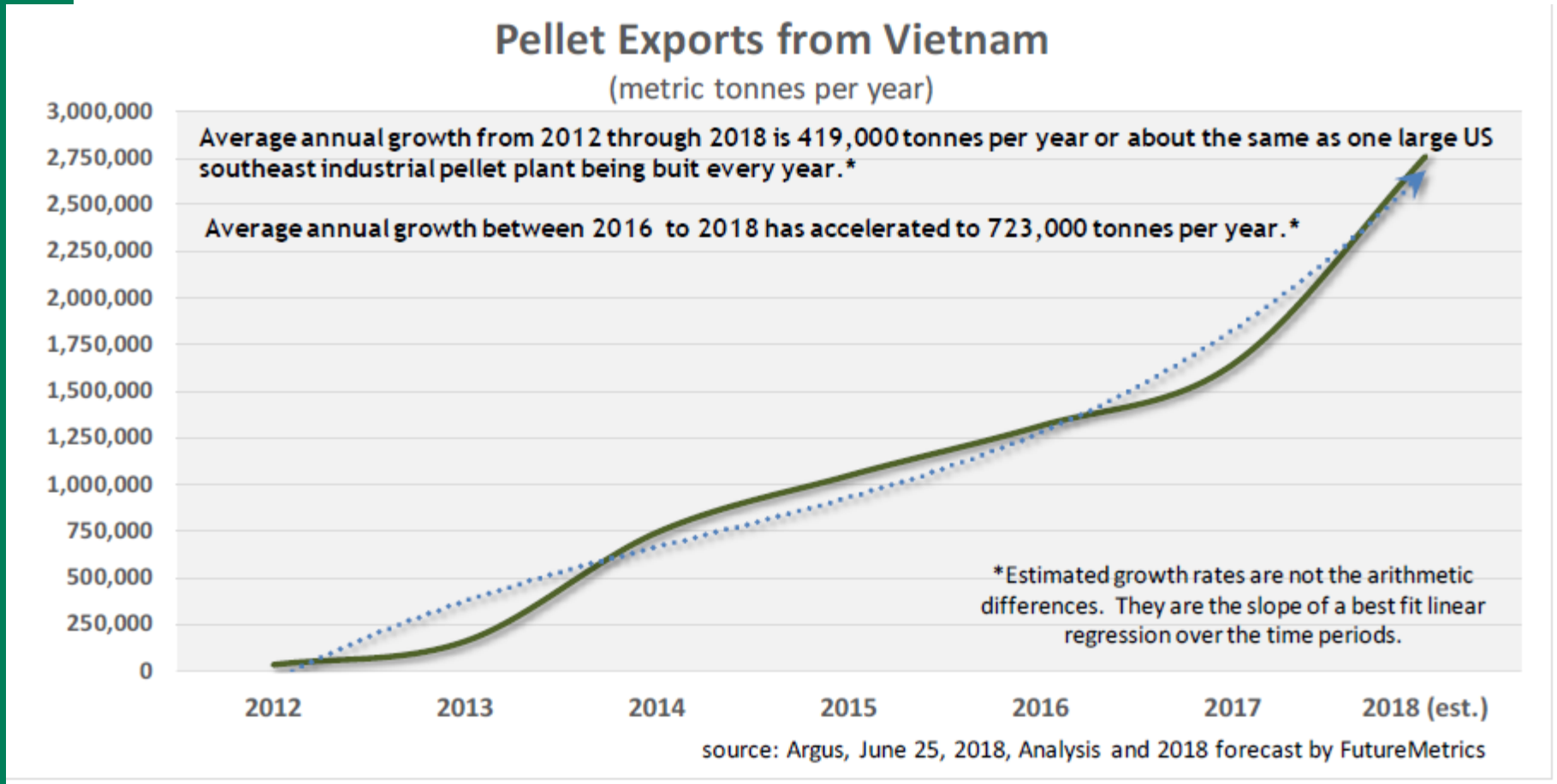
Top 5 global exporters



Vietnam a major exporter…



Source: Argus, FutureMetrics

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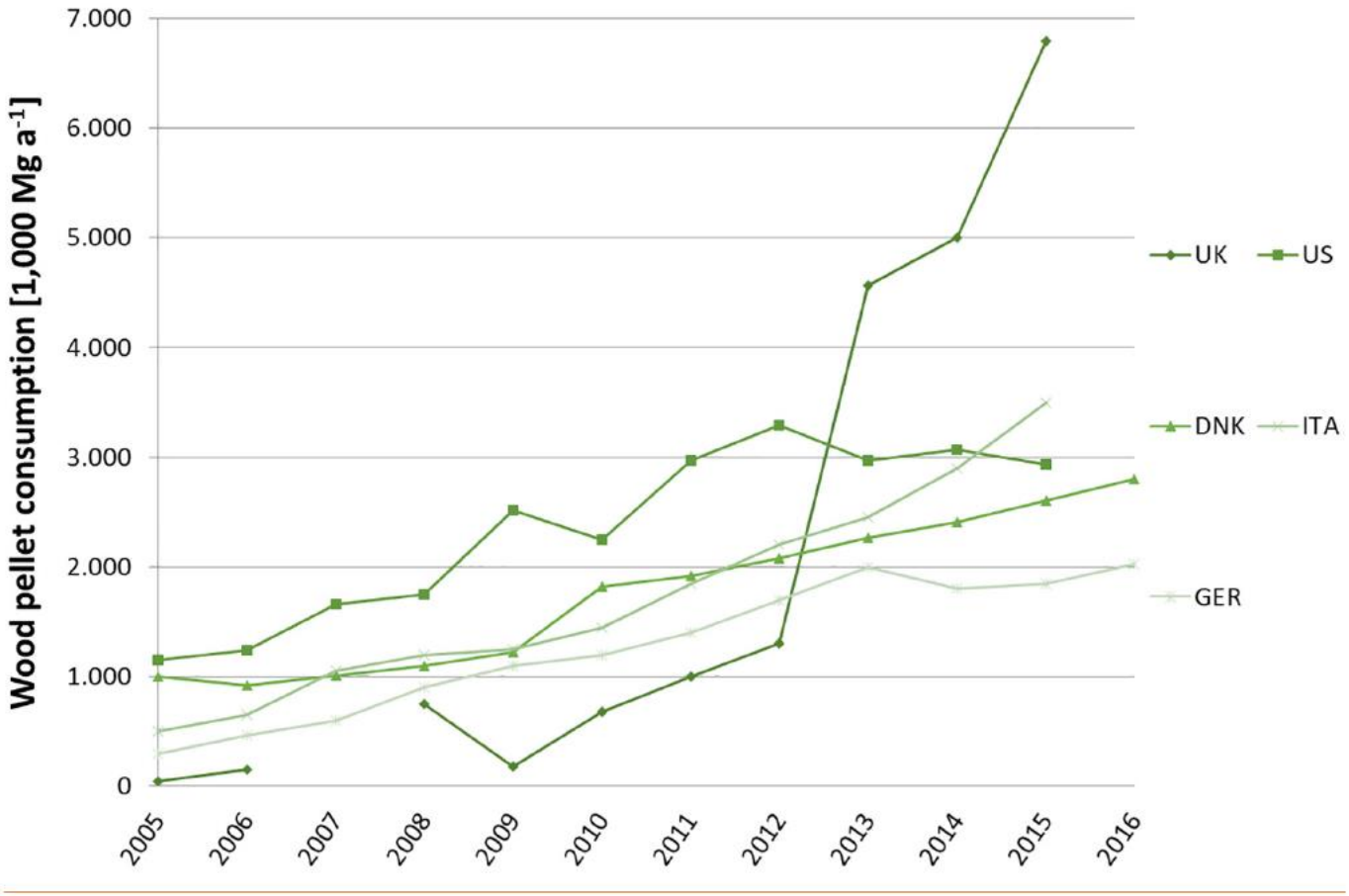
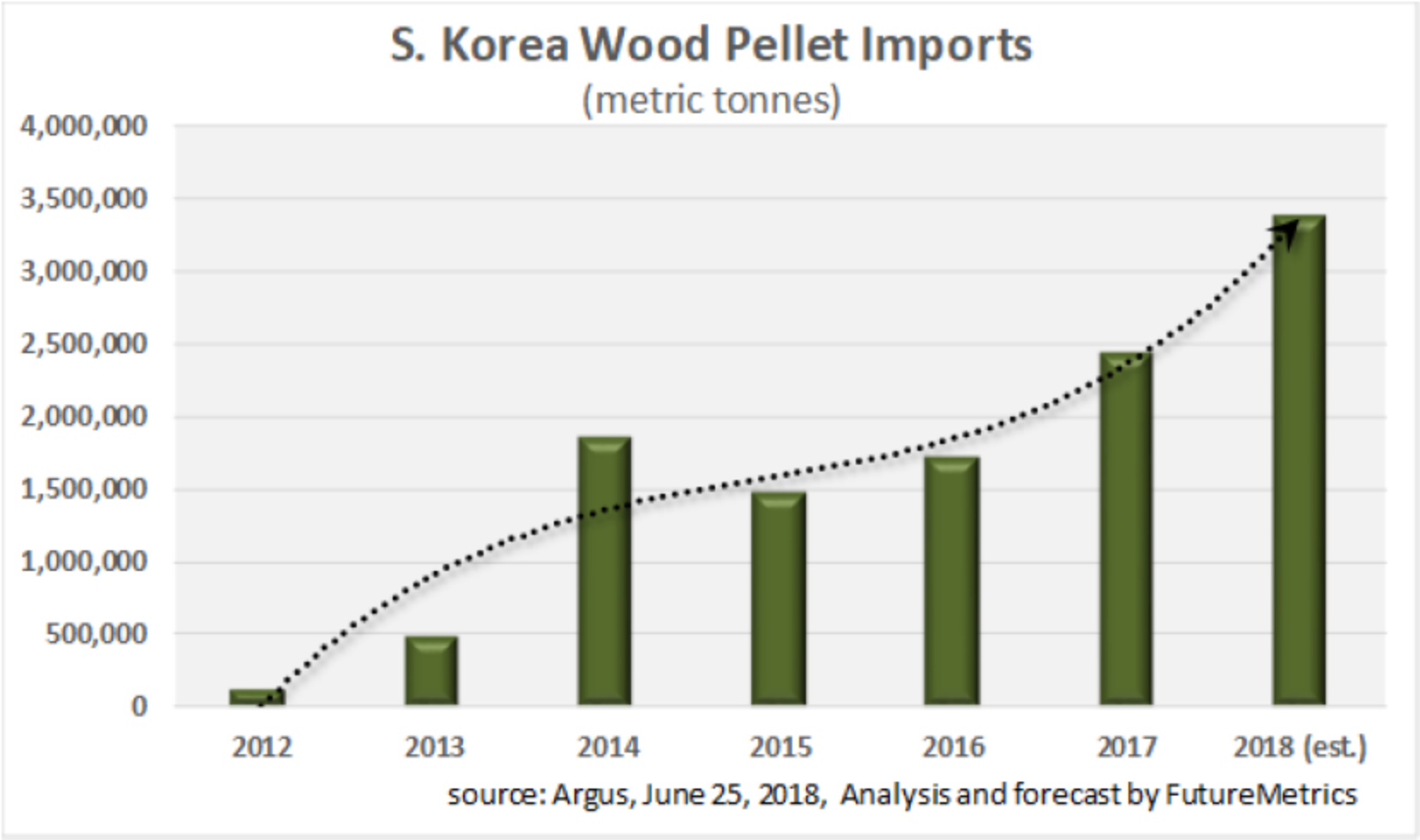
Top 5 global consumers



And Korea a major consumer…



Source: Argus, FutureMetrics

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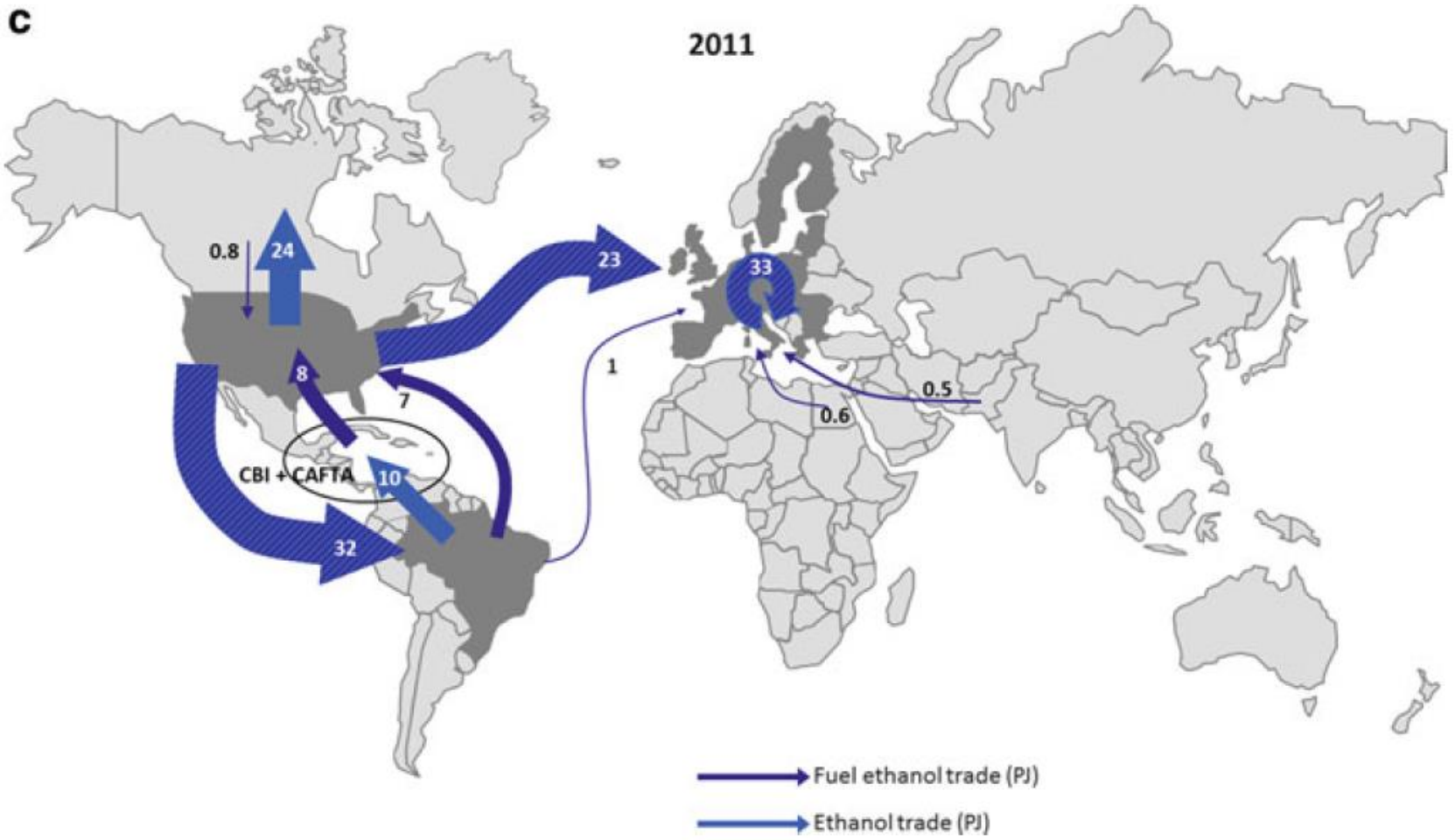
Global bioethanol trade 2008-2011



(Source: Lamers et al., Chapter 2 In Junginger et al. International Bioenergy Trade, Springer 2013)

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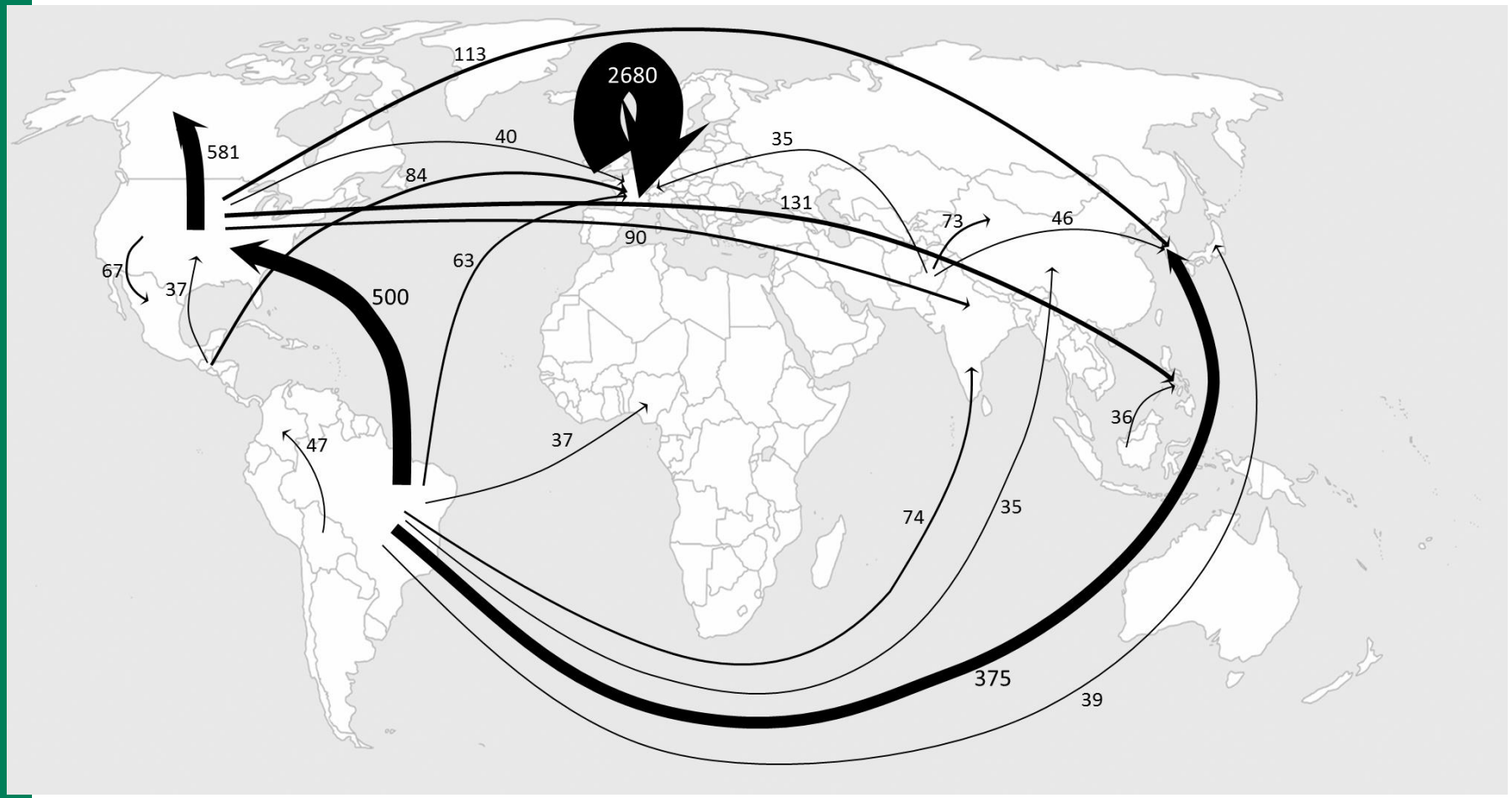
International ethanol trade 2015



Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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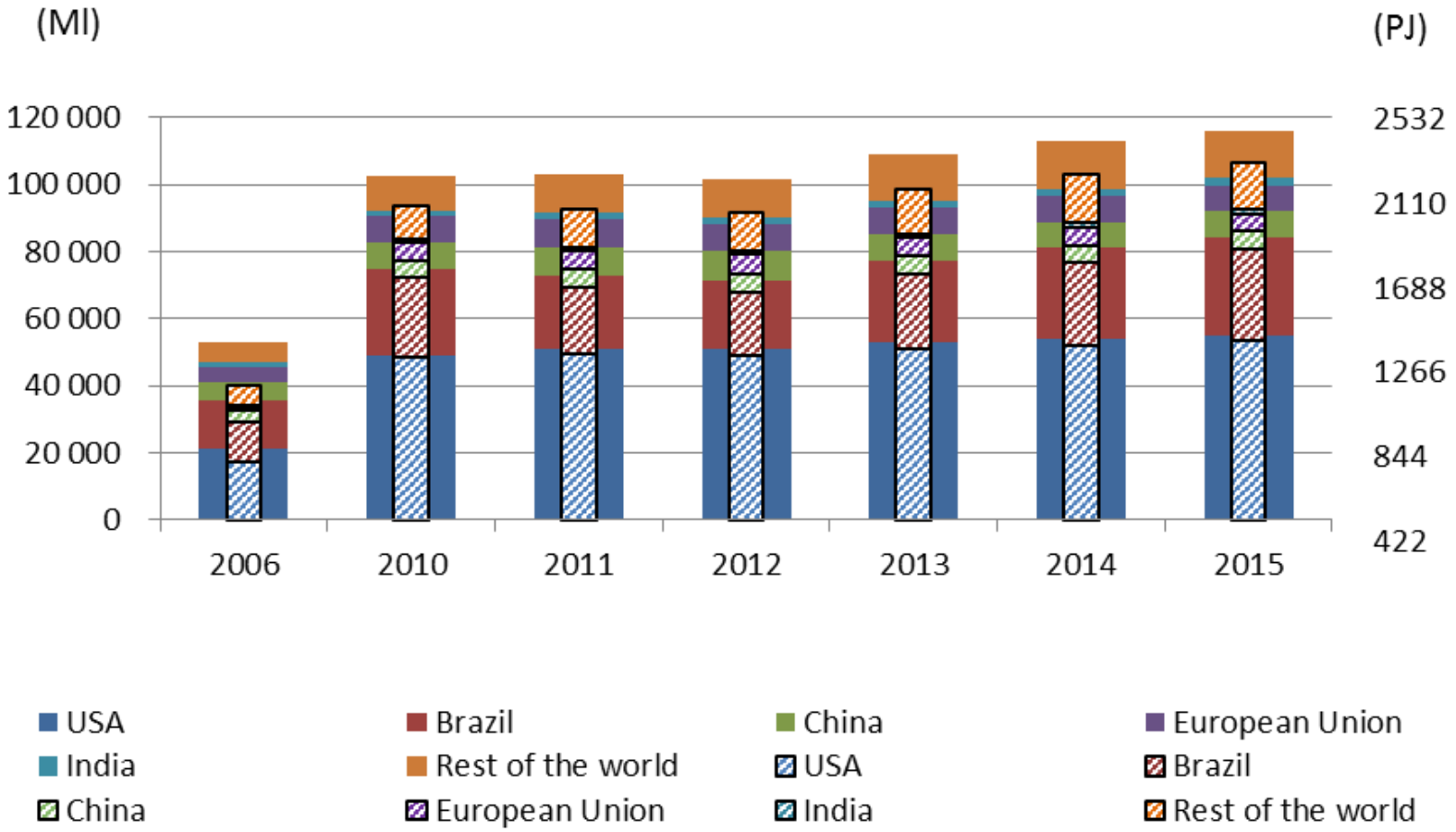
Total consumption of ethanol (large bars) and share used as transport fuel (small bars)



Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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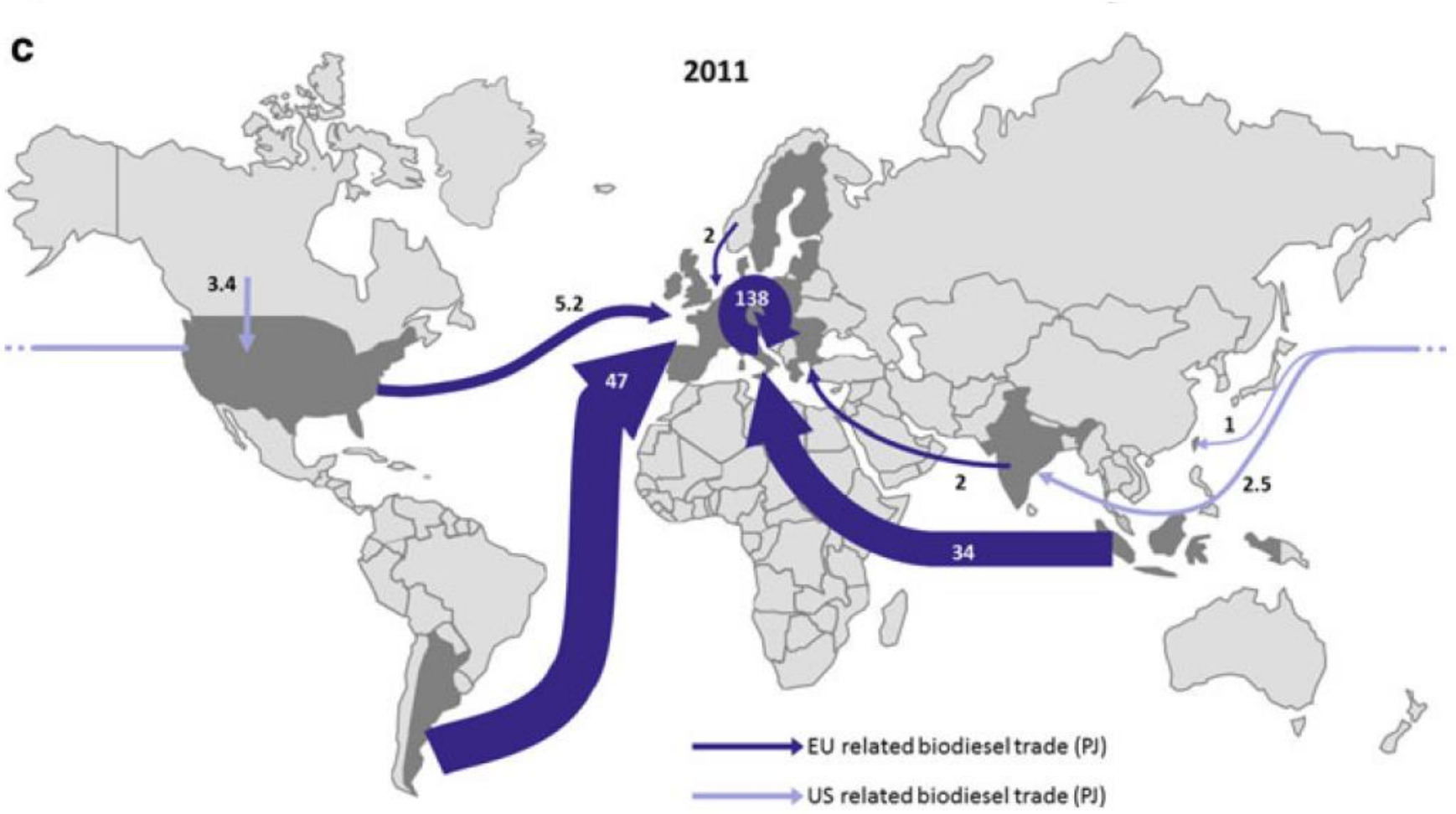
Global biodiesel trade 2008-2011



(Source: Lamers et al., Chapter 2 In Junginger et al. International Bioenergy Trade, Springer 2013)

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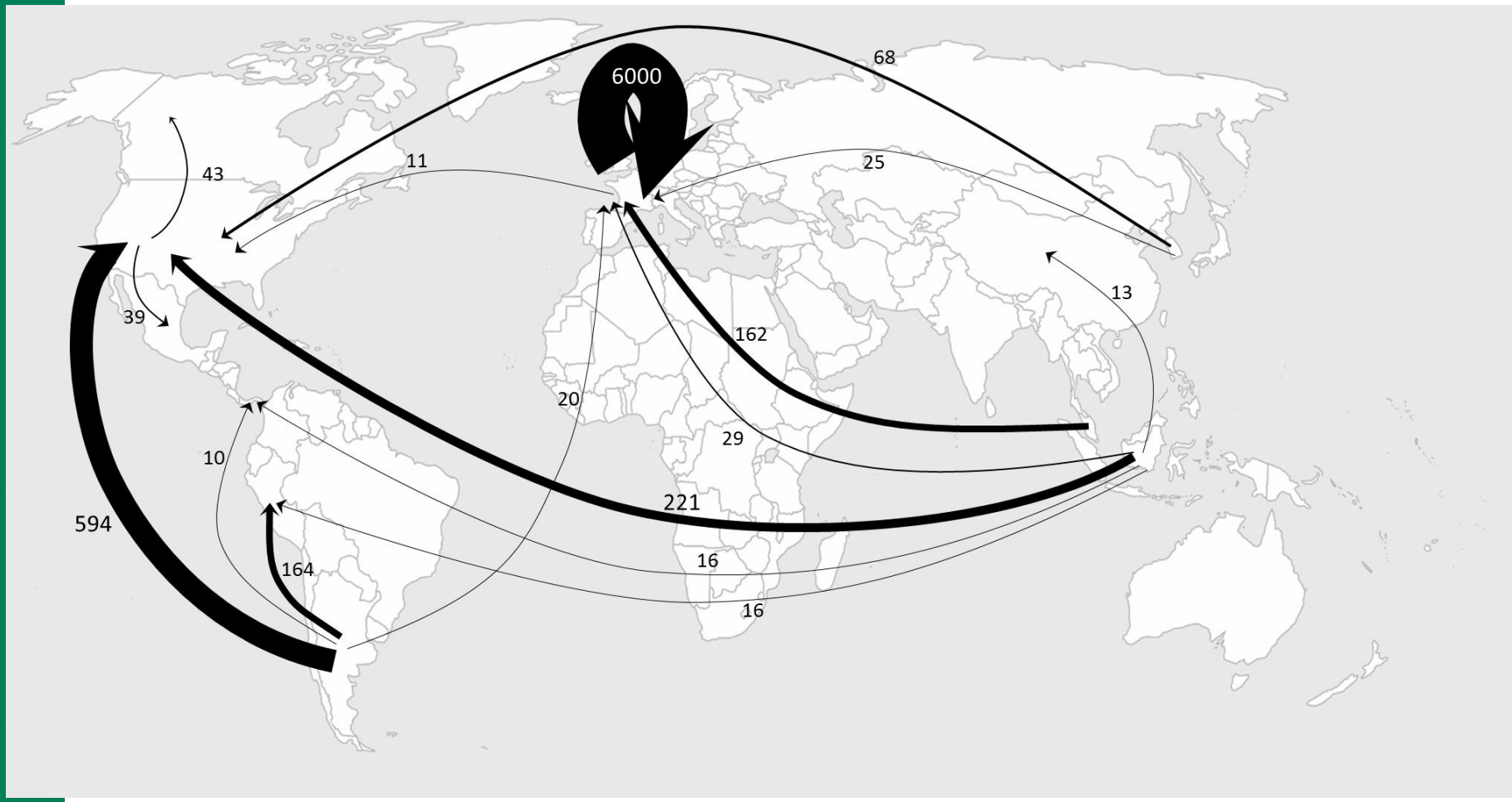
International biodiesel trade 2015



Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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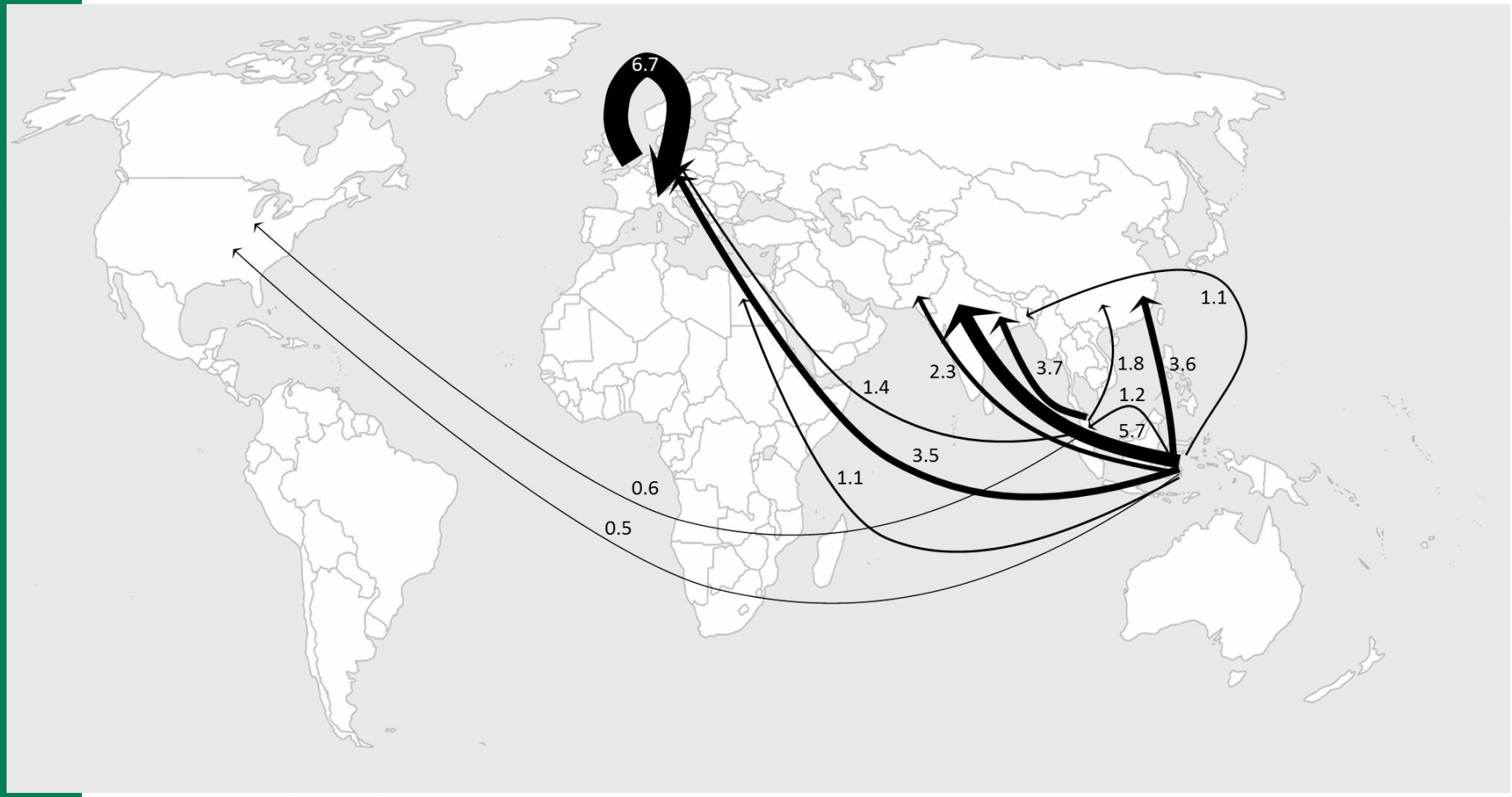
International palm oil trade 2015 (for all end-uses)



Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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Palm oil consumption / end-use in the EU

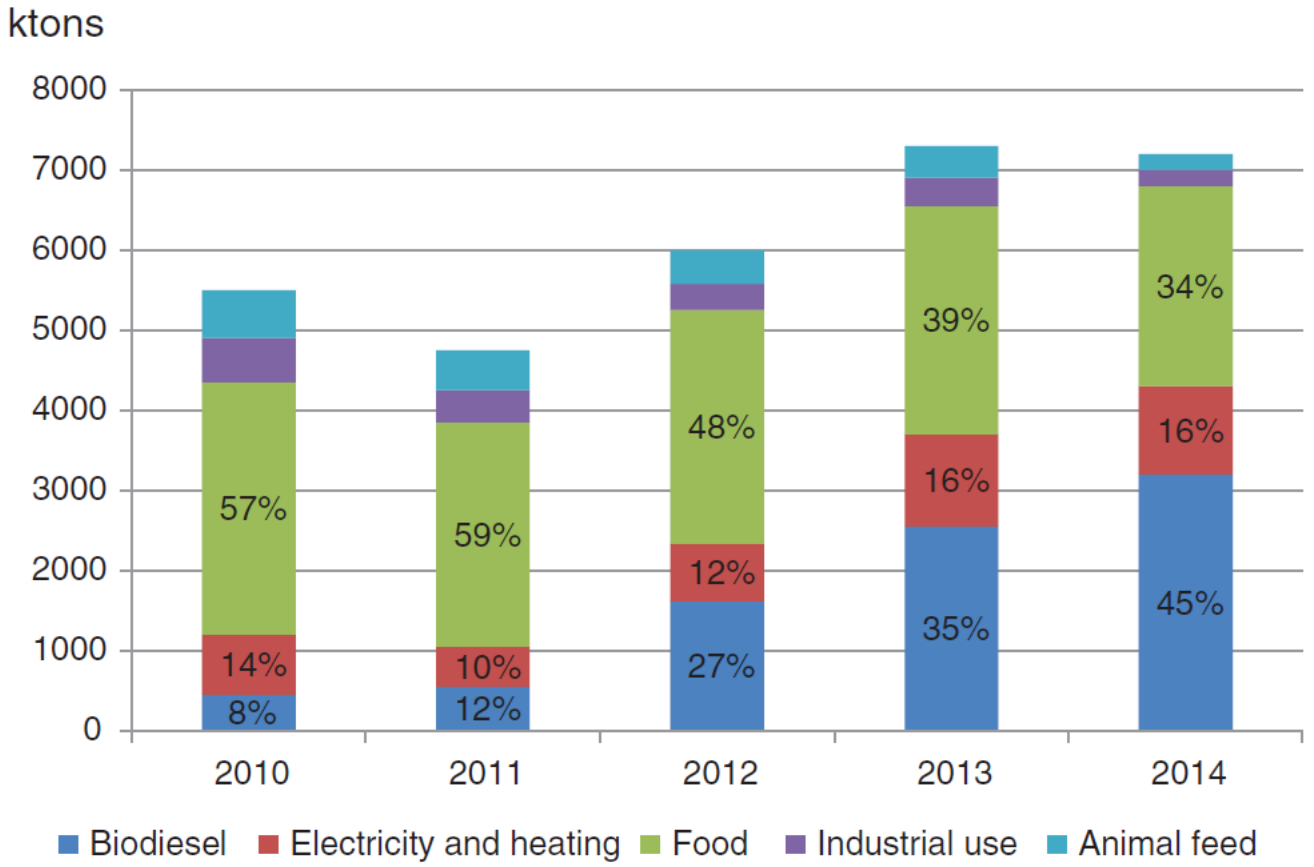

Figure 9. Palm oil consumption in the EU. Data were obtained from.[29,43]

Source: Proskurina, Junginger et al. BioFPR, 2018 DOI: 10.1002/bbb.1858 *All numbers in ktonnes*

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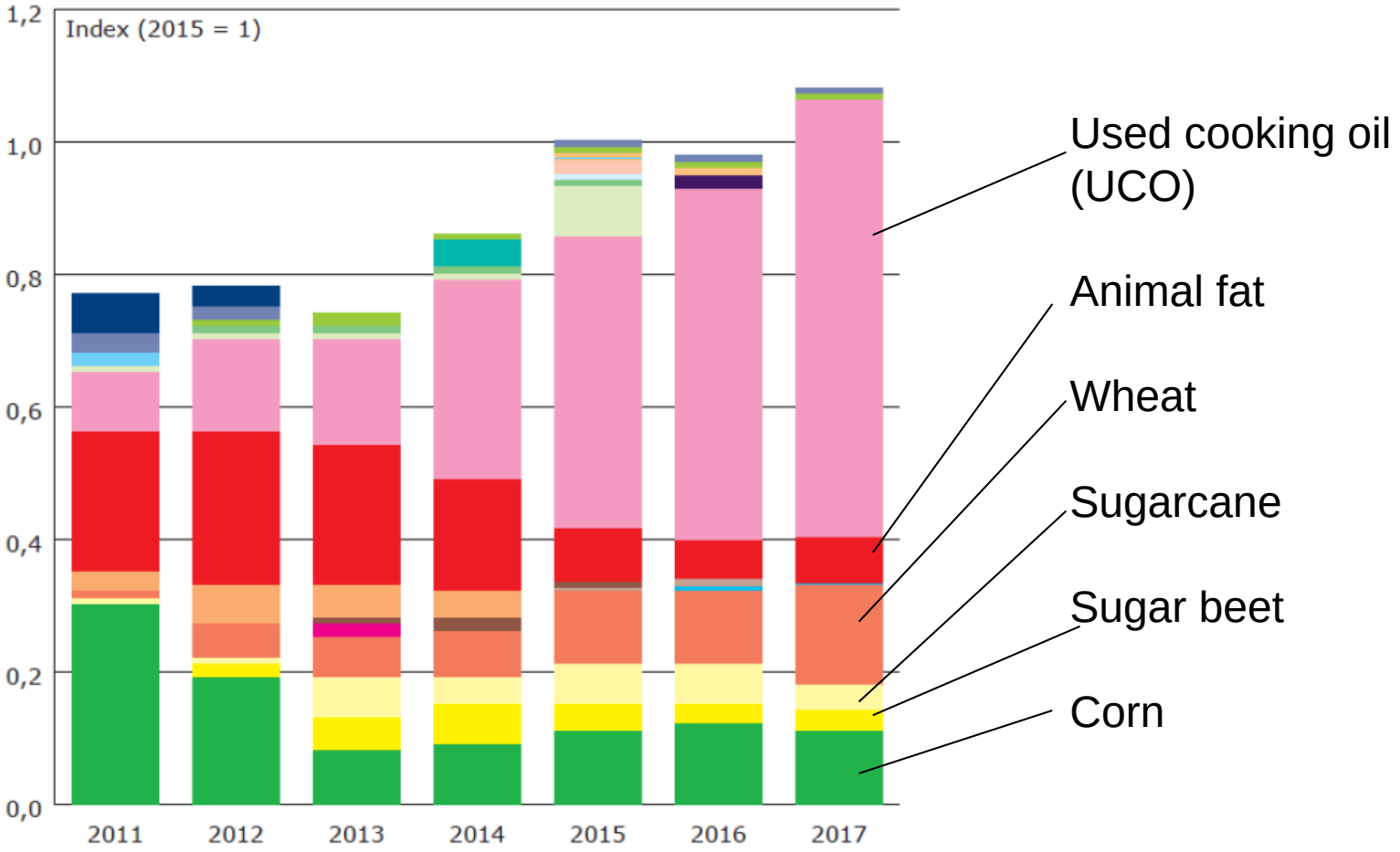
Liquid transport fuel use in NL

(based on physical energy content)



Source: Rapportage Energie voor Vervoer 2017, 18 juni 2018, NeA

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Summary & final remarks

- Global trade of both solid and liquid biomass has been increasing strongly in the past two decades
- Nowadays, approximately 2% of all bioenergy consumed is traded internationally – but in some countries, the share of imported biomass is much higher
- Demand is almost always triggered by policy incentives – and thus subject to fluctuations
- Trade is expected to grow further with increasing demand for biomass in industrialized countries
- Sustainability is both major driver and major concern – more this afternoon

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Panel debate

Question 1: For the next decade,

What will be the major exporting countries in the East and South East Asian region?

What type of solid and/or liquid biomass will they export?

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Panel debate

Question 2: For the next decade:

What will be the major countries exporting to the East and South East Asian region?

What type of solid and/or liquid biomass will they import?

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Question 3: What will be the main drivers for these developments? Mainly national support schemes as part of climate change mitigation policies, or also other drivers?

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Question 4: What will be the main barriers: Costs/competition with fossil fuels? Logistic constraints/mobilization of biomass? Sustainability concerns/legislation? Others?