



Sustainable supply chains for the bioeconomy

Prof. Dr. Martin Junginger
Workshop the bioeconomy in the Netherlands –
Valorisation from biomass to high-end products,
5.September 2018, Tokyo

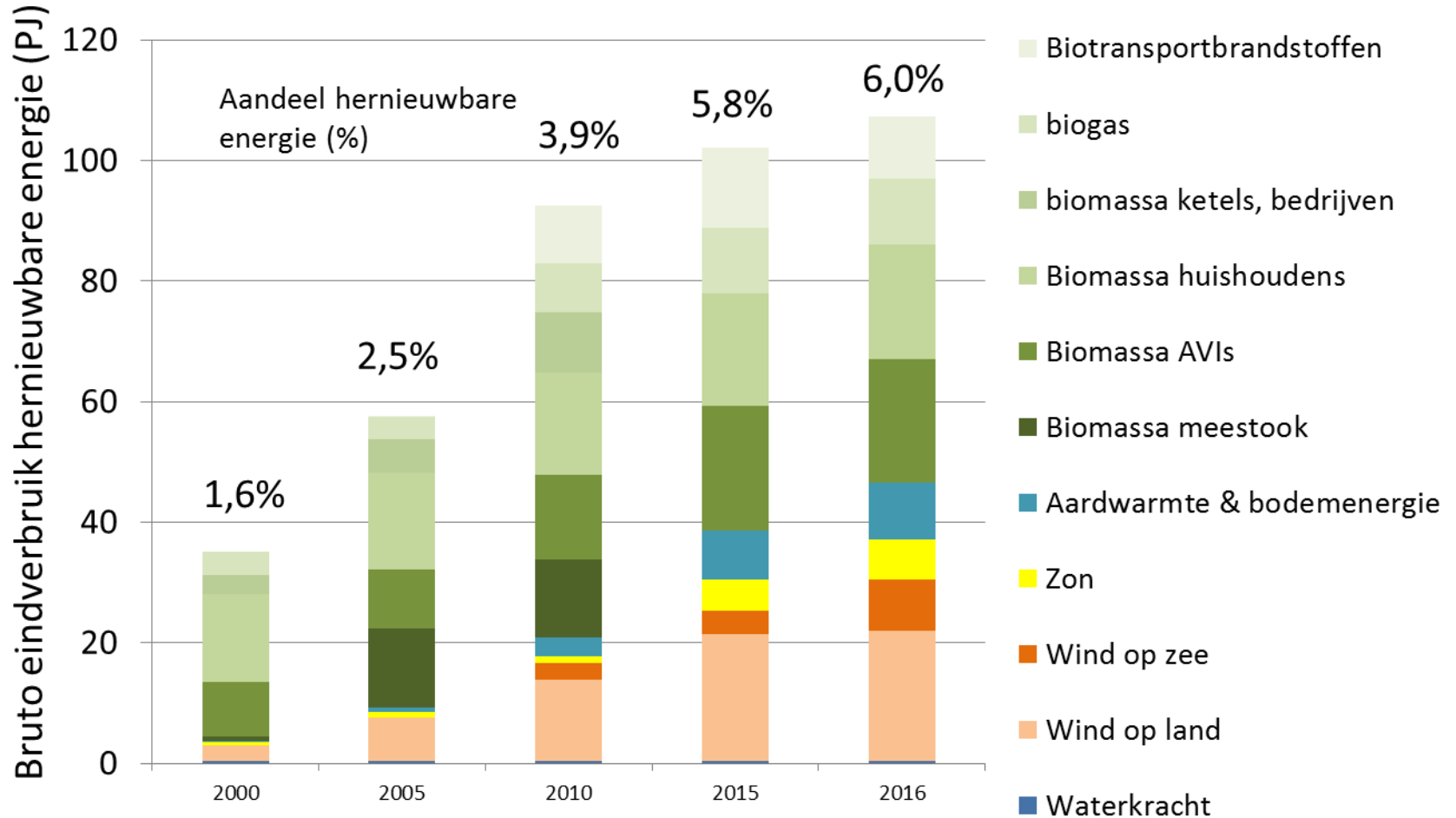


Overview

- Current status of the Dutch renewable energy targets and the Dutch BBE
- Use of solid and liquid biomass for energy and sustainability requirements
- Future outlook



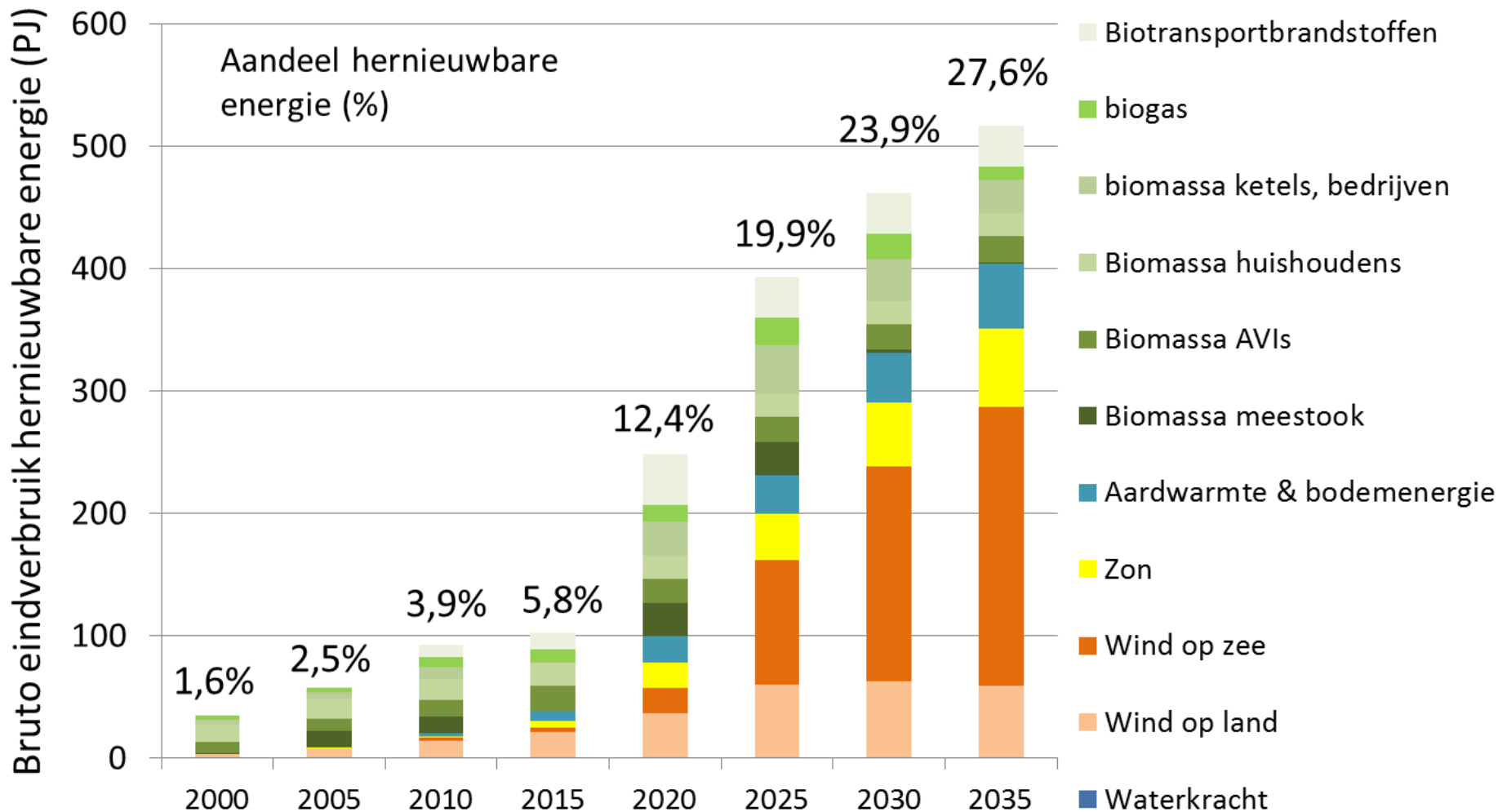
Renewable energy in NL



Bron: Nationale Energieverkenningen / ECN, 2017. Met dank aan Marc Londo



Projection till 2035

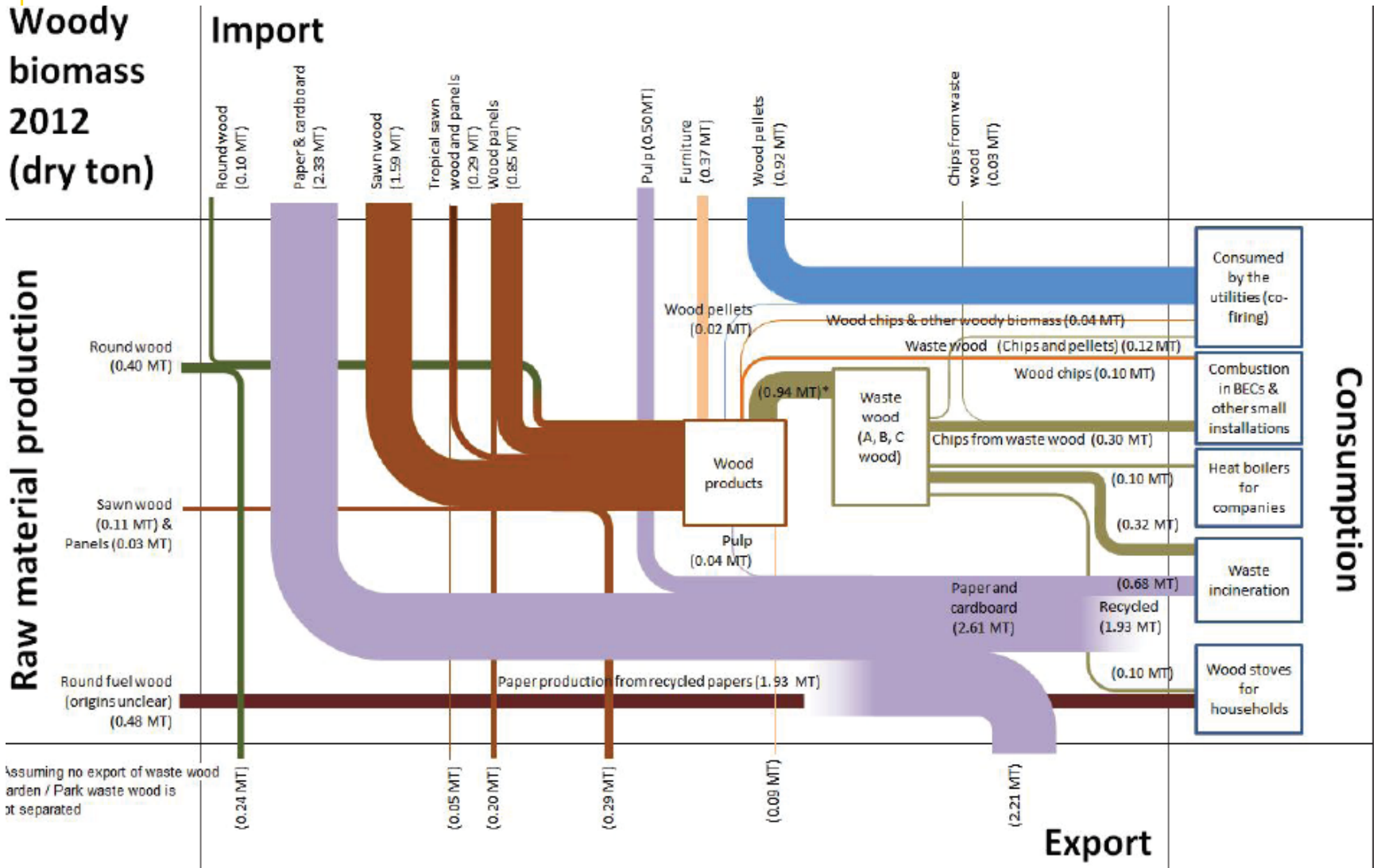


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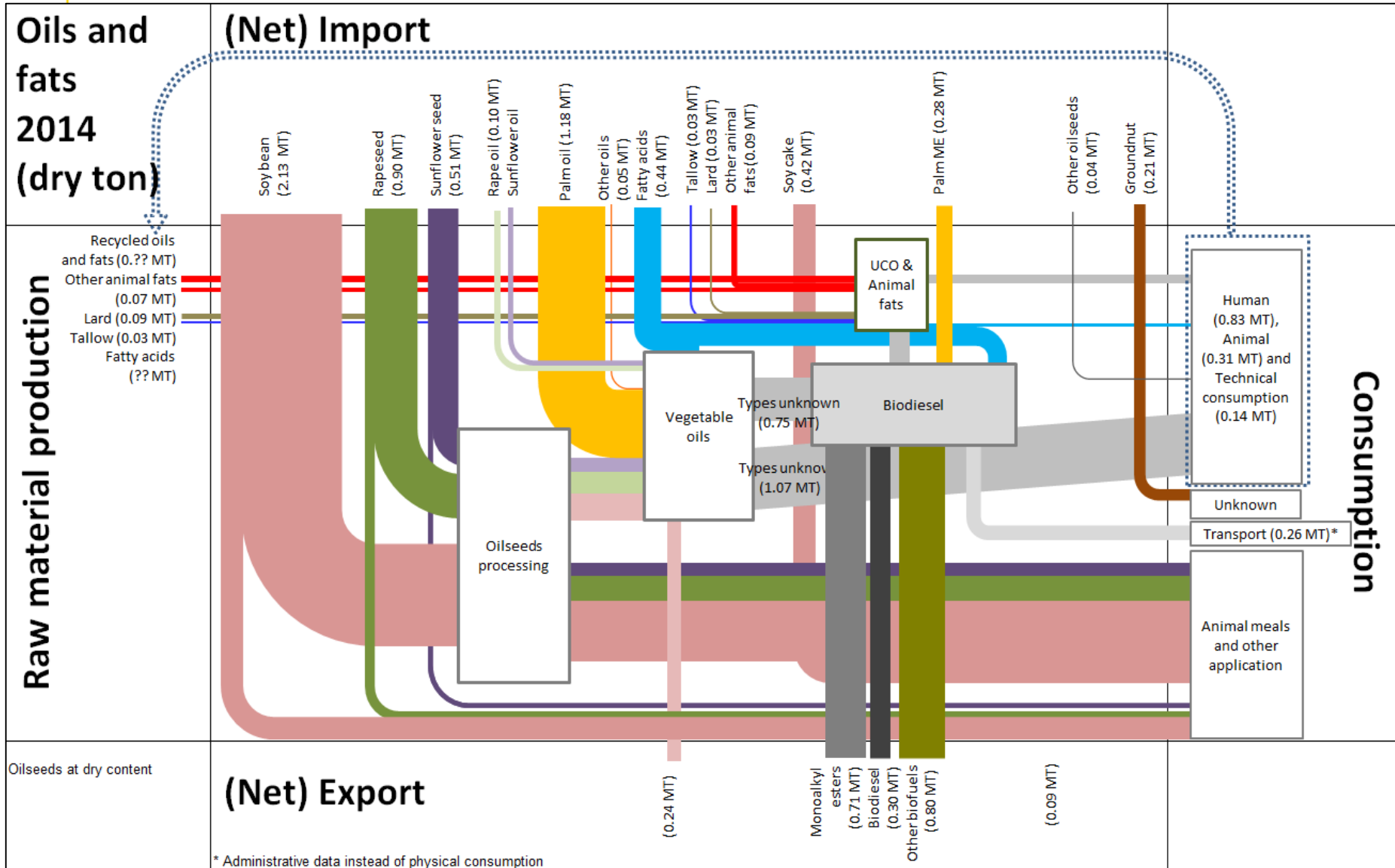
The Dutch Biobased Economy

Woody biomass 2012 (dry ton)





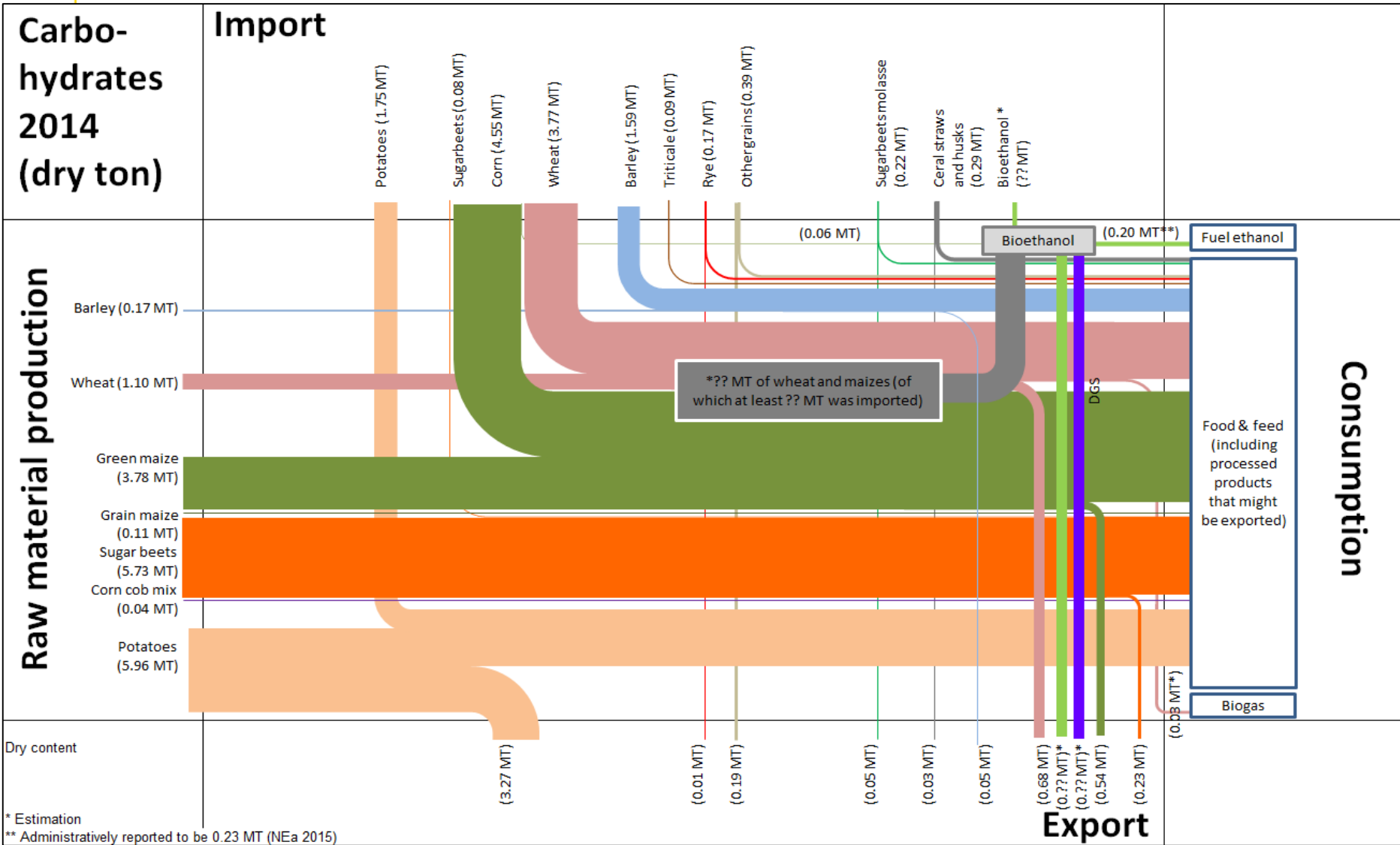
The Dutch Bio(based) Economy



* Administrative data instead of physical consumption

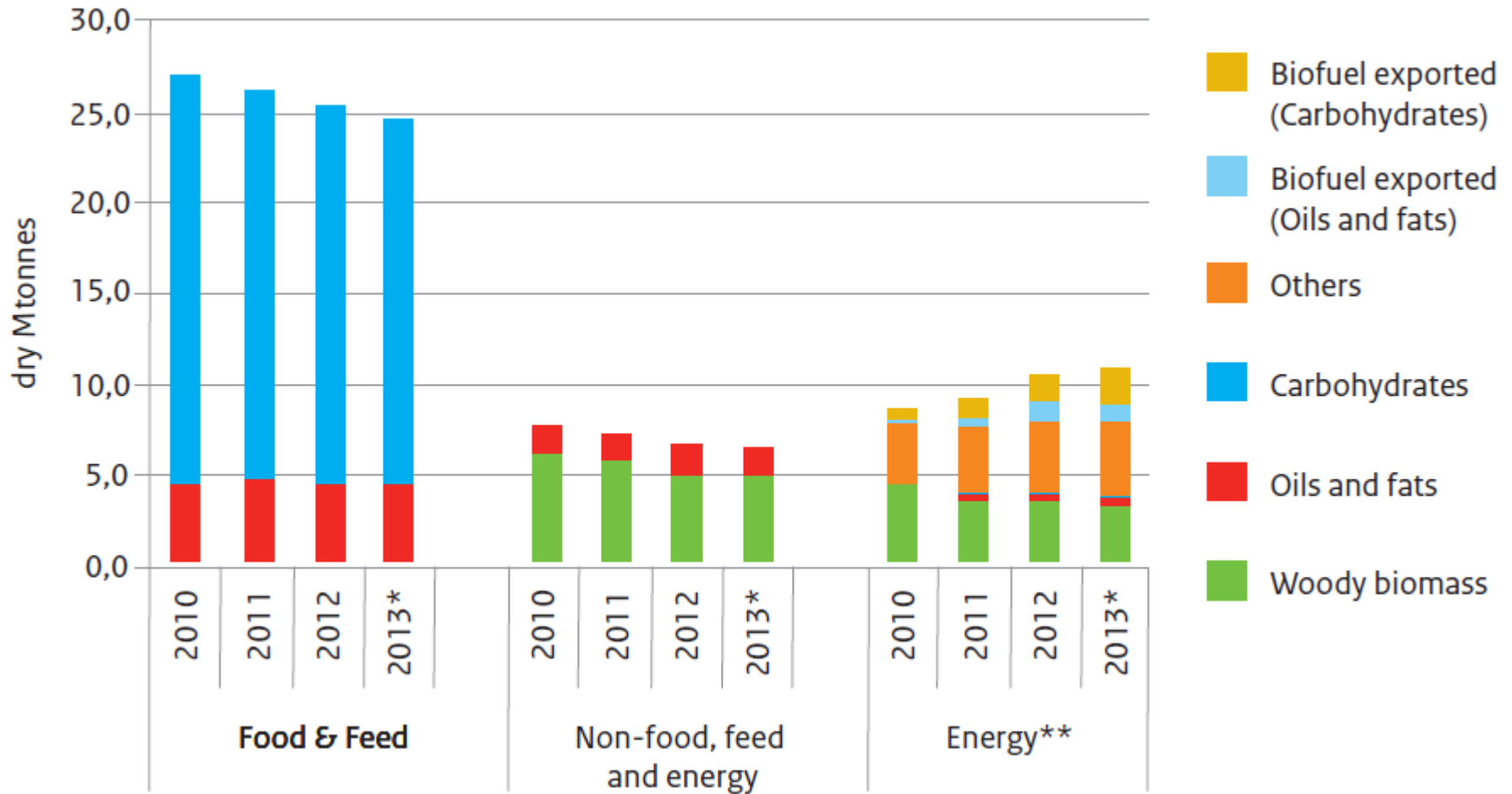


The Dutch Bio(based) Economy





The Dutch Bio(based) Economy





Origin and end use of biomass

- Domestic Dutch biomass potential is limited, and almost fully utilized
- Additional growth in MSW combustion unlikely, also small scale domestic use under pressure (finedust emissions)
- For 2018-2024, about 3 million tonnes of wood pellets (and some agri-residues) is expected to replace coal in coal power plants, almost 100% from imports, domestic sustainability criteria
- Use of conventional, waste-based and advanced biofuels for transport, >80% from imports, EU sustainability criteria



Past solid biomass use in coal power plants

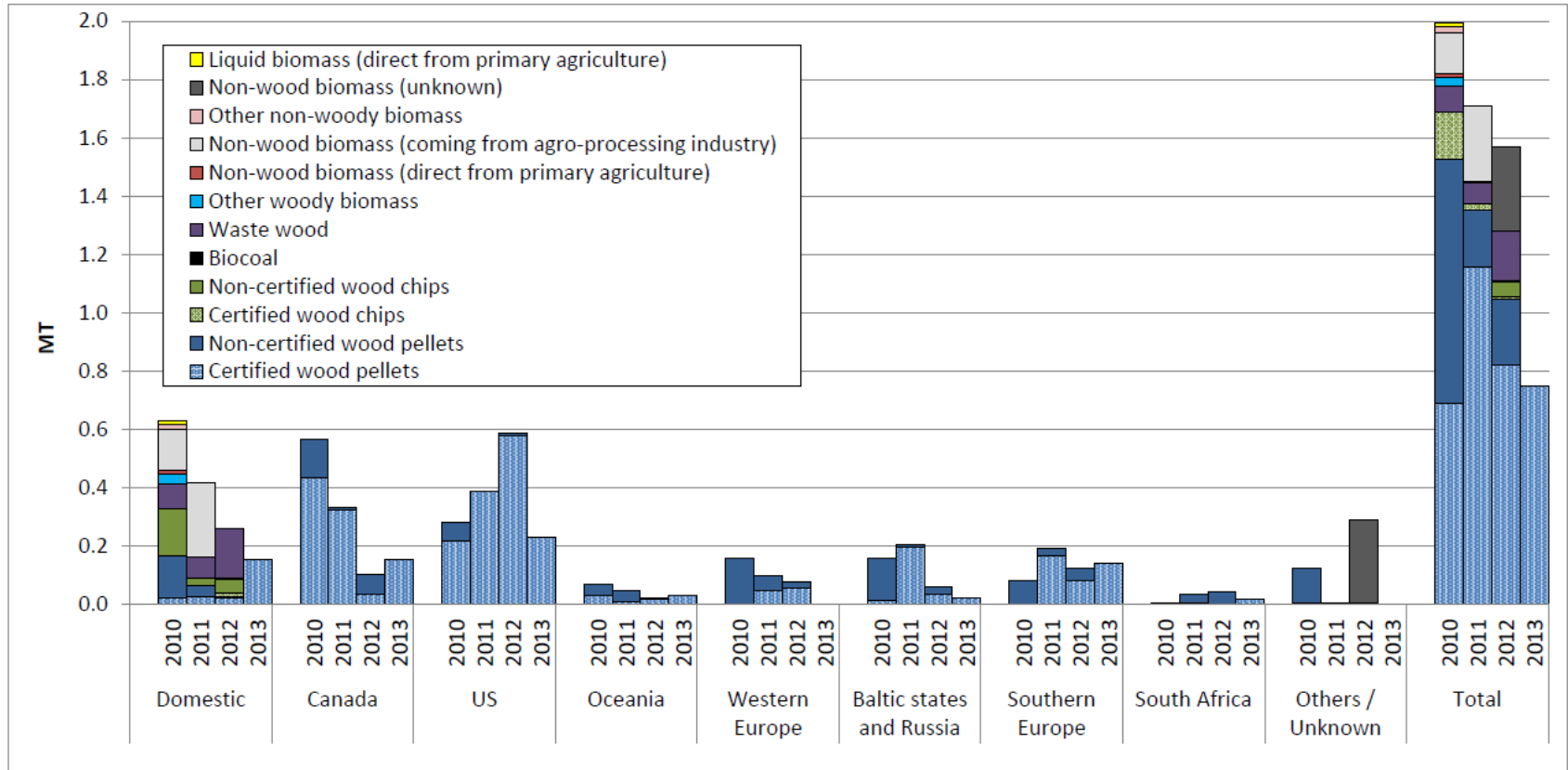


Figure 3-2 Biomass co-fired by the Dutch utilities in 2010 -2013*

Source: Task 40 country report 2014



<i>Legend</i>	✓	Covered in the legislation
	±	Partly covered in the legislation
	→	Plans to be covered in the future
	✗	Not covered in legislation

Sustainability Requirements for solid biomass

	RO, RHI, CfDs - UK	GCs - BE	IA - DK	SDE+ NL
I. Strictness of legislation	Legally binding	Legally binding	Voluntary	Legally binding (when implemented)
II. Timeline of implementation	End of 2015	Already implemented	2016	2018
III. Sustainability Criteria Coverage				
A. Greenhouse Gas Emission	✓	✓	✓	✓
B. Land Use:				
B1. Sustainable Forest Management:				
<i>Legal, sustainable sourcing</i>	✓	±	✓	✓
<i>Forest productivity & well-functioning</i>	✓	✗	✓	✓
<i>Biodiversity protection</i>	✓	✗	✓	✓
<i>Ecosystems conservation</i>	✓	✗	✓	✓

Legend

- ✓ Covered in the legislation
- ± Partly covered in the legislation
- Plans to be covered in the future
- × Not covered in legislation

National Incentive Schemes for Solid Biomass (continued)

	RO, RHI, CfDs - UK	GCs - BE	IA - DK	SDE+ NL
B2. Land criteria	✓	×	×	✓
B3. iLUC	×	×	→	✓
C. Other sustainability requirements				
C1. Fuel classification	✓	±	→	✓
C2. Carbon debt	×	→	→	✓
C3. Compliance with laws & local rights	✓	±	✓	✓
C4. Chain of Custody	✓	±	✓	✓
C5. Mass balance	✓	✓	→	✓
C6. Cascading use of biomass	×	→	→	→
C7. Feedstock competition prevention	×	±	±	✓
IV. Recognition of other voluntary international schemes	✓	±	✓	→
	(FSC, PEFC, SBP)	(FSC, PEFC)	(FSC, PEFC, SBP)	To be identified



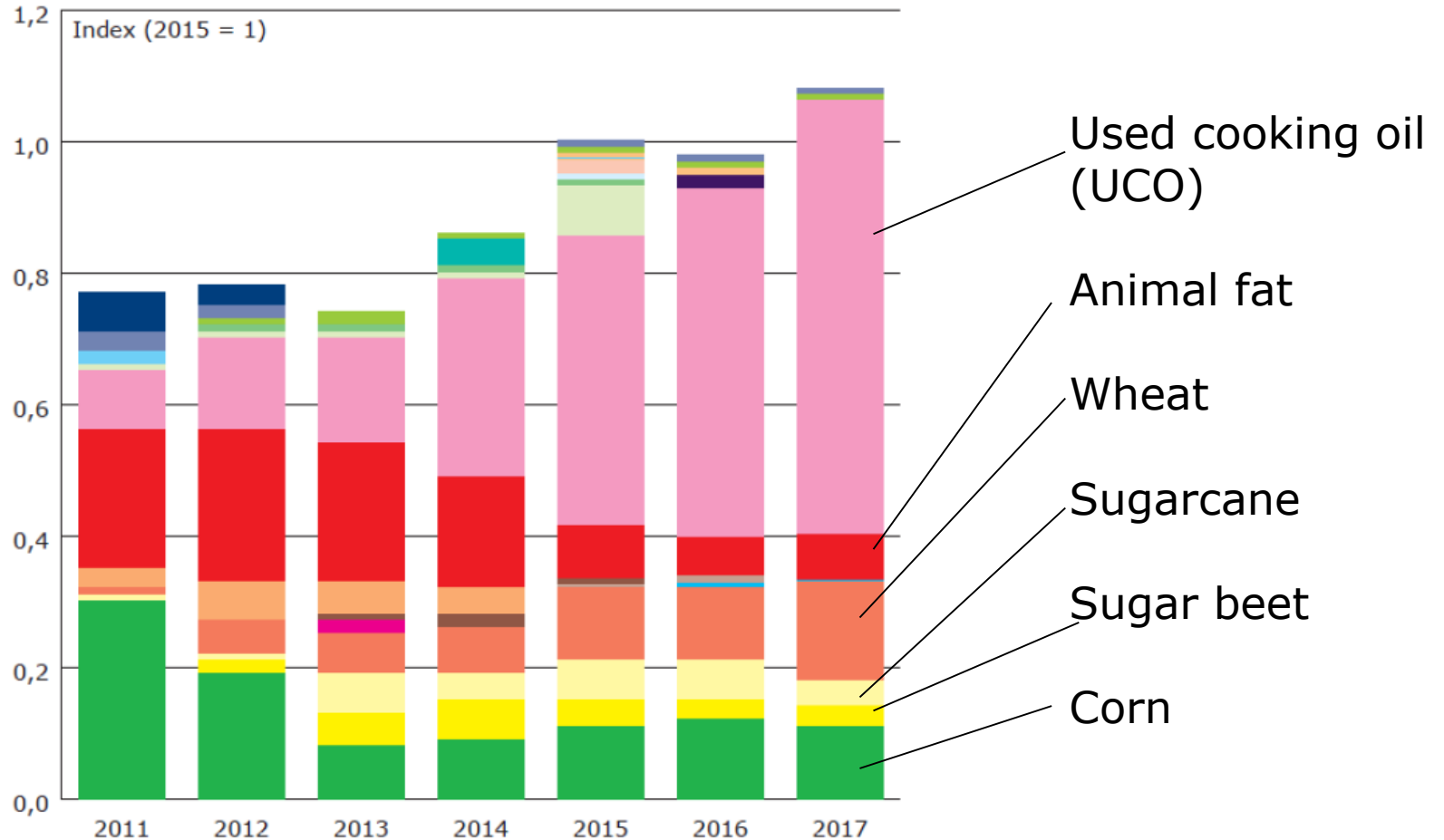
Liquid transport fuel use

- All liquid biofuels need to comply with RED-I sustainability criteria
- In 2017, 100% of liquid biofuel use was ISCC certified
- The very dominant use of UCO would ideally imply a very low sustainability risk, but fraud is occasionally reported
- Global UCO potential is limited and demand is further increasing



Liquid transport fuel use

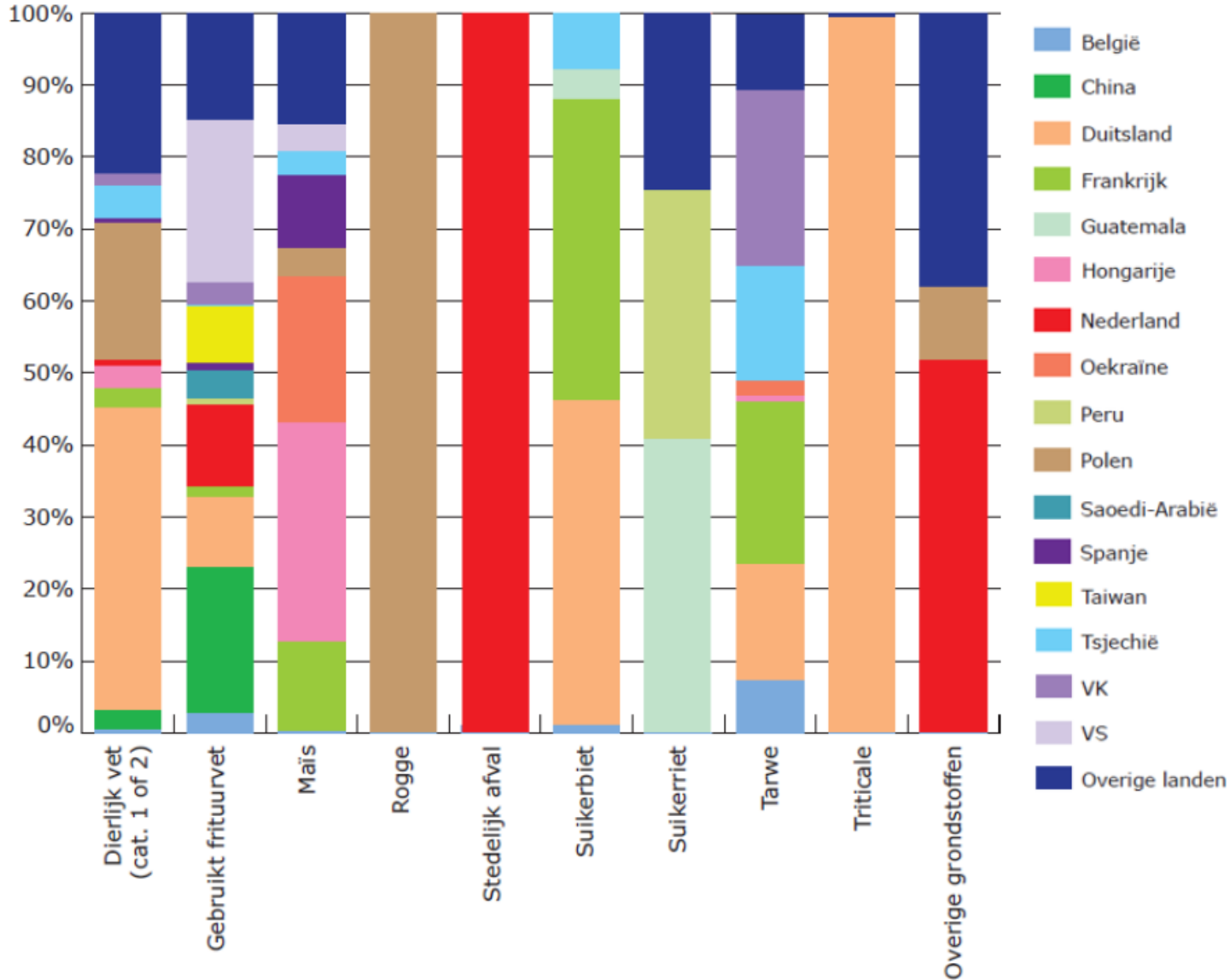
(based on physical energy content)



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

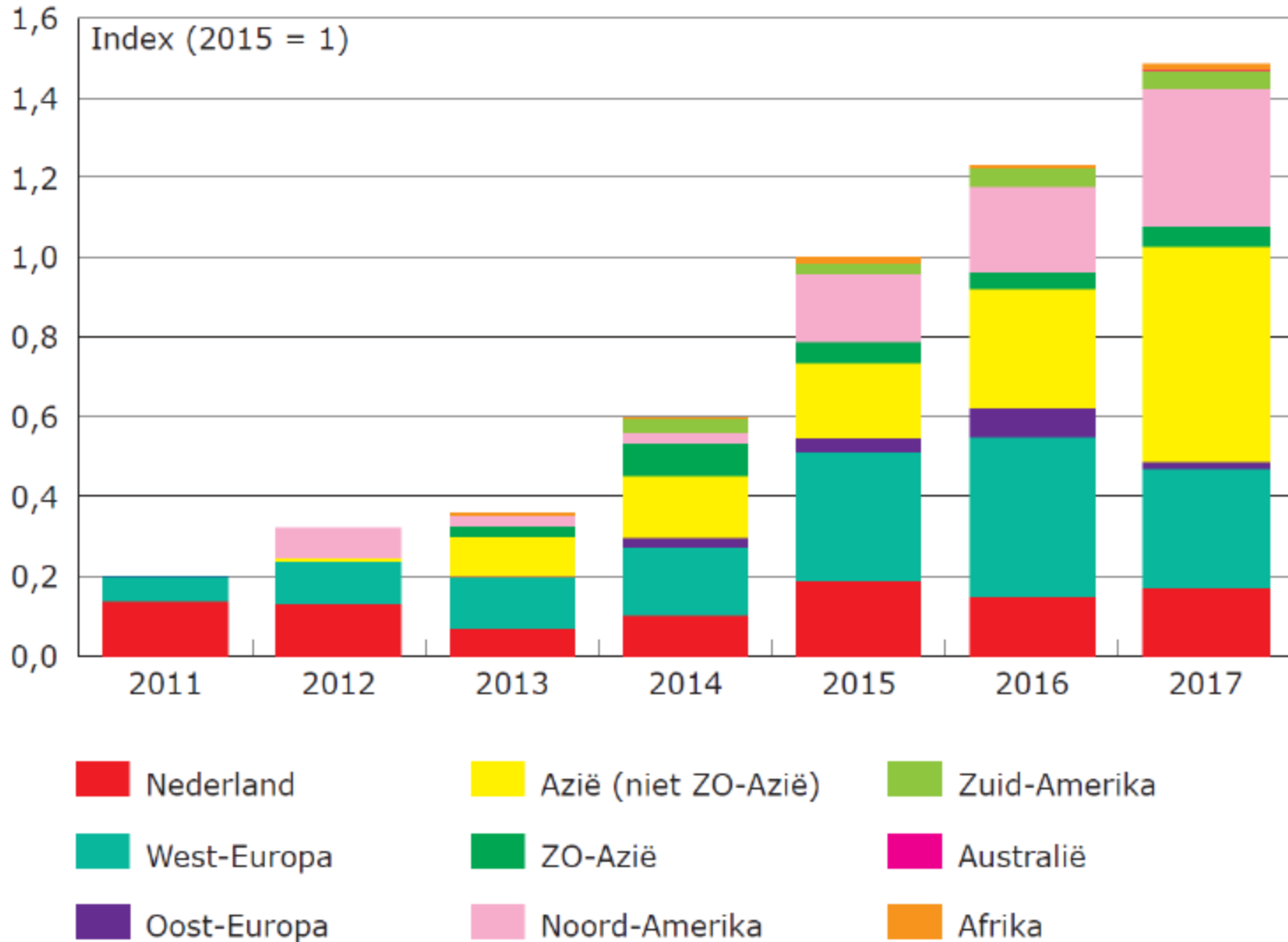


Liquid transport fuel use - origin





UCO origin



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



RED-I

RED-II

(proposal, winter pack.)

Targets

- 10% biofuels in 2020, *applying to each MS*
- 0.5% voluntary target advanced biofuels

- 1.7→6.8% for cat. 1-5 fuels, *applying EU-wide*
- Subtarget: 0.5→3.6% for cat-1 (advanced) biofuels)

Caps

- 7% on food-based biofuels

- 7.0→3.8% for cat-6 (food-based) biofuels
- 1.7% for cat-2 fuels

Sectors

(In the nominator)

- Road and rail

- Road, rail
- Aviation and marine with a 1.2 multiplier

GHG threshold

- - 50%
- - 60% post 2015 installations
- Fossil fuel: 83.8 CO_{2eq}/MJ

- -50% for pre-2015,
- -60% for post 2015
- -70% for post 2021
- Fossil fuel: 94 CO_{2eq}/MJ *(iLUC factors remain the same)*



Targets

RED-II (proposal 2016)

- 1.7→6.8% for cat. 1-5 fuels, *applying EU-wide*
- Subtarget: 0.5→3.6% for cat-1 (advanced) biofuels)

RED-II (agreement 14 June)

- 14% RES in transport by 2030
- Subtarget: 0.2% 2022 →3.5% 2030 for cat-1 (advanced) biofuels)

Caps

- 7.0→3.8% for cat-6 (food-based) biofuels
- 1.7% for cat-2 fuels

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- 1.7% for cat-2 fuels
- Palm oil frozen at 2019 levels, phase out 2023-2030

Sectors

(In the nominator)

- Road, rail
- Aviation and marine with a 1.2 multiplier

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- Aviation and marine with a 1.2 multiplier
- EV: 4.0, RES-e in trains: 1.5%

GHG threshold

- -50% for pre-2015,
- -60% for post 2015
- -70% for post 2021

- -50% for pre-2015,
- -60% for post 2015
- -65% for post 2021



Bioenergy within the clean energy package

- GHG savings criteria for electricity/heating/cooling from biomass: 70% (after 2021), 80% (after 2026)
- **Exemptions to sustainability criteria:**
 - Waste & Industrial residues – only GHG criteria
 - Installations below 20 MW (solid biomass fuels) and 2 MW (gaseous biomass fuels) unless member states decide otherwise
- **RES-E installations only to be accounted to the targets and supports if:**
 - Not using fossil fuels as a main fuel
 - 50 – 100 MW: meeting Best Available technology associated energy efficiency levels or using Biomass CCS
 - Above 100 MW: min. electrical efficiency of 36% or applying Biomass CCS



Forest biomass

- Legality of harvesting operations
- Forest regeneration of harvested areas
- Areas designated by law for nature protection purposes including wetlands/peatlands are protected
- Minimize negative impacts on soil quality and biodiversity
- Long-term production capacity of forests is maintained or improved
- LULUCF criteria
- **Risk based approach:**
 - a) **Sustainability criteria are in place and enforced at national level**
 - b) **If not, sustainability criteria have to be ensured at sourcing level**



Outlook

- Next to renewable energy targets, several plans have been announced to build lignocellulosic biorefineries for bioplastics & advanced biofuels
- this could lead to another 3-4 million tonnes of wood demand in the next ≥ 5 years
- No sustainability requirements yet for biochemicals / materials
- To meet Dutch climate mitigation targets, on the long term, 130-200 PJ imports are likely required (amongst others for BECCS)
- \Rightarrow Securing substantial **&** sustainable biomass imports will be a key priority & preconditions for further expanding the Dutch bioeconomy



Thank you for your attention!

Questions?