GCIRC technical meeting 2017

8th – 11th May 2017 - Malmö

„Global Biodiesel – Current Situation and Perspectives“

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Outline

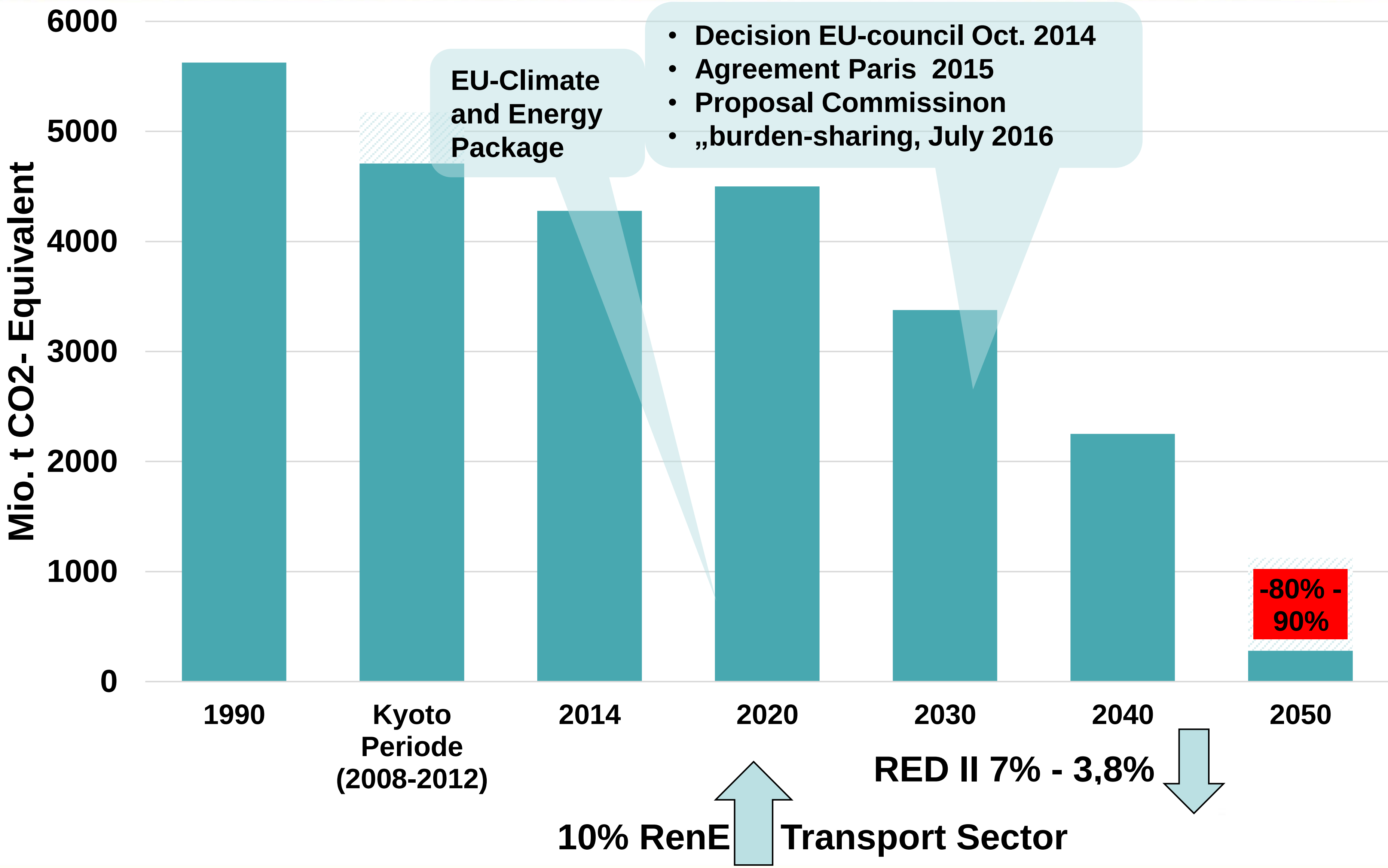
1. *Introduction:*
   - COP 21 GHG-reduction targets => driving force for decarbonisation strategies

2. *Biodiesel production:* - global / EU
   - raw material composition
   - market distortions
   - mandates

3. *„Barriers“ and „Options“ for using biodiesel / veg. Oil:*
   - warranties
   - quality requirements / emission regulations
   - HVO/co-processing

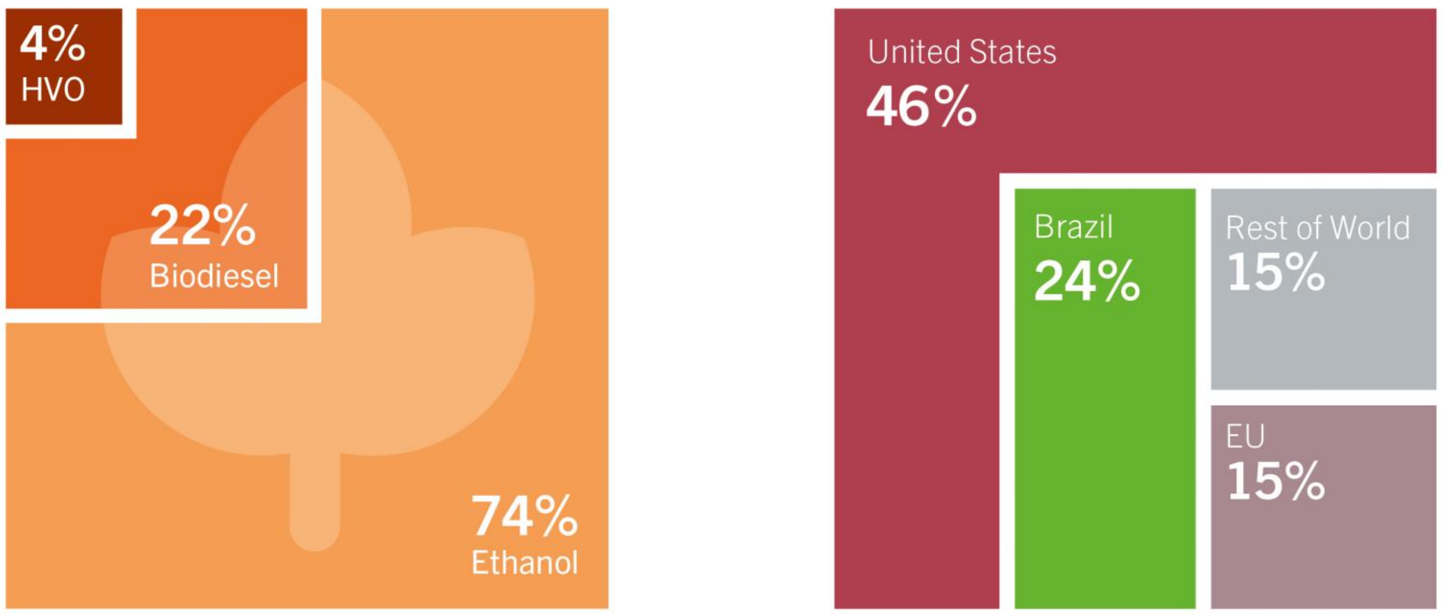
4. *Conclusion / Outlook*

GHG reduction targets / EU 1990 - 2050



Source: European Environment Agency, 2016

Biofuels Global Production, Shares by Type and by Country/Region, 2015



BIODIESEL: World Production by Country (Mn T)

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	2012	2013	2014	2015	2016F
EU-28	9.66	10.60	12.00*	11.60*	11.50*
U.S.A.	3.50	4.72	4.80	4.90*	5.25*
Argentina	2.46	2.00	2.58	1.90*	2.05*
Brazil	2.39	2.56	3.00	3.48*	3.96*
Colombia	.49	.50	.52	51*	.54*
Singapore	.73	.79	.74	72*	.77*
Indonesia	1.91	2.60	2.86	1.60*	2.55*
Malaysia	.25*	.47	.62	.77*	.70*
Thailand	.92*	.95	.98	.92*	.94*
Oth.ctries.	2.20	2.66*	2.94*	2.80*	2.84*
Total	24.51	27.85	31.04	29.20*	31.10*

Source: Oil World, 12/2015

Feedstock use worldwide for Biodiesel

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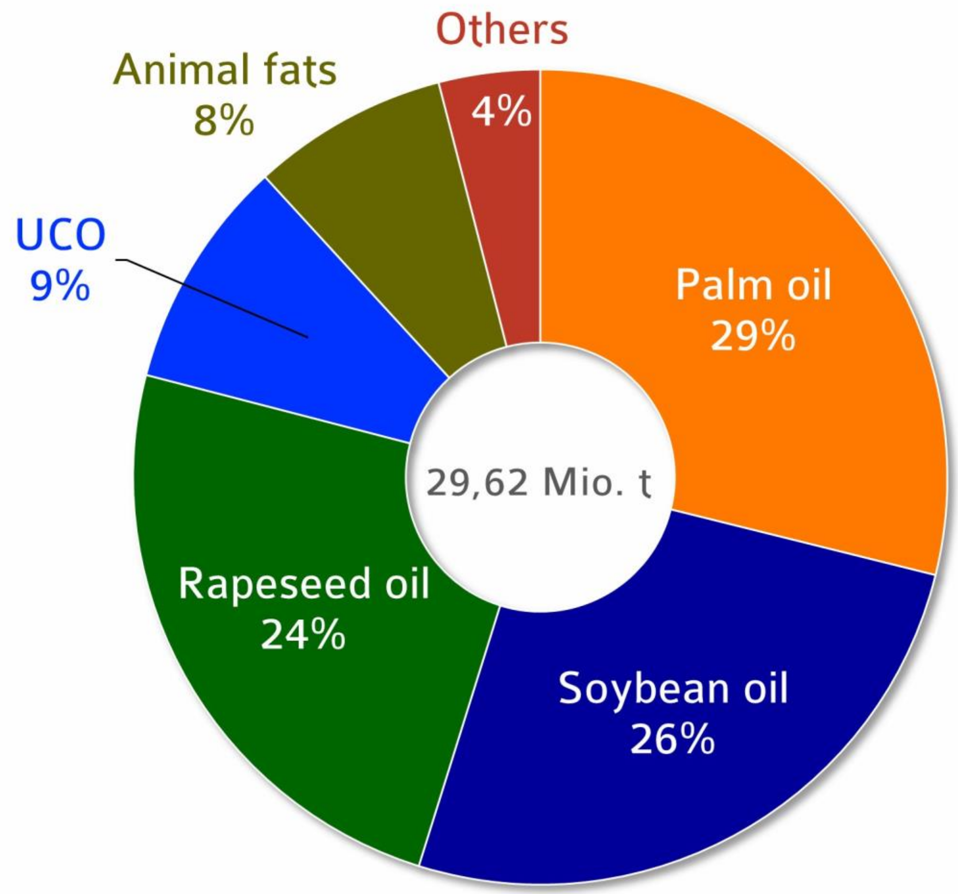
Feedstock use for biodiesel production, worldwide, 2015, in %



UCO = Used cooking oil

Source: Oil World

BIODIESEL: EU 28 by Country (Mn T)

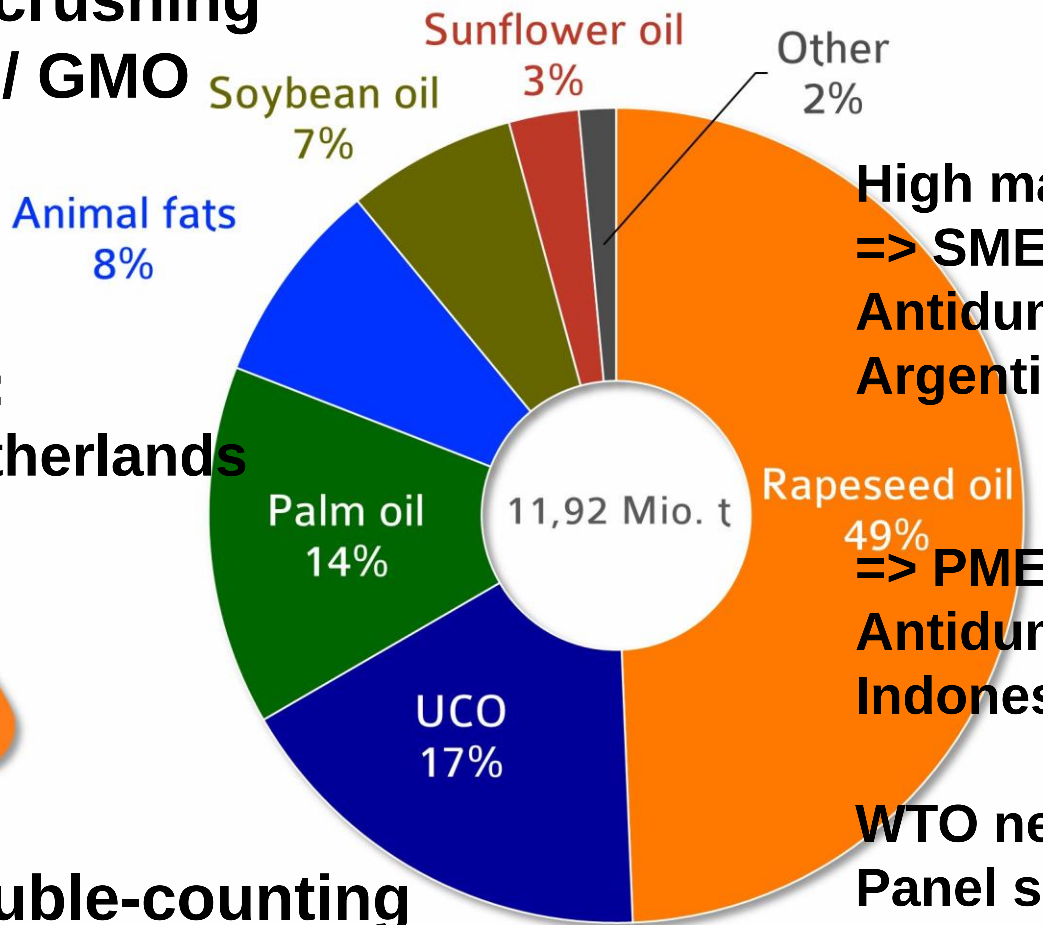
	2012	2013	2014	2015	2016F
France	2.08	2.11*	2.05*	2.10*	2.05*
Germany	2.63	2.73*	3.00*	2.85*	2.87*
Italy	.45	.62	1.00*	.92*	.88*
Poland	.54	.55	.54*	.52*	.52*
Spain	.52	.73*	1.14*	1.12*	1.10*
Austria	.35	.35*	.36*	.35*	.35*
Belgium	.40	.42*	.47*	.42*	.42*
Netherlands	.80	1.10	1.35*	1.30*	1.30*
Finland	.20	.25*	.19*	.20*	.20*
U.K.	.33	.36	.41*	.42*	.41*
Portugal	.31	.29*	.32*	.30*	.30*
Czech Rep.	.17	.19	.23*	.18*	.18*
Other EU	.88	.90*	.94*	.92*	.92*
EU-28	9.66	10.60	12.00*	11.60*	11.50*

Source: Oil World, 12/2015

Feedstock use in Biodiesel in the EU-28

Feedstock use for biodiesel production in the EU-28, 2015, in %

Soybean crushing
Germany / GMO



High market share of RME?
=> SME:
Antidumping duties
Argentina

Neste/HVO:
Finland/Netherlands

=> PME:
Antidumping duties
Indonesia

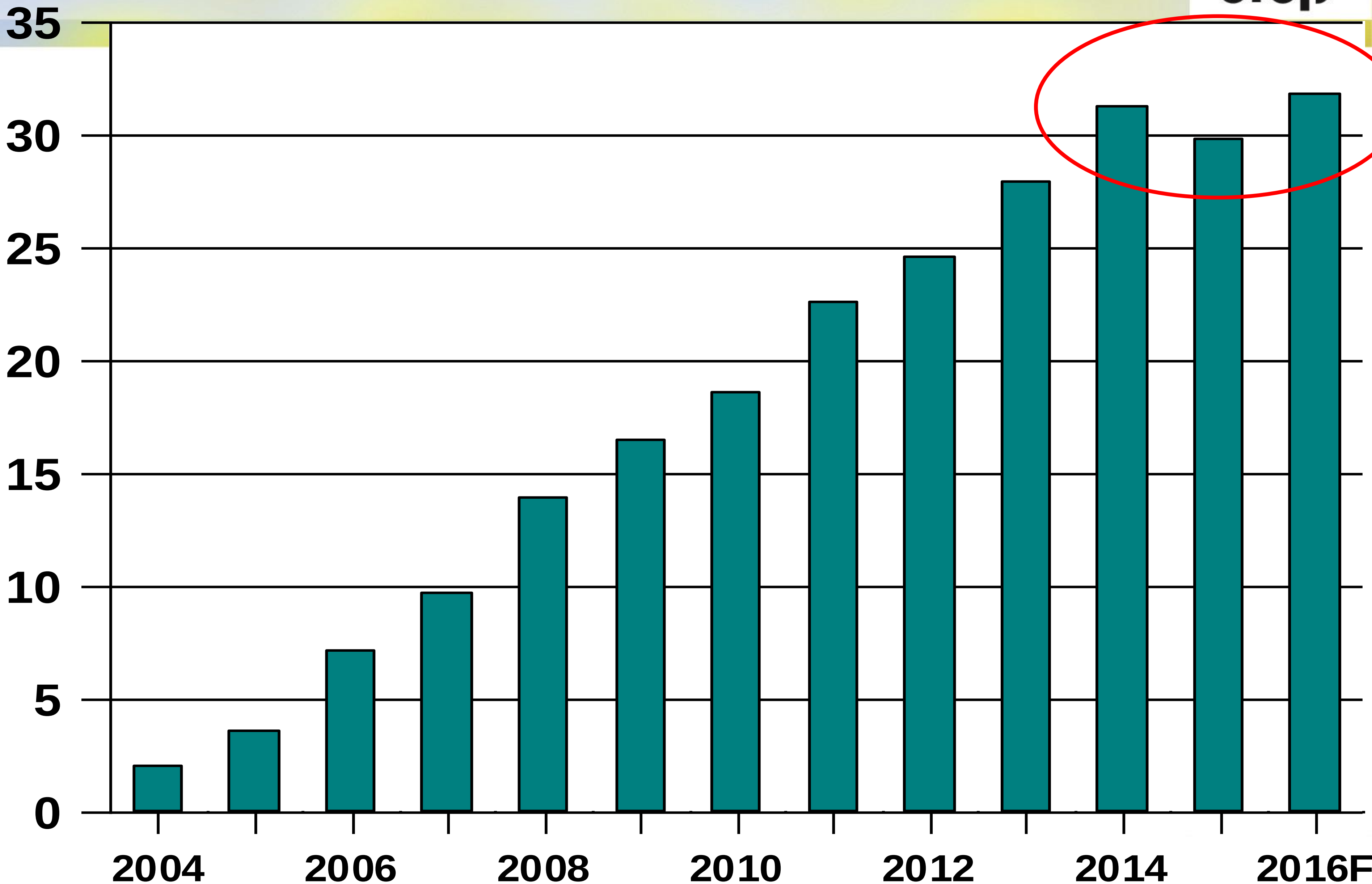
WTO negotiation / dispute
Panel still ongoing
- ending end of 2017?!

Double-counting
GHG reduction advantage

UCO = Used cooking oil

Source: FAS

World Production of Biodiesel (Mn T)



Source: Oil World

„Segregation tendencies“

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European Union

RED I and iLUC-directive until 2020:
=> limitation 7% cap on food/feed crop based biofuels

RED II - time period 2020 to 2030:
=> no sub-target for renewable energy in transport sector
=> MS are free to „abolish“ biofuels
Currently: NGOs – bashing campaigns against palm oil
⇒ general aim to get rid of all veg. oils for energy purposes

„Rest of the World“?

- Still increasing mandates!

„Rest of the World“?

=>! Biofuel mandates*

Biofuel mandates %	2015	2016
Indonesia	15	20***
Malaysia	10 (7)	10 (7)
Argentina	10	10
Brazil	7	7 20/30**
Thailand	7	7
USA RFS Program	5.8 million tonnes	6.3 million tonnes ****

* higher outside EU
** Truck fleet test for market introduction
*** 20 % ⟶ CHP units (Industry) | **** 2017: 6.7 million tonne

Conclusions / outlook

1. COP21 – commitment - Traffic sector: GHG emissions are increasing => most important challenge (growth rates in Asia!)

2. „Segregation“ of the international development:

- European Union: ↓ => oversupply and export ↑ world market

- the Americas („by-product soy-oil“) / Asia: „reaction“ => increasing mandates

- limiting factors: missing warranties / compatibility of FAME with engine and fuel quality requiremtes (R&D challange!) alternative – HVO/co-processing

=> rape seed oil price remains under pressure!- consequences for the seed price? / competivity in cropping systems? (medium-/longterm?

3. COP21: national action plans in 2020
   - see 1. – biofuel / biodiesel option?!

Thank you for your attention!

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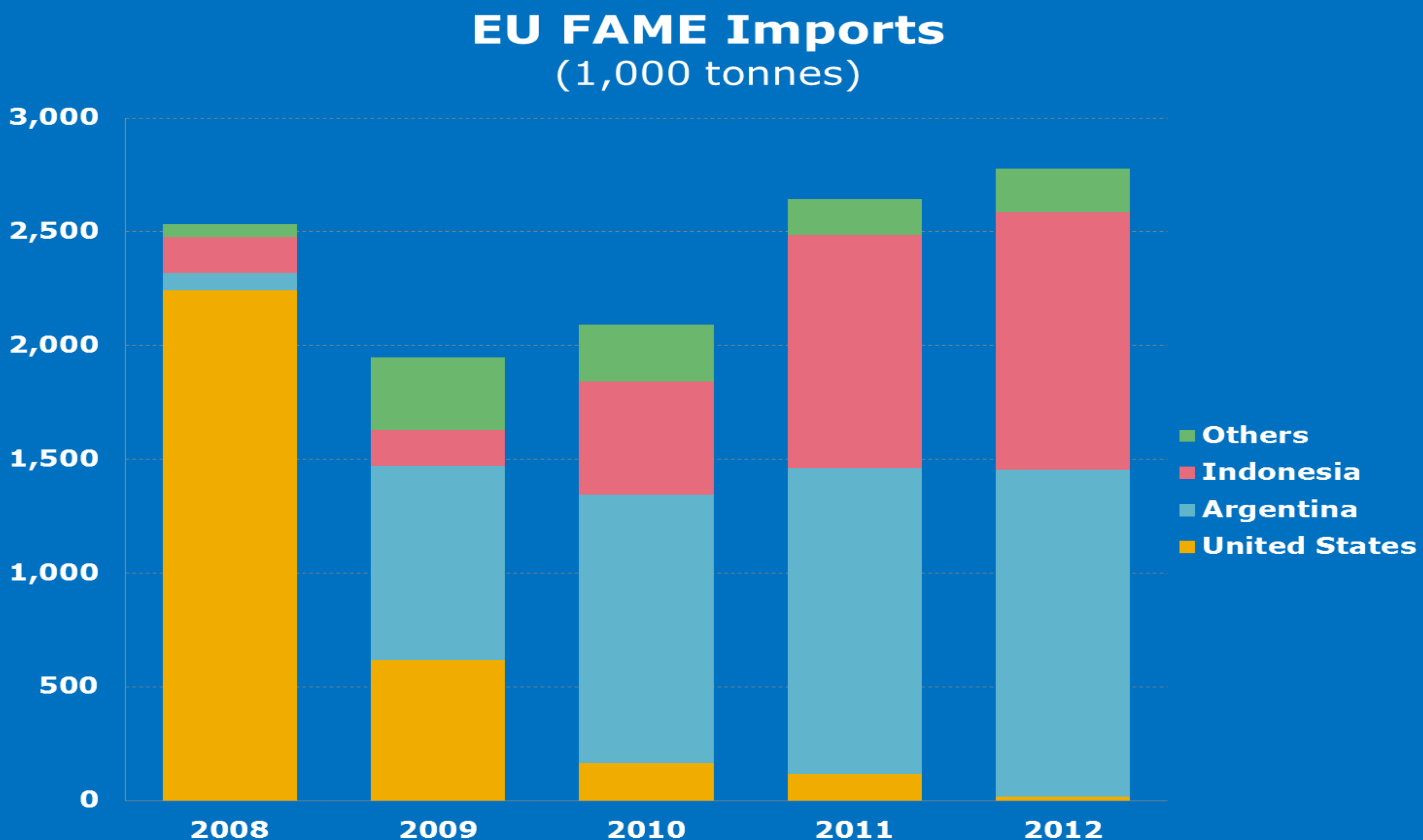
Biodiesel Imports into the EU



Quelle: F. O. Licht

Top Five Countries – Annual investment / net capacity additions / biofuel production in 2015

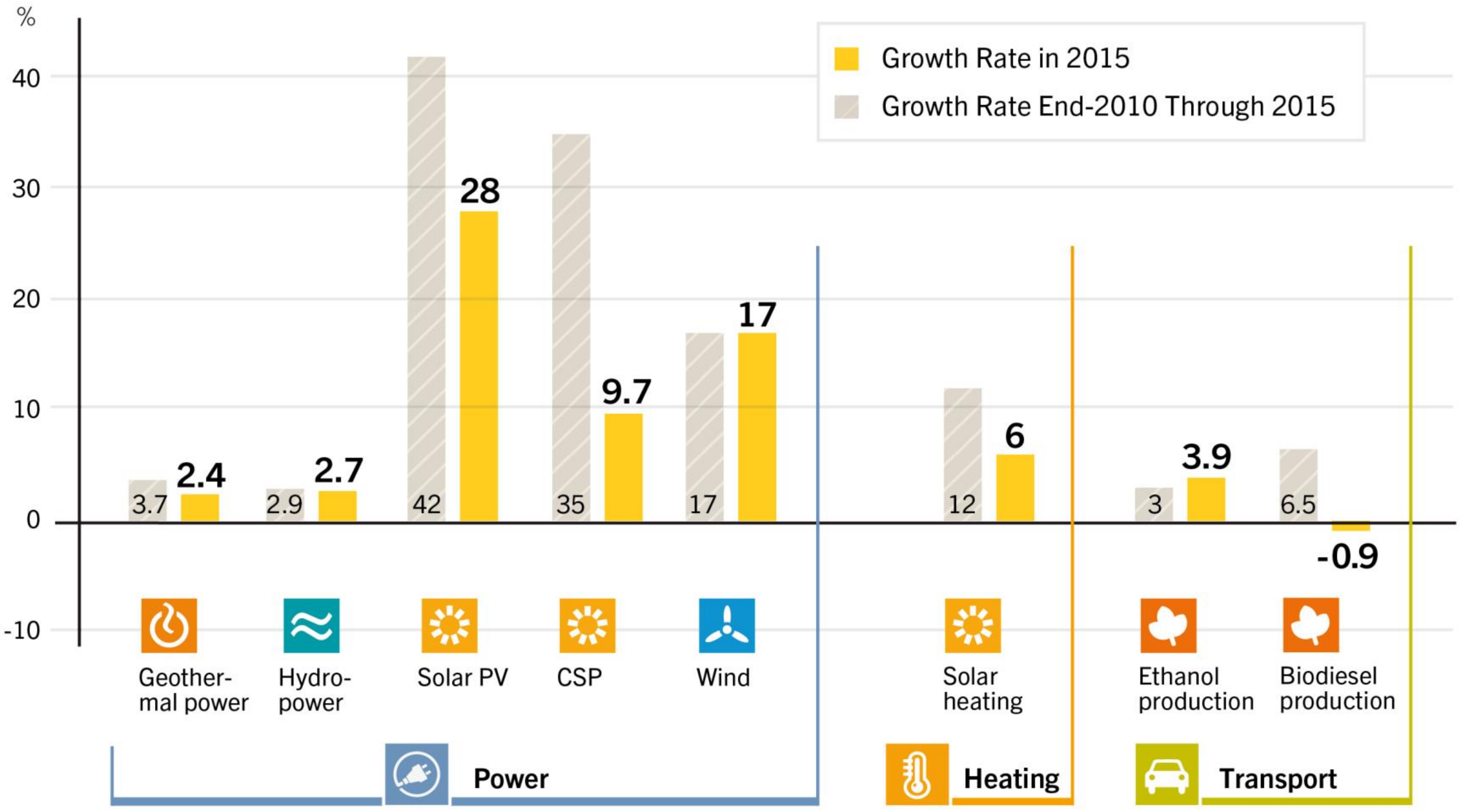
	1	2	3	4	5
Investment in renewable power and fuels (not including hydro > 50 MW)	**China**	United States	Japan	United Kingdom	India
Investment in renewable power and fuels per unit GDP	**Mauritania**	Honduras	Uruguay	Morocco	Jamaica
Geothermal power capacity	**Turkey**	United States	Mexico	Kenya	Germany/Japan
Hydropower capacity	**China**	Brazil	Turkey	India	Vietnam
Solar PV capacity	**China**	Japan	United States	United Kingdom	India
Concentrating solar thermal power (CSP) capacity	**Morocco**	South Africa	United States	–	–
Wind power capacity	**China**	United States	Germany	Brazil	India
Solar water heating capacity	**China**	Turkey	Brazil	India	United States
Biodiesel production[1]	USA	Brazil	Argent.	Indonesia	France
Ethanol production	USA	Brazil	China	Canada	Thailand

REN21 *Renewables 2016 Global Status Report*

[1]**geändert UFOP**

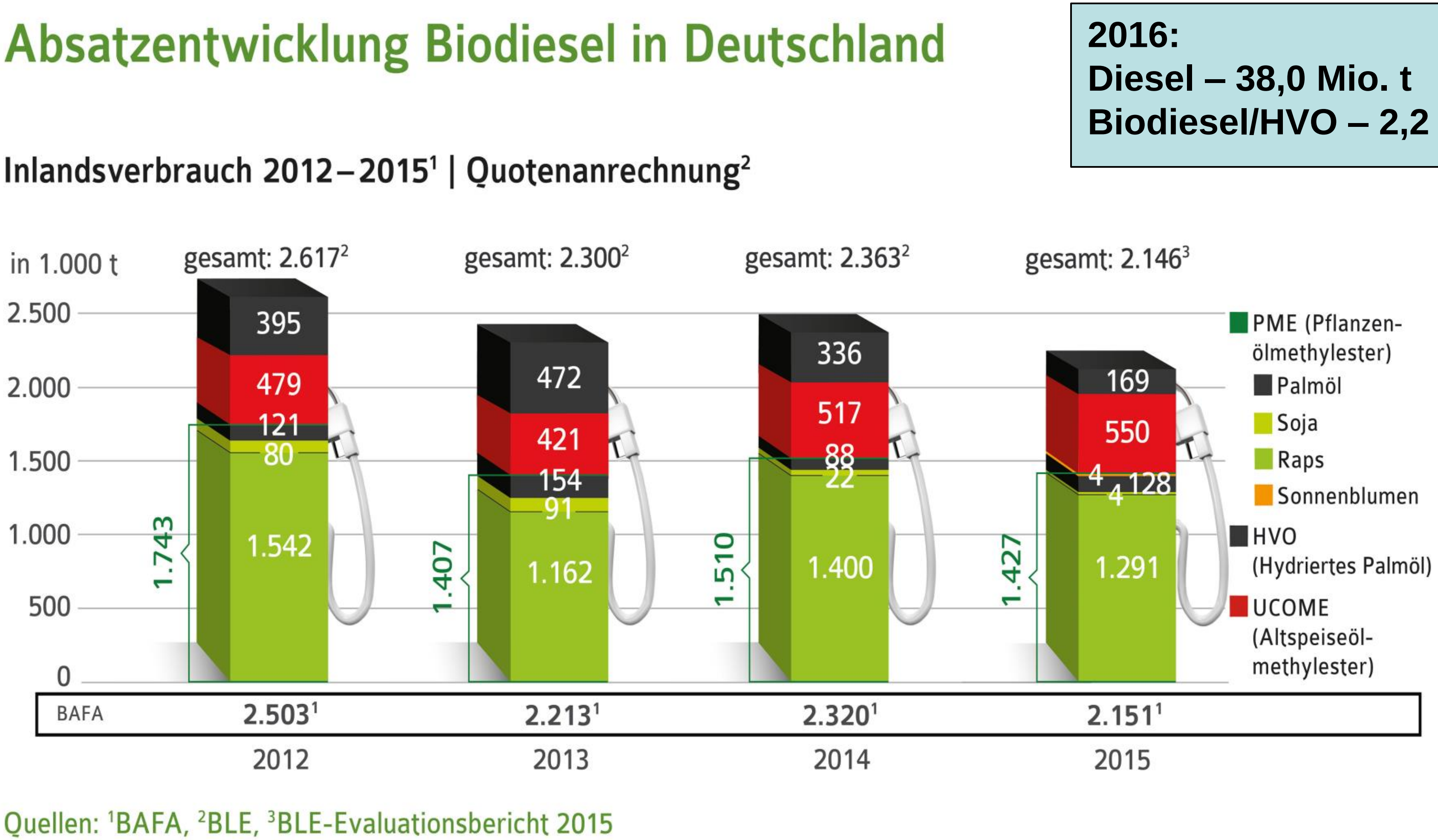
REN21 Renewable Energy Policy Network for the 21st Century

Average Annual Growth Rates of Renewable Energy Capacity and Biofuels Production, End-2010 to End-2015

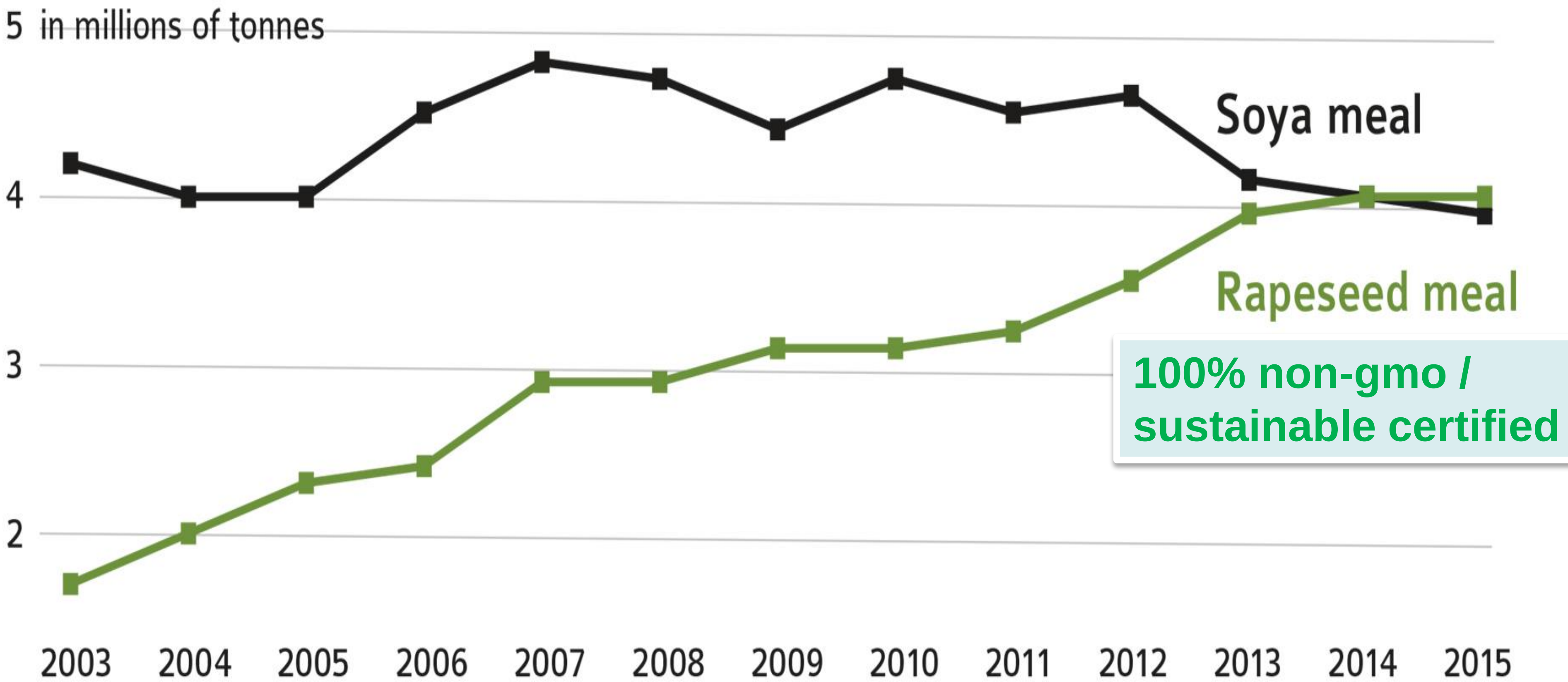


Biodiesel consumption in Germany 2012 - 2015

2016:
Diesel – 38,0 Mio. t
Biodiesel/HVO – 2,2 Mio.t



What do German farmers use as feed?



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