IEA Bioenergy

Task 42 Biorefining

Country Report
Germany

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THÜNEN

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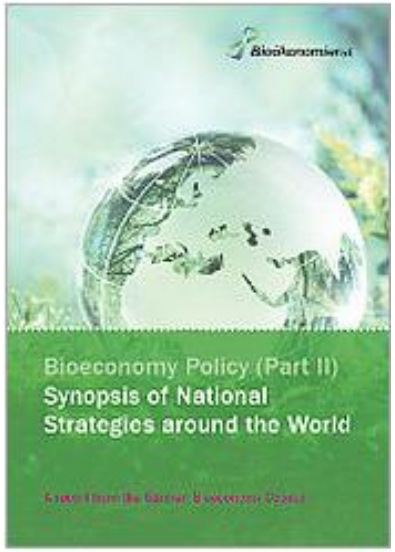
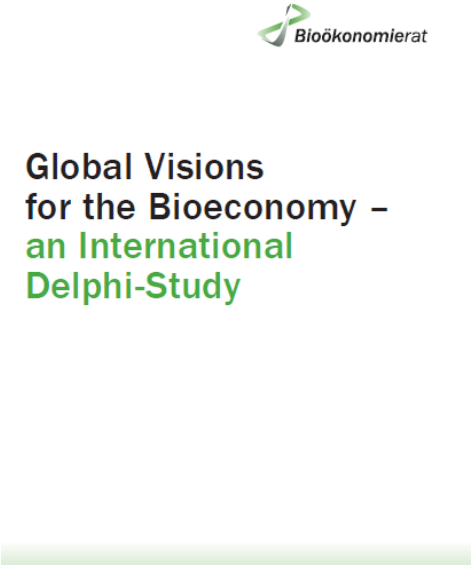
Strategy reports

Wood in the Bioeconomy

National policy strategies



Global visions Bioeconomy



Research strategy Bioeconomy 2030

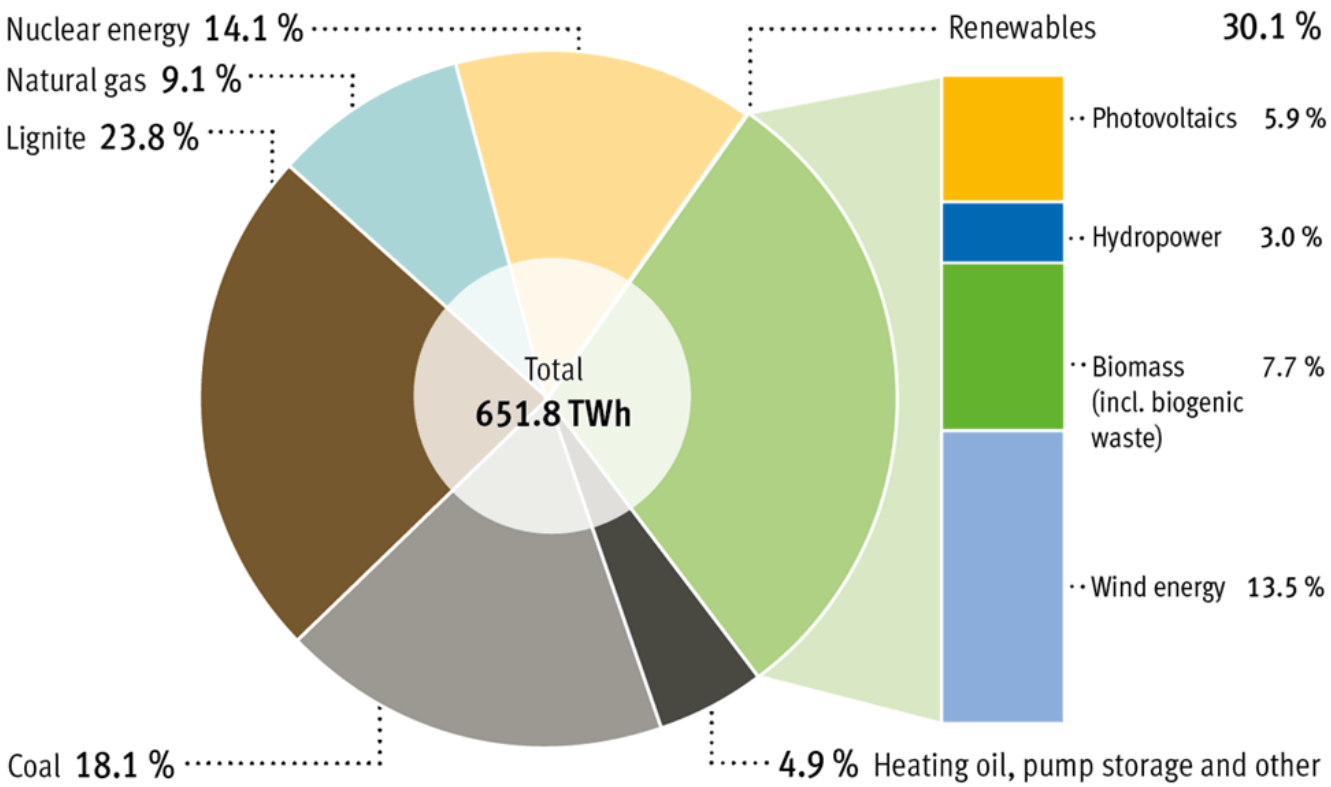
http://biooekonomierat.de/en/publications

Renewable energy targets for 2020

Share of	2015	Targets
Primary energy consumption	12.5 %	18 % until 2020
Electricity consumption	32.6 %	40–45 % until 2025
Final energy consumption Heating and cooling	13.2 %	14 % until 2020
Final energy consumption Transport	Transport (incl. electricity) 5.3 %	6 % GHG savings in the transport sector by biofuels

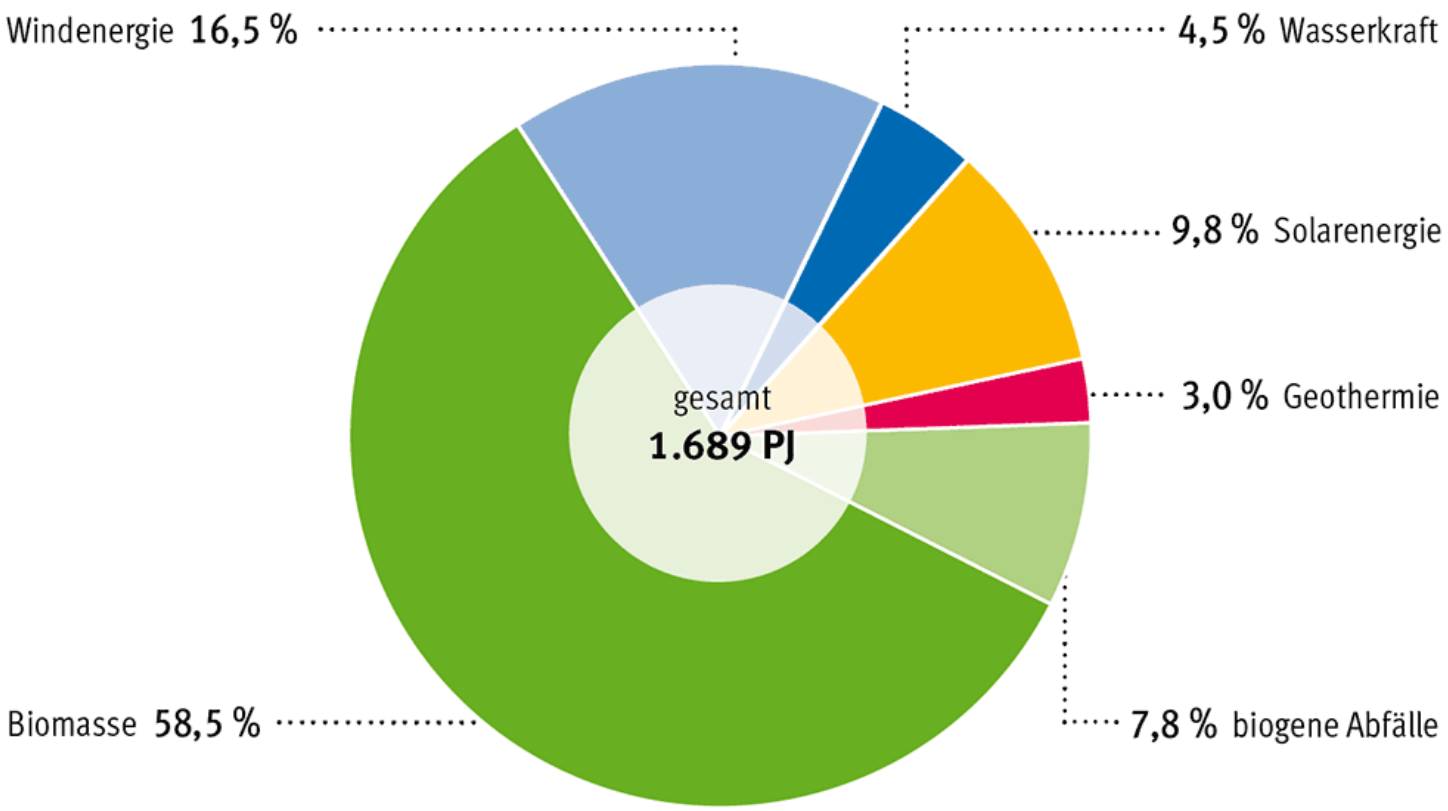
Source: FNR according AGEE-Stat (February 2016)

Primary energy consumption in 2015



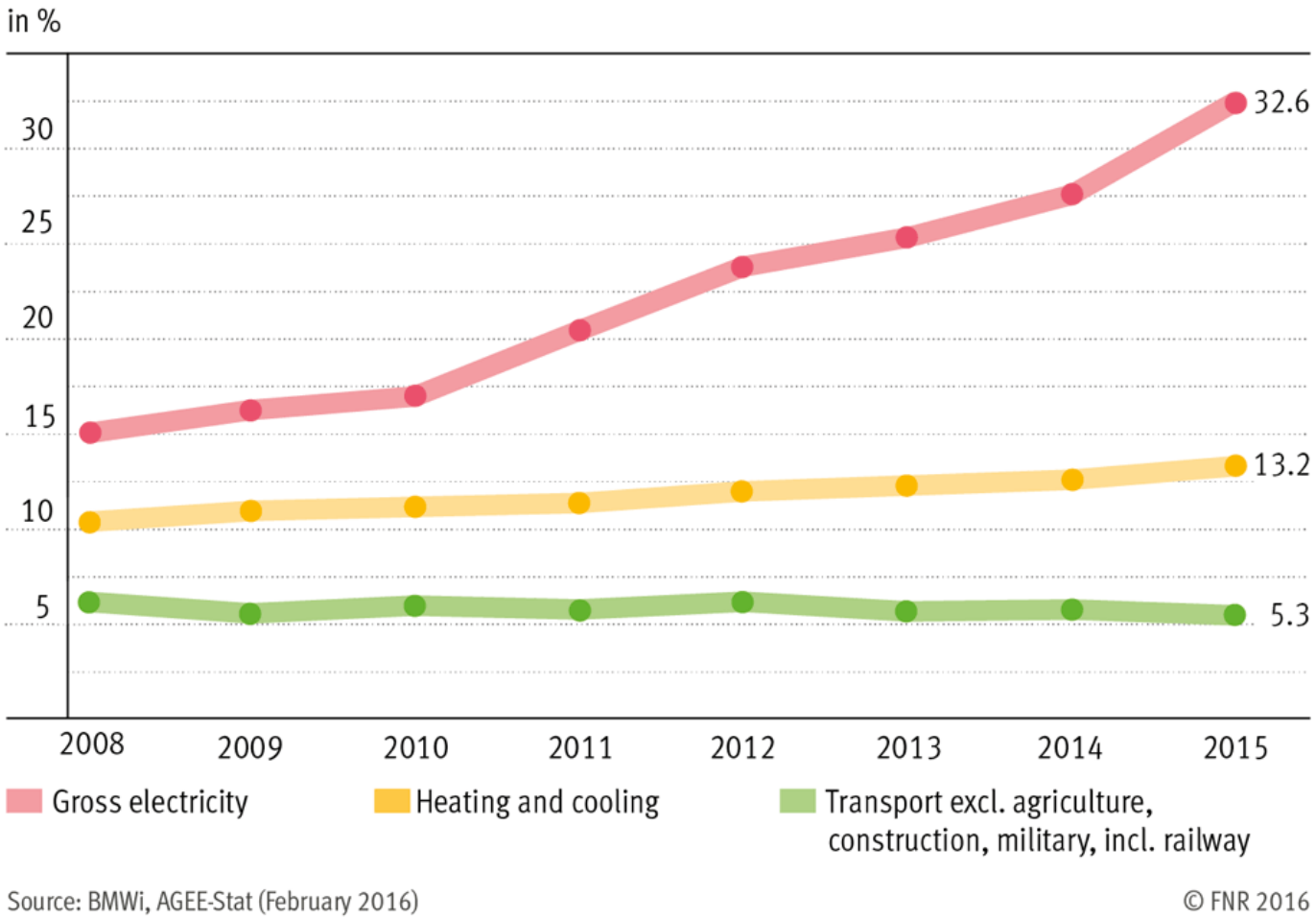
Source: FNR according AGEB (February 2016)

Primary energy production from renewables in 2015

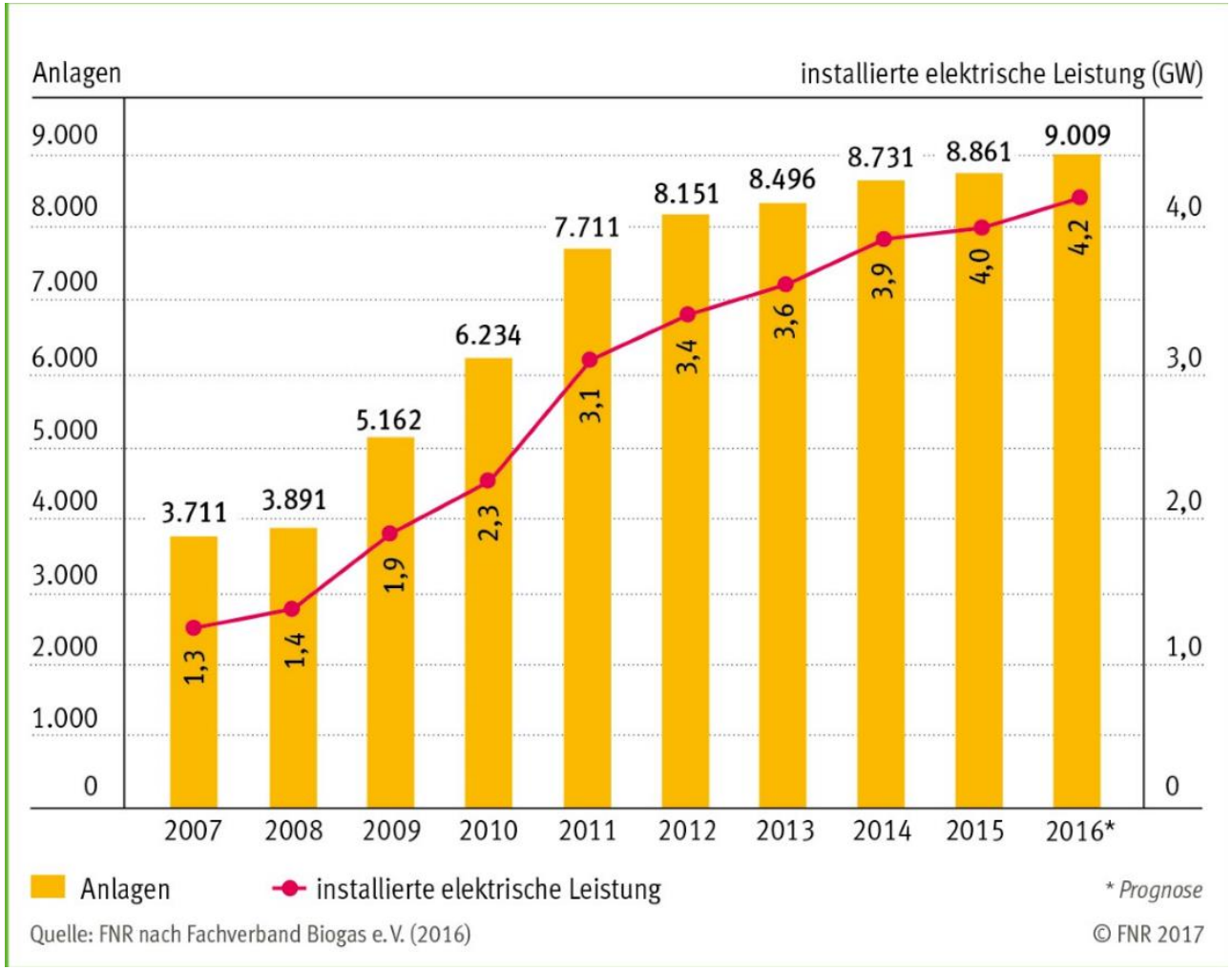


Quelle: FNR nach ZSW/AGEB (Januar 2017)

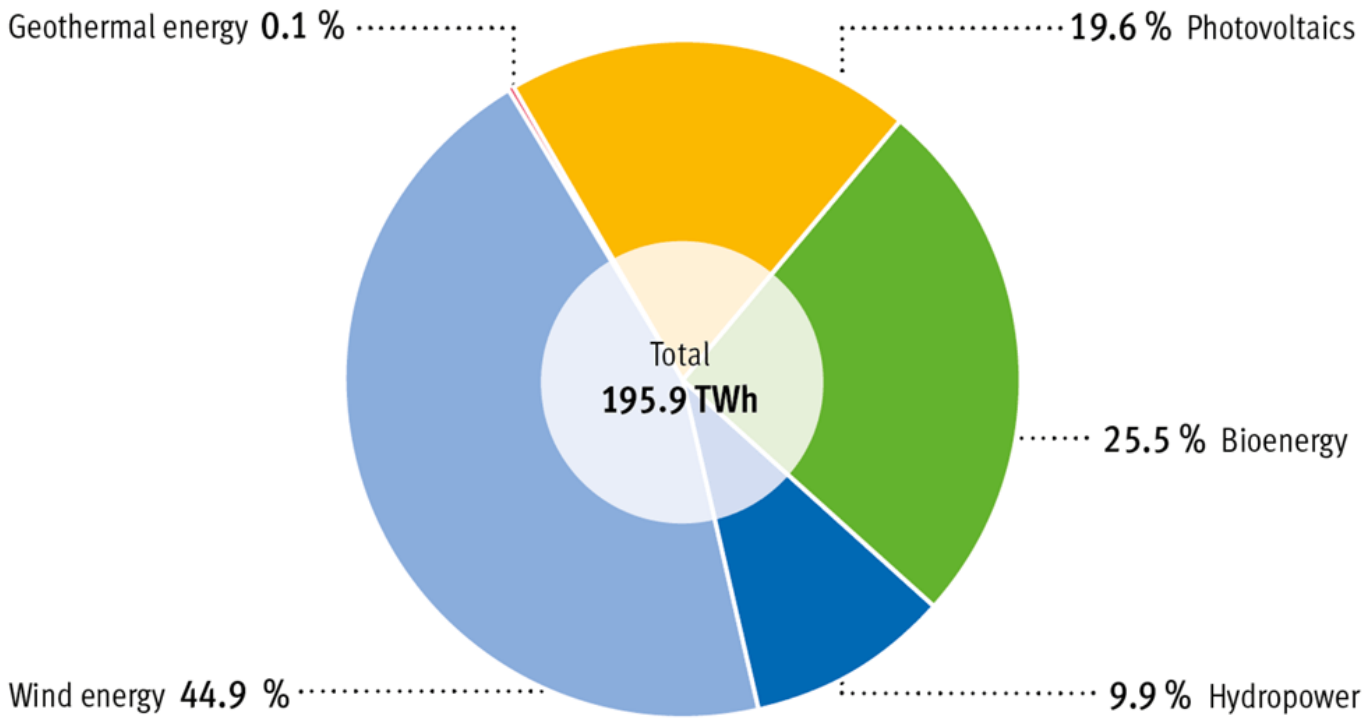
Renewable energy development



Biogas plants

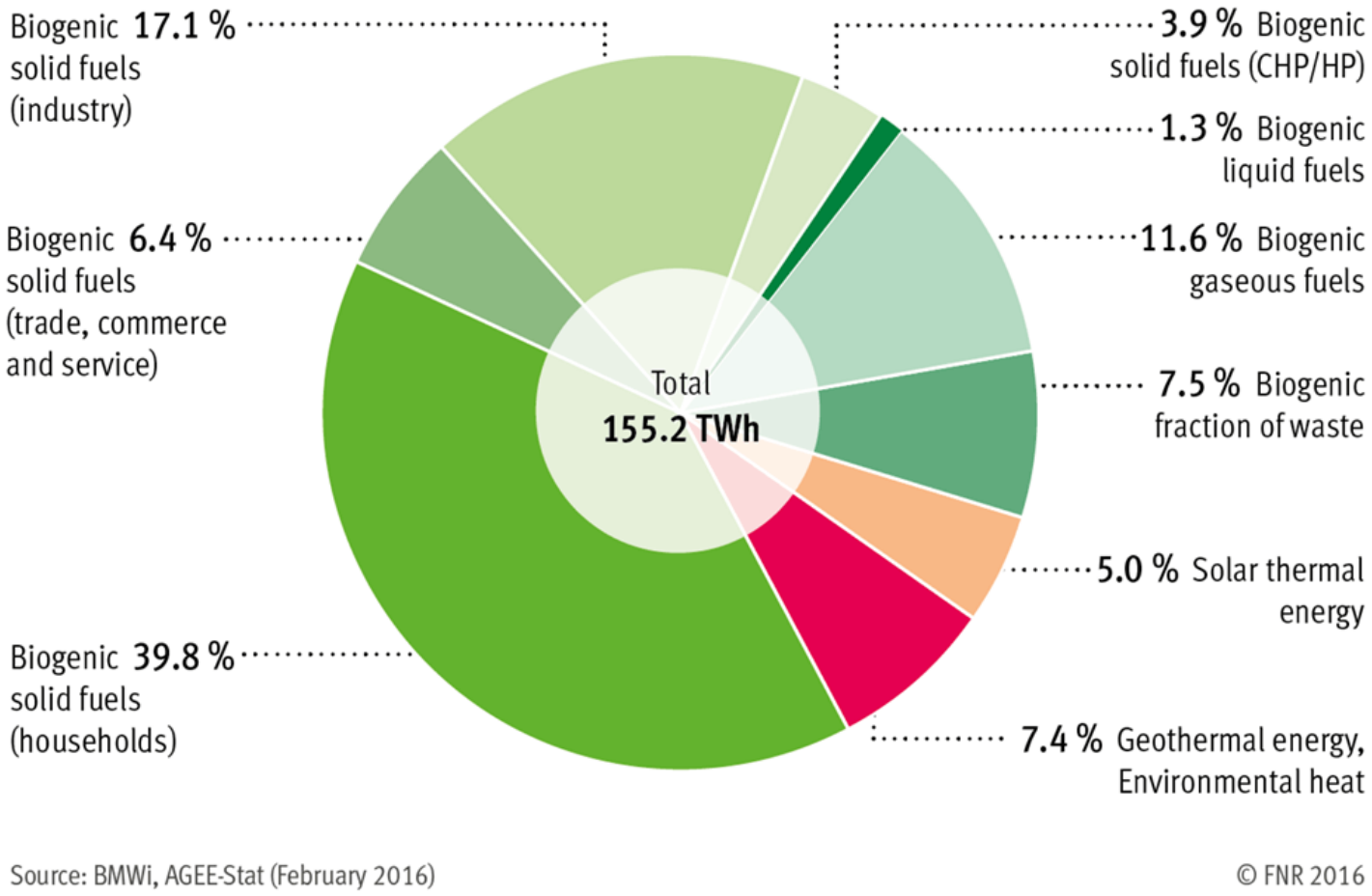


Electricity from renewables



Source: BMWi, AGEE-Stat (February 2016)

Heat production from renewables (88% biogenic)



Source: BMWi, AGEE-Stat (February 2016)

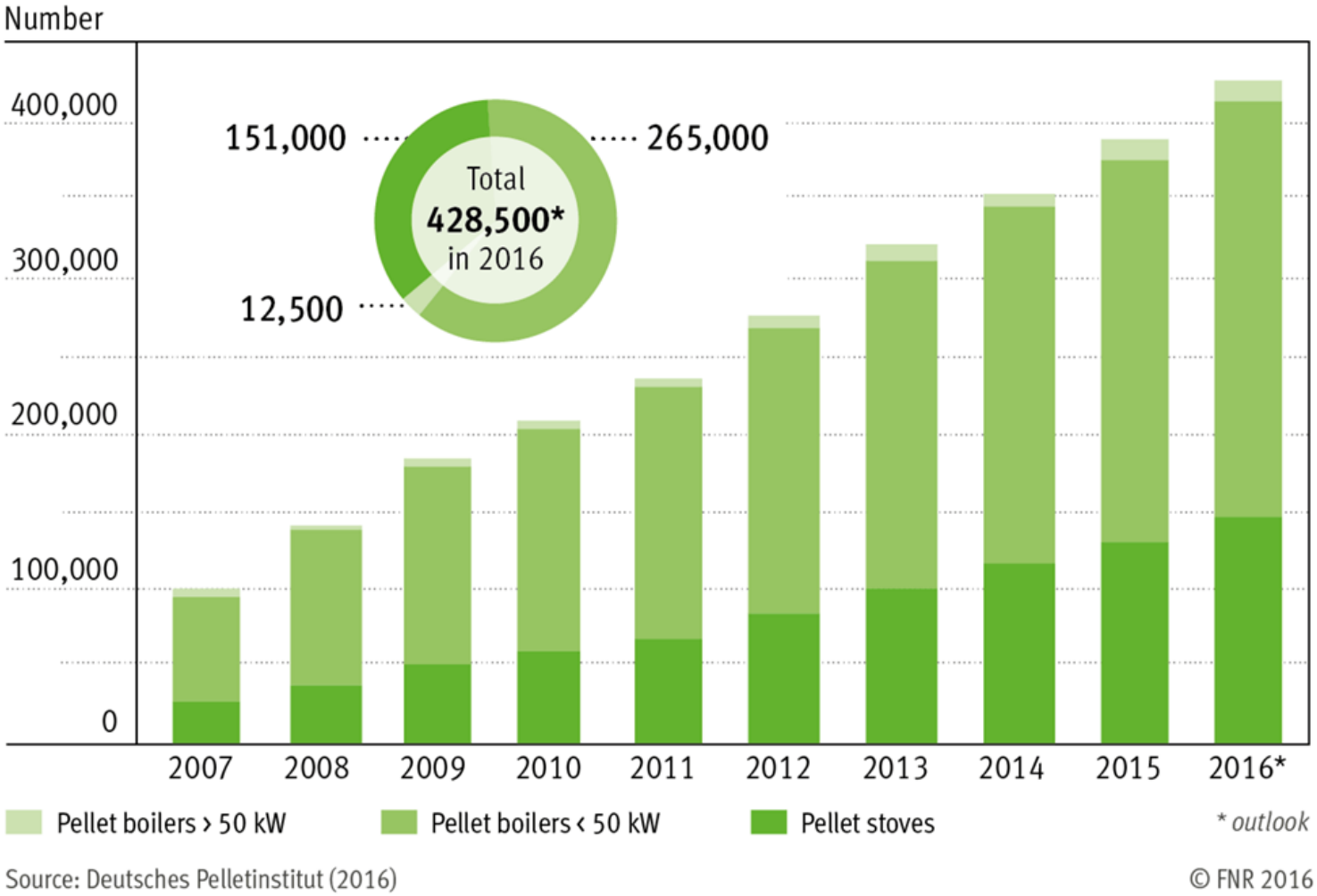
Standards for solid fuels

Fuel	Standard
General requirements	DIN EN ISO 17225-1:2014-09
Wood pellets	DIN EN ISO 17225-2:2014-09
Wood briquettes	DIN EN ISO 17225-3:2014-09
Wood chips	DIN EN ISO 17225-4:2014-09
Firewood	DIN EN ISO 17225-5:2014-09
Non-wooden pellets*	DIN EN ISO 17225-6:2014-09

Source: Beuth Verlag

** stalk-type biomass; fruit biomass; defined and undefined biomass blends*

Pellet boilers installed



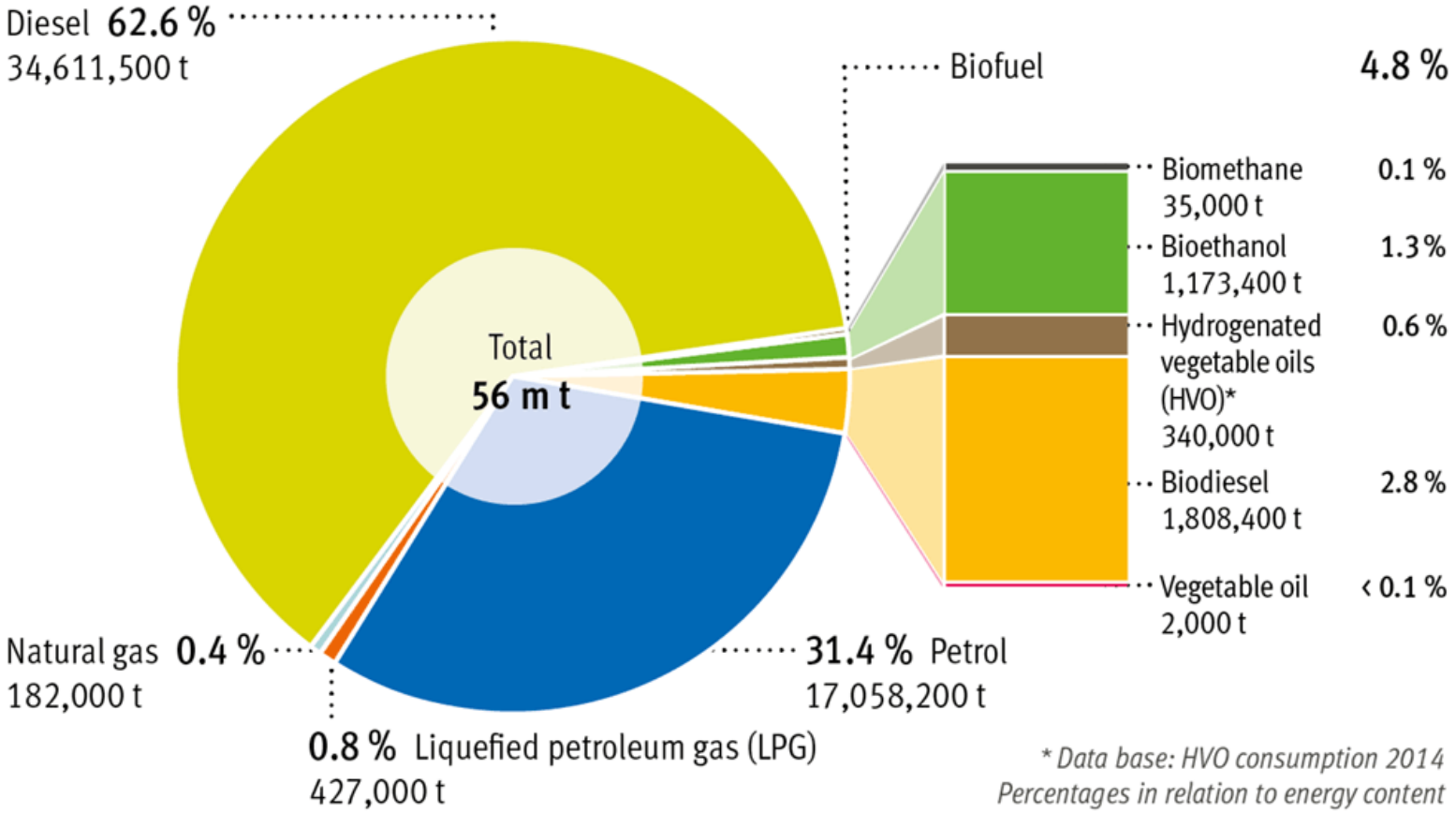
Fuel standards in Germany

Fuel	Standard	Notes
Diesel (B 7)	DIN EN 590	Diesel with up to 7 vol% Biodiesel (Status: 04/2014)
Biodiesel (B 100)	DIN EN 14214	Fatty acid methyl esters (FAME) for diesel engines (Status: 06/2014)
Rapeseed oil fuel	DIN 51605	Rapeseed oil fuel for engines suitable for vegetable oils (Status: 01/2016)
Vegetable oil fuel	DIN 51623	Fuels for engines suitable for vegetable oils Vegetable oil Requirements and test methods (Status: 12/2015)
Petrol (E 5)	DIN EN 228	Unleaded petrol with up to 5 vol% ethanol or rather 15 vol% ETBE (Status: 10/2014)
Petrol (E 10)	DIN EN 228	Petrol E 10 – with up to 10 vol% ethanol (Status: 10/2014)
Ethanol	DIN EN 15376	Ethanol as blend component in petrol (Status: 12/2014)
Ethanol (E 85)	DIN 51625	– min. 75 to max. 86 vol% ethanol – class A (summer) – min. 70 to 80 vol% ethanol – class B (winter)
Natural gas & Biomethane	DIN EN 16723-2	Biomethane must fulfill the standard for natural gas as fuel – a mixture of biomethane and natural gas is possible in any proportion (Status: 06/2014)

Source: FNR (July 2016)

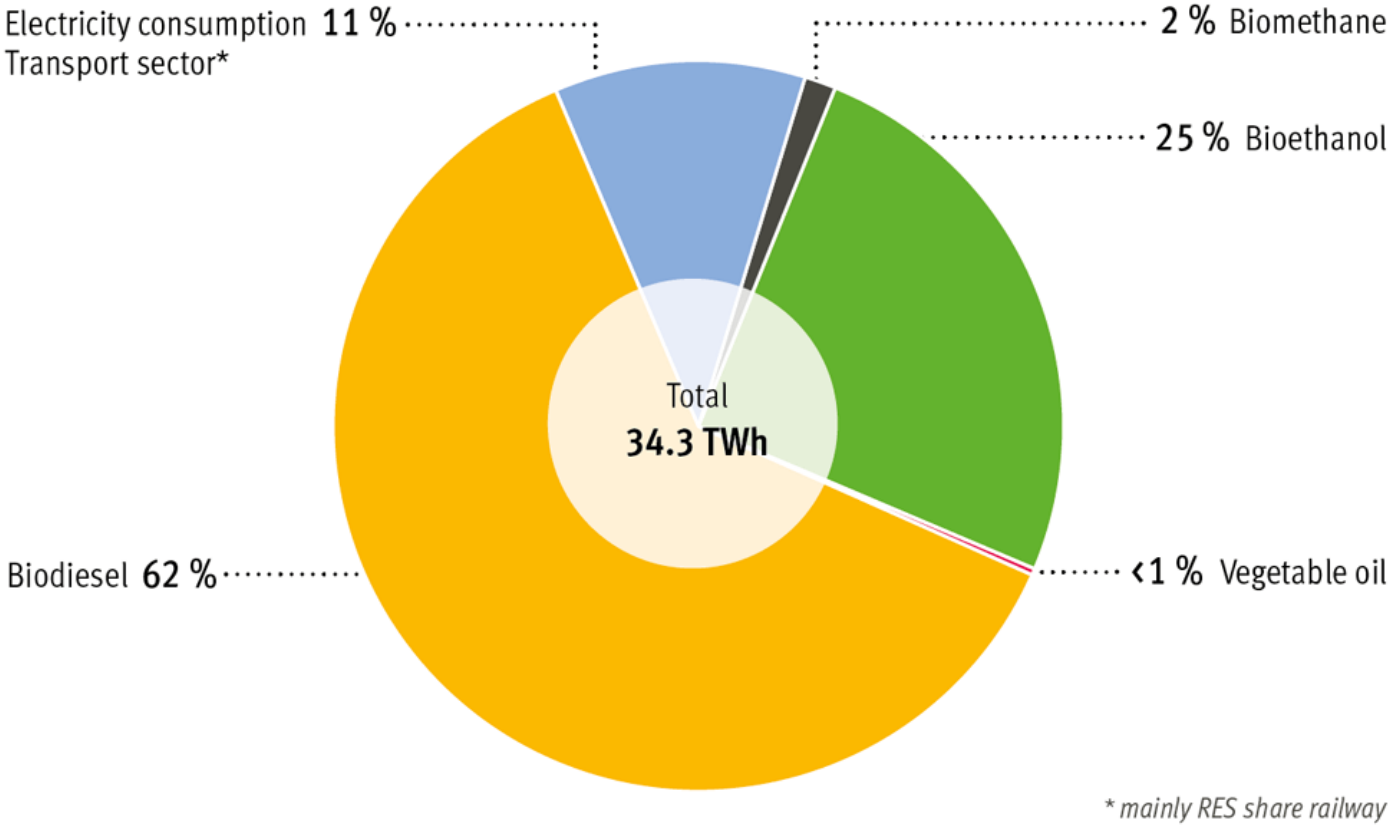
vol%: Percentage by volume

Transport fuel consumption in 2015



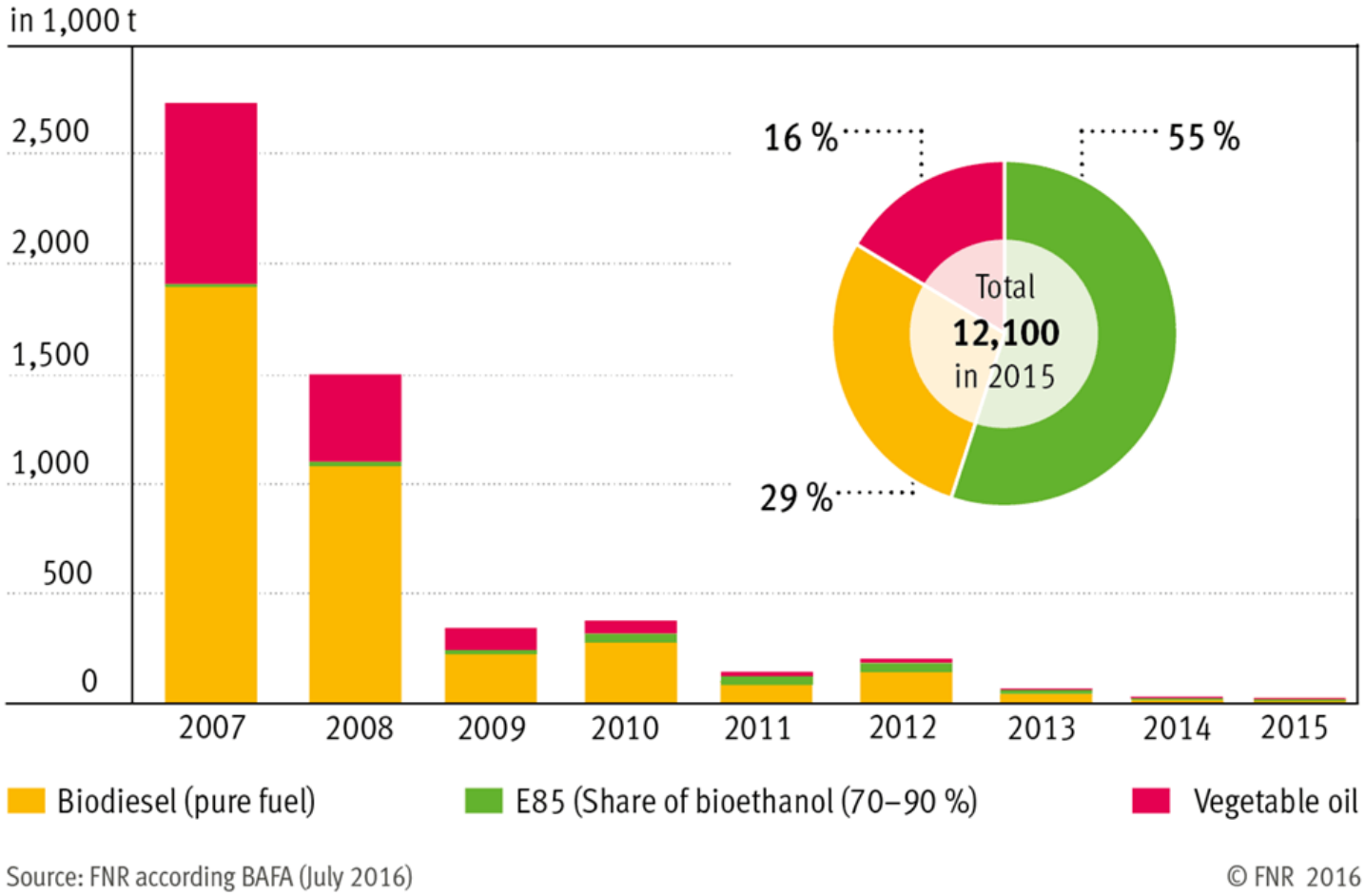
Source: FNR, according to BAFA, Destatis, DVFG, BMF (July 2016)

Renewable energy in the transport sector in 2015

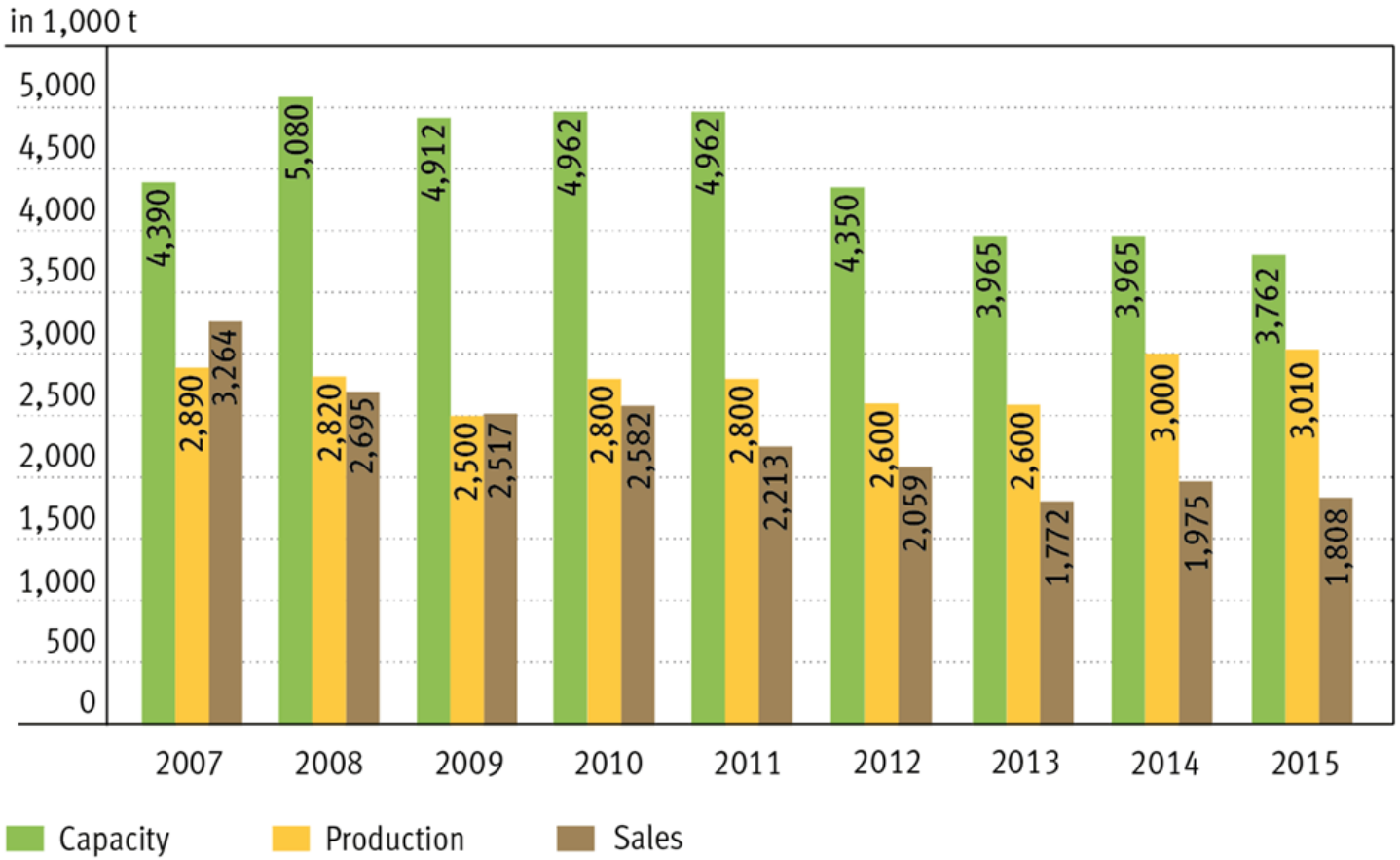


Source: FNR according AGEE-Stat (February 2016)

Development of pure biofuel sales

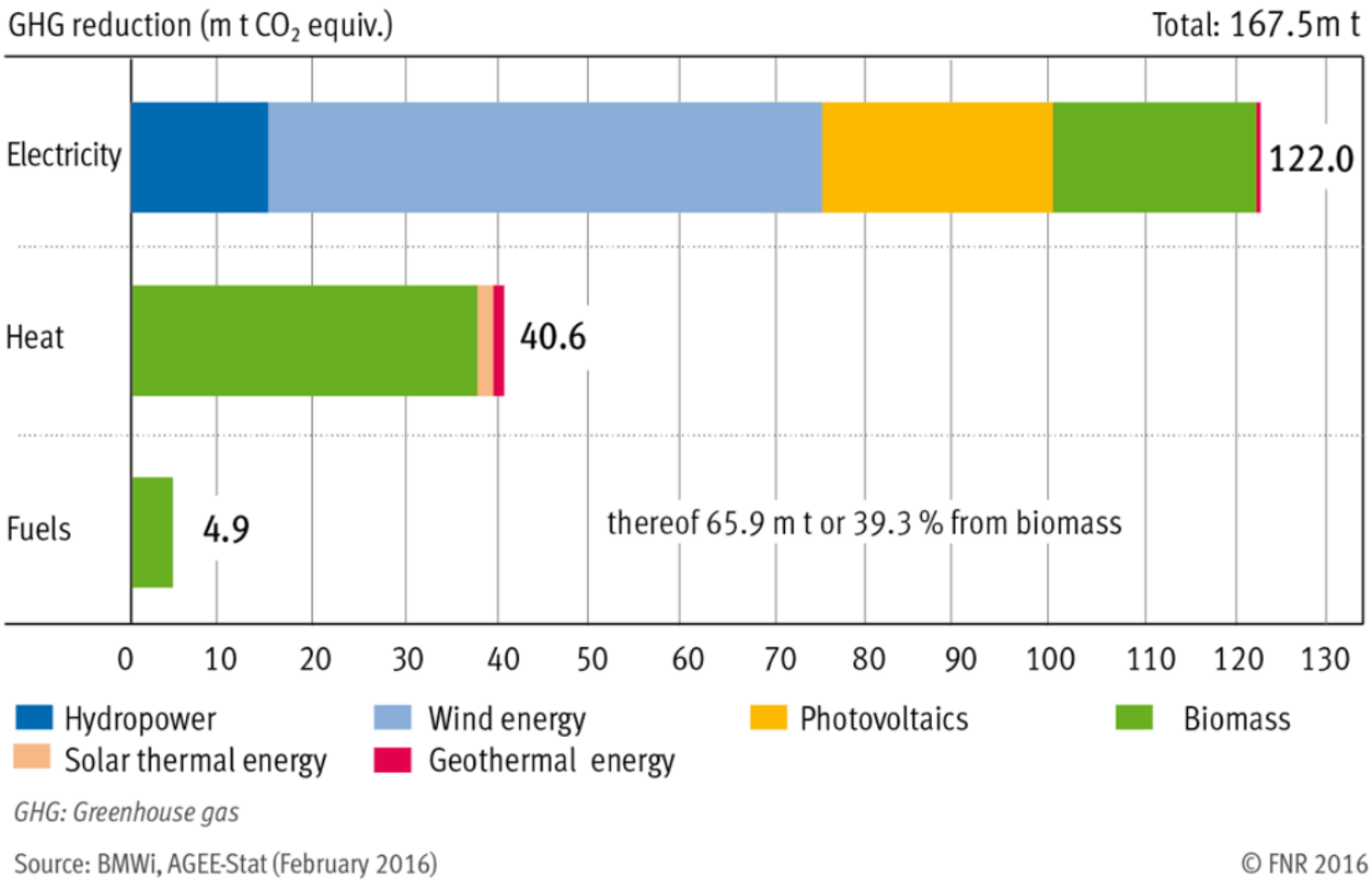


Development of biodiesel production and sales

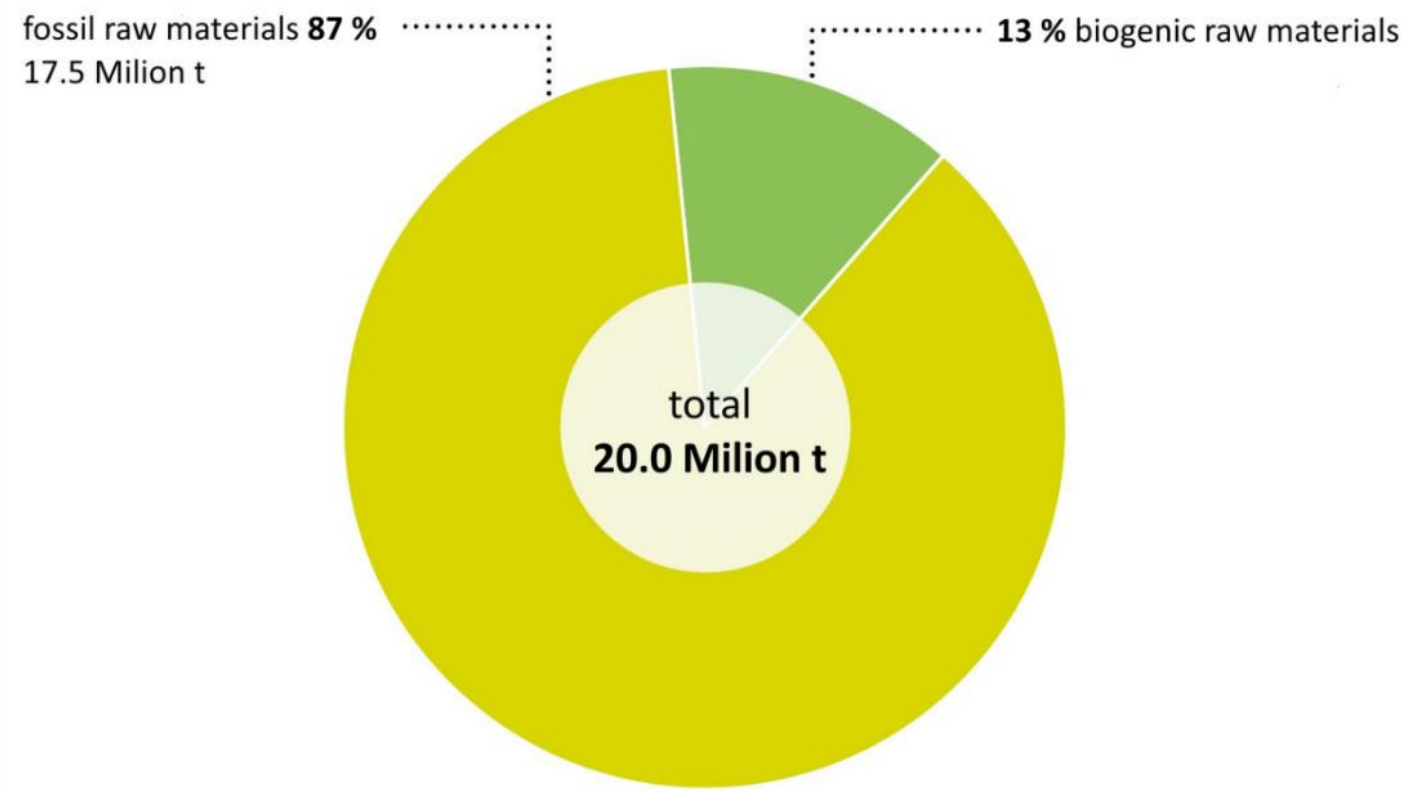


Source: Ufop, VDB, BAFA, BMF, FNR (August 2016)

Greenhouse gas (GHG) emission reduction

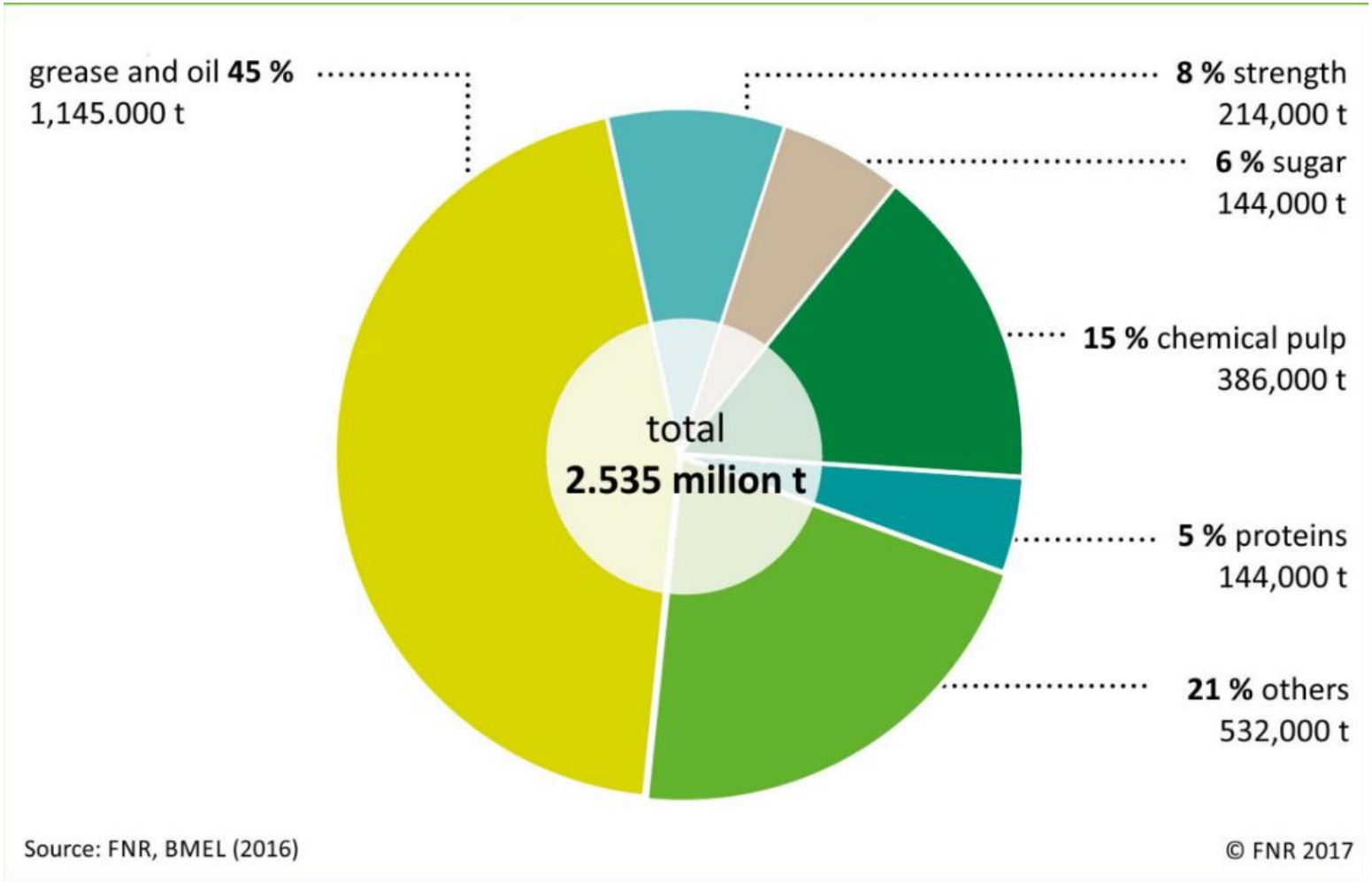


Material use in the chemical industry in 2015

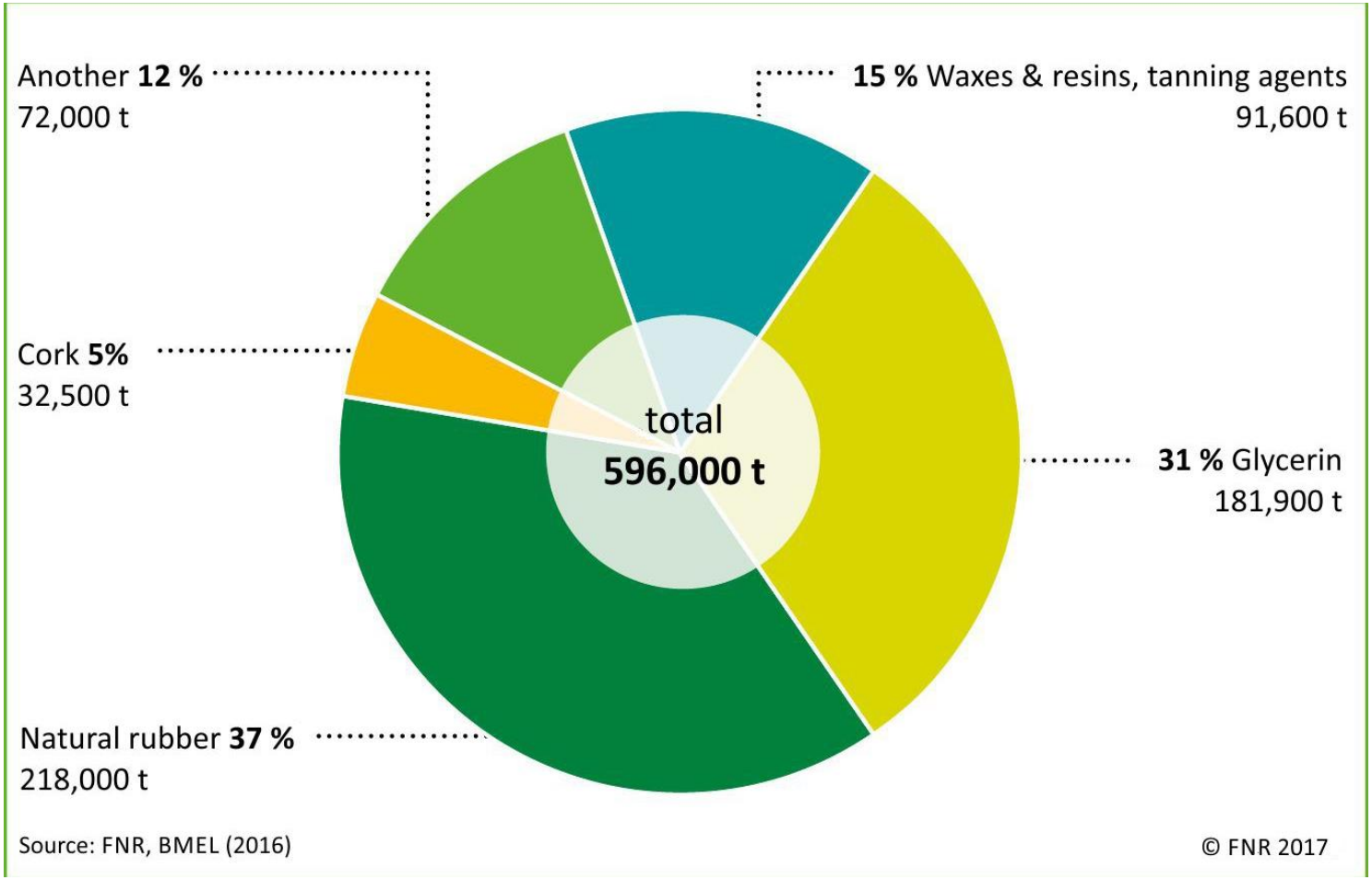


Source: FNR, VCI (2016)

Renewable raw materials in the chemical industry



Use of other biogenic raw materials in 2015



Biomass use for industry and bioenergy

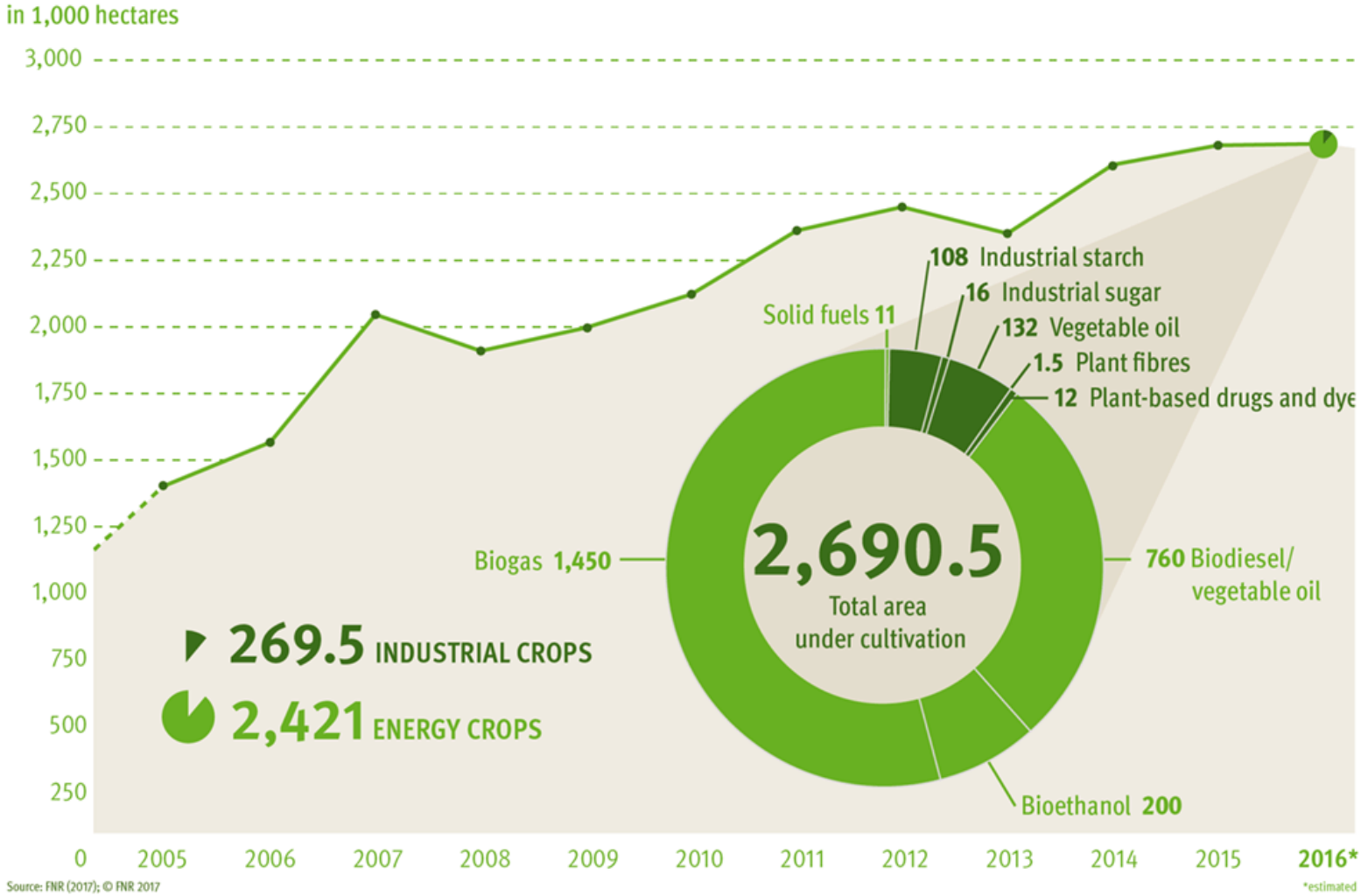
CULTIVATION OF RENEWABLE RESOURCES IN GERMANY 2014 – 2016 (IN HECTARES)

Plants	Feedstock	2014	2015*	2016**
Industrial crops	Industrial starch	106,000	108,500	108,000
	Industrial sugar	12,500	15,000	16,000
	Technical rapeseed oil	115,500	129,000	122,500
	Technical sunflower oil	6,000	6,500	6,000
	Technical linseed oil	3,500	3,500	3,500
	Plant fibres	1,000	1,500	1,500
	Plant-based drugs and dyes	12,000	12,000	12,000
	Industrial crops total	**256,500**	**276,000**	**269,500**
Energy crops	Rapeseed oil for biodiesel/vegetable oil	798,500	800,000	760,000
	Crops for bioethanol	188,000	200,000	200,000
	Crops for biogas	1,353,500	1,400,000	1,450,000
	Crops for solid fuels (e.g. farmed wood, miscanthus)	10,500	11,000	11,000
	Energy crops total	**2,350,500**	**2,411,000**	**2,421,000**
Total acreage of renewable resources		**2,607,000**	**2,687,000**	**2,690,500**

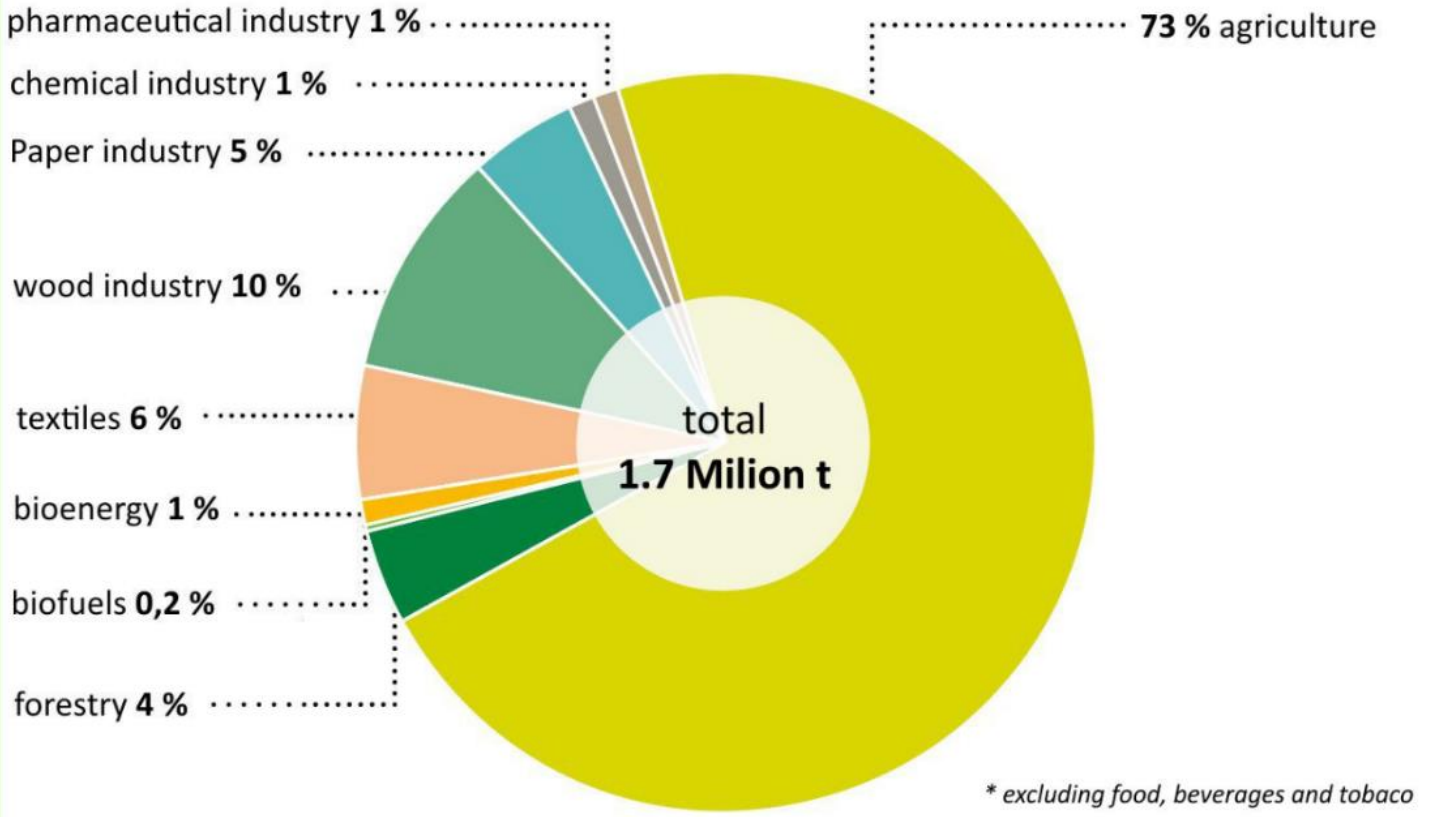
Source: FNR (2017)

*preliminary values **estimated values

Area demand for agricultural biomass

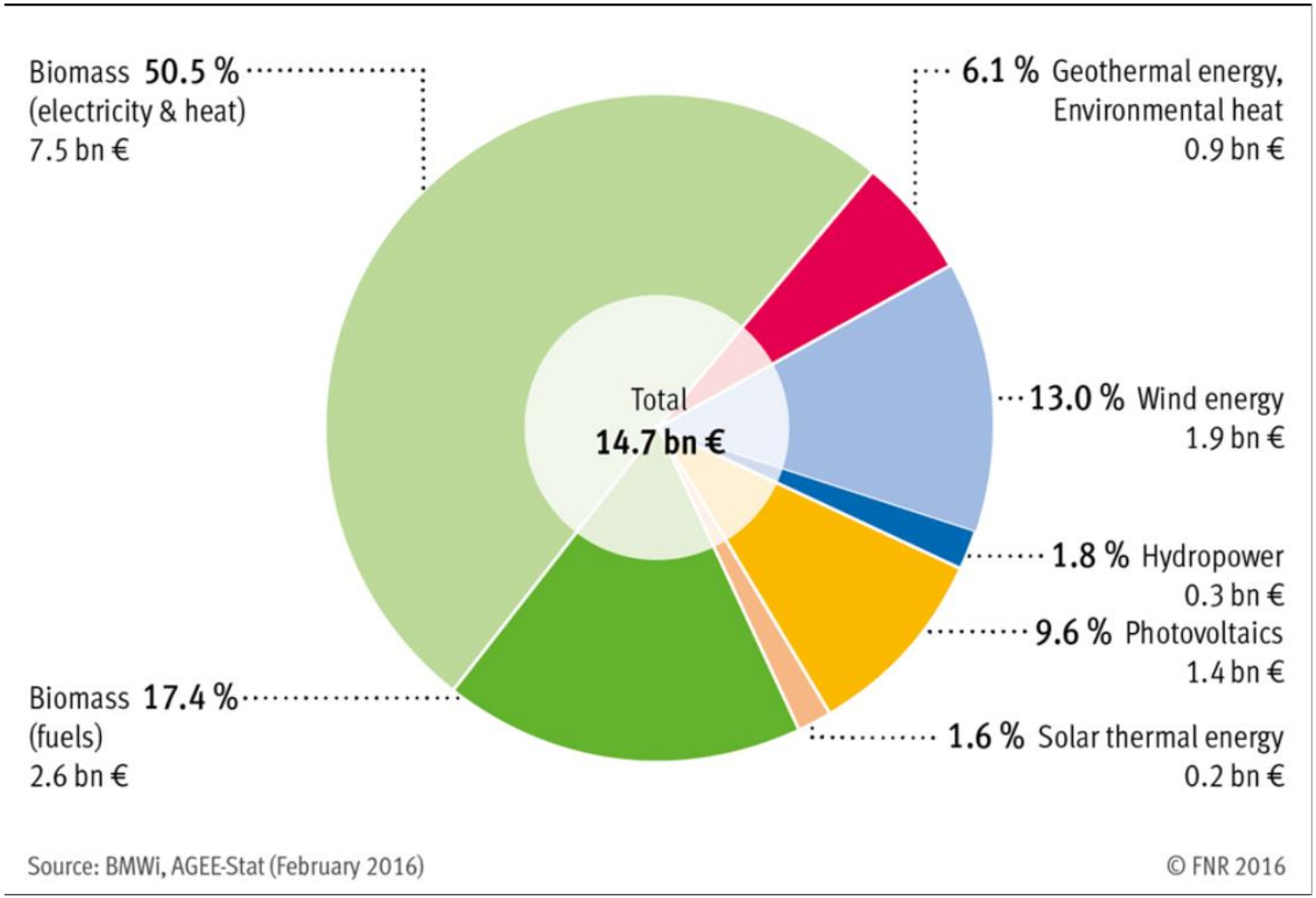


Employment in the bioeconomy

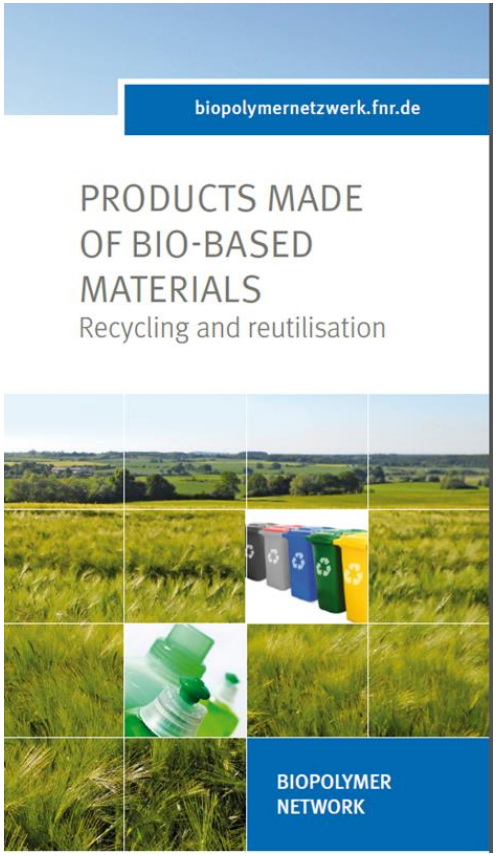


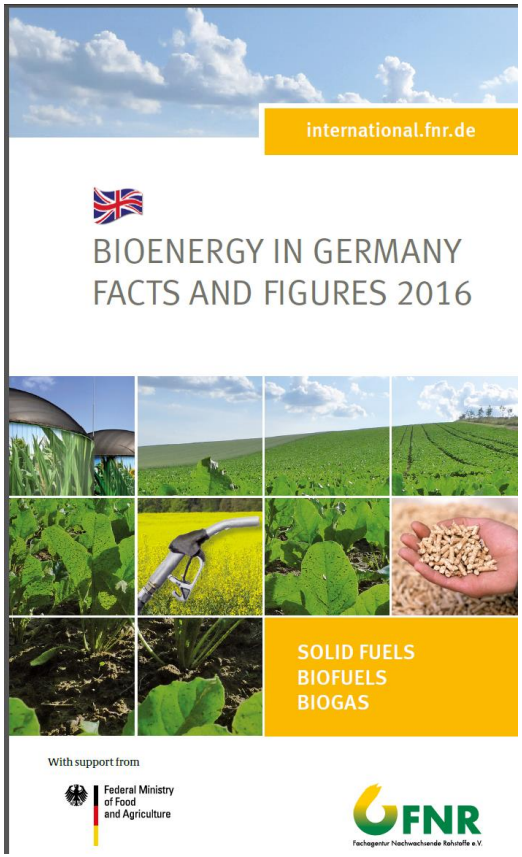
Source: Piotrowski et al., European Bioeconomy in Figures, www.bio-based.eu/markets (2016)

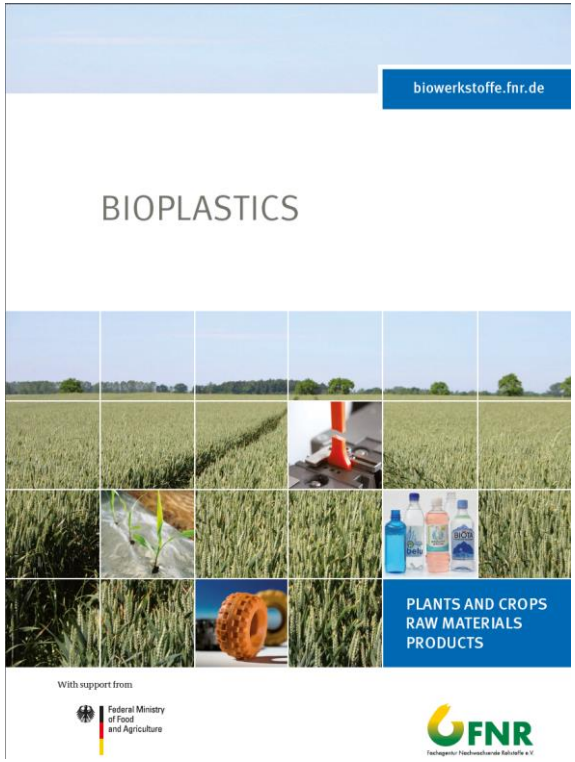
Turnover of renewable energy



Information available in English







https://mediathek.fnr.de/broschuren/fremdsprachige-publikationen/english-books.html

Selected national stakeholders involved in the field of biorefining

Companies	Federations/ networks	Research/ Science	Ministries/ Authorities	NGOs
www.basf.de	www.dechema.de	www.thuenen.de	www.bmel.de	www.wwf.de
www.beiersdorf.de	www.staerkeverband.de	www.iinas.de	www.bmbf.de	www.nabu.de
www.evonik.de	www.ovid-verband.de	www.nova-institute.eu	www.bmu.de	www.welthungerhilfe.de
www.fuchs-europe.de	www.vci.de	www.umsicht.fraunhofer.de	www.fnr.de	www.brot-fuer-welt.de
www.henkel.de	www.ibbnetzwerk-gmbh.de	www.dbfz.de	www.ble.de	
www.nordzucker.de	www.vdp-online.de	www.cbp.fraunhofer.de	www.umweltbundesamt.de	
www.suedzucker.de	www.biorn.org/de/	www.kit.edu		
www.linde-engineering.com	www.bio.nrw.de/en/home	www.ifeu.de		
www.cargill.com	www.ufop.de			

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