Karlsruhe Institute of Technology

Implementation agenda Germany & others

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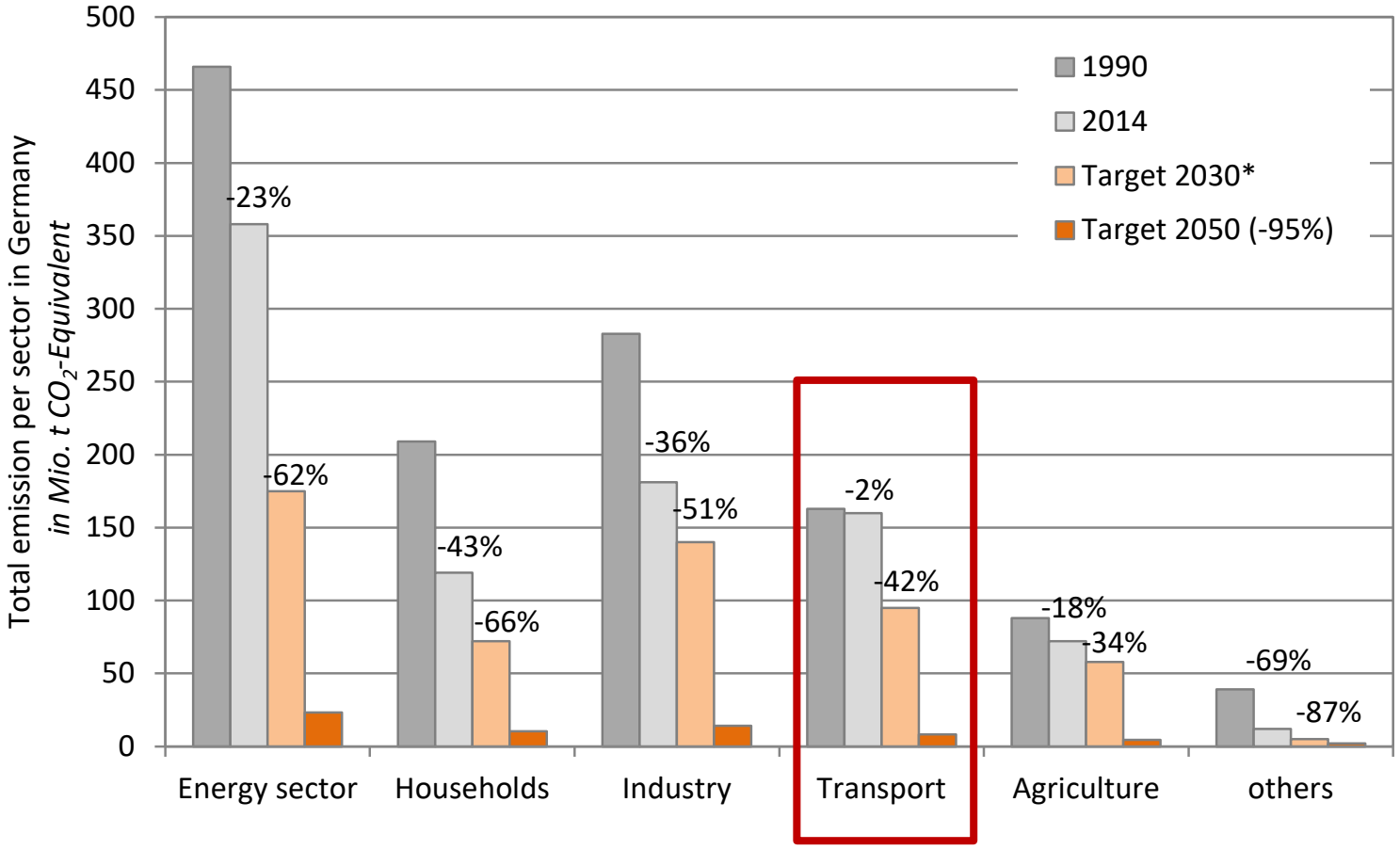
Main driver | Climate protection

- Following Paris Agreement focus of climate protection plan of the German Federal Government until 2050 inter alia on low-carbon technologies, CO_2 use and efficient renewable products from biomass and electricity



*upper target value

Background and policy

Policies to promote biofuels

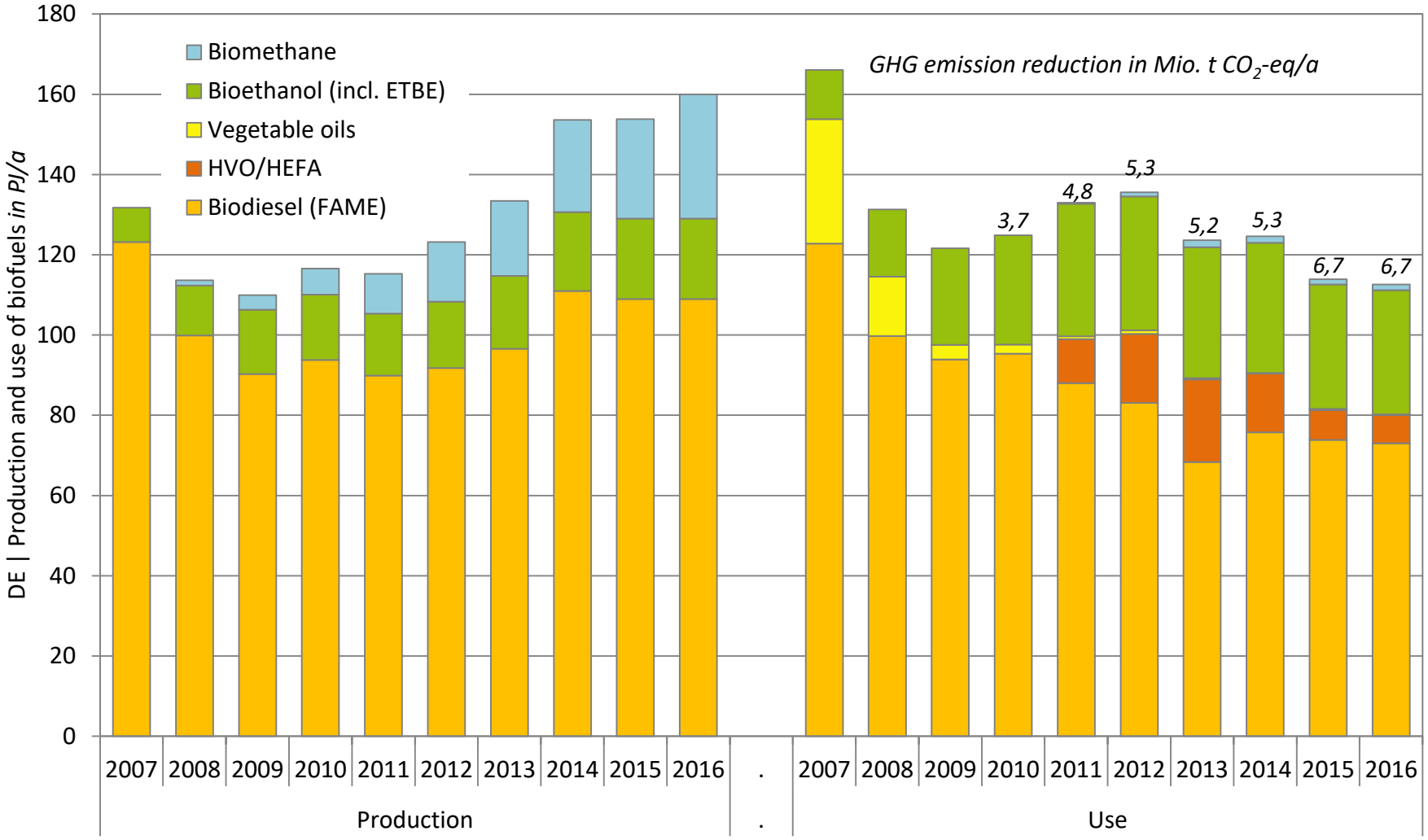
Type of policy	Yes/No (Provide Details /Comments)
Mandates or biofuel volume obligation	Has been shifted from energy related quota to a GHG quota in 2015. Until 2014 there were a biofuel obligation for gasoline of about 2,8% (previously 3,6%), for diesel about 4,4% and for total 6,25% (previously increasing from 6,75% in 2010 to 7,75% in 2014) Limits of maximum energetic share of conventional biofuels such as biodiesel (FAME), ethanol, HVO/HEFA based on food-competing feedstocks as well as mandates for advanced fuels according EU RED will be regulated in the 38. BImSchV
Indicate whether the carbon intensity or emissions of biofuels are taken into account	Germany is the first EU member state who implemented the GHG related quota: from 2015 3.5% (previously 3%); from 2017 4% (previously 4,5%); from 2020 6% (previously 7%) GHG mitigation (compared to fossil gasoline and diesel mix) for the entire fuel sector
Indicate if financial incentives provided (e.g. subsidies, credits, incentives)	Biofuels that are counted within the quota are fully taxed (for diesel fuels similar to fossil diesel which is about 47,04 EURct/l respectively 44,90 EURct/l for biodiesel/FAME and vegetable oil, for gasoline fuels 65,45 EURct/l, 1,39 EURct/kWh for CNG/biomethane until 2023).This is also true for E85 and advanced biofuels from 2016 onwards. Just the agriculture and forestry remains fully tax exempted.
Indicate financial assistance (e.g. loan guarantees, grants)	For facilities partly via R&D&D projects Financial support focussed on emobility for plugin battery electric vehicles (BEVs) up to 4 000 EUR and for loading stations up to 3 000 EUR (some municipalities with 5 000 EUR)
Indicate if you have a Low Carbon Fuel standard or Clean Fuel Standard	Cf. GHG quota; Indirectly given via the national application of the binding methodology of EU RED within the BioKraftNachV with minimum GHG reduction potentials of 35%, 50% for all facilities from 2018 and for new one from 10/2015 and 60% for new facilities from 2017 (current average on GHG mitigation potential is about 73%)

Policies to promote biofuels

Type of policy	Yes/No (Provide Details /Comments)
Other market based- mechanisms	Carbon tax Indirectly via CO_2 tax for passenger cars (KraftStG).
Do you have specific policies promoting advanced biofuels (specify – blend mandate, etc.)	Yes, soon; cf. mandates
Do you have any sustainability measurement/verification process for biofuels	yes The Federal Government authorized the “Bundesanstalt für Landwirtschaft und Ernährung” (BLE - Federal Institute of Agriculture and Nutrition) to guide and supervise the certification of biofuels. The BLE is responsible for the acknowledgment and control of certification systems, certification bodies and the web-based documentation system, called “Nabisy”.
Do you have specific policies promoting aviation biofuels (e.g. can they qualify for incentives)	no
How easy is it for new biofuels to enter the market and/or earn incentives	With regard to no financial incentives for advanced / new biofuel quite difficult, even within the GHG quota; maybe an appropriate advanced fuel quota will contribute implementation of such fuels.
Any other policies that promote biofuels production and consumption	no

Developments and perspectives

Conventional biofuels



[a] for 2016 preliminary estimation DBFZ, [b] HVO / HEFA: no production in DE.; Biomethane: Production esp. for KWK and heat sector, [c] GHG reduction: 2009 + 2010: 35% acoording min. requirements of RED, 2011-2015: calculation based on BLE data

Developments and perspectives

Advanced fuel producers

Name of company	Status (planned; operational; closed)	Technology	Production capacity
Clariant	operational	Cellulosic ethanol	Demo plant sunliquid® in Straubing, operational since 2014, TRL 7, FRL 6 1,000 t/a (from 4,500 t/a straw)
Global Bioenergies, Fraunhofer CBP	operational	Isobutene	Demonstration plant (TRL 6) start operation in 2017
KIT, CAC, Air Liquide	operational	BTL	bioliq® demo plant, 2 MW pyrolysis, TRL 6 5 MW gasification 40-80 bar (TRL 6), 2 MW gasoline synthesis
Fraunhofer CBP, Thyssen, Linde	operational	Cellulosic ethanol	pilot plant in Leuna, operational since 2013, TRL 4-5 lignocellulose pre-treatment: 1 t wood/week fermentation + enzyme production: 10 to 10.000 l, TRL 5, FRL 5
Verbio AG	operational	Biomethane, bioethanol	Commercial plant, 16,5 MW (136 GWh/a) from 40 kt/a straw, TRL 8, FRL 8 (260 kt/a bioethanol + 480 GWh biomethane)

Triennium 2019-2021

Proposal for priority topics

Contribution to

- Subtask *Technology and Commercialization*
- Monitoring of algal biofuel technologies >> e.g. DBFZ delegate CEN/TC 454 Working Group Algae processing
- Advanced fuels for advanced engines >> continuing network with AMF, starting with IEA combustion (?)
- Approach for feedstock-to-biofuel supply chain (technologies, costs, sustainability)
- Power-to-liquid (PTL) technologies: Recent developments in the field of electrofuels; Fuels from CO_2 and methanol-based fuels (possible interaction with China)
- Reduction of harmful emissions: Oxygenate fuels for green combustion (free of soot and NO_x), e.g. oxymethylene ethers; Gasoline without soot precursors
- Analysis and assessment of power-to-liquids (or electrofuels) in terms of TRL/FRL, costs and GHG >> lots of activities in Germany

National representatives

Please do not hesitate to contact us

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