



Press workshop on sustainable energy solutions

« Renewables for the transport sector – which routes are open? »

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Comparing greenhouse gas (GHG) emissions of renewable energy options in the transport sector

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- **LBST profile**
- Greenhouse gas emissions
- Example scenarios



Company profile

- Independent expert for sustainable energy and mobility for over 30 years
- Bridging technology, markets, and policy
- Renewable energies, fuels, infrastructure
- Technology-based strategy consulting, System and technology studies, Sustainability assessment
- Global and long term perspective
- Rigorous system approach – thinking outside the box
- Serving international clients in industry, finance, politics, and NGOs

Selected studies

- German Mobility & Fuels Strategy (MKS)
- EC-JRC/EUCAR/CONCAWE 'Well-to-Tank Analysis of Transport Fuels'
- European Parliament, ITRE & ENVI Committee
- German Research Association for Combustion Engines (FVV)

Content



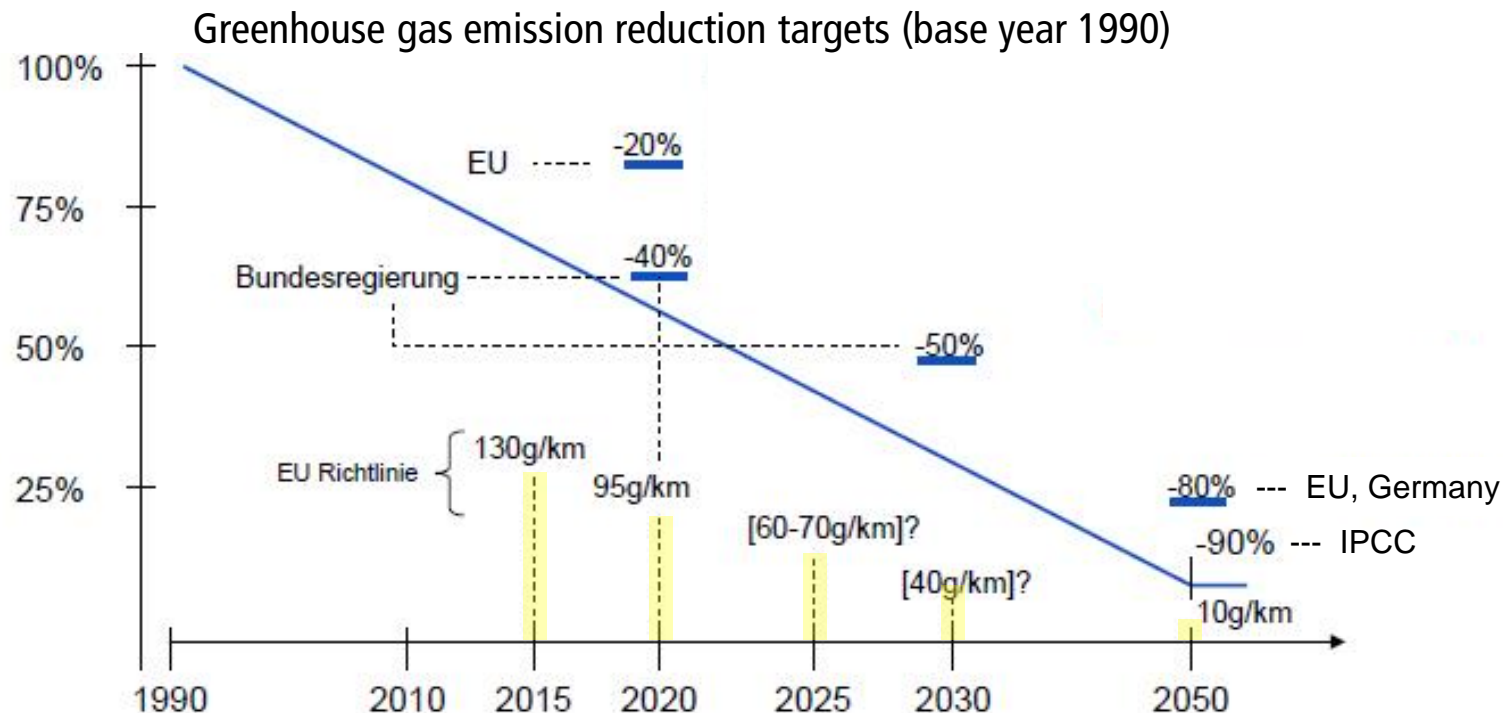
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Significant efforts required to achieve GHG reduction targets

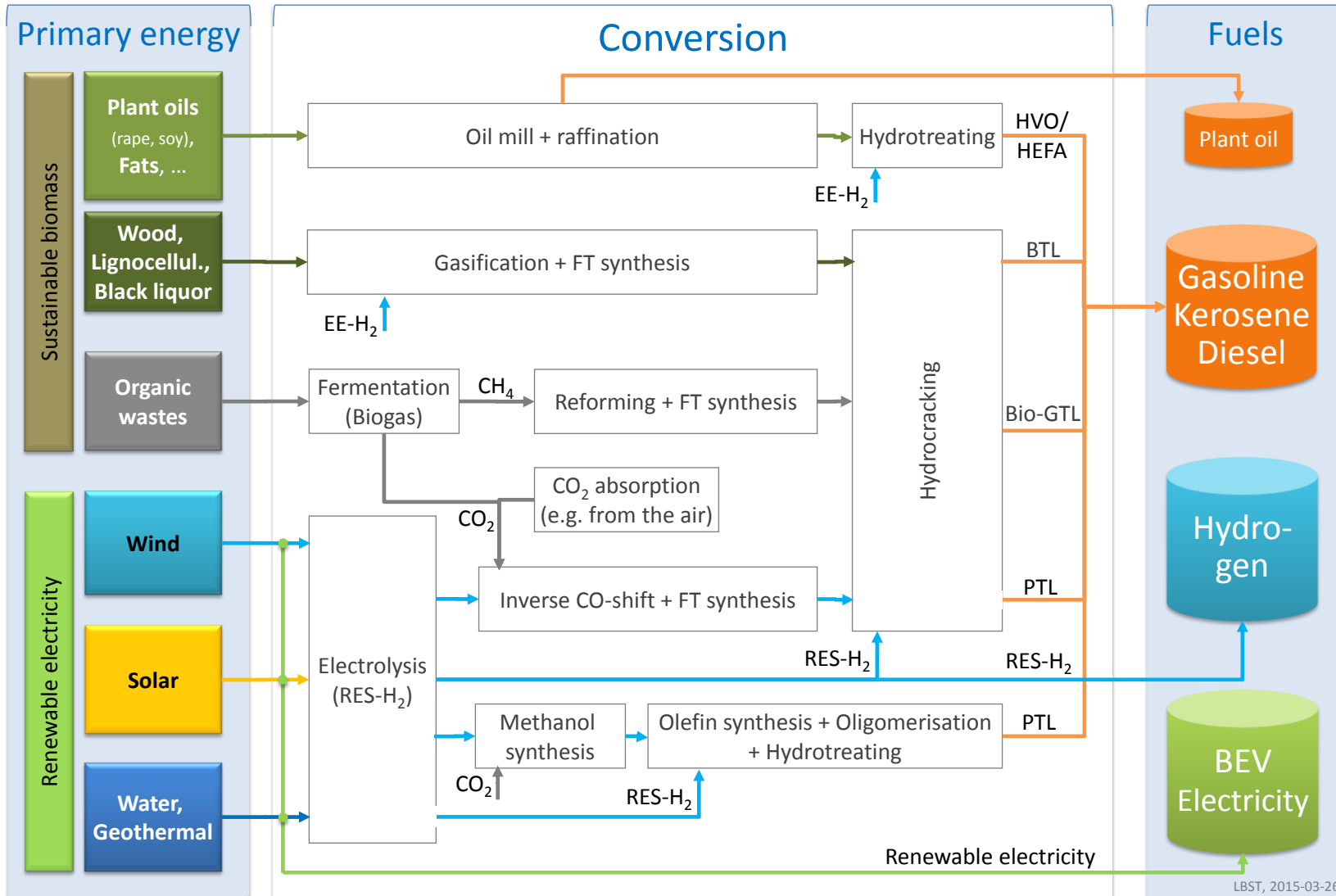


- Demanding reduction targets for greenhouse gas and selected pollutant emissions ,well-to-use'
- At the same time, rising global energy demands (in absolute terms)
- Critical for staying within the reduction corridor: System transformation may take significant time
- EU regulatory framework is currently in a state of stall/move, and blurry post-2020
 - EU Fuel Quality Directive (FQD) and EU Renewables Energy Directive (RED) under review for years now
 - National infrastructure plans to be developed for EU Alternative Fuels Infrastructure Directive (AFID)

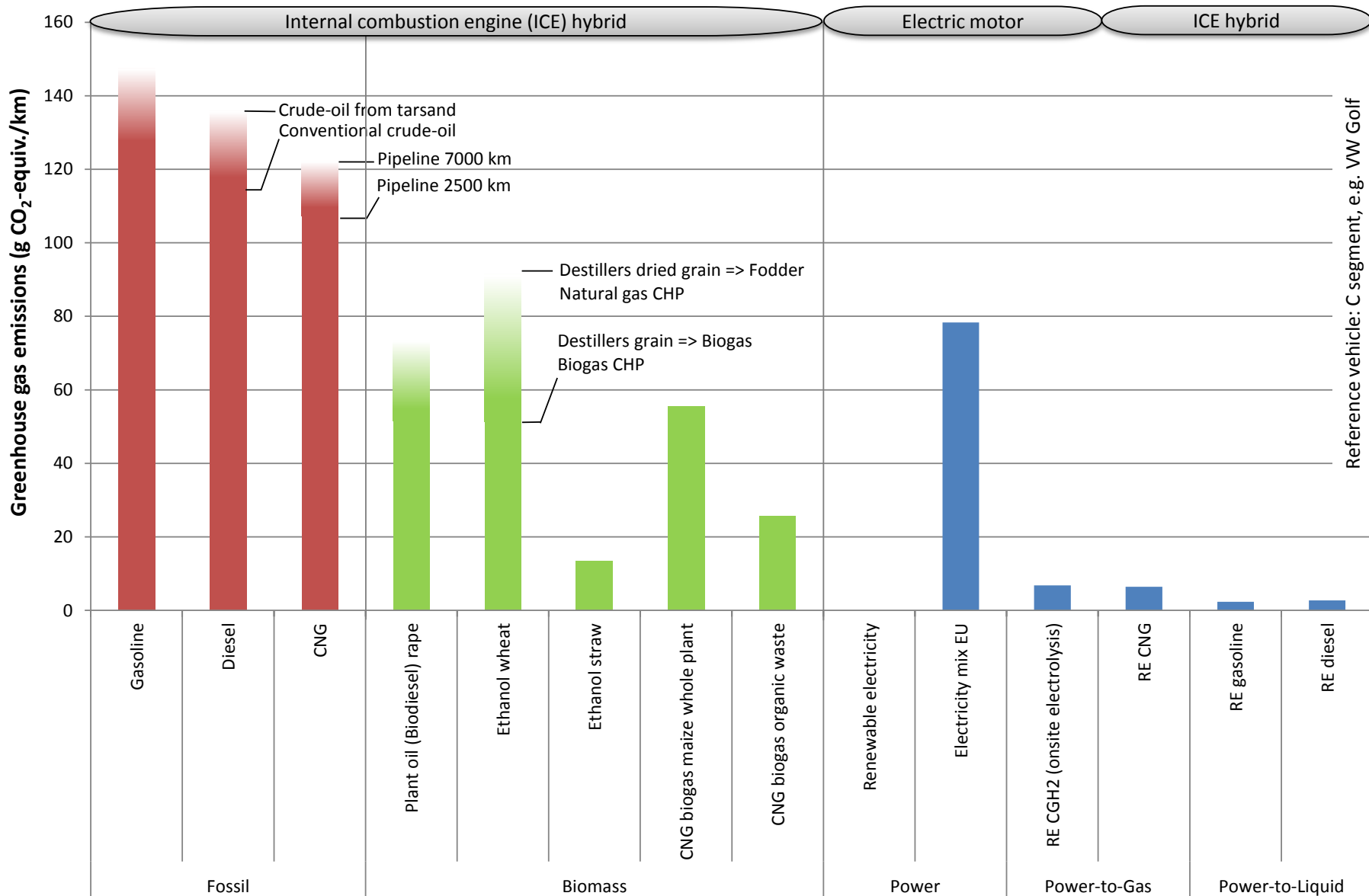


Transportation fuels from biomass and renewable electricity

→ Many routes lead to Rome, and there is no optimal way



GHG emissions of fossil and renewable fuels 'well-to-wheel'



Content



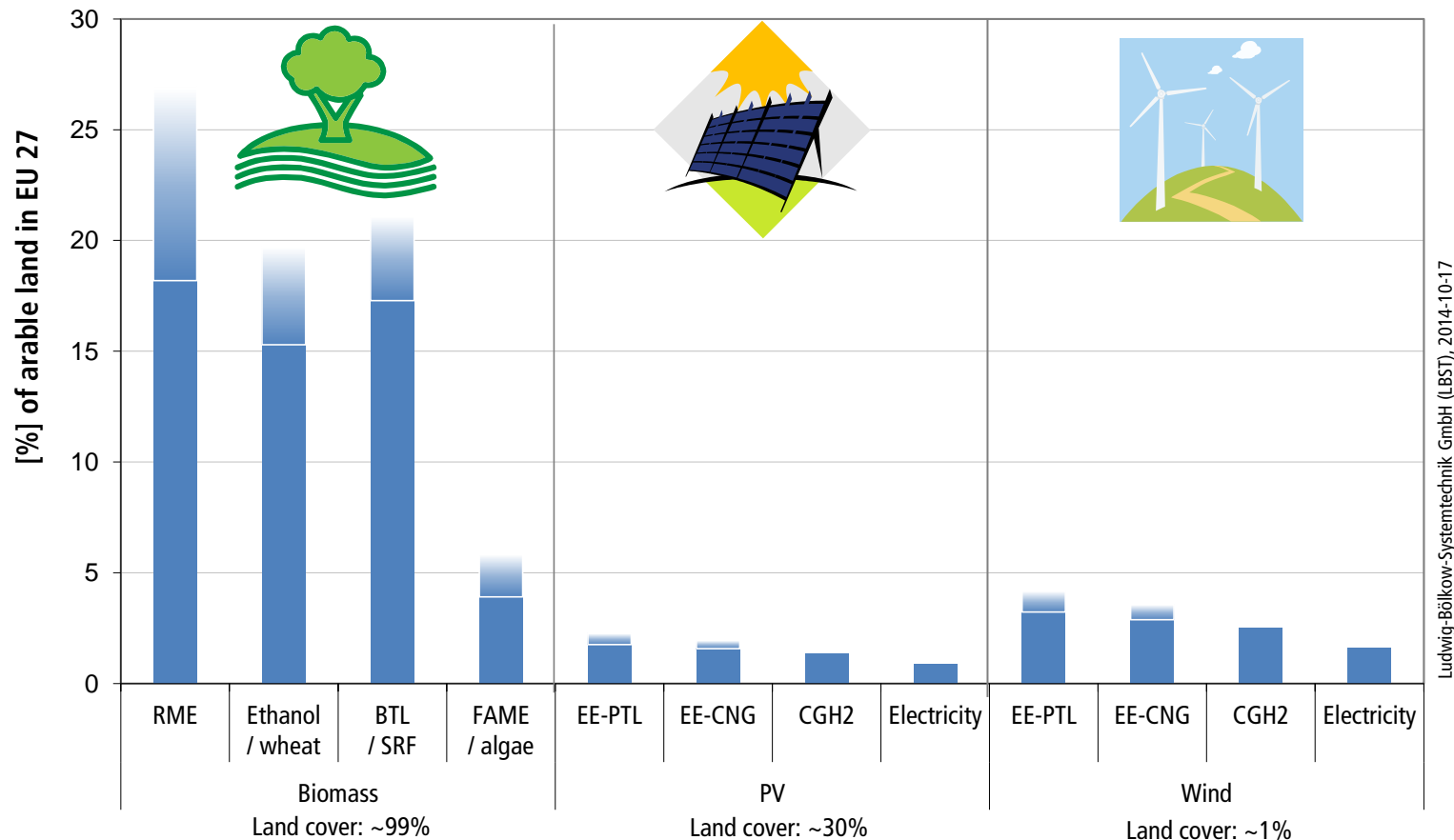
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How much EU land is (ceteris paribus) needed to fulfil the EU-RED 10% renewable fuel target in transport by 2020?



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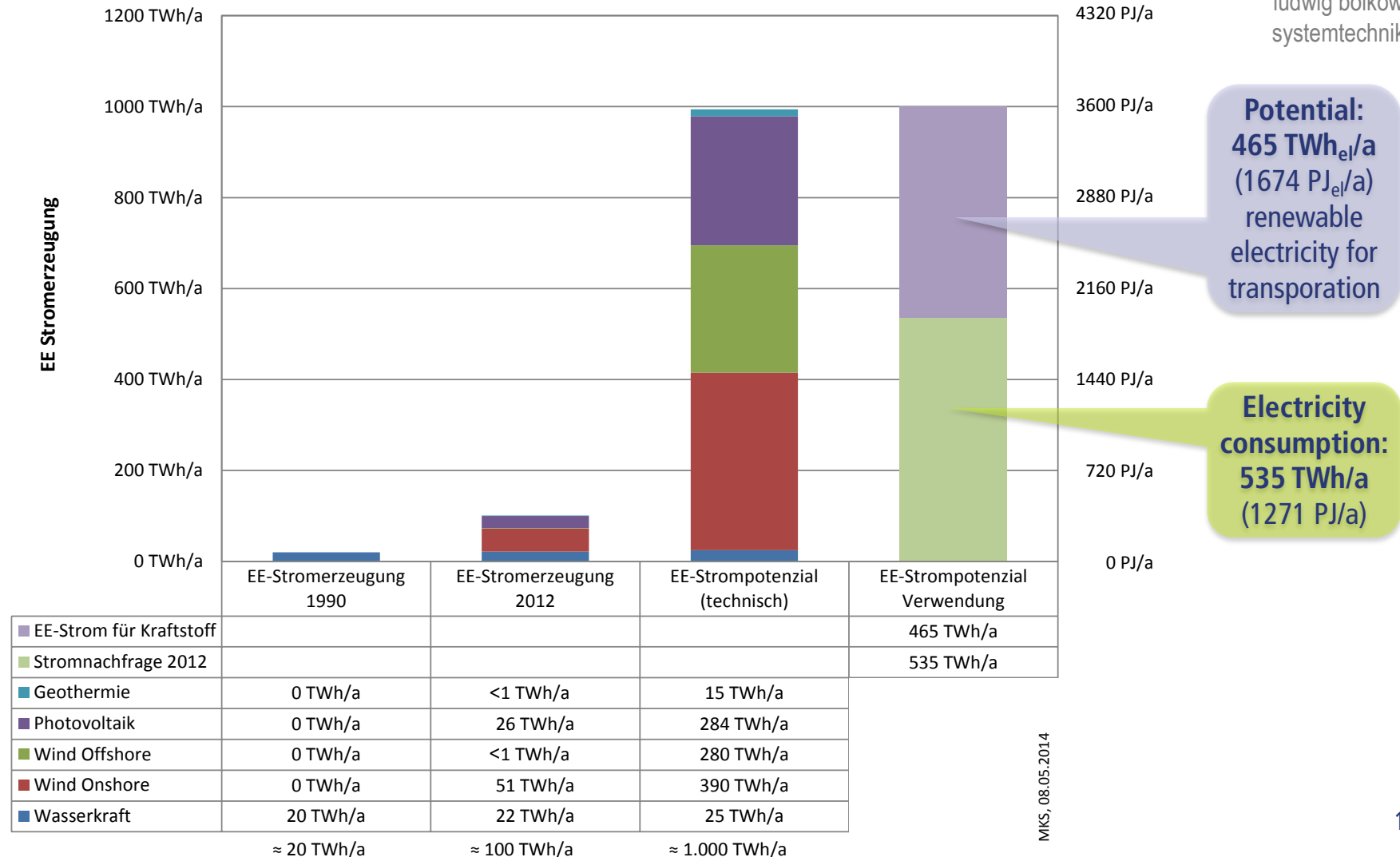
Ludwig-Bölkow-Systemtechnik GmbH (LBST), 2014-10-17

- With biomass pathways, substitution of animal feed taken into account.
- ➔ Electricity and electricity-based fuels have low land area requirements. The ‚well-to-tank‘ efficiency of PtX is misleading when compared with biofuels.

Technical potential for renewable electricity in Germany (conservative approach)



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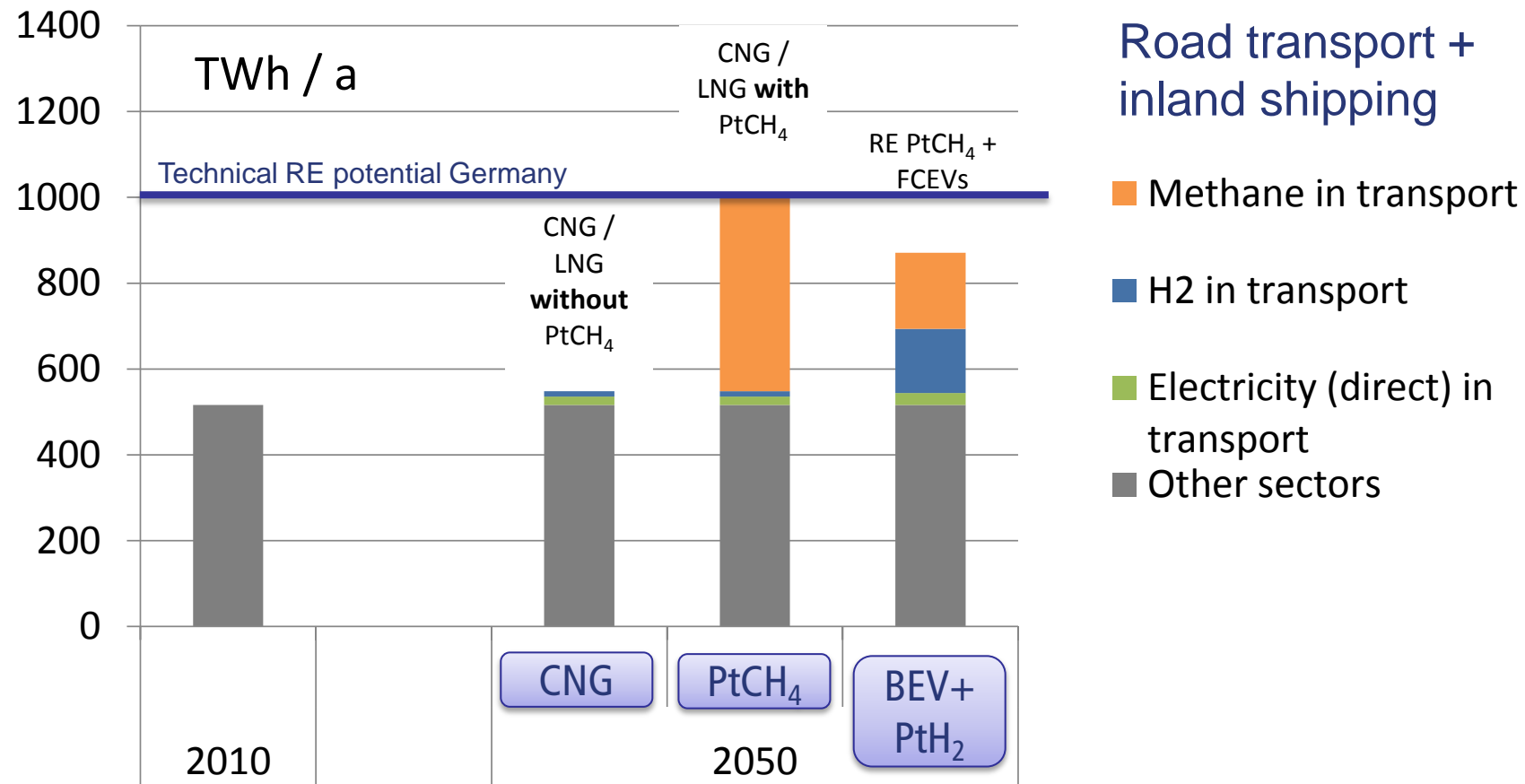
MKS, 08.05.2014

Fuel/drivetrain choices and fuel demand – 3 scenarios



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- Transportation demand in Germany: Traffic Prognosis 2030
- Technical renewable electricity potential in Germany: ~1000 TWh/a



Source: MFS PtG study (2014 w/ VP2030)
31 March 2015

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Key messages – fuel for thought



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- Blind spots result from focusing environmental assessments on greenhouse gases only
→ Biodiversity, water, criteria pollutants, social aspects, etc
- There is no single optimal fuel with regard to technology, economics, and ecology
→ Diversification of fuel/drivetrain portfolio in the midterm, downsizing, and electrification
- Efficiency measures alone will not do for achieving greenhouse gas targets
→ Renewables, sufficiency
- Societal question: Where shall the valuable (but limited) biomass go to?
→ Several (cascading) uses
- Renewable electricity and fuels derived from renewable electricity, e.g. hydrogen, synthetic methane or power-to-liquids, provide both large quantity and high emission reduction potentials
→ Accountability towards environmental targets must be given
- There is a trade-off between fuels, infrastructures, and availability:
 - Renewable (drop-in) fuels use already established infrastructures
– but limited availability (i.e. rising fuel production costs)
 - Renewable power-to-gas (hydrogen, methane) as well the direct use of renewable electricity both provide very high efficiency and availability potentials
– but require a switch of infrastructures and drivetrains (i.e. investments)

Contact



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