



Fuels and Drives of the Future Network

Fuel options for open-technology design of tomorrow's climate-friendly transportation

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The EnergyAgency.NRW

Operational Platform of the State of North Rhine-Westphalia with Broad Expertise in the Energy Sector (Structured in ten Networks [biomass, photovoltaics, wind power])



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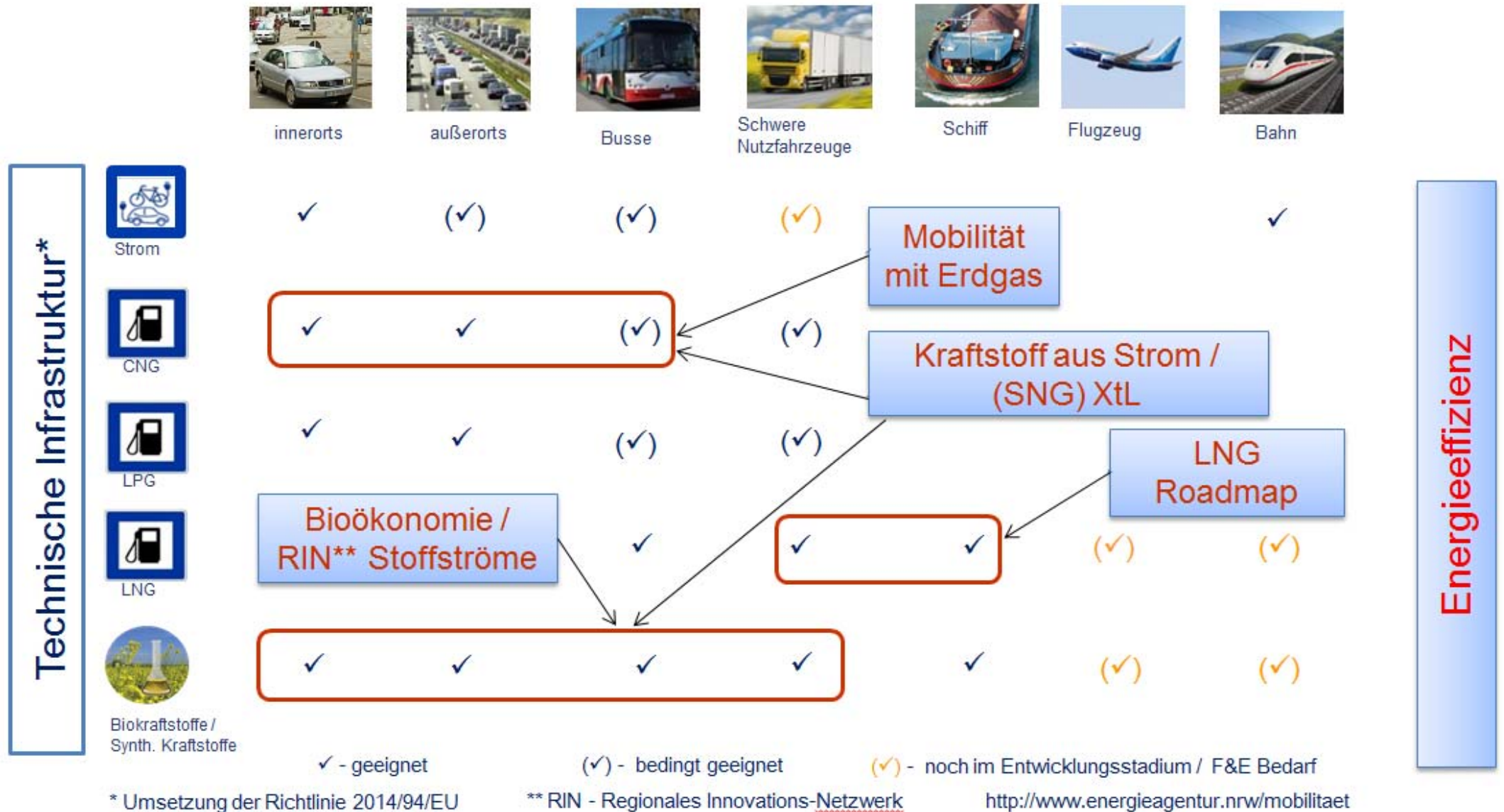
Topics:

- Efficient and Climate-Friendly Vehicle and Drive Concepts
- Fuels and Renewable Energy
- Technical Infrastructure
- Mobility and Fuel Strategy

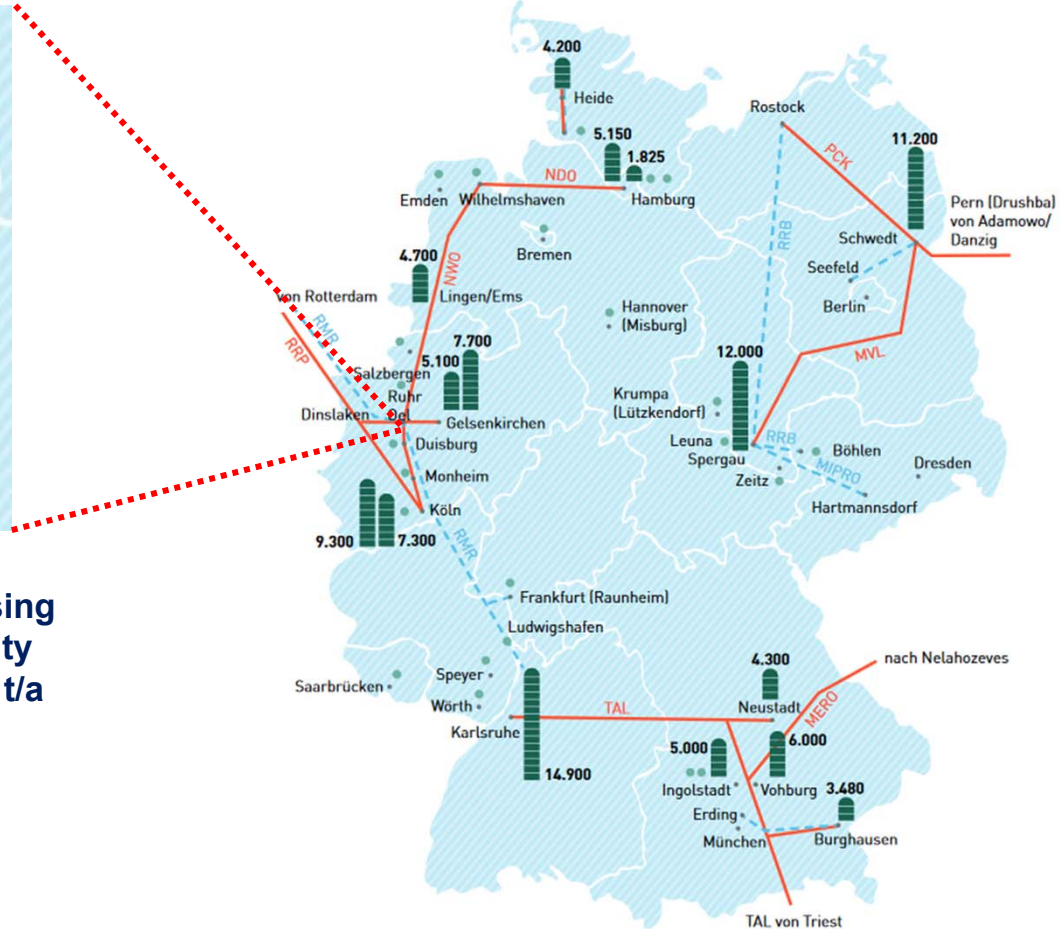
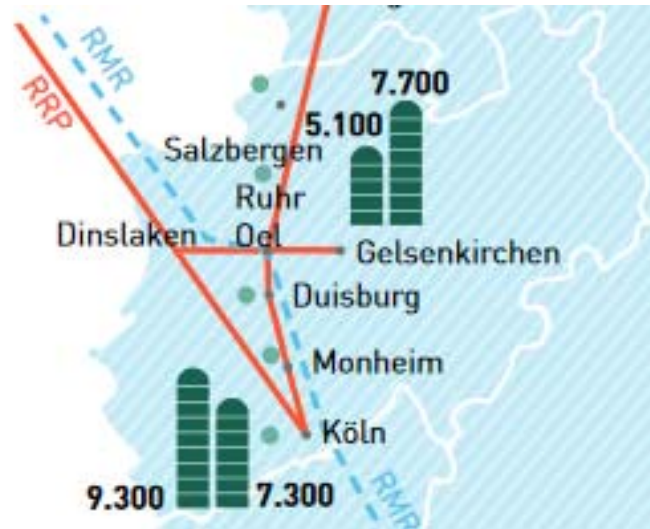
Applications:

- Road (Cars, Light and Heavy Commercial vehicles, buses, off-road applications (e.g. agriculture))
- Rail, Aviation, Shipping
- International Cooperation

Strategy for mobility and future fuels



Refineries in NRW



processing capacity in mio. t/a

12,8

9,3

7,3

102,2

29,4

Ruhr Oel GmbH

Pawiker Straße 30, 45896 Gelsenkirchen

Rheinland Raffinerie Werk Nord

Godorfer Hauptstraße 150, 50997 Köln

Rheinland Raffinerie Werk Süd

Ludwigshafener Straße 1, 50389 Wesseling

Germany

NRW

- crude oil pipelines
- - - refined product pipelines
- crude oil converting refinery (with atmospheric distillation)
processing capacity in thousand t/a
1 box relates to 1 mio. tons
- closed refinery

Stand: 31.12.2016



Quelle: mww.de

Biofuel Producers in NRW

- **ecoMation GmbH – Werk, Lünen**
 - Products:
 - animal fats based biodiesel
 - plant fats based biodiesel
 - glycerol
- **NEW - Natural Energy West, Neuss**
 - Products:
 - vegetable oil
 - feed
 - biodiesel
- **REG Germany AG (former Petrotec), Borken**
 - Products:
 - biodiesel from used cooking oil
 - methanol
 - glycerol



(eigene Darstellung)

Project Examples in NRW

Project I - "Zero Emission" of the RVK

- Regionalverkehr Köln GmbH (RVK) has commissioned its first three biogas buses.
- By 2030 at the latest, only procurement of vehicles with climate-neutral drive systems.
- The construction of its own bio natural gas filling station is planned.
- In the district of Euskirchen, about 7.0 million t of regionally produced biogas are available each year - enough for the entire bus transport.



Source: nationalpark-eifel.de

Project II - "BioMates" of the Fraunhofer UMSICHT, BP and EFEU

- The project aspires in combining innovative 2nd generation biomass conversion technologies for the cost-effective production of bio-based intermediates (BioMates) that can be further upgraded in existing oil refineries as renewable and reliable co-feedstocks.
- The resulting approach will allow minimisation of fossil energy requirements and therefore operating expense, minimization of capital expense as it will partially rely on underlying refinery conversion capacity, and increased bio-content of final transportation fuels.



Further sample projects in NRW

Project	Partner Industry	Abstract	Funding	Project Duration
bioCO₂nvert	Ostwestfalen-Lippe University of Applied Sciences, CropEnergies AG ,Viessmann Group u.a.	Development of a research facility for a CO ₂ -free biorefinery for the production of synthetic methane in combination with a bioethanol plant	BMBF	2018-
Carbon2Chem	thyssenkrupp AG, MPI, Fraunhofer, ...	Use of metallurgical gases as precursors for fuels, plastics and fertilizers	BMBF	2016-2026
Fabiene	RWE AG, thyssenkrupp industrial Solutions GmbH	Flexible supply of electricity and fuel from lignite based on fluidized bed gasification	BMWi	2016-2021
greenfuel	Gensoric GmbH, innogy SE	Demonstration of a decentralized concept for methanol synthesis and application in an inland waterway vessel	innogy SE, EGC Essen	since 2017
Cluster of Excellence Tailor-Made Fuels from Biomass (TMFB) / Competence Center Power to Fuel	RWTH Aachen University	A description of a fuel design process that can be used to make tailor-made fuels with any biomass properties Power-to-X deals with the question of how surplus energy can be used or stored from renewable energy sources.	BMBF, DFG	since 2007
Fuel model region (Diesel R33)	<i>in progress</i>	Development of a fuel that exceeds the requirements of DIN EN 590 and contains a proportion of 33 percent renewable or biogenic fuel components	<i>in progress</i>	
Bio-LNG	<i>in progress</i>	Development of bio-Lng fleet applications	<i>in progress</i>	

Conclusion

- In the future, a **wider range of fuels and propulsion systems** will be available on the market. Regional and local initiatives serve as trailblazers for market penetration
- When building business models, reliability, environmental performance, uniform norms and standards as well as comfort and handling serve as **acceptance criteria**
- Intralogistics, mixed fleets, company pools and fleets (e.g. parcel services) serve as applications of commercial fleets
- The expansion of the **technical infrastructure** will continue in the future
- There are activities in many cities and municipalities for a modern **mobility and fuel strategy** (electric mobility with battery and fuel cell, infrastructure development, fleet management, cost effectiveness)
- The EnergyAgency.NRW networks support partner search, the integration of science and (local) economics and impart knowledge through potential studies and feasibility studies

Contact

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