Nachhaltigkeit im Transport – wie können Güter wettbewerbsfähig auf die Schiene verlagert werden?

Dr. Thorsten Bieker

Veranstaltung im Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit am 08.07.2016
Chemicals remains a growth industry

Chemistry as enabler for current and future needs

- ~10bn people by 2050
- 70% of the world population will live in cities by 2050
- 50% more primary energy consumption by 2050
- 30% more food needed by 2050
Climate protection at BASF

- With our climate protection products, we make an important contribution to climate protection and energy efficiency.

- We invest around one third of research expenditures in the development of products and processes for climate protection and energy efficiency.

- We reduce emissions along the entire value chain.

- We have set ourselves ambitious goals to reduce greenhouse gas emissions in our production by 2020 and want to reduce emissions per ton of sales product by 40% compared with 2002.
We help our customers to reduce their CO₂ emissions

Prevention of greenhouse gas emissions through the use of BASF products 2015 (in million metric tons of CO₂ equivalents*)

Without using BASF’s products 1,210

Using BASF’s products 680

Emissions avoided: 530 (Attributable to BASF: 11%)

* CO₂ equivalents = units for measuring the impact of greenhouse gas emissions on the greenhouse effect
Climate protection at BASF

Products for
- avoiding greenhouse gas emissions
- adapting to climate change

Reduction of greenhouse gas emissions in
- production
- value chains
We assume responsibility along the entire value chain

Greenhouse gas emissions along the BASF value chain in 2015
(in million metric tons of CO$_2$ equivalents)

54 Suppliers
Purchased products, services and capital goods

4 Transport
Transport of products, Employees’ commuting and business travel

22 BASF
Production (including generation of steam and electricity)

43 Customers
Emissions from the use of end products

18 Disposal
Incineration with energy recovery, landfilling

4 Other
BASF Supply Chain fosters sustainability at competitive cost by a proper modal split

CO\textsubscript{2} emission by mode of transport (gCO\textsubscript{2}/tkm)

- Barge (downstream): 10
- Barge (upstream): 20
- Rail: 21
- Road: 65

Source: VCI-Leitfaden zur Ermittlung der CO\textsubscript{2}-Emissionen in der Logistik der chemischen Industrie, 06.07.2010
Transportation Volume BASF Ludwigshafen 2015

Volume inbound + outbound: 14.3 mio t

42% Barge
= 22 ships / day

32% Road
= 1,966 trucks / day

26% Rail
= 363 rail cars / day

+ internal transportation volume
5.5 mio t 2015
Rail Transport

- 230 km Tracks
- 780 Switches
- Hump
- 161 Loading stations
- Railway undertaking
## Competitive Advantage

<table>
<thead>
<tr>
<th>Factor</th>
<th>Classic Rail Tank Car</th>
<th>Intermodal (TC)</th>
<th>Tank Lorry</th>
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Rail must shorten innovation cycle times to survive
Lightweight composites help to reduce weight in automobiles

Current models
Replacement of hang-on parts
Structural parts
Whole modules and assembly-systems
Complete new vehicle concepts

2010  2015  2020  2025  2030

In rail there are (almost) no activities to reduce weight

- Disadvantage in competition
- Disadvantage to achieve further CO₂ reduction

⇒ Minimum weight restrictions / guidelines / regulations
  - 1 t minimum weight per meter
  - 4 t minimum axle load (5 t disk brake)
**New rail optimized 45’ tank container**

**Existing 4 axle rail tank cars**

- Volume: 70,000 liter
- Payload: 64 tons
- Gross weight: 90 tons

**New 45’ TC**

- Volume: 63,000 liter
- Payload: 66 tons
- Gross weight: 75 tons (90 tons incl. wagon)

**Existing 20’ to 26’ TC**

- Volume: 25,000 to 36,000 liter
- Payload: 32 tons
- Gross weight: 36 tons

**BASF Innovation**

**Innovation: storage rail & barge optimized 45’ tank container**

- Costs advantage thru separate optimization of tank and wagon
- Less handlings & lower filling costs compared to existing 20’ TC
- “Shunting” via cranes possible
- Further automation of last and first mile process possible
BASF 45′ tank container
BASF 45′ tank container
Further Innovation first mile process possible

Google Car: prototype 2014

Mercedes truck: prototype 2014

Rolls Royce Ship: study 2014

Automation of first & last mile process is opportunity for conventional rail to keep competitive advantages and to shift more volume to rail
Summary
Competitive Advantage

- new rail 45’ TC process
- Intermodal (TC)
- tank lorry

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We create chemistry