

International Transport Forum, May 28th 2008

Contribution of Freight Transport for the Reduction of CO₂ Emissions

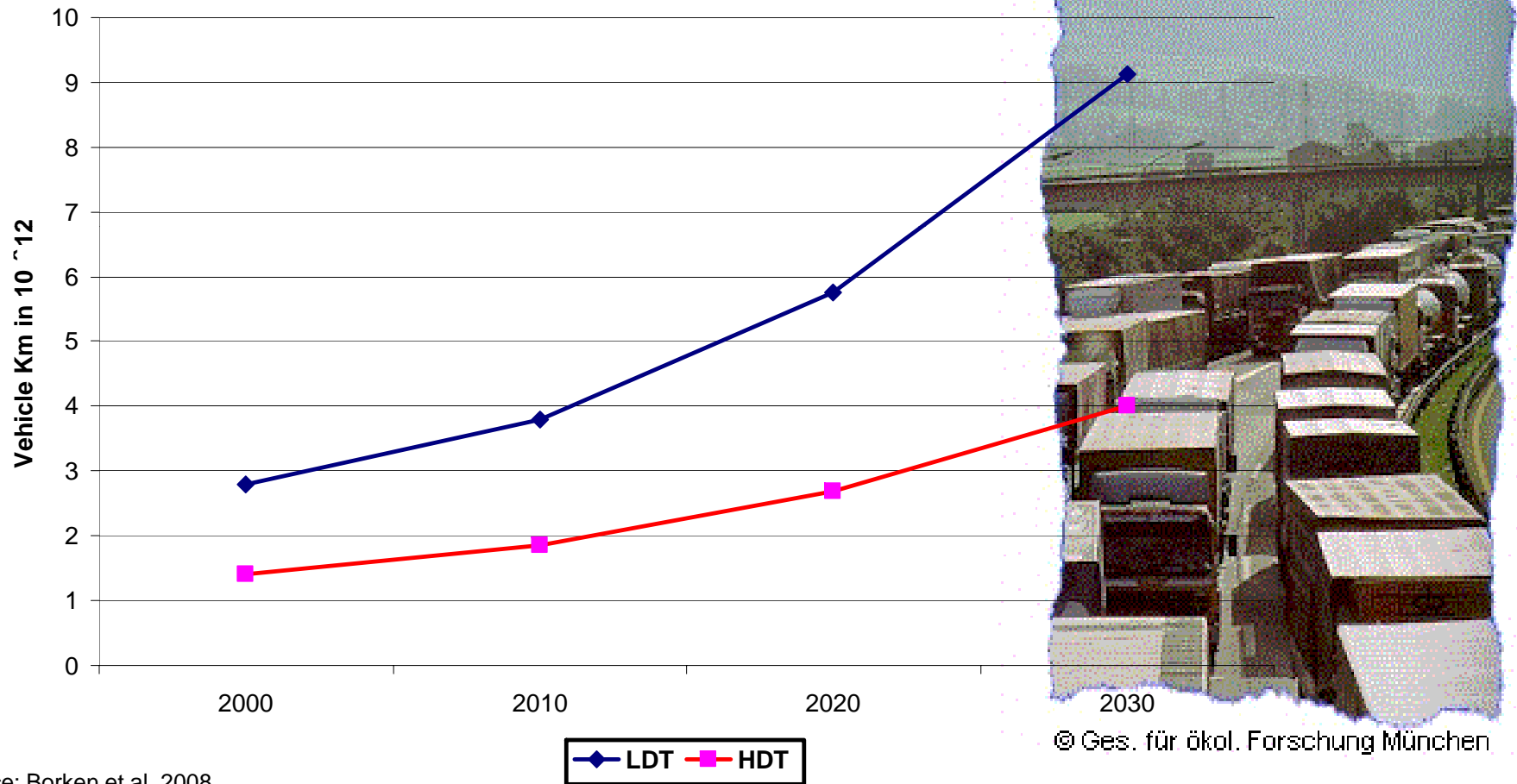
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Institute of Transport Research**



**Deutsches Zentrum
für Luft- und Raumfahrt e.V.**
in der Helmholtz-Gemeinschaft



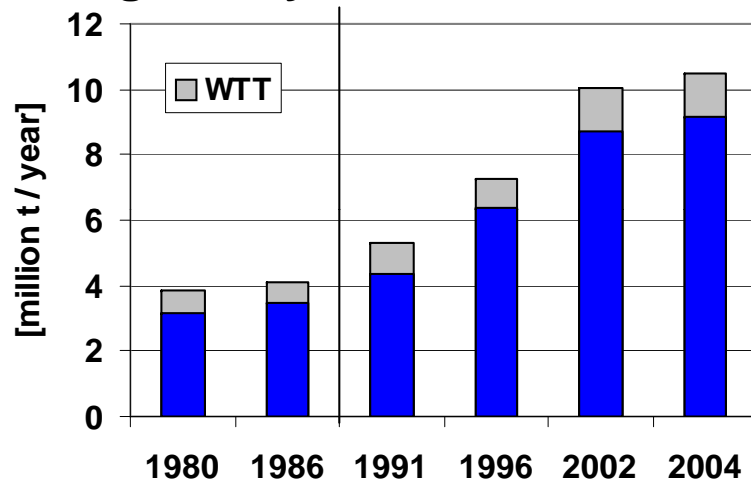
Increase of goods transport (vehicle km worldwide)



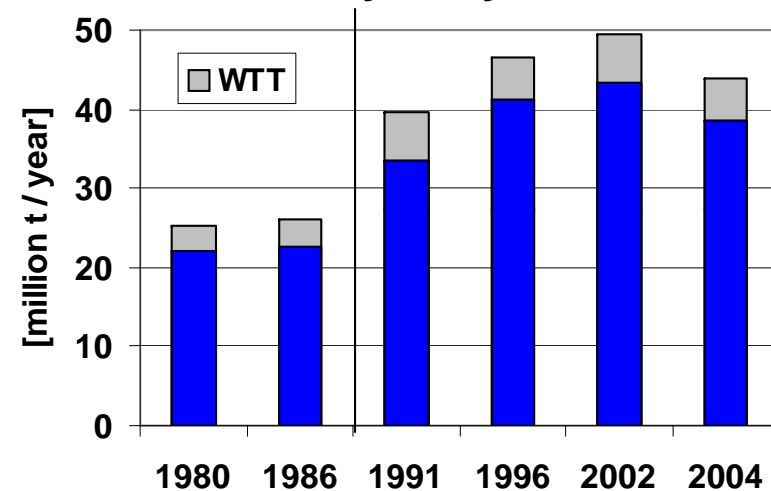
Source: Borken et al. 2008

CO₂ emissions of road freight transport Germany

Light Duty Trucks < 3.5 t GVW



Heavy Duty Trucks

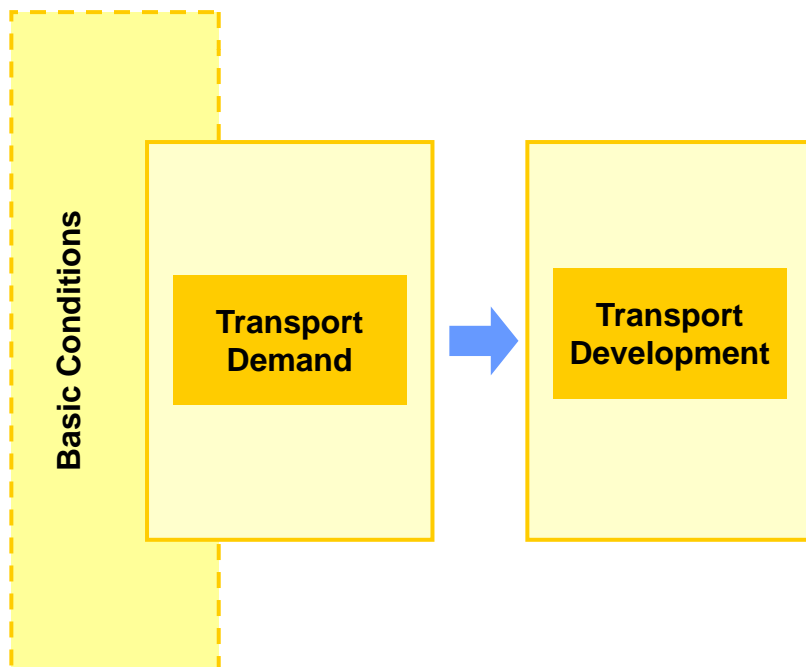


- According to their strongly increased mileage CO₂ emissions of light duty trucks have doubled from 1991 to 2004
- Data about performance (tkm) of LD trucks are not available
- HD trucks: performance (tkm) increased by 55% from 1991 to 2004, emissions by 10%



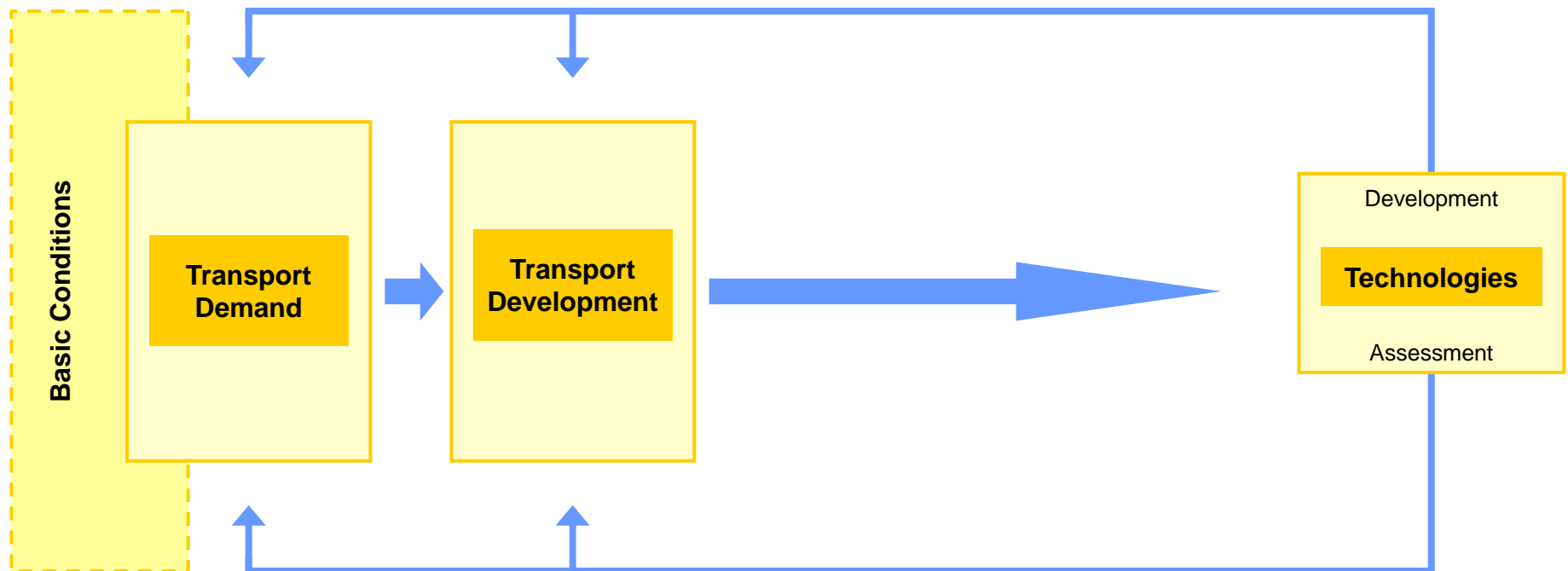
The Transport-Environment Process Chain

Core Topics: ➤ Transport Demand and Development



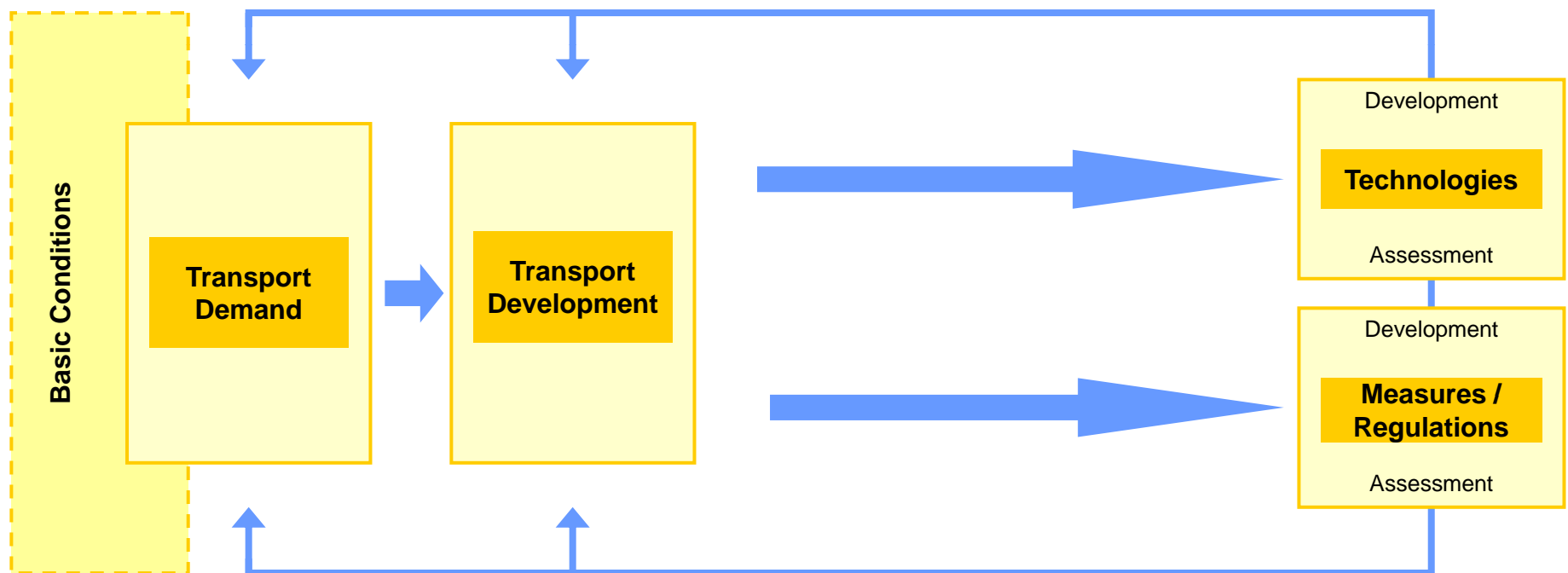
The Transport-Environment Process Chain

- Core Topics: ➤ Transport Demand and Development
➤ Technologies



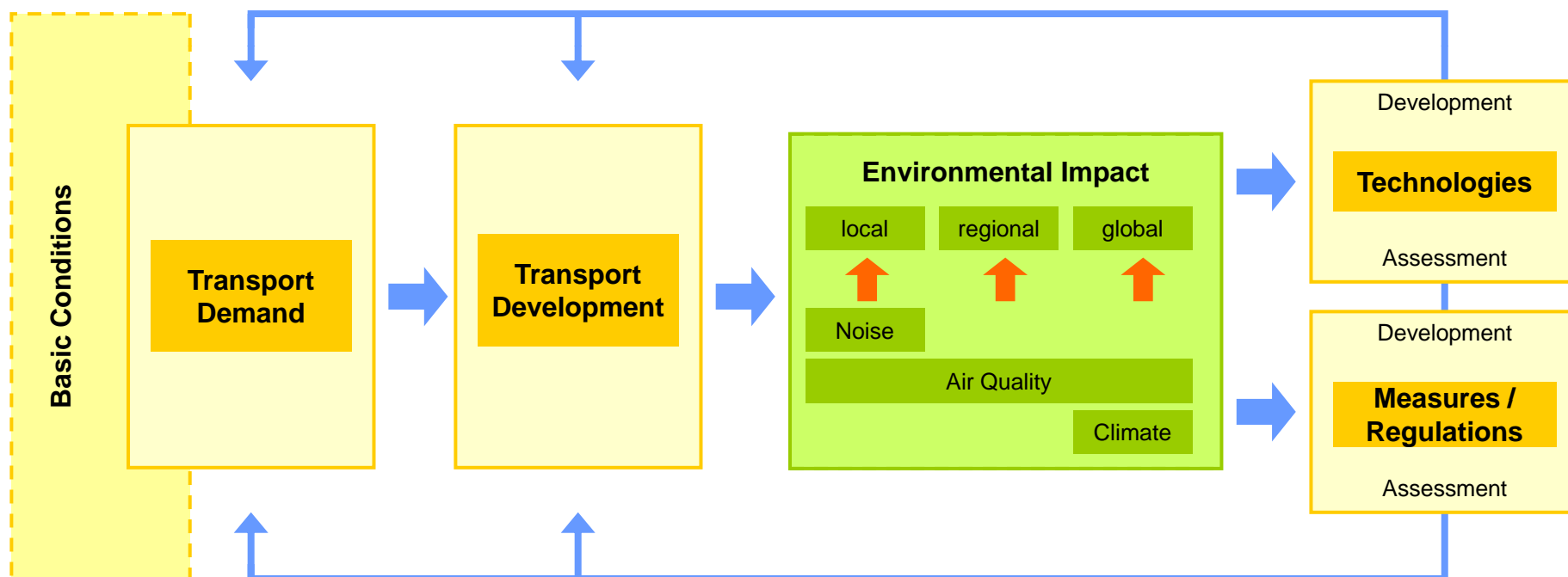
The Transport-Environment Process Chain

- Core Topics:
- Transport Demand and Development
 - Technologies
 - Measures and Regulations

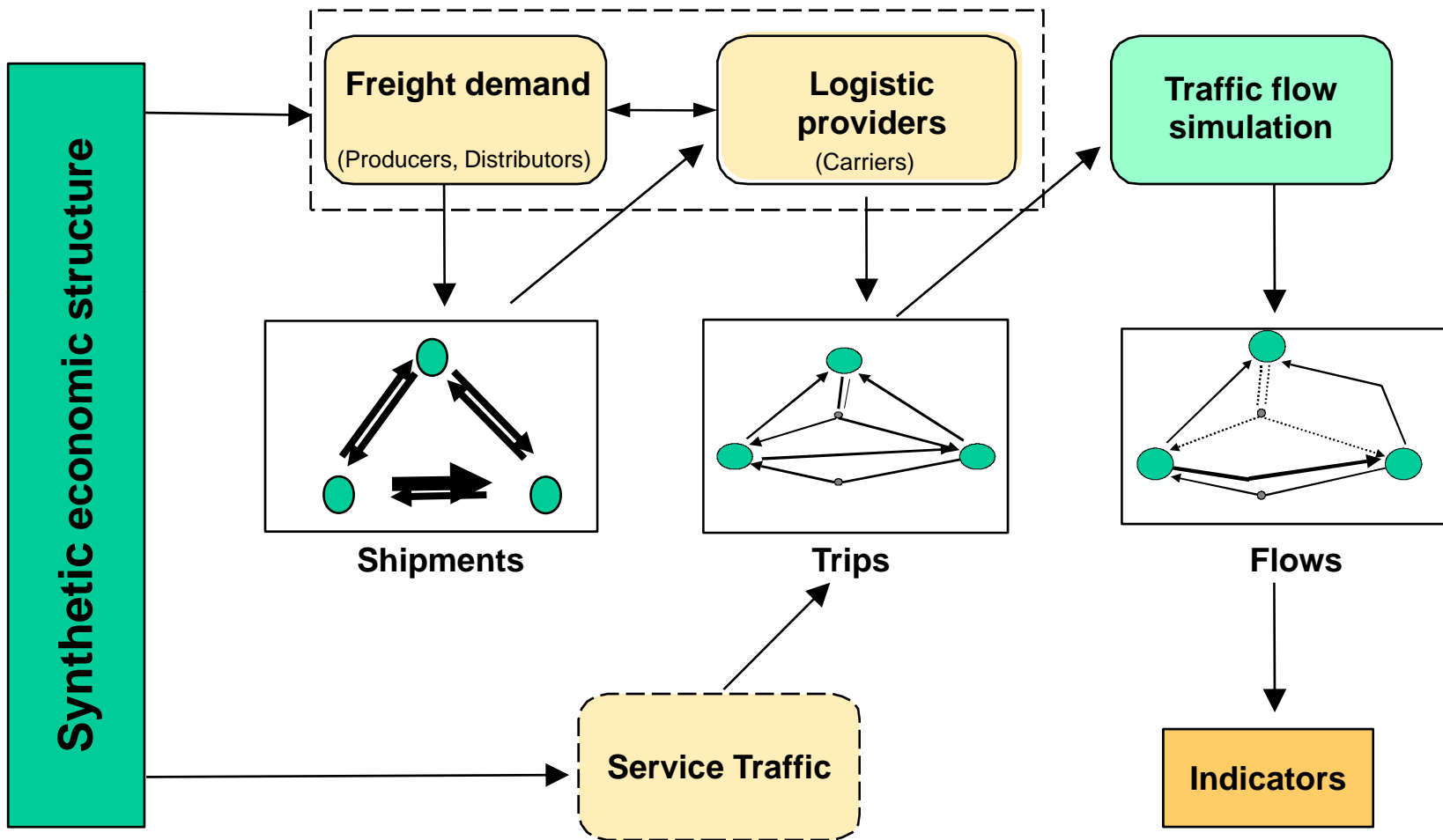


The Transport-Environment Process Chain

- Core Topics:
- Transport Demand and Development
 - Technologies
 - Measures and Regulations
 - Environmental Impact



Freight Transport Demand and Development

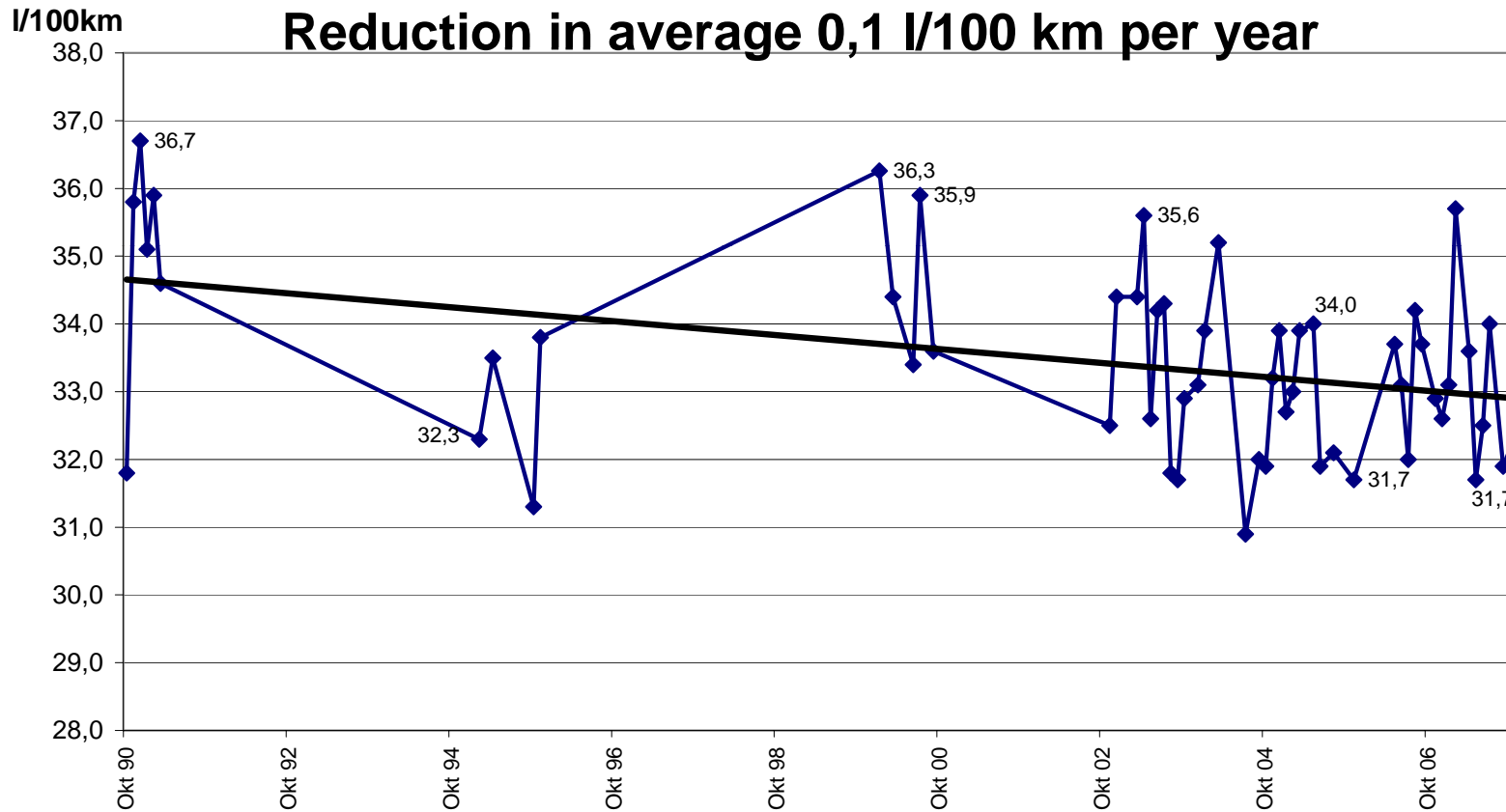




Technologies

Average fuel consumption of HDT (>7.5t)

Reduction in average 0,1 l/100 km per year



SOURCE: Own data analysis based on standardized tests of journal Verkehrsrundschau

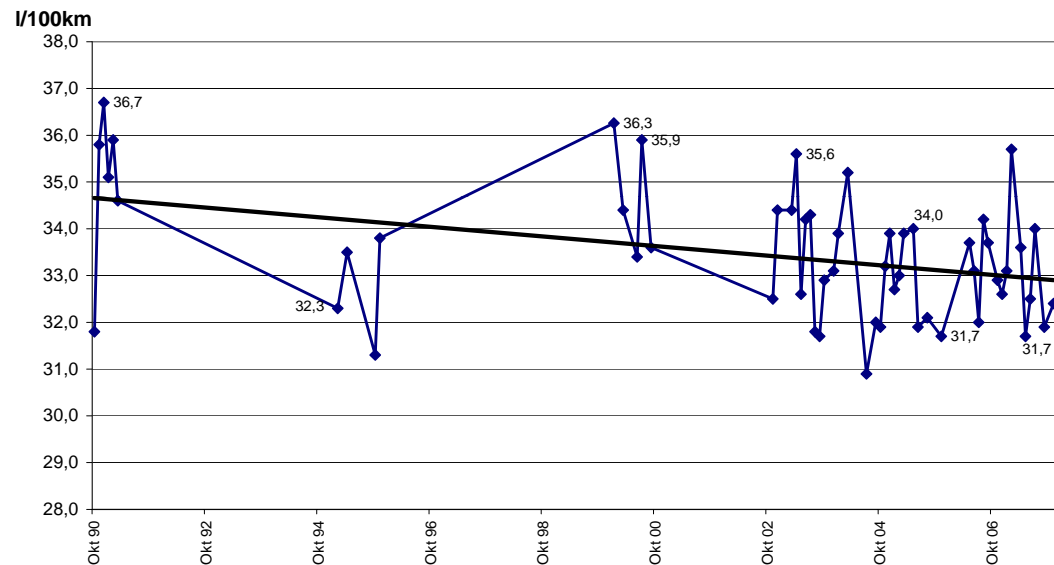
Technologies



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- Reduction of Rolling Resistance
- Improvement of Power Train
- Improvement of Aerodynamics of the whole Vehicle
- Improvement of Energy Supply Management of the engine and devices for the driver
- Assuming up to 15% reduction of fuel consumption to y2030

Average fuel consumption of HDT (>7.5t)
Reduction in average 0,1 l/100 km per year



SOURCE: Own data analysis based on standardized tests of journal Verkehrsrundschau

Measures and Regulations

- Toll is without reference to CO2 emission (but with reference to pollutant categories)
- Toll = promoter of efficient transport organisation?

Rate of loaded distance of German HDT (Mio km), 2000-2006

Year	2000	2001	2002	2003	2004	2005	2006
Loaded distance [km]	21.449	21.981	21.456	21.579	22.549	22.885	24.225
Unloaded distance [km]	7.045	6.777	6.289	6.060	5.931	5.628	6.017
Rate of loaded km [%]	75,3	76,4	77,3	78,1	79,2	80,3	80,1

Source: Stat. Mitteilungen des BAG und des KBA, Reihe 8

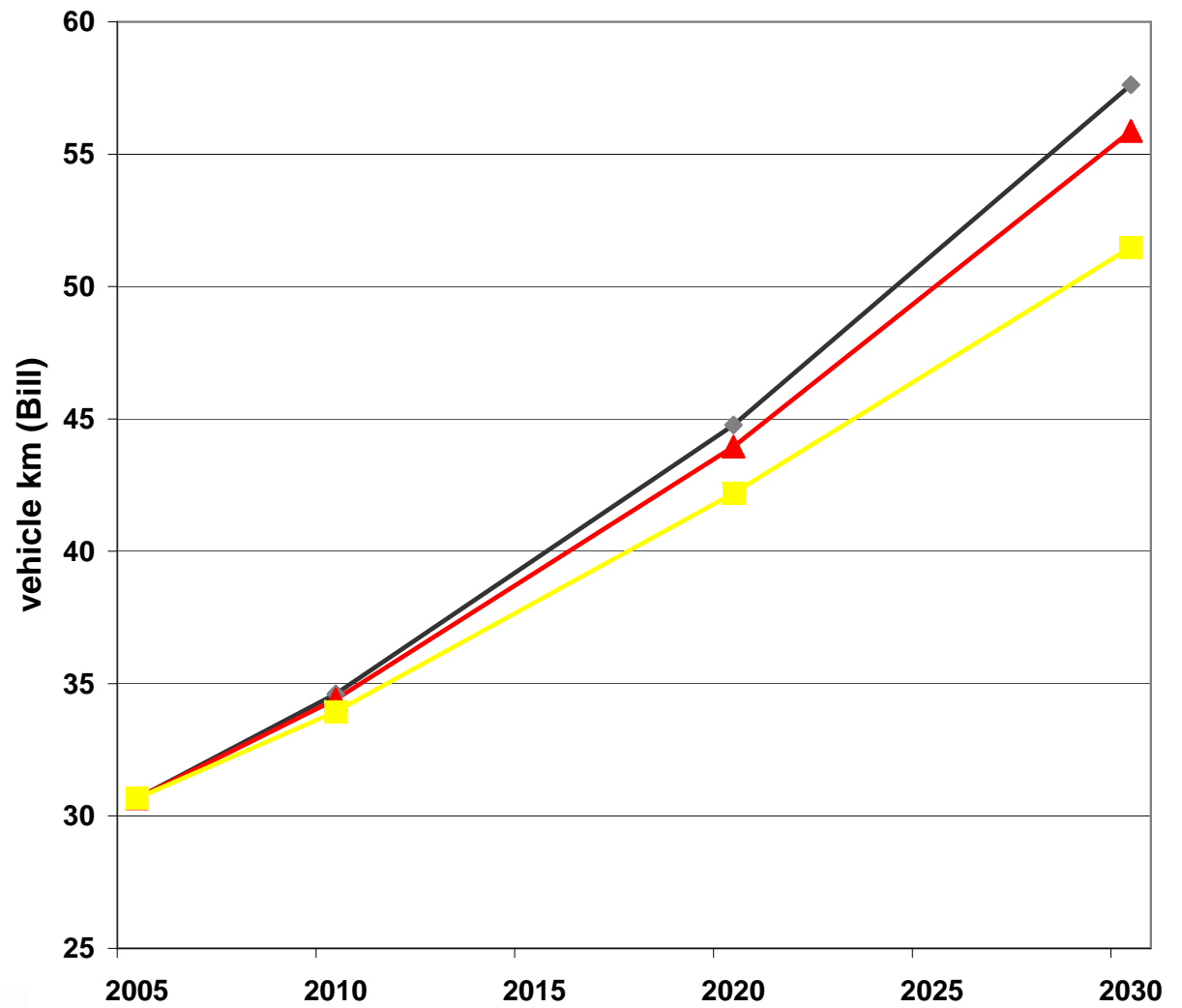
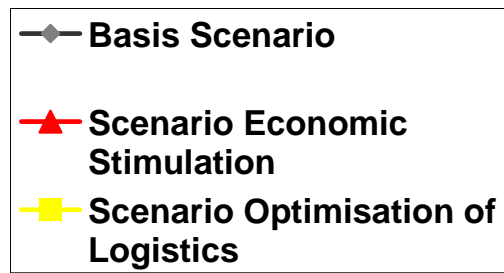

**introduction of a TOLL
system in Germany**

- New toll rates with more incentives for lower emission vehicles
- Restrictions for EURO 0,1 and 2 standard trucks on Austrian motorway at the Inntal



Measures and Regulations

Scenarios for development of vehicle km of HDT in Germany in y2030



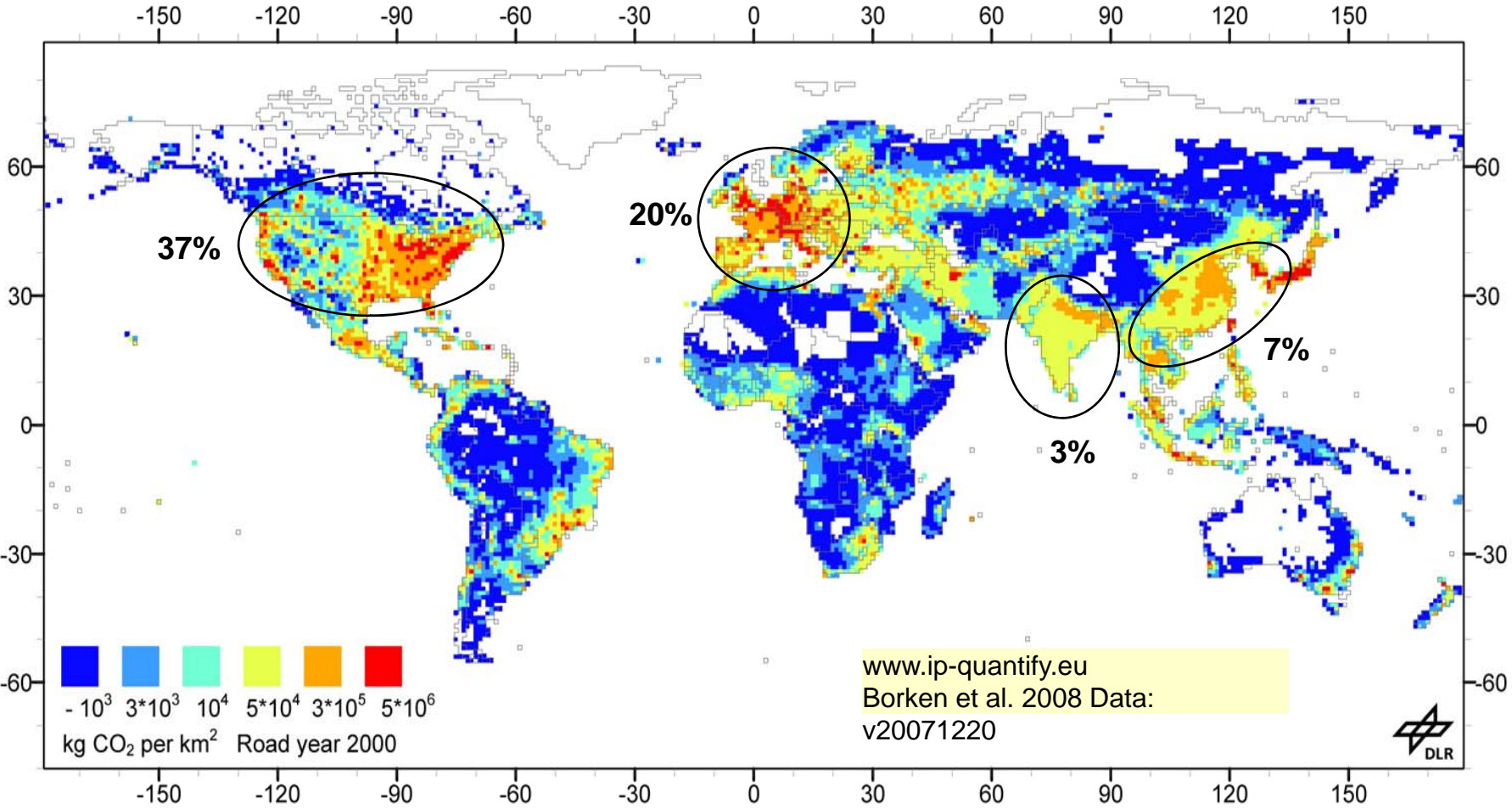
SOURCE: Based on own modeling results, model WiVSim





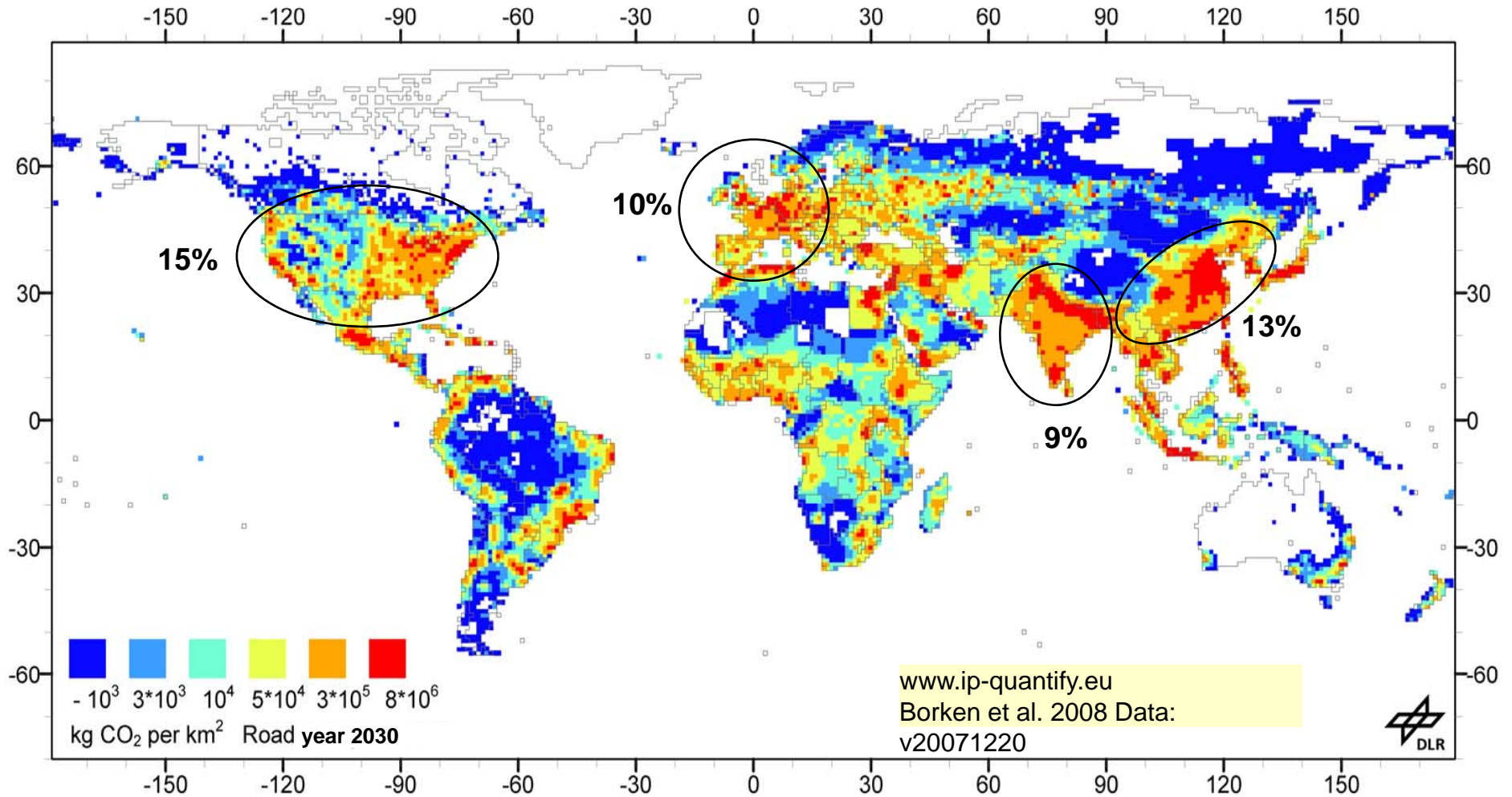
Environmental Impact

Road transport's CO2 emissions by region in y2000



~4300 Gt CO₂ from road transportation globally in 2000, of which ~35% by LDT/HDT

Road transport's CO2 emissions by region in y2030



Total CO2 in 2030 >> factor 2 compared to 2000. Share trucks grown to ~50%.

Conclusions

- CO2 Reduction of Freight Transport must come from
 - Technologies
 - Optimisation of logistic processes
 - Measures and Regulations for economic stimulation
 - Changing of Modal Shift to rail, intermodal transport (rail and inland water way) and short sea shipping
 - Other

