

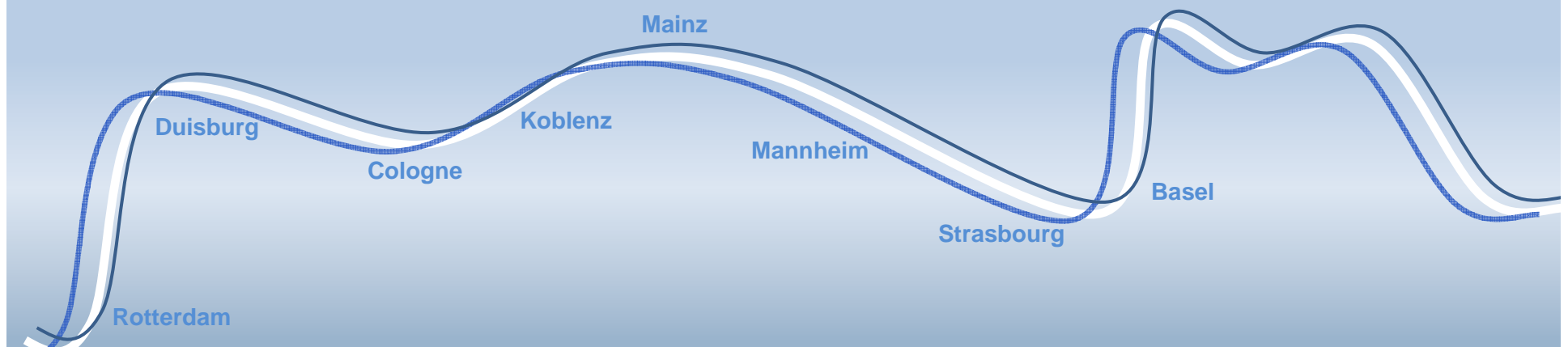
International Spring seminar “Socio-economic influences on the discharge of the River Rhine

Bregenz, Austria, 26th -27th March 2014

Shipping on the Rhine – developments and prospects for the demand and supply side, with consideration of the climate change



Hans van der Werf, Secretary-General
Central Commission for the Navigation of the Rhine





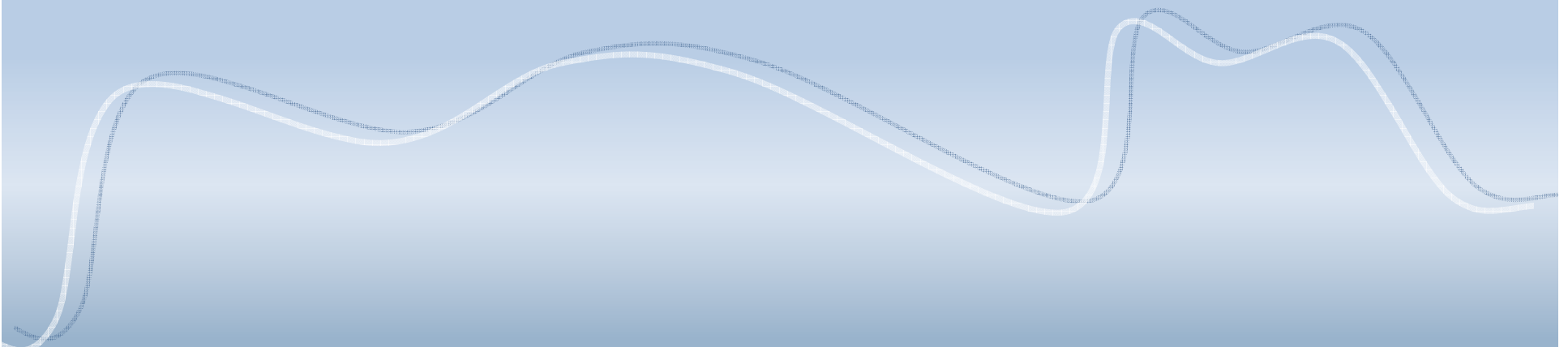
Outline

1. **Goods Transport on the Rhine (Transport Demand Side)**
2. **Fleet Development (Transport Supply Side)**
3. **The interference of Rhine Shipping with hydrological parameters**
4. **Passenger Shipping**
5. **Conclusions**



1. Goods Transport on the Rhine

(Transport Demand side)

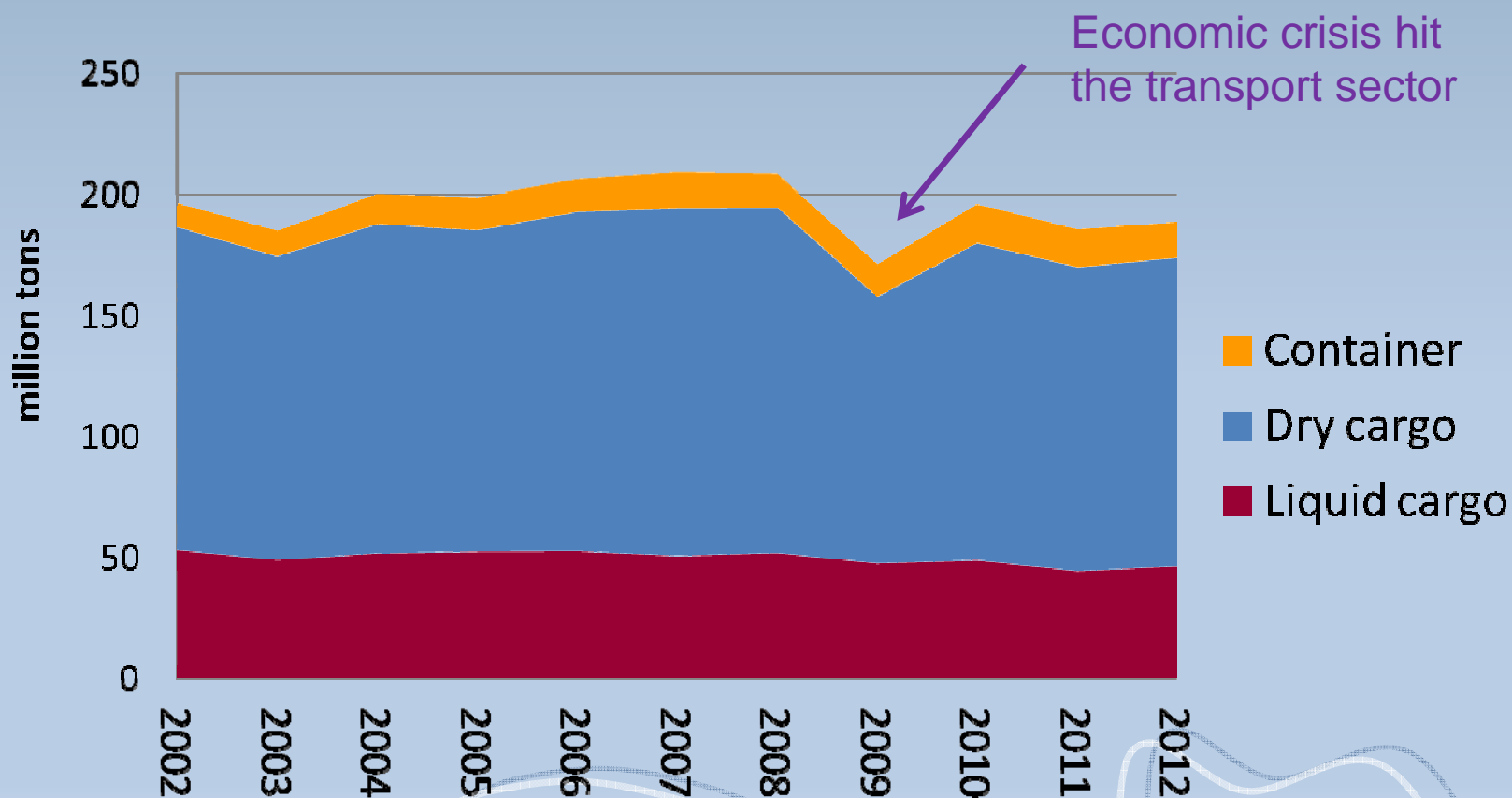




Transport volumes on the Rhine

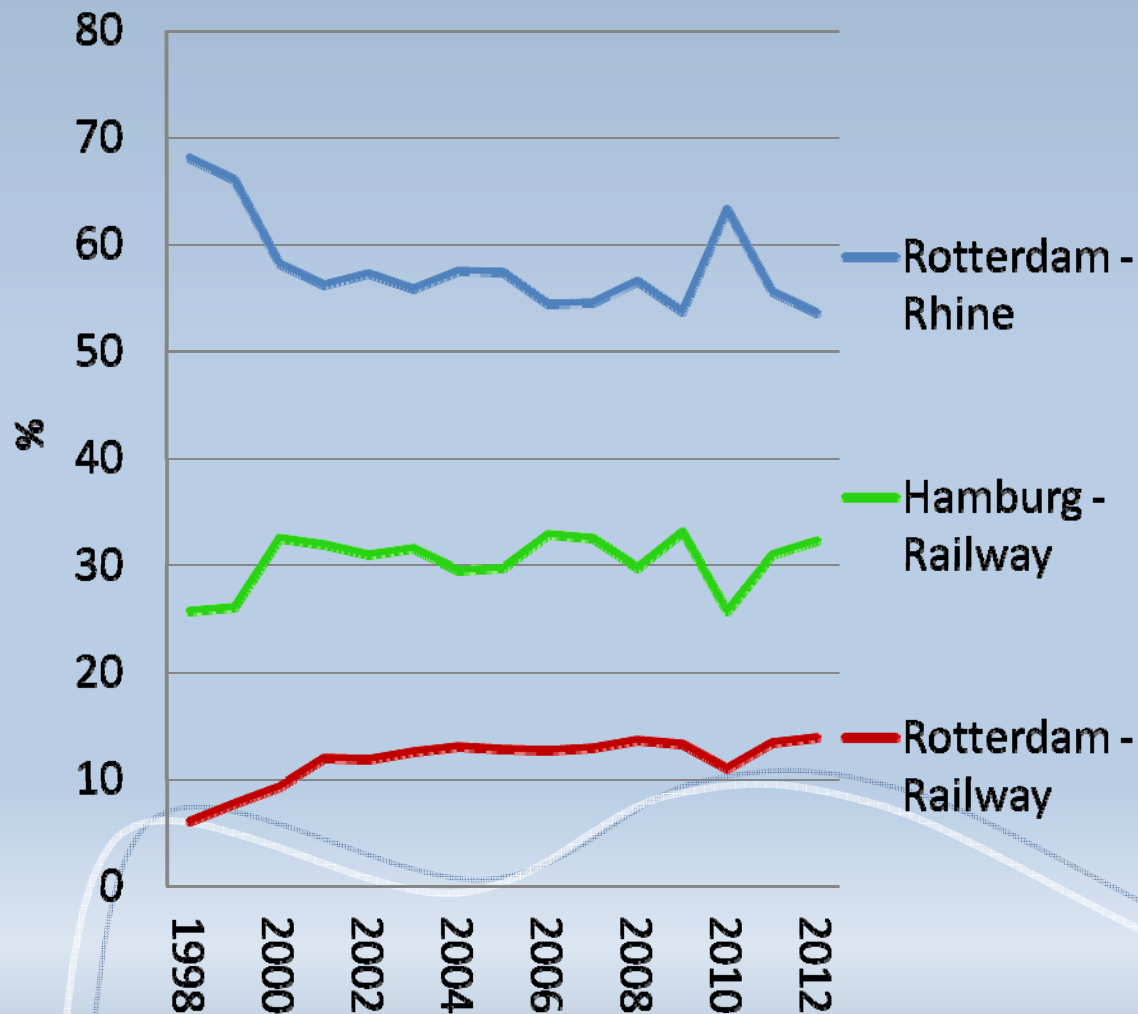
(Mio. tons, 2002-2012)

Source: destatis and calculations CGNR



- 2/3 of the transport volumes is dry cargo
- 1/4 is liquid cargo
- 1/12 is container transport

Strategic Role of the Rhine for the provision of raw materials - Imports of iron ore to Germany per mode of transport (%)



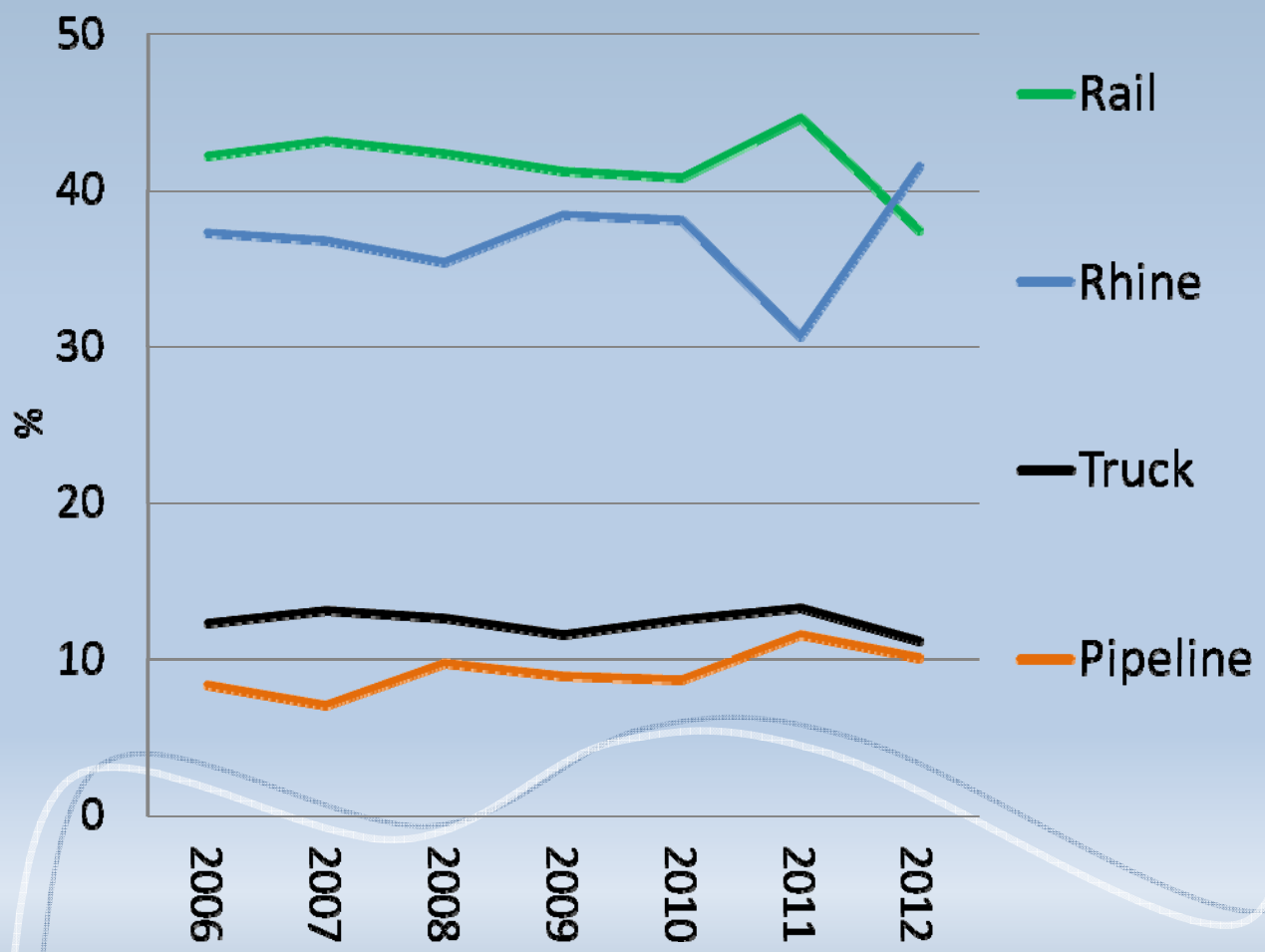
Rotterdam - Rhine = Import of iron ore via the seaport of Rotterdam and transport on the Rhine to the steel industry in the hinterland

Hamburg-Railway = Import via the seaport of Hamburg and transport by rail to the hinterland

Rotterdam-Railway = Import of iron ore via Rotterdam and transport by rail to the hinterland

Source: German Steel Association

Strategic Role of the Rhine for the provision of raw materials – Import of mineral oil products to Switzerland per mode of transport (%)

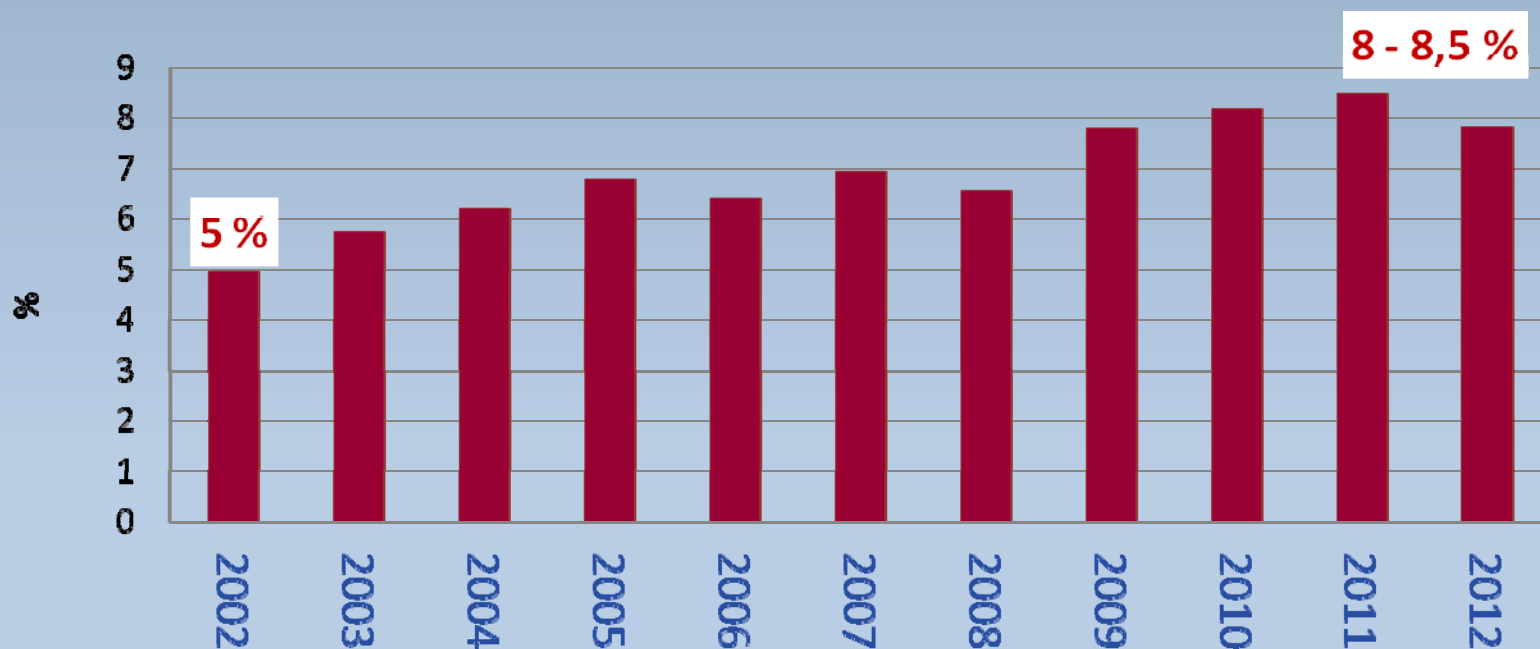


- In 2006-2012, the Rhine delivered on average 37 % of the mineral oil imports of Switzerland
- The Rhine has free capacities and was able to substitute the outfall of Swiss refineries in 2012

Source: Schweizerische Erdöl-Vereinigung and calculation CCNR



Share of Container transport is rising



Source: destatis and calculations GCNR,
calculated on the basis of tons

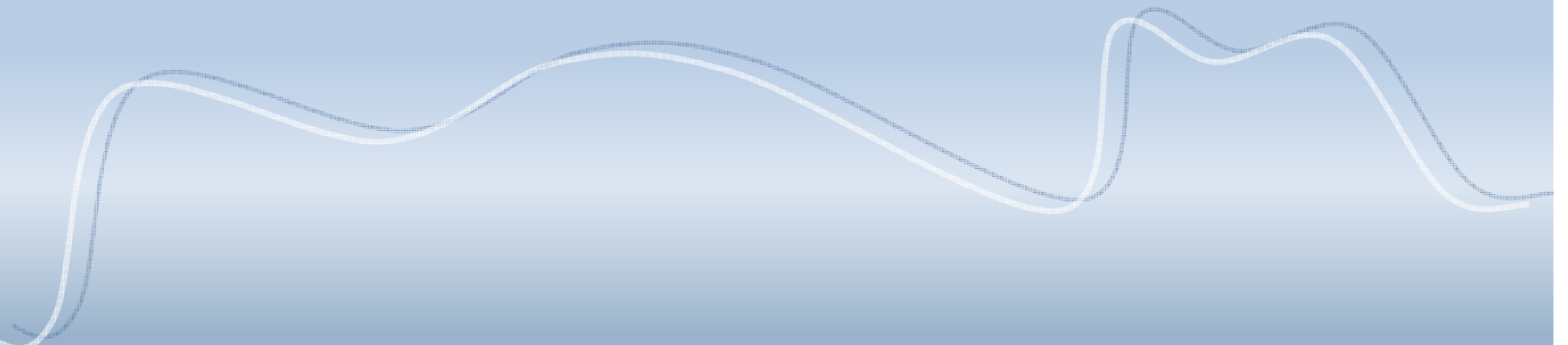
In 2012, container transport on the Rhine amounted to:

- 2 million TEU,
- 1,3 million container boxes, with a net loading weight of 14,7 million tons

Amount of TEU on the Rhine almost doubled within 2000-2012



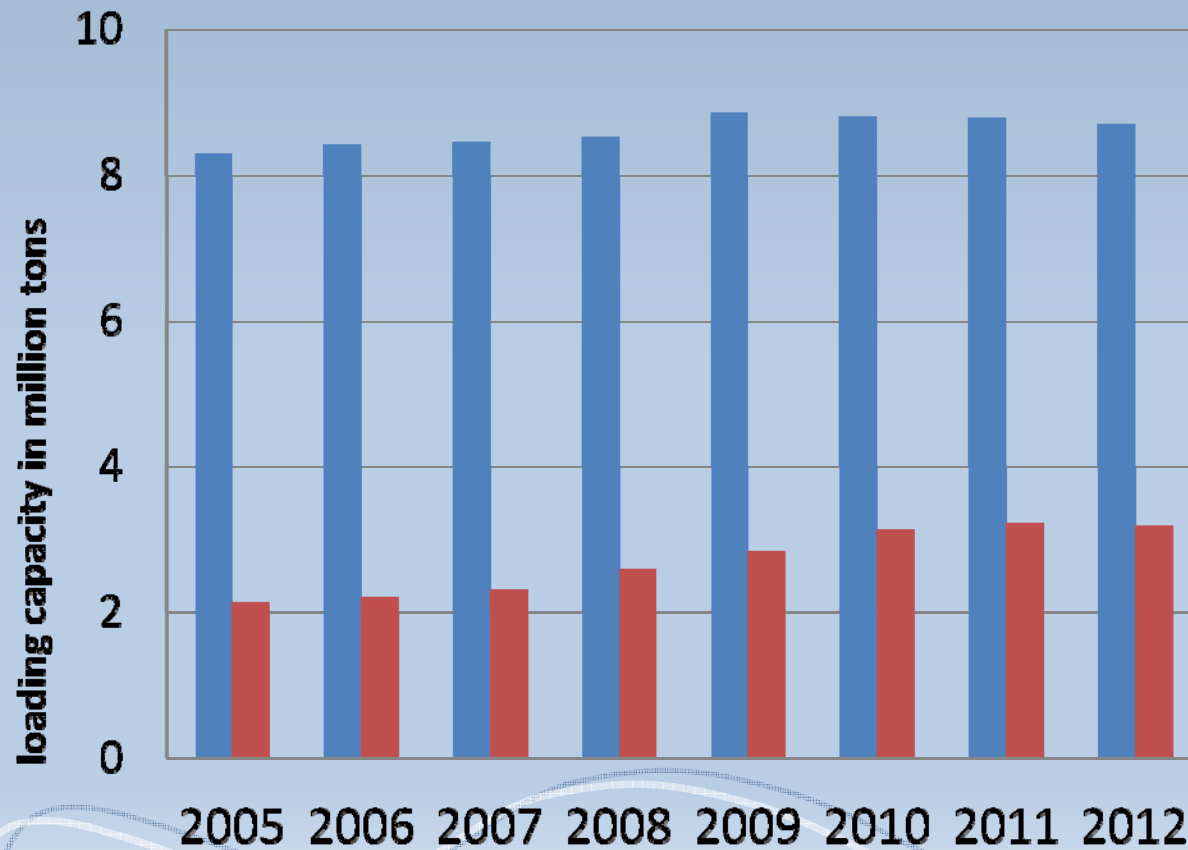
2. Fleet Development (Transport Supply side)



The Inland Waterway fleet in Western Europe (GE, NL, BE, FRA, CH, LUX) 2005-2012



Source: CGNR based on national authorities

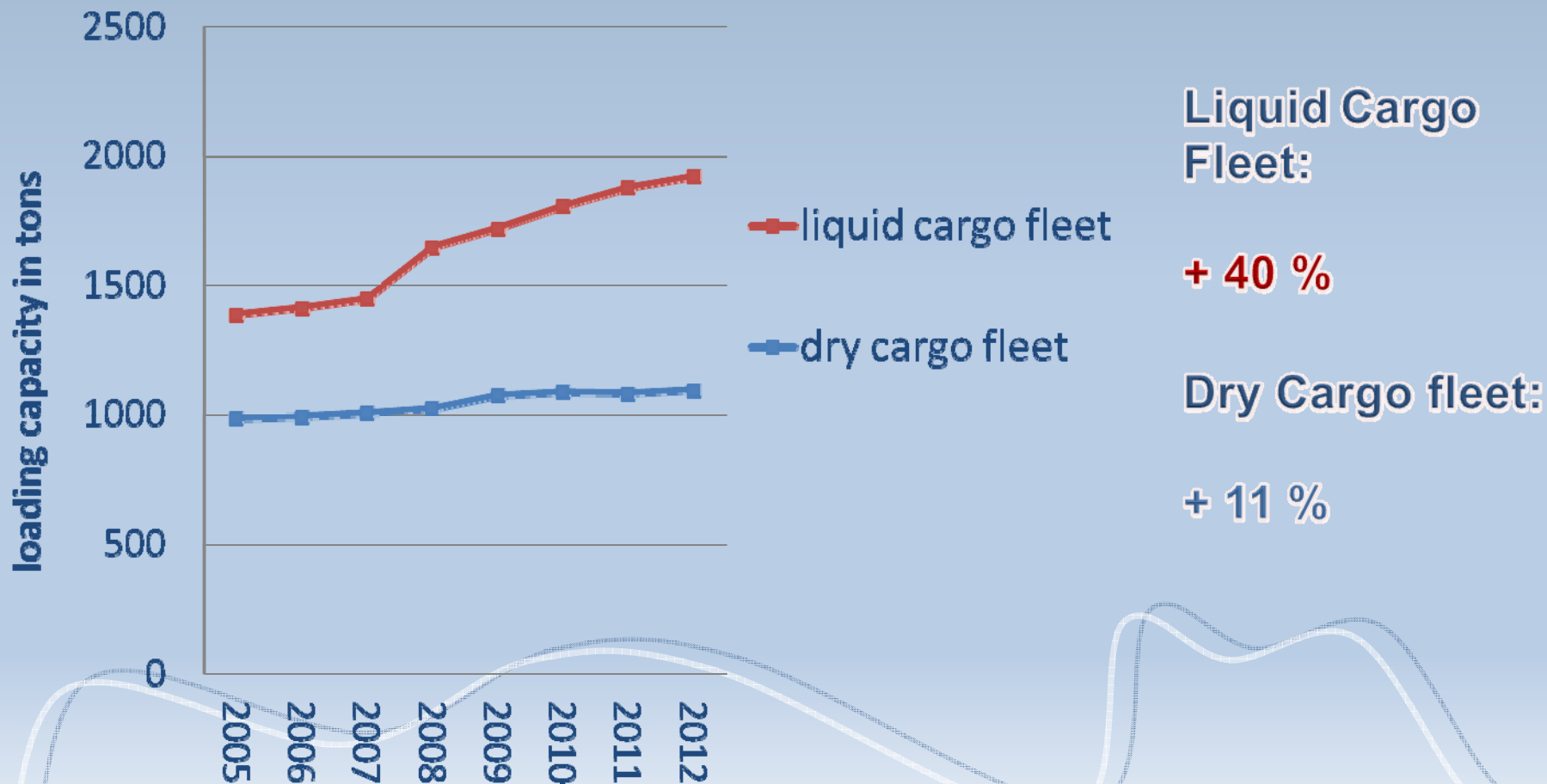


Dry Cargo Tonnage:
+ 5 % between 2005 and 2012

Liquid Cargo Tonnage:
+ 50 % between 2005 and 2012

■ Dry Cargo Shipping ■ Tanker Shipping

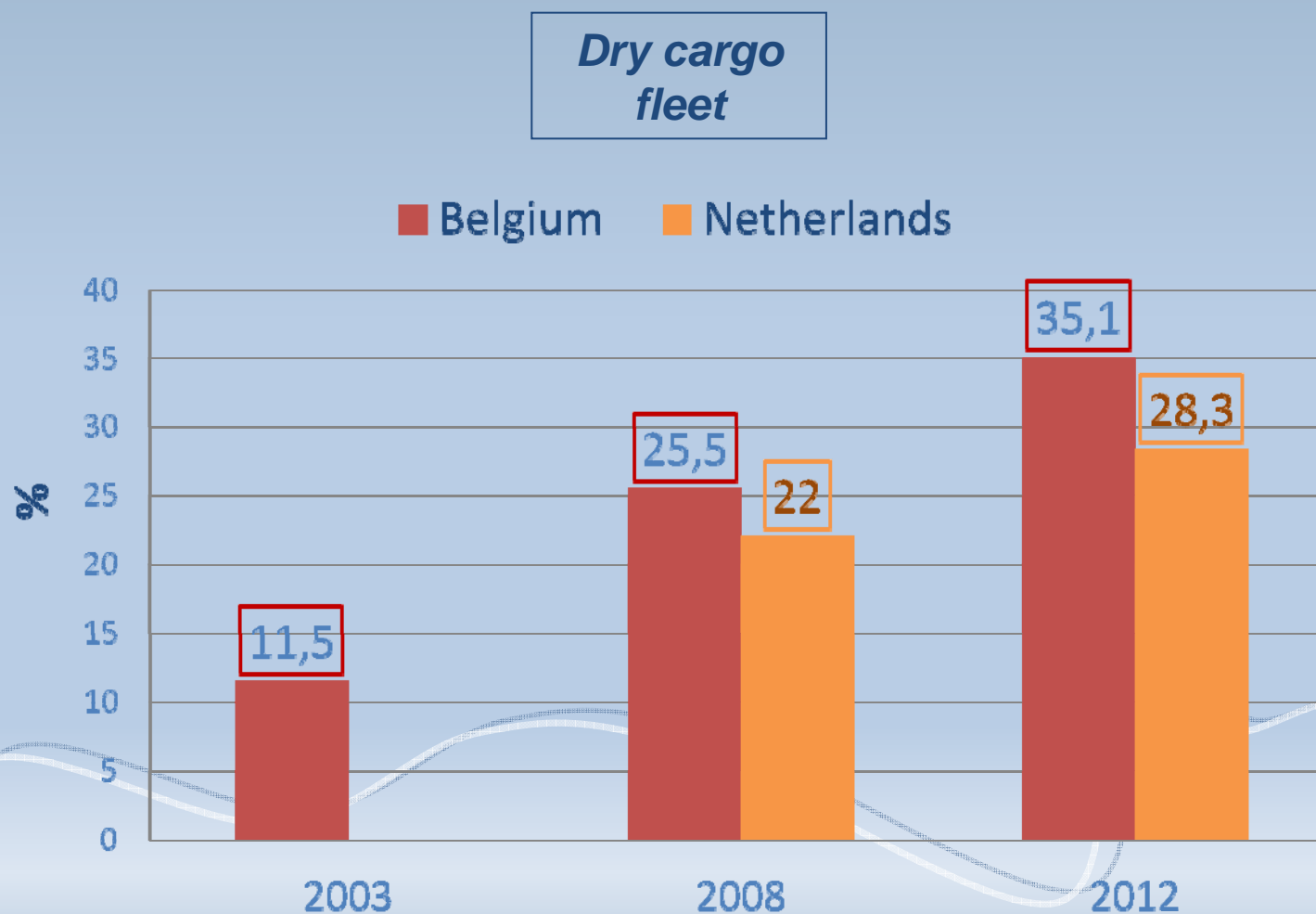
The average loading capacity per inland vessel 2005-2012



Source: CCNR calculations



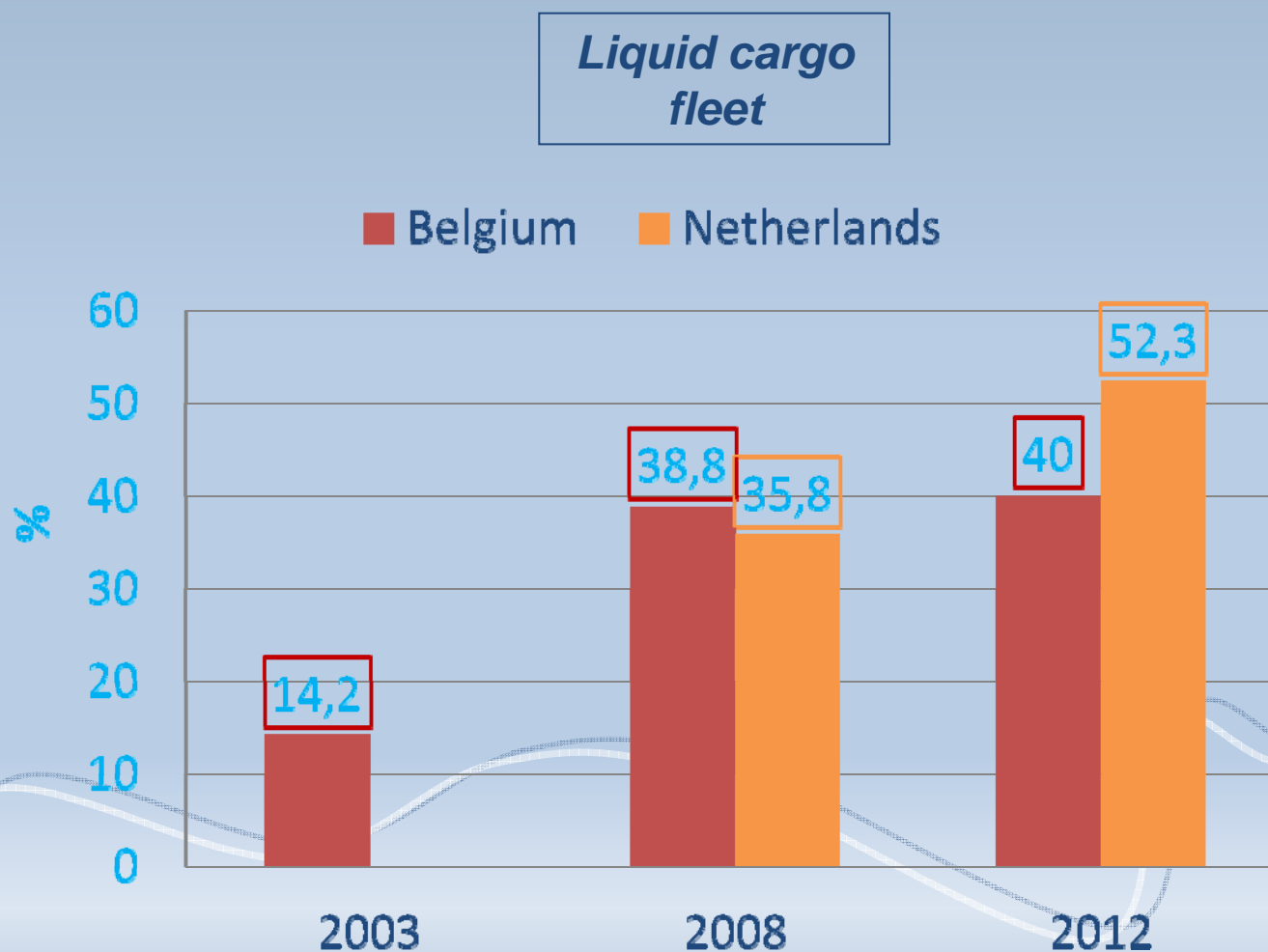
Structural changes in the inland fleet: Rising share of vessel tonnage class > 3.000 t



Source: CCNR calculations based on national authorities. No values were available for the dutch fleet in 2003



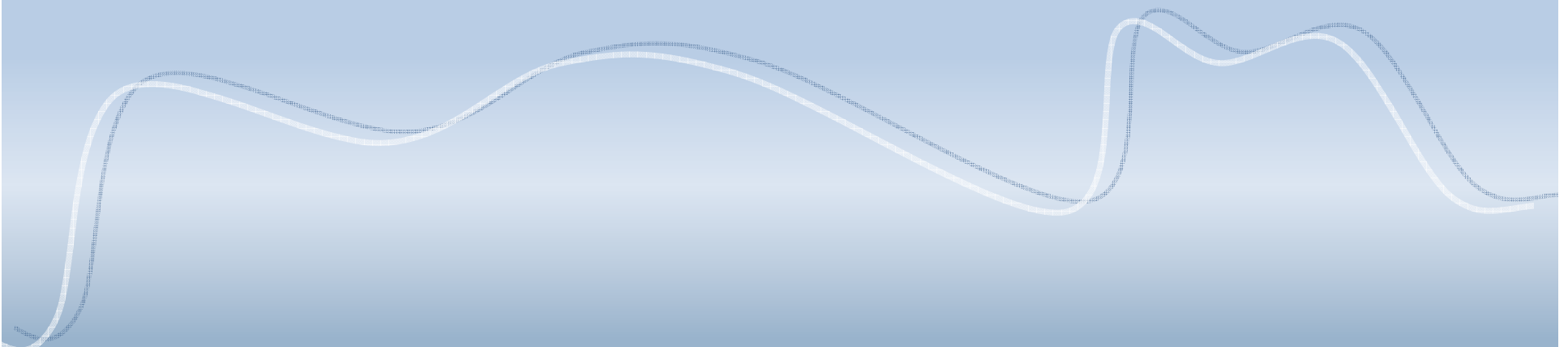
Structural changes in the inland fleet: Rising share of vessel tonnage class > 3.000 t



Source: CCNR calculations based on national authorities. No values were available for the dutch fleet in 2003



3. The interference of Rhine Shipping with hydrological parameters



Scenarios for climate change and their relevance for Rhine shipping



- Near future (2021-2050): no clear tendency for lower or for higher water levels. Therefore no clear tendency for higher or lower transport costs
- Far Future (2050-2070): an increase of the average costs of Rhine Shipping is expected, due to lower water levels in the summer period.
- The cost increase is especially strong for bigger vessels and push convoys. For smaller vessels, it is less severe.
- Adaptation measures:
 - change in the fleet structure (preference for smaller vessels)
 - changes in shipbuilding
 - logistical adaptation measures: change in stock-keeping policies

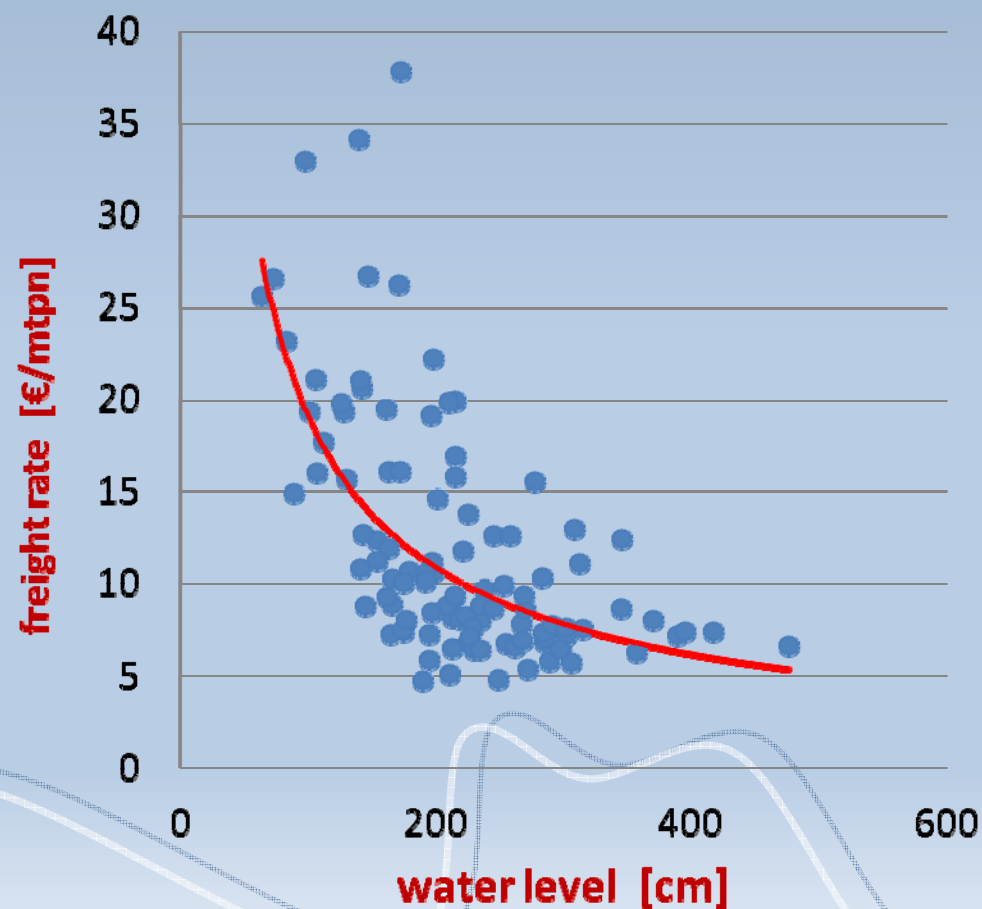


The impact of low water levels and larger vessels for economic indicators in inland shipping

- Low water levels have an opposite effect on the transport price in inland shipping.

- A falling water level induces an increase in the transport price (freight rate level), due to a shrinking cargo space per vessel. For bigger vessels, this effect is stronger than for smaller vessels.

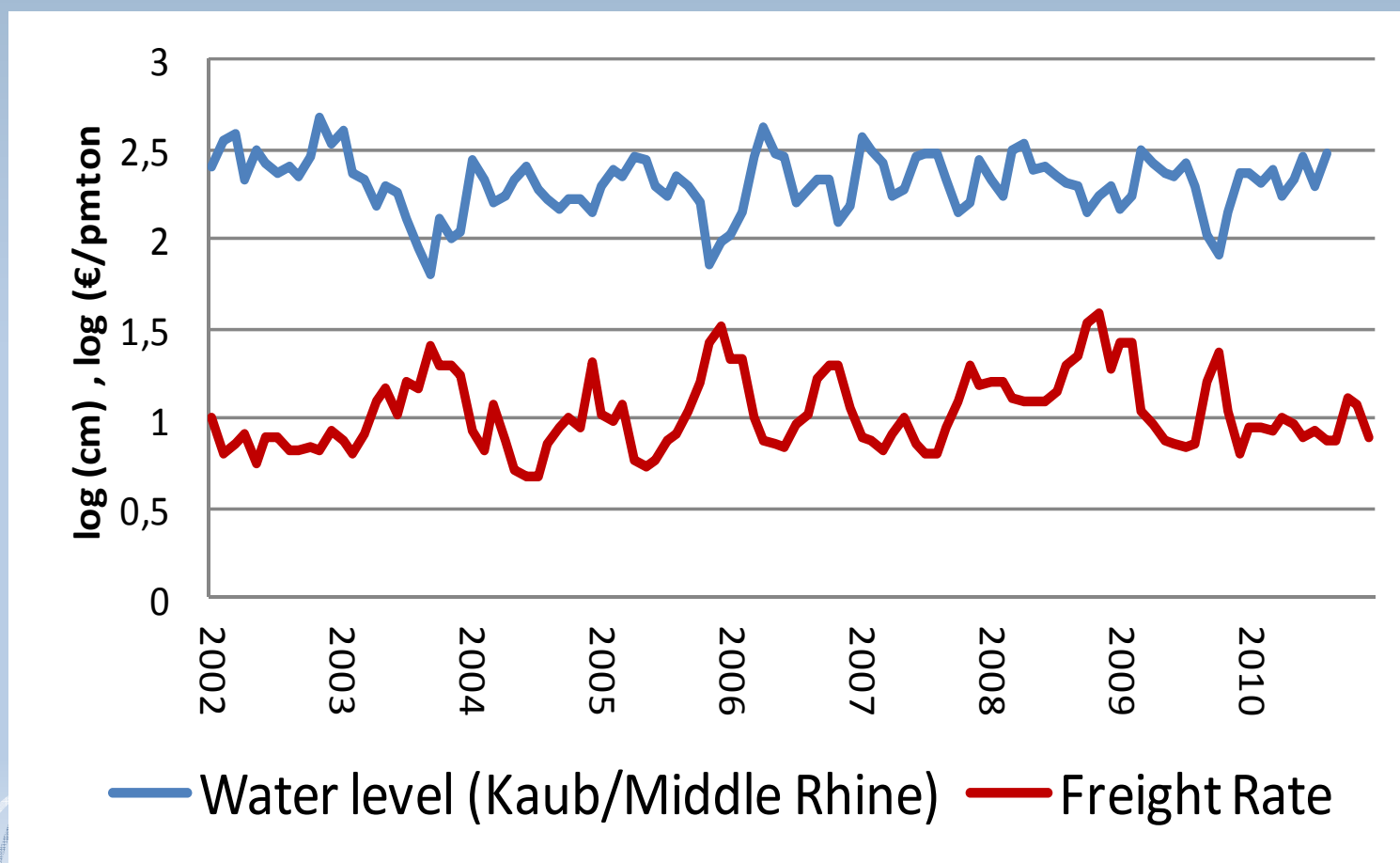
- Larger vessels induce lower unit costs per transport output, but this economic gain can only be realized when water levels are sufficiently high.



Source: CCNR, based on data from PJK International and Bundesamt für Gewässerkunde



Influence of water levels on the transport price in Rhine shipping



Source: Bundesamt für Gewässerkunde,
PJK International, calculation CCNR

Opposite relationship
The lower the water level, the higher the freight rate

Price Elasticity of transport demand under climate change scenarios



Lower water levels in the summer → Reduction of the loading degree of inland vessels.



Freight rates are rising



Transport demand is falling
(Price elasticity = - 0,4 due to estimations by Jonkeren / 2009)



For a 10 % rise of freight rates, the transport demand is reduced by 4 %.

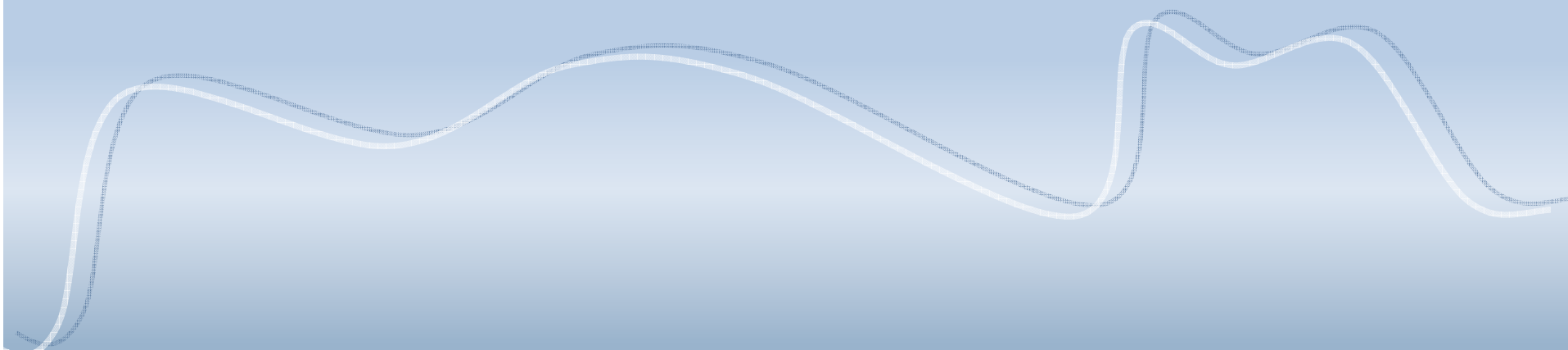


The modal shift effects are dependant on the type of goods

For low value goods, (e.g. sand, stones, building materials) a freight rate increase could induce a loss of market shares



4. Passenger Shipping



Economic significance of Passenger Shipping



- There are about 1.550 **day trip vessels** active in Europe, compared to 260 river cruise vessels
- In the **day trip segment** on rivers (without lakes), about 30 million passengers per year are counted in Western Europe (GE, FRA, NL, BE, CH)
- In the **river cruise segment**, about 1 million passengers per year are estimated for European rivers
- More than one half of all **river cruise vessels** active in Europe in 2013 were built within the period 2000-2012
- The **river cruise** segment is a high growth segment.

Source: CCNR based on different sources

Climate Change Aspects for Passenger Shipping

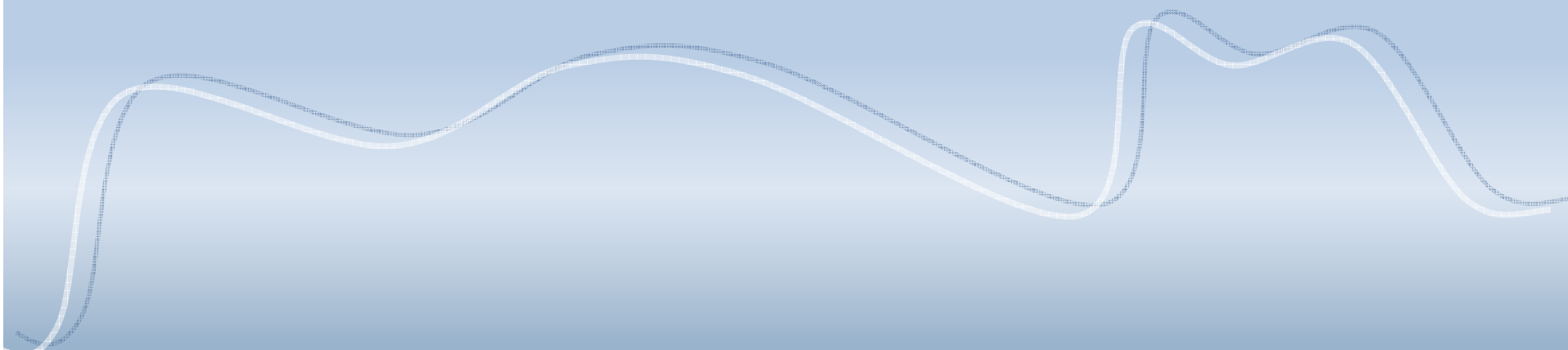


- The vulnerability of Passenger shipping towards climate change is slightly different than in goods transport.
- Low water levels are less important from a technical point of view. (But river cruise vessels can be indirectly affected by low water periods, through traffic interruptions by authorities when water levels are low)
- High water levels in combination with low bridges can pose natural restrictions for the travel routes of river cruise vessels.

Source: CCNR, based on different sources



4. Conclusions





Conclusions

- The Rhine plays a strategic role for the provision of raw materials for several industries and countries.
- The container transport on the Rhine has almost doubled during the time span 2000- 2011.
- In recent years, a trend for bigger vessels could be observed. Bigger vessels imply a reduction of the unit costs in inland shipping.
- Possible future climate change poses a threat for the economic performance of inland shipping. Higher freight rates can represent a loss of the competitive position of IWT as a price leader in the transport market
- Changes in shipbuilding might be one of several adaptation measures for climate change. An adaptation of the Rhine itself is less realistic, given the ecological impacts of such measures.

Conclusions

- The Rhine plays a strategic role for the provision of raw materials for certain industries and countries.
- Rhine shipping has a large potential for increasing goods transport, for example in container transport, due to free capacities.
- Future effects of climate change might pose a threat for economic parameters in Rhine shipping.



Thank you very much for
your attention!

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