



Ministry of Infrastructure and the
Environment

Future of freight transport and logistics

Jan Francke

KiM Netherlands Institute for
Transport Policy Analysis

4 December 2014



Outline

1. KiM Netherlands Institute for Transport Policy Analysis
2. Logistic & Freight transport scope
3. Driving forces in freight transport
4. Trends and hypes in logistics
5. Freight scenario's

6. UK Freight Planning to 2035, CILT, 2014



1. KiM Netherlands Institute for Transport Policy Analysis

- **Research institute** within the Netherlands Ministry of Infrastructure and Environment
- **Established in 2006** to support evidence-based transport policymaking





Products and services

- **Demand-driven** research on strategic policy questions
- **'Knowledge-at-the-table'**
- Internal **observational reports** on own initiative





KiM is part of the Ministry, but...

- Research content is **independent** of policy or politics
- All research studies are **peer-reviewed**
- All publications are **publicly available**

KiM core themes

1. Mobility, accessibility and spatial planning
2. Mobility of groups
3. Sustainable mobility, safety and transition
4. **Models and data**
5. Social economic importance, the role of government and market organization
6. Policy evaluation and assessment frameworks

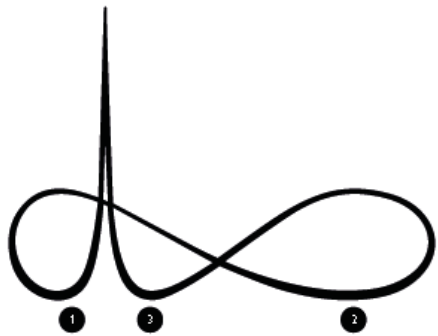


Ministry of Infrastructure and the
Environment

2. Scope logistics and freight transport



Top Sector Logistics



Direct logistics activities

- Added value: 55,0 billion euro
- Employment: 813.000 working years
- Turnover: 125,8 billion euro

1 Transportation and handling

- Added value: 29,3 billion euro
- Employment: 433.000 working years
- Turnover: 67,8 billion euro

2 Storage and warehousing

- Added value: 14,4 billion euro
- Employment: 212.000 working years
- Turnover: 33,3 billion euro

3 Supply Chain Management

- Added value: 11,3 billion euro
- Employment: 168.000 working years
- Turnover: 24,7 billion euro

Indirect logistics effects

- Added value: 11,8 billion euro
- Employment: 121.000 working years
- Turnover: 17,0 billion euro

4 VAL and VAS

- Added value: 2,2 billion euro
- Employment: 34.000 working years
- Turnover: 3,6 billion euro

5 Support activities

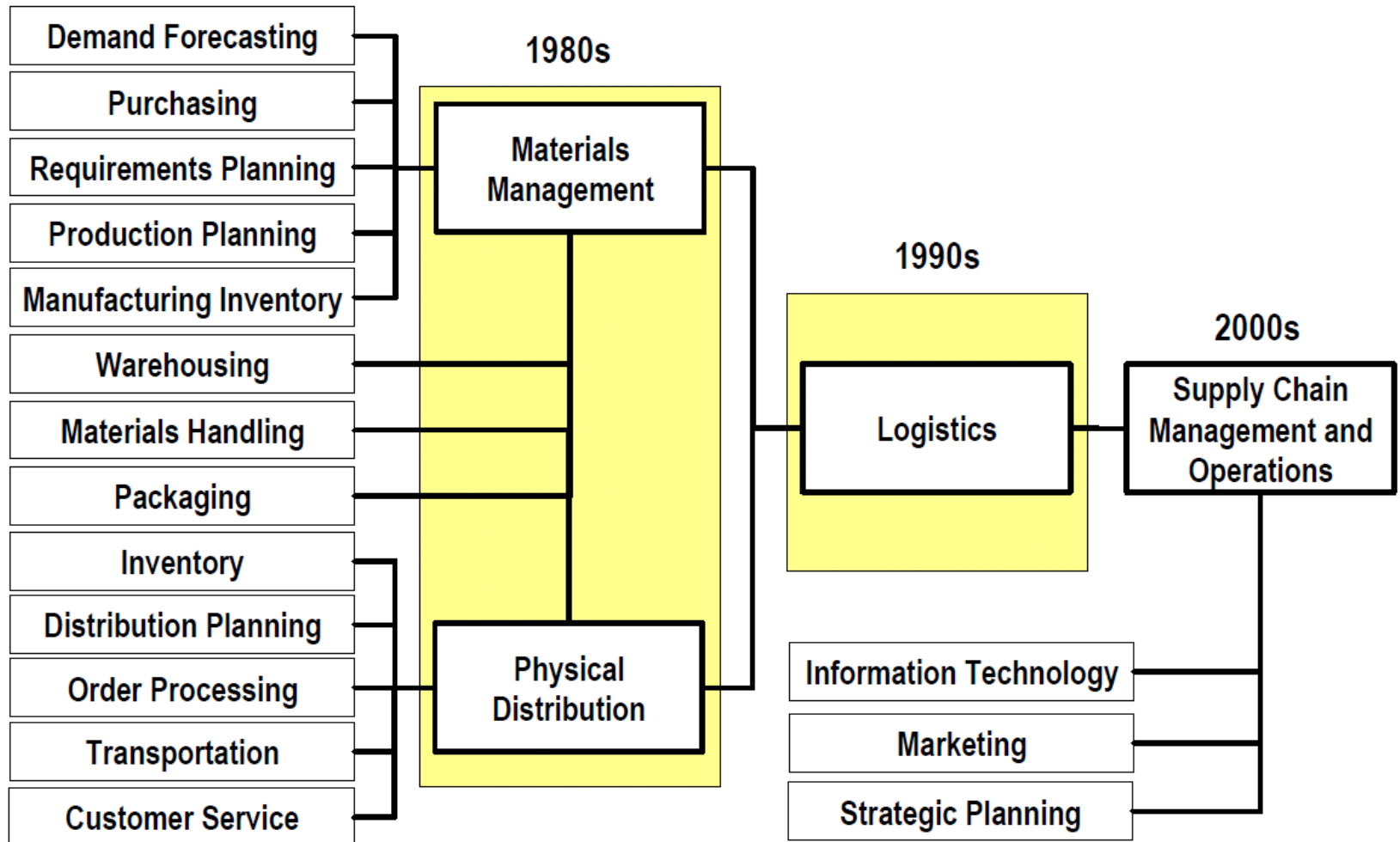
- Added value: 9,6 billion euro
- Employment: 86.000 working years
- Turnover: 13,3 billion euro

EXCEL IN LOGISTICS

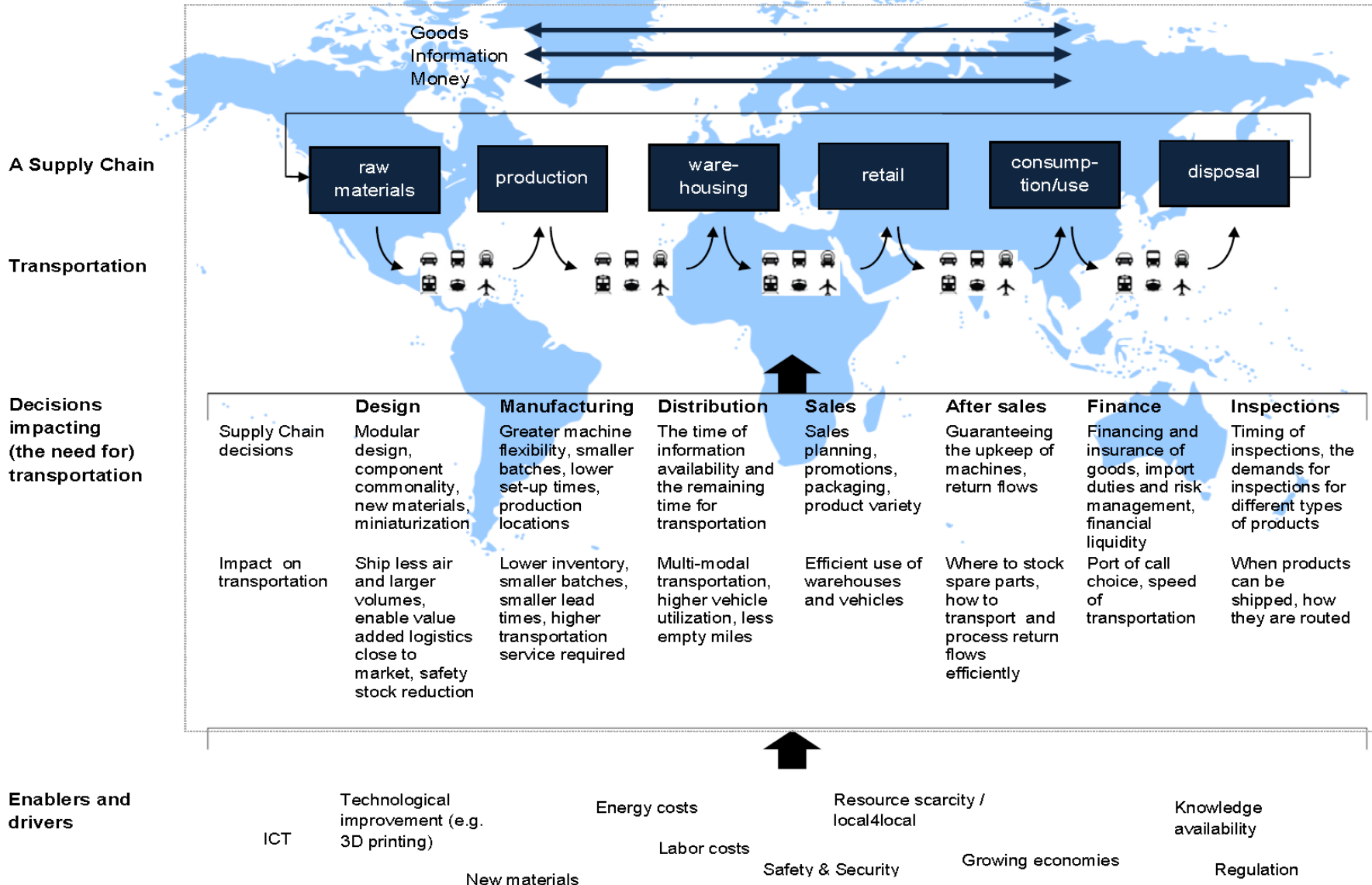
SPL, 2014



logistic management -> supply chain management

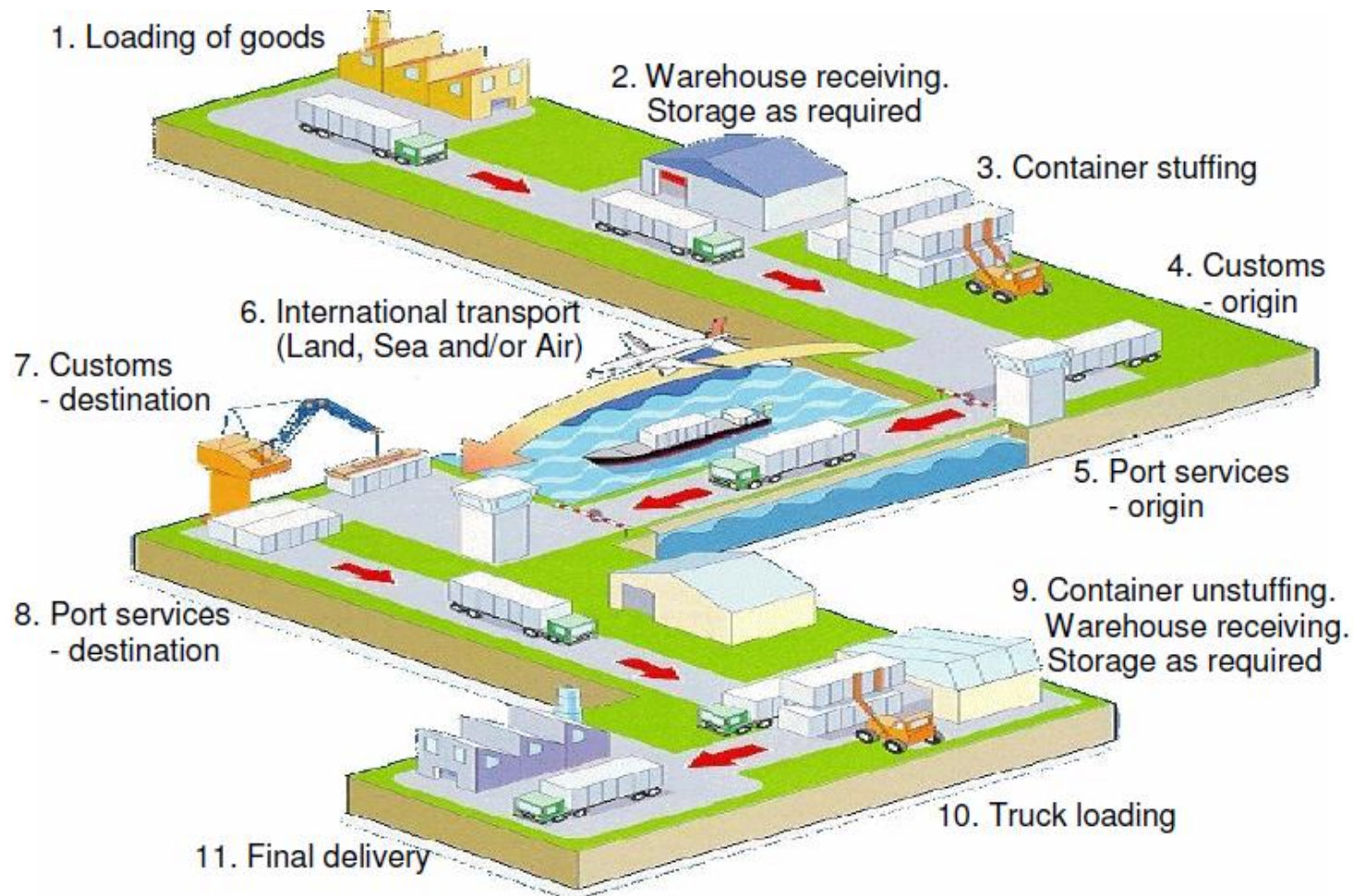


Logistics and Supply Chain





Transport chain



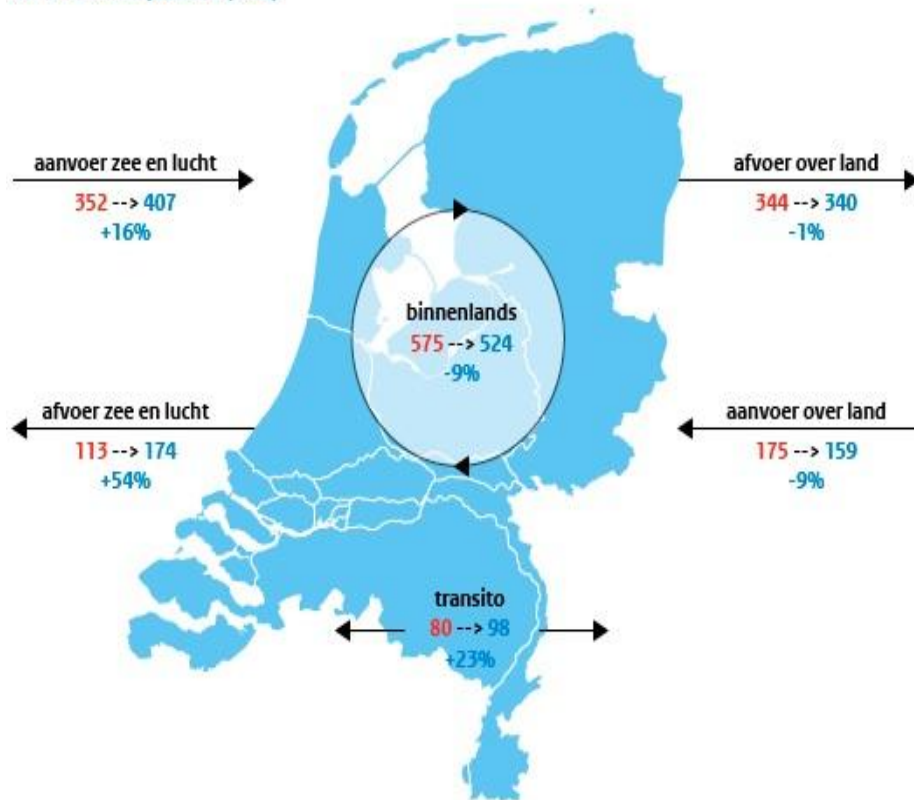
Murphy, 2004



Freight transport information for evidence based policy

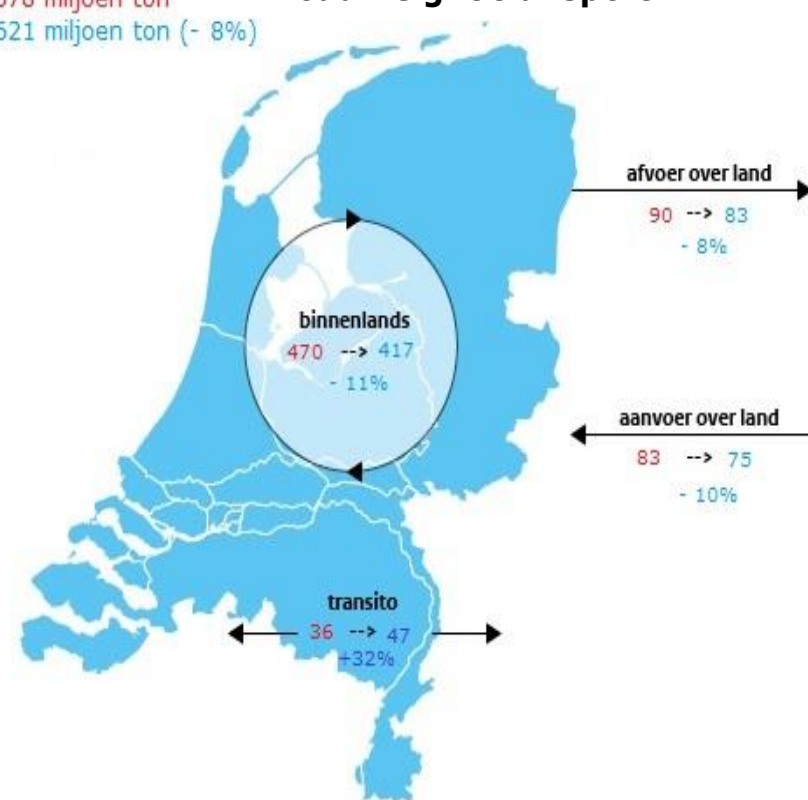
2004: 1.639 miljoen ton
2013: 1.701 miljoen ton (+4%)

all modes



2004: 678 miljoen ton
2013: 621 miljoen ton (- 8%)

road freight transport



KiM, Mobiliteitsbeeld 2014



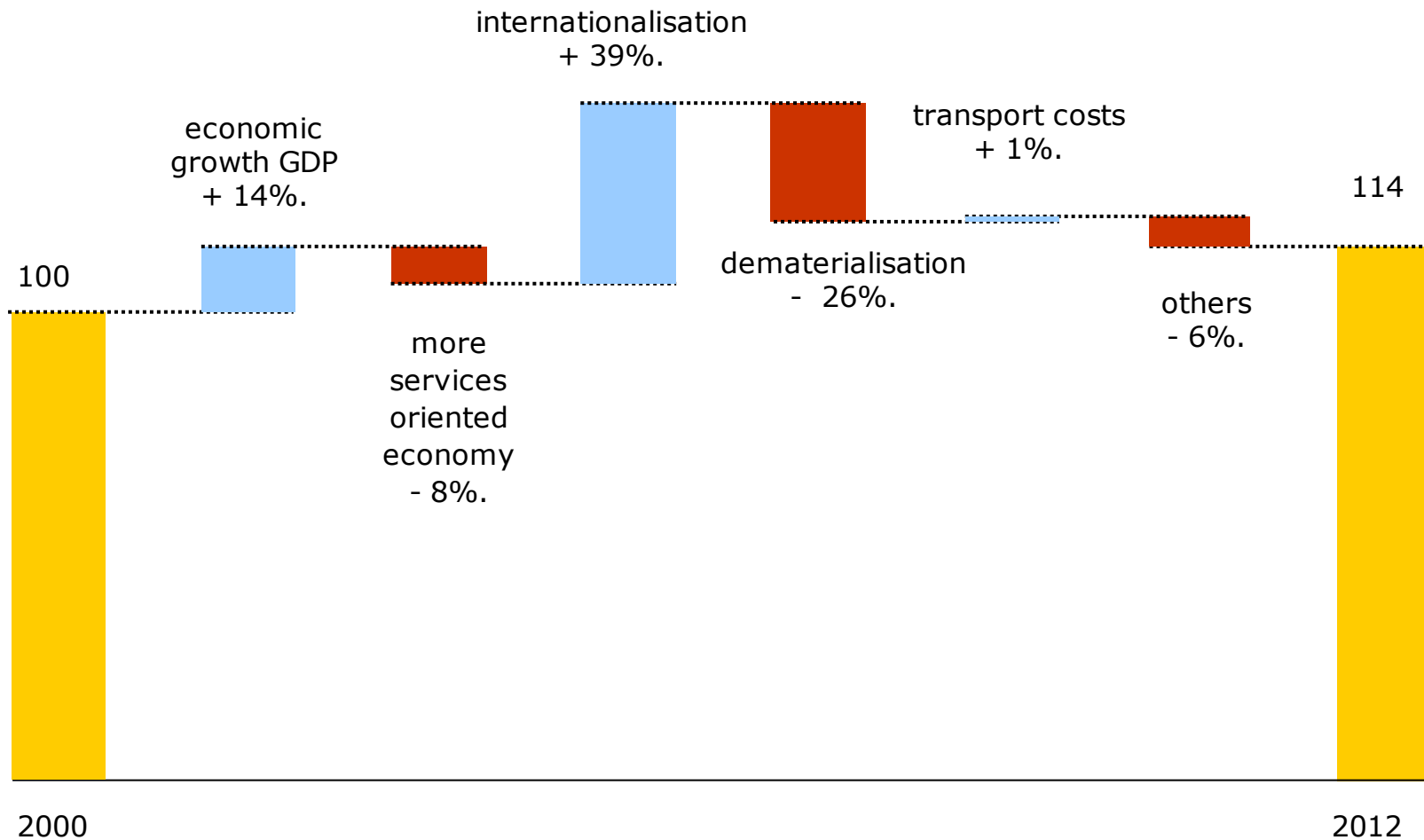
Ministry of Infrastructure and the Environment

3. Driving forces of freight transport





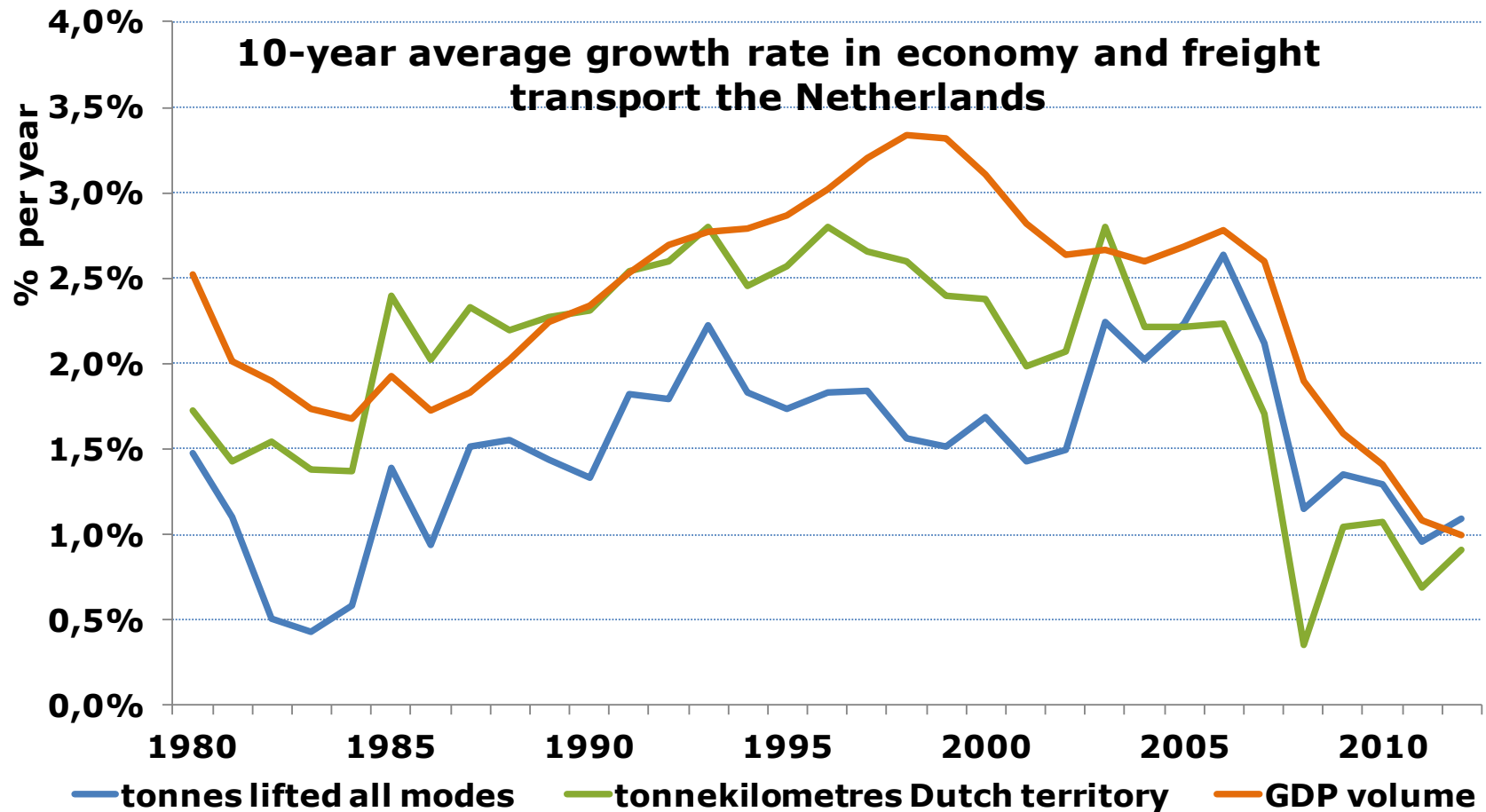
Decomposition of development of freight volume



KiM, Mobiliteitsbalans 2013

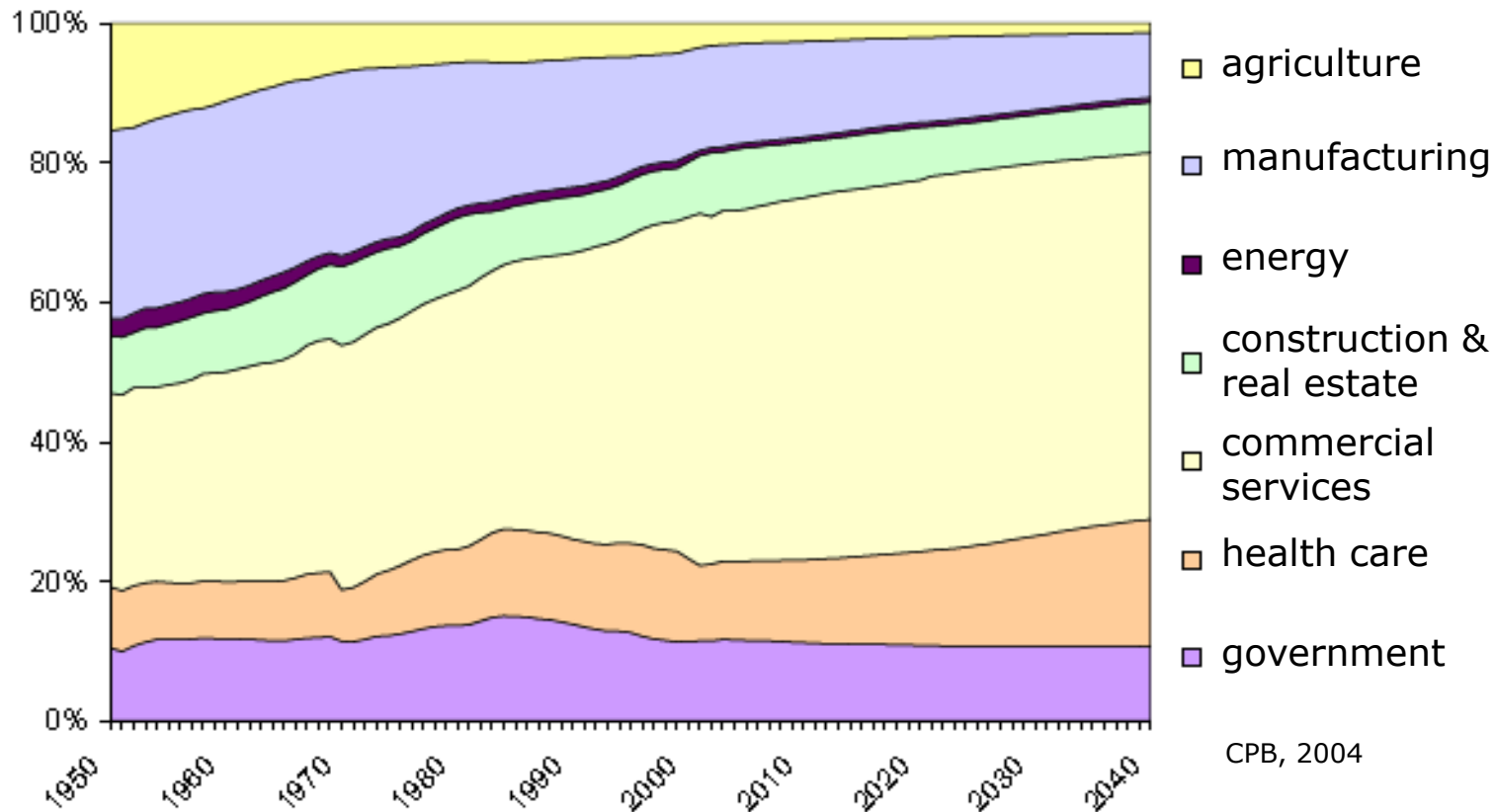


Economic drive: decoupling ?





Service driven economy: % employment

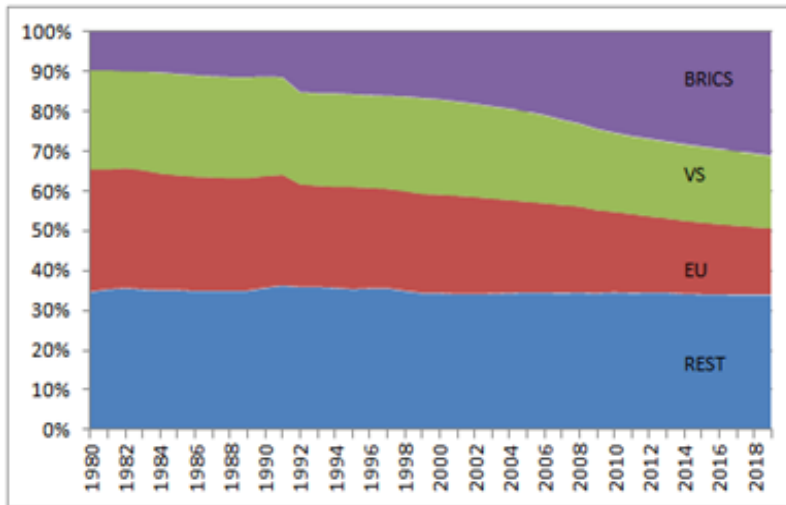


CPB, 2004

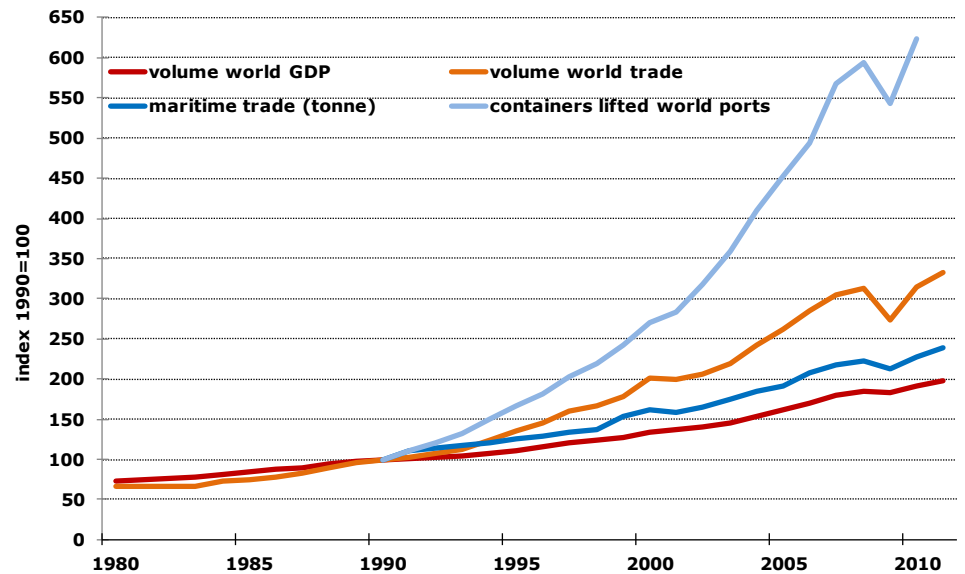
already > 75% of GDP in service sectors



Internationalisation or globalisation



GDP by world region, IMF, 2014



bron: CPB, UNCTAD, OSC Ltd



Dematerialisation -> higher value & smaller products

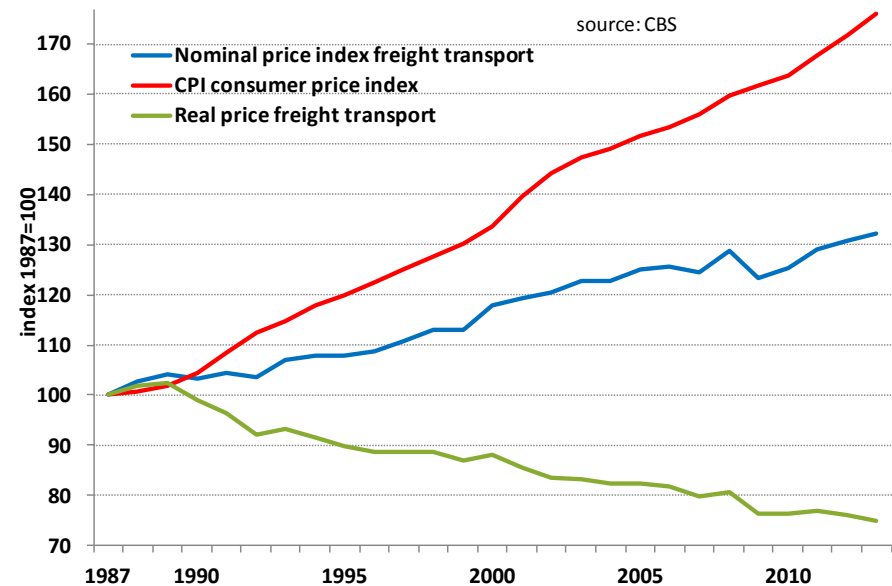
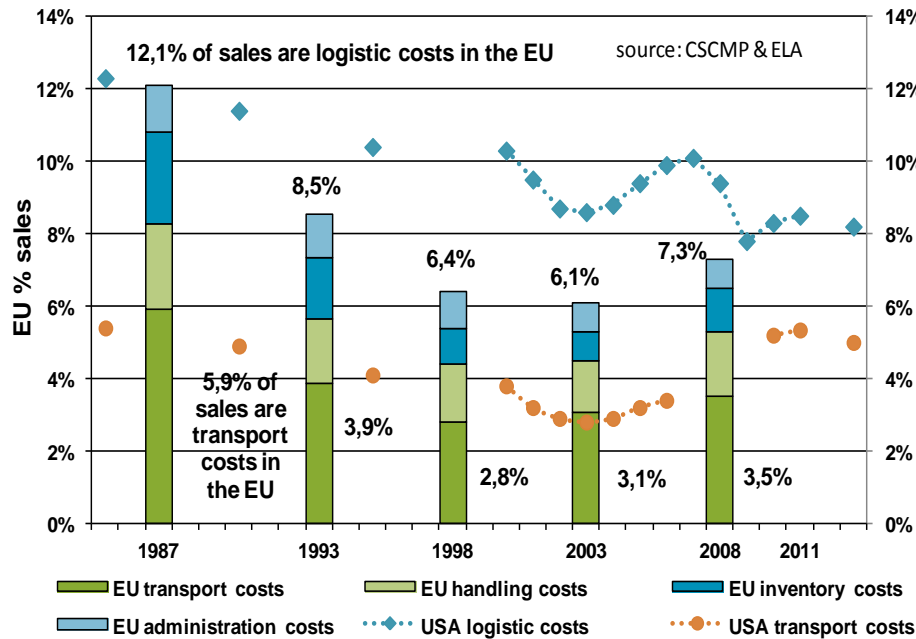
Major improvements in 'material efficiency':

- Increase modularisation and remanufacturing: more 'closed loop' supply chains?
- Digitisation of physical products: entertainment, news and educational content
- Designing products with less material: miniaturisation, product downsizing

Higher value (€) per weight/volume (kg/m³)



Logistic and transport costs decrease





Ministry of Infrastructure and the Environment

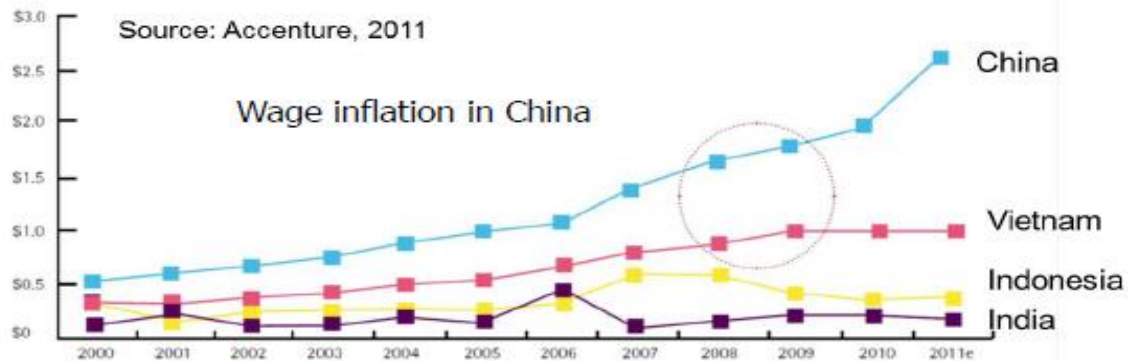


4. Trends and hypes in logistics



Trend or Hype Reshoring?

Reshoring of Manufacturing to the EU

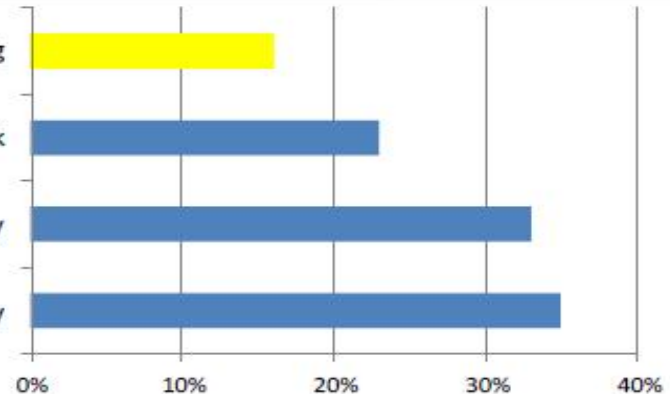


EU manufacturing wages still on average 15 times higher than those in China

Reasons for reshoring

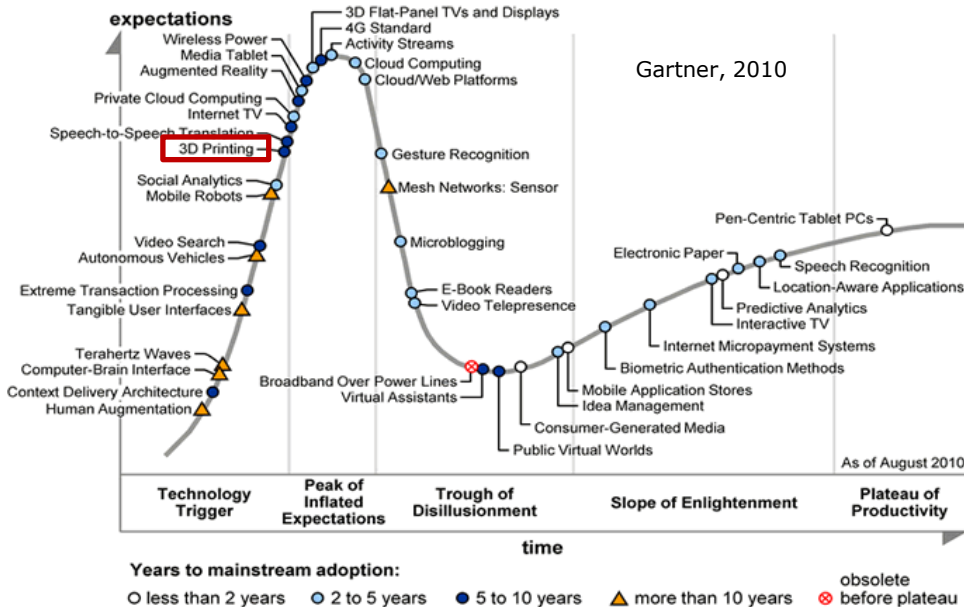
300 UK manufacturers survey by UK Engineering Employers' Federation 2013

- erosion of labour cost saving
- supply chain disruption risk
- delivery speed and reliability
- product quality

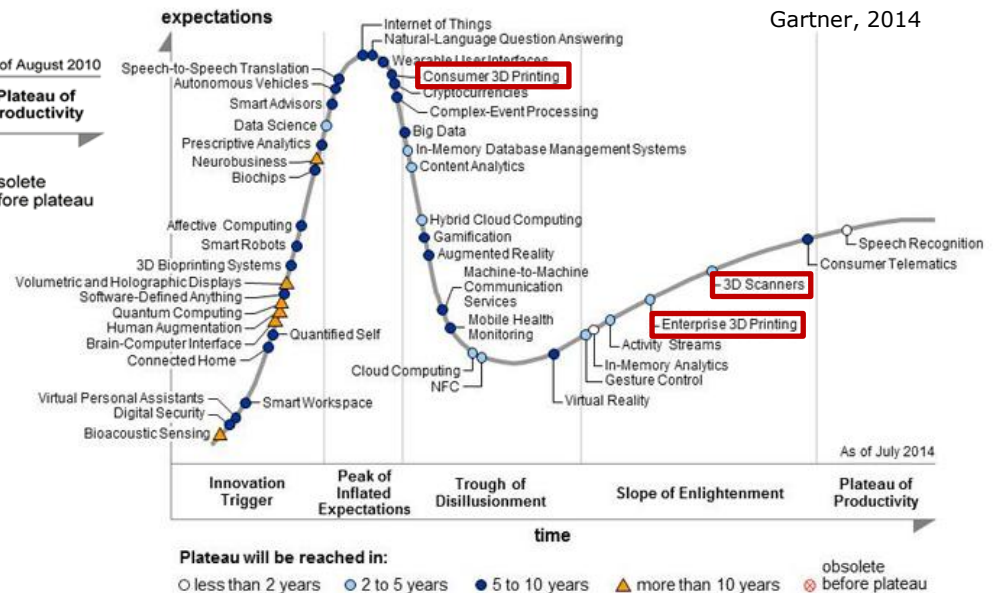




Trend or Hype?



3D printing ?



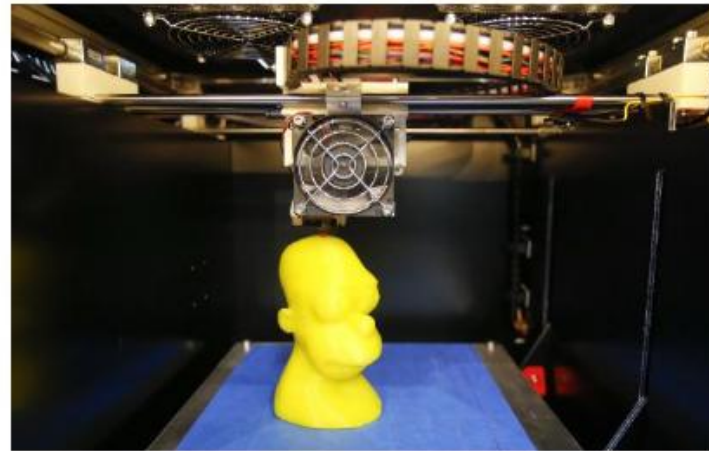


Trend or Hype?

Washington Post 13th March 2014

How 3D printing could transform Amazon and online shopping

BY DOMINIC BASULTO March 13 at 8:29 am



Amazon's new pilot program for 3D-printed products could end up revolutionizing the way we think about online commerce. (Fabrizio Bensch/Reuters)

[Amazon's recent decision to create an e-commerce storefront for 3D-printed products](#)

Theoretically, one day Amazon might just sell the design file for a product, and the consumer would print the design file at home with a 3D printer in the comfort of his or her living room. Presumably, these consumers would also be purchasing their 3D printers and supplies from Amazon's 3D Printer Store.

Jeff Bezos owns both Amazon and the Washington Post

McKinnon, 2014

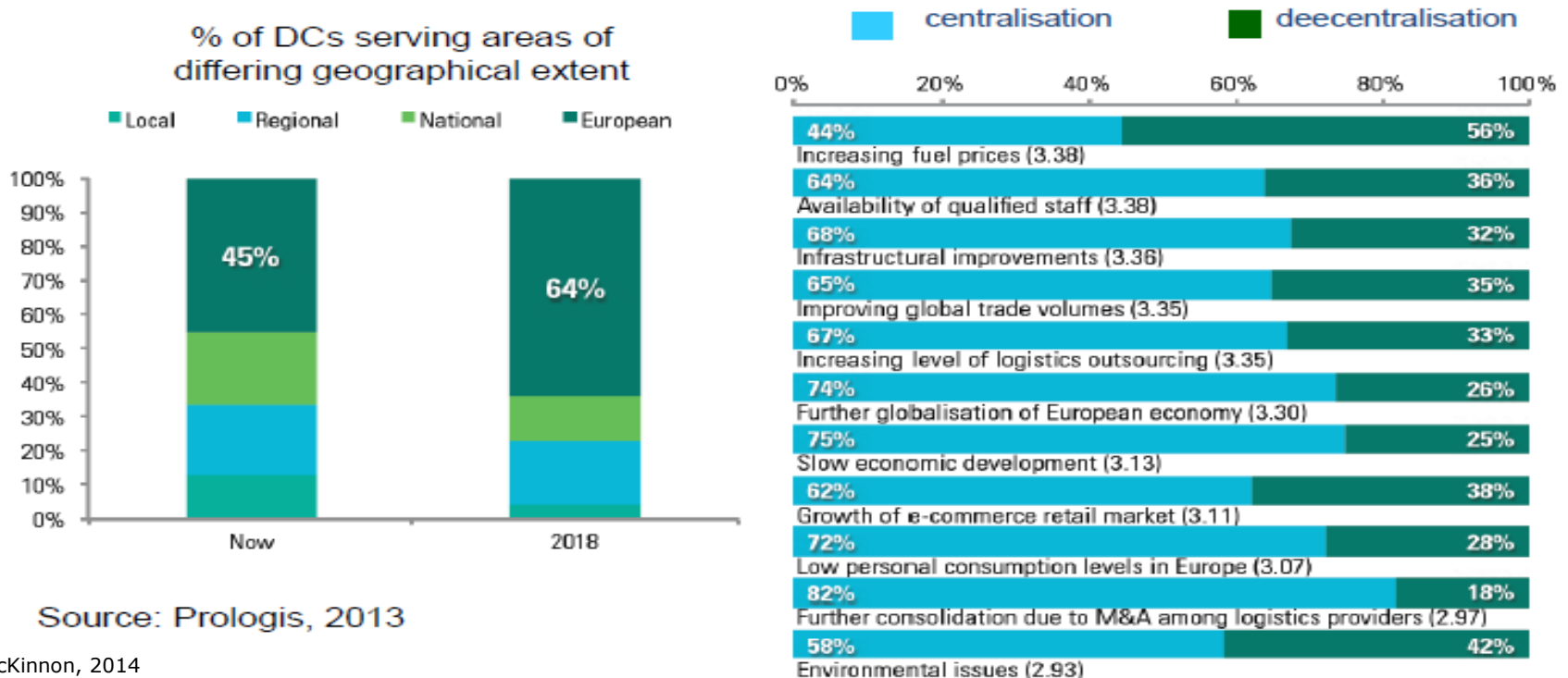


Trend or Hype centralisation or decentralisation?

Restructuring of Logistics Systems within the EU?

Potential for future centralisation of production and warehousing?

At an advanced stage within countries, but at an EU level?

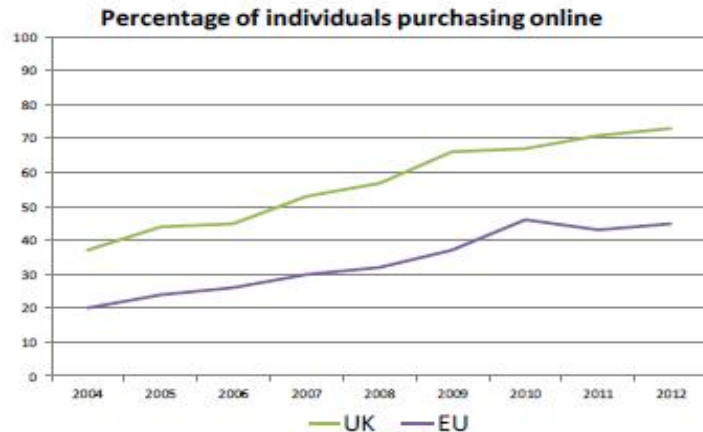


McKinnon, 2014



Trend or Hype?

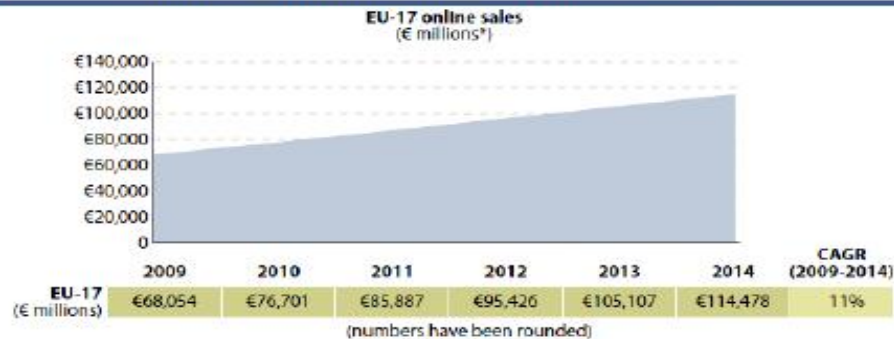
Market Mega-trend: *Growth of Online Retailing*



McKinnon, 2014

Source: Eurostat, 2012

Forecast of Online Retail Sales in EU 17 2009-2014



Source: Forrester Research Online Retail Forecast, 1/10 (Western Europe)
 *Data presented in 2009 constant euros

56543

Source: Forrester Research, Inc.

Omni-Channel Shopper
Anytime, Anywhere and Any Product

Retailer
 In-Store Traffic
 Conversion Rate
 Basket Size

Seamless, consistent and integrated shopping experience across all marketing channels that is personalized, relevant and meaningful.

omni-channel logistics



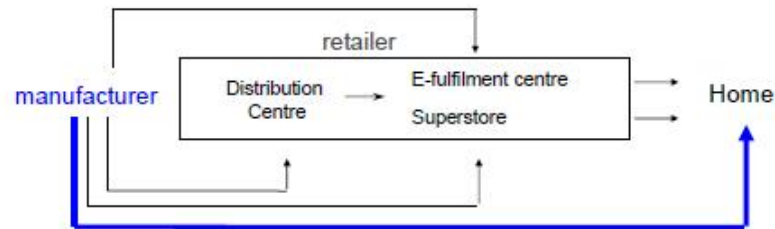
Trend or Hype e-commerce and home delivery?

Future Development of Last Mile Logistics

development of unattended delivery infrastructure



entry of FMCG manufacturers into the online market



switch from vans to self-employed couriers

trip chaining reduces marginal costs
redefines interface between personal and freight movement

same day delivery:



Shutl

Amazon Prime –
delivery by drone



McKinnon, 2014



11 reasons why distribution by drone is unlikely to work

Very limited range – in the absence of a battery miracle

Impossible inventory trade-off between product range and decentralised distribution

Very high energy-intensity - energy cost per order exorbitant

Lacks the scale economies of hub-spoke distribution and last-mile groupage

Requires very high-precision GPS to pinpoint domestic delivery points

Household reception system very difficult and costly to standardise and operate

No backloading of an extremely expensive transport mode

Accident / liability risk: *'One kid hit in the face with an Amazon drone and Bezos' fortune likely shrinks'* (Wohlsen, 2013)

Security risk: ideal target-practice for guns and air rifles

Virtually no-one will value same-day delivery that highly – except super-rich niche

Authorities very unlikely to approve use of urban air-space by delivery drones

McKinnon, 2014



Trend or Hype?

The Physical Internet

Synchromodality



Ministry of Infrastructure and the Environment

OR



5. Freight transport scenario's



25 years of long term scenario's in the Netherlands

year	publication	period	scenario names			
1985	The Dutch economy in the long term	1985-2010	Low	Middle	High	
1992	The Netherlands in triplo: scenario study of the Dutch Economy (NiD)	1990-2015	Global Shift	European Renaissance	Balanced Growth	
1997	Economy and physical surroundings: policy challenges and possible solutions (EFO)	1995-2020	Divided Europe	European Coordination	Global Competition	
2006	Welfare, prosperity and quality of the living environment (WLO)	2000-2040	Regional Communities	Strong Europe	Transatlantic Market	Global Economy

Independent governmental organisations long term projections for policy analysis:

- CPB Netherlands Bureau for Economic Policy Analysis
- PBL Netherlands Environmental Assessment Agency



The future is uncertain: scenario's 2040

International cooperation

Strong Europe (SE)		Global Economy (GE)	
% p/a 2001-2040			
World Trade	4,5%	5,6%	World Trade
World GDP	2,5%	3,1%	World GDP
Non-OECD GDP	4,6%	5,0%	Non-OECD GDP
EU-15 GDP	1,6%	2,5%	EU-15 GDP
Nld GDP	1,6%	2,6%	Nld GDP
Nld population	18,9 mln	19,7 mln	Nld population
Nld GDP/capita	1,1%	2,1%	Nld GDP/capita
Regional Communities (RC)		Transatlantic Markets (TM)	
World Trade	2,4%	3,7%	World Trade
World GDP	1,7%	2,3%	World GDP
Non-OECD GDP	3,6%	3,2%	Non-OECD GDP
EU-15 GDP	0,6%	1,9%	EU-15 GDP
Nld GDP	0,7%	1,9%	Nld GDP
Nld population	15,7 mln	17,1 mln	Nld population
Nld GDP/capita	0,7%	1,7%	Nld GDP/capita

National sovereignty

WLO scenario's with two key uncertainties:

Y) to which extent will nations and international trade blocks cooperate and exchange, giving up some of their cultural identity and sovereignty?

X) how will governments balance between market forces and a strong public sector?

Source: Lejour, 2003 and CPB/PBL, 2006



WLO passenger and freight mobility in 2040

Strong Europe (SE)

emphasis on international cooperation and public responsibilities, extended infrastructure investments

Population 2040:	18.9 mln
GDP/capita (2001 = 100):	156
Households:	8.6 mln
Passenger cars:	9.7 mln
Growth passengermobility (pkm) against 2002	+30%
Growth inland freight transport (tkm) against 2002:	+40%
Congestion hours against 2002:	0%
NO _x emissions transport:	-70%
CO ₂ emissions transport:	+20%

Global Economy (GE)

emphasis on international cooperation and private responsibilities, extended infrastructure investments

Population 2040:	19.7 mln
GDP/capita (2001 = 100):	221
Households:	10.0 mln
Passenger cars:	11.8 mln
Growth passengermobility (pkm) against 2002	+40%
Growth inland freight transport (tkm) against 2002:	+120%
Congestion hours against 2002:	+70%
NO _x emissions transport:	-40%
CO ₂ emissions transport:	+70%

Regional Communities (RC)

emphasis on national sovereignty and public responsibilities, extended infrastructure investments

Population 2040:	15.7 mln
GDP/capita (2001 = 100):	133
Households:	6.9 mln
Passenger cars:	7.7 mln
Growth passengermobility (pkm) against 2002	+5%
Growth inland freight transport (tkm) against 2002:	-5%
Congestion hours against 2002:	-70%
NO _x emissions transport:	-75%
CO ₂ emissions transport:	-5%

Transatlantic Markets (TM)

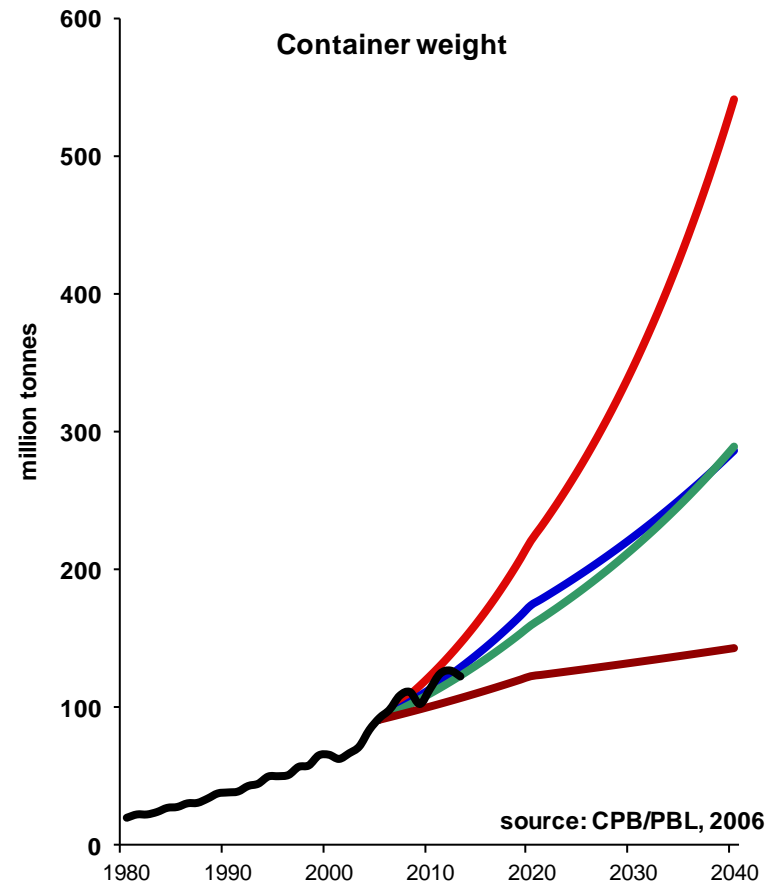
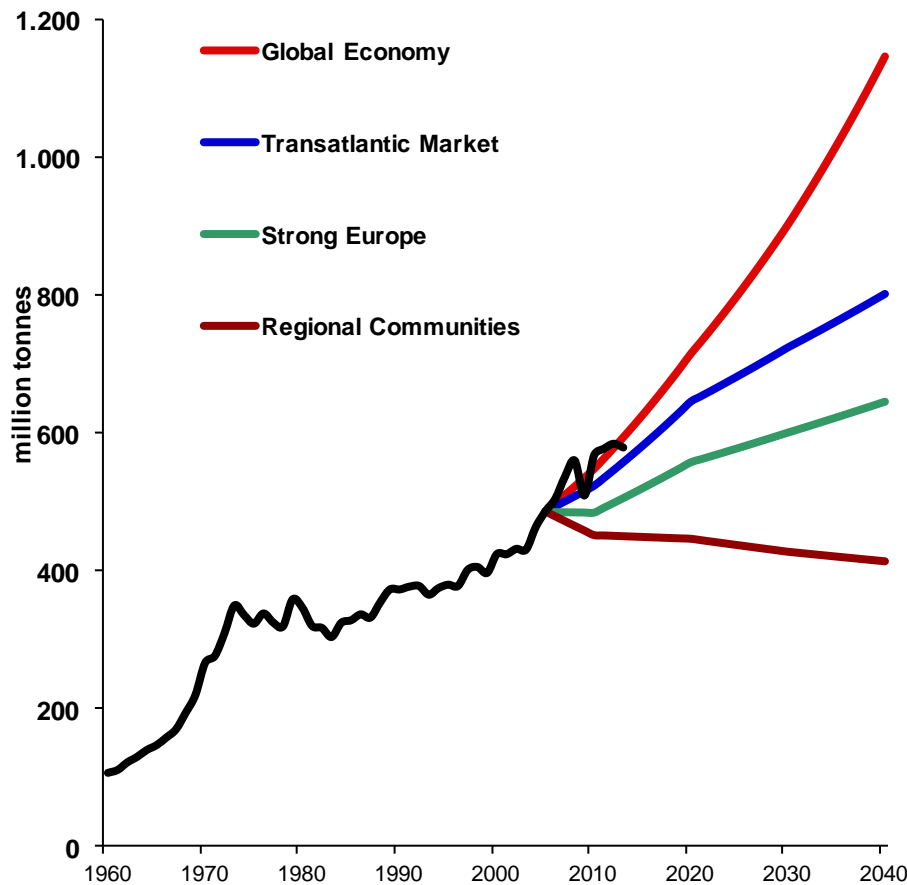
emphasis on national sovereignty and private responsibilities, extended infrastructure investments

Population 2040:	17.1 mln
GDP/capita (2001 = 100):	195
Households:	8.5 mln
Passenger cars:	9.5 mln
Growth passengermobility (pkm) against 2002	+20%
Growth inland freight transport (tkm) against 2002:	+65%
Congestion hours against 2002:	-10%
NO _x emissions transport:	-55%
CO ₂ emissions transport:	+35%

Source: CPB/PBL, 2006



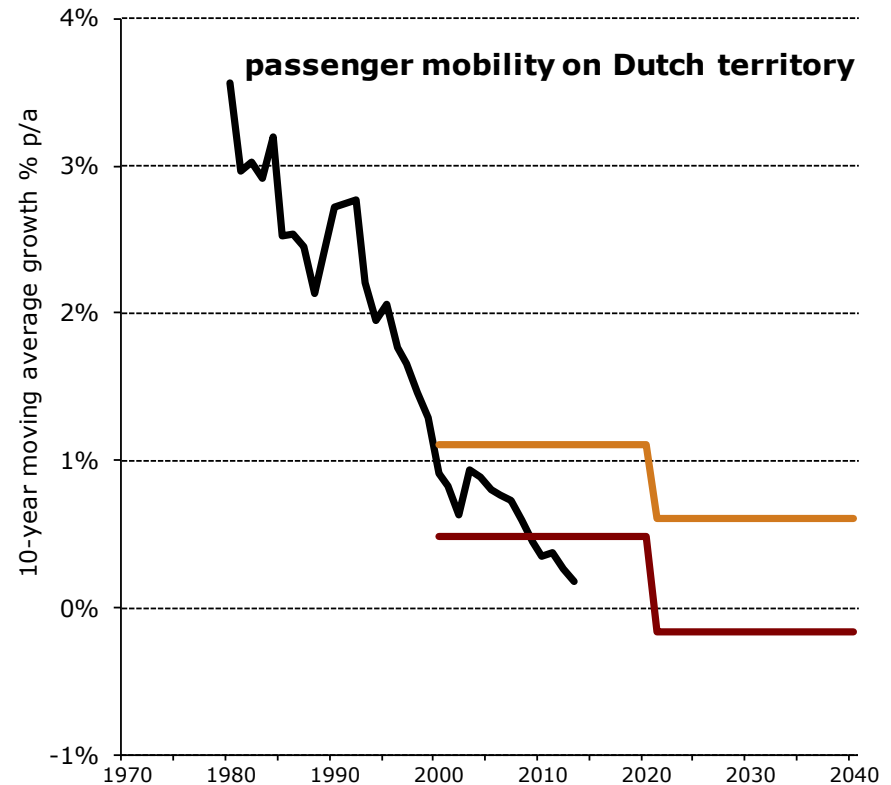
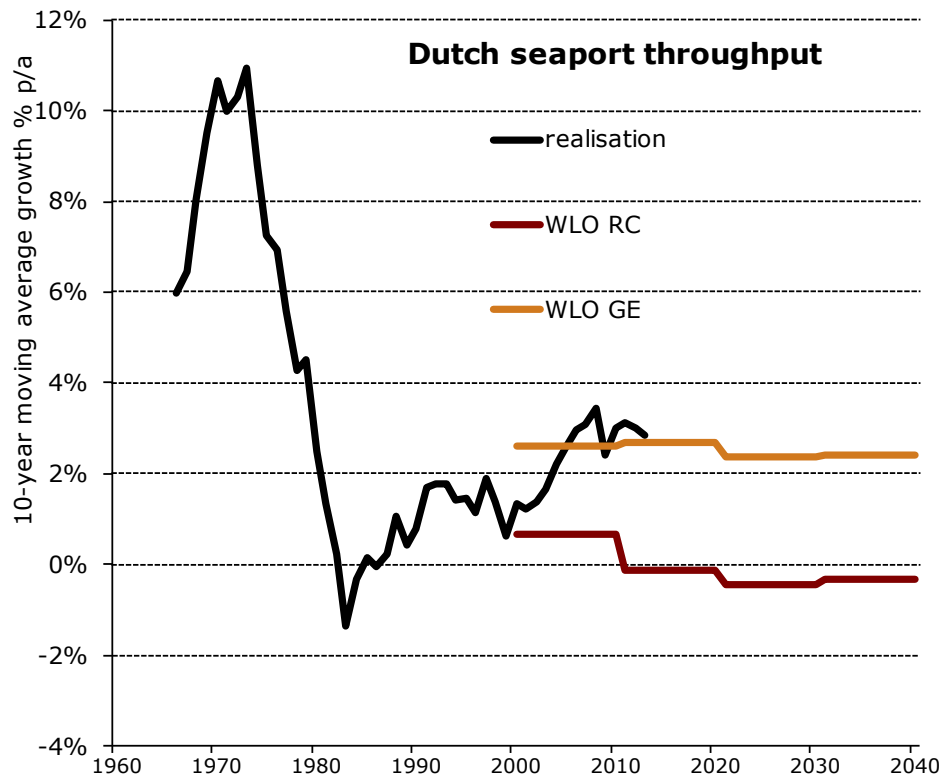
Bandwidth scenario's: Dutch ports throughput



source: CPB/PBL, 2006

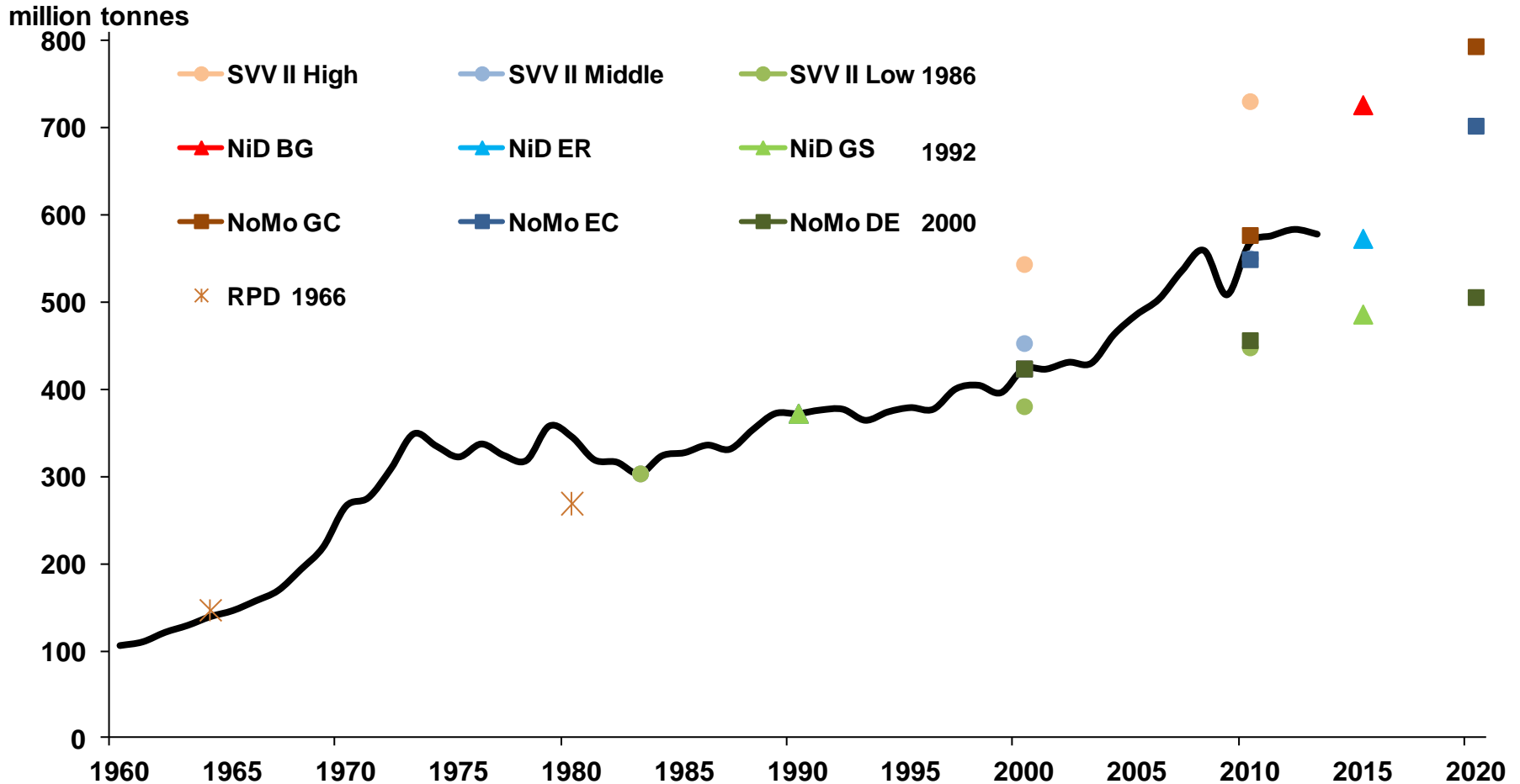


Different perspectives for the future





The future is history for port transshipment





The future is history continued

policy document	title	year	horizon period	port throughput		GDP volume		relevant world trade volume	
				proj.	real	proj.	real	proj.	real
				% p/a between base year and 2010					
Zeehavennota	RPD	1966	1964-1980	3,9%	5,8%	4,6%	3,9%	n.a.	n.a.
Structuurschema Verkeer en Vervoer II	SVVII-Low	1986	1983-2000-2010	1,5%		1,4%		1,9%	
	SVVII-Middle	1986	1983-2000-2010	2,2%	2,3%	2,7%	2,5%	4,0%	4,9%
	SVVII-High	1986	1983-2000-2010	3,3%		3,6%		6,0%	
Transport in Balans	NiD BG	1992	1990-2015	0,9%		1,7%		4,6%	
	NiD ER	1992	1990-2015	1,4%	2,1%	2,8%	2,3%	6,6%	4,5%
	NiD GS	1992	1990-2015	2,2%		3,3%		7,7%	
Nota Mobiliteit	NoMo DE	2000	2000-2010-2020	0,7%		0,9%		3,4%	
	NoMo EC	2000	2000-2010-2020	2,6%	3,0%	2,4%	1,4%	6,2%	3,2%
	NoMo GC	2000	2000-2010-2020	3,1%		3,1%		7,8%	

- overall picture seems OK: port throughput within bandwidth of scenario projections
- is it a coincidence, calculated nonsense or educated guess?



Thank you for your attention

Web: www.kimnet.nl

E-mail: jan.francke@minienm.nl

Phone: +31 (0)70-456 1965

