Karlsruher Institut für Technologie

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European transport infrastructure policy – overview and challenges

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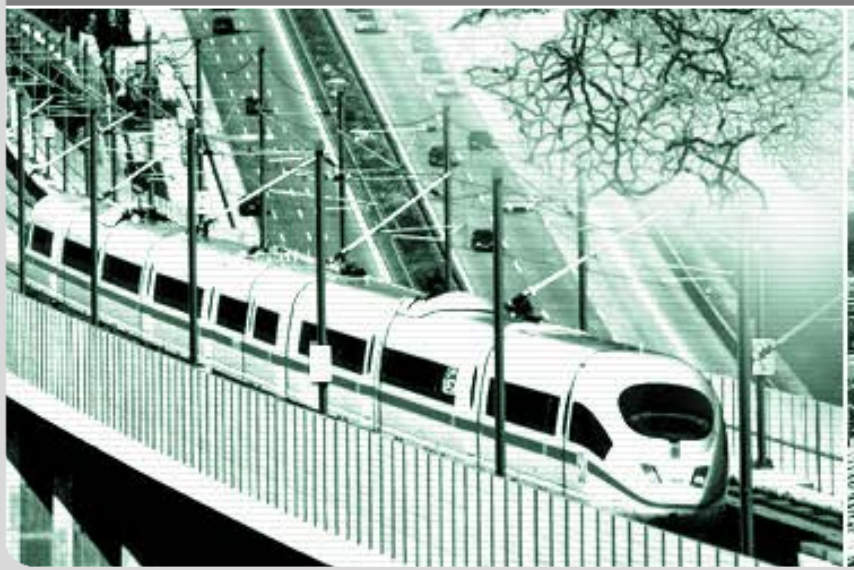


Agenda

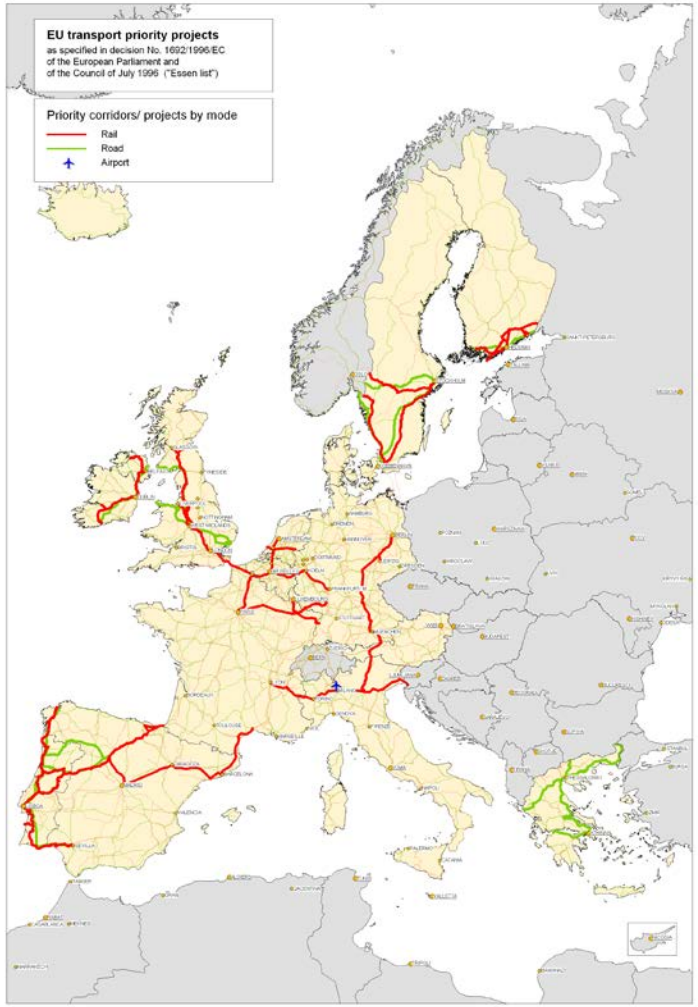
- History of EU transport infrastructure planning
- Current scope of transport infrastructure planning
- Success stories
- Challenges
- Conclusions

Part I

History of EU transport infrastructure planning

Planning stage 1994

"Essen list"



- TEN-T planning – 1994

Priority corridors/ projects by mode

Rail

Road

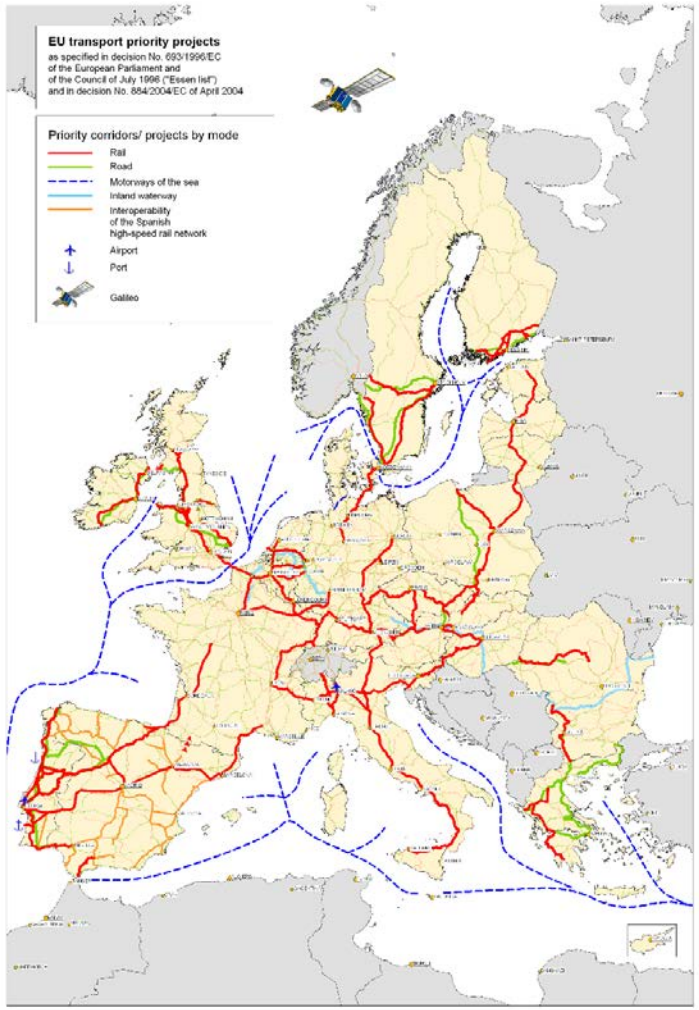
Airport

- Projects decided on the EU summit in Essen in 1994
- Adopted by the European Parliament and the European Council in 1996

Source: Szimba 2008

Planning stage 2004

"Priority projects"



- TEN-T planning – 2004

Priority corridors/ projects by mode

- Rail
- Road
- Motorways of the sea
- Inland waterway
- Interoperability of the Spanish high-speed rail network
- Airport
- Port
- Galileo

- List of corridors/ projects approved by the European Council and the European Parliament in April 2004
- Financial dimension of the planned investments (estimation 2004): 225 billion € up to the year 2020

Source: Szimba 2008

Planning stage 2004

Corridors – Main advantages of the corridor concept

- The possibility of stimulating the participation of stakeholders
- Combining short-term and long-term infrastructure planning
- Allowing coherent infrastructure planning at regional level
- Taking into account the operating conditions for transport services

Sources: Reynaud et al. (1996), Chatelus (1999)

Planning stage 2004

‘Priority sections’ on ‘priority projects’

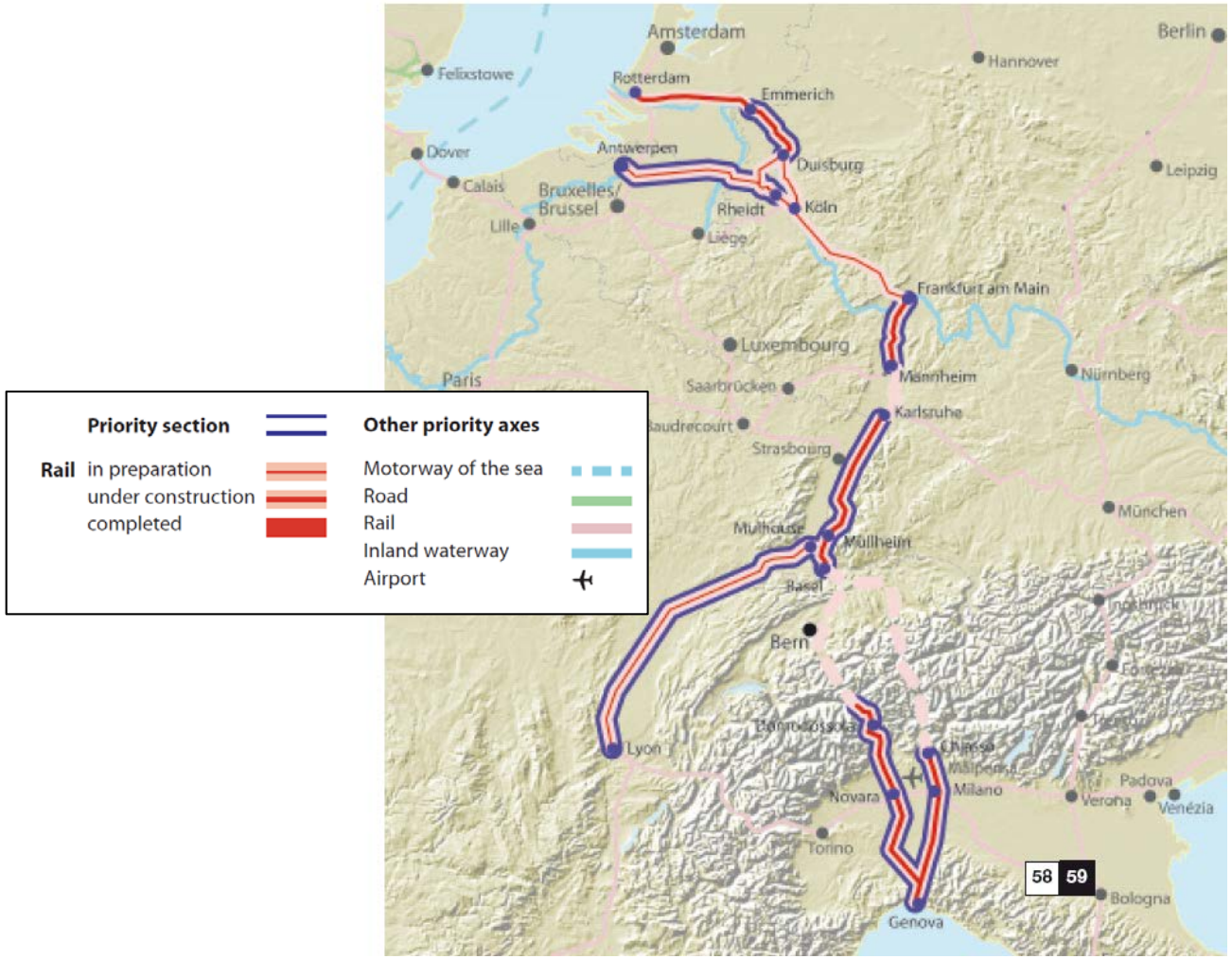
- Organisation of priority projects along ‘priority sections’, e.g.

P24, Railway axis Lyon/ Genova – Basel – Duisburg – Rotterdam/ Antwerp

- Consisting of following ‘priority sections’:
  - Lyon – Mulhouse – Müllheim
  - Genova – Milano/ Novara – Swiss border
  - Basel – Karlsruhe
  - Frankfurt –Mannheim
  - Duisburg – Emmerich
  - Iron Rhine (Rheidt – Antwerp)

Planning stage 2004

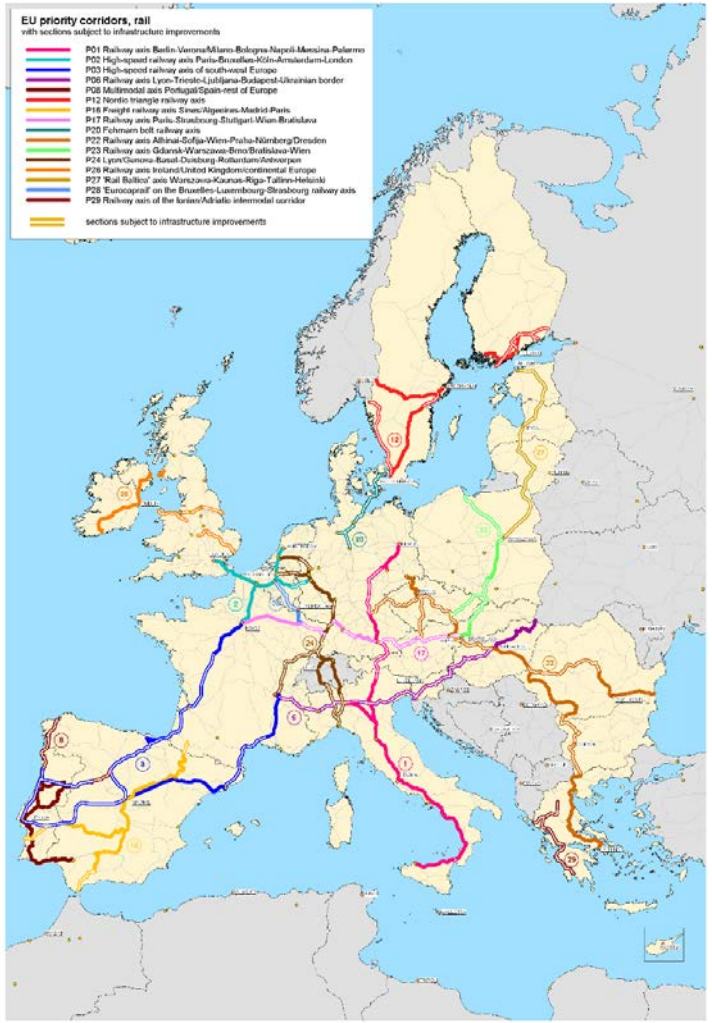
‘Priority sections’ on ‘priority projects’



Source: European Commission

Planning stage 2004

Overview of rail corridors



EU priority corridors, rail
with sections subject to infrastructure improvements

- P01 Railway axis Berlin-Verona/Milano-Bologna-Napoli-Messina-Palermo
- P02 High-speed railway axis Paris-Bruxelles-Köln-Amsterdam-London
- P03 High-speed railway axis of south-west Europe
- P06 Railway axis Lyon-Trieste-Ljubljana-Budapest-Ukrainian border
- P08 Multimodal axis Portugal/Spain-rest of Europe
- P12 Nordic triangle railway axis
- P16 Freight railway axis Sines/Algeciras-Madrid-Paris
- P17 Railway axis Paris-Strasbourg-Stuttgart-Wien-Bratislava
- P20 Fehmarn belt railway axis
- P22 Railway axis Athinai-Sofija-Wien-Praha-Nürnberg/Dresden
- P23 Railway axis Gdansk-Warszawa-Brno/Bratislava-Wien
- P24 Lyon/Genova-Basel-Duisburg-Rotterdam/Antwerpen
- P26 Railway axis Ireland/United Kingdom/continental Europe
- P27 'Rail Baltica' axis Warszawa-Kaunas-Riga-Tallinn-Helsinki
- P28 'Eurocaprail' on the Bruxelles-Luxembourg-Strasbourg railway axis
- P29 Railway axis of the Ionian/Adriatic intermodal corridor

sections subject to infrastructure improvements

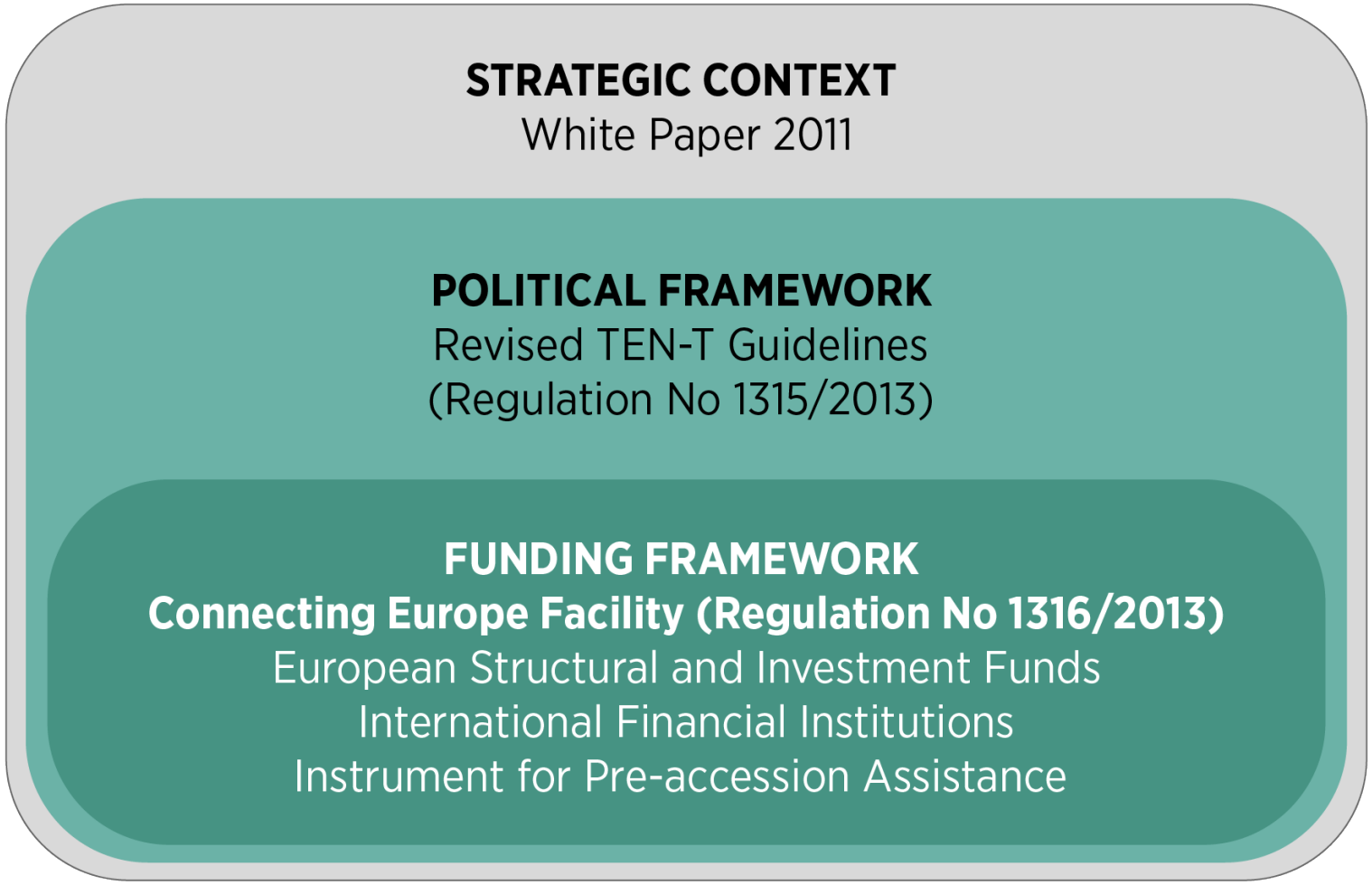
Source: Szimba 2008

Part II

Current scope of transport infrastructure planning

Overview

Strategic, political and funding framework



White Paper (2011)

Roadmap to a Single European Transport Area

- Roadmap to a Single European Transport Area – Towards a Competitive and Resource-Efficient Transport System
- Key target: by 2050, achieve a **reduction of transport GHG emissions by at least 60%** with respect to 1990

White Paper (2011)

Selected targets

- General targets
  - Deployment of air, land and waterborne transport management systems (e.g. ERTMS)
  - Deployment of the European global navigation satellite system (Galileo)
  - Establish the basis for a European multimodal transport information, management and payment system

- Targets for 2030
  - 30% of road freight over 300 km should shift to other modes
  - Triple the length of the existing high-speed rail network
  - Completion of a fully functional and EU-wide multimodal TEN-T ‘core network’

White Paper (2011)

Selected targets

- Targets for 2050
  - Complete the European high-speed rail network
  - Completion of the high-quality and capacity TEN-T network
  - 50% of road freight over 300 km should shift to other modes
  - The majority of medium-distance passenger transport is operated by rail
  - Connecting all core network airports to the rail network, preferably high-speed
  - Ensure that all core seaports are sufficiently connected to the rail freight and, where possible, inland waterway system

Dual layer approach of TEN-T planning

TEN-T Guidelines 1315/2013

- Core and Comprehensive Network
- The Core Network
  - Consist of those parts of the comprehensive network which are of the **highest strategic importance** for achieving the objectives for the development of the TEN-T network
  - The core network should constitute the **backbone of a sustainable multimodal transport network**
  - Should stimulate the development of the entire comprehensive network
  - It should enable Union action to concentrate on those components of the trans-European transport network with the **highest European added value**, in particular cross-border sections, missing links, multimodal connecting points and major bottlenecks
  - Implementation horizon: 2030

Dual layer approach of TEN-T planning

TEN-T Guidelines 1315/2013

- The Comprehensive Network
  - Consists of all existing and planned transport infrastructures of the TEN-T network…
  - …and measures promoting the efficient and socially and environmentally sustainable use of such infrastructure.
  - Implementation horizon: 2050

- Specification of “core” and “comprehensive” infrastructure (links and nodes) in TEN-T Guideline 1315/2013

Core and Comprehensive Network

Rail

Source: TENtec

Core and Comprehensive Network

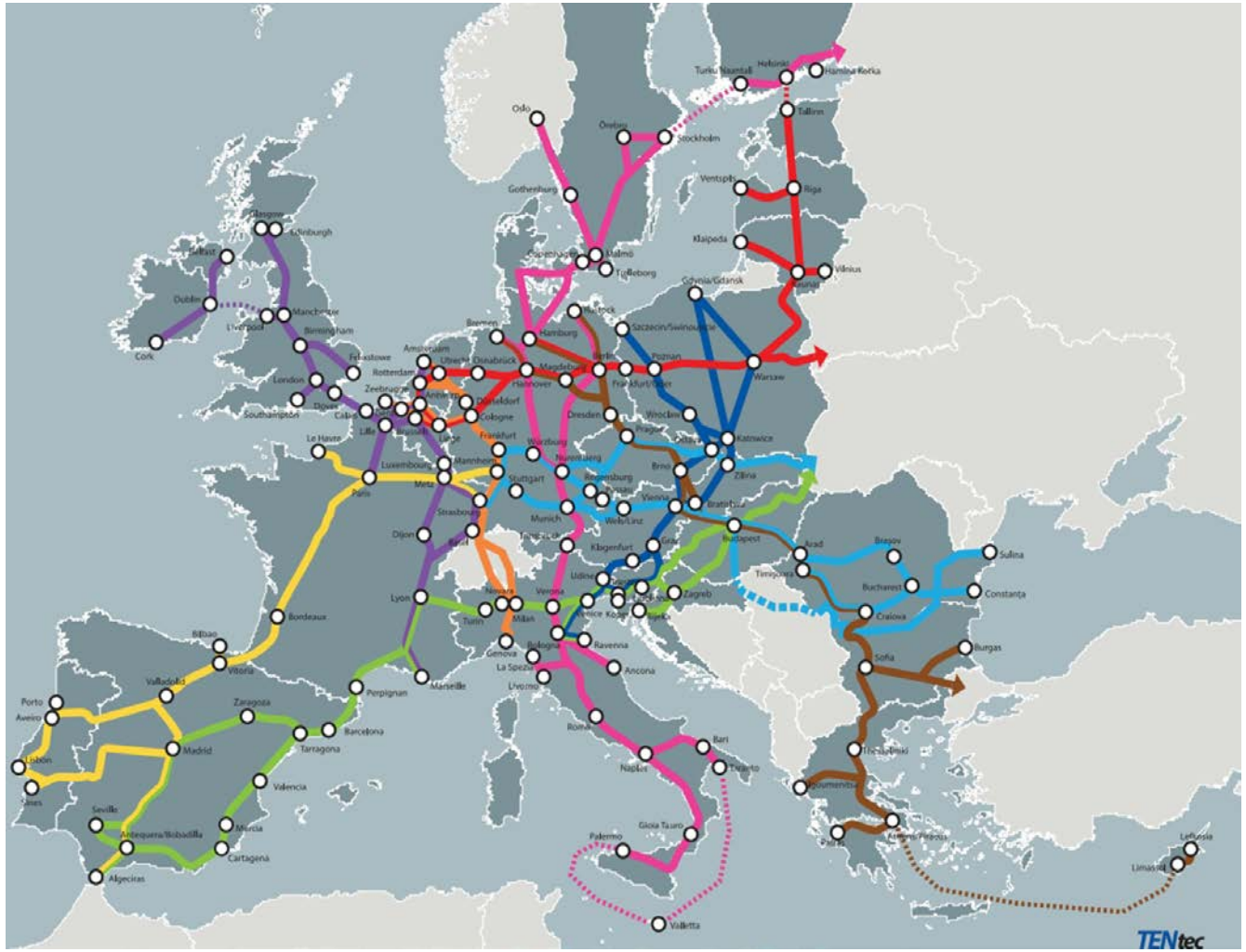
Rail + rail/road terminals + ports

Source: TENtec

Core Network Corridors

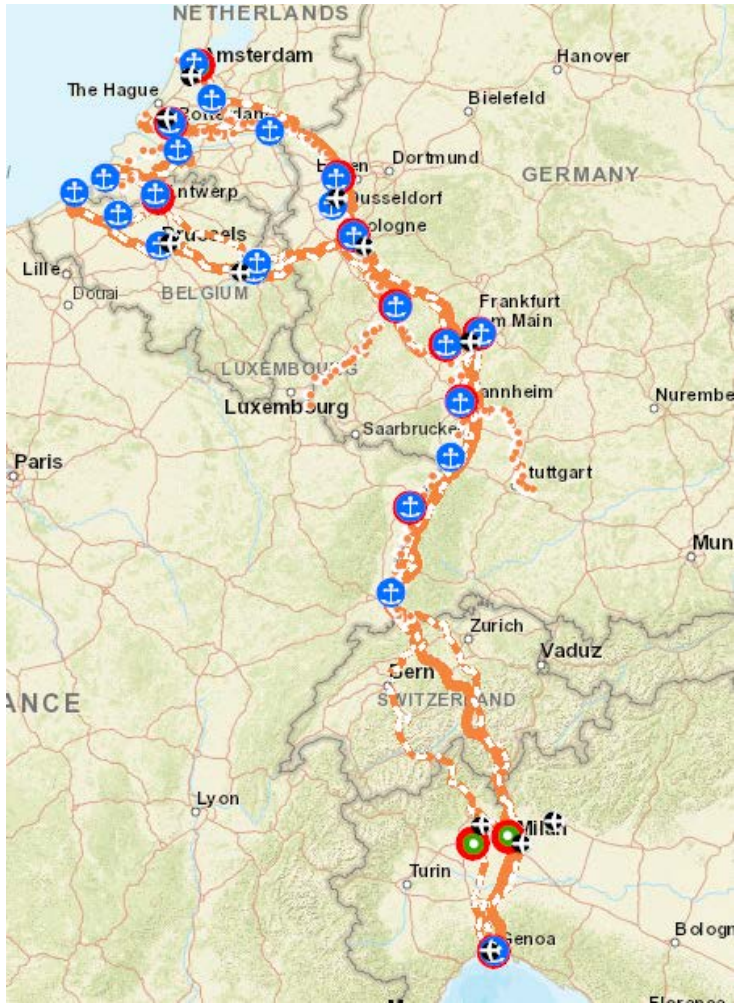
Basic features

- Nine Core Network Corridors (CNC), ERTMS and Motorways of the Sea
- Multimodal, involving at least 3 Member States
- Each CNC has a European Coordinator
- Support the implementation of the core network
- Synchronise investments in order to optimise network benefits
- Consultative Corridor Fora, with involvement of all stakeholders



Core Network Corridors

Example: CNC Rhine – Alpine



Source: TENtec

Funding Framework

Connecting Europe Facility (CEF)

- Funding Framework 2014–2020, managed by INEA
- Covers three sectors: transport, energy, telecommunication
- Budget: 29.9 billion €, thereof 23.4 billion for transport (including 11.3 billion € reserved for Cohesion Member States)
- Budget mainly spent as grants, but also through innovative financial instruments
- Grants
  - Core Network (5% for cross-border comprehensive network sections)
  - Rail, Inland Waterways, Connections to ports and airports, Traffic Management systems, MoS, Road cross-border only
- Eligibility of financial instruments: all projects eligible under TEN-T Guidelines
- Annual/ multi-annual calls for EU-cofunding of infrastructure projects and studies

Outlook

Draft concept for the new financing period 2021–2028

- Focus on decarbonisation, and making transport connected, sustainable, inclusive, safe and secure
- 60% of the budget to be spent on the construction of new infrastructure and 40% to upgrading existing infrastructure
- High priority to cross-border sections
- Integration of core maritime ports into the core network corridors, which are further aligned with rail freight corridors
- Overall CEF budget around 35 billion €
  - CEF Transport: 14.5 billion €
  - Cohesion Fund contribution to CEF Transport: 11.3 billion €
  - Military mobility: 1.7 billion €

Source: European Parliament (2020)

Part III

Success stories

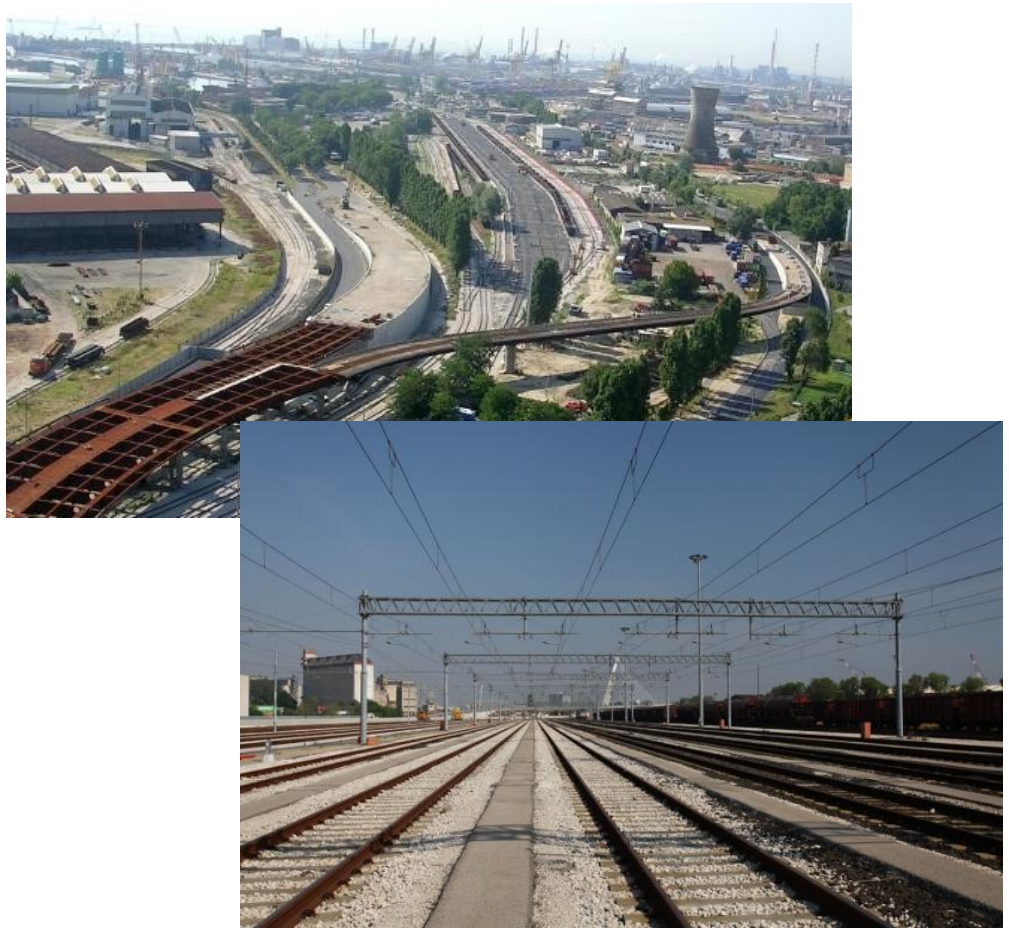
Success Story I

Improving rail terminal facilities at the Port of Venice

- Provision of additional facilities to enlarge the capacity for railfreight operations
- Construction of seven new parallel railway tracks and electrification of three railway tracks used for arrivals and departures

- Implementation period: 2007 – 2012

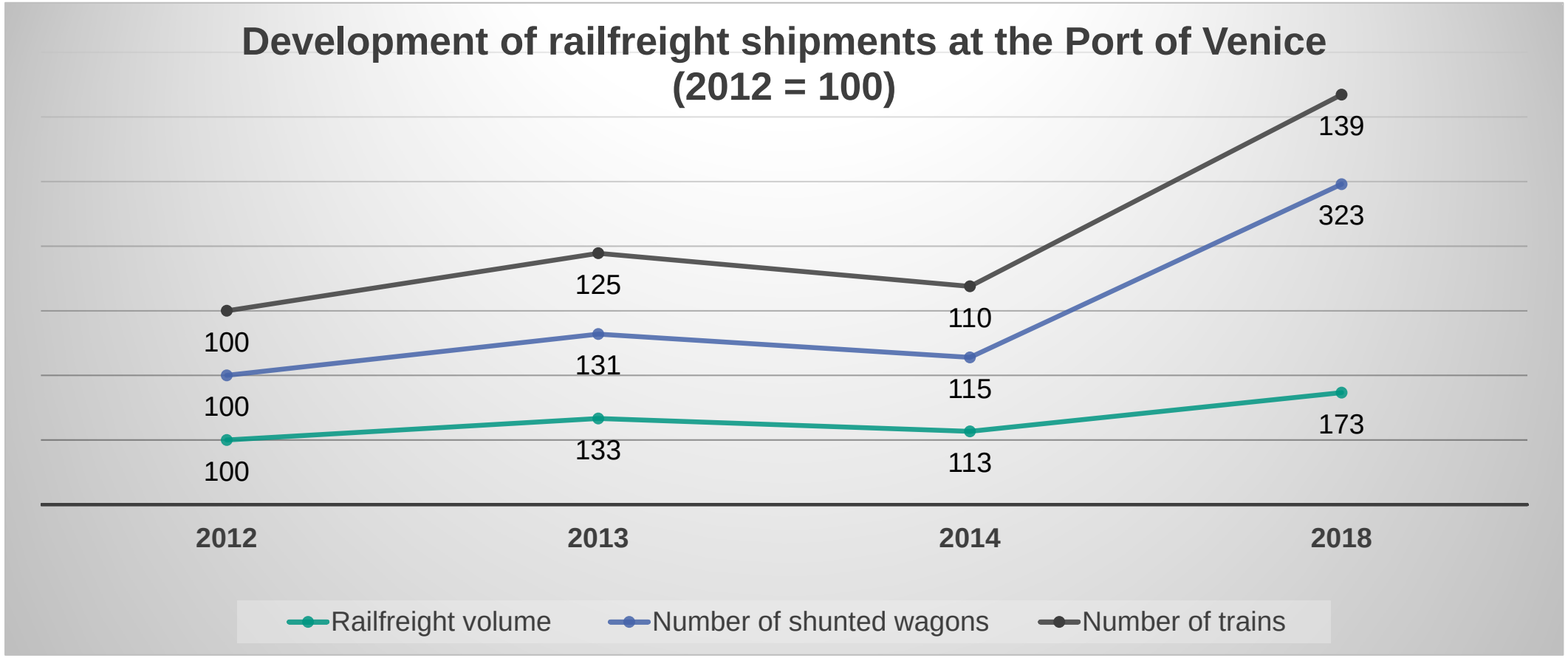
Source: INEA



Source: INEA

Success Story I

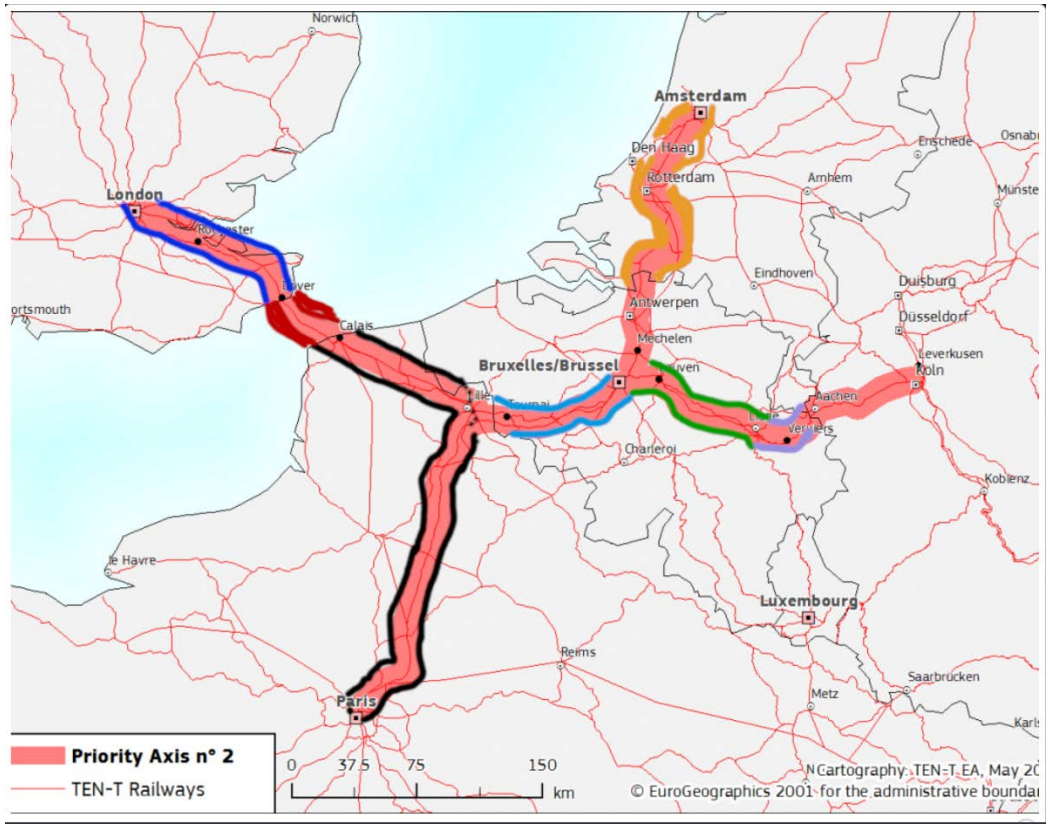
Improving rail terminal facilities at the Port of Venice



Source: Own synthesis, based on data by Port of Venice

Success Story II

Paris/Brussels/Köln/Amsterdam/London (PBKAL) high-speed lines



Project	Country	Opened
Channel Tunnel	France/UK	1994
LGV Nord	France	1993
HSL 1	Belgium	1997
HSL 2	Belgium	2002
CTRL I	UK	2003
CTRL II	UK	2007
HSL-Zuid	Netherlands	2009
HSL 3	Germany	2009

Source: Goldsmith & Boeuf (2019)

Chan-nel Tunnel | TGV Nord | HSL 1 | HSL 2 | CTRL I+II | HSL-Zuid | HSL 3

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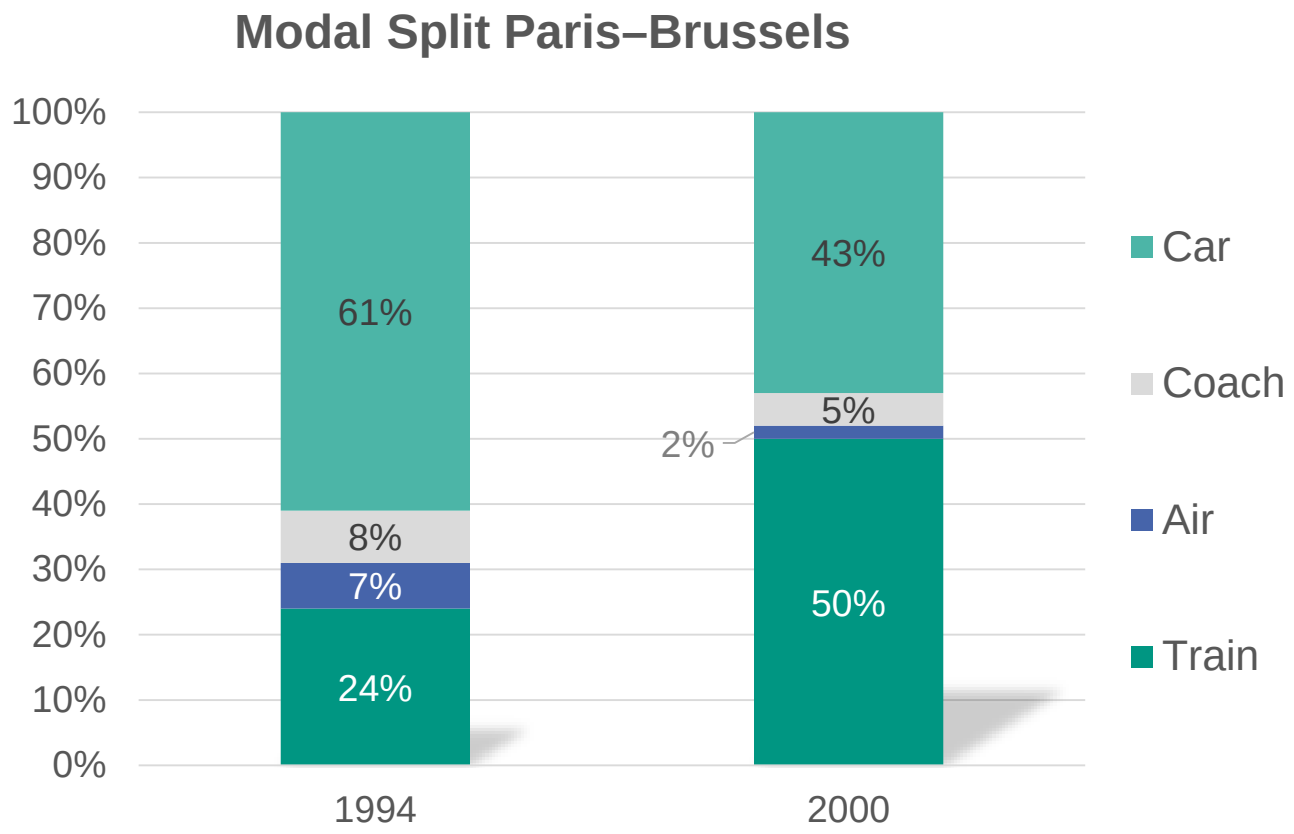

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Source: Givoni & Dobruszkes (2013)

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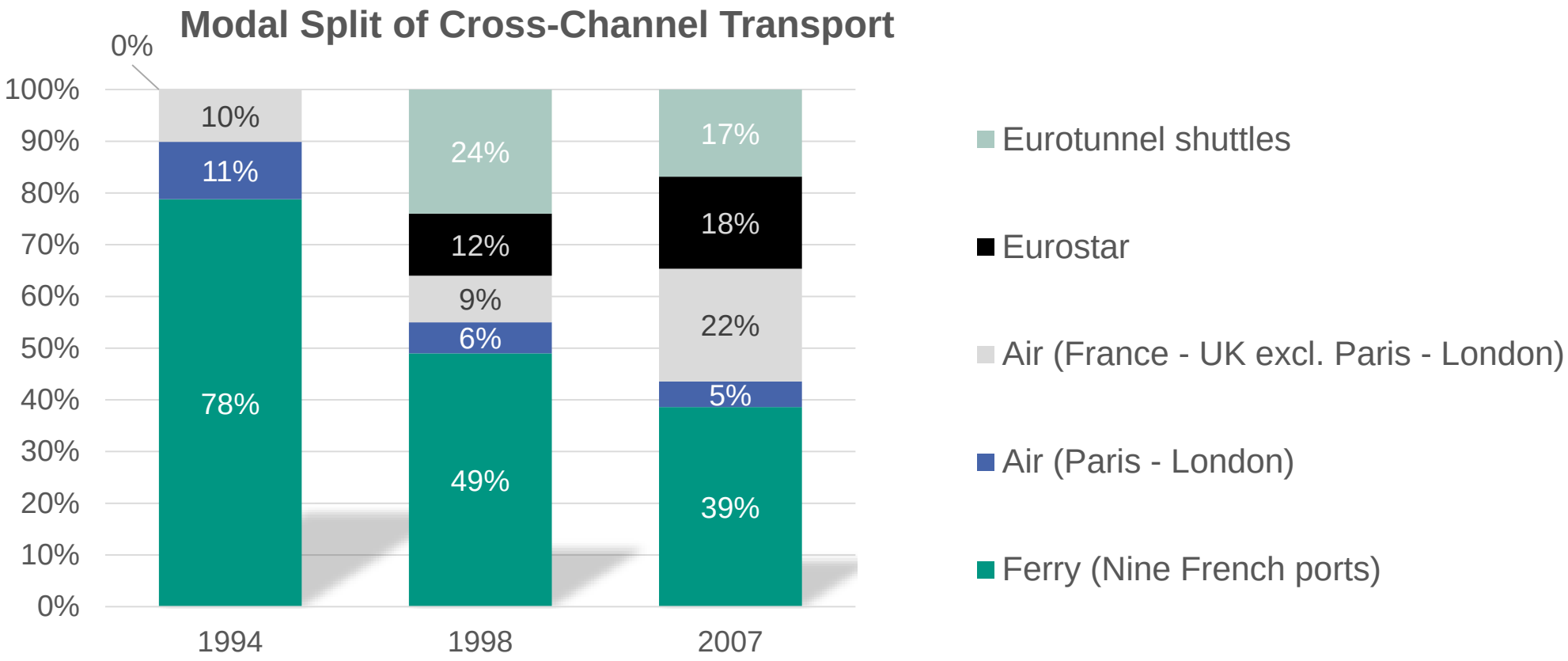
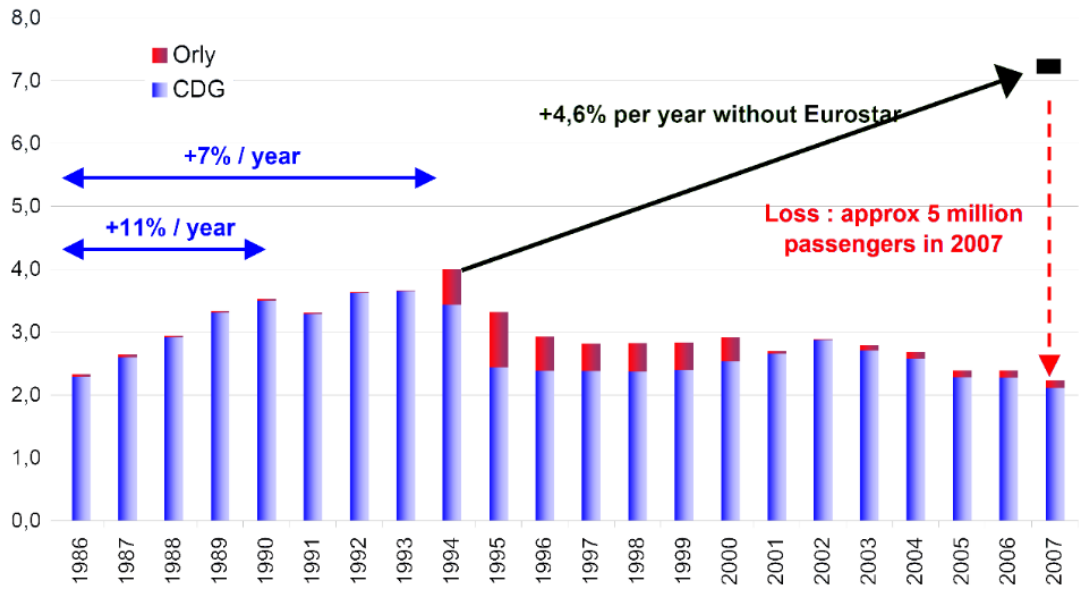


Source: Givoni & Dobruszkes (2013)

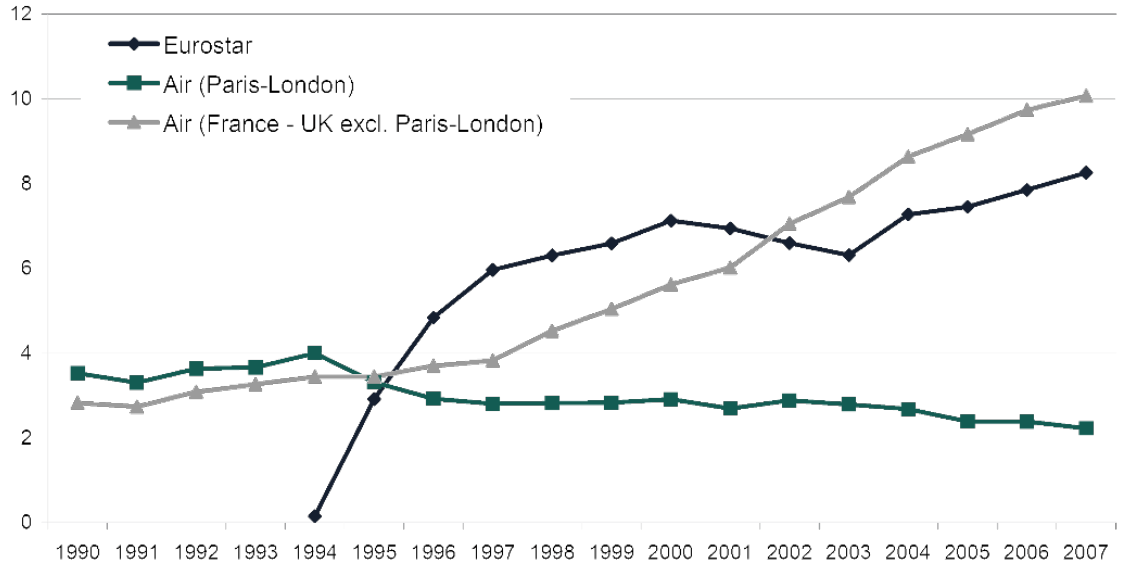
Success Story II

Paris/Brussels/Köln/Amsterdam/London (PBKAL) high-speed lines

Air traffic between Paris and London (millions of passengers)



Air and rail cross-Channel traffic (Eurostar) (millions of passengers)



Source: Ayoun (2008)

Part IV

Challenges

Techno-economic and social challenge

Megaprojects – a few famous examples

- Brenner base tunnel
- Mont Cenis base tunnel
- Fehmarnbelt fixed link
- Stuttgart 21
- Rail Baltica
- HSR projects in Sweden
- HSR line between Madrid and Lisbon
- Øresund fixed link
- NEAT

Source: bbt-se.com

Source: femern.com

Techno-economic and social challenge

Megaprojects – What is a “megaproject”?

- Investment costs > one billion USD
- Subject to controversial debates and discussions
- Former and ongoing megaprojects have shown that transparency and involvement of stakeholders tend to be insufficient
- Involve (problematic) social and environmental effects
- Failing of megaprojects can lead to system relevant company and state collapses

Source: e.g., Flyvbjerg, Bruzelius and Rothengatter (2003)

Source: bahnprojekt-stuttgart-ulm.de

Source: Wikimedia Commons

Techno-economic and social challenge

Megaprojects – Observed challenges with megaprojects

- Systematical underestimation of costs
- Systematical underestimation of construction time
- Systematical overestimation of transport demand and thus benefits

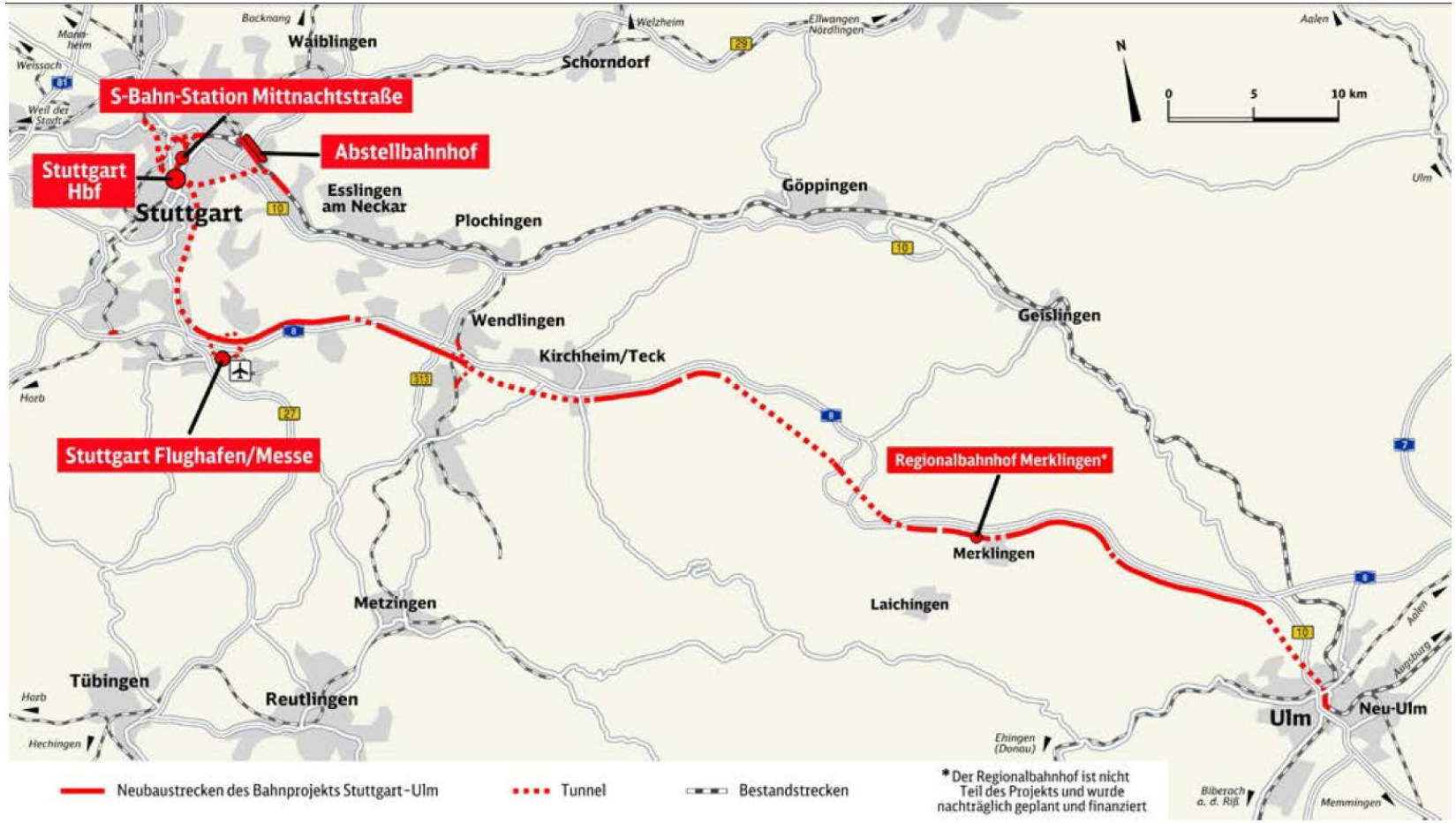
Optimism bias

- Actual magnitude of environmental impacts differs significantly from forecasted impacts
- Important impacts of a megaproject on regional, national or international developments do not materialize or are too diffuse to be scientifically verified
- Actual economic efficiency differs significantly from the forecasted economic efficiency

Sources: e.g., Flyvbjerg, Bruzelius and Rothengatter (2003); Miller and Szimba (2015)

Techno-economic and social challenge

Megaprojects – Example: Stuttgart 21



Source: bahnprojekt-stuttgart-ulm.de

Techno-economic and social challenge

Megaprojects – Example: Stuttgart 21

Source: bahnprojekt-stuttgart-ulm.de

Techno-economic and social challenge

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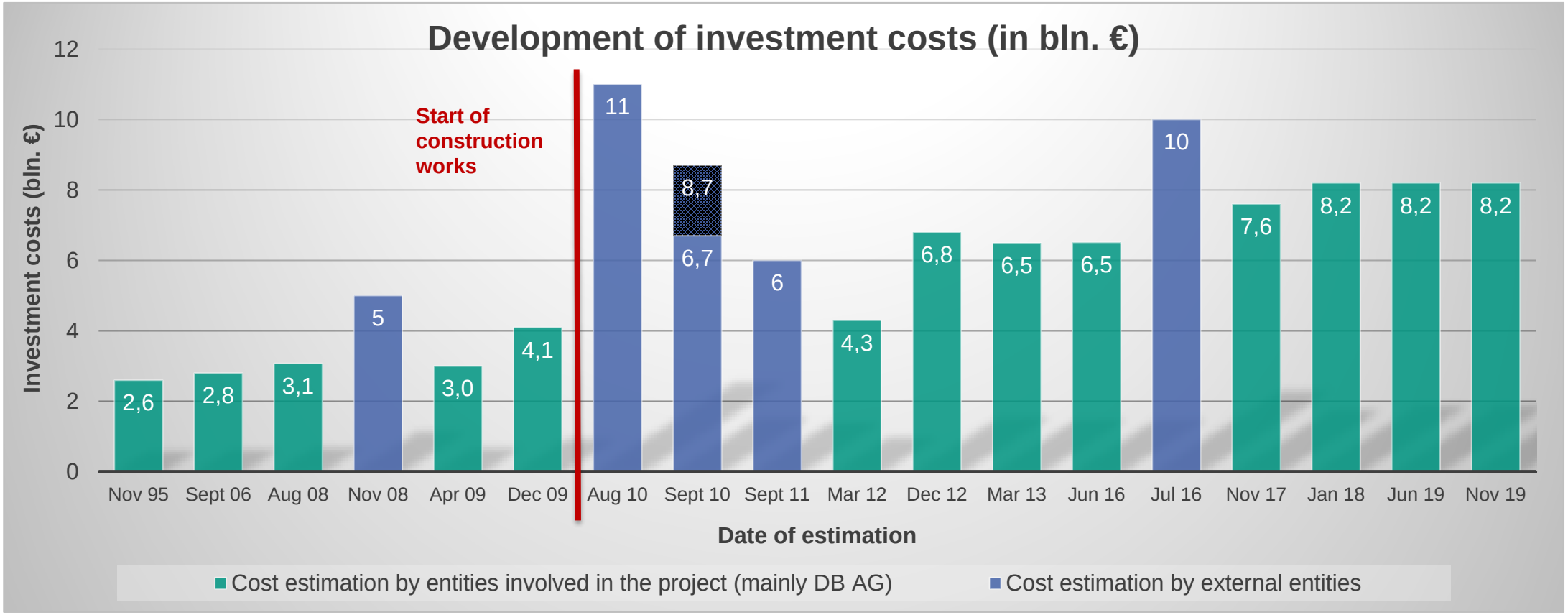
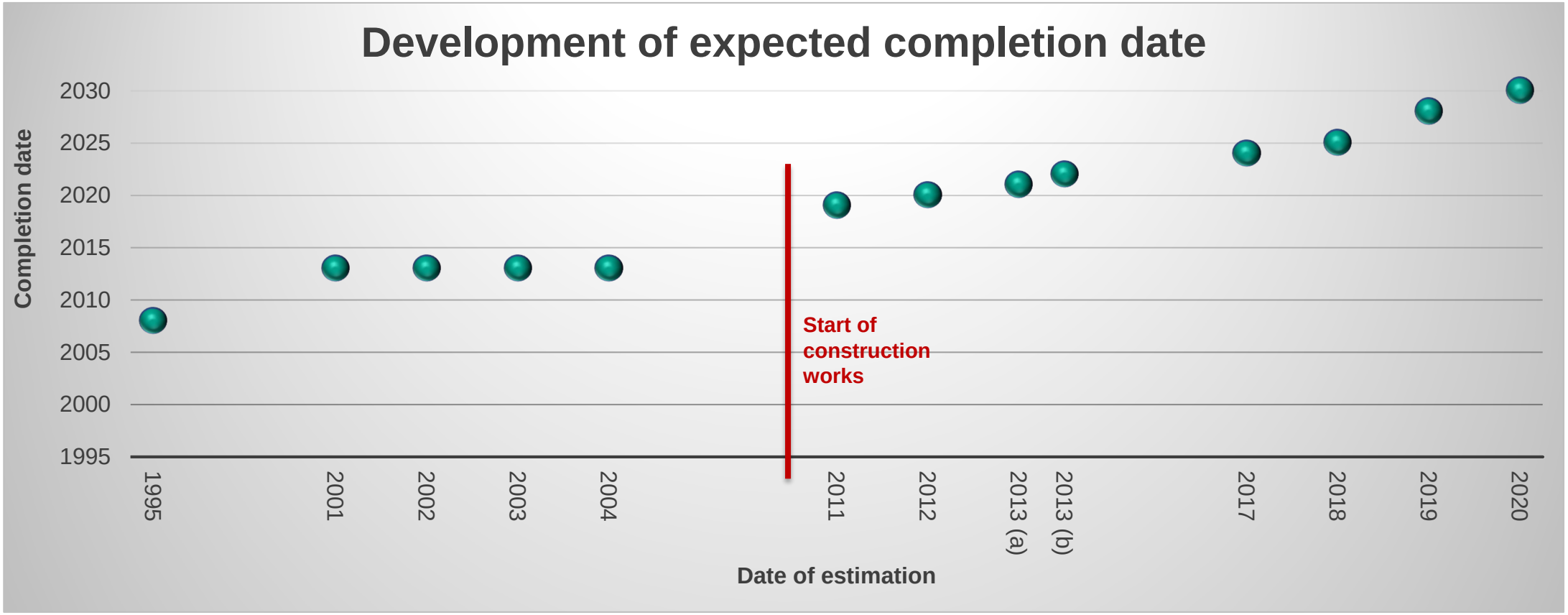


Source: Own synthesis, based on various sources

Techno-economic and social challenge

Megaprojects – Example: Stuttgart 21

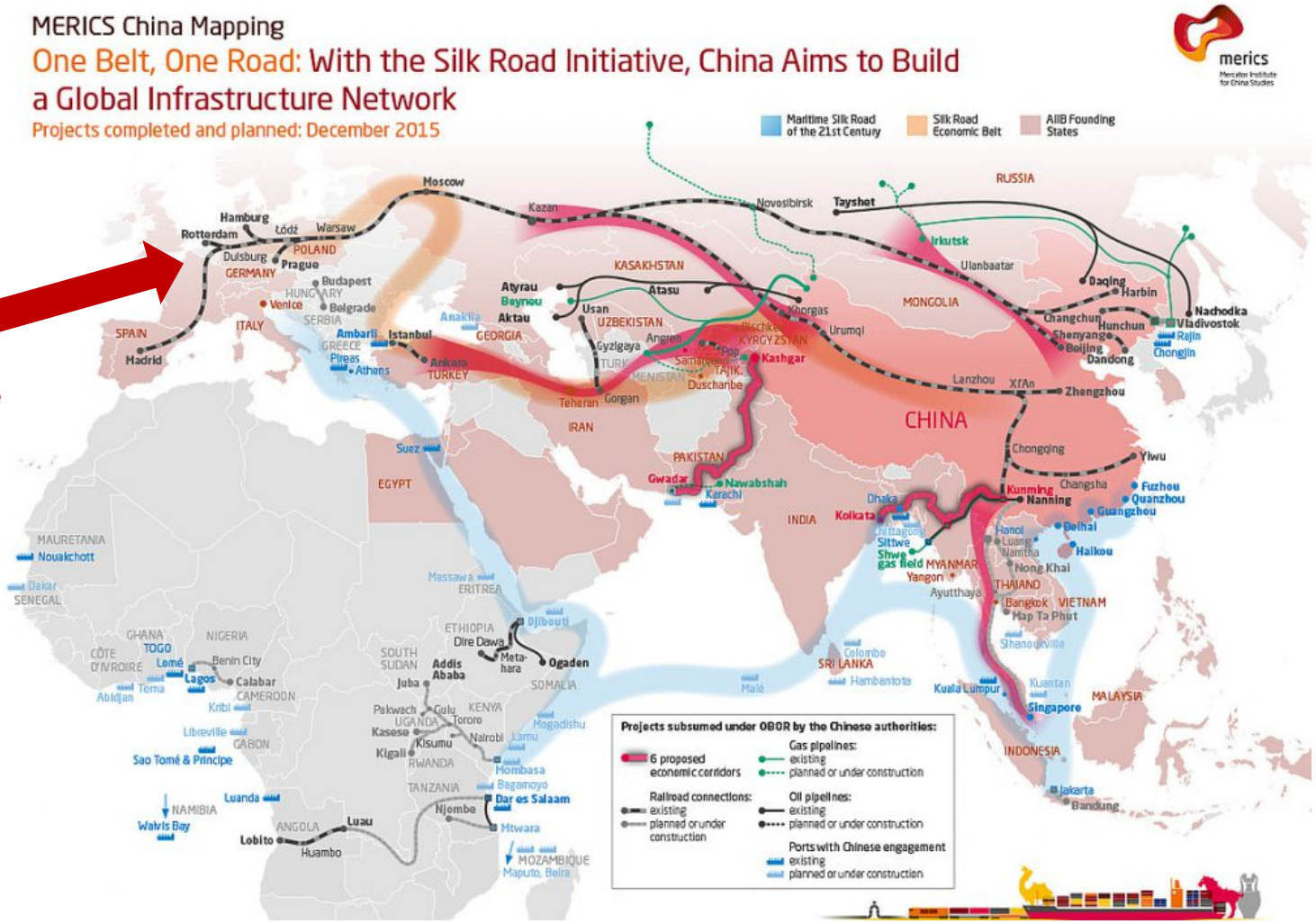


Source: Own synthesis, based on various sources

Geo-political and -strategic challenge

China – a new player in European infrastructure planning

New Eurasia Land Bridge
Economic Corridor



Source: MERICS

Geo-political and -strategic challenge

China – a new player in European infrastructure planning

- Examples of involvement by China
  - Cooperation between China and Central and Eastern European Countries (“17+1 Initiative”)
  - Significant investments in the port of Piraeus by COSCO
  - Financing (not funding) of the upgrade of the rail line between Belgrade and Budapest by China
  - Development of multimodal logistic centers in CEE countries
  - Promotion and planning of large infrastructure projects (e.g., Helsinki–Talinn undersea tunnel by Chinese investor Touchstone Capital Partners)

Part V

Conclusions

Conclusions

- TEN-T policy has played a crucial role for **integrating national networks** and has been an important facilitator of European integration
- Infrastructure planning along **international multimodal corridors** is an appropriate approach to develop infrastructure that meets the requirement of all concerned stakeholders
- The scope of the **TEN-T budget is restricted** in relation to the overall dimension of the investment plans (=> strong commitment needed by member states, infrastructure managers and private investors)
- Need to **align China's interests** in enhancing European transport infrastructure **with EU strategy** (facilitate a win:win situation)
- Need for applicants for EU co-funding: Make enhanced use of **scientific advice for the planning and implementation of megaprojects**, e.g.
  - Consideration of optimism bias in the planning phase (project appraisal)
  - Tighter risk management procedures, stakeholder involvement and a clear allocation of responsibilities in the planning and implementation stage

Thank you for your attention.

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