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# Roadmap to Zero-Carbon Combined Transport 2050

Investment needs to enable decarbonisation of  
inland freight transportation through  
zero-carbon combined transport



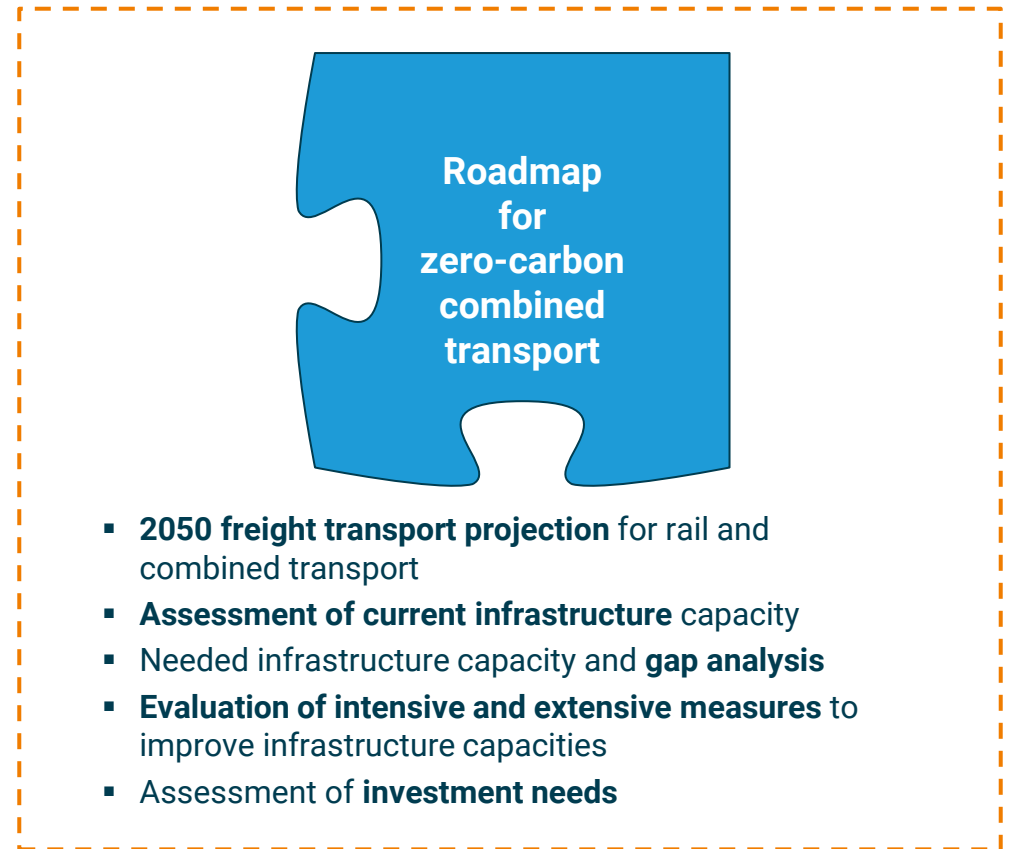
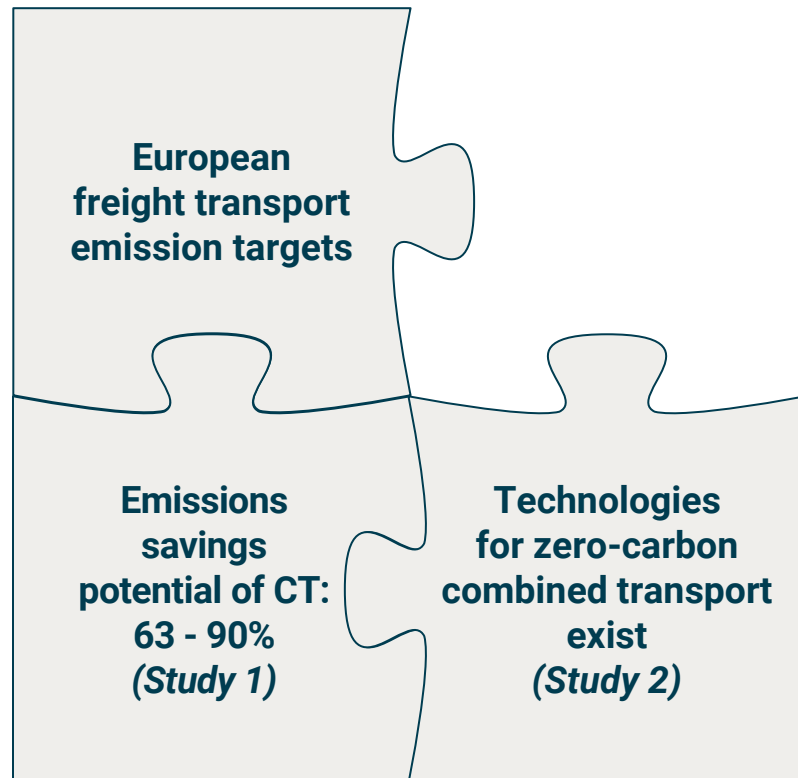
Brussels, 30.11.2022

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# Combined Transport offers the fulfilment of EU emission targets through superior energy efficiency and emission savings compared to trucking

This study is part of a series highlighting the technical, regulatory and investment requirements to enable sustainable door-to-door combined transport.



The study aims to identify the necessary investments needed to enable the widespread implementation of zero-carbon combined transport in Europe in 2050.

# This study presents projections for transport demand in Europe to examine how the infrastructure can cope with the needs of combined transport

Following an analysis of the projected development of freight transport, each mode of combined transport is examined individually



- **Projection of freight transport** (Based on *EU Reference Scenario 2020*)
- **Projection of rail share** in line with climate and industry objectives (e.g., Transport 2050 whitepaper)
- Development and assessment of **rail and combined transport share**

## Capacity assessment



## Investment assessment

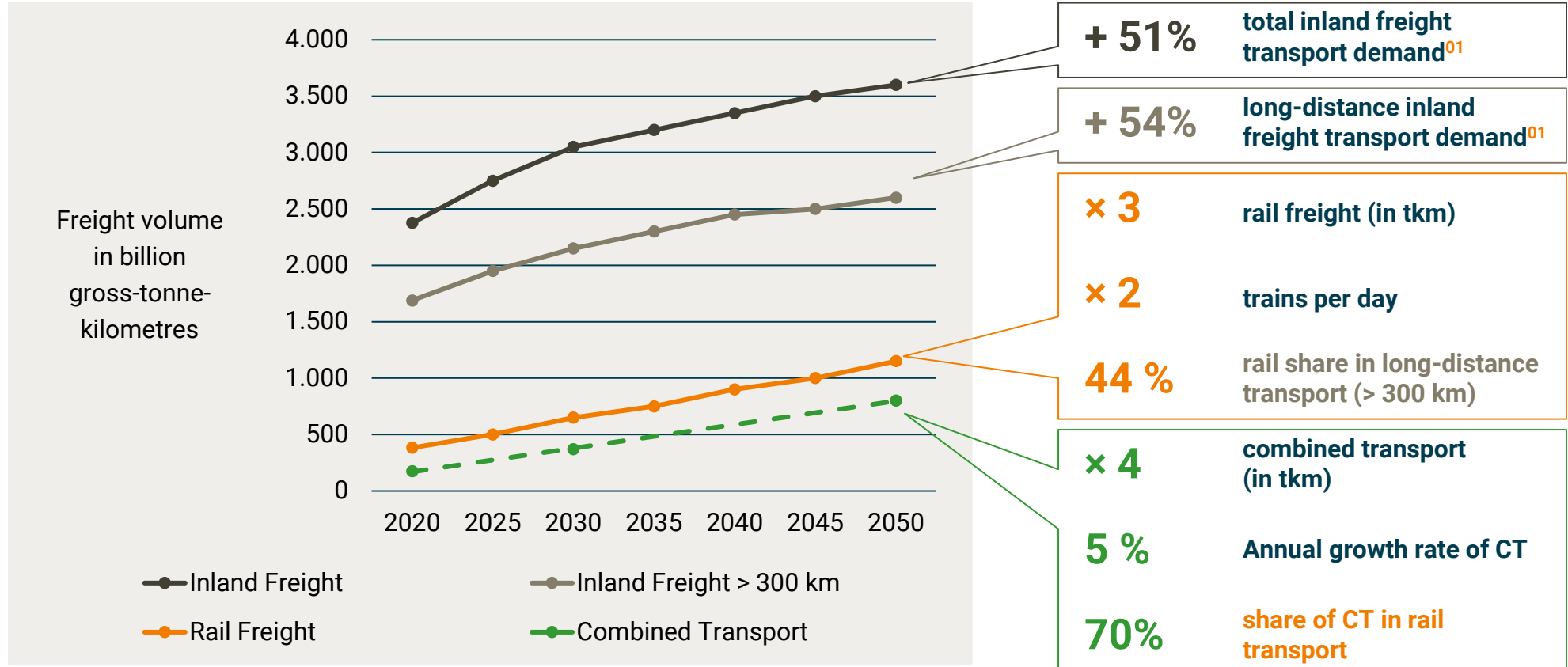


- **Current infrastructure capabilities** and **capacity utilization**
- **Capacity demand in 2050**
- **Gap analysis** and assessment of measures for **capacity improvements** (incl. measures proposed for the revision of the TEN-T Guidelines Regulation)
- Evaluation of already agreed **investments within TEN-T**
- Cost assessment **per measure**
- **Estimation of investment gap**

For each mode of combined transport this study evaluates the projected demand, the capacity gap as well as measures to increase infrastructure capacity along with the necessary investments.

# The development of freight demand, of rail freight and combined transport holds key figures to remember

Development of freight volumes: overall demand evolution, rail freight and combined transport

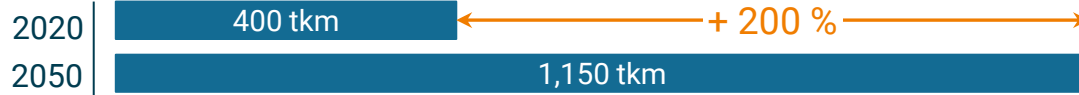


▶ The demand for freight transport, especially by rail, will increase continuously in the coming years.

# The European rail infrastructure requires capacity increases to support demand in 2050

## Utilization of rail infrastructure

Rail freight in billion tkm



Trains per day<sup>02</sup>



### Train capacity

### Track capacity

	P400	740m, 22.5 t axle load	ERTMS	100 km/h speed	Timetable redesign	Elimination of bottle necks <sup>03</sup>
Capacity	5%	41%	25%	66%	15%	up to 300%
Cost (in billion)	€ 5 bn	€ 150 bn	€ 30 bn	€ 49 bn	€ 1 bn	€ 159 bn
Implementation	48%	43%	48%	66%	from 2028	

Cumulated capacity increase potentials within the existing rail infrastructure

**< 150 %<sup>01</sup>**

Investments needs until 2050

**| € 490 billion**

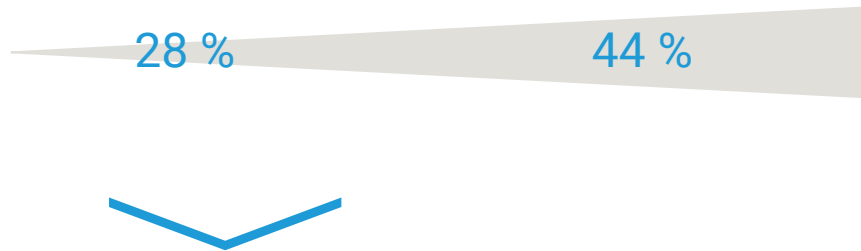
With the analyzed TEN-T measures, the increase in rail freight demand can be compensated for, but € 490 billion investments are needed until 2050.

# Modal shift and the sustained growth of combined transport will result in savings in the road sector

Well maintained road infrastructure is also a necessary for combined transport – however an overall lower utilisation can be expected due to the shift to rail.

EU Reference Scenario 2050      Transport 2050 objective<sup>01</sup>

**Rail share in long distance freight transport**



**Long distance road transport**

420 billion tkm

**Combined transport road legs**

40 billion tkm

**Trucking hours**

350 million hours

**Demand for container chassis (net new)**

60,000 chassis

**i Road legs in CT**

~15% of a CT transport chain is typically by road

75 km average CT road leg distance

**TEN-T road network**

77% status of completion

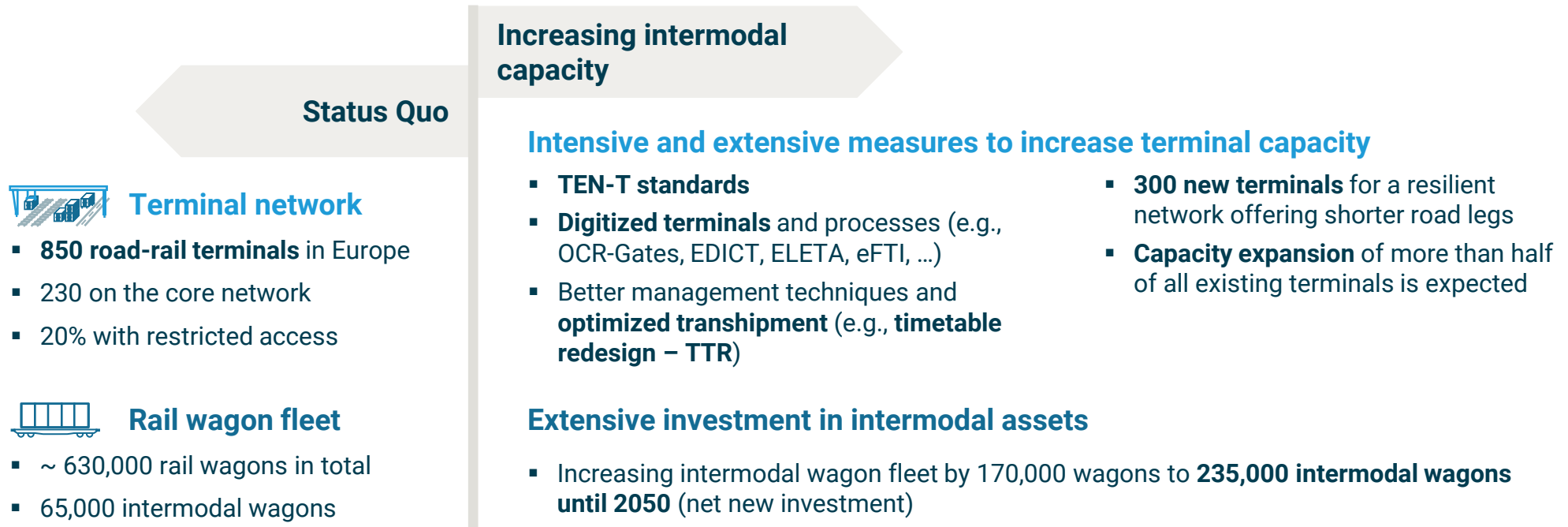
€ 80 bn invested until 2020

€ 11 bn additionally planned until 2050

Maintenance expenses and investments planned to be spent on the road infrastructure may be redirected towards other modes.

# The terminal infrastructure and other intermodal assets will require net new capital inflow until 2050

Net new investments are required in intermodal assets like terminals, wagons, and loading units.



Cumulated capacity increase potentials within the existing rail infrastructure

| > 100 %

Investments needs until 2050

| € 47 billion

About 300 additional terminals and measures to increase capacity are needed for a comprehensive road-rail terminal network.

# A transport projection that delivers the climate objectives challenges the transport network and offers savings potential

## Management summary (1/2)



Implementation of the revised **TEN-T regulation allows for necessary capacity increases**



**Climate objectives are met by 2050**

32 % rail share in freight transport

**44 % rail share in long-distance transport (50% shift met with IWW)**

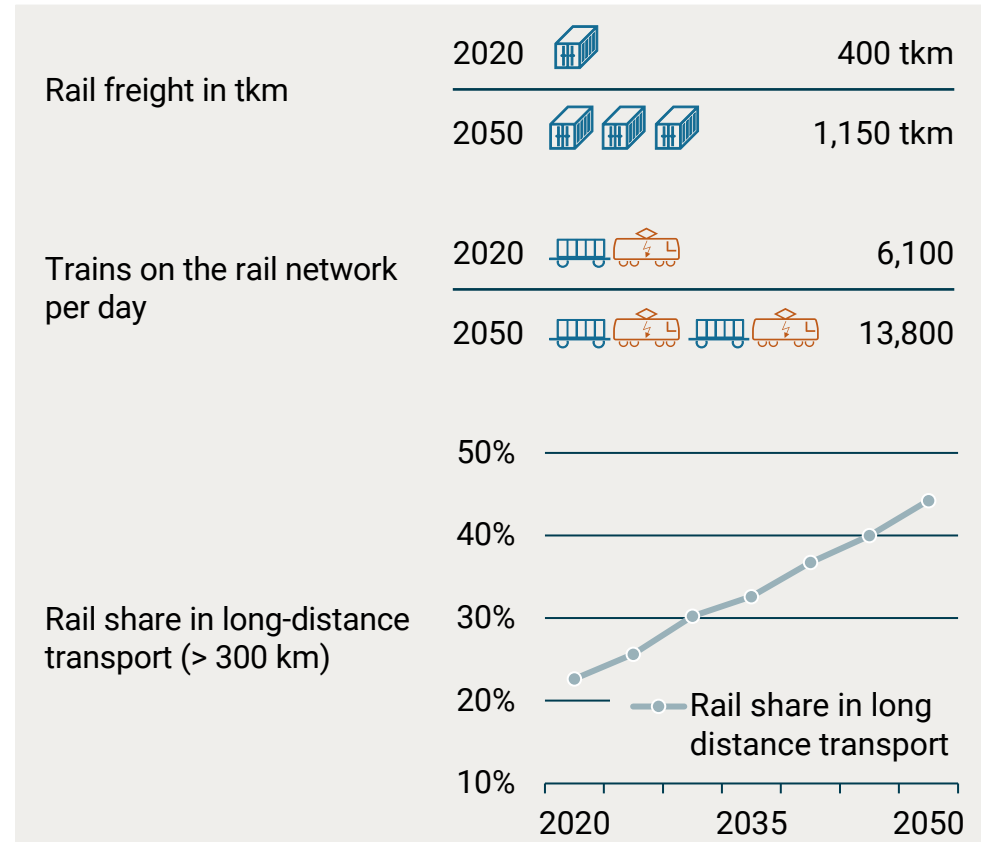


**Less truck hours required** (compared to the EU Reference Scenario)

**350 million less truck hours**

**170,000 fewer truck drivers**

**6,7 billion litres of diesel to be saved** (on the basis of Euro 6 trucks)



An increased share to rail freight transport together with a continued growth of CT allows to meet the European climate goals within a transport network fulfilling the revised TEN-T standards.



# The roadmap to zero-carbon door-to-door combined transport shows the milestones, investment needs, and anticipated performance levels

## Management summary (2/2)



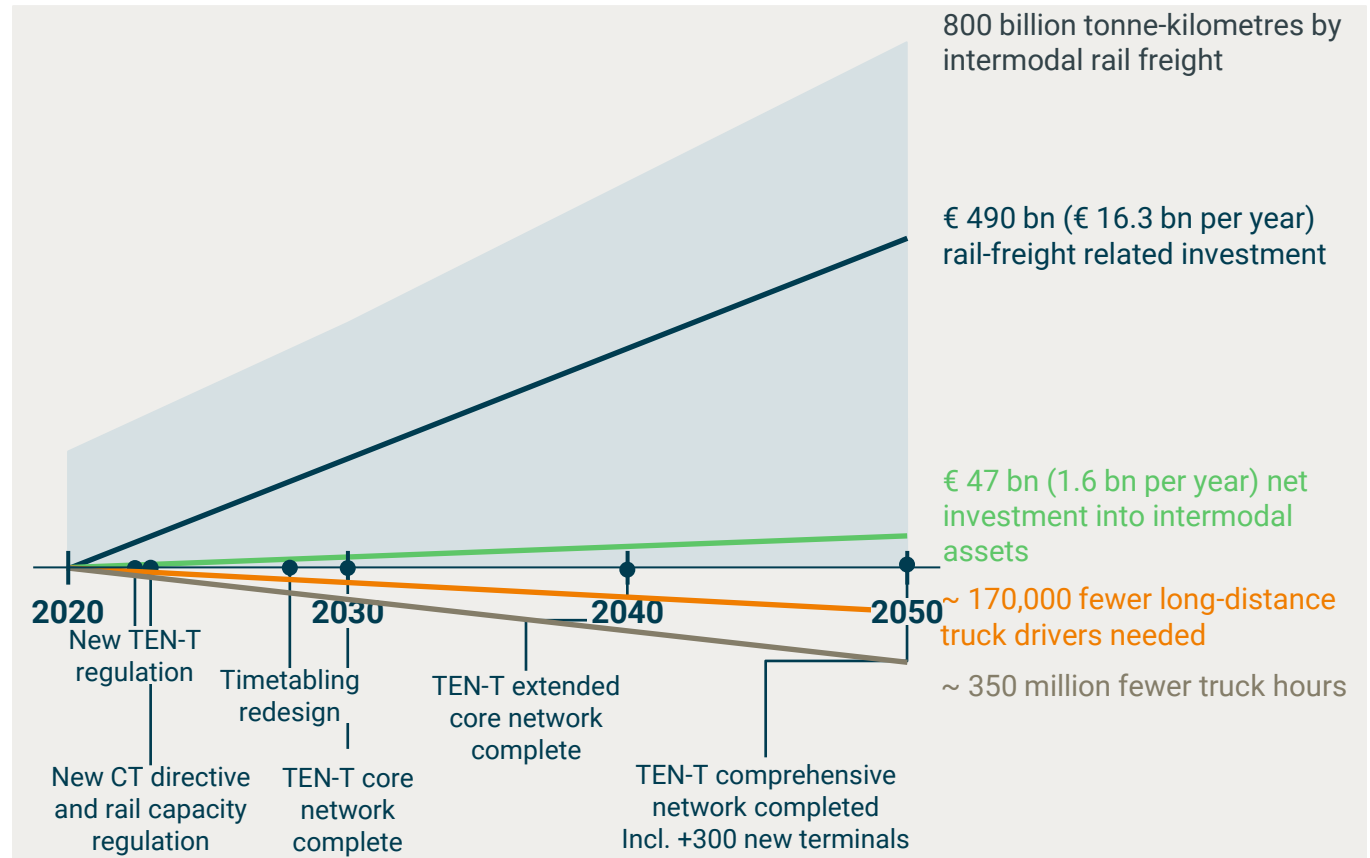
**Rail infrastructure**  
€ 16.3 billion yearly



**Intermodal capital assets**  
€ 1.6 billion yearly



**5% annual growth of intermodal freight transportation year-on-year**



Zero-carbon door-to-door combined transport is technically possible today and becomes more and more available until 2050 – to handle the projected demand increase, investments into the infrastructure are needed.



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The logo for d-fine, featuring the lowercase letters 'd-fine' in a white, sans-serif font. The 'd' is slightly larger and positioned to the left of the 'fine'.

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