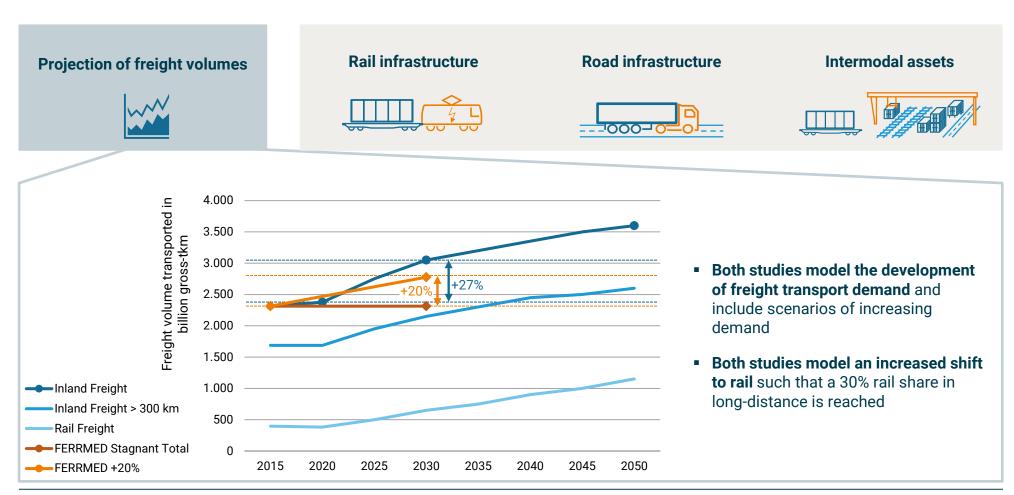
# Roadmap to zero-carbon Combined Transport

Validation of the UIRR & d-fine study "Roadmap to zero-carbon CT" with FERRMEDs bottom-up analysis of the network



# We examined projections for transport demand in Europe to determine investment demand to achieve zero-carbon CT and climate goals

Based on projected transport volumes, both studies determine the investment needs to achieve CT and rail shares to meet climate targets



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Projection of freight volumes

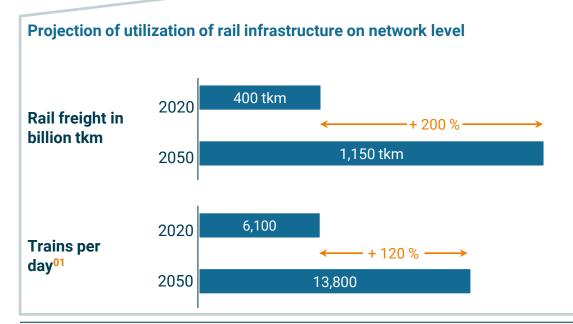






Intermodal assets





- In both studies, capacity requirements are determined based on projections of number of trains on network or segment level
- Both acknowledge, that due to better train utilization, the number of trains increases underproportionally
- FERRMED additionally proposes to establish a novel approach of transport operations which requires further infrastructure and investments
- Broken down to **yearly investments**, the analysis results are similar:
  - € 18 bn / yr for the top-down (until 2050), € 28 bn / yr for the bottom-up (until 2030)

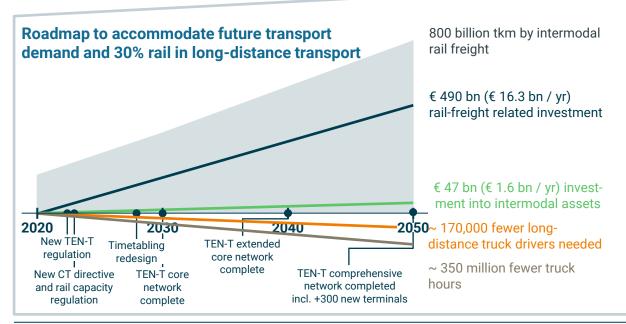
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- Both studies see a neutral or net positive effect of the transport shift for road infrastructure investments
- Both describe capacity gains for terminals for the analysed period between 5-30%
- Both indicate the need for new terminals:
  +300 terminals in the top-down case,
  +400 terminals in the bottom-up + FIRRST case
- Both derive the required increase of the wagon fleet:
  the top-down case yields +120% until 2050,
  the bottom-up case indicates 10-30% until 2030

### Both studies show investment needs to establish a resilient network for effective and efficient CT

Main findings for the validation of our top-down Roadmap Study with the bottom-up analysis of FERRMED.



### **Modelling of transport demand**

- Both studies model an increase in total transport demand
- Use of EU ref. scenario which gives +27% in 2030 compared to 2020.
- Modelling of a stagnant case, and a +20% scenario for 2030 based on 2015 numbers.



### Measures for track capacity

- Measures and their costs and capacity potential on network level.
- Measures based on local bottlenecks and attribution of all costs based on freight share.



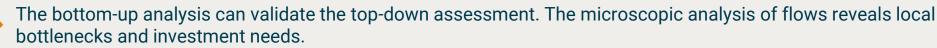
### **Intermodal Assets**

- Both studies see demand of +300 or +400 new terminals
- Demand analysis yields that the wagon fleet needs to double until 2015 (€ 0.4 bn / yr).
- Increase of the wagon fleet of 10-30% until 2030 and demand for new locomotives (€ 1 bn / yr).



#### **Investments**

- Both studies used similar unit costs for infrastructure.
- Investment need of € 537 bn until 2050 (€ 18 bn / yr) for rail infrastructure and intermodal assets.
- Investment in infrastructure and a novel operation model of
  € 197 bn for freight until 2030 (€ 28 bn / yr).



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