



Why is the modal shift important?

Zero-emission impact on external costs

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Navigating the Future of European Waters with Autonomous Innovation

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What are external costs of transport?

External costs

Costs incurred by a third party as a result of a transaction which the third party is not a part of.

Societal costs from transportation are such costs

Societal costs

Accidents, pollution, road congestion, climate, habitat damage, etc.



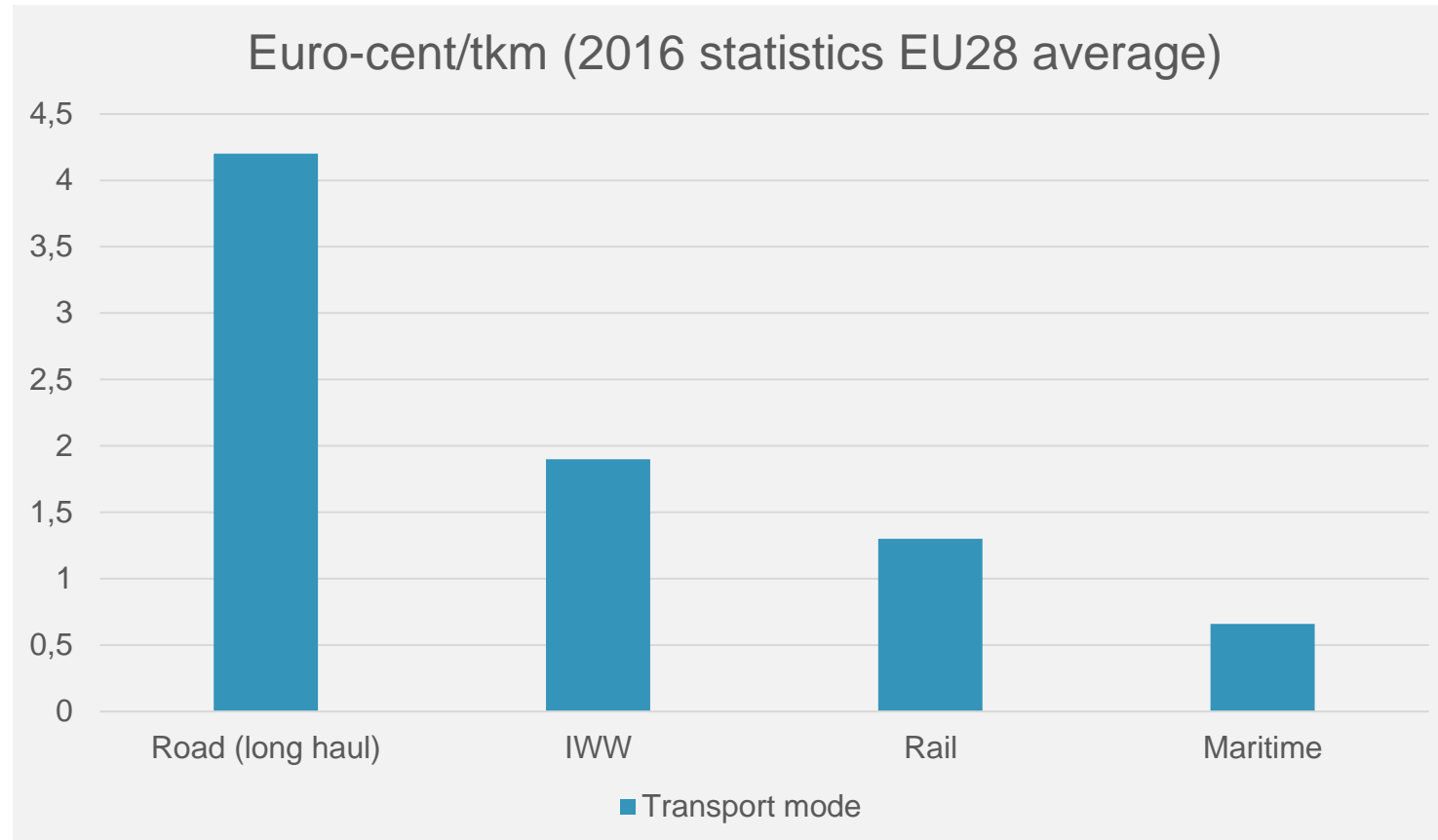
External costs: quantified in monetary terms



H. V.-W. L. Van-Essen, A. Svhroten, D. Sutter, V. Bieler, S. Maffi, ... and K. El-Beyrouy, “Handbook on the external costs of transport,” European Commission, Brussels, 2019.



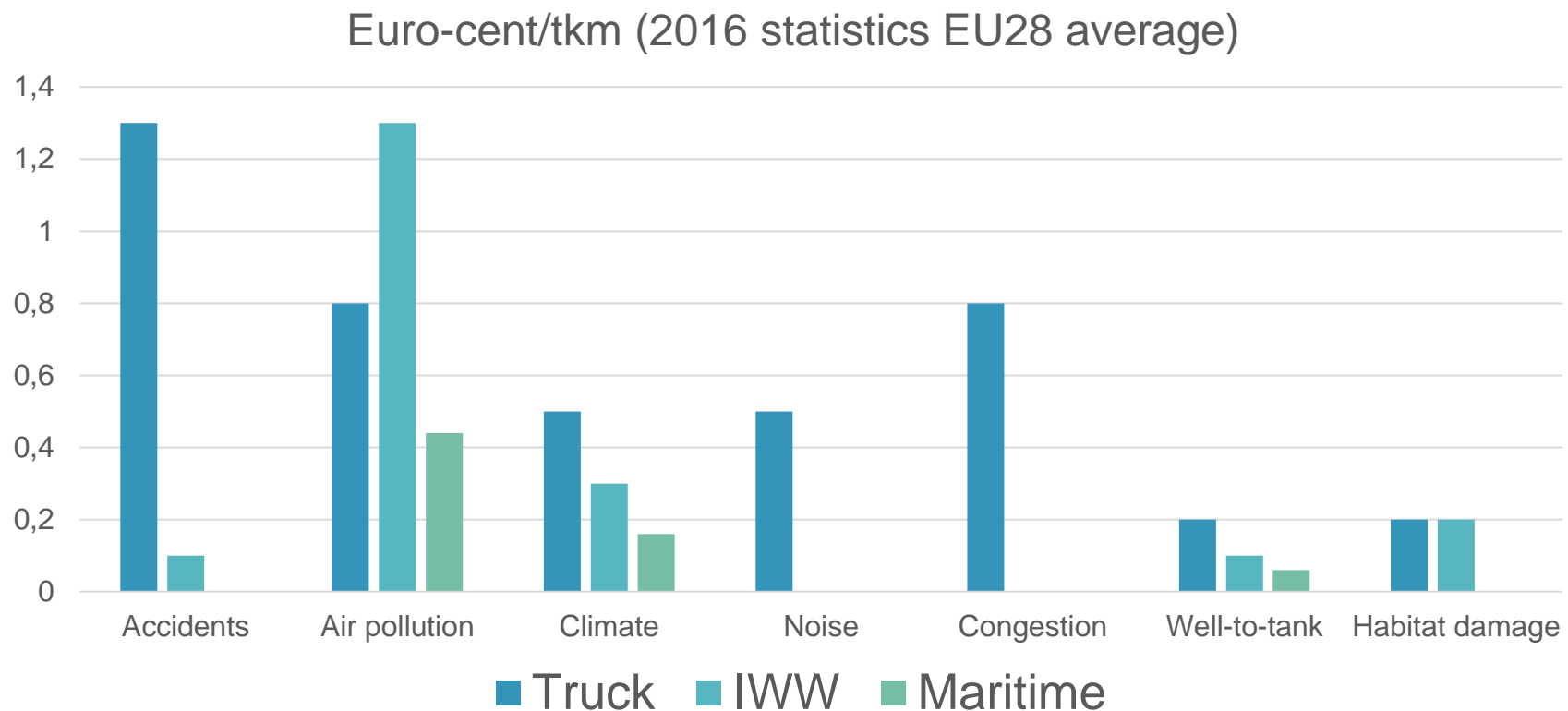
External costs (societal costs from transport)



H. V.-W. L. Van-Essen, A. Svhroten, D. Sutter, V. Bieler, S. Maffi, ... and K. El-Beyrouy, "Handbook on the external costs of transport," European Commission, Brussels, 2019.



External costs by category

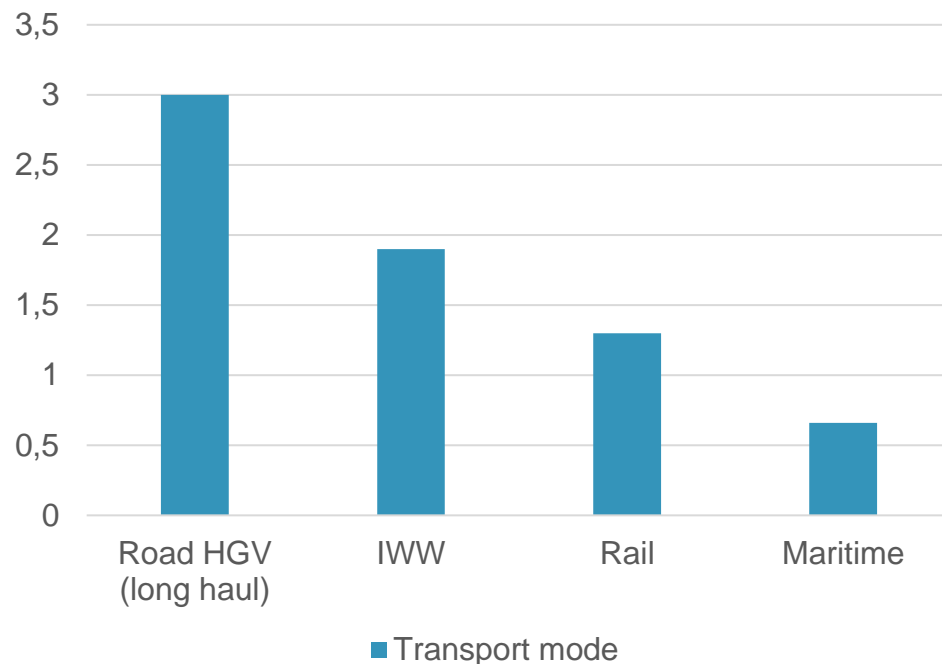


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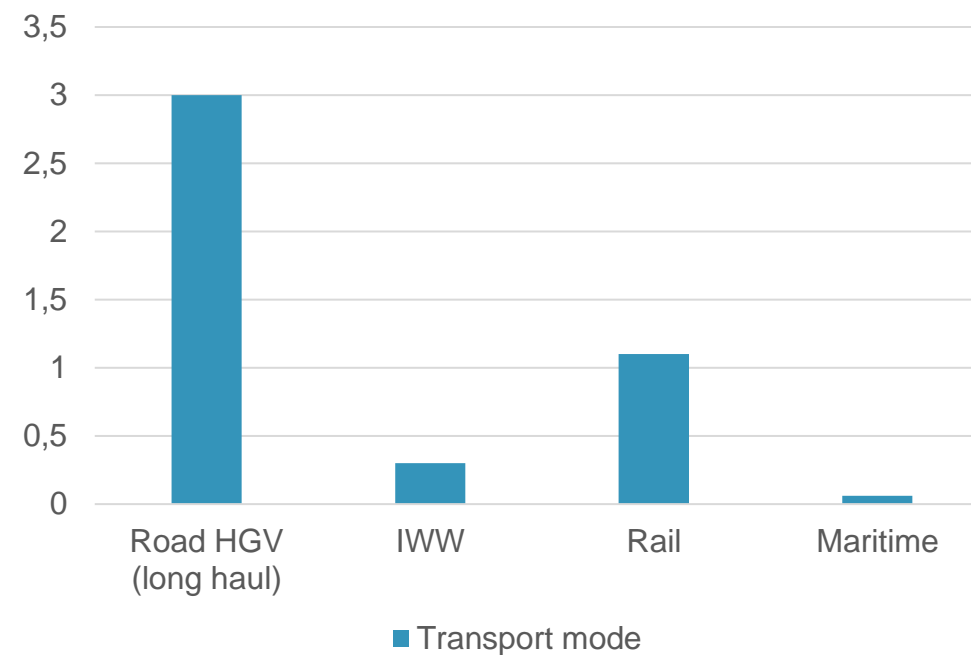
External cost impact by zero-emission



Zero emission Trucks vs conventional
IWW, Rail and Maritime



If all modes are zero emission



Conclusions



- Zero-emission transport is important
- **Importance of modal shift is not reduced by emission free trucks!**
- Competitiveness of waterborne transport must be improved
 - Autonomous ships could be the answer 😊





Thank you

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