

The Global Warming Reduction Potential of Night Trains

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Back-on-Track.eu

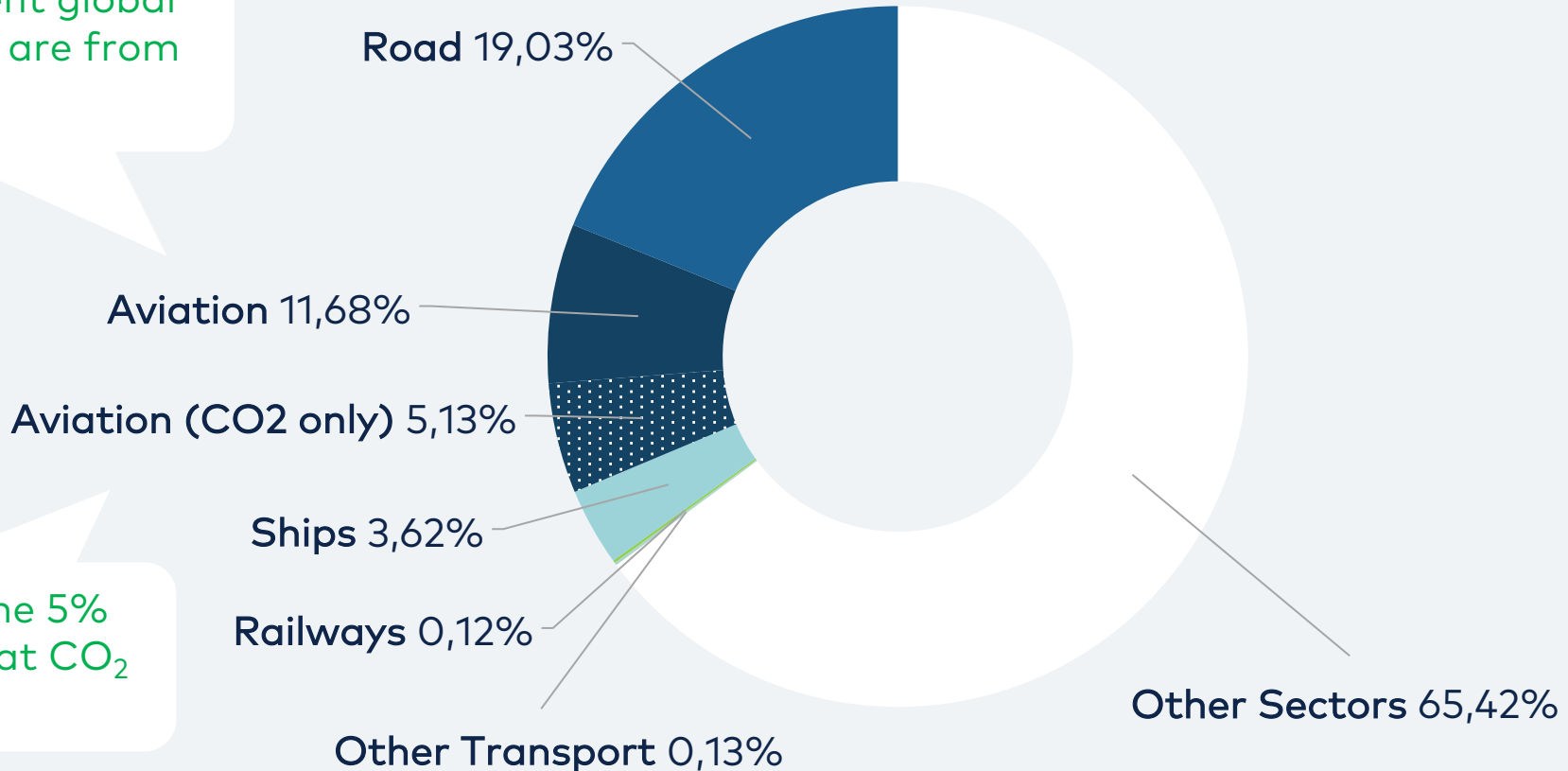
European network to promote
cross-border night trains

Transport share of EU Greenhouse gas emissions 2019

CO₂e incl. non-CO₂ Radiative Forcing (GWP*), incl. UK

12 % of the EU's current global warming contribution are from aviation

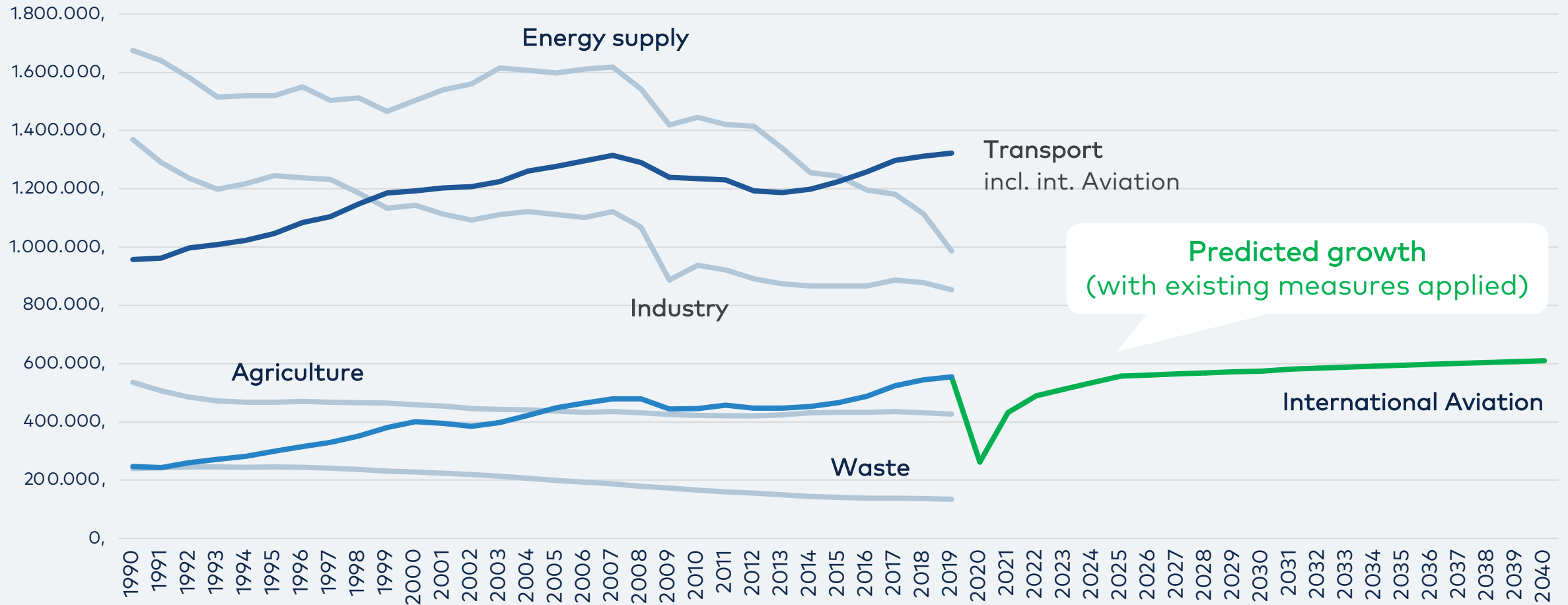
... far more than the 5% when you just look at CO₂ emissions.



Source: Back-on-Track.eu | 9/2022 | Based on EEA, Lee et al.

Development of EU Greenhouse gas emissions 1990-2019

in ktCO₂e incl. non-CO₂ Radiative Forcing (GWP*), incl. UK

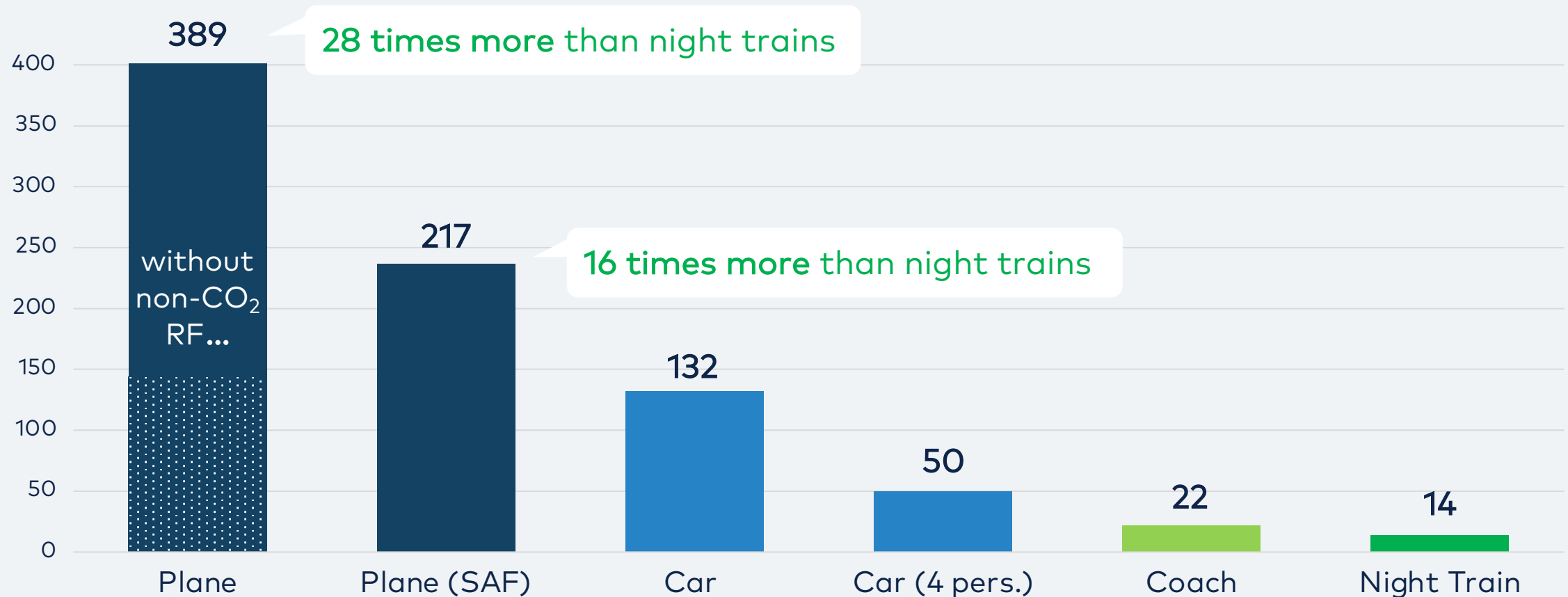


Source: Back-on-Track.eu | 9/2022 | Based on EEA, Lee et al.

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Greenhouse gas emissions per km by mode of transport

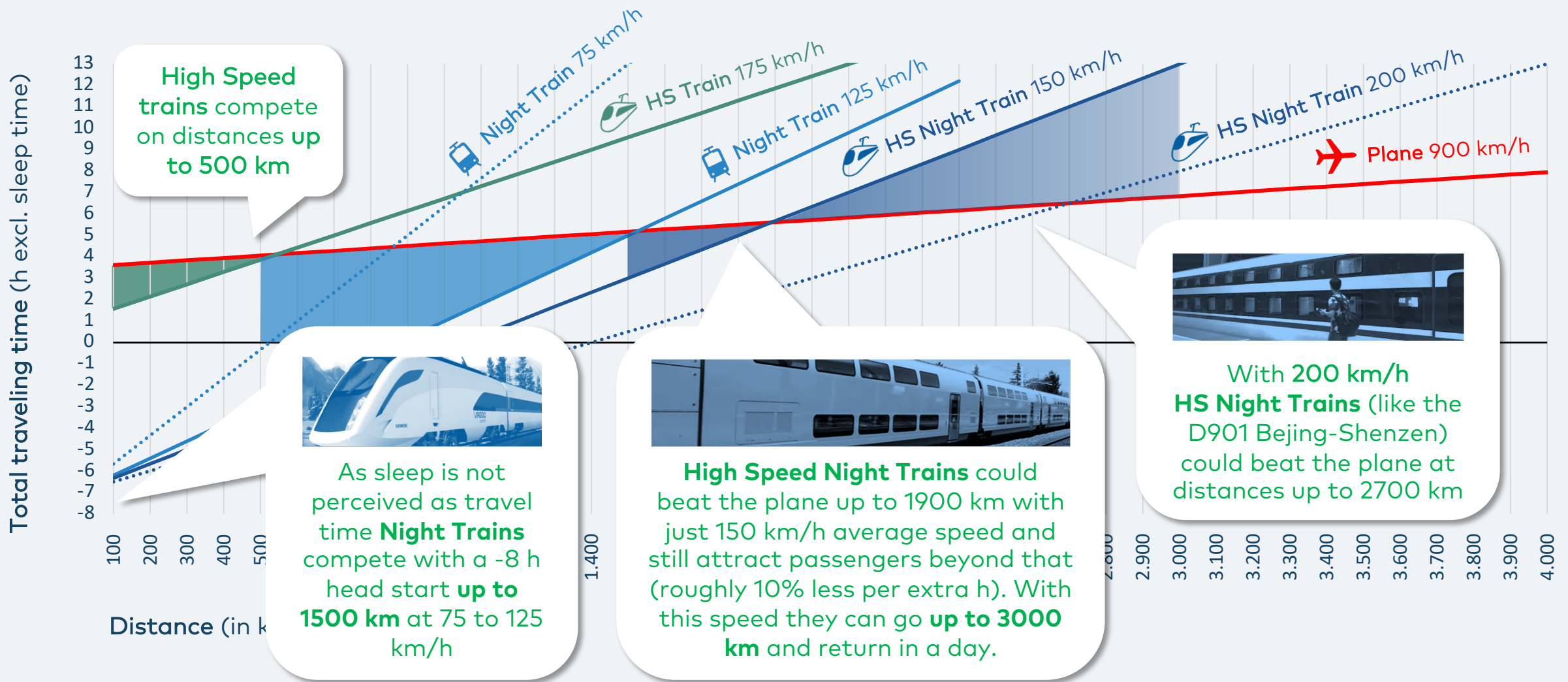
gCO₂e per passenger, well-to-wheel, incl. non-CO₂ radiative forcing (GWP*)



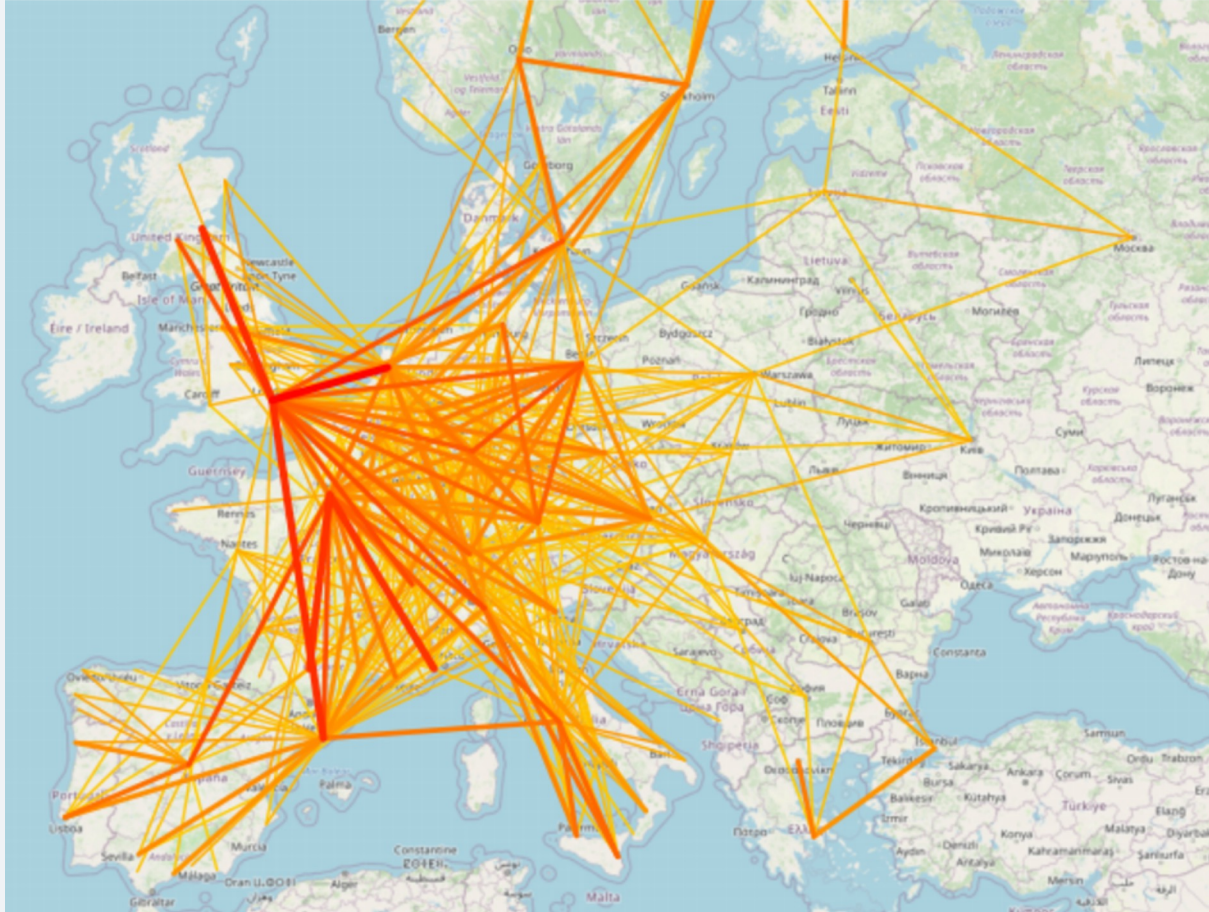
Source: Back-on-Track.eu | 8/2022 | SAF = Sustainable Aviation Fuel | Based on IEA (2019), Sausen (SAF)

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Night trains go further



Replaceable connections 500-1500 km:



Out of 1.1 B EU aviation passengers (in 2019)

- **362 M passengers on replaceable routes (501 to 1500km)**

Source: [Oui au train de nuit, 2021](#)

Replaceable connections 500-3000 km:



Out of 1.1 B EU aviation passengers (in 2019)

- 362 M passengers on replaceable routes (501 to 1500km)
- 213 M passengers on replaceable routes (1500 to 3000km)

For 50% of 1.1 B EU aviation passengers night trains could provide an alternative.

Source: [Oui au train de nuit, 2021](#)

How many would use the alternative?

69%

So, if night trains were offered to 50% of all EU aviation and we can assume **69% would use them** (as long as prices are reasonable and travel times competitive as in the 500-1500 km segment) ...

of Europeans are **very or fairly** willing to use night trains.

25%

... and if some would use night trains even if travel times (excl. sleep) exceed those of a plane trip so we may assume 11,4% less potential per 1 extra hour (at 150 km/h avg. speed) so we may still assume **53% average preference in the 1500-3000 km segment** ...

of Europeans are **very** willing to use night trains.

... then **32% of all EU aviation passengers** would shift to night trains.

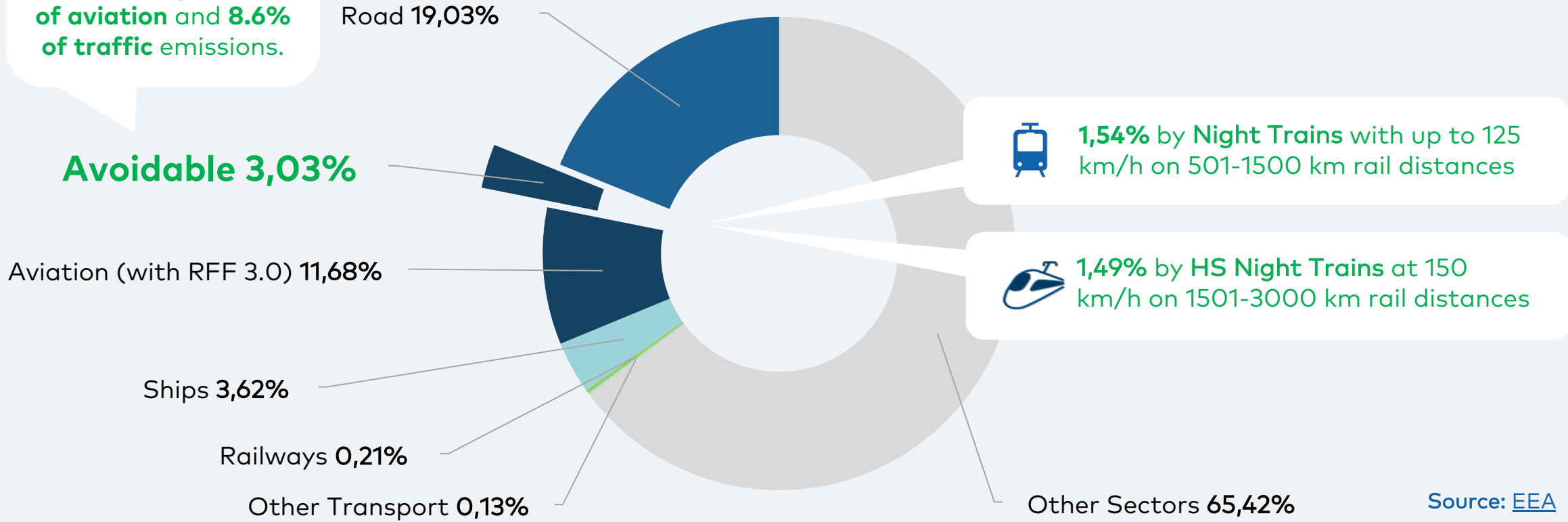
Source: [YouGov](#)

The GHG avoiding potential of night trains

EU CO₂e* Emissions 2019

incl. a Radiative Forcing Factor (RFF) of non-CO₂ emissions (3.0 times the CO₂ value using GWP method)

If, as estimated, 32% of EU aviation passengers would shift, this equals **26% of aviation** and **8.6% of traffic emissions**.



Source: [EEA](#)

#3percentOverNight

Thank you. And let's share the good news!

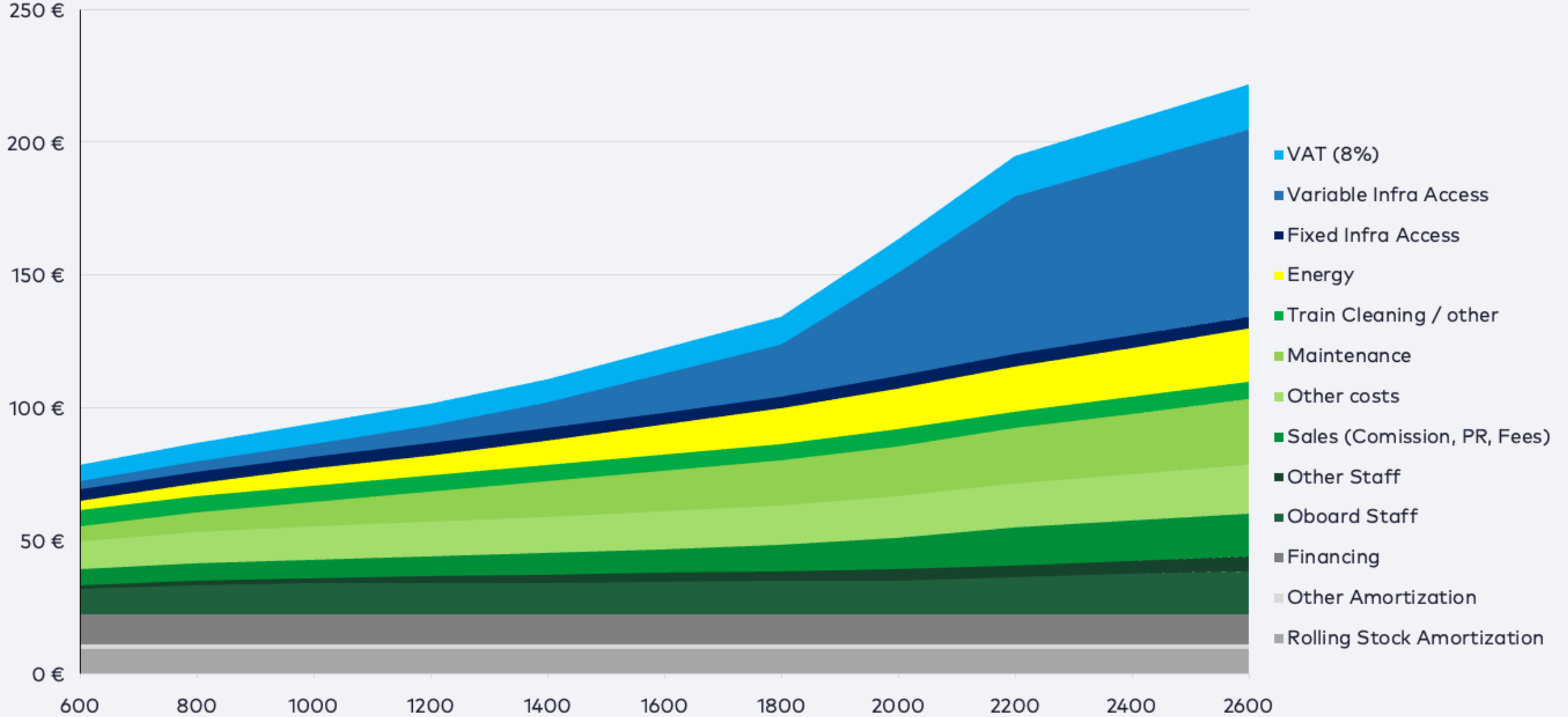
What needs to be done?

Almost cost-neutral when confined to night trains, but important to serve higher travel distances and thus increase market share

Make night trains more attractive:

- Define night trains as a market segment
- **Reduce their track access charges** to direct cost
- Offer long-term timetable slots
- Help financing additional rolling stock (equal EIB conditions)
- Tax international rail no higher than international aviation
- Make buying tickets easier and safer
- **Charge aviation according to its environmental cost.**

Night Train Average Ticket Price Components by distance in km



Source: Back-on-Track.eu | 6/2023

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What needs to be done?

Invest in new rolling stock:



250 M additional passengers per year need **2066** new **night trains** with 10 coaches and 414 berths each that may go everywhere with at least 200 km/h (approx. 67 B €* order volume)



112 M additional passengers per year need **488** new **HS night trains** with 788 berths each in sleeper and couchette coaches that may go almost everywhere with up to 270 km/h (approx. 30 B €* order volume)

2554 new night trains

97 B € order volume*

@ 85 € EU carbon permit price
amortised within **8 years.**

* Estimate based on published order volumes:

[400 M € for 140 coaches](#) and [75 M for 15 multi-system engines](#) and [335 M € for 12 trainsets](#)

About



Back-on-Track.eu

European network to promote
cross-border night trains

Back-on-Track is a European network of local initiatives in support of cross-border passenger train services and night trains in particular.

With its more than 400 members, Back-on-Track organises actions, conferences, publishes studies and advises policy makers and the public on night train issues.

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