Back-on-Track.eu

European network to support cross-border night trains

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To whom it may concern

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as suggested by our Danish group, we had a quick look at the claim of Norways Jernbanedirektoratet in regard of the climate impact of a night train from Oslo to Copenhagen, that

Gevinsten for samfunnet av reduserte utslipp er imidlertid ikke på mer enn 2-3 millioner kroner *Translated in English: The benefit to society of reduced emissions is however not more than 2-3 million*

Within the context this is compared to the yearly need for subsidies, so we must assume this applies to the social benefit within a year and refers to Norwegian Crowns (NOK).

The planned train would consist in the maximum configuration of 3 sleeping cars 3 couchette cars and 4 seating cars, that might come from used rolling stock, according to

Jernbanedirektoratet: Vurdering av nattog Oslo-København
https://kommunikasjon.ntb.no/data/attachments/00770/7b999f41-d014-4a85-be51-f2606efc2e9d.pdf

So, for the time being we can only assume a standard configuration of

- 36 berths in the sleeping car (for maximum 108 passengers per train)
- 60 berths in the couchette car (for a maximum 180 passengers per train)
- 80 seats in the seating car (for a maximum 320 passengers per train).

Of this total capacity of 608 passengers per day and direction we should withdraw

- 5% less capacity of rolling stock for maintenance reasons,
- 20% if we assume an average booking rate of 80%, which is more than the ordinary occupancy rate of long distance trains (which have to follow a schedule), not more than the average airline booking rate, and less than the current booking rate of ÖBB night jets (according to our own research),

resulting in

- 59918 sold berths in sleeping cars (per year, both directions),
- 99864 sold berths in couchette cars (per year, both directions) and
- 177536 sold seats in seating cars (per year, both directions).

Another 20% car capacity should be withdrawn of the number of sold berths in sleeping cars and couchette cars to get the passenger numbers as – when using conventional rolling stock - for privacy reasons passengers may book empty berths to have a complete compartment for themselves. (This would not be the necessary if modern double-decker rolling stock with a sufficient number of cabin berths were purchased.) This results in an assumption of potentially offering the train to

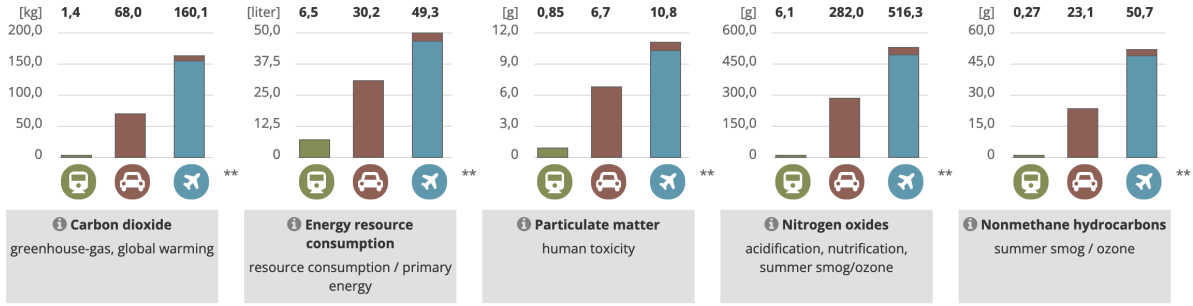
- 47 934 passengers in sleeping cars (per year, both directions),
- 79 891 passengers in couchette cars (per year, both directions),
- 177 536 passengers in seating cars (per year, both directions) and
- a total of **305 361** passengers per year.

We would further assume that the examined night train service would currently be no alternative for coach travellers, could to a small extent attract car passengers but mainly served as an alternative to flight passengers, with a ratio of

- 80% shifting from plane to rail (244 289 passengers per year) and
- 20% shifting from car to rail (61 072 passengers per year).

To examine the potential effect on the climate we used the EcoPassenger Tool (http://www.ecopassenger.org) which is based on the well-established TREMOD model. This model allows to also examine the climate effect (the radiative forcing effect for 100 years, to be more precise) of non-CO2 emissions (particularly water vapour) in aviation, based on flight distance data, and compares it with the emissions from trains based on the energy mix used on the actual route. We did choose a high capacity for the train, to reflect that the calculation for train emissions is based on the current train connection, which consists of four trains, mainly regional trains, which typically have an average occupancy rate of less than 50%, which would not reflect our assumptions for the night train service. For the car emissions we took the standard settings of a mid-sized Euro-4 diesel car with the EU average occupancy rate of 1.5 passengers per car.

EcoPassenger Result for the distance Oslo S – Copenhagen H:



** incl. feeder by railway services resp. car

According to EcoPassenger we may assume that the train could save

- 158,7 kg CO2e per passenger shifting from plane to rail
- 66,6 kg CO2e per passenger shifting from car to rail

Thus we may assume to save each year

- 38 769 t CO2e saved by 244 289 passengers shifting from plane to rail
- 4 067 t CO2e saved by 61 072 passengers shifting from car to rail
- a total of **42 836** t CO2e per year.

To estimate the value of saved CO2 emissions we looked at the current price for EU carbon permits, which is currently 89.80 EUR (Source: https://tradingeconomics.com).

As we don’t know exactly when Jernbanedirektoratet estimated the social benefit we may assume 85.00 EUR which is roughly the average of the last months and equals roughly 823.00 NOK (Source: https://www.fxexchangerate.com/). If we multiply 42 836 t CO2e with 823.00 NOK we get 35,254,028 NOK.

So we would estimate the value of saved CO2 emissions alone - measured in carbon permit costs – to be roughly 35 Million NOK per year.

This value does not yet include the social value of saved energy resource consumption, saved intoxication by particulate matter, saved acidification and nutrification by nitrogen oxides saved summer smog by nonmethane hydrogen carbons and saved noise pollution.

We conclude that there is a considerable contrast to the 2-3 Million NOK social benefit estimated by Jernbanedirektoratet, that needs an explanation and further examination.

With best regards,

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Vice Chairman