How can Evacuated Tube Transport (ETT) help in meeting targets of Kyoto protocol

Dutch plans foresee the building of 20 GW offshore wind parks by year 2036, investing 60 B€ of private and 15 to 25 B€ from the government contribution [1] and a step in this direction is made with the recently published commitment to build 4.45 GW at sea by year 2023 [2], see explained in the figure below. In year 2036 as a result, a 61 TWh/year of sustainable energy can be produced and 23 Mton of CO_2 emissions can be eliminated (35 MTon mentioned in [1] is an outdated figure, as CO_2 emission is 0.37 kg per kWh of electricity for the Netherlands [3]). Furthermore, 6 GW of wind parks are planned onshore in year 2020 [2].

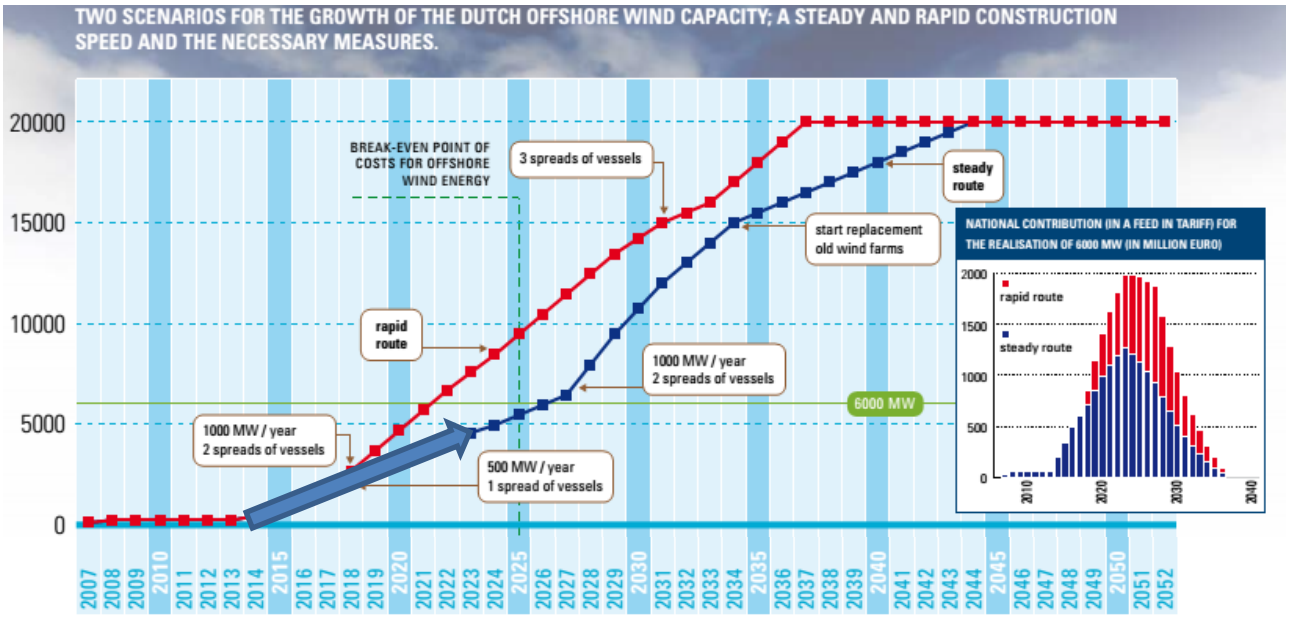

Figure. Two scenarios for the growth of the Dutch offshore wind (vertical axis: generation capacity in MW, horizontal axis: years [1]; the end of the blue arrow indicates the commitment to build 4.45 GW in year 2023 [2])

To compare, a national ETT network [4] needs an investment of 10-13 B€ [5], it can be completed in year 2025 and after 10 years of operation, by year 2035 it could expand and carry 90% of passengers and cargo in the Netherlands [4.1]. Currently transport in NL uses 500 PJ/year of energy (or 140 TWh/year), for obvious reasons it will only be more in year 2035 if business will go as usual. ETT uses less than 2% of energy of the conventional transport. So in the year 2035, 123 TWh/year could be saved by ETT system. Also, well over 70 Mtons/year (40% of the country's total) of CO_2 emission could be eliminated (CO_2 emission for cars is 0.4-0.8 kg/kWh). Conventional transport (road, plane, rail, ship) will adapt to ETT and as a result of this process, additional investment savings will follow.

In conclusion, an introduction of national ETT network requires less than ¼ of the investment in offshore wind parks, ETT allows saving 2 times more energy per year than will be generated with the wind parks and eliminates 3 times as much of CO_2 emissions. Moreover, ETT network will be onshore and will have less operation and maintenance costs. Besides all that, ETT network transports people and goods and provides many other benefits [5] (new degree in freedom of mobility; increased value of land in remote areas; travel time savings with no waiting or congestion; no noise, pollutions or vibrations; not affected by weather or temperature; low impact on the environment and wildlife; reduced fuel and oil dependence, etc.), so one can ask himself: what wind parks offer besides generating sustainable electricity? We thus kindly request CPB and the Dutch government to make an independent Social Cost Benefit Analysis (MKBA) and comparison of the two projects and to publish it.

References

[1] http://www.we-at-sea.org/wp-content/uploads/2013/01/brochoffshorewe_en.pdf
[2] http://www.rijksoverheid.nl/onderwerpen/duurzame-energie/nieuws/2013/12/20/kabinet-wijst-nieuwe-gebieden-aan-voor-windparken-op-zee.html
[3] Netherlands Energy Efficiency report ABB (January 2011):
http://www05.abb.com/global/scot/scot316.nsf/veritydisplay/d64375a1f48d514ac12578dc002e00b3/$file/netherlands
[4] http://www.et3.nl/ (4.1: the link to: Generic proposal for ET3 high speed ground transportation system)
[5] http://quantumtrain.com/et3/