ENVIRONMENTAL FOOTPRINT OF GAS LOGISTICS: LNG vs. pipeline

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The aim of the study is to estimate emissions of CO$_2$, NO$_x$, and CH$_4$ caused by processing and transportation of a unit of dry gas in either a gaseous form via a pipeline, or as LNG with ships from the Norwegian shelf to relevant markets.

The emission intensities of the pipeline and LNG chains are estimated through adding up emission intensities from extraction, processing, and transportation segments.
The case study

Pipeline chains:

2. Åsgard – Åsgard – Kårstø – Europipe II – Dornum
5. Ormen Lange – Nyhamna – Langeled – Easington
10. Sleipner Vest – Zeepipe – Zeebrugge

LNG chains:

- Snøhvit field – Melkøya – Cove Point, US (4072 nautical miles)
  – Iberdrola, Spain (2019 nautical miles)
  – Zeebrugge, Belgium (1375 nautical miles)

Source: NPD, 2016
103,059 kg is attributed to the power generation for the transportation to Kårstø. In total, out of 175,986 kg of CO$_2$ emitted per a Sm3 o.e. of gas produced and transported from the Norne to Germany, **120,975 kg CO$_2$ is due to the upstream and export transportation.**
Summary

• The logistical system connecting the Norwegian Shelf with Europe has a significant effect on the Norwegian total climate gas emissions.

• There is a great variety in the environmental footprints of gas logistics chains on the Norwegian Shelf.

• The existing pipeline system gives Norway an advantage in the “green” competition in supplying Europe with gas.