



FACT SHEET: COMPARING U.S. LNG AND COAL GREENHOUSE GAS EMISSIONS

The Center for Liquefied Natural Gas' "LNG and Coal Life Cycle Assessment of Greenhouse Gas Emissions" report quantifies the environmental benefits of replacing coal with U.S. exported liquefied natural gas (LNG) in five key international markets.

The study measures the emissions from every part of the LNG process – from wellhead, to liquefaction plant, during export by tanker, at the LNG receiving terminal, and as end-use for power generation – and compares them with a similarly comprehensive assessment of the entire coal life-cycle.

This lifecycle analysis found that in every scenario considered, exporting U.S.-produced natural gas to Germany, Japan, South Korea, China, or India creates significantly less emissions than continued use of coal.

Highlights from the Pace Global-authored report include:

- **New “efficient” coal-fired plants will still emit more GHGs than the High case for LNG:** Compared to the most intensive (High) GHG Case for LNG, an efficient new build coal-fired power plant will emit 92% more emissions on a life-cycle basis.
- **New “efficient” coal-fired plants produce more than double the GHG emissions than the Low LNG case:** In the five export markets studied, an “efficient” new-build coal fired power plant will, on average, emit 106% more emissions over the entire life cycle than the least intensive (Low) LNG case.
- **Emissions from existing coal fired plants are significantly greater than the High GHG case for LNG:** Emissions from the average existing coal-fired power plants in the five LNG export markets studied were found to range between 139% and 148% greater than the High GHG case for LNG.
- **Emissions from existing coal fired plants are highest in comparison to the Low GHG LNG case:** Compared to the Low LNG case, existing coal technology was found to produce anywhere between 117% and 194% more GHG emissions over its entire life cycle.
- **In both the LNG and coal LCA the majority of emissions occurred during combustion:** A substantial majority of emissions for both coal and LNG occur during the power generation process. For LNG, 67%-74% (representing the high and low case for LNG) occur during combustion, while for coal, the figure ranges between 79% (existing) and 77% (efficient new build).
- **Combustion emissions were greater for all coal cases than for LNG:** Coal emissions during combustion were greater in all cases than that of LNG. Emissions from raw materials acquisition were also generally higher for coal than for LNG.

Methodology: The report assumes that the natural gas in the LNG scenario originates at the Haynesville Shale in Texas, is transported to a U.S. Gulf Coast LNG export terminal for liquefaction, and then shipped to one of the five markets, where it undergoes regasification and is transported to a local power plant for gas-fired electric generation.

Due to the sheer volume of possible scenarios for LNG, the study employs High and Low GHG cases to provide an indication of the range of reasonable estimates. Similarly, the coal lifecycle analysis uses existing installed and efficient new build technologies to benchmark the high-low range for GHG emissions.

Coal lifecycle emissions represent the country or regional average coal supply pathway and combustion characteristics, where that information is available. As the majority of coal consumed in Germany, China, and India is produced domestically, mining emissions were estimated assuming local conditions for both mining operations and transport. Coal consumed in Japan and South Korea is almost entirely imported, typically from Australia.