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EIS Case Studies on GHG Emissions and Their Social Costs

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Office of Energy Projects



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FERC/EIS-0330F

January 2023

Ohio Valley Connector Expansion Project

FINAL ENVIRONMENTAL IMPACT STATEMENT

Equitrans, LP

Docket No. CP22-44-000

Abstract:

The staff of the Federal Energy Regulatory Commission (Commission) prepared a final environmental impact statement (EIS) for the Ohio Valley Connector Expansion Project (Project) proposed by Equitrans, LP (Equitrans) in Pennsylvania, West Virginia, and Ohio. The Project would involve the acquisition of the existing non-jurisdictional Cygrymus Compressor Station in Greene County, Pennsylvania and the addition of compression, as well as additional compression at two existing compressor stations: the Corona Compressor Station in Wetzel County, West Virginia and the Plasma Compressor Station in Monroe County, Ohio. Equitrans would also construct approximately 5.5 miles of pipeline and ancillary facilities in different locations related to the compressor stations, use temporary access roads and staging areas to support construction activities, and establish new permanent access roads to support operation of the new facilities. The Project would provide approximately 350,000 dekatherms per day to mid-continent and the Gulf Coast markets. The U.S. Army Corps of Engineers, Huntington District, participated as a cooperating agency in the preparation of the EIS. Commission staff concludes that construction and operation of the Project would not result in significant adverse impacts, with the exception of climate change impacts, which are not characterized in the EIS as significant or insignificant.

Contact:

Office of External Affairs, (866) 208-FERC
Estimate of Staff's Time Spent in the Preparation of this EIS: \$ 39,904.94
There were no direct contract or travel costs.
Cooperating Agency cost (U.S. Army Corps of Engineers) \$400.00

Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street NE, Washington, DC 20426



US Army Corps of Engineers

Proposed Action:

Modification of 3 existing natural gas compressor stations and construction of 5.5 miles of new gas pipeline in PA, WV, and OH to provide 350 million cubic feet of natural gas to mid-continent and Gulf Coast markets for 10-year contract period

Subject to FERC approval

Ohio Valley Connector Expansion Project



GHG Analysis:

- Construction Emissions – 10,030 metric tons CO₂e over 2-year period
- Operation Direct Emissions – 263,976 mt CO₂e/year, mostly from compressor stations and mostly CO₂
- Downstream Emissions - “cannot estimate the nature or location of end use of the Project’s subscribed capacity... downstream emissions are not reasonably foreseeable” but total estimated to be up to 6.386 million mt CO₂e

Ohio Valley Connector Expansion Project



- Upstream Emissions - “environmental effects resulting from natural gas production are likely neither caused by a proposed project nor are they reasonably foreseeable consequences of [FERC’s] approval of a project” and ” To date, the Commission has not found upstream emissions to be an effect of any proposed project”
- Context of Annual Direct Operation GHG Emissions
 - 0.005% of national 2020 emissions
 - 0.05% of PA emissions, 0.09% of WV emissions, 0.04% of OH emissions (all 2019)
 - 0.05% of PA 2025 CO₂e emissions goal, 0.18% of PA 2050 CO₂e emissions goal

Ohio Valley Connector Expansion Project



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Social Cost of GHG Emissions:

- Calculated at recommendation of EPA
- For construction and 10 years of operation
- Determined separately for CO₂, CH₄, N₂O
- Totals in 2020\$:
 - 5% discount rate - \$36,037,716
 - 3% discount rate - \$130,301,895
 - 2.5% discount rate - \$195,249,069

On Significance:

“This EIS is not characterizing the Project’s GHG emissions as significant or insignificant because the Commission is conducting a generic proceeding to determine whether and how the Commission will conduct significance determinations going forward.”



U.S. Department of Energy



ALASKA LNG PROJECT

Final Supplemental Environmental Impact Statement

January 2023



Volume 1 of 2
Chapters 1 through 9

DOE/EIS-0512-S1



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- DOE action is authorization for export of natural gas to non-free trade agreement countries
- DOE was cooperating agency on 2020 FERC FEIS
- SEIS prepared in response to Sierra Club request for rehearing and EOs 13990, 14008
- SEIS evaluates upstream impacts from natural gas production and life-cycle GHG emissions from export of that gas

Alaska LNG Project



- Export up to 2.55 billion cubic feet/day of LNG over 30+ years from North Slope
- Gas treatment plant, 800-mile pipeline, compressor stations, LNG liquefaction facility
- Gas produced by North Slope oil wells currently reinjected to maintain well pressure

SEIS Alternatives



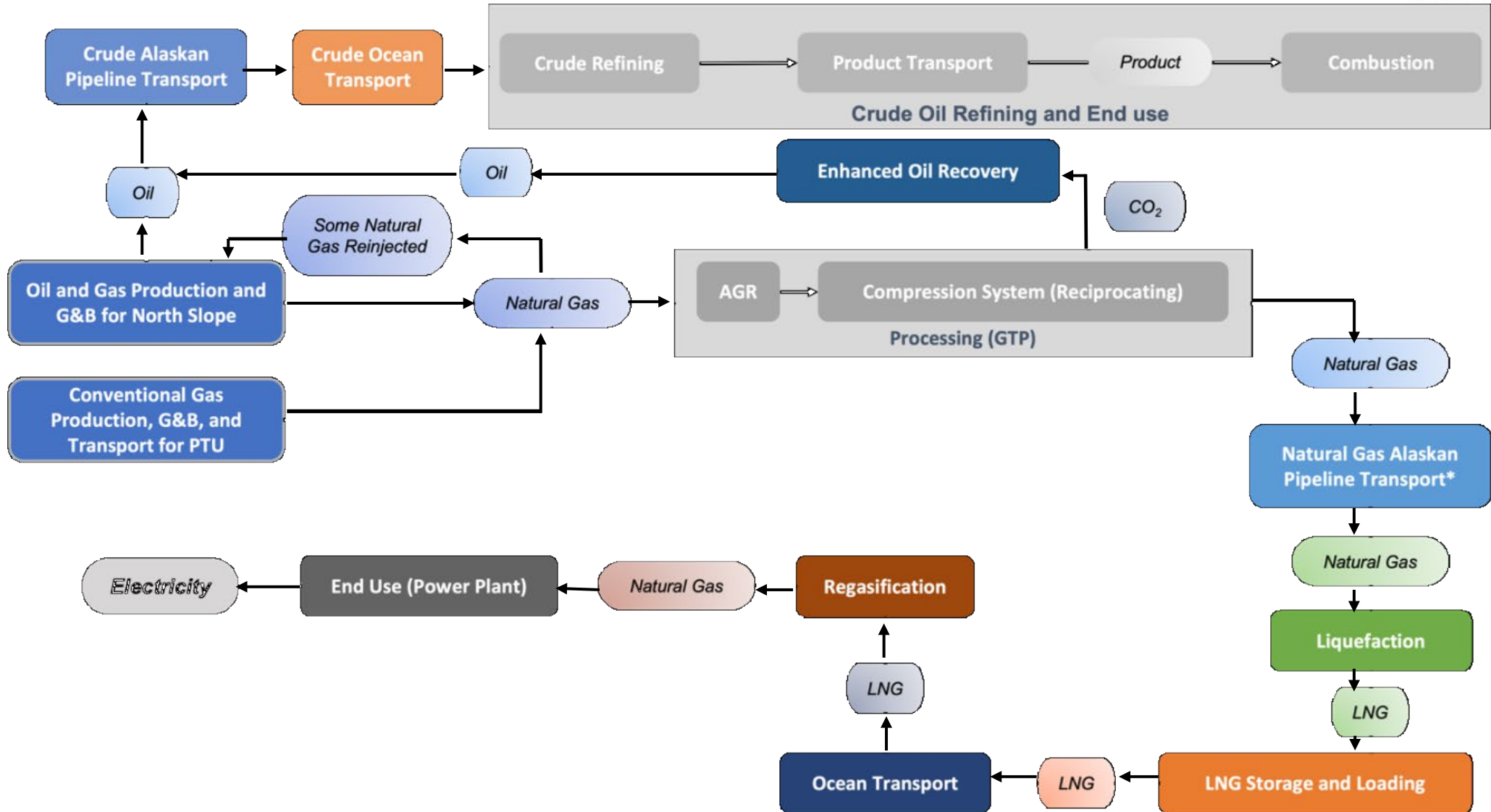
- SEIS assumes no alternative project would access North Slope gas reserves
- No Action Alternative 1 – “Business as Usual” – no Alaska LNG Project and LNG would be produced elsewhere to meet foreign market demand
- No Action Alternative 2 – “Non-Equivalent Energy Baseline – No Alaska LNG Project and no replacement gas production
- Action Alternative:
 - Scenario 1 – CO₂ produced by gas treatment plant stored in reservoir
 - Scenario 2 – CO₂ produced by GTP used for enhanced oil recovery

Key Assumptions



- LNG used to generate electricity in combined cycle gas plant, analyzed with and without CCS
- 4 destination countries – Japan, South Korea, China, India
- Steady oil and gas production over 33-year modeling period
- Functional unit in life cycle analysis (LCA) is 1 MWh of electricity generated in LNG receiving country
- Did not evaluate use of LNG for non-power applications (probably higher emissions)

LCA Process Flow Diagram – Proposed Action with Enhanced Oil Recovery

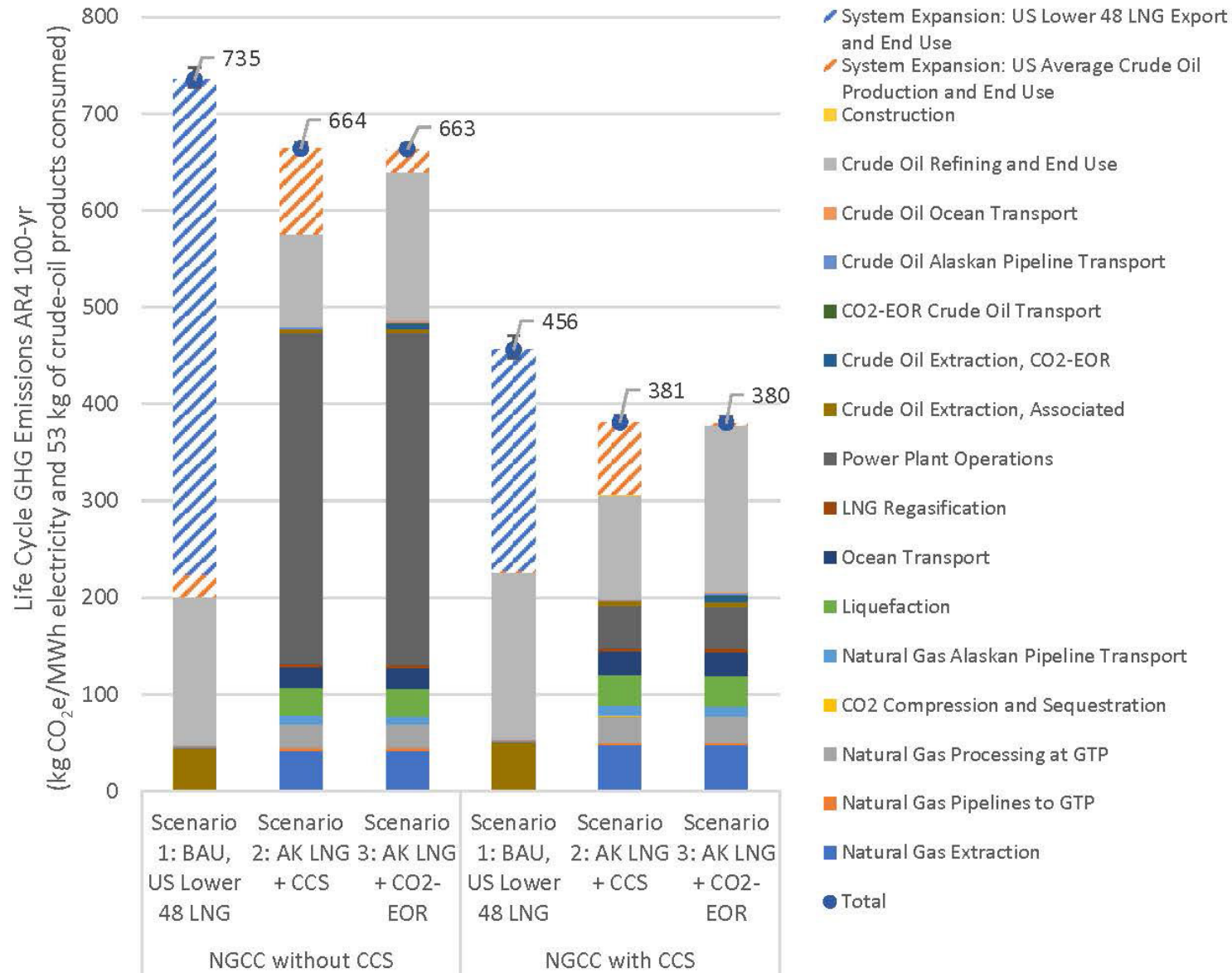


LCA Functional Units – Export to China

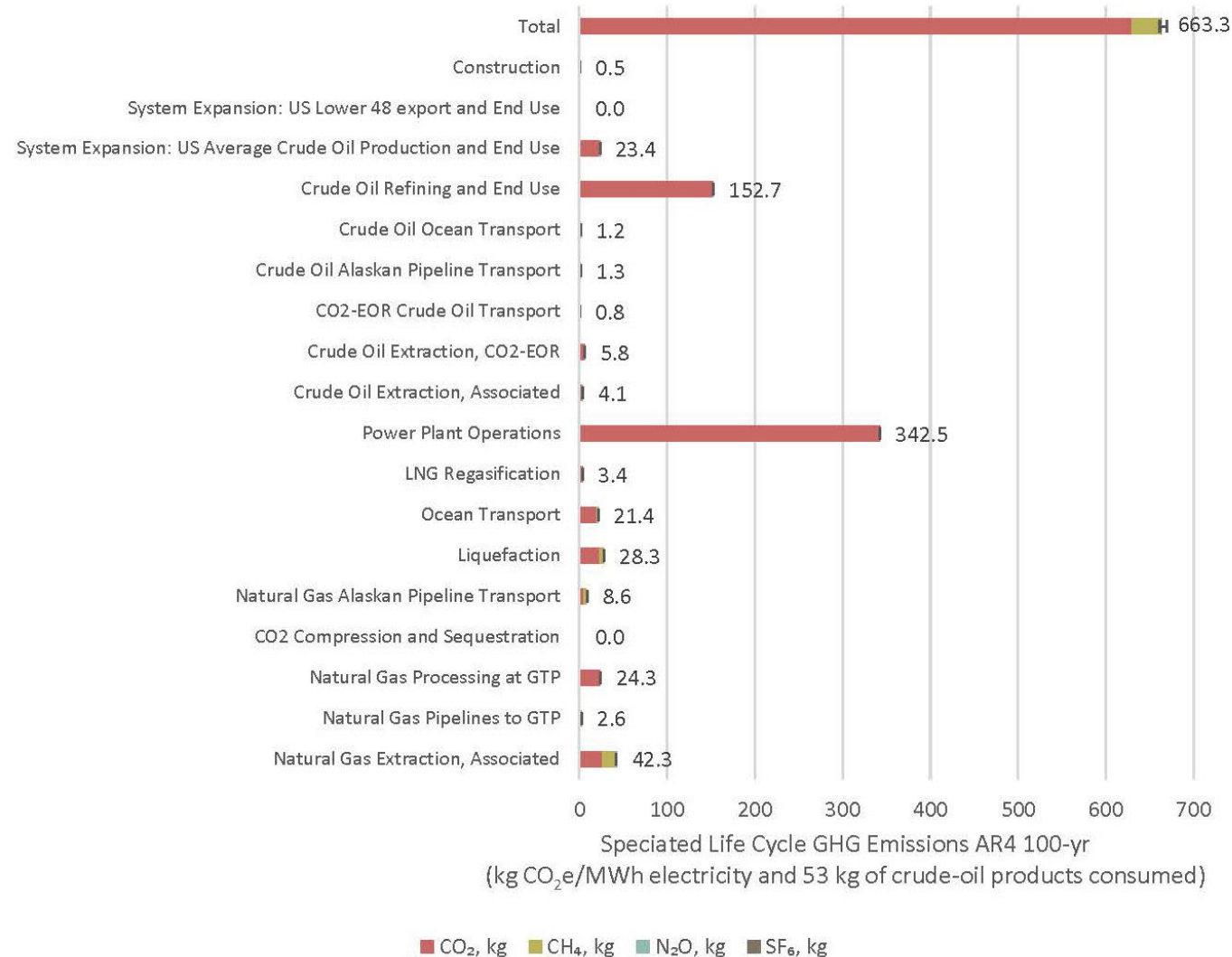


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LCA Results – kg CO₂e/MWh electricity, NGCC w/o CCS, China



Alaska LNG Life Cycle Emissions



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| | No Action, Business as Usual Scenario* | Proposed Action, CO ₂ storage | Proposed Action, CO ₂ used for EOR |
|---|---|--|---|
| Oil Production, MMbbl | 1,402 (Total) 1,356 (North Slope) 47 (Lower 48) | 1,402 (Total) 849 (North Slope) 554 (Lower 48) | 1,402 (Total) 1,360 (North Slope) 42 (Lower 48) |
| LNG Export, Tcf | 27.83 (Lower 48) | 27.83 (North Slope) | 27.83 (North Slope) |
| Cumulative LC GHG Emissions, MMmt CO ₂ e, no CCS | 3,011 to 3,023 | 2,737 to 2,797 | 2,737 to 2,797 |
| Cumulative LC GHG Emissions, MMmt CO ₂ e, with CCS | 1,714 to 1,728 | 1,443 to 1,519 | 1,443 to 1,519 |

* Assumes Alaska LNG would be replaced by Lower 48 LNG

Alaska LNG Life Cycle Emissions - 2



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| | No Action, Non-Equivalent Energy Baseline* | Proposed Action, CO ₂ storage | Proposed Action, CO ₂ used for EOR |
|---|--|--|---|
| Oil Production, MMbbl | 1,356 (North Slope) | 849 (North Slope) | 1,360 (North Slope) |
| LNG Export, Tcf | 0 | 27.83 (North Slope) | 27.83 (North Slope) |
| Cumulative LC GHG Emissions, MMmt CO ₂ e, no CCS | 853 | 2,440 to 2,501 | 2,714 to 2,775 |
| Cumulative LC GHG Emissions, MMmt CO ₂ e, with CCS | 853 | 1,146 to 1,223 | 1,420 to 1,496 |

* Assumes Alaska LNG would be not replaced by other LNG

Alaska LNG – Social Cost* of LC GHG Emissions By Country



| | No Action, Business as Usual, no CCS | No Action, Business as Usual, with CCS | Proposed Action, CO ₂ Storage, no CCS | Proposed Action, CO ₂ Storage, with CCS | Proposed Action, EOR, no CCS | Proposed Action, EOR, with CCS |
|-------------|--------------------------------------|--|--|--|------------------------------|--------------------------------|
| Japan | 395.9 | 229.7 | 358.7 | 192.9 | 358.6 | 192.7 |
| South Korea | 397.2 | 231.3 | 359.8 | 194.3 | 359.7 | 194.2 |
| China | 397.2 | 231.4 | 359.9 | 194.4 | 349.7 | 194.2 |
| India | 396.7 | 230.7 | 365.6 | 202.7 | 365.4 | 202.5 |

*Billion 2020\$, 3% discount rate, 95th percentile