

May 16, 2023

FissionTransition Analysis:

Will Offshore Wind Capacity Subsidized by the Inflation Reduction Act Result in a Net Increase or Decrease in CO2 Emissions?

Climate Benefits of Offshore Wind

Though calculating the climate benefits of proposed offshore wind farms involves a wide range of uncertainties, we employed a simple proxy estimate we believe is resource-neutral. For offshore wind, we analyzed the CO2 emissions that would be prevented by 30 gigawatts (GW) of offshore wind capacity, over the period 2022-2047, based on average CO2 grid emissions from the U.S. grid in 2022. For simplicity, we assumed capacity would increase linearly over the ten year period: the first year would consider 3 GW of capacity, the second, 6 GW, and so forth. The sum of all energy generation, over the first ten year period, can be derived from the median of total capacity across ten years: 15 GW. For the following 15-year period (to compare to the estimated 25-year lifetime of offshore oil wells), 30 GW of wind generation is considered to be operational.

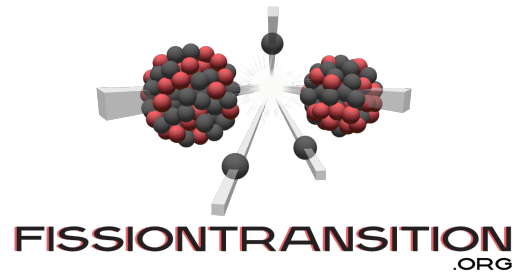
Energy generated by offshore wind over the first ten years =
15 GW x
50% (estimated capacity factor for future offshore wind by 2040)¹ x
8760 hrs/yr x
10 yrs =
657.0 terawatthours (TWh)

For the remaining 15 years =
30 GW x
50% capacity factor x
8760 hrs/yr x
15 yrs =
1,971.0 TWh

Total production over 25 years =
657.0 TWh +
1,971.0 TWh =
2,628.0 TWh

Average 2022 CO2-equivalent (CO2e) emissions of U.S. electricity per terawatthour (TWh):
1,539 million tonnes (MT) of total 2022 CO2e emissions from U.S. electricity sector² /
4,243 TWh total 2022 generation of U.S. electricity³ =
.363 megatons (MT) / TWh

Total CO2e emissions prevented by 25 years of U.S. wind construction/generation =
2628.0 TWh x
.363 MT/TWh =
954.0 MT CO2e



Climate Consequences of Additional Offshore Oil Drilling

The belief offshore drilling in the U.S. will prevent the extraction of a corresponding quantity of foreign oil is misplaced:

1. Whether extracted in the U.S. or elsewhere, all internal-combustion fuels refined from crude will eventually be consumed, with their CO₂e emissions expelled to the air.
2. In 2022 the U.S. exported 11% more oil than was imported. Thus, there exists sufficient domestic supply to power all U.S. transportation and manufacturing requiring oil and its derivatives.

Quantity of offshore crude oil extracted over 25 years as a result of the Inflation Reduction Act =

600 million acres x
52.3 barrels per acre/year (avg. retrieved from offshore drilling)⁴ x
25 yrs =
784.5 billion barrels

Total emissions from extracted oil =

784.5 billion barrels x
74% (percentage of oil used to produce gasoline and diesel fuel)⁵ x
.317 tonnes CO₂ per 42-gallon barrel⁶ =
184,028.0 MT

Net CO₂e emissions resulting from implementation of the Inflation Reduction Act of 2022:

184,028.0 MT - 954.0 MT = 183,074.0 MT =
183.1 gigatonnes (GT)

- Offshore wind farms will offset less than 1 percent (.5%) of the CO₂e emitted by oil extracted under the terms of the Inflation Reduction Act of 2022.
- Extraction of oil authorized by the IRA will result in 183.1 gigatonnes of additional CO₂e emissions – five times more than those emitted worldwide in 2022.

¹ "Offshore Wind Outlook 2019" *International Energy Agency*, p.40. <https://www.iea.org/reports/offshore-wind-outlook-2019>

² "How much of U.S. carbon dioxide emissions are associated with electricity generation?" *U.S. Energy Information Administration* 1 May 2023. <https://www.eia.gov/tools/faqs/faq.php?id=77&t=11>

³ "What is U.S. electricity generation by energy source?" *U.S. Energy Information Administration* Feb 2023. <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>

⁴ "How much oil and gas comes from federal territory?" *USAFacts.com* 21 Nov 2022. <https://usafacts.org/articles/how-much-oil-and-gas-comes-from-federal-territory/>

⁵ "Petroleum and Other Liquids: Supply and Disposition" *U.S. Energy Information Administration* Feb 2023. https://www.eia.gov/dnav/pet/pet_sum_snd_d_nus_mbbldpd_m_cur.htm

⁶ Bliss, Jim. "Carbon dioxide emissions per barrel of crude". *The Quiet Road* 20 Mar 2008. <http://numero57.net/2008/03/20/carbon-dioxide-emissions-per-barrel-of-crude/>