

Methodology Note – Rosebank and Jackdaw's combined lifetime carbon emissions

Stat 1: Rosebank's estimated lifetime emissions would cause up to 57,400 excess heat deaths, more than the babies born in Scotland in 1 year.

Stat 2: Rosebank and Jackdaw's combined lifetime carbon emissions would cause up to 65,495 excess heat deaths, a toll equivalent to the entire population of Inverness (Scotland) or Clacton-on-Sea (England).

Common methodology to all calculations

The calculations use a concept called the mortality cost of carbon, which assesses excess deaths due to temperature changes caused by climate change. It is one of the metrics used to calculate the social cost of carbon (SC-CO₂).ⁱ The SC-CO₂ measures the monetized value of the damages to society caused by an incremental metric ton of CO₂ emissions, including also changes in agricultural productivity, damages caused by sea level rise, mortality and decline in human health and labour productivity. The SC-CO₂ is widely used, for instance, by the United States Environmental Protection Agency (US EPA) to evaluate the impact of mitigation policies. The concept is used to calculate the cost-benefit analysis required when agencies propose environmental rules.

We choose to use the mortality cost of carbon, which shows the impact on human lives of excess heat. The mortality cost of carbon (MCC) is used to calculate the SC-CO₂. The estimated mortality cost of carbon per metric ton of 2020 emissions equivalent is 2.26×10^{-4} (0.000226).ⁱⁱ According to the researcher, the MCC varies minimally from year to year, meaning that we can use the 2020 MCC estimate to calculate the mortality cost of 2026 emissions.

The deaths calculated span the period 2020–2100 (roughly 80 years), the window used in the underlying study.ⁱⁱⁱ Separate research has found that CO₂ emissions reach their maximum warming effect around a decade after being emitted.^{iv} We treat this as an indicative, not precisely established, guide to when mortality impacts are also likely to be greatest.

Stat 1

- The estimated MCC per metric ton of emissions equivalent is: 2.26×10^{-4} (0.000226).^v
- Rosebank's estimated lifetime emissions: 254,000,000 tonnes of CO₂ equivalent.^{vi}
- Excess heat deaths: $254,000,000 \times 0.000226 = 57,404$
- Live births registered in Scotland in 2024: 45,763.^{vii}

So, Rosebank's estimated lifetime emissions would cause approximately 57,400 excess heat deaths, more than the number of babies born in Scotland in one year.

Stat 2

- The estimated MCC per metric ton of emissions equivalent is: 2.26×10^{-4} (0.000226).^{viii}
- Jackdaw's estimated lifetime emissions: up to 35,800,000 tonnes of CO₂ equivalent, per the operator's highest-production scenario (the same assessment's lower scenario is at 23,600,000 tonnes of CO₂ equivalent).^{ix}
- Excess heat deaths from Jackdaw: $35,800,000 \times 0.000226 = 8,091$
- Combined with Rosebank (57,404): 65,495 excess heat deaths.

The population of Inverness is approximately 63,004^x and of Clacton-on-Sea approximately 53,766^{xi}, both lower than 65,495. Meaning the combined excess heat deaths from Rosebank and Jackdaw's lifetime emissions would be roughly equivalent to the entire population of either city.

Notes

ⁱ K. Rennert et al. (2022). Comprehensive Evidence Implies a Higher Social Cost of CO₂. *Nature*, 610, 687–692. <https://www.nature.com/articles/s41586-022-05224-9>

ⁱⁱ R.D. Bressler. (2021). *The Mortality Cost of Carbon*. *Nature Communications*, 12, 4467. <https://doi.org/10.1038/s41467-021-24487-w>

ⁱⁱⁱ R.D. Bressler. (2021). *The Mortality Cost of Carbon*.

^{iv} K.L. Ricke and K. Caldeira. (2014). Maximum warming occurs about one decade after a carbon dioxide emission. *Environmental Research Letters*. 9, 124002. <https://iopscience.iop.org/article/10.1088/1748-9326/9/12/124002>

^v R.D. Bressler. (2021). *The Mortality Cost of Carbon*.

^{vi} Uplift. (2026). *Rosebank oil field: the complete guide*. <https://www.upliftuk.org/post/rosebank-oil-field-the-complete-guide>

^{vii} National Records of Scotland. (2025). *Record low births and fertility rate*. <https://www.nrscotland.gov.uk/latest-news/record-low-births-and-fertility-rate/>

^{viii} R.D. Bressler. (2021). *The Mortality Cost of Carbon*.

^{ix} BBC. (2025). *Potential emissions revealed for controversial Jackdaw gas field*. <https://www.bbc.co.uk/news/articles/c3d09xp1ye2o>

^x The Press and Journal. (2024). *The population of Inverness: Why is it so hard to get a straight answer to how many people live in the Highland capital?* Accessed 5 August 2026. <https://www.pressandjournal.co.uk/fp/news/inverness/6486537/what-is-the-population-of-inverness/>

^{xi} Ministry of Housing, Communities and Local Government. (2025). *Clacton-on-Sea: local data profile*. Accessed 5 August 2026. <https://assets.publishing.service.gov.uk/media/68779cbb760bf6cedaf5bcfa/Clacton-on-Sea.pdf>.