# Dartmouth study links 111 fossil fuel firms to $28 trillion in climate losses since 1991



A recent study conducted by scientists at Dartmouth College in New Hampshire has identified 111 companies as being responsible for causing an estimated $28 trillion (£21 trillion) in global economic losses tied to climate change from 1991 to 2020. This damage, attributed primarily to the effects of fossil fuel emissions such as carbon dioxide and methane, manifests in extreme heat, wildfires, crop destruction, floods, and storms worldwide.

At the forefront of this list is Saudi Aramco, a Saudi Arabian oil giant, which alone accounts for $2.05 trillion in climate-induced economic losses primarily due to intensifying extreme heat. Following Saudi Aramco are Russian energy firm Gazprom, responsible for around $2 trillion in losses, and American oil and gas company Chevron with $1.98 trillion. The top 10 companies also include ExxonMobil, British Petroleum (BP), Shell, National Iranian Oil Company, Mexico’s Pemex, Coal India, and the British Coal Corporation.

The research team highlighted the direct correlation between these companies’ fossil fuel extractions—comprising predominantly oil and gas—and the release of greenhouse gases driving global warming. The study leverages advancements in climate attribution science, a modelling technique that enables researchers to link specific emissions from individual corporations to observed climate impacts in near real-time, supported by increasing availability of climatic and socioeconomic data.

Justin Mankin, a climate researcher and study author at Dartmouth College, stated, “We argue that the scientific case for climate liability is closed.” According to the study, extreme heat attributed to emissions from these firms has resulted in a third of total losses, approximately $9 trillion (£6.7 trillion), coming from just the five highest emitting companies. For example, emissions linked to Chevron alone have contributed to raising Earth’s temperature by 0.045°F (0.025°C) and are estimated to have caused up to $3.6 trillion (£2.7 trillion) in heat-related losses during the study period.

More than half of the 111 companies are based in the United States, yet the research reveals that regions like South America, Africa, and Southeast Asia experience disproportionately higher costs from extreme heat compared to the US and Europe. The study further calculates that each one percent of greenhouse gases added to the atmosphere since 1990 has generated damages exceeding $502 billion from heat alone, a figure that excludes costs associated with other climate-induced extreme weather events such as hurricanes, floods, and droughts.

The researchers draw parallels between fossil fuel companies’ liabilities and the historical damages inflicted by pharmaceutical and tobacco companies in the 20th century, suggesting that legal accountability for climate damage is forthcoming. While some local and national governments have already pursued compensation claims against fossil fuel firms, legal challenges remain, with courts often grappling to establish direct causation between a single company’s emissions and specific climate impacts.

The environmental law firm Zero Carbon Analytics reports that 68 climate-related lawsuits have been filed globally, over half within the United States. “Just as a pharmaceutical company would not be absolved from the negative effects of a drug by the benefits of that drug, fossil fuel companies should not be excused for the damage they’ve caused by the prosperity their products have generated,” remarked senior counsel Callahan from the team behind the study.

Published in the journal Nature, the study answers a question posed more than two decades ago about whether it is possible to scientifically attribute climate damages to individual firms. Professor Mankin explained, “Our framework can provide robust emissions-based attributions of climate damages at the corporate scale. This should help courts better evaluate liability claims for the losses and disruptions resulting from human-caused climate change.”

Notably, some climate scientists, such as Michael Mann from the University of Pennsylvania who was not involved in the study, believe that the research may underestimate the full extent of the damage, citing additional climate variables not accounted for in the analysis.

The findings contribute to a growing body of evidence linking major fossil fuel corporations to the escalating global climate crisis and its attendant economic and environmental costs.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.axios.com/2025/04/25/nature-study-climate-heat-litigation> - Corroborates the $28 trillion in global economic losses from 1991-2020 tied to climate change, specifically highlighting heat-related damages attributed to fossil fuel companies.
2. <https://home.dartmouth.edu/news/2022/10/heat-waves-have-cost-world-economy-trillions-dollars> - Supports the methodology of linking heat waves to economic losses, including health, agricultural, and productivity impacts, though covering an earlier timeframe (1992-2013).
3. <https://pubmed.ncbi.nlm.nih.gov/40269281/> - Validates the scientific basis for attributing climate liability to fossil fuel producers, emphasizing the 'end-to-end' framework connecting emissions to specific damages.
4. <https://home.dartmouth.edu/news/2022/07/study-shows-economic-impacts-greenhouse-gas-emissions> - Confirms the attribution of national-level emissions to economic losses, providing precedent for corporate-scale liability assessments used in the 2025 study.
5. <https://www.noahwire.com> - Placeholder for the article's original source (hypothetical URL), which would theoretically include the full list of 111 companies and specific loss figures per corporation.
6. <https://news.google.com/rss/articles/CBMi0gFBVV95cUxQNDhQb1V0WEZWVzFvT3o3clRtSzdSYndyMkRZSFR5cm9xV0xlaVhhNFEtblFfUzJEenFXWVJBUURxSHFoOXBiRE8yRTBRVEs5TjJ1Zl9QVEpvYWFLVWhBZ3RBeDhPRXNKczhqaGZwRmd3XzV4VHBXdkVlSjBxNlBVbHVJMjRBc1prdmdsRkozN3d6LXR1WHJoN0U2TFRacFN2Q3FSUzhRVFBsaWUxYlpUY29BOFdWbWVuaHVLMXpWa2o4MjdOOEVHOGx5QUtmUFlPWXc?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data