

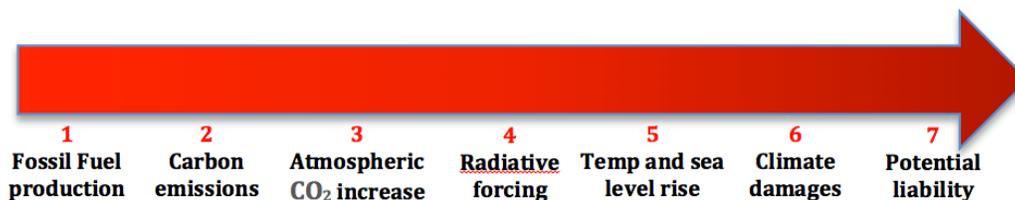
Press Release – embargoed to 08:00 EDT / 9 October 2019  
**Carbon Majors: Update of Top Twenty companies 1965-2017**

Climate Accountability Institute is releasing a new dataset quantifying how much each of the largest oil, natural gas, and coal companies has contributed to the climate crisis since 1965. We find that the Top Twenty companies have collectively contributed 480 billion tonnes of carbon dioxide and methane, chiefly from the combustion of their products, equivalent to 35% of all fossil fuel and cement emissions worldwide since 1965 (global total of 1.35 *trillion* tCO<sub>2</sub>e).

The table sums emissions for the period 1965 to 2017. Global emissions are also shown, and company emissions are shown as percent of global emissions over the same period.

Entity	MtCO <sub>2</sub> e	% of global
1. Saudi Aramco, Saudi Arabia	59,262	4.38%
2. Chevron, USA	43,345	3.20%
3. Gazprom, Russia	43,230	3.19%
4. ExxonMobil, USA	41,904	3.09%
5. National Iranian Oil Co.	35,658	2.63%
6. BP, UK	34,015	2.51%
7. Royal Dutch Shell, The Netherlands	31,948	2.36%
8. Coal India, India	23,124	1.71%
9. Pemex, Mexico	22,645	1.67%
10. Petroleos de Venezuela (PDVSA)	15,745	1.16%
11. PetroChina / China Natl Petroleum	15,632	1.15%
12. Peabody Energy, USA	15,385	1.14%
13. ConocoPhillips, USA	15,229	1.12%
14. Abu Dhabi, United Arab Emirates	13,840	1.01%
15. Kuwait Petroleum Corp., Kuwait	13,479	1.00%
16. Iraq National Oil Co., Iraq	12,596	0.93%
17. Total SA, France	12,352	0.91%
18. Sonatrach, Algeria	12,302	0.91%
19. BHP Billiton, Australia	9,802	0.72%
20. Petrobras, Brazil	8,676	0.64%
Top Twenty	480,168	35.45%
Global	1,354,388	100.00%

On the theory that fossil fuel producers bear substantial responsibility for the adverse impacts of their products, we set out to determine how much each company’s carbon fuels contributed to rising carbon dioxide emissions. We also estimate their direct operational emissions (~12% of their total), which include CO<sub>2</sub> from flaring and venting and own fuel use, and fugitive methane. The arrow illustrates the arc of CAI’s work from quantifying and attributing emissions to carbon producers, modeling their impact on global climate, and contributing to efforts to hold companies accountable for climate damages.

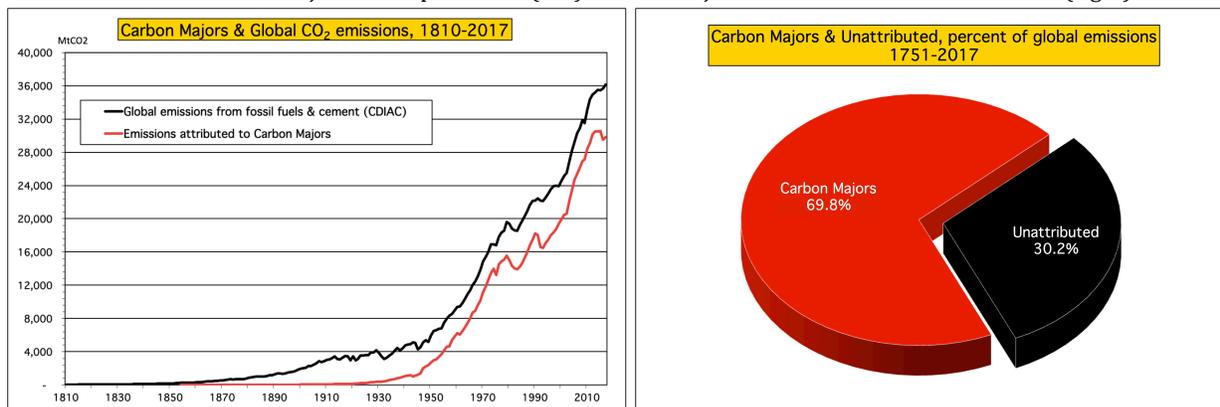


We chose 1965 as the starting point for this new data because recent research has revealed that by mid-1960s the climate impact of fossil fuels was known by industry leaders and politicians. Although global consumers from individuals to corporations are the ultimate emitters of carbon dioxide, we focus on the fossil fuel companies that, in our view, have produced and marketed the carbon fuels to billions of consumers with the knowledge that their use *as intended* will worsen the climate crisis.

**Key findings:**

- Global fossil fuel and cement emissions from 1965 to 2018 totaled 1,354 billion tonnes of carbon dioxide and energy-related methane (GtCO<sub>2e</sub>);
- The twenty largest investor-owned and state-owned fossil fuel companies produced carbon fuels that emitted 35% of the global total (480 GtCO<sub>2e</sub>);
- If we look over the entire historical data we find the current database of 103 fossil fuel and cement entities emitted 1,221 GtCO<sub>2e</sub>, or 69.8% of global since 1751 (1.75 TtCO<sub>2e</sub>); of which the Top Twenty companies are responsible for 526 GtCO<sub>2e</sub>, or 30% of all fossil fuel and cement emission since 1751;
- These companies have significant moral, financial, and legal responsibility for the climate crisis, and a commensurate burden to help address the problem;
- Half of all global fossil fuel and cement CO<sub>2</sub> emissions since 1751 have been emitted since 1990;
- The climate crisis is worsening, global emissions are still rising, and they must peak immediately in order to reduce emissions by 45% by 2030 and net zero by 2050.

Global emissions of carbon dioxide for fossil fuel use and cement production from 1810 to 2017 (black) and the emissions attributed to 103 major carbon producers (red). Carbon Majors and “unattributed” 1751-2017 (right).



It is incumbent on companies that value their social license to operate to respect climate science, manage corporate risks accordingly, commit to reducing future production of carbon fuels and their emissions in alignment with the Paris Agreement pathway under 1.5 °C (net zero by 2050), support the decarbonization of the global economy, and shift their capital investments toward renewables, carbon sequestration, and low-carbon fuels in line with science-based targets. Companies leading this transition will prosper, and laggards will perish. We will be watching.



Respectfully,

*Richard Heede*

Director, Climate Accountability Institute.

**About Climate Accountability Institute**

CAI is an independent research institute focusing on anthropogenic climate change, dangerous interference with the climate system, tracing emissions of carbon dioxide to oil, gas, and coal companies' production of carbon fuels, modelling the rise in temperature and sea level rise, risk reduction strategies, and disclosure requirements regarding GHG emissions. CAI gratefully acknowledges financial support from Union of Concerned Scientists, Wallace Global Fund, and Rockefeller Brothers Fund. [www.climateaccountability.org](http://www.climateaccountability.org)

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**Recent publications**

Heede, Richard (2019) *Carbon Majors: Accounting for carbon and methane emissions 1854-2010 Methods & Results Report*, re-issued with new foreword, ISBN 978-3-659-57841-0, OmniScriptum, Riga, 148 pp.

Heede, Richard (2019) *Carbon Majors: Updating activity data, adding entities, & calculating emissions: A Training Manual*, Climate Accountability Institute, Snowmass CO, 56 pp. [www.climateaccountability.org/publications.html](http://www.climateaccountability.org/publications.html)

Licker, Rachel, Brenda Ekwurzel, Scott C. Doney, Sarah R. Cooley, Ivan D. Lima, Richard Heede, & Peter C. Frumhoff (in review) Attributing ocean acidification to major carbon producers, *Environmental Research Letters*.

Heede, Richard (2017) Carbon producers' tar pit: dinosaurs beware: The path to accountability of fossil fuel producers for climate change & climate damages, *Institute for New Economic Thinking: Plenary Conference* Edinburgh, 23 October 2017, Climate Accountability Institute, October, 16 pp.

Ekwurzel, B., J. Boneham, M. W. Dalton, R. Heede, R. J. Mera, M. R. Allen, & P. C. Frumhoff (2017) The rise in global atmospheric CO<sub>2</sub>, surface temperature, and sea level from emissions traced to major carbon producers, *Climatic Change*, vol. 144:579-590. <https://link.springer.com/article/10.1007/s10584-017-1978-0#SupplementaryMaterial>

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Heede, Richard, & Naomi Oreskes (2016): Potential emissions of CO<sub>2</sub> and methane from proven reserves of fossil fuels, *Global Environmental Change*, vol. 36:12-20. [www.sciencedirect.com/science/article/pii/S0959378015300637](http://www.sciencedirect.com/science/article/pii/S0959378015300637)

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Frumhoff, P., R. Heede, & N. Oreskes (2015) The climate responsibilities of industrial carbon producers, *Climatic Change*, vol. 132:157-171. [link.springer.com/article/10.1007/s10584-015-1472-5](http://link.springer.com/article/10.1007/s10584-015-1472-5)

Heede, Richard (2014) Tracing anthropogenic CO<sub>2</sub> and methane emissions to fossil fuel and cement producers 1854-2010, *Climatic Change*, vol. 122(1): 229-241. <https://link.springer.com/article/10.1007/s10584-013-0986-y>

**Top Twenty carbon major companies operational and product emissions cumulative to 2017**

Entity	Product-related CO <sub>2</sub> MtCO <sub>2</sub>	Flaring, own fuel, vented CO <sub>2</sub> MtCO <sub>2</sub>	Fugitive methane MtCO <sub>2</sub> e	Total emissions MtCO <sub>2</sub> e	Percent of global 1751-2017
1. Saudi Aramco, Saudi Arabia	54,364	1,346	3,820	59,530	3.40%
2. Chevron, USA	48,513	1,560	4,723	54,796	3.13%
3. ExxonMobil, USA	45,293	1,699	5,245	52,237	2.98%
4. Gazprom, Russian Federation	32,281	2,638	8,311	43,230	2.47%
5. BP, UK	35,451	1,136	3,452	40,039	2.29%
6. Royal Dutch Shell, The Netherlands	33,085	1,240	3,829	38,154	2.18%
7. National Iranian Oil Company	33,193	1,043	3,058	37,294	2.13%
8. Pemex, Mexico	21,058	669	1,965	23,692	1.35%
9. Coal India	20,079	0	2,347	23,126	1.35%
10. ConocoPhillips, USA	15,962	714	2,169	18,846	1.08%
11. Peabody Energy, USA	14,509	0	1,639	16,148	0.92%
12. Petroleos de Venezuela	14,421	401	1,159	15,980	0.91%
13. PetroChina, China	13,813	460	1,359	15,632	0.89%
14. Total, France	12,788	445	1,321	14,554	0.83%
15. Abu Dhabi	12,330	386	1,130	13,845	0.79%
16. Kuwait Petroleum Corp.	12,634	299	841	13,774	0.79%
17. Iraq NOC	11,729	251	695	12,675	0.72%
18. Sonatrach, Algeria	10,239	519	1,592	12,351	0.71%
19. BHP Billiton	8,794	87	1,013	9,894	0.57%
20. CONSOL Energy	8,844	12	1,021	9,877	0.56%
Sum of Top Twenty IOCs & SOEs	460,080	14,907	50,689	525,676	30.03%
Global ind'l CO <sub>2</sub> & CH <sub>4</sub> : 1751-2017	1,574,302		176,132	1,750,434	100.00%