



Columbia Center on Sustainable Investment

A JOINT CENTER OF COLUMBIA LAW SCHOOL
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PRESS RELEASE:

How Much Have the Oil Supermajors Contributed to Climate Change? The carbon footprint of the oil refining and petroleum product sales sectors

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A new study by Columbia University's Columbia Center on Sustainable Investment (CCSI) uncovers the magnitude and complexity of the carbon footprint of the Oil Supermajors, the six largest publicly traded oil companies by revenue and political influence. From 1980 to 2019, petroleum products sold by BP, Chevron, Eni, ExxonMobil, Shell, and TotalEnergies accounted for emissions of more than 508 metric gigatons of carbon dioxide equivalent (Gt CO₂e), and the companies' oil refining segment accounted for approximately 443 Gt CO₂e. Together, the six companies accounted for more than 35% of the global carbon footprint of the petroleum products sales sector, which nearly doubled in the 40-year period, and approximately 23% of the footprint of the oil refining sector, which increased by approximately 51% in the same period, without considering gas value chains. Understanding and reducing the oil industry's footprint is a first-order necessity in addressing the climate emergency. The lack of transparency and consistency in the companies' emission accounting and reporting, as the study highlights, casts a shadow of doubt on the credibility of their net-zero pledges.

Using open-source models, the study estimates country-specific life-cycle greenhouse gas emission factors for the sectors of crude oil refining and sales of petroleum products refined from crude oil, covering the period 1980–2019 and including the 83 countries that jointly accounted for 93% of the global crude oil refining throughput in 2015. It also estimates the global and country-level carbon footprints of the two sectors as well as the life-cycle greenhouse gas emissions from the supermajors' businesses in the two sectors. The resulting estimates of carbon footprints are not meant to be added up as they overlap.

The supermajors refine and sell petroleum products originating from crude oil extracted by themselves as well as other companies; the study estimates all these emissions, regardless of the origin of the crude oil. Because of these interconnections of the value chains, the supermajors own a sizable share of the refining and sales sectors, and the carbon intensities of the companies are within a narrow range.

"The companies' value chains are so mingled that, in the current state of data disclosure, differentiating between companies' footprints is a difficult exercise," says co-author Perrine Toledano, Head of Mining and Energy at CCSI.

Richard Heede's groundbreaking Carbon Majors study of 2014 (updated to 2018) estimated the cumulative carbon footprint of the supermajors based on their equity production of oil as well as gas from 1965 to 2018. A focus on their extraction-based activities conceals the full scale of their hold on oil value chains. The CCSI study, in turn, exposes the supermajors' contribution to midstream and downstream emissions.

The report also scrutinizes companies' emission accounting and reporting methods, concluding that their numbers rely on a variety of reporting boundaries, volumes, and accounting methodologies that are not fully transparent. "Without consistent and transparent emission accounting, companies' net-zero commitments and targets are meaningless," stresses co-author Martin Dietrich Brauch, CCSI's Senior Legal and Economics Researcher. Most problematic is that companies fail to report scope 3 emissions consistently and comprehensively.

The CCSI study addresses various shortcomings of corporate emissions reporting while acknowledging the limitations of its own methodology. "These limitations attest to the lack of data transparency and standardized carbon accounting at both country and corporate level," explains co-author Jiarui Chen, a Master of Science in Financial Engineering (MSFE) candidate at Columbia University.

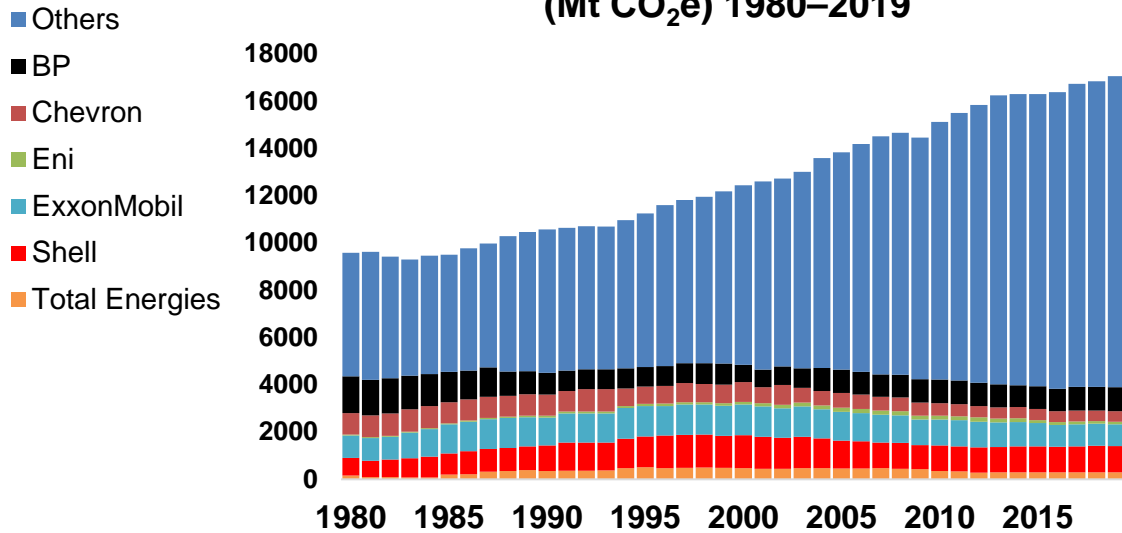
These data deficiencies prevent informed decision-making by investors, consumers, and policy makers, who hold the levers to influence companies to reduce their carbon footprint. To address these limitations, the Coalition on Material Emissions Transparency (COMET)—an initiative between CCSI, the Payne Institute for Public Policy at the Colorado School of Mines, RMI, and the secretariat of the United Nations Framework Convention on Climate Change (UN Climate Change)—is creating a harmonized GHG calculation framework applicable to all mineral and industrial supply chains.

Read the study [here](#) and see the Infogram [here](#).

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The **Columbia Center on Sustainable Investment (CCSI)** is a joint center of Columbia Law School and the Earth Institute at Columbia University and the only university-based applied research center and forum dedicated to the study, practice, and discussion of sustainable international investment. CCSI integrates legal, economic, and policy expertise, and approaches sustainable investment holistically, bridging investment law, natural resource management, human rights, economics, political economy, and environmental management. It conducts rigorous research, provides policy analysis and advisory services, offers educational programs, develops tools and resources, and fosters multi-stakeholder dialogue and knowledge sharing among policymakers, development advocates, scholars, business leaders, and community stakeholders. It works to strengthen the sustainable development potential of international investment, and to ensure that international investment is mutually beneficial for investors and the citizens of recipient countries. Learn more at <http://ccsi.columbia.edu>.

Emissions from the Oil Supermajors' Petroleum Products Sales Segments (Mt CO₂e) 1980–2019



Emissions from the Oil Supermajors' Oil Refining Segments (Mt CO₂e) 1980–2019

