

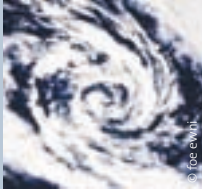


Friends of
the Earth
International

exxon's climate footprint

the contribution of ExxonMobil to
climate change since 1882 | January 2004





friends of the earth Friends of the Earth International is the world's largest grassroots environmental network, uniting 68 diverse national member groups and some 5,000 local activist groups on every continent. With approximately one million members and supporters around the world, we campaign on today's most urgent environmental and social issues. We challenge the current model of economic and corporate globalization, and promote solutions that will help to create environmentally sustainable and socially just societies.

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(Please contact the FoEI Secretariat or check our website for FoE groups' contact info)

Published January, 2004 in London, United Kingdom.

Friends of the Earth is grateful to the Minor Foundation for Major Challenges for funding the work that has made this briefing possible. See www.minor-foundation.no

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executive summary



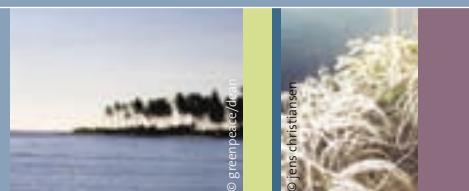
ExxonMobil is one of the biggest oil companies in the world, and is also known as Esso, Mobil, Imperial Oil, Tomen General and Exxon, in different countries. ExxonMobil produces 4.5 million barrels of oil a day. In 2002 alone, it sold 2,831 million barrels of oil. This is equivalent to 298 million tonnes of carbon.

For many years ExxonMobil has been active in undermining climate science and policy making, in particular by lobbying against the Kyoto Protocol, the main international agreement to tackle climate change.

In spring 2003, Friends of the Earth commissioned two ground-breaking studies by independent experts to establish the contribution ExxonMobil has made to climate change since 1882. This briefing summarises their findings and assesses their potential implications.

The first study estimated the carbon dioxide and methane emissions from ExxonMobil's operations and the burning of its products back to its early days as the Standard Oil Trust in 1882. The second study used these figures to run a well-known climate model to calculate the contribution these emissions have made, and will make, to atmospheric concentrations of these gases, to increases in global average surface temperature and to sea level rise.

Forest fires near Nogliki-Sakhalin, Sakhalin, Russia.



the studies found:

- From 1882-2002, ExxonMobil's emissions of carbon dioxide total an estimated 20.3 billion tonnes of carbon – or 4.7% - 5.3% of global carbon dioxide emissions. In other words, about 5% - one twentieth - of the world total. If we add in methane the total emissions are about 21.53 billion tonnes of carbon equivalent.
- Seven of the top 10 years of ExxonMobil's emissions have been since 1996, when the IPCC Second Assessment Report found "a discernible human influence on global climate". ExxonMobil's response to this international scientific consensus was to increase its production of fossil fuels to record levels.
- 99.9% of ExxonMobil's emissions have happened since Arrhenius' first calculation of global warming in 1896. 65% of its emissions have happened since the Study of Man's Impact on Climate conference of leading scientists reported a danger of rapid and serious global change caused by humans in 1971.
- ExxonMobil's emissions contributed 4.8 to 5.5% of total carbon dioxide concentrations above pre-industrial levels, in 2002. This percentage contribution from ExxonMobil has steadily increased, rising from 0% in 1882, to 2.5 to 2.8% in 1960 and then almost doubling in the last forty years to 4.8 to 5.5% in 2002. The contribution of methane emissions is smaller, peaking at 1.6% of total global concentrations above pre-industrial levels in 2002.

- ExxonMobil's emissions have contributed between 3.4% and 3.7% of total attributable temperature change since 1882, and 2% of the sea level rise. Given the slow response of sea level to changes in temperature, even if all greenhouse gas emissions ceased in 2003, past emissions will continue to affect sea level, resulting in an ExxonMobil contribution of 3.2 to 3.6% of total sea level rise in 2200.

ExxonMobil's greenhouse gas emissions are huge in absolute terms, and significant in relative terms. They have continued to increase, despite the strengthening of climate change science over the years and despite international efforts to reduce emissions. It must be held responsible for its behaviour, both morally and legally.

Ultimately, the precise financial impact for ExxonMobil will depend on decisions of courts and other means of determining responsibility for the impacts of climate change. The potential financial cost for the company is impossible to quantify yet could clearly be vast. One assessment of the annual losses due to climate change suggests they will reach almost \$150 billion in the next decade.

friends of the earth calls on exxonmobil to:

- State publicly that the evidence presented by the Intergovernmental Panel on Climate Change now demonstrates that man-made climate change is happening and that the burning of fossil fuels is the major cause of the problem.
- Stop funding organisations that strive to undermine the consensus that burning fossil fuels is the major cause of man-made climate change and/or which seek to prevent action being taken to cut emissions.

- Support publicly the entry into force of the internationally agreed Kyoto Protocol, including its mandatory cuts in carbon dioxide emissions, fully support the effective implementation of the Protocol and the wider provisions of the United Nations Framework Convention on Climate Change and play a constructive role in the negotiation of future agreements to stop dangerous climate change.
- State publicly that it is responsible for causing man-made climate change.
- Assess its potential liability for the current and future damage caused by climate change and set aside a segregated fund to meet claims that may, in the future, be made against it.

1. introduction

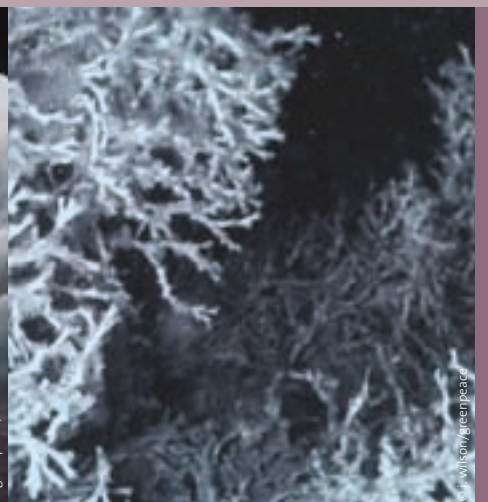
In spring 2003, Friends of the Earth commissioned two ground-breaking studies by independent experts to establish the contribution ExxonMobil has made to climate change since 1882. This briefing summarises their findings and assesses their potential implications.

The first study,¹ (the emissions study), estimates the carbon dioxide and methane emissions from ExxonMobil's operations and the burning of its products back to its early days as the Standard Oil Trust in 1882. The second study,² (the impacts study) uses these figures to run a well-known climate model to calculate the contribution these emissions have made, and will make, to atmospheric concentrations of these gases, to increases in global average surface temperature and to sea level rise.

We summarise these studies in this briefing, which has five parts. Firstly, we sum up what scientists are saying about man-made climate change. Then we explain why ExxonMobil's contribution is important. Then we look at how the two studies were carried out and at their findings. Finally we consider their implications. But first, what are scientists saying about climate change?

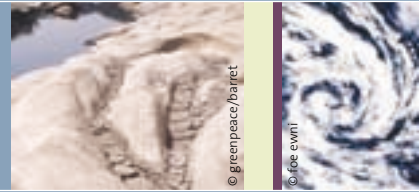
Polar Bears, Alaska, USA.

Coral, North Atlantic, Rockall Bank.



- 1 | ExxonMobil Corporation Emissions Inventory 1882-2002: Methods and Results, plus associated spreadsheets, 30 pages + 90 pages. Richard Heede, Climate Mitigation Services, Snowmass, Colorado. Dec 2003.
- 2 | Assessing the Effects of CO₂, CH₄ and N₂O Emissions on Atmospheric Concentrations, Changes in Radiative Forcing, Changes in Global Mean Surface Temperature, and Changes in Sea Level: A Case Study. Jim Salinger and Greg Bodeker, National Institute of Water & Atmospheric Research Ltd. Dec 2003.

2. the problem of climate change



2.1 what is climate change?

The atmosphere contains naturally-occurring gases that trap some of the light reflected off the earth. The main gases responsible are water vapour, carbon dioxide, ozone, methane and nitrous oxide. Together with clouds, these gases help keep the Earth's surface warmer than it would otherwise be. This is the natural greenhouse effect.

Human activities, such as burning fossil fuels and agriculture, produce carbon dioxide and other greenhouse gases. These man-made emissions lead to increases in greenhouse gases and an enhanced greenhouse effect. Burning fossil fuels is by far the biggest source of man-made greenhouse gases. The impact of this enhanced greenhouse effect on the weather is referred to as climate change.

2.2 are the levels of greenhouse gases changing?

Yes. There is some natural variation in the concentrations of the greenhouse gases over time leading to natural variation in climate. However, concentrations of carbon dioxide now are substantially higher than at any time over the last 420,000 years. The current rate of increase is also higher than at any time during the past 20,000 years.³

2.3 is the climate changing?

This increase in the concentration of greenhouse gases is causing changes in the global climate. The United Nations has established an independent, international committee of experts called the Intergovernmental Panel on Climate Change (IPCC) that reviews scientific research about climate change every few years. The IPCC provides reports that governments use to make decisions on what to do about climate change. They say global average surface temperatures increased by about 0.6°C during the last century. In 2001, their Third Assessment Report concluded that most of the warming observed over the last 50 years is due to human activities.⁴

2.4 how are humans causing climate change?

About three quarters of the man-made emissions of carbon dioxide to the atmosphere during the last twenty years are the result of fossil fuel burning. Burning fossil fuels such as coal, oil products, natural gas, petrol and diesel releases carbon dioxide into the atmosphere directly. We use fossil fuels for almost everything we do: heating our homes, cooking meals, powering our cars and fuelling electric power plants.

Most other man-made emissions are from changes in land-use - especially deforestation. When forests are destroyed the carbon stored in the trees escapes to the atmosphere as carbon dioxide. Other activities such as raising cattle and planting rice emit methane, nitrous oxide and other greenhouse gases.

The developed countries contain about a fifth of the world's population but are responsible for three fifths of the world's greenhouse gas emissions.⁵ The United States, alone, produces twenty five per cent of the emissions despite having only five per cent of the world's people.⁶

Yet, the IPCC says that the poorest people in the poorest countries of the world are likely to suffer most from climate change⁷ - because they are more likely to depend on farming for their living and because their governments haven't the resources to protect them from droughts, floods and hurricanes.⁸

3 | Third Assessment Report - Working Group I "The Scientific Basis" Summary for Policy Makers. Intergovernmental Panel on Climate Change. 2001

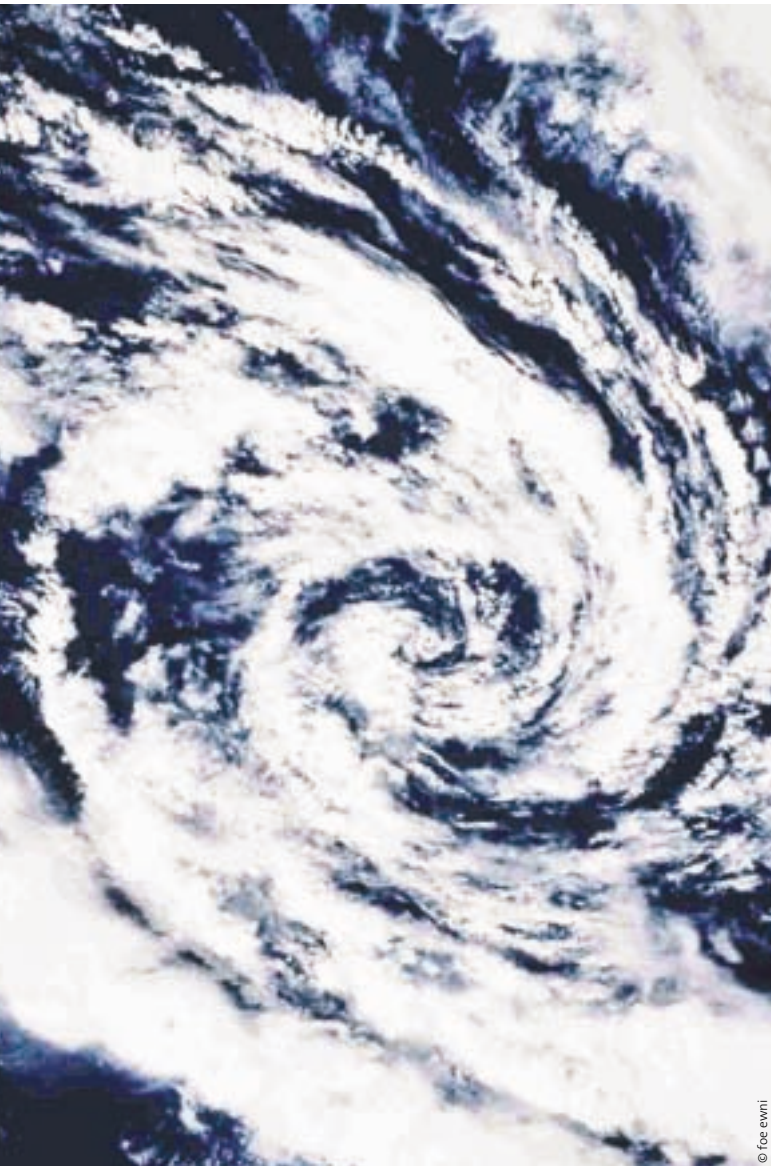
4 | Climate Change 2001 - Synthesis Report. Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change. 2001

5 | UN Department of Public Information/UNFCCC "FAQ: global climate change" <http://unfccc.int/press/dossiers/factsheet.html>

6 | World Energy Council http://www.worldenergy.org/wec-geis/publications/default/archives/tech_papers/other_tech_papers/WECco2rpt97app.aspx#table1

7/8 | Third Assessment Report - Working Group II "Climate change 2001: impacts, adaptation and vulnerability" Summary for Policy Makers. Intergovernmental Panel on Climate Change. 2001

3. introduction to exxonmobil



3.1 what is exxonmobil?

ExxonMobil is one of the world's largest oil companies, and is also known as Esso, Mobil, Imperial Oil, Tonen General and Exxon, in different countries. The company had profits of over \$11 billion worldwide in 2002. By 2010, it plans to spend \$100 billion in looking for new oil and gas⁹, and all but rules out a future role for renewable energy¹⁰. ExxonMobil produces 4.5 million barrels of oil a day. In 2002 alone, it produced 2831 million barrels of oil. This is equivalent to 298 million tonnes of carbon¹¹. In comparison, the UK releases approximately 155 million tonnes of carbon from burning fossil fuels in a year.¹²

3.2 why choose exxonmobil?

Debate on responsibility for climate change has tended to focus on countries and their current emissions. Yet the climate change we are seeing now is a result of previous emissions over many years.

Scientists, taking up a suggestion from Brazil, are beginning to assess the impact of countries' past emissions. This kind of information will help society decide, morally and legally, where responsibility for the impacts of climate change should lie.

Friends of the Earth believes this approach is valid but should not be confined to countries. It could also be used to assign responsibility to companies, to industrial sectors or to particular activities. Friends of the Earth believes it is especially important to calculate the emissions attributable to companies as some have profited enormously from their polluting activities and have lobbied against measures to cut emissions.

ExxonMobil is one of the world's largest oil companies. It has gained much from the exploration and extraction of fossil fuels and has been a prominent opponent of measures to limit climate change. It is one of the last to continue to challenge the scientific consensus that climate change is happening.

ExxonMobil's refusal to accept the link between its business and global warming comes right from the top of the company. In 2002, Lee Raymond, Chairman and CEO of ExxonMobil said "we in ExxonMobil do not believe

9 | http://www.exxonmobil.com/Corporate/Newsroom/Newsreleases/xom_nr_190902.asp

10 | http://www.exxonmobil.com/UK-English/Newsroom/UK_NR_Speech_AS_051103.asp

11 | See "emissions study" (ref 1) – Sheet "Aggregated Product Sales" – Cells K135 and L135

12 | The Carbon Dioxide Information Analysis Centre <http://cdiac.ornl.gov/ftp/trends/emissions/uki.dat>

13 | Remarks by Lee R. Raymond, Chairman and CEO, Exxon Mobil Corporation, 7th Annual Asia Oil & Gas Conference, Kuala Lumpur, Malaysia, June 10, 2002. http://www2.exxonmobil.com/corporate/Newsroom/SpchsIntnws/Corp_NR_SpchIntnrvw_KLSpeech_100602.asp

14 | "Corporate Governance and climate change: making the connection" CERES and IRRC Cogan D 2003.

15 | Greenpeace (2002) "Denial and deception" http://www.stopesso.com/pdf/exxon_denial.pdf

16 | <http://www2.exxonmobil.com/Files/Corporate/010118.pdf>

17 | ExxonMobil advertisement "Moving past Kyoto..." <http://www2.exxonmobil.com/Files/Corporate/170401.pdf>



that the science required to establish this linkage between fossil fuels and warming has been demonstrated - and many scientists agree".¹³

For many years ExxonMobil has been active in undermining climate science and policy making, in particular by lobbying against the Kyoto Protocol, the main international agreement to tackle climate change.

In the lead-up to the agreement of the Kyoto Protocol, ExxonMobil was a key member of the Global Climate Coalition, a powerful industry group which attempted to frustrate international negotiations on climate change. Other GCC members, such as Ford, General Motors, Shell and BP, left the Coalition as the scientific consensus on climate change became stronger. Exxon and the then separate Mobil both remained members until the group was disbanded.¹⁴

ExxonMobil also took part in planning a \$6 million American Petroleum Institute (API) public relations campaign to undermine support for scientific consensus on climate change. The API's campaign plan said that "victory will be achieved when those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality".¹⁵

ExxonMobil has been pivotal in lobbying against Kyoto on its way to ratification in key countries such as the United States. In the week before US President George Bush, was inaugurated, ExxonMobil took out an advertisement in a leading US newspaper claiming: "the unrealistic and economically damaging Kyoto process needs to be rethought".¹⁶

The month before President Bush announced his rejection of Kyoto, ExxonMobil again placed adverts in major US newspapers. Entitled "Moving past Kyoto ...", the first advert claimed that leading the list of "fundamental flaws" of the Kyoto Protocol "is the growing recognition that most governments cannot meet the politically chosen targets without resorting to economy-wrecking measures". It went on to say that "Kyoto was too much too soon"¹⁷ and that "the Kyoto Protocol approach would be a serious mistake".¹⁸

ExxonMobil has been accused of making misleading use of scientists' data in its arguments against climate change. For example, at its shareholder meeting in May 2000, ExxonMobil's Chairman and CEO, Lee Raymond, used a chart of temperature data from the Sargasso Sea to

refute the scientific conclusion that worldwide global warming was happening. The author of the study quoted said "I believe ExxonMobil has been misleading in its use of the Sargasso Sea data ... I think the sad thing is that a company with the resources of ExxonMobil is exploiting the data for political purposes".¹⁹

ExxonMobil also funds dozens of think tanks and lobby groups which vociferously oppose the Kyoto Protocol and provide a regular mouthpiece for a small group of climate sceptic scientists fighting the international scientific consensus.

Seven of these joined 26 other groups and individuals, in a joint letter to applaud US President George Bush's decision not to attend the UN summit in Johannesburg in 2002. They claimed "the least important global environmental issue is potential global warming and we hope that your negotiators at Johannesburg can keep it off the table and out of the spotlight".²⁰

Many, such as Citizens for a Sound Economy (CSE), are prominent in their opposition to the Kyoto Protocol and other measures to limit emissions.²¹ ExxonMobil gave CSE \$250,000 in 2001.²²

Many, such as the Frontiers of Freedom Institute, are members of the Cooler Heads Coalition which aims to "dispel the myths of global warming by exposing flawed economic, scientific, and risk analysis".²³ ExxonMobil gave Frontiers of Freedom \$232,000 in 2002.²⁴

Some, such as the Competitive Enterprise Institute (CEI), have even taken legal action to limit the distribution of reports on climate change. The CEI has received \$685,000 from ExxonMobil in the last two years, with more than \$400,000 in 2002.²⁵ In March 2001, the US-based Clean Air Trust named the CEI's Myron Ebell, who was then chairman of the Cooler Heads Coalition, its Clean Air 'Villain of the Month' after he wrote an e-mail to Coalition colleagues claiming they had "won a famous victory" in persuading President Bush not to ratify Kyoto.²⁶ Marlo Lewis, vice president for policy at the Competitive Enterprise Institute, is the current Cooler Heads group leader.²⁷ In November 2003, he wrote to the Financial Times claiming the "Kyoto Protocol is a Predatory Trade Strategy Masquerading as an Environmental Treaty".²⁸

18 | http://www2.exxonmobil.com/Files/Corporate/170401_1.pdf

19 | Dr Lloyd Keigwin, Woods Hole Oceanographic Institute, December 2000, letter to Campaign ExxonMobil about the Sargasso Sea Data.

20 | http://www.foei.co.uk/resource/press_releases/20020815121848.html

21 | see, for example, http://www.cse.org/processor/printer.php?issue_id=1608 or http://www.cse.org/informed/issues_template.php/1364.htm

22 | http://www2.exxonmobil.com/Corporate/Files/Corporate/public_policy1.pdf

23 | <http://www.globalwarming.org/about.htm>

24 | http://www2.exxonmobil.com/Corporate/Files/Corporate/public_policy1.pdf

25 | http://www2.exxonmobil.com/Corporate/Files/Corporate/public_policy1.pdf

26 | <http://www.cleanairtrust.org/villain.0301.html>

27 | <http://www.globalwarming.org/broccool.html>

28 | <http://www.cei.org/utills/printer.cfm?AID=3750>

4. methods

We set out in this section some of the methods adopted by the experts in carrying out the studies.

4.1 what products and activities are covered?

The emissions study provides data on emissions from the burning of kerosene and jet fuel, gasoline and naphthas, diesel and heating oils, heavy fuels, speciality products, other oil products, natural gas and coal, as well as from venting and flaring, company energy use and fugitive methane. Table 1 in the report of the emissions study provides a detailed summary of what's covered and what's not covered.

4.2 where does the data come from?

The data on ExxonMobil emissions in the emissions study were mostly taken from company production and marketing data, such as those set out in annual reports and other official documents. Where these data were not available – for example, for methane leakage and company energy use - estimates were made on the basis of other well-documented data, including court documents and books on the history of the company.

Non-ExxonMobil emissions were estimated in the impact study by calculating global emissions over time and subtracting ExxonMobil emissions, separately for carbon dioxide and for methane.

The figures for global carbon dioxide emissions over time – “time series” - were obtained from two independent and recognised sources. The first time series combined US Government data sets on emissions from fossil fuel burning, cement manufacture and gas flaring (“Marland”) and on those from land use changes (“Houghton & Hackler”). The second time series came from a widely used data-base on total carbon dioxide emissions divided into categories of biofuel combustion, deforestation, international transport, fossil fuel combustion, fossil fuel production and industrial processes (“EDGAR/HYDE”). EDGAR/HYDE data were also used for global methane emissions over time.

4.3 which emissions are included?

The emissions study covered the two main greenhouse gases - carbon dioxide and methane. Together, they comprise 93% of total US greenhouse gas emissions. The other four gases covered by the Kyoto Protocol - nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) were omitted from this study, because of the lack of published data. In 2001, nitrous oxide made up about 5% of total US emissions. As climate changes from methane cannot be calculated separately from nitrous oxide, however, this latter gas was included in the impacts study.

4.4 what did we do with the data?

As a part of the impacts study, the data from the emissions study were fed into a version of the well-respected and widely-used climate model, known as the “Bern CC model”. The model enables us to attribute the relative contribution of ExxonMobil’s emissions to atmospheric concentrations, radiative forcing, global temperature change and then sea level change.

4.5 what time period does the study cover?

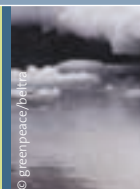
The ExxonMobil Corporation was formed by a merger of the Exxon Corporation and the Mobil Corporation in 1999. The two independent companies had existed since 1911. Before that, they were two of the thirty four companies that comprised the Standard Oil Company which was initially established under John D. Rockefeller’s leadership in 1870, reorganised as the Standard Oil Trust in 1882, but split up in 1911 as the result of a US Supreme Court order. This landmark ruling was aimed at breaking up their monopoly to prevent price-fixing and predatory pricing. Recently, this process has been reversed as many oil companies have merged and re-merged, creating new oil giants.

The time period for the emissions study is 1882-2002. The time period for the impacts study was selected as 1750 to 2002, because emissions before 1882 will partially offset emissions after 1882.

Torrential rains slice a massive gorge into the capital city of Maputo, Mozambique. The road and 100 homes were lost.



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© greenpeace/bétra

4.6 how can we separate the effects of ExxonMobil's emissions from other global emissions?

These emissions of ExxonMobil cannot be viewed in isolation from greenhouse gas emissions from other sources. This is because the emission of two tons of carbon dioxide does not produce twice the effect of the emission of one ton of carbon dioxide. An analogy can be drawn with how light passes through glass. If one pane of glass removes 50% of the light passing through, two panes do not remove 100% - they remove 75%.

This means that non-ExxonMobil emissions offset the environmental impact of ExxonMobil emissions, and vice versa. As a result, the attribution of environmental effects is not simple. To deal with this, the impacts study used a proportional method to distribute the effects of emissions between the sources. The total effect is distributed proportionally between the emission sources, so the proportion between ExxonMobil emissions and non-ExxonMobil emissions is considered to be the same as the proportion between the effects of ExxonMobil emissions and the effects of non-ExxonMobil emissions.

4.7 how certain are the methods and results?

In a historical and unprecedented work of this kind, there will be several uncertainties, and these are detailed in the studies. For example, the bases for product sales data reporting often change and are not transparent; company data on natural gas sales appear underestimates by as much as 30%; and there is a lack of measured data from ExxonMobil on company energy use. These uncertainties have been accounted for in the emissions study. Even though it could be improved, its author is "highly confident" in its overall result. In other words, the improvements that we expect could be made would not significantly affect the overall results.

The impacts study could not be done without looking at global greenhouse gas emissions from all sources. And this involves uncertainty, as can be seen from the different figures obtained from different sets of data. Overall, however, sound data has been used in running the model and the model is well respected and widely used amongst climate scientists.

Ultimately, if there is any quibbling over the overall contribution, the answer is simple and lies with ExxonMobil: show us why our confidence is misplaced.



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5. results

5.1 what were the results?

Readers are referred to the reports of the emission study and of the impacts study for the detailed results. Also Friends of the Earth has compiled a detailed table showing how ExxonMobil emissions have increased whilst the scientific evidence for climate change has strengthened, based largely on information from the American Institute of Physics.

how much has ExxonMobil emitted?

- From 1882-2002, ExxonMobil's emissions of carbon dioxide total an estimated 20.3 billion tonnes of carbon – or 4.7% - 5.3% of global carbon dioxide emissions. In other words, about 5% - one twentieth - of the world total.
- If we add in methane the total emissions are about 21.53 billion tonnes of carbon equivalent – of which a nearly quarter has been emitted since 1992, when governments met in Rio de Janeiro to sign the United Nations Framework Convention to tackle climate change.

- 7 of the top 10 years of ExxonMobil's emissions have been since 1996, when the IPCC Second Assessment Report found “a discernible human influence on global climate”. ExxonMobil's response to this international scientific consensus was to increase its production of fossil fuels to record levels.

- Only two countries in the world – the US and China, emitted more carbon dioxide in the year 2000 than ExxonMobil and its customers.²⁹

how have its emissions changed as climate change science has strengthened?

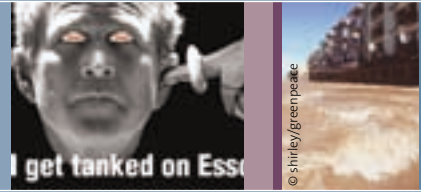
- 99.9% of ExxonMobil's emissions have happened since Arrhenius' first calculation of global warming in 1896.
- 83% of these emissions have happened since Keeling accurately measured carbon dioxide in the Earth's atmosphere and detected an annual rise in concentrations in 1960.
- 73% of these emissions have happened since the International Global Atmospheric Research Program was established and Manabe &



View at sunset of the Esso refinery in Ingolstadt.

²⁹ | See “emissions study” (ref 1) – Sheet “GHG Sum” – Cell X133, and Trends <http://cdiac.ornl.gov/trends/emis/top2000.tot>

Stop Esso billboard.



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Receding waters reveal devastation to evacuated town Xai Xai, Limpopo River Basin, Mozambique.

Wetherald made a convincing calculation that doubling carbon dioxide would raise world temperatures a couple of degrees in 1967.

- 65% of these emissions have happened since the Study of Man's Impact on Climate conference of leading scientists reported a danger of rapid and serious global change caused by humans in 1971.

what does this mean for the atmosphere?

- The contribution of emissions from ExxonMobil to total carbon dioxide concentrations above pre-industrial levels in 2002 was 4.8 to 5.5%. This percentage contribution from ExxonMobil has steadily increased, rising from 0% in 1882, to 2.5 to 2.8% in 1960 and then almost doubling in the last forty years to 4.8 to 5.5% in 2002. The contribution of methane emissions is smaller, peaking at 1.6% of total global concentrations above pre-industrial levels, in 2002.
- The contribution of ExxonMobil to radiative forcing (a concept used by scientists to examine the energy balance of the Earth's atmosphere) peaks at 0.088 Watts per square metre in 2002. This is equivalent to about 3.6 to 4.0% of the global total attributed radiative forcing change.

what does this mean in terms of climate change?

- ExxonMobil's emissions have contributed between 3.4% and 3.7% of total attributable temperature change since 1882, and 2% of the sea level rise. Given the slow response of sea level to changes in temperature, even if all greenhouse gas emissions ceased in 2003, past emissions will continue to effect sea level, resulting in an ExxonMobil contribution of 3.2 to 3.6% of total sea level rise in 2200.

exxonmobil: total emissions of carbon dioxide and methane, 1882-2002

million tonnes of carbon-equivalent per year

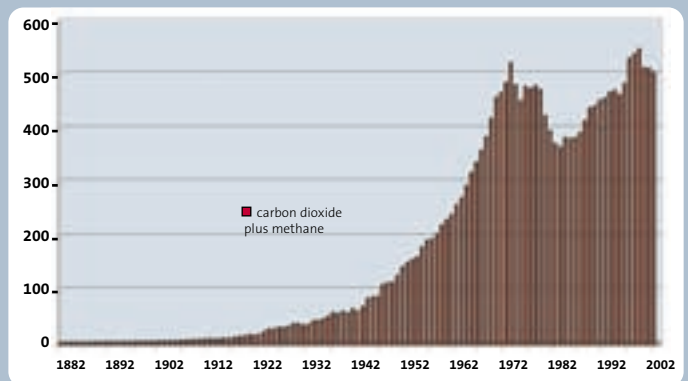


figure 1 showing total emissions of carbon dioxide and methane from ExxonMobil (and its predecessors) from 1882 to 2002



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Stranded people waiting in line for supplies after flooding in Mozambique.

6. conclusions



6.1 what does this mean for ExxonMobil?

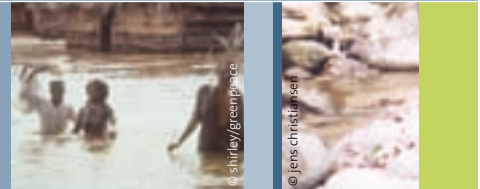
ExxonMobil's greenhouse gas emissions are huge in absolute terms, and significant in relative terms. They have continued to increase, despite the strengthening of climate change science over the years and despite international efforts to reduce emissions. This shameful state of affairs is made worse by the company's attempts to undermine the science and international action to reduce emissions and by its rejection of renewable energy. It is well past the time when ExxonMobil's private interest can continue to threaten and harm the public interest. It must be held responsible for its behaviour, both morally and legally.

Ultimately, the precise financial impact for ExxonMobil will depend on decisions of courts and other means of determining responsibility for the impacts of climate change. The potential financial cost for the company is impossible to quantify yet with any precision. However, assessments of the cost of climate change or of the cost of weather-related disasters have been made and can be used to give an indication of costs ExxonMobil may face:

- Red Cross data show weather-related disasters have cost over \$400 billion in the last ten years.³⁰
- In 2001, the reinsurance agency, Munich Re estimated the worldwide damage from climate change would exceed \$300 billion per year by 2050.^{31/32}

Flooded farmland in the Limpopo River Basin, Mozambique.

© dive-shirley/greenpeace



• Yet, the climate change working group of the UNEP Finance Initiative has since said: “worldwide economic losses due to natural disasters appear to be doubling every ten years and, on current trends, *annual losses will reach almost \$150 billion in the next decade*”³³ [our emphasis].

ExxonMobil’s potential financial exposure to claims for damages can be seen by considering the sectors affected by more intense heatwaves, fewer cold spells and more intense precipitation – the changes in climate that the IPCC considers very likely³⁴ in the 21st century. These include electricity generation, construction, forestry, water supply, agriculture, industry, health, transport and tourism.³⁵

The costs for ExxonMobil could clearly be vast.

6.2 what must exxonmobil do?

friends of the earth calls on exxonmobil to:

- State publicly that the evidence presented by the Intergovernmental Panel on Climate Change now demonstrates that man-made climate change is happening and that the burning of fossil fuels is the major cause of the problem.
- Stop funding organisations that strive to undermine the consensus that burning fossil fuels is the major cause of man-made climate change and/or which seek to prevent action being taken to cut emissions.
- Support publicly the entry into force of the internationally agreed Kyoto Protocol, including its mandatory cuts in carbon dioxide emissions, fully support the effective implementation of the Protocol and the wider provisions of the United Nations Framework Convention on Climate Change and play a constructive role in the negotiation of future agreements to stop dangerous climate change.
- State publicly that it is responsible for causing man-made climate change.
- Assess its potential liability for the current and future damage caused by climate change and set aside a segregated fund to meet claims that may, in the future, be made against it.

references

This summary report is based on previous research commissioned by Friends of the Earth. Unless otherwise stated all the figures used in this summary are from the two documents below.

- ExxonMobil Corporation Emissions Inventory 1882-2002: Methods and Results, plus associated spreadsheets, 30 pages + 90 pages. Richard Heede, Climate Mitigation Services, Snowmass, Colorado. Dec 2003.
- Assessing the Effects of CO₂, CH₄ and N₂O Emissions on Atmospheric Concentrations, Changes in Radiative Forcing, Changes in Global Mean Surface Temperature, and Changes in Sea Level: A Case Study. Jim Salinger and Greg Bodeker, National Institute of Water & Atmospheric Research Ltd. Dec 2003.



30 | “World Disasters Report: focus on ethics in aid” International Federation of Red Cross and Red Crescent Societies 2003 Table 8

31 | UNEP Press Notice “Global warming may cost the world...” (3 February, 2001)

32 | “Insuring against catastrophe” Our Planet Berz G 2001

33 | “Climate risk to global economy” CEO briefing http://unepfi.net/cc/ceobriefing_ccwg_unepfi.pdf UNEP Finance Initiatives. July 2002.

34 | Third Assessment Report - Working Group I “The Scientific Basis” Summary for Policy Makers, Intergovernmental Panel on Climate Change. 2001, Table 1. Very likely refers to a judgmental estimate of confidence by Working Group 1 that an event has a 90-99% chance of occurring.

35 | Third Assessment Report – Working Group II “Climate change 2001: impacts, adaptation and vulnerability”. Intergovernmental Panel on Climate Change. 2001, Table 8.1.

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