

FOSSIL  
REVOLUTION

GREENPEACE

# ADVERTISING CLIMATE CHAOS:

How much is  
advertising  
cars and  
flights  
fuelling  
the climate  
emergency?



*“The most affected people  
in the most affected areas  
still remain unheard and  
the voices of future generations  
are drowning in... greenwash  
and empty words and promises”.*

COP26, 5 Nov 2021, Greta Thunberg

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# EXECUTIVE SUMMARY

The climate crisis is accelerating, emissions from the transport sector are rising, and the last seven years were globally the warmest on record.<sup>1</sup>

Despite this, airlines and carmakers continue to advertise high-emitting products such as flights, SUVs, and internal combustion engine (ICE) vehicles. They do so with the obvious intent of increasing the consumption of fossil fuel-based transport to make profits.

This is big business. These industries, particularly car companies, are often among the top ten advertisers in European Union (EU) countries. This means that in the EU car makers and airline companies, who are some of the biggest emitters in the EU energy sectors,<sup>2</sup> and have some of the biggest advertising budgets in multiple countries in Europe,<sup>3</sup> are promoting fossil fuel powered flights and cars and not revealing the impact of their advertisements

on subsequent emissions. This pattern is mirrored elsewhere globally, with the UK car industry spending £1.9 billion in 2019 on digital advertising alone.<sup>4</sup>

In this report, The New Weather Institute and Greenpeace estimate for the first time the total impact of car and airline advertising on fossil fuel based consumption patterns and the subsequent carbon emissions, both globally and within the EU in 2019.

We estimate that globally car and airline advertising in 2019 could be responsible for between 202 and 606 million tonnes (Mt) of greenhouse gas emissions (CO<sub>2</sub>e). This ranges from the Netherlands' entire GHG emissions in 2019 to almost twice the amount of Spain's total emissions in 2019. Within the EU, ads from these companies are linked to an estimated maximum of 122 MtCO<sub>2</sub>e of emissions, which is more than Belgium's total GHG emissions in 2019<sup>5</sup>.

1 Copernicus "Globally, the seven hottest years on record were the last seven; carbon dioxide and methane concentrations continue to rise" 10th January 2022 <https://climate.copernicus.eu/copernicus-globally-seven-hottest-years-record-were-last-seven>

2 EEA, Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021, May 2021 [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party) Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021, page 84

3 Forbes, Exclusive: Top Investors in Internet Advertising in 2020, and the Sites That Attracted the Most Ad Volumes 17th February 2021. Secondary source Statista Companies with the highest online advertising budgets in Romania 2020 <https://www.statista.com/statistics/1263558/romania-companies-with-the-largest-online-advertising-budget/>

Kantar/ Statista Leading advertisers in France in 2020, by advertising spending <https://www.statista.com/statistics/435380/highest-spending-advertisers-in-france/> secondary source. Secondary source Delphine Le Goff 07/04/2021 <https://www.strategies.fr/actualites/medias/4059054W/etude-kantar-un-top-100-annonceurs-marque-par-la-covid.html>

Resumé Kantar Sifos Reklamätningar 4th February 2020 <https://www.resume.se/affarer/annonsorer/de-var-sveriges-storsta-annonsorer-2019/>

Nielsen; Dentsu; Brand News Media Group March 2021 <https://www.brand-news.it/intelligence/dati/pubblicita-volkswagen-top-spender-in-italia-anche-nel-2020-con-99-milioni/>

InfoAdex; Reason Why Spain The InfoAdex 2021 Study, in graphs February 2021 <https://www.reasonwhy.es/actualidad/estudio-infoadex-2021-inversion-publicitaria-graficos>

4 ActiveWin HOW MUCH DO CAR COMPANIES SPEND ON MARKETING? December 2020 <https://www.activewin.co.uk/blog/how-much-do-car-companies-spend-on-marketing/#~:text=Recent%20studies%20suggest%20that%20in,digital%20ad's%20by%20the%20UK.>

5 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Belgium 2019 117MtCO<sub>2</sub>e (Ex-

Stopping these ads could therefore have a significant impact in cutting Europe's emissions in the short term, by removing the ability of polluting companies to promote dirty products and services, and by changing attitudes towards fossil fuel consumption and promotion.


Greenpeace, the New Weather Institute and 30 other NGOs and movement partners are also campaigning for a wider [ban on fossil fuel advertising and sponsorships](#), in response to the climate, nature and public health crises associated with the continued extraction and burning of oil, coal and gas. This would affect carmakers, airlines and fossil fuel companies, prohibiting any company whose business encourages the unsustainable consumption of fossil fuels from running adverts or buying sponsorships. If one million EU citizens sign this initiative, the European Commission will be required to consider introducing a new law.

The current report, however, is limited in scope to only carmakers and airlines. It is also limited in time: we have not considered historical emissions and the extent to which these were encouraged by advertising. This means that the overall impact of 'fossil fuel advertising' is certainly far greater than what we are

presently able to show. These decisions were necessary due to the many challenges faced in compiling the data. These challenges, along with our methodology and the data we used, are detailed below.

We call on carmakers, airlines and the advertising industry to publish the necessary data to improve this model. This would be a welcome step to enable researchers to paint a clearer picture of the contribution of advertising to the climate crisis, a matter of essential public interest. In particular we are calling for greater transparency, in a manner subject to independent verification, around companies' Return on Advertising Spend (ROAS) – a key variable in our calculations.

Rapid, large-scale and unprecedented climate action is needed to preserve a habitable planet, and yet companies are still able to promote climate-wrecking products - in the way that they were once able to promote lethal tobacco products - with little to no restrictions. This must change. The decision to end tobacco advertising in the interests of public health shows that change is possible. Companies should no longer be allowed to encourage the consumption of products that perpetuate and worsen the climate crisis.



*"From the advertising sector's perspective, sometimes it will be better for your client not to turn up... It will do them no good because they will be pilloried because their attempt to greenwash themselves will ultimately not succeed".*

Charles Ogilvie, COP 26 climate summit, Strategy Director for the UK government<sup>6</sup>

cluding emissions relating to land use, land-use change and forestry)[https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

<sup>6</sup> Advertising Association, December 16, 2020, Ad Net Zero: COP26 Briefing with Strategy Director, Charles Ogilvie <https://adassoc.org.uk/events/ad-net-zero-cop26-briefing-with-strategydirector-charles-ogilvie/>

# KEY CALCULATIONS



**A** note on the figures: our estimate for the additional emissions that result from the increased consumption of cars and flights due to advertising, are expressed in a possible range. Without access to commercially guarded figures on the two sectors' actual returns on advertising spending that would allow a single figure to be generated, our estimates provide a low-to-high range based on a few, selected, typical ratios for the returns on spending on advertising. Further below we provide figures for the ratios 2:1, 4:1, and 6:1.

## CAR INDUSTRY CALCULATIONS

### GLOBAL

- GHG emissions that could be influenced by global car advertising in 2019 are estimated to be up to 572MtCO<sub>2</sub>e. This is significantly higher<sup>7</sup> than Australia's total GHG emissions in 2019 (545MtCO<sub>2</sub>e).<sup>8</sup>

- The full possible range using our selected ratios of the emissions that could be influenced by global car advertising is estimated to be between 572MtCO<sub>2</sub>e and 191MtCO<sub>2</sub>e.
- This means at our minimum estimate, the GHG emissions influenced by global car advertising in 2019 would be over the total GHG emissions of the Netherlands in 2019 (180MtCO<sub>2</sub>e).<sup>9</sup>

### EUROPEAN

- GHG emissions that could be influenced by car advertising in the EU in 2019 are estimated to be up to 113MtCO<sub>2</sub>e. This would be more than Romania's total GHG emissions in 2019 (112MtCO<sub>2</sub>e).<sup>10</sup> Romania was the fifth largest coal consuming country in the EU in 2020.<sup>11</sup>
- The full range of the emissions that could be influenced by car advertising in the EU in 2019 is estimated to be between 38MtCO<sub>2</sub>e and 113MtCO<sub>2</sub>e.
- This means at our minimum estimate, the GHG emissions influenced by EU based car advertising in 2019 would be 2MtCO<sub>2</sub>e less than Slovakia's total GHG emissions in 2019.<sup>12</sup>

7 27MtCO<sub>2</sub>e which is the equivalent of burning 13,500,000t of coal according to United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator March 2021 <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (equivalent from pounds to kg transferred)

8 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Australia 2019 545MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

9 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Netherlands 2019 180MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

10 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Romania 2019 112MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

11 Country Watch Largest coal consuming countries in Europe in 2020 August 2021 <https://www.countrywatch.com/>

12 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Slovakia 2019 40MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

## AIRLINE INDUSTRY CALCULATIONS

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### GLOBAL

- Greenhouse gas emissions influenced by airline advertising in 2019 could be up to 34MtCO<sub>2</sub>e globally. This is the equivalent of 17,000,000t of coal burnt.<sup>13</sup>
- The full range of the global emissions that could be influenced by airline advertising is between 11MtCO<sub>2</sub>e and 34MtCO<sub>2</sub>e.
- This means at our minimum estimate, the GHG emissions influenced by global airline advertising in 2019 would be the equivalent to burning 5,510t of coal.<sup>14</sup>

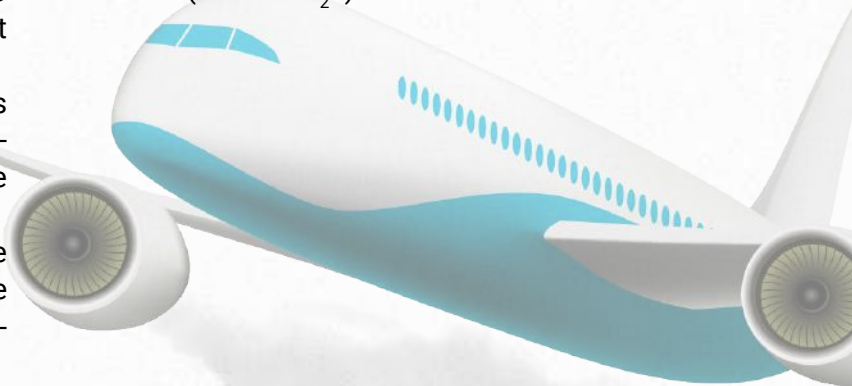
### EUROPEAN

- Greenhouse gas emissions influenced by airline advertising in 2019 could be up to 9MtCO<sub>2</sub>e in the EU. This is the equivalent to burning 4,510t of coal.<sup>15</sup>
- The full range of the European emissions that could be influenced by airline companies' advertisements is estimated to be between 3MtCO<sub>2</sub>e and 9MtCO<sub>2</sub>e
- This means at our minimum estimate, the GHG emissions influenced by EU airline advertising in 2019 would be the equivalent of burning or 1,500t of coal.<sup>16</sup>

## GLOBAL CAR AND AIRLINE EMISSIONS RESULTING FROM ADVERTISING COMBINED

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- If we combine the emissions resulting from advertising from the automotive and airline industries globally using the 6:1 ratio, we can estimate the combined advertising emissions would add up to (572MtCO<sub>2</sub>e + 34MtCO<sub>2</sub>e) 606MtCO<sub>2</sub>e. This is almost as much as twice the amount of Spain's total GHG emissions in 2019<sup>17</sup> (315MtCO<sub>2</sub>e - 2 = 630MtCO<sub>2</sub>e).
- If we use the minimum ratio (2:1) and add up the minimum estimated emissions from the automotive and airline industries globally in 2019 it would reach (191MtCO<sub>2</sub>e + 11MtCO<sub>2</sub>e) 202MtCO<sub>2</sub>e more than the Netherlands total GHG emissions in 2019 (180MtCO<sub>2</sub>e).<sup>18</sup>



13 United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator March 2021 <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (equivalent from pounds to kg transferred)

14 United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator March 2021 <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (equivalent from pounds to kg transferred)

15 United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator March 2021 <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (equivalent from pounds to kg transferred)

16 United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator March 2021 <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (equivalent from pounds to kg transferred)

17 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Spain 2019 315MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party) Total GHG emissions without LULUCF

18 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Netherlands 2019 180MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

## EUROPEAN CAR AND AIRLINE EMISSIONS RESULTING FROM ADVERTISING COMBINED

- If we combine the maximum estimated emissions resulting from advertising from the automotive and airline industries across the EU, we can estimate the combined advertising emissions would add up to  $(113\text{MtCO}_2\text{e} + 9\text{MtCO}_2\text{e})$   $122\text{MtCO}_2\text{e}$ . This is more than Belgium's total GHG emissions in 2019 ( $117\text{MtCO}_2\text{e}$ ).<sup>19</sup>
- If we use the minimum ratio (2:1) and added up the minimum estimated emissions from the automotive and airline industries in the EU ( $3\text{MtCO}_2\text{e} + 38\text{MtCO}_2\text{e}$ )  $41\text{MtCO}_2\text{e}$  this would amount to roughly the total GHG emissions of Denmark in 2019 ( $46\text{MtCO}_2\text{e}$ ).<sup>20</sup>

The advertising industry has developed a number of metrics which it uses to quantify the impact advertising campaigns have on its revenues from customers. It uses this information to demonstrate the value advertising can add to a company's activities. One of these metrics is the Return on Advertising Spend or ROAS. This measure attempts to quantify the impact of an advertising campaign by taking the increase in revenue brought about by the campaign and dividing that by the money spent on the campaign (similar to a Return on Investment calculation used by businesses to compare different investments, but narrowly focusing on advertising spend only and excluding other costs).

If the advertising industry is responsible for influencing increases in revenue as a result of increasing sales of the goods and services of its customers, then a question arises: should it also bear some responsibility for its role in increasing carbon emissions as well?



A group made up of advertising insiders called the Purpose Disruptors<sup>21</sup> proposed that new metrics should be developed to quantify advertising's impact on climate change and this analysis has been influenced by their work.<sup>22</sup> The Purpose Disruptors issued a challenge to their industry to make better data available to allow these sorts of analyses to happen as a matter of course. Key data needed

<sup>19</sup> United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Belgium 2019  $117\text{MtCO}_2\text{e}$  (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

<sup>20</sup> United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Denmark 2019  $46\text{MtCO}_2\text{e}$  (Excluding emissions relating to land use, land-use change and forestry) [https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

<sup>21</sup> Purpose Disruptors Advertised Emissions November 2021 <https://www.purposedisruptors.org/advertised-emissions>

<sup>22</sup> Badvertising MEASURING THE CARBON IMPACT OF ADVERTISING November 2020 <https://www.badverts.org/latest/measuring-the-carbon-impact-of-advertising>

to calculate these estimates are not readily available. However it is possible to piece together sufficient information to derive an estimate of broadly where the true value is likely to lie. Our estimates are expressed across a range of the values typically found for ROAS and are made on the basis of available data using a number of normative assumptions.

With better data it will be possible to refine these estimates. We encourage the industry to publish this data so that a better understanding of the scale of advertising's contribution to climate change can be obtained. This is a discussion paper to boost debate around the role of advertising in driving up CO<sub>2</sub> emissions, and we welcome receiving more transparent data particularly demonstrating the ROAS from relevant companies.

## METHODOLOGY

Due to the lack of publicly accessible data showing the Return on Advertising Spend (ROAS) for high carbon industries, we have calculated the extent to which airline and car companies' advertisements and subsequent sales are encouraging an increase in carbon emissions based on a range of ROAS values commonly reported across a range of businesses, and using standard, available data on the emissions of the sector on a global scale. These are estimates due to the lack of transparency from the automotive and airline industries regarding their return on advertising spend. Should these sectors wish to have more accurate data in the public domain, we would welcome access to their ROAS figures.

## ADVERTISING SPEND

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The first data point that we need is an estimate of the total advertising spend by the industry as a whole. In the case of both the airline and automotive industries these global figures are not readily available.

A ranking of US advertising spend is collated each year in the Ad Age Leading National Advertisers 2020 Fact Pack,<sup>23</sup> and this publication includes a number of major automotive brands and airlines. In addition to this advertising spend data we sourced data on revenues by these companies listed in table 1 and 2 from their Form 10-K annual report submitted to the Securities and Exchange Commission (and in many cases this report also contains estimates of advertising and promotional expenses for the reporting year).

By taking this spend and dividing it by the revenue generated by the airline or automotive manufacturer in the US we can estimate the advertising spend as a percentage of revenue.

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23 Ad Age Leading National Advertisers Fact Pack 2020 [https://s3-prod.adage.com/s3fs-public/2020-07/lnafp\\_aa\\_20200713\\_locked.pdf](https://s3-prod.adage.com/s3fs-public/2020-07/lnafp_aa_20200713_locked.pdf)

# TABLE 1

## US ADVERTISING SPEND AND REVENUES BY MAJOR AUTOMOTIVE COMPANIES<sup>24</sup>

Company	Ad Spend (Million)	Revenues (Million)	Ad Spend %
Delta Air Lines	\$288	\$47,007	0.6%
Southwest Airlines	\$212	\$22,428	0.9%
United Airlines	\$212	\$43,259	0.5%
American Airlines	\$129	\$45,768	0.3%
Alaska Airlines	\$72	\$8,781	0.8%
JetBlue Airlines	\$66	\$8,094	0.8%

# TABLE 2

## US ADVERTISING SPEND AND REVENUES BY MAJOR AIRLINE COMPANIES

Company	Ad Spend (Million)	Revenues (Million) <sup>24</sup>	Ad Spend %
GM	\$2,952	\$96,733	3.1%
Ford	\$2,280	\$98,053	2.3%
Fiat Chrysler	\$2,053	\$65,556	3.1%
Toyota	\$1,508	\$96,236	1.6%
Honda	\$1,390	\$77,445	1.8%
Nissan	\$990	\$48,958	2.0%
Volkswagen	\$780	\$38,741	2.0%
Hyundai	\$627	\$31,009	2.0%

<sup>24</sup> Ad Age Leading National Advertisers Fact Pack 2020 [https://s3-prod.adage.com/s3fs-public/2020-07/lnafp\\_aa\\_20200713\\_locked.pdf](https://s3-prod.adage.com/s3fs-public/2020-07/lnafp_aa_20200713_locked.pdf); and Form 10-K annual reports submitted to the Securities and Exchange Commission.

<sup>24</sup> The dollar amount given here has in some cases been converted from other currencies, mostly using exchange rates published in the company's Form 10-K or using a typical exchange rate for 2019 if the rate was not published in the report.

If we then make the assumption that US airline and car manufacturer advertising spend as a percentage of revenues is typical of the global industry then we can use estimates of total global revenue to derive an estimate of advertising spend by the global industry.

Industry market research firm IBISWorld publishes data for the global passenger car market<sup>25</sup> and estimates that in 2019 global revenues amounted to just under \$3 trillion. This is corroborated by analysis by McKinsey<sup>26</sup> which found a vehicle sales market size of \$2.75 trillion growing at 2% per annum. An alternative way to look at global passenger car revenue is to use the average price of cars in different markets<sup>27</sup> and weight that price by the number of cars sold.<sup>28</sup> This gives a global average price of about \$28,600 and implies a total market of around \$2.5 trillion.

Adopting the lower estimate of global automotive revenues (\$2.5 trillion) and applying a median value for the estimate of advertising spend (2%) implies global advertising spend by the automotive industry in the region of \$50 billion per year. This estimate is backed up by market research<sup>29</sup> which suggests that in 14 markets representing 74% of car sales, \$35.5 billion was spent on advertising in 2018. Extrapolated to 100% of car sales this would imply advertising expenditure of around \$48 billion.

The International Air Transport Association (IATA) publishes revenue data for the global airline industry split by cargo and passenger operations.<sup>30</sup> Global passenger revenues in 2019 were reported to be \$607 billion. Total revenue passenger-km (RPKs) in that year amounted to nearly 8,700 billion RPKs so the revenue per RPK equates to around \$0.10/RPK.

## GREENHOUSE GAS EMISSIONS PER DOLLAR OF REVENUE

In order to calculate the greenhouse gas emissions per dollar of revenue generated it was necessary to derive an estimate of the total greenhouse gas emissions generated by new passenger cars and passenger flights in 2019.

The greenhouse gas emissions of car production goes beyond the fuel burnt by the vehicle and include the vehicle manufacturing emissions (which are all generated at the start of the vehicle's life and so can be allocated to the first year of use) and the emissions associated with the production of the fuel (which adds around 25% to the emissions associated with the combustion of fuel<sup>31</sup>).

25 Ibis World Global Car & Automobile Manufacturing - Market Size 2005–2027 April 2021 <https://www.ibisworld.com/global/market-size/global-car-automobile-manufacturing/>

26 Paul Gao, Hans-Werner Kaas, Detlev Mohr und Dominik Wee McKinsey & Company Automotive revolution- perspective towards 2030 <https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/disruptive-trends-that-will-transform-the-auto-industry/de-DE>

27 Munoz Felipe Jato Electric cars cost double the price of other cars on the market today October 2021 <https://www.jato.com/electric-cars-cost-double-the-price-of-other-cars-on-the-market-today/>

28 IEA Global car sales by key markets, 2005-2020 17th May 2020 <https://www.iea.org/data-and-statistics/charts/global-car-sales-by-key-markets-2005-2020>

29 Zenith Global Intelligence: automotive adspend forecasts 2019 <https://www.zenithmedia.com/wp-content/uploads/2019/03/Automotive-adspend-forecasts-2019-executive-summary.pdf>

30 <https://www.iata.org/en/publications/economics/?page=1&Search=&EconomicsL1=149&EconomicsL2=150&Ordering=DateDesc>

31 <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021> Average WTT emissions for petrol and diesel are 0.61kgCO<sub>2</sub>e/litre while average TTW emissions are 2.35kgCO<sub>2</sub>e/kWh

Using reviews of life cycle assessments by the International Council on Clean Transportation<sup>32</sup> and Transport and Environment (ICCT)<sup>33</sup> produces an estimate of lifecycle emissions for petrol and diesel cars of around 54tCO<sub>2</sub>e for medium-sized cars over 225,000km. Applying this figure to the 87 million vehicles registered in 2019 implies that each year of new car sales adds around 5GtCO<sub>2</sub>e to the atmosphere over the vehicles' lifetimes. This estimate is corroborated by research published by Greenpeace<sup>34</sup> which found that in 2018 the automotive industry's total greenhouse gas emissions amounted to 4.9GtCO<sub>2</sub>e, greater than the EU's total greenhouse gas emissions that year.

On the basis of a \$2.5 trillion global passenger car market, the industry generates lifecycle emissions of around 1.9kgCO<sub>2</sub>e/\$.

Estimates of the aviation industry's greenhouse gas emissions are published by IATA who estimate that 905MtCO<sub>2</sub> was generated by airlines in 2018.<sup>35</sup> This represents direct CO<sub>2</sub> emissions from the combustion of the fuel only. The extraction, refining and transportation of aviation fuel adds a further 21% in 'well-to-tank' emissions to this figure.<sup>36</sup>

In that year airlines generated around \$100 billion in freight revenues and \$600 billion in passenger revenues. Using these revenue figures to allocate the emissions between

freight and passengers, we estimate that emissions from passenger travel generated around 776MtCO<sub>2</sub> of direct emissions. For comparison, the ICCT publishes an independent estimate of emissions from passenger travel each year and estimates that passenger transport generated 785MtCO<sub>2</sub>.<sup>37</sup>

By combining the well-to-tank emissions with the direct emissions and dividing by the passenger revenue we estimate that the emissions per dollar of revenue generated from passenger travel equate to around 1.54kgCO<sub>2</sub>e/\$.

## RETURN ON ADVERTISING SPEND

The final component of the calculation is an estimate of the increase in revenue brought about by advertising as a ratio of the spend on advertising (the Return on Advertising Spend or ROAS). Publicly available data on what sort of average ROAS can be expected for airline or automotive advertising is not readily available.

Published benchmarking for the retail sector suggests that the average ROAS is around 3:1 (i.e. for every \$1 spent on advertising, \$3 of revenue is generated)<sup>38</sup> but ranges from below 2:1 up to 4:1 depending on the channel.<sup>39</sup> Research published by the Purpose

32 Georg Bieker A GLOBAL COMPARISON OF THE LIFE-CYCLE GREENHOUSE GAS EMISSIONS OF COMBUSTION ENGINE AND ELECTRIC PASSENGER CARS July 2021 ICCT The International Council on Clean Transportation <https://theicct.org/publications/global-LCA-passenger-cars-jul2021>

33 Lucien Matheiu How clean are electric cars? Transport and Environment April 2020 <https://www.transportenvironment.org/discover/how-clean-are-electric-cars/>

34 Greenpeace International Car industry's 2018 carbon footprint exceeds EU greenhouse gas emissions. Crashing the climate <https://www.greenpeace.de/publikationen/crashing-climate> ; <https://www.greenpeace.org/international/press-release/24131/car-industrys-2018-carbon-footprint-exceeds-eu-greenhouse-gas-emissions-greenpeace/>

35 <https://www.iata.org/en/iata-repository/publications/economic-reports/airline-industry-economic-performance---june-2019---report/>

36 <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021> Average WTT emissions for aviation turbine fuels are 0.53kgCO<sub>2</sub>e/litre while TTW emissions are 2.55kgCO<sub>2</sub>e/kWh.

37 Brandon Graver, Ph.D., Dan Rutherford, Ph.D., and Sola Zheng CO2 EMISSIONS FROM COMMERCIAL AVIATION: 2013, 2018, AND 2019 October 8th 2020 ICCT (The International Council on Clean Transportation) <https://theicct.org/publications/co2-emissions-commercial-aviation-2020>

38 <https://info.ncsolutions.com/blog/ncs-announces-roas-benchmarks-across-media>

39 For example, Google ads are estimated to deliver an ROAS of 2:1 <https://economicimpact.google.com/methodology/>

Disruptors found that between 2013 and 2019, for every £1 spent on advertising, between £5.50 and £6.30 of UK economic activity was generated.<sup>40</sup> This was backed up by research in 2011 commissioned by the Advertising Association which estimated that each £1 spent on advertising generated £6 of economic activity.<sup>41</sup>

Businesses with thin margins need to achieve a higher ROAS in order to avoid the advertising costs eroding those margins. Many automotive manufacturers and airlines have, overall, comparatively slender margins.<sup>42</sup>



## RESULTS

The graphs below show how the quantity of greenhouse gas emissions which could be attributed to the advertising purchased by the car and airline industries varies with increasing ROAS.

Figure 3 shows that likely values of ROAS imply that tens of megatonnes of greenhouse gas emissions could plausibly be attributed to global airline advertising spend:

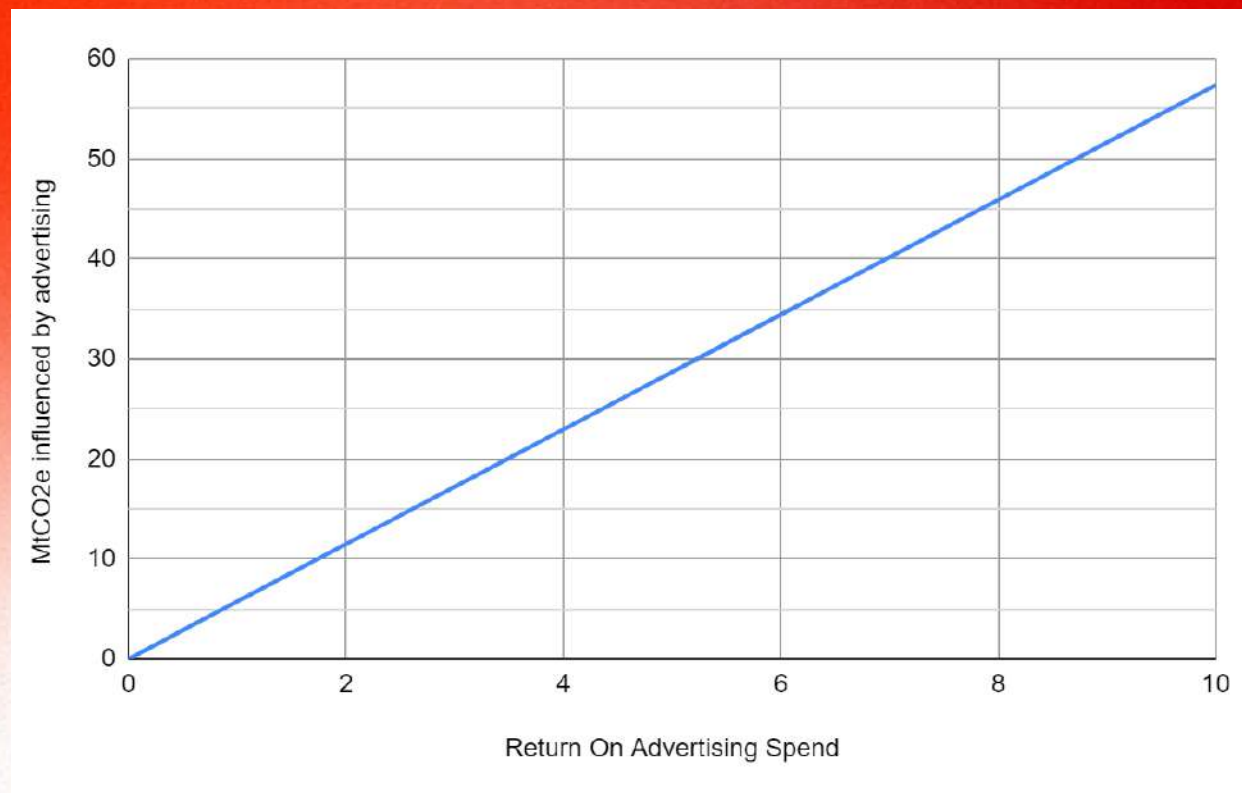
<sup>40</sup> Purpose Disruptors Advertised Emissions November 2021 <https://www.purposedisruptors.org/advertised-emissions>

<sup>41</sup> Advertising Association Deloitte Advertising Pays: How advertising fuels the EU Economy 2020 <https://eaca.eu/wp-content/uploads/2017/11/advertising-pays-how-advertising-fuels-the-uk-economy.pdf>

<sup>42</sup> In 2020 car makers made average margins of 5% according to David Bailey, Professor of industrial strategy David Bailey at Birmingham Business School, <https://cardealermagazine.co.uk/publish/how-much-profit-do-car-manufacturers-make-on-new-cars-the-truth-versus-perception/234641> For airlines overall in normal circumstances it is very similar, projected pre-pandemic to be 5.5% in 2020 <https://www.statista.com/statistics/225856/ebit-margin-of-commercial-airlines-world-wide/>

# FIGURE 3

## GREENHOUSE GAS EMISSIONS INFLUENCED BY GLOBAL AIRLINE ADVERTISING AGAINST RETURN ON ADVERTISING SPEND IN 2019



We note that the wider travel industry makes extensive use of advertising to promote international mobility which is overwhelmingly via aircraft but the impact of this advertising was not included in this analysis.

Based on the level of ROAS which can be expected from advertising, the following estimates for greenhouse gas emissions

influenced by advertising for the airline industry, both globally and for the European Union, are given in Table 4 below. EU emissions were estimated using the EU's share (26.8%) of 2019 revenue passenger-km according to IATA.<sup>43</sup>

<sup>43</sup> IATA Air Passenger Market Analysis January 2020 <https://www.iata.org/en/iata-repository/publications/economic-reports/air-passenger-market-analysis---jan-2020/>

# TABLE 4

## GREENHOUSE GAS EMISSIONS INFLUENCED BY AIRLINE ADVERTISING FOR EXAMPLE VALUES OF RETURN ON ADVERTISING SPEND IN 2019

Return on Advertising Spend	Global Airline Emissions Influenced by Advertising	EU Airline Emissions Influenced by Advertising
2:1	11MtCO <sub>2</sub> e	3MtCO <sub>2</sub> e
4:1	23MtCO <sub>2</sub> e	6MtCO <sub>2</sub> e
6:1	34MtCO <sub>2</sub> e	9MtCO <sub>2</sub> e

If we assumed a ROAS of 6:1 (our maximum estimate) is achieved by advertising for the airline industry, the emissions which can be attributed to advertising would be in the order of 34MtCO<sub>2</sub>e for global aviation and 9MtCO<sub>2</sub>e for European aviation. The former amounts to the equivalent of 17,000t of coal burnt. The latter amounts to the equivalent of burning 4,510t of coal.

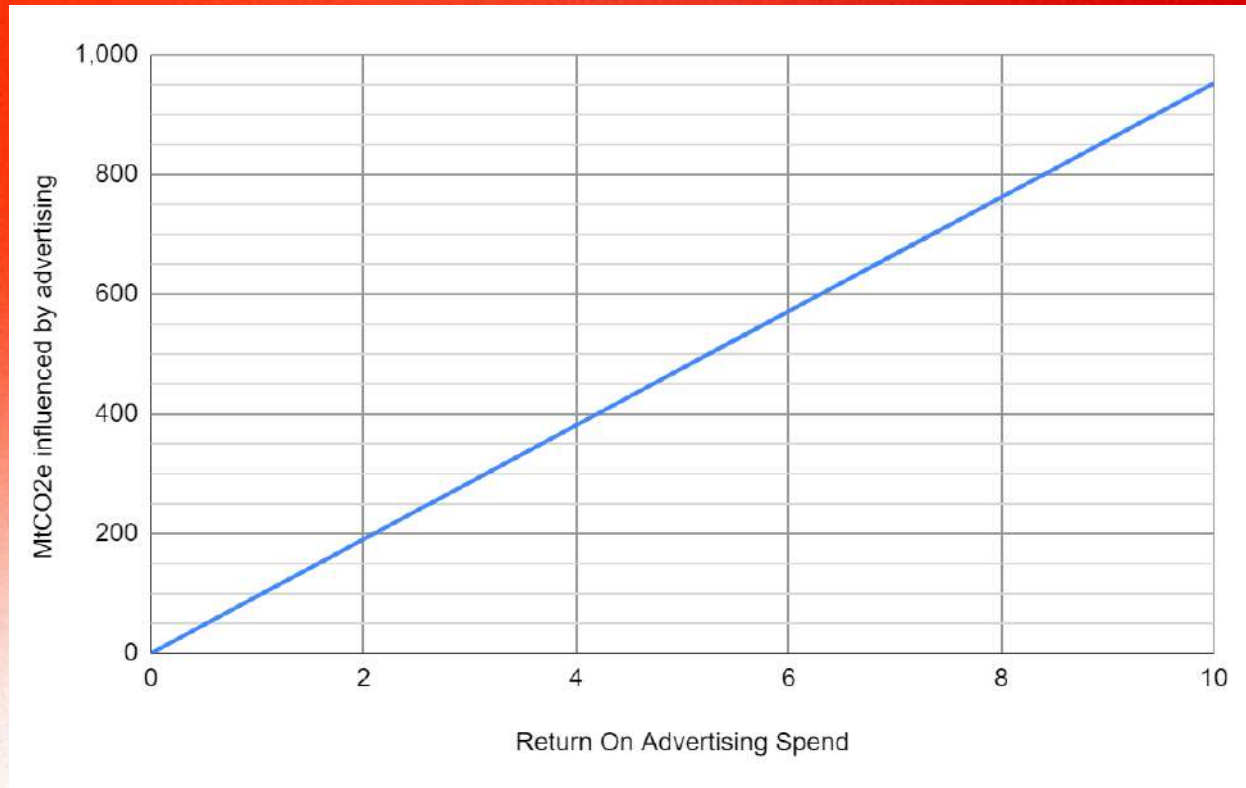
We also note that the greenhouse gas emissions arising from aviation fuel combustion are only one part of aviation's impact on climate change. The latest estimates suggest that the non-CO<sub>2</sub> warming effects of aviation (e.g. from soot particles, contrails and cirrus-cloud formation) could outweigh the impact of CO<sub>2</sub> generated from the combustion of fuel by a factor of 2:1,<sup>44</sup> implying that the total contribution to warming is likely to be substantially greater than the above estimates.

The second chart in Figure 5 shows that the cumulative, lifetime emissions attributable to advertising spend for the global automotive industry is likely to be in the order of hundreds of millions of tonnes of CO<sub>2</sub>e:

<sup>44</sup> Carbon Brief Prof David S Lee Guest post: Calculating the true climate impact of aviation emissions 21 September 2020 <https://www.carbonbrief.org/guest-post-calculating-the-true-climate-impact-of-aviation-emissions>

# FIGURE 5

## GREENHOUSE GAS EMISSIONS INFLUENCED BY GLOBAL CAR ADVERTISING AGAINST RETURN ON ADVERTISING SPEND IN 2019



Based on the level of ROAS which can be expected from advertising, the following estimates for greenhouse gas emissions influenced by advertising for the automotive industry, both globally and for the European

Union, are given in Table 6 below. EU emissions were estimated using the EU's share (19.8%) of 2019 car registrations according to the IEA:<sup>45</sup>

<sup>45</sup> IEA Global car sales by key markets 2005-2020 17th May 2020 <https://www.iea.org/data-and-statistics/charts/global-car-sales-by-key-markets-2005-2020>

# TABLE 6

## LIFETIME GREENHOUSE GAS EMISSIONS INFLUENCED BY CAR ADVERTISING FOR EXAMPLE VALUES OF RETURN ON ADVERTISING SPEND IN 2019

Return on Advertising Spend	Global Automotive Emissions Influenced by Advertising	EU Automotive Emissions Influenced by Advertising
2:1	191MtCO <sub>2</sub> e	38MtCO <sub>2</sub> e
4:1	381MtCO <sub>2</sub> e	75MtCO <sub>2</sub> e
6:1	572MtCO <sub>2</sub> e	113MtCO <sub>2</sub> e

If we assume a maximum estimate, with a ROAS of 6:1 is achieved by advertising for the automotive industry's advertising activities, the emissions which can be attributed to advertising would be between 572MtCO<sub>2</sub>e for global automotive emissions and 113MtCO<sub>2</sub>e for European aviation emissions. The global figure amounts to 572MtCO<sub>2</sub>e which is

significantly higher<sup>46</sup> than Australia's total GHG emissions in 2019 (545MtCO<sub>2</sub>e).<sup>47</sup> The European figure amounts to 113MtCO<sub>2</sub>e. This would be more than Romania's total GHG emissions in 2019 (112MtCO<sub>2</sub>e). Romania was the fifth largest coal consuming country in the EU in 2020<sup>48</sup>.

46 27MtCO<sub>2</sub>e which is the equivalent of burning 13536kg of coal. United States Environmental Protection Agency Greenhouse Gas Equivalencies Calculator March 2021 <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> (equivalent from pounds to kg transferred)

47 United Nations Climate Change Greenhouse Gas Inventory Data - Detailed data by Party. Australia 2019 545MtCO<sub>2</sub>e (Excluding emissions relating to land use, land-use change and forestry)[https://di.unfccc.int/detailed\\_data\\_by\\_party](https://di.unfccc.int/detailed_data_by_party)

48 Country Watch Largest coal consuming countries in Europe in 2020 August 2021 <https://www.countrywatch.com/>

# CONCLUSION

This paper sheds light on what we already know. Flying and driving hybrid and ICE cars has a huge negative impact on the climate emergency, in 2019 27% of the EU's emissions came from road transportation alone<sup>49</sup>. With that knowledge, allowing companies to advertise heavily polluting products for profit has a wrecking effect on all other efforts at stopping the ever worsening climate emergency. Thankfully, there is a growing movement to end fossil advertisements, but we need to go further, we need laws applied internationally to stop the prolific greenwashing

and high carbon advertisements that are delaying climate action. Thankfully, we have an opportunity to stop this. If the [European Citizens Initiative](#) that calls on the European Commission to legally end fossil advertisements and sponsorships reaches one million signatures, the EU Commission will have to consider this as a law. The EU has already introduced a directive banning cross border tobacco advertising and sponsorships for our collective health. Now it's time for a similar law against fossil fuel industries for the health of the planet and the preservation of our future.

This briefing was commissioned by Greenpeace Netherlands, published by GP Nordics and researched and published by the New Weather Institute.

The Greenpeace logo, featuring the word "GREENPEACE" in a bold, green, sans-serif font.

<sup>49</sup> EEA, Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021, May 2021 [https://di.un-fccc.int/detailed\\_data\\_by\\_party](https://di.un-fccc.int/detailed_data_by_party) Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021, page 84