



Dirty Snow

**The Snow Thieves 2 report:
how a ban on polluter
sponsorships in winter sport
can help save our snow**





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This report is produced by New Weather Institute UK and Sweden as part of Save Our Snow, a joint campaign to end fossil sponsorships in sports.

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Summary



Key findings:

- Climate change is an immediate threat to winter sports. On current trends, in mid-latitudes in the Northern Hemisphere winters are expected to continue to shrink by 4.7 days per decade. In a high emission scenario, by the end of the century, that means winter could be as short as 31 days, a single month.¹
- But, winter sports are currently being sponsored by the very companies whose pollution heats the atmosphere, melting the snow and ice they depend on.
- Using a calculation for the known relationship between emissions and snow cover loss, the existing CO₂ emissions of seven polluting winter sports sponsors (Audi, Ford, SAS, Equinor, Aker, Volvo, Preem), presented here as case studies, will melt an area 1,968 square kilometres (km²) of spring snow every year. That is equal to a land surface area 437 times bigger than the ground area used for skiing of Åre, Sweden's largest ski resort and a potential bidder for the 2030 Winter Olympics; and 195 times bigger than the skiing area of Skicircus Saalbach, one of the world's largest skiing areas host of the FIS Alpine World Cup Finals 2024.
- But now, this report provides, for the first time, a new, clear formula to calculate the additional CO₂ emissions that will result from any given sponsorship deal.
- We show that, depending on the sponsoring company's carbon footprint, a sponsorship deal can generate up to 100 kg of CO₂e² per sponsored euro.
- Seven case studies of sponsorship deals with major polluters are presented. Secrecy is a barrier to knowing the size of many sponsorship deals. But one multi-million euro, publicly reported deal between the International Ski & Snowboard Federation (FIS) with car maker Audi we calculate will generate between 103,000–144,000 tonnes CO₂e (equivalent to burning between 238,000 and 333,000 barrels of oil³).

¹ Jiamin Wang, Y.Guan, L. Wu, X. Guan, W. Cai, J. Huang, W. Dong, B. Zhang: Changing lengths of the four seasons by global warming. *Geophysical Research Letters*, 48. Supporting Information. 19 February 2021.

<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2020GL091753>

² The CO₂e (carbon dioxide equivalent) for a gas is derived by multiplying the weight of the gas by its associated GWP (Global Warming Power).

³ <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>

- In the other cases, and based on reasonable estimates, named companies' sponsorship deals with snowsport organisations are estimated to generate between 11,500 and 192,000 tonnes of CO₂e each.
- The report concludes that winter sports athletes, organisations and event organisers must take responsibility, end polluting sponsorships, and stop winter sports being used as a billboard by companies whose activities are destroying the sports' future.

The future of winter sports is closely interwoven with the future of the climate. Rising temperatures and the ensuing loss of snow cover are shortening seasons, creating difficult and sometimes dangerous skiing conditions. Many ski resorts are struggling and some have already had to close.⁴

Looking specifically at temperature changes during the main skiing season of November to March from 1970 to 2022, the average temperature in the Northern Hemisphere has now increased by a remarkable 0.43°C per decade.⁵

In mid-latitudes in the Northern Hemisphere winters are expected to continue to shrink at a rate of 4.7 days per decade and may, in a high emission scenario, by the end of the century be as short as 31 days, from 18 December to 18 January.⁶ In other words, winter may last only a single month.

Wherever we look, we see sport being used as an advertising billboard for polluting businesses that promote goods and services that cause disproportionate harm to the climate and environment. Whether it is fossil fuel companies, car manufacturers, or airlines, high-carbon advertising and sponsorships have become standard at every level of sport – from sponsorship deals with individual athletes, to elite-level international federations and tournaments.

It is a contemporary and even more damaging equivalent of the days when sport was a target for tobacco advertising and sponsorship. And, perhaps the reasons for climate polluters being drawn to sport are similar. Sport has an image

⁴ James Reynolds: *Europe's ski slopes 'missing one crucial detail - SNOW'*, MailOnline, 5 February 2024.

<https://www.dailymail.co.uk/news/article-13047607/Europes-ski-slopes-missing-one-crucial-SNOW-Warm-temperatures-hit-resorts-France-Italy-Switzerland-entire-mountains-snowless-hot-artificial-snow-cannons.html>

⁵ NOAA, National Centers for Environmental Information: *Climate at a Glance Global Time Series*, 2024.

https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/time-series/nhem/land/5/3/1970-2024?trend=true&trend_base=10&begtrendyear=1970&endtrendyear=2022

⁶ Jiamin Wang, Y.Guan, L. Wu, X. Guan, W. Cai, J. Huang, W. Dong, B. Zhang: *Changing lengths of the four seasons by global warming*. *Geophysical Research Letters*, 48. Supporting Information. 19 February 2021.

<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2020GL091753>

of health and vigour, it appeals to both a huge global audience and to young people, the next generation's consumers. Yet in both cases, tobacco and fossil fuels, the products wreck the target audience's future.

While some progressive sports organisations have begun to calculate and disclose their own CO₂ emissions, none has yet included the CO₂ footprint generated by some of their sponsors. A footprint that this report shows is an order of magnitude larger than the size of the sports' organisation's own.

This report presents, for the first time, a general formula to calculate emissions of CO₂e per sponsorship euro for any specific company:

$$\frac{CO_2e}{EUR_{sp}} = \frac{CO_2etot}{(WACC \times REV_{tot})}$$

where:

CO₂etot = the combined (scope 1, 2 and 3) yearly carbon dioxide equivalent emissions⁷ of the company;

WACC = the Weighted Average Cost of Capital, estimated to be 7.0% (see Appendix I);

REV_{tot} = the company's gross revenue.

This formula can be used by athletes, teams, federations or event organisers to assess how much a potential sponsorship deal would increase the environmental impact of the recipient of sponsorship (were they to accept the logical consequences of helping to promote the polluter in question).

The report goes on to examine examples of sponsorship deals where carbon-intensive, polluting companies are attempting to use sports sponsorship to improve their stained reputations at a time of growing awareness of the climate crisis.

⁷ The CO₂e (carbon dioxide equivalent) for any gas is derived by multiplying the weight of the gas by its associated GWP (Global Warming Power).

The following table presents the outcomes of this analysis in a condensed, illustrative form:

Table 1: Total emissions, CO₂e per sponsor euro, and estimated tonnes CO₂e per sponsorship deal

Sponsor	Emissions (tonnes CO ₂ e/year) ⁸	Kg CO ₂ e/ sponsor EUR	Tonnes CO ₂ e per €1 million sponsorship deal ⁹
Audi	88,900,000	20.6	20,600
Ford	338,000,000	33.1	33,100
SAS	6,000,000	23.0	23,000
Equinor	254,000,000	26.4	26,400
Aker Group	15,600,000	95.8	95,800
Volvo Cars	38,000,000	18.5	18,500
Preem	47,900,000	44.9	44,900

Finally, we make three core recommendations to help athletes, teams and event organisers take an approach to sponsorship agreements that is more in line with the interests and long term survival of winter sports:

- 1. Disclose the value of sponsorships from heavily polluting companies** in order that their climate impact can be assessed transparently.
- 2. Introduce robust ‘snow safe’ climate due diligence tests and screening, setting guiding principles for prospective commercial partners:** to reduce any risk of partnering with polluters, engaging players, fans and the surrounding community in the process.
- 3. Screen-out highly polluting commercial partners** such as oil and gas companies, car manufacturers and airlines.

A practical guide for sports organisations on making informed, responsible sponsorship decisions can be found in the Badvertising report: [How to screen-out polluting sponsors – A low-carbon toolkit for sports organisations.](#)

⁸ Total emissions, scope 1, 2, and 3.

⁹ Estimated

The heat is on



The world is getting warmer and winters are getting shorter. Last year, 2023, was the warmest on Earth since modern records began, exceeding the previous record set in 2016 by a significant margin.

The global annual average for 2023 was estimated to be 1.54°C above the average. This is the first time that any year has exceeded the 1.5°C threshold stipulated in international climate agreements.¹⁰

The same year, Europe and Asia had their second warmest year on record, while North America's had its warmest year ever in modern times.¹¹



Half of the world's ski resorts are in Europe, where they generate about €28 billion.

© Getty/iStock

A new record was also seen in 2023 for the concentration of carbon dioxide in the atmosphere, accumulated due to human activities such as burning fossil fuels. The annual amount of CO₂ emitted in 2023 was 1.1 percent higher than

¹⁰ Berkeley Earth: *Global Temperature Report for 2023, Annual Temperature Anomaly, Dataset*, analysis run on 07-Feb-2024 05:19:02.

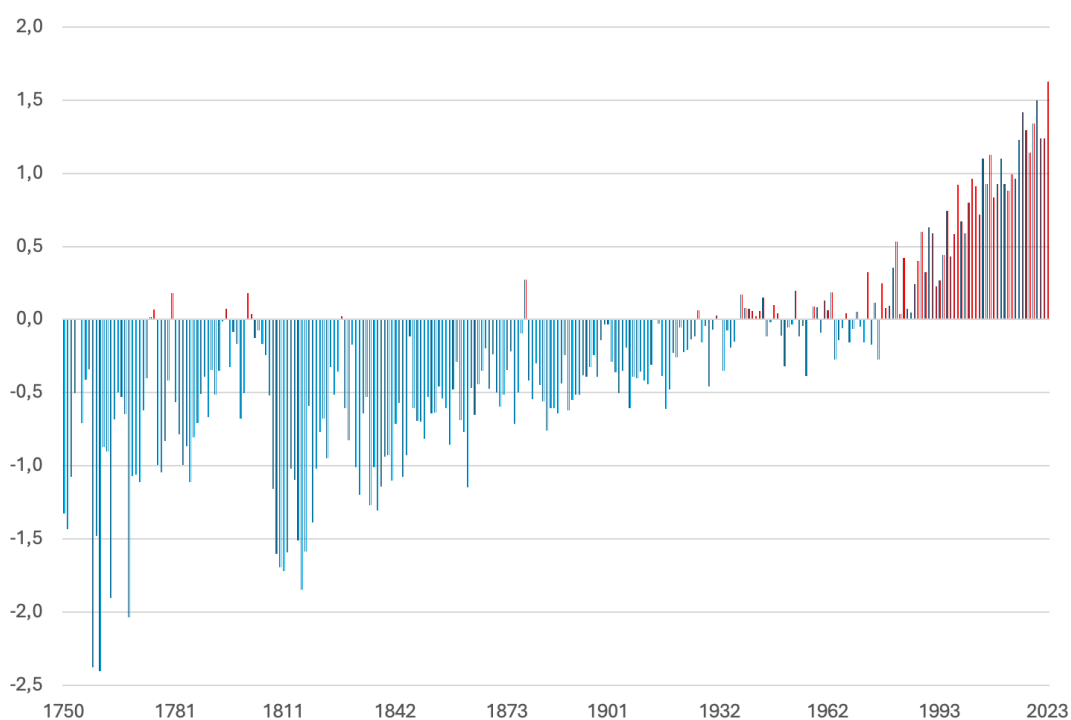
<https://berkeleyearth.org/global-temperature-report-for-2023/>

¹¹ NOAA National Centers for Environmental Information: *Annual 2023 Global Climate Report, February 2024*.

<https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202313>

2022 and set a new all-time high.¹² It is worth noting that this has happened when scientific awareness of global heating has never been greater or more conclusive, and in a year when multiple climate extremes have impacted communities around the world, with wildfires, floods, droughts causing loss of life and livelihoods. A crucial gap between scientific advice on climate breakdown and a lack of action needs explaining. Part of that explanation is the way that polluting sponsors are able to exploit the global stage of sport to continue to normalise high-carbon products and lifestyles, while maintaining their social licence to operate.

Figure 1: Global Land January–December Temperature Anomalies (with respect to the 1951–1980 average)¹³



Looking specifically at temperature changes during the main winter sports season of November to March, from 1970 to 2022, the average temperature in the Northern Hemisphere has increased by a remarkable 0.43°C per decade.¹⁴

¹² Berkeley Earth: *Global Temperature Report for 2023, Annual Temperature Anomaly, Dataset*, analysis run on 07-Feb-2024 05:19:02.

<https://berkeleyearth.org/global-temperature-report-for-2023/>

¹³ Berkeley Earth: *Global Temperature Report for 2023, Annual Temperature Anomaly, Dataset*, analysis run on 07-Feb-2024 05:19:02.

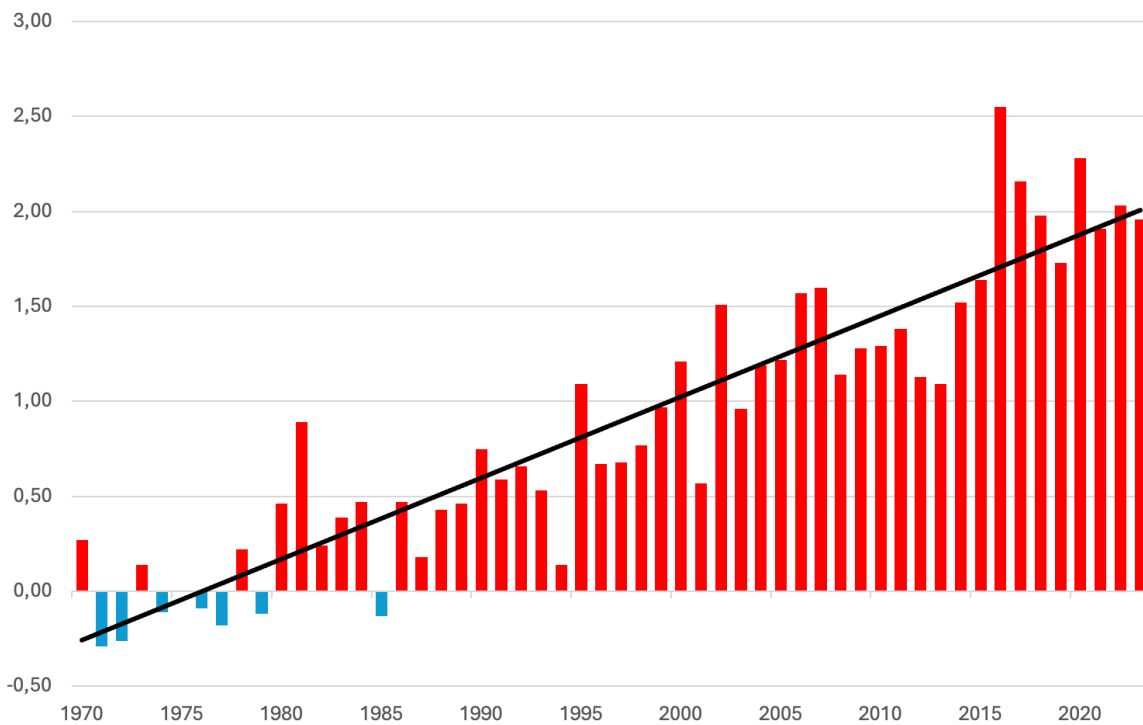
<https://berkeleyearth.org/global-temperature-report-for-2023/>

¹⁴ NOAA, National Centers for Environmental Information: *Climate at a Glance Global Time Series*, 2024.

https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/time-series/nhem/land/5/3/1970-2024?trend=true&trend_base=10&begtrendyear=1970&endtrendyear=2022

In mid-latitudes in the Northern Hemisphere, winters are expected to continue to shrink at a rate of 4.7 days per decade and may, in a high emission scenario, by the end of the century be as short as 31 days, from 18 December to 18 January.¹⁵ In other words, winter may last only a single month by the end of this century.

Figure 1: Northern Hemisphere Land November–March Temperature Anomalies (with respect to the 1901–2000 average)¹⁶



An estimated 28,707 square kilometres of Greenland's ice sheet and glaciers, about the size of Armenia, have melted over the last three decades.¹⁷ Consequences of the increased area of bare ground and vegetation include decreased land surface albedo (the ability to reflect light) and increased methane emissions, both exacerbating further climate heating.

¹⁵ Jiamin Wang, Y.Guan, L. Wu, X. Guan, W. Cai, J. Huang, W. Dong, B. Zhang: Changing lengths of the four seasons by global warming. *Geophysical Research Letters*, 48. Supporting Information. 19 February 2021. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2020GL091753>

¹⁶ NOAA, National Centers for Environmental Information: *Climate at a Glance Global Time Series*, 2024. https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/time-series/nhem/land/5/3/1970-2024?trend=true&trend_base=10&begtrendyear=1970&endtrendyear=2022

¹⁷ Michael Grimes, J.L. Carrivick, M.W. Smith, A.J.Comber: *Land cover changes across Greenland dominated by a doubling of vegetation in three decades*, *Sci Rep* 14, 3120, 13 February 2024. <https://doi.org/10.1038/s41598-024-52124-1>

The bleak future of winter sports



As we have seen, the global rise in temperatures is exacerbated in land areas over the Northern Hemisphere. In the past 45 years, land surface temperatures have risen about twice as fast as those over the oceans,¹⁸ hitting hardest in some of the places most associated with winter sports.

Projected future changes include further reduced extents of seasonal snow cover,¹⁹ and scientists have calculated that winters will shorten by 10–24 days per 1°C of local warming.²⁰

Assessing climate impacts on skiing areas can sometimes be confusing as there still are sites that actually report good, and even increasing, snow depths. But the explanation for this does not bode well for the future of snow sports: a changing climate often leads to increased and shifting precipitation patterns, as warmer air holds more moisture, which – as long as the temperature stays below 0°C – will fall as snow. As warming continues up the slopes and northwards, the thick snow covers will be replaced by heavy rains. For this reason, snow cover extent may be a better indicator of change than snow depth.

Rising temperatures threaten the ski industry world-wide and many ski resorts have had to close down operations, temporarily or for good.

In the popular French resort of Saint-Colomban-des-Villards in the Alps, ski lifts have stopped running completely because of the lack of snow following temperatures climbing all the way up to 13°C.²¹

Mount Terminillo in Italy's Apennine mountains has been left entirely snowless this winter. The resort is not even able to use

¹⁸ European Union, Copernicus Climate Change Service: Climate Indicators: Temperature. <https://climate.copernicus.eu/climate-indicators/temperature>

¹⁹ IPCC: *Summary for Policymakers*. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 2023. https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

²⁰ Kimmo Ruosteenoja, T. Markkanen, J. Räisänen: *Thermal seasons in northern Europe in projected future climate*, Volume 40, Issue 10, August 2020. <https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/joc.6466>

²¹ Saskia O'Donoghue: Europe's ski resorts are grinding to a halt during what could be the hottest February ever, EuroNews, 24 February 2024. <https://www.euronews.com/travel/2024/02/24/europes-ski-resorts-are-grinding-to-a-halt-during-what-could-be-the-hottest-february-ever>

its snow cannons. "It's simply too hot," says Vincenzo Regnini, president of local ski lift firm ASM Retti.²²

The once-popular ski runs of Dent-de-Vaulion in the Swiss Jura Mountains are now deserted as unusually mild weather has driven away winter sport enthusiasts and forced ski resorts to close across the country.²³



Ski slope made of artificial snow.

© Lukas Seitz.

Several alpine and cross-country ski races have been cancelled halfway into the 2023–24 season. By 21st February, nine of the planned Alpine Ski World Cup races of the season were cancelled.²⁴

The winter sports industry is increasingly responding to the threatening effects of climate change with investments in snowmaking facilities.

Today, a growing majority of ski slopes in the European Alps are equipped for snowmaking. 25 percent of skiing areas in Germany, 39 percent in France; 54 percent in Switzerland; 70

²² James Saunders: Warm weather forces ski resort to close as 'it's too hot even for fake snow', GB News, 6 February 2024.

<https://www.gbnews.com/news/world/warm-weather-ski-resort-italy-closed>

²³ Denis Balibouse: Swiss ski spot left snowless, deserted by mild January, Reuters, 3 February 2024.

<https://www.reuters.com/business/environment/swiss-ski-spot-left-snowless-deserted-by-mild-january-2024-02-02/>

²⁴ International Ski and Snowboard Federation: Calendar and results.

<https://www.fis-ski.com/DB/general/calendar-results.html?eventselection=&place=§orcode=AL&seasoncode=2024&categorycode=WC&disciplinecode=&gendercode=&racedate=&racecodex=&nationcode=&seasonmonth=X-2024&saveselection=-1&seasonselection=>

percent in Austria; and a whopping 90 percent of ski areas in Italy are served by artificial snowmaking machinery.²⁵

In an Olympic setting, artificial snow was first introduced at the 1980 Winter Olympics in Lake Placid, New York, and has since been used increasingly. About 80 percent of the snow used in Sochi, Russia in 2014 was artificial, topped by 98 percent in Pyeongchang, South Korea in 2018. In the Beijing Winter Games 2022, 100 percent of the snow used was artificial.²⁶

Italy, which is scheduled to host the Winter Olympics in 2026 (sponsored by fossil gas giant ENI), is currently experiencing growing problems in preparing tracks and courses that will keep enough snow in time for the games.²⁷



© Getty/iStock, Josef Kubes.

But snowmaking also comes with a cost. In Switzerland, larger resorts use around 17 percent of their daily operating expenses for snowmaking. Snowmaking also uses large amounts of water and energy to produce the snow, which creates a vicious cycle. If the energy for snowmaking is generated by burning fossil fuel, which globally is likely, then it

²⁵ Seilbahnen Schweiz: 2022 – Fakten & Zahlen zur Schweizer Seilbahnbranche. 2022. <https://www.seilbahnen.org/de/Branche/Statistiken/Fakten-Zahlen>

²⁶ Chad de Guzman: What Artificial Snow at the 2022 Olympics Means for the Future of Winter Games. Time 8 February 2022.

<https://time.com/6146039/artificial-snow-2022-olympics-beijing/>

²⁷ Giulia Carbonaro: Spiralling costs and melting snow: Do the Winter Olympics have a future?, EuroNews, 4 august 2023.

<https://www.euronews.com/2023/08/04/spiralling-costs-and-melting-snow-do-the-winter-olympics-have-a-future>

increases emissions further and, ultimately, accelerates the loss of snow.

Europe is the largest global ski tourism market, with about 50 percent of the world's total ski resorts and over 80 percent of the world's larger ski resorts (resorts with more than 1 million skier visits per year).²⁸

Based on future climate change scenarios, scientists have investigated how the frequency of snow-scarce winters will change with the level of global warming for various scenarios with different levels of snowmaking (0, 25, 50 and 75 percent of respective ski area).

In the tables below, the snow supply risk to European ski tourism is displayed as a function of the global warming level and the level of snowmaking.

The risk levels are defined as follows: a frequency of 30 percent of winters below a level of snow scarcity that makes skiing impossible, is referred to as "moderate" (orange). A frequency of 40 percent is referred to as "high" (red). The risk reaches the "very high" domain (dark red) at a frequency of 50 percent and above, i.e. snow-scarce conditions encountered at least once every two years on average.

The level of snow scarcity is plotted against four levels of artificial snowmaking as a percentage of groomed ski area covered: No snowmaking; 25, 50, and 75 percent artificial snow covering ski areas.

²⁸ Laurent Vanat: 2021 Report on Snow and Mountain Tourism, Overview of the key industry figures for ski resorts, 13th edition, April 2021. <https://www.vanat.ch/RM-world-report-2021.pdf>

Table 2: European snow supply risk levels²⁹

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	70%	50%	30%	20%
	3°C	60%	40%	20%	20%
	2°C	50%	30%	10%	10%
	1.5°C	40%	30%	10%	10%

Nordic mountains

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	60%	40%	40%
	3°C	60%	40%	20%	30%
	2°C	50%	20%	10%	10%
	1.5°C	40%	20%	10%	10%

Alps-France

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	60%	40%	40%
	3°C	60%	40%	20%	30%
	2°C	50%	20%	10%	10%
	1.5°C	40%	20%	10%	10%

Alps-Switzerland

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	60%	40%	30%
	3°C	60%	40%	20%	20%
	2°C	50%	20%	10%	10%
	1.5°C	40%	20%	10%	10%

Alps-Austria

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	60%	40%	40%
	3°C	60%	40%	30%	20%
	2°C	40%	20%	10%	10%
	1.5°C	40%	20%	10%	10%

Alps-Germany

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	70%	60%	60%
	3°C	70%	50%	40%	50%
	2°C	50%	30%	10%	20%
	1.5°C	40%	20%	10%	20%

Alps-Italy

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	90%	80%	60%	60%
	3°C	80%	60%	40%	40%
	2°C	70%	50%	20%	20%
	1.5°C	60%	30%	10%	20%

Alps-Slovenia

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	90%	80%	80%	90%
	3°C	70%	50%	50%	70%
	2°C	50%	30%	30%	60%
	1.5°C	40%	20%	20%	40%

East European middle mountains

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	70%	80%	90%
	3°C	60%	40%	50%	70%
	2°C	40%	20%	30%	50%
	1.5°C	30%	20%	20%	30%

Carpathians

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	80%	60%	60%	70%
	3°C	60%	40%	40%	50%
	2°C	40%	20%	20%	30%
	1.5°C	40%	20%	20%	30%

Pyrenees

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	90%	80%	70%	80%
	3°C	70%	50%	40%	60%
	2°C	60%	30%	20%	40%
	1.5°C	40%	20%	10%	30%

French-Swiss middle mountains

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	90%	90%	80%	90%
	3°C	70%	60%	60%	70%
	2°C	60%	40%	40%	50%
	1.5°C	40%	30%	30%	40%

Balkans/Southeast Europe

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	90%	80%	70%	80%
	3°C	80%	50%	50%	60%
	2°C	60%	30%	30%	40%
	1.5°C	40%	20%	20%	30%

British Isles

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	100%	100%	100%	100%
	3°C	80%	80%	90%	100%
	2°C	70%	60%	80%	90%
	1.5°C	70%	60%	70%	80%

European middle mountains west

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	90%	100%	100%	100%
	3°C	80%	80%	90%	90%
	2°C	70%	60%	70%	80%
	1.5°C	60%	50%	60%	70%

Iberian mountains

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	100%	100%	100%	100%
	3°C	90%	90%	90%	90%
	2°C	80%	70%	80%	80%
	1.5°C	60%	60%	60%	80%

Apennines

		Artificial snowmaking			
		0%	25%	50%	75%
Global warming	4°C	100%	90%	90%	100%
	3°C	90%	80%	80%	90%
	2°C	70%	60%	70%	80%
	1.5°C	60%	50%	60%	80%

²⁹ Hugues François, R. Samacoïts, D.N. Bird, J.Körberl, et. al.: *Climate change exacerbates snow-water-energy challenges for European ski tourism*. Nature Climate Change 13, 935-942, 28 August 2023. <https://www.nature.com/articles/s41558-023-01759-5>

Dirty Money



The 2023 report, *The Snow Thieves*, identified more than one hundred high carbon sponsorship deals within winter sports.³⁰ So what is the reason oil companies, car makers and airlines pour millions of euros into sponsoring snow sports year on year? And how much are they actually pouring into this climate-vulnerable sport?

Corporate marketing executives see the opportunities in being associated with sports that have an active and aspirational reputation, as well as a large number of international fans. Research shows that winter sports fans are more actively engaged and that there are fewer negative attitudes towards sponsors of winter sports than towards those sponsoring other sports. In fact, experts say that because of these reasons, winter sports are more attractive to sponsors than, for example, football.³¹

Does sponsorships matter?

Advertising and marketing works, which is why the world's biggest corporations invest so much – and why tobacco ads and sponsorships were banned.

Numerous studies have shown the effects of marketing and advertising campaigns on consumer behaviour. Tobacco marketing, once an ever-present in sports sponsorship, is an extensively studied area. After thorough research of the scientific literature on media communication in tobacco promotion, the National Cancer Institute, a division of the

³⁰ <https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

³¹ Lars Stegelmann: Winter Sports – More Attractive to Sponsors than Football. Nielsen Sports. 5 January 2016. <http://niensports.wpengine.com/winter-sports-more-attractive-to-sponsors-than-football/>

National Institute of Health under the U.S. Department of Health, concluded:

“The total weight of evidence—from multiple types of studies, conducted by investigators from different disciplines, and using data from many countries—demonstrates a causal relationship between tobacco advertising and promotion and increased tobacco use.”³²

Sponsorship of sports is a massive industry – and it is growing. The size of individual sponsorship deals are considered trade secrets and are seldom disclosed to the public,³³ but market research agencies, specialising in sport sponsorships, estimate the size of the global sponsorship market to be somewhere between 50 and 100 billion US dollars and bound to double within the next ten years.

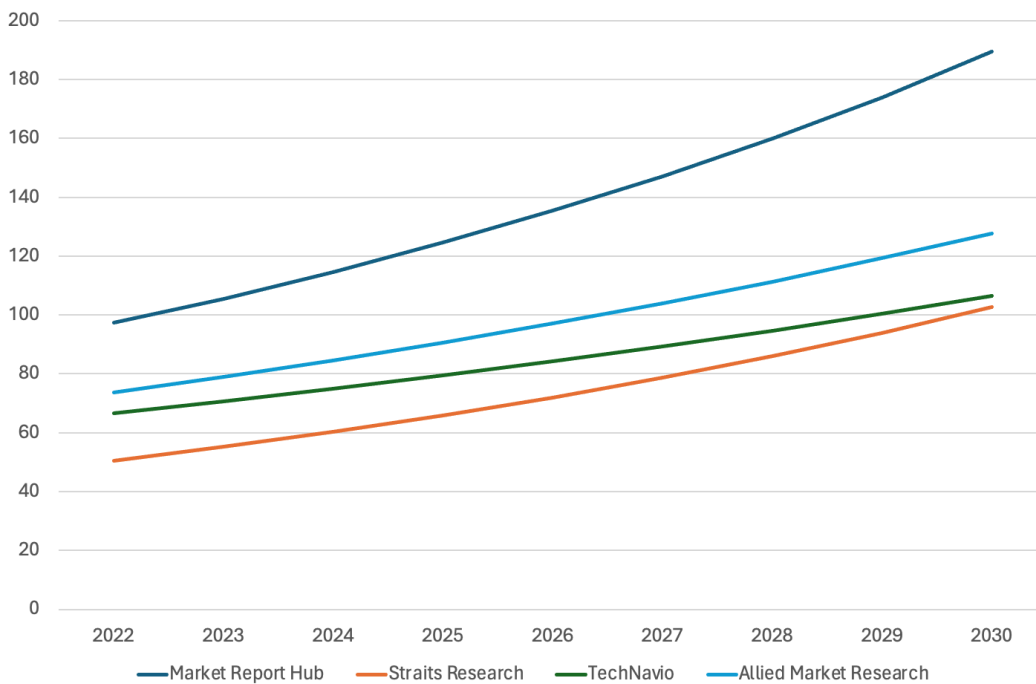
³² Ronald M. Davis, E.A. Gilpin, B. Loken, et. al.: The Role of the Media in Promoting and Reducing Tobacco Use, National Cancer Institute, Tobacco Control Monograph No. 19, Bethesda, June 2008.

<https://cancercontrol.cancer.gov/brp/tcrb/monographs/monograph-19>

³³ Joacim Larsson von Garaguly: *Vasaloppet – resan från skidtävling och skidlöpare till produkter och kunder, En studie om kommersialisering och professionalisering*, Stockholm 7 June 2016.

<http://du.diva-portal.org/smash/get/diva2:937270/FULLTEXT01.pdf>

Table 2: Global Sports Sponsorship Market Size estimates, in billion USD^{34, 35, 36, 37}



Advertisers may argue that they are only trying to get a bigger share of an existing market or that they are promoting free choice. However, advertising also increases the size of an entire market by creating more consumers. For example, car manufacturers that are appealing to families to purchase a second or third car.

The purpose of advertising is to achieve brand recognition, dominance and to sell more products. Advertising would not be the multi-billion industry it is if it did not work. The reason for a car manufacturer to sponsor a ski race is to ultimately sell more cars. As a sponsorship manager at Volvo Cars puts it:

“There are many good reasons for Volvo to be engaged actively in sports... We increase awareness of our trademark. And, naturally, we sell more cars.”³⁸

³⁴ Market report hub: Sport Sponsorship Market. <https://www.marketreporthub.com/report/03478/Sports-Sponsorship-Market>

³⁵ Straits Research: Sport Sponsorship Market. <https://straitsresearch.com/report/sports-sponsorship-market>

³⁶ TechNavio: Sport Sponsorship Market by Type, Application and Geography - Forecast and Analysis 2023-2027. <https://www.technavio.com/report/sports-sponsorship-market-industry-analysis>

³⁷ Allied Market Research: Sport Sponsorship Market, 2032. <https://www.alliedmarketresearch.com/sports-sponsorship-market-A121165>

³⁸ Volvo Cars: Sports is a vital part of the sponsoring strategy. Press release. 27 December 2007. <https://www.media.volvocars.com/global/en-gb/media/pressreleases/13805?preview=true&t=14054e1a-dc65-48e3-baec-1390d3d4d382>

Dirty Snow



Polluting companies are usually eager to talk about what they will do for the climate – but always in the future tense. Their sustainability reports and other marketing communications are typically filled with accounts of plans, targets, ambitions and commitments – all things that will happen later – but very little about the damage that their pollution is doing right now.

A car manufacturer is likely to tell us about their new line of electric cars, even if that only represents a fraction of their production. Oil companies talk-up their investments in renewable energy, which represent a tiny fraction of their operations and investments.



Ski slope with only artificial snow in a dry winter.

© Getty/iStock

Since January 2023, the EU Corporate Sustainability Reporting Directive (CSRD) requires all large companies and most listed companies to disclose information on what they see as the risks and opportunities arising from social and environmental

issues, and on the impact of their activities on people and the planet.³⁹

Companies subject to the CSRD will have to report according to European Sustainability Reporting Standards (ESRS). Each company will need to disclose, in metric tonnes of CO₂e, its greenhouse gas emissions as a total, as well as scope 1, 2, and 3, respectively.⁴⁰

Scope	Definition
Scope 1	Direct GHG emissions from sources that are owned or controlled by the undertaking.
Scope 2	Indirect emissions from the generation of purchased or acquired electricity, steam, heat or cooling consumed by the undertaking.
Scope 3	All indirect GHG emissions (not included in scope 2 GHG emissions) that occur in the value chain of the reporting undertaking, including both upstream and downstream emissions.

The regulation entered into force on 1 January 2024 and will for most companies be applicable to the reporting published in 2025.

Knowing a company's total emissions of greenhouse gases will make it possible to calculate how much extra CO₂e a certain investment, including investments into sponsorships and commercial partnerships, is likely to generate.

A general formula to calculate emissions per sponsorship for a specific company can thus be expressed as:

$$\frac{CO2e}{EUR_{sp}} = \frac{CO2_{tot}}{(WACC \times REV_{tot})}$$

where:

³⁹ European Commission: *Corporate sustainability reporting*. https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

⁴⁰ European Commission: *Commission Delegated Regulation (EU) 2023/2772*, Official Journal of the European Union, 31 July 2023. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L_202302772

$CO2_{tot}$ = the combined (scope 1, 2 and 3) yearly carbon dioxide equivalent emissions⁴¹ of the company;

$WACC$ = the Weighted Average Cost of Capital, estimated to be 7.0% (see Appendix I);

REV_{tot} = the company's gross revenue.

This straightforward but revealing formula is further explained in Appendix I and is used to calculate the climate impacts of several following examples of sponsorship.

Of the approach, Professor Richard Murphy of Sheffield University Management School said, "What this work shows is that companies' pollution can be reliably linked to the activities that they sponsor. This methodology shows how to estimate just how much on a reliable and comparable basis. Every sponsorship deal should be appraised in this way."

However, our calculations on the climate impacts of sponsorships used in the report should also be seen as quite conservative for a number of reasons:

- The 7.0 percent of return should be taken as a minimum and most corporate executives will likely be hoping for a better return on investments.
- Every sponsorship manager knows that the sum that is provided to the sponsee is only one part of the whole cost. One US study showed that sponsors spent an average \$2.20 extra for every \$1 paid in the sponsorship deal.⁴² If it is not followed up by other marketing activities, promotions, staff activities etc, it will only be money down the drain.
- A sponsoring company will be eager to use what it has "bought". The more the asset is used, the more benefit the company will draw; and the more investments will need to be returned.

⁴¹ Carbon dioxide equivalent or CO_2e means the number of metric tonnes of CO_2 emissions with the same global warming potential as one metric ton of another greenhouse gas

⁴² IEG: IEG's guide to sponsorship, 2017.

<https://www.sponsorship.com/ieg/files/59/59ada496-cd2c-4ac2-9382-060d86fcbdc4.pdf>



The area around a cable car station. Economic losses of ski resorts are great when temperatures are high.
© Getty/iStock

Sponsoring Climate Change



Below are seven case studies of sponsorship deals between high-carbon businesses and winter sports associations and events, highlighting the impact those deals are having on the climate, the fans of snowsports, and on the very future of snowsports itself.

Using the methodology presented in the report *The Snow Thieves*, there is also a calculation of each company's total impact on the loss of spring snow cover included. For a more detailed explanation of this calculation, see Appendix II.

International Ski and Snowboard Federation – Audi

Each sponsorship euro from Audi will generate increased emissions of 33 kg CO₂e.

A 5–7 million euro sponsorship deal with Audi will generate 103,000–144,000 tonnes CO₂e.

The International Ski and Snowboard Federation (FIS) is the highest governing body in snowsports, with 135 member associations, covering 13 disciplines and organising more than 7000 events each year.

FIS is responsible for the Olympic skiing disciplines as well as for setting international competition rules.⁴³

FIS is not willing to disclose any details of its funding arrangements. However, a report from German sponsorship consultancy firm, SPOBIS, reports that one of its main sponsors, Audi, has an ongoing sponsorship deal with FIS in the region of 5–7 million euro.⁴⁴

⁴³ International Ski and Snowboard Federation. <https://www.fis-ski.com/en>

⁴⁴ SPOBIS: Branchen-Sponsorships, Finanzdienstleistung, October 2023. <https://spobis.com/reports/Branchen-Sponsorships>

FIS has had agreements with Audi since 2002, and in 2022 that partnership was extended for another four years.⁴⁵

Audi is one of few international corporations that do not report their CO₂ emissions, including scope 3 emissions. The company simply states that “this information is not currently reported for reasons of confidentiality” in its 2022 Combined Annual and Sustainability Report.⁴⁶

As Audi is one of the brands within the Volkswagen Group, it is assumed in the following calculation that Audi’s share of the Group’s total CO₂ emissions is equal to its share of the Group’s total revenue, an assumption that is supported by examining a similar brand, BMW, that presents a very similar CO₂e emission per vehicle.

Audi

In 2022, Audi’s total revenue was 61,753 million euro while producing 1,700,200 vehicles, almost exclusively cars.⁴⁷ That means that each manufactured car generated an average income of 36,300 euro

Also in 2022, Audi’s estimated total emissions (scope 1, 2, and 3) were 88,9 million tonnes CO₂e, corresponding to an average of 52.3 tonnes per car.

It is reasonable to assume that Audi will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If Audi spends 5–7 million euro on sponsoring the International Ski and Snowboard Federation and wants a 7.0 percent return, they will need to sell an additional 1,966–2,753 cars. That in turn will create increased emissions of 103,000–144,000 tonnes of CO₂e, corresponding to 20.6 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO_2e}{EUR_{sp}} = \frac{CO_2e_{tot}}{WACC \times REV_{tot}} =$$

⁴⁵ Audi MediaCenter: Partnership with FIS extended: Audi to shape Alpine Ski World Cup for four more years.

<https://www.audi-mediacycenter.com/en/press-releases/partnership-with-fis-extended-audi-to-shape-alpine-ski-world-cup-for-four-more-years-14976>

⁴⁶ Audi: 2022 Combined Annual and Sustainability Report, March 16, 2023, p.148.

<https://www.audi.com/content/dam/gbp2/downloads/report/annual-reports/2022/en/audi-report-2022.pdf>

⁴⁷ Ibid.

$$\frac{88.9 \text{ billion kg CO}_2\text{e}}{0.07 \times 61.7 \text{ billion EUR}} = 20.6 \text{ kg CO}_2\text{e/EUR}$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all Audi's operations are responsible for the loss of 222 square kilometres (km²) of snow cover each year.⁴⁸ (See also Appendix II)

The International Ski and Snowboard federation says they are committed to disclose their own CO₂ emissions, but has not yet done so, despite the threat posed to snowsports by continued emissions.

Swedish Ski Association – Ford and SAS

Each sponsorship euro from Ford will generate increased emissions of 33 kg CO₂e.

A one million euro sponsorship deal with Ford will generate 33,000 tonnes CO₂e.

Each sponsorship euro from SAS will generate increased emissions of 23 kg CO₂e.

A 500,000 euro sponsorship deal with SAS will generate 11,500 tonnes CO₂e.

The Swedish Ski Association is the sports governing body for skiing in Sweden. Its mission is to promote and administer ski

⁴⁸ For an explanation of the calculation, see Mats Abrahamsson et. al: *The Snow Thieves*, How high-carbon sponsors are melting winter sports, New Weather Institute, February 2023.
<https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

and snowboard sports, and to represent Swedish snow sports internationally and as a member of FIS.

The Swedish Ski Association is one of Sweden's largest sports associations with 1,230 local clubs and 153,411 individual members. The association organises around 40 major races each year and, together with its member clubs, arranges more than 700 local races.

The Swedish Ski Association is not willing to disclose the details of its funding arrangements but report that during the season of 2022–23, it received 11.9 million euro from all its sponsorship deals together.⁴⁹

The Swedish cross country team has signed agreements with both car maker Ford and with Scandinavian Airlines (SAS). The alpine team has agreements with Audi and with SAS.

A lack of transparency means that the value of individual deals is not available, meaning that to give an illustrative indication of impact we must make judgements about their likely size based on the type and range of sponsors and the overall level of sponsorship income. Given that, it is not unreasonable to estimate the value of Ford's sponsorship at one million euros and SAS' at 500,000 euros. We will revise our calculations should the actual individual sponsorship sums be made public.

Ford Motor Company is one of the largest manufacturers of cars in the world with operations on all continents. Ford is also a big-time worldwide sponsor of sports events and facilities.

Ford

In 2022, Ford's total revenue was 145.9 million euro while producing 4.25 million cars. That means that each manufactured car generated an average income of 34,340 euro.⁵⁰

Also in 2022, Ford's reported total emissions (scope 1, 2, and 3) were 337.8 million tonnes CO₂e, corresponding to an average of 79,5 tonnes CO₂e per car.⁵¹

⁴⁹ Svenska Skidförbundet: Verksamhetsberättelse 2022–2023.
<https://www.skidor.com/download/18.5330d99c18bcc0899dcba34c/1700474010773/Verksamhetsber%C3%A4ttelse%20SSF%202022-2023.pdf>

⁵⁰ Ford: Helping Build a Better World, Integrated Sustainability and Financial Report 2023.
https://s201.q4cdn.com/693218008/files/doc_financials/2022/ar/2023-Integrated-Sustainability-and-Financial-Report.pdf

⁵¹ Ibid

It is reasonable to assume that Ford will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If Ford spends one million euros on sponsoring the Swedish national cross country ski team and wants a 7.0 percent return, they will need to sell an additional 416 cars. That in turn will create increased emissions of 33,000 tonnes of CO₂e, corresponding to 33 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO_2e}{EUR_{sp}} = \frac{CO_2e_{tot}}{WACC \times REV_{tot}} =$$
$$\frac{337.8 \text{ billion kg } CO_2e}{0.07 \times 145.9 \text{ billion EUR}} = 33 \text{ kg } CO_2e / EUR$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all Ford's operations are responsible for the loss of 843 square kilometres (km²) of snow cover each year.⁵²

Ford also sponsors the Swedish national cross-country ski cup *Ford Smart Energy Cup*. Combined emissions for all ski races of the Ford Smart Energy Cup 2022–2023, excluding emissions from sponsoring companies, was 161 tonnes CO₂e.⁵³

⁵² For an explanation of the calculation, see Mats Abrahamsson et. al.: *The Snow Thieves*, How high-carbon sponsors are melting winter sports, New Weather Institute, February 2023.
<https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

⁵³ Gidås Hållbarhetsbyrå AB: Klimatredovisning Ford Smart Energy Cup – Winter edition, 30 August 2023.
<https://www.skidor.com/download/18.3827627018a9317e7b273b93/1695025565725/230831%20Klimatredovisning-FSEC%2022-23.pdf>



Skiing slopes covered with plastic sheets to prevent them from melting, Swiss Alps, near Diavolezza.

© Getty/iStock.

Scandinavian Airlines (SAS) was a Swedish–Danish–Norwegian half private, half state-owned airline. After severe financial turmoil, the company restructured in 2023 with the Swedish state selling its shares to the Air France–KLM Group.

SAS discloses some CO₂ emission figures but chooses to include neither its scope 3 emissions or the non-CO₂ impacts.

To compensate for that, this report uses figures from Chalmers University of Technology that adds 24 percent for upstreams emissions and 70 percent for non-CO₂ emissions⁵⁴ to SAS' own figures of 3.1 million tonnes CO₂e, making a total of 6.0 million tonnes CO₂e.

⁵⁴ Jörgen Larsson, A. Kamb: Metodrapporter för www.klimatsemester.se, Institutionen för Rymd-, geo- och miljövetenskap, Avdelningen för fysisk resursteori, Chalmers Tekniska Högskola, Göteborg 2022. <https://klimatsmartsemester.se/sites/default/files/metodrapport-klimatsmart-semester-version3.pdf>

SAS

In 2022, SAS' total revenue was 3.73 billion euro while selling 23.7 million airline tickets. That means that each sold airline ticket generated an average income of 157 euro.⁵⁵

Also in 2022, SAS' estimated total emissions (scope 1, 2, and 3) were 6.0 million tonnes CO₂e, corresponding to an average of 253 kg CO₂e per airline ticket.⁵⁶

It is reasonable to assume that SAS will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If SAS spends 500,000 euros on sponsoring the Swedish national cross country ski team and wants a 7.0 percent return, they will need to sell an additional 45,354 tickets. That in turn will create increased emissions of 11,500 tonnes of CO₂e, corresponding to 23 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO_2e}{EUR_{sp}} = \frac{CO_{2e}^{tot}}{WACC \times REV_{tot}} =$$
$$\frac{6.0 \text{ billion kg } CO_2e}{0.07 \times 3.73 \text{ billion EUR}} = 23 \text{ kg } CO_2e/EUR$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all SAS' operations are responsible for the loss of 15 square kilometres (km²) of snow cover each year.

By way of comparison, the Swedish Skiing Association's total operations in the 2021/2022 season caused emissions of 1,284 tonnes of CO₂e, of which the cross-country skiing team generated approximately 540 tonnes, all according to the Association's own calculations.⁵⁷

⁵⁵ SAS: Annual and Sustainability Report, Fiscal year 2023.
<https://www.sasgroup.net/files/Main/290/3923242/sas-annual-and-sustainability-report-fy-2023.pdf>

⁵⁶ Ibid

⁵⁷ Svenska Skidförbundet: Verksamhetsberättelse 2021–2022.
<https://www.skidor.com/download/18.5889933c18529c5912e22e26/1671554510385/Verksamhetsber%C3%A4ttelse%20SSF%202021%202022%20uppslag.pdf>

Norwegian Ski Federation – Equinor

Each sponsorship euro from Equinor will generate increased emissions of 26.4 kg CO₂e.

A one million euro sponsorship deal with Equinor will generate 26,400 tonnes CO₂e.

The Norwegian Ski Federation (Norges Skiforbund) is the sports governing body for snow sports in Norway. It is also the national representative of the International Ski And Snowboard Federation.

The Norwegian Ski Federation is not willing to disclose any details of its sponsorship deals but during the season 2021-22, the Federation had income from sponsorship deals of 144 million Norwegian Kroner, corresponding to 12,6 million euro.⁵⁸

Since 2009, fossil fuel giant Equinor has been a main sponsor of the federation. It is not unreasonable to estimate the value of Equinor's sponsorship agreement with the Norwegian Ski Federation at one million euro.

Equinor ASA is a state-owned multinational conglomerate, headquartered in Stavanger, Norway. It was formed in 2007 through a merger between Statoil and the oil and gas division of Norsk Hydro.

In November 2023, Greenpeace and local group Nature and Youth asked a Norwegian court to block the development of three North Sea oil and fields, citing insufficient assessment of global climate impact from future petroleum use. On 18 January 2024, the court ruled the three permits invalid because their environmental impact was not sufficiently assessed.⁵⁹

In March 2023, a group of international investors asked for a meeting with Prime Minister Jonas Gahr Støre to discuss

⁵⁸ Norges Skiforbund: Årsberetning 2021-2022. https://www.skiforbundet.no/contentassets/7230ac425e51409b88de662781b646fc/nsf-arsberetning_2021-2022_v3.pdf

⁵⁹ Nerijus Adomaitis, Gwladys Fouche: Three Norwegian oil and gas fields permits invalidated on environmental grounds, Reuters, 18 January 2024. <https://www.reuters.com/business/energy/development-permits-3-norway-oil-gas-fields-are-invalid-court-rules-2024-01-18/>

Equinor's climate transition plan. "We are concerned that the company's plans will fall short when it comes to reaching the 1.5 degree target," 18 financial institutions wrote in a joint letter to the Prime Minister's office.⁶⁰

Equinor

In 2022, Equinor's total revenue was 137.5 billion euro while selling 1,434 mmboe (million barrels of oil equivalent) of oil and gas. That means that each sold boe of oil and gas generated an average income of 96 euro.⁶¹

Also in 2022, Equinor's reported total emissions (scope 1, 2, and 3) were 254.4 million tonnes CO₂e, corresponding to an average of 177 kg CO₂e per boe.⁶²

It is reasonable to assume that Equinor will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If Equinor spends one million euros on sponsoring the Norwegian Ski Federation and wants a 7.0 percent return, they will need to sell an additional 149,000 boe of oil and gas. That in turn will create increased emissions of 26,400 tonnes of CO₂e, corresponding to 26.4 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO_2e}{EUR_{sp}} = \frac{CO_{2e}^{tot}}{WACC \times REV_{tot}} =$$
$$\frac{254.4 \text{ billion kg } CO_2e}{0.07 \times 137.5 \text{ billion EUR}} = 26.4 \text{ kg } CO_2e/EUR$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all

⁶⁰ Malene Emeilie Rustad: Investorgruppe ut mot Equinors klimaplan: Vil ha statsministeren på banen, E24, 25 March 2023. <https://e24.no/energi-og-klima/i/APJzBx/investorgruppe-ut-mot-equinors-klimaplan-vil-ha-statsministeren-paa-banen>

⁶¹Equinor: 2022 Integrated Annual Report. <https://cdn.equinor.com/files/h61q9gi9/global/03d92ebc1ab4f124aabe4fa5be40da3dec6e24b4.pdf?2022-annual-report-equinor.pdf>

⁶² Ibid

Equinor's operations are responsible for the loss of 635 square kilometres (km²) of snow cover each year.⁶³

By way of comparison, the Norwegian Ski Federation's total operations in the 2022–23 season caused emissions of 1,280.5 tonnes of CO₂e, of which the cross-country skiing team generated approximately 182.7 tonnes, all according to the Federation's own calculations.⁶⁴

GB Snowsport – Aker

Each sponsorship euro from Aker will generate increased emissions of 95.8 kg CO₂e.

A two million euro sponsorship deal with Aker will generate 191,600 tonnes CO₂e.

GB Snowsport is the national governing body for skiing and snowboarding in the UK. GB Snowsport has committed to "leading climate change initiatives and stewarding sustainability in winter sports". To achieve this, GB Snowsport has agreed on four focus areas:

- Reduce the overall environmental and climate impact of GB Snowsport activities
- Educate about sustainability and encourage climate action
- Promote sustainable and responsible consumption
- Advocate for sustainability and climate action through communication

GB Snowsport has not disclosed the climate footprint of its own activities.

⁶³ For an explanation of the calculation, see Mats Abrahamsson et. al.: The Snow Thieves, How high-carbon sponsors are melting winter sports, New Weather Institute, February 2023.
<https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

⁶⁴ Norges skiforbund: Kartlegger skisportens klimautslipp.
<https://www.skiforbundet.no/norges-skiforbund/nyheter/2023/11/kartlegger-skisporten-s-klimautslipp/>

After a disappointing performance at the Beijing 2022 Winter Olympics, GB Snowsport's Cross Country team lost their funding from the British Olympics Association and UK Sports. In a last minute deal in November 2022, the team accepted a sponsorship agreement with Aker Solutions ASA. Since then, the British Cross Country and Para Nordic World Cup teams perform as part of the so called *Team Aker Dæhlie*, a multinational team founded and funded by Aker.⁶⁵

During Team Aker Dæhlie's first year, the skiing season 2022-23, the team consisted of 23 skiers with a total budget of 15 million Norwegian Kroner, corresponding to 1.32 million euro.⁶⁶ For the season 2023-24, the team has grown to a total of 41 athletes including the skiers from GB Snowsport.⁶⁷

It is not unreasonable to estimate the value of Aker's sponsorship agreement with GB Snowsport and Team Aker Dæhlie at two million euro.

Aker ASA is a Norwegian industrial investment company with ownership interests mainly in oil and gas, but also in other sectors. Included in the group are Aker BP, a company engaged in exploration, field development and production of oil and gas on the Norwegian continental shelf.

Another company in the group is Aker Solutions, an industrial conglomerate providing services to the oil and gas industry. Until April 2023, Aker also held a majority share in Aker Energy that explores for fossil gas off of Ghana, but this was then sold to Africa Finance Corporation, a multinational financial institution.

⁶⁵ GB Snowsport: British cross country and para nordic squads join team aker dæhlie. <https://gbsnowsport.com/british-cross-country-and-para-nordic-squads-join-team-aker-daehlie/>

⁶⁶ Langrenn.com: Skiforbundets tidligere hovedsponsor satser på privatlag: Team Aker Dæhlie, 17 June 2022. <https://www.langrenn.com/langlop/skiforbundets-tidligere-hovedsponsor-satser-pa-privatlag-team-aker-daehlie/>

⁶⁷ ProXskiing.com: Team Aker Dæhlie for Season 2023/2024, 6 June 2023. <https://www.proxskiing.com/long-distance/team-aker-daehlie-for-season-2023-2024/>



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In 2007, Aker Solutions (then Aker Kværner) was criticised by human rights advocates, including Amnesty International, for supporting torture and abuse of prisoners at the Guantánamo base through the company's role in construction and as a supplier to the prison camp.⁶⁸

In September 2022 another part of the Aker Group, Aker Horizon, was kicked out as a sponsor of a conference organised by YOUNGO, the youth constituency of the United Nations Framework Convention on Climate Change (UNFCCC) on grounds of "youthwashing and greenwashing".⁶⁹

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⁶⁸ Amnesty International Norway: Aker Kværner har medvirket til tortur på Guantánamo, 10 Jan 2007.

<https://amnesty.no/aker-kvaerner-har-medvirket-til-tortur-pa-guantanamo>

⁶⁹ Paul Dobson: COP26 youth conference ends sponsorship with oil firm linked to Guantánamo Bay, the Ferret, 4 October 2021.

<https://theferret.scot/cop26-youth-conference-ends-sponsorship-oil-firm/>

Aker

As a group with a diverse set of products and services, Aker's production can be measured by the workforce provided by the parent company's share of employees in all its daughter entities.

In 2022, Aker Group's consolidated revenue was 2.33 billion euro while Aker ASA's share of the total number of employees was 7,438. That means that each employee generated an average income of 313,000 euro.⁷⁰

Also in 2022, Aker Group's reported total emissions (scope 1, 2, and 3) were 15.6 million tonnes CO₂e, corresponding to an average of 2,100 tonnes per employee.⁷¹

It is reasonable to assume that Aker will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If Aker spends 2 million euros on sponsoring GB Snowsport and Team Aker Dæhlie and wants a 7.0 percent return, they will need to engage the workforce of another 91 employees. That in turn will create increased emissions of 192,000 tonnes of CO₂e, corresponding to 95.8 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO2e}{EURsp} = \frac{CO2etot}{WACC \times REVtot} =$$
$$\frac{15.6 \text{ billion kg } CO2e}{0.07 \times 2.33 \text{ billion } EUR} = 95.8 \text{ kg } CO2e/EUR$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all Aker's operations are responsible for the loss of 39 square kilometres (km²) of snow cover each year.⁷²

⁷⁰Aker ASA: *Annual Report 2022*.

<https://akerasa.ams3.cdn.digitaloceanspaces.com/annual-reports/Aker-ASA-Annual-Report-2022.pdf>

⁷¹Aker ASA: *Sustainability Report 2022*.

https://akerasa.ams3.cdn.digitaloceanspaces.com/images/Aker-ASA-Sustainability-Report-2022_2023-03-29-053346_mqzy.pdf

⁷²For an explanation of the calculation, see Mats Abrahamsson et. al: *The Snow Thieves*, How high-carbon sponsors are melting winter sports, New Weather Institute, February 2023.

<https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

Vasaloppet – Volvo Cars and Preem

Each sponsorship euro from Volvo Cars will generate increased emissions of 18.5 kg CO₂e.

A one million euro sponsorship deal with Volvo Cars will generate 18,500 tonnes CO₂e.

Each sponsorship euro from Preem will generate increased emissions of 44.9 kg CO₂e.

A one million euro sponsorship deal with Preem will generate 44,900 tonnes CO₂e.

Vasaloppet is the world's biggest cross country ski race. It is an annual long distance race held in Dalarna, Sweden on the first Sunday of March each year. It is the oldest cross country ski race in the world as well as the one with the highest number of participants.

The Vasaloppet itself, together with a whole series of smaller ski races during the *Vasaloppet Week*, has turned into a major business and is an important source of income for the local tourism industry.

Vasaloppet is not willing to disclose any details of its funding arrangements but it can be deduced from its annual reports and other sources of information that sponsoring and licensing activities generate around 6 million euros out of a total income of 13.3 million.^{73,74}

Two of the major sponsors of Vasaloppet are car maker Volvo Cars and oil company Preem.

⁷³ AllaBolag: Vasaloppet Marknads Aktiebolag.
<https://www.allabolag.se/5562998392/vasaloppets-marknads-aktiebolag>

⁷⁴ Centrum för Näringslivshistoria, Bizstories: *Vasaloppet – en pionjär i sponsorspären*.
17 April 2020.
<https://www.bizstories.se/foretagen/vasaloppet-en-pionjar-i-sponsorsparen/>

It is not unreasonable to estimate the value of Volvo Car's and Preem's sponsorship agreements with Vasaloppet at one million euro each.

Volvo Cars is a Swedish multinational manufacturer of luxury vehicles.

Volvo has a reputation for producing the heaviest, and therefore most energy-consuming, cars in Europe, a high proportion of which being SUVs.⁷⁵ The International Energy Agency (IEA) reports that SUVs have been the second-largest contributor to the increase in global fossil CO₂ emissions in recent years.⁷⁶

Volvo was also a very late entrant into the market for full Battery Electric Vehicles (BEVs). In 2022, only 10.9 percent of Volvo's global sales of 615,121 cars were fully electric.⁷⁷

Volvo Cars

In 2022, Volvo Cars' total revenue was 29.3 billion euro while producing 615,121 cars. That means that each produced car generated an average income of 47,650 euro.⁷⁸

Also in 2022, Volvo Cars' reported total emissions (scope 1, 2, and 3) were 38 million tonnes CO₂e, corresponding to an average of 61,8 tonnes CO₂e per car.⁷⁹

It is reasonable to assume that Volvo Cars will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If Volvo Cars spends one million euros on sponsoring Vasaloppet and expects a 7.0 percent return, they will need to sell an additional 300 cars. That in turn will

⁷⁵ Lucien Mathieu and Julia Poliscanova: Mission (almost) accomplished. Transport & Environment. October 2020.
https://www.transportenvironment.org/wp-content/uploads/2021/05/2020_10_TE_Car_CO2_report_final-1.pdf

⁷⁶ Laura Cozzi, Apostolos Petropoulos: Growing preference for SUVs challenges emissions reductions in passenger car market. IEA. 15 October 2019.
<https://www.iea.org/commentaries/growing-preference-for-suvs-challenges-emissions-reductions-in-passenger-car-market>

⁷⁷ Volvo Cars Global Newsroom: Volvo Cars reports Full Year 2022 sales, share of fully electric cars at 10.9%. Press release 5 January 2023.
<https://www.media.volvocars.com/global/en-gb/media/pressreleases/308388/volvo-cars-reports-full-year-2022-sales-share-of-fully-electric-cars-at-109>

⁷⁸ Volvo Cars: Års- och hållbarhetsredovisning 2022.
<https://vp272.alertir.com/afw/files/press/volvocar/202303076446-1.pdf>

⁷⁹ Ibid

create increased emissions of 18,500 tonnes of CO₂e, corresponding to 18.5 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO_2e}{EUR_{sp}} = \frac{CO_2e_{tot}}{WACC \times REV_{tot}} =$$
$$\frac{38 \text{ billion kg } CO_2e}{0.07 \times 29.3 \text{ billion EUR}} = 18.5 \text{ kg } CO_2e/EUR$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all Volvo Car's operations are responsible for the loss of 95 square kilometres (km²) of snow cover each year.⁸⁰

Preem is a petroleum corporation with 570 petrol stations and two oil refineries in Sweden. Preem is owned by Saudi billionaire Mohammed Al Amoudi via his British-Swedish holding company Corral Petroleum Holdings AB.

In 1916, Preem submitted an application to expand its refinery at Lysekil on the Swedish west coast. The new plant was planned to be the single biggest emitter of CO₂ in Sweden. After four years of campaigning from environmental groups, the plans were cancelled by Preem in September 2020.

Preem

In 2022, Preem's total revenue was 15.2 billion euro while producing 16.4 million cubic metres (m³) of fossil fuels. That means that each produced m³ of fossil fuels generated an average income of 927 euro.⁸¹

Also in 2022, Preem's reported total emissions (scope 1, 2, and 3) were 47.9 million tonnes CO₂e, corresponding to an average of 2.9 tonnes CO₂e per m³ fossil fuel.⁸²

⁸⁰ For an explanation of the calculation, see Mats Abrahamsson et. al.: *The Snow Thieves*, How high-carbon sponsors are melting winter sports, New Weather Institute, February 2023.
<https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

⁸¹ Preem: *Annual Report 2022*.
https://www.preem.se/globalassets/om-preem/finansuell-info/arsredovisningar/2022/preem_annual_report_2022.pdf

⁸² Preem: *Sustainability Report 2022*.
https://www.preem.se/globalassets/om-preem/hallbarhet/hallbarhetsredovisning/preem_sustainability-report-2022.pdf

It is reasonable to assume that Preem will expect a return of at least 7.0 percent on any investment they make, including investments in sponsorships.

If Preem spends one million euros on sponsoring Vasaloppet and expects a 7.0 percent return, the company will need to Produce an additional 15,400 m³ fossil fuels. That in turn will create increased emissions of 45,00 tonnes of CO₂e, corresponding to 45 kg of CO₂e per sponsor euro.

Or using the formula:

$$\frac{CO2e}{EUR_{sp}} = \frac{CO2e_{tot}}{WACC \times REV_{tot}} =$$
$$\frac{47.9 \text{ billion kg } CO2e}{0.07 \times 15.2 \text{ billion EUR}} = 44.9 \text{ kg } CO2e/EUR$$

Using the methodology presented in the report *The Snow Thieves*, it can be estimated that the emissions caused by all Preem's operations are responsible for the loss of 119 square kilometres (km²) of snow cover each year.⁸³

⁸³ For an explanation of the calculation, see Mats Abrahamsson et. al: *The Snow Thieves*, How high-carbon sponsors are melting winter sports, New Weather Institute, February 2023.
<https://www.badverts.org/latest/new-badvertising-report-finds-major-polluters-melting-the-snow-of-the-winter-sports-they-sponsor>

The snowball is rolling



There are already many initiatives around the world, both private and public, to ban or regulate high-carbon advertising.⁸⁴ In France, car makers must soon pick one of three slogans to include in TV, radio, print and online adverts: “On a daily basis, take public transport”, “Consider carpooling”, or “For short journeys, walking or bicycling is preferable.”⁸⁵

The City of Amsterdam, alongside several other Dutch cities, have banned fossil fuel advertising onboard public transport and in public spaces.⁸⁶

In the UK, several councils have passed motions to restrict high-carbon advertising.⁸⁷

On the media side, British newspaper The Guardian has banned all advertising from fossil fuel firms since January 2020,⁸⁸ following a similar decision by Swedish Newspaper Dagens ETC in September 2019.⁸⁹

Climate advocacy group Comms Declare, founded by marketing professionals, runs the Fossil Ad Ban campaign in Australia. The group reports that 16 local councils, including Sydney and Melbourne, already have bans on fossil fuel advertising and sponsorships.⁹⁰

On 21 January 2024, the Stockholm regional council took a decision to ban fossil fuel advertisements on public transport.

⁸⁴ Reclame Fossilvrij: Worldwide initiatives to ban fossil fuel advertisements. <https://verbiedfossilereclame.nl/only-words/>

⁸⁵ Lottie Limb: French car adverts must encourage people to bike and walk. Euronews.green. 7 January 2022. <https://www.euronews.com/green/2022/01/07/french-car-adverts-must-encourage-people-to-bike-and-walk>

⁸⁶ Reclame Fossilvrij: Worldwide initiatives to ban fossil fuel advertisements. <https://verbiedfossilereclame.nl/only-words/>

⁸⁷ Andrew Simms: It worked with cigarettes. Let’s ban ads for climate-wrecking products. New Scientist. 4 May 2022. <https://www.newscientist.com/article/mg25433851-200-it-worked-with-cigarettes-lets-ban-ads-for-climate-wrecking-products/>

⁸⁸ JimWaterson: Guardian to ban advertising from fossil fuel firms. The Guardian. 29 January 2020. <https://www.theguardian.com/media/2020/jan/29/guardian-to-ban-advertising-from-fossil-fuel-firms-climate-crisis>

⁸⁹ Andreas Gustavsson: Swedish newspaper Dagens ETC: “From now on we will reject all fossil-fuel ads”, 26 September 2019. <https://www.etc.se/ledare/swedish-newspaper-dagens-etc-now-we-will-reject-all-fossil-fuel-ads>

⁹⁰ Coms Declare: *Fossil Ad Ban*. <https://fossiladban.org/about/>

In 2022, Tennis Australia – the governing body for tennis in Australia that runs the major Opens and Cups in the country – was pushed by a grassroots campaign to drop oil and gas major Santos as a sponsor, after one year of the multiyear deal.⁹¹

Following media comments made by Australian cricketer Pat Cummins in 2023, Cricket Australia’s sponsorship deal with coal giant Alinta Energy was brought to a swift conclusion.⁹²

In 2023, German footballing giant, FC Bayern Munich, recently ended their partnership with state-owned Qatar Airways after five years following fan protest against the Gulf State’s human rights record.⁹³

In early 2023, the English Rugby Football Union (RFU), the national governing body for both grassroots and elite rugby, turned down a very lucrative five-year sponsorship agreement with oil and gas giant ExxonMobil, estimated to be worth around £2.5m.⁹⁴ The reasons for turning down this deal were cited as fears of facing public backlash.

In the wake of Russia’s invasion of Ukraine in 2022, finally UEFA ended its partnership with Russian fossil fuel giant Gazprom with immediate effect and across all competitions.⁹⁵ The deal was estimated to be worth \$45 million per year.⁹⁶

In 2021, Channel 4 dropped fossil fuel major BP from its coverage of the Paralympics.⁹⁷

⁹¹ The Guardian, 2022, “Tennis Australia ends partnership with Santos after one year”, <https://www.theguardian.com/sport/2022/jan/23/tennis-australia-ends-partnership-with-santos-after-one-year>

⁹² Sky News Australia, 2023, “Alinta Energy’s major sponsorship deal with Cricket Australia ends after Pat Cummins storm over ‘ethical objections’”, <https://www.skynews.com.au/australia-news/sport/alinta-energys-major-sponsorship-deal-with-cricket-australia-ends-after-pat-cummins-storm-over-ethical-objections/news-story/>

⁹³ The Athletic, 2023, “Bayern Munich and Qatar Airways end partnership following fan protests”, <https://theathletic.com/4646860/2023/06/28/bayern-munich-qatar-airways-sponsorship/>

⁹⁴ SportBusiness, 2023, “EXCLUSIVE: RFU turned down ExxonMobil sponsorship over PR concerns”, <https://www.sportbusiness.com/news/exclusive-rfu-turned-down-exxonmobil-sponsorship-over-pr-concerns/>

⁹⁵ UEFA, 2022, “UEFA ends partnership with Gazprom”, <https://www.uefa.com/insideuefa/mediaservices/mediareleases/news/0272-148df50f5c71-e40e92534a4b-1000--uefa-ends-partnership-with-gazprom/>

⁹⁶ Sportico, 2022, “UEFA drops \$45 million Gazprom sponsorship as Russia sanctions grow”, <https://www.sportico.com/business/sponsorship/2022/uefa-drops-gazprom-after-russia-invades-ukraine-1234666739/>

⁹⁷ Culture Unstained, 2021, “BP no longer sponsor of Channel 4 Paralympics coverage”, <https://cultureunstained.org/2021/08/24/bp-dropped-as-sponsor-of-channel-4-paralympics-coverage/>



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Our call and recommendations



If snowsports are to have a future, immediate measures to stop the emissions of greenhouse gases must be taken. Fossil industry advertising undermines action in many ways. It stimulates the demand for fossil fuels and products and activities that depend upon them, locking societies even deeper into high-carbon infrastructures and behaviours, and thereby blocking the change and investments needed.

Some sports organisations are taking the threat posed by climate breakdown seriously, and have laid out ambitions to tackle it.

Some organisations make the effort to calculate their own climate footprint. As this report has shown, however, the climate impact of the sports organisation's own activities is dwarfed by the impact of the sponsorship from polluting sponsors.

It is absolutely possible to use the formula presented in this report to assess each sponsor's climate footprint. However, that would be a very cumbersome and resource intensive endeavour.

It is far simpler to just say **no** to all sponsorships from high-carbon businesses and introduce blanket bans on sponsorship deals with oil companies, car makers, and airlines.

Our call

We are calling on everyone involved in professional winter sports to end sponsorship deals with companies that are major drivers of climate change, such as oil and gas companies, manufacturers of fossil-fueled cars, and airlines.

We also call on law-makers on all levels to introduce 'tobacco-style' bans on advertising from such companies.

The following steps are helpful recommendations for any athlete, sports organisation or event organiser that cares about the future of winter sports:

1. **Disclose the value of sponsorships from heavily polluting companies** in order that their climate impact can be assessed transparently.
2. **Introduce robust 'snow safe' climate due diligence tests and screening, setting guiding principles for prospective commercial partners:** to reduce any risk

of partnering with polluters, engaging players, fans and the surrounding community in the process.

- 3. Screen-out highly polluting commercial partners** such as oil and gas companies, car manufacturers and airlines.

A practical guide for sports organisations on making informed, responsible sponsorship decisions can be found in the Badvertising report [How to screen-out polluting sponsors – A low-carbon toolkit for sports organisations](#).

Appendix I



WACC

When a company makes a decision about an investment, for example whether to invest in a sponsorship agreement or not, the company has to weigh the present costs against future profits. This is not an easy task as there are always many unknown factors at play but in the end, no sound corporate executive would allow a cost that is not expected, sooner or later, to produce a reasonable return.

So, what is a reasonable return? The lowest rate of return a project or investment must achieve before a manager or investor deems it acceptable is called the hurdle rate or the minimum acceptable rate of return. The hurdle rate is company specific and is influenced by factors such as cost of capital, alternative opportunities and risk.

A common way to determine a minimum hurdle rate is to use the Weighted Average Cost of Capital (WACC)⁹⁸. The WACC represents a company's average after-tax cost of capital from all sources, including common stock, preferred stock, bonds, and other forms of debt. In other words, any investment with a return below WACC would be a bad investment.

The WACC is also company specific and may vary with time and circumstances. However, an analysis of available data shows that WACCs, at least in OECD countries, have a tendency to aggregate around 7 percent.

KPMG makes a very thorough assessment of WACCs in the German speaking countries of Europe surveying 322 companies in Germany, Austria and Switzerland. The 2023 issue shows a spread in yearly averages between 6.6 and 8.8 percent with a ten year average of 7.1 percent.⁹⁹

In a 2023 report, investment bank Morgan Stanley assesses the WACC of the companies included in the Russell 3000 over a period from 1985 to 2022. The average is 7.9 percent but the curve is slightly declining.¹⁰⁰

⁹⁸ Corporate Finance Institute: *Hurdle Rate Definition*.
<https://corporatefinanceinstitute.com/resources/valuation/hurdle-rate-definition/>

⁹⁹ KPMG: *Cost of Capital Study 2023*.
<https://kpmg.com/de/en/home/insights/2023/10/cost-of-capital-study-2023.html>

¹⁰⁰: Michael J. Mauboussin, D. Callahan: *Cost of Capital, A Practical Guide to Measuring Opportunity Cost*, Morgan Stanley, Counterpoint Global Insights, 2023.
https://www.morganstanley.com/im/publication/insights/articles/article_costofcapital.pdf

In January 2024, the New York University Stern School of Business made a very wide assessment of the cost of capital for 6,481 US based companies, determining the average cost of capital for the total market at 7.00 percent.

According to the OECD, the WACC for major oil companies as well as for the automobile industry oscillates around seven percent.¹⁰¹

This report uses an expected WACC of seven percent in all its calculations.

¹⁰¹ OECD: Financial markets and Climate Transition, Opportunities, Challenges and Policy Implications, 2021.
<https://www.oecd.org/finance/Financial-Markets-and-Climate-Transition-Opportunities-Challenges-and-Policy-Implications.pdf>

Appendix II



Loss of snow cover

For the calculation of the loss of snow cover, we have used data and information from Rutgers University Snow Lab showing an overall annual northern hemisphere loss of 90,600 km² of May snow cover since 1970.¹⁰²

As there is an approximately linear relationship between the global surface air temperature in a given year and the cumulative CO₂e emissions up to that year,¹⁰³ we have used the yearly CO₂e emissions of 36.3 billion tonnes¹⁰⁴ and calculated the effect on changes in May snow cover to be 2.5 m² per tonne of CO₂e per year (90,600 km² per year / 36 billion tonnes CO₂e per year = 2.5 m² per tonne of CO₂e per year).

Using this figure and multiplying with the yearly emissions of CO₂e by the respective company, we could calculate each company's impact on the loss of snow cover in May each year.

The reason for choosing May for this calculation is that the changes are most pronounced at the end of the winter season. Between 1967 and 2022, April snow cover declined by 1.32 percent per decade, May snow cover by 4.1 percent per decade, and June snow cover by 12.95 percent per decade.¹⁰⁵ As the winter season shrinks, what earlier happened in May and June will now happen in April and soon in March and February.

¹⁰² Rutgers University Global Snow Lab: *Area of Snow Extent*.
<http://climate.rutgers.edu/snowcover/index.php>

¹⁰³ Rypdal M, Boers N, Fredriksen H-B, Eiselt K-U, Johansen A, Martinsen A, Falck Mentzoni E, Gravervsen RG and Rypdal K: *Estimating Remaining Carbon Budgets Using Temperature Responses Informed by CMIP6*. *Front. Clim.* 3:686058. 12 July 2021.
<https://www.frontiersin.org/articles/10.3389/fclim.2021.686058/full>

¹⁰⁴ IEA: *Global CO₂ emissions rebounded to their highest level in history in 2021*. 8 March 2022.
<https://www.iea.org/news/global-co2-emissions-rebounded-to-their-highest-level-in-history-in-2021>

¹⁰⁵ NOAA Climate.gov: *Climate change: spring snow cover in the Northern Hemisphere*. 17 August 2022.
<https://www.climate.gov/news-features/understanding-climate/climate-change-spring-snow-cover-northern-hemisphere>

Appendix III



Q&A – Sponsorship CO₂ emissions

Are the CO₂e per sponsorship euro exact numbers?

They are reasonable and conservative estimates of cumulative scope 1–3 emissions. In fact, real climate effects of the sponsorship deals are likely to be higher as the increased production in the examples given is a minimum. Most companies would definitely hope for a bigger increase in production. It is also a fact that sponsorship deals usually involve many other costs for the sponsoring company e.g. in the form of advertisements, staff activities and administration. These costs will also have to be recovered.

Will the sponsor not just find another athlete/team/event to sponsor?

They might try. But the more actors within the sports community that refuse sponsorship deals with high-carbon emitters, the more will follow. That will in the end contribute to the pressure on these companies to reform their production. It will also be a moral act, simply to do what is right.

If we refuse to work with these sponsors, doesn't that just mean that people will buy from other producers whose advertising they see elsewhere instead?

In some cases perhaps, but in other cases with less such promotions that normalise polluting products and lifestyles, people will choose to stay at home or go by train instead of taking a flight; or won't choose to buy a new (or second or third) fossil-fueled car. In the longer term, people will buy less petrol if car use isn't normalised by advertising. Refusing to be part of the fossil industry's marketing efforts is also a strong message. And again, a growing and visible stance against them will speed up the transition to a fossil-free society.

But does sponsorship always mean more products sold, can't it also be about goodwill, branding or general positioning?

Up to a point, but when it comes down to it, corporations are not charities and all such efforts are made to increase profit in the end. Few executives will survive long if they allow an expense that isn't expected to produce a reasonable level of return sooner or later.

Do you know for sure that companies demand a seven percent return on their investments?

No one knows exactly what each executive decision-maker will have in mind for their investments. It is likely to be different from company to company, from time to time, and also depending on what risk is involved. But the seven percent is a reasonable and consistent estimate of the cost of capital based on available data - see Appendix One - and it is common across OECD countries over time, and the OECD notes it is typical for oil majors and car companies. The factor of seven percent can, however, be exchanged for any other factor when using the formula presented in the report whenever circumstances make that more appropriate.

Should all sports clubs and event organisers now start calculating their sponsors' CO₂ emissions?

Not necessarily, no, that could be a cumbersome and resource demanding exercise. Of course, clear, comparable disclosure by polluters would make things easier. It is much easier for those in the sports world to just say no to all sponsorships from high-carbon emitters such as oil companies, car makers and airlines.

Many athletes, clubs and organisers have relied on sponsorship from fossil-intense companies. Where will their money then come from?

They will need to find other sources of income, including other companies perhaps from emerging, green economic sectors, that are willing to sponsor winter sports to get exposure. This should not be an insurmountable problem since winter sports have great appeal. When advertising for tobacco was banned some years ago sports and media asked the same question, but it was never a problem to find new sponsors and advertisers.

Car manufacturers are increasingly selling electric vehicles and some airlines have started to use biofuels. Why should winter sports boycott them?

Sponsoring from companies that only sell electric cars is not a problem since they have a smaller impact on the climate. But there is no major manufacturer of fossil-fueled cars that has a business strategy compatible with the globally agreed aim to keep global heating below 2°C. Their share of electric vehicles is typically around 10 percent, meaning that 90 percent of the sales are still fossil-fueled. No airline has a verified plan to reduce its emissions anywhere near what is needed and where aviation is concerned there is no serious, available technological fix, no alternative form of propulsion that can work at scale. In fact, airlines are far behind even car manufacturers and are a growing problem.

Shouldn't a sponsorship that promotes electric cars be ok?

Yes, if the advertising company only makes fully electric cars. But advertisements for an electric model from a manufacturer who mainly produces fossil-fueled cars is actually an ad for the brand itself, not the specific model, and mainly leads to increased sales of fossil-fueled cars.