User perceptions of sustainable online advertising

Qualitative interviews on how internet users perceive sustainable online advertising initiatives

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Executive Summary

To gain insights into people's awareness of carbon emissions associated with online advertising, as well as their perspectives of sustainability advertising initiatives, one-on-one interviews were conducted with nine internet users. Participants were from three major markets (USA, Germany, UK) and varied gender, age, and income backgrounds. Three participants currently used adblocking software.

Awareness of the environmental impact of online advertising focused on energy consumption to load, serve or produce advertisements.

Emissions related to personal internet usage were rarely considered when participants thought about their personal carbon footprint. Online advertising was seen to impact one's personal carbon footprint by requiring more energy consumption to serve or load ads, with some participants also noting emissions related to targeting ads or bidding for ad placements. Ad formats that required more energy to serve or load or had higher production value, namely video ads but also interactive, animated, gaming and popup advertisements, were perceived as having a greater environmental impact. The most common suggestion for how to reduce the environmental impact of online advertising was to regulate emissions, either through a formal certification or compliance standard, by reducing the number or type of ad formats in use, or by setting a limit or requiring advertisers compensate for carbon emissions from advertisements.

Responsibility for reducing emissions was most frequently attributed to advertisers and brands, but users recognised a need for an industry standard or code of practice.

Responsibility for reducing the environmental impact of online advertising was attributed to a range of sources, most frequently advertising agencies and by extension, the

companies or brands commissioning the ads. The need for a standard or code of practice to guide the industry on how to create and distribute online advertising was mentioned in a number of ways, either directly to suggest an official standard or guideline denoting sustainable advertising practices or indirectly through restrictions to file sizes or use of lower-emitting ad formats. Although unaware of any existing bodies, a third of participants thought a governing body or regulator should be responsible for reducing emissions related to online advertising.

A sustainability initiative would need to be associated with an independent, credible and reputable source to be perceived as trustworthy to internet users.

A sustainable advertising initiative would need to be associated with an independent, credible and reputable source or a known or established partner to be considered trustworthy. Transparency and clear messaging would help users to evaluate the trustworthiness of an initiative, as would promotion of the initiative by a reputable outlet (e.g., news website). The absence of these aforementioned qualities would lead participants to doubt or distrust an initiative, and appearance alongside misleading or poor quality content could hurt its credibility. A label, disclaimer or dedicated message on a webpage or advertisement would signal to users that publishers and/or advertisers were using sustainable advertising, along with clear messaging about what the sustainability initiative was.

Sustainable online advertising was perceived to have a positive impact on brands and publishers

For brands, it was important that sustainable advertising was part of a package of initiatives and congruent with the sustainability efforts or reputation of the brand to avoid attributions of greenwashing. Similarly, while the majority of participants would want to support brands who use sustainable advertising, it would not necessarily factor into purchasing decisions unless it was a distinguishing feature between brands with similar

reputations. <u>For publishers</u>, participants thought sustainable advertising might increase user engagement with websites and potentially even encourage users to pay more attention to the ads. However, it was important that expectations about sustainable advertising matched users' experience (e.g., fewer ads, less ad clutter). Although content was of primary importance when engaging with a website, sustainable online advertising was seen as a unique selling point for first-time visitors to a website.

Summary

Awareness of the environmental impact of online advertising was limited and many participants emphasized the need for clear communication and messaging about what a sustainable online advertising initiative meant. While responsibility was often attributed to advertisers and brands to make efforts to reduce their carbon emissions, the need for an independent governing body to set standards or a code of practice to guide industry was stated repeatedly. Crucially, this governing body would need to be independent, credible, and reputable to be considered trustworthy. Brands and publishers who used sustainable online advertising would be perceived positively, but it was important that sustainable online advertising was congruent with other efforts and the sustainability reputation of the brand or publisher. Participants often oscillated between solutions that could be implemented by publishers and advertisers, suggesting a general lack of awareness of the online advertising ecosystem. Thus, potential messaging around sustainability initiatives should adequately reflect the efforts of both players to ensure the benefits are attributed to the relevant parties.

Study Overview

There is limited research on people's perceptions of the environmental impact of browsing the internet and even less on perceptions of sustainable online advertising. Thus, it is not clear how aware users are of the impact of online advertising on the environment, how much control they want to have over the sustainability of their browsing experience, or what potential solutions they would support. To gain insights into people's awareness of carbon emissions associated with using the internet and online advertising, as well as their perspectives of sustainability advertising initiatives, one-on-one interviews were conducted with internet users.

Interviews were conducted between 17 and 28 April, 2023 using the participant recruitment platform "UserTesting". Interviews took approximately one hour to complete. Participants were asked questions to gauge their perceptions on the following topics:

A. Emissions associated with their internet usage and online advertising,

B. Online advertising and perspectives on who should take responsibility for reducing carbon emissions

C. 'Sustainable advertising' and the actors & actions involved

D. Sustainable advertising mock-up initiative

E. Brands that use sustainable online advertising

F. Publishers who use sustainable online advertising

These insights will inform the design of a more comprehensive user survey.

Study Methodology

Research provider

The Acceptable Ads Committee (AAC) commissioned a qualitative research study to understand how aware global internet users are of the environmental impact of online advertising and to gauge consumer support for sustainable online advertising initiatives. The study was conducted by eyeo and overseen by the AAC.

Participants

A total of nine participants were interviewed before it was determined that responses had reached saturation (i.e., that no markedly different themes emerged). Participants were aged between 26-58 years of age, five were male, and three currently used an adblocker. Six participants were from the UK, two were from Germany and one from the USA and participants with lower (20-40,000 USD), middle (60-124,000) and higher (125-200,000 USD) income were represented.

Table 1. Participant characteristics

Pseudonym	Gender	Age	Income	Country	Ad blocking user
P1	M	58	100-125,000	UK	No
P2	M	35	175-200,000	UK	No
P3	F	30	100-124,000	USA	No
P4	F	34	60-80,000	GER	No
P5	M	37	80-99,000	UK	Yes
P6	M	44	20-40,000	UK	Yes

P7	F	33	125-150,000	GER	No
P8	F	26	20-40,000	UK	Yes
P9	M	55	20-40,000	UK	No

Study Insights

People's perceptions of emissions associated with their internet usage and online advertising

Participants rarely mentioned emissions related to their internet usage when thinking about their personal carbon footprint. Even when prompted, most participants focused on energy usage – either on their own device or related to running servers or storing data. When considering the environmental impact of online advertising, many participants considered the increased energy consumption required to serve or load ads on a webpage – often referring to the increased energy usage they experienced on their personal devices to load certain websites as a cue to its impact. A third of participants considered emissions related to auctions or targeted advertising. Few participants had changed their online browsing behavior in consideration of its environmental impact, and if they had taken action, they changed a single online activity (e.g., online search, email provider).

Question 1: Please think about the things that you do that could have an impact on the environment. What do you think are the major contributors to your carbon footprint?

The most frequently mentioned contributors to participants' carbon footprints were transportation (6/9 participants), food choices or food packaging (6/9 participants), and energy or resource consumption (5/9 participants). Three participants referred more generally to purchasing behavior (e.g., buying certain products or refills to reduce waste). Only two participants mentioned anything related to technology: one participant mentioned the use of devices (although more from a manufacturing perspective) and another explicitly stated email, internet usage, and data storage as contributing to one's carbon footprint:

> "*Data like just like the use of the internet and storage. I know that's one that uses a lot of your carbon footprint without you realizing it. And that's definitely one that uses a lot of mine cause I've got a lot of emails from years ago.*" (P8)

In summary, when participants thought about major contributors to their personal carbon footprint, only one participant considered any cause related to their internet usage.

Question 2: What do you think contributes to your carbon footprint when using the internet (e.g., what you see or do online)?

When asked more explicitly to think about their carbon footprint while using the internet, participants focused on energy usage, either generally – in order to run servers to store data (5/9 participants) – or in terms of the energy usage required on their own personal computer (e.g., to browse the internet, load ads; 4/9 participants). Three participants provided specific examples of usage that requires more energy/data storage: video conferencing, online gaming, streaming, email and cryptomining.

Two participants spontaneously mentioned usage related to loading ads when discussing higher personal energy usage they experience when loading certain websites.

> *"Well I think if you take websites like* [x,y,z]*, even though it has good content ...it's usually the amount of advertising that's actually on the website and it's usually, I suppose in their particular instances going to be multimedia adverts. Usually if you like ad adverts say videos that also start by themselves and the like, so those sorts of things"* (P1).

> *"It has to be the ads and supplementary content. Some of them do auto run of videos, so they're, so are some that the videos just start running automatically without you doing anything. So that is behavior that is the most, I think that's, that's the main culprit if I, if I think about it."* (P5)

When prompted to think about different types of files needed to be exchanged to load content on their computer, one additional participant mentioned energy usage associated with data banks, and that if a website had loads of adverts, these would need to be stored somewhere .

Two participants stated that they did not know or had never thought about their carbon footprint associated with internet usage.

In summary, when thinking about one's carbon footprint when using the internet, participants most frequently thought of contributors related to energy usage – either on the participant's own devices or related to running servers or storing data. If online advertising was mentioned, participants considered the increase in energy consumption required to load or store ads.

Question 3: If you think specifically of online advertising… How do you think online advertising affects the environment?

Most participants thought of the energy consumption associated with loading data to display on a webpage (5/9 participants) or related to running servers or data storage (4/9

participants). Three participants referred more specifically to emissions related to auctions or targeted advertising.

> "*And then this is getting out of my comfort zone cuz I don't work in this type of area, but like as far as I understand it, there's like an auction that happens when you load a page of what's gonna be sold to you. So that everything is probably quite costly in, in terms of like, you know, environmental impact. So yeah, it, it definitely strikes me as something that would be quite carbon intensive.*" (P2)

One third of participants referred to different types of ads as having greater environmental impact, such as interactive or animated ads.

> "*I know that some, some online advertising it requires a bit more, I don't know, like power behind it I guess. Because there are some that are really interactive now. It's not just like, you know, like a, a picture or like a moving image or anything. Like you have to actually get involved. Right. And so I guess those would make a bit more of an impact versus like the original versions, like just the pictures.*" (P4)

> "*...it'd be kind of on the top end between videos and storage because those ad spaces are always there and the ad can also vary by what they are. So like they're not always static pictures, they most likely always lead to another page which is like obviously another interaction that's needing to be run through. And then they obviously have to stay there, they change and they're like updated by different codes and run using a lot of different things. So I can imagine them* [online advertisements]*, yeah, being kind of more medium high.*" (P8)

One participant focused on the impact of advertising on increasing consumption, both in terms of influencing people's purchasing behavior and related to increasing consumption of content on the internet (e.g., clicking on ads takes the user to another website). Similarly, another participant mentioned that viewing web pages with online advertising increased

the amount of time people spent on the page. Only one participant mentioned the production of ads as having an environmental impact.

One participant emphasized that the environmental impact of the products or services being advertised would be bigger than those related to online advertising.

In general, when participants considered the environmental impact of online advertising, they focused on emissions related to energy consumption to use a device or to store, serve or load data to display ads on a webpage. In many cases, participants described physical cues that suggested greater energy consumption or loading of data, such as the slow loading of a webpage or the increased processing power required on their personal device. Some participants attributed these experiences to more interactive or intensive ad formats (e.g., video ads, animation). Although some participants mentioned emissions related to bidding or targeting of ads, their awareness of how this impacted the environment focused on energy consumption related to servers or data storage.

Question 4: Have you ever changed your browsing behavior as a result of the environmental impacts of the activities you mentioned/online advertising? If so, how?

Five participants stated they had not changed their behavior as a result of the environmental impact of the activities they mentioned and one of these participants also reported **not** starting an activity because they considered the environmental footprint of the activity (cryptomining). Four participants did indicate that they had made some change to their browsing behavior. Two participants reported using an alternative search engine that promoted sustainability (Ecosia):

> "*I use a browser* [Ecosia] *that is more eco-friendly because they actively show, you know, commitment to, you know, changing our bad behavior or planting more trees so it is contributing to the environment positively.*" (P3)

However, only one of these participants continued to use the service as the other participant found the user interface and results from Google search preferable. One participant reported switching to a sustainable email provider and another reported installing an adblocker – initially to block annoying ads but noted that now it also had the added benefit of being more sustainable:

> "*So going to some of these sites, some of them are dodgy, they just bring up lots of pop-ups ads and everything, spyware. So I'm just, okay, so at that point it was like, mm, I need to get an AdBlocker to just stop this, you know, incessant popups and ads. So that was the main driver at that point. But you know, going now, when I went, so based on the past few six, seven years with all the sustainability and all, it kind of deals two birds with one stone, to use that phrase.*" (P5)

Four participants were asked more specifically whether <u>their awareness of the environmental impact of online advertising</u> had changed their browsing behavior. Two participants had not changed their browsing behavior. One participant again responded that they used the search engine "Ecosia" because of its environmental actions. Two participants mentioned using ad blockers although one admitted that their motivation for doing so was to reduce the inconvenience or performance hit related to viewing ads. One participant also mentioned clearing cookies in their browser.

> "*No. When, whenever I've blocked ads in the past or like whenever I pay extra to skip ads, it's often for a reason like performance hit or just because like the ads are such an inconvenience … it's very difficult for me to like put a number to what the impact would be kind of server wise and, and so like until this interview it hasn't been something that I've considered like, you know, I can put the pieces together logically but it hasn't been a factor in like my decision making before this.*" (P2)

In summary, few participants reported taking any explicit action to change their browsing behavior in light of the environmental impact of their online activities, and when actions were taken, these tended to involve using or switching to a sustainable product or service

in relation to a single online activity (e.g., online search, email). One participant noted the sustainability benefits of ad blockers at reducing the impact of online advertisements, although this was secondary to the main purpose of blocking annoying ads.

People's perceptions of online advertising and perspectives on who should take responsibility for reducing carbon emissions.

Ad formats that require more energy consumption to serve or load or with higher production value were perceived as having a greater environmental impact, namely video ads but also interactive, animated, gaming and popup advertisements. Few participants considered emissions related to targeted advertising (e.g., data consumption).

Responsibility for reducing the environmental impact of online advertising was attributed to a range of sources, most frequently advertising agencies and by extension, the companies or brands commissioning the ads. Ad tech and publishers were mentioned by only a few participants. A third of participants considered that a governing body or regulator should be responsible but none were aware of any existing bodies.

The most common suggestion for how to reduce the environmental impact of online advertising was to regulate emissions, either through a formal certification or compliance standard, by reducing the number or type of ad formats in use, or setting a limit or requiring advertisers compensate for carbon emissions from advertisements. If reducing supply chain emissions was mentioned, these focused on emissions related to production. Despite some participants acknowledging that there needs to be more awareness of emissions related to online advertising, they did not agree whether it should be the responsibility of the user or the company/brand.

Prior to being asked the following questions, participants were provided with some information about the carbon emissions associated with online advertising:

"Carbon is emitted when an ad is produced; this has to do with sending actors and staff to locations to create the ad. Carbon is also emitted when the ad is distributed and displayed on your device. This is due to the electricity required by the servers that host and serve your ad, as well as the electricity consumed by your device itself."

Question 5: What types of ads or the way in which ads are displayed do you think have a greater impact on the environment than others?

Seven of the nine participants mentioned video ads as having the most environmental impact, with five participants considering emissions related to the production of video content and three mentioning the increased energy consumption required to load video ads. Animated, gaming or interactive ads were also mentioned by three participants.

> "*So like ads where like say if you go over a certain box it shows you something different where it produces something that isn't due to clicking on the ad in that kind of way. So I guess things that have that kind of like maybe popup aspect. I'd say video ads, like I said before. Yeah, those two I would say would be the main.*" (P8)

Participants often made comparisons between the impact of video, animated or interactive ads relative to static images or pictures:

> "*animation video would be the, the biggest thing. I imagine if there's sound attached that probably also does it. So like in order of least impact text only, like I'm thinking old school Google ads and then static image then like gif style, then video, then video with audio.*" (P2)

> "*Well if it's just a picture of like an advert with some writing on it and that won't take that much data storage and probably not much rendering. But when you use a video for advertising, that'll probably affect the environment and energy use because it requires more rendering doesn't it? Like a video? Yeah. Or graphics.*" (P6)

"I would say the videos are the ones that would be the main culprits because obviously to do a video there's more manpower needed, more resources and everything. And then to the end point, which is showing the video and you know, it consumes more energy than obviously looking at a picture or a gif or whatever. " (P5)

"I can imagine popup windows maybe have greater data consumption than if I'm scrolling through a website or something and just somewhere in between there's a banner ad like that." (P7)

Three participants referred more generally to the greater environmental impact of ads that have more production value (e.g., filming, travel to locations, more people/resources involved).

Two participants considered the environmental impact of targeted advertising.

"So I can imagine that targeted ads like that are more expensive or not more expensive, but more polluting. In that they have to process even more data, so to speak, or more data is needed to even be able to do that targeted." (P7)

"the bit I sort of get is the amount of effort that actually goes into the process of serving you an ad. Not just the actual ad itself, but also trying to find an ad that's say relevant to me ... So both in terms of, you know, people, brain power computing and the like. The actual process of trying to get an advert to me that I will click on, to me that's always struck me as wildly wasteful and ineffective. [...] why waste your time doing all that when you can just ask me what my preferences are..." (P1)

In summary, participants perceived ad formats that required more energy consumption or production value as having a greater environmental impact, primarily video ads but also interactive, animated, gaming or popup advertisements. In most cases, participants contrasted these ad formats with static or image ads. Only two participants considered emissions involved in targeting advertising to a user.

Question 6: Who do you think is responsible for reducing the environmental impact of online advertisements?

When it came to identifying who was responsible for reducing the environmental impact of online advertisements, participants assigned responsibility to a range of actors. Most frequently, participants put the onus on advertising agencies or campaigns (5/9 participants):

> *"the company that is responsible for producing the ads also have the responsibility because they are the one ultimately creating them."* (P3)

> *"I imagine it would be somebody at the advertising agency."* (P9)

Ad tech was referred to by two participants who mentioned companies that were responsible for tracking or serving ads:

> *"… people who, who spring to mind are the likes of Facebook, for instance, the upper ones I think Google's double click and the like, those sorts of companies and the sorts of companies that sort of try to make money from actually tracking you across the internet."* (P1)

Two participants also thought the responsibility lay with the companies commissioning the advertisements:

> *"I think it has to be the advertisers, or the companies commissioning the adverts … online ad companies as well as the clients should be both responsible."* (P5)

Two participants thought the publisher held the responsibility for controlling the environmental impact of the online advertisements they displayed:

> *"I definitely, the person like, or the, the thing that is holding they, the ad, I mean they, they should be checking them and then as long as they, they think that it's it's fine and that they're happy with what, what the impact is, then you know, they, they're the one*

who are hosting, that's the word I'm looking for. Yeah. If they are like hosting it, then they have to agree with all parts of it." (P4)

Two participants thought consumers should take some responsibility, with one suggesting users could make themselves aware of the impact and identify actions to reduce it (e.g., ad blockers). One participant did not think the consumers held any responsibility as they were just the passive consumers of online advertisements.

Three participants thought there was (1 participant) or should be a governing body (2 participants) to regulate carbon emissions related to online advertising, although none of the participants were aware of any specific governing body or regulator.

> *"There's no like governing bodies that I can think of that are like responsible for the online advertising industry globally. So it would need, and it's not gonna be like a UN resolution, so I mean ideally it would be at the hands of something like the EU or you know, like at a kind of continental country level that there would be some regulations..."* (P2)

In summary, most participants felt the responsibility for reducing the environmental impact of online advertising lay with advertising agencies and by extension, the companies or brands commissioning the ads. Ad tech and publishers were also mentioned by a few participants. The need for a governing body or regulator was brought up by three participants who noted a lack of awareness of any existing bodies responsible for reducing carbon emissions related to online advertising.

Question 7: How do you think [x, y and z] should take responsibility for reducing their environmental impact?

Similar to the range of parties participants held responsible for the environmental impact of online advertising, participants gave a broad range of suggestions for how these parties should take responsibility and reduce their impact.

Four participants thought there should be some formal certification or compliance standard that advertisers and companies should abide by, or an internal policy or guideline to adhere to. One participant went further to suggest that these certificates could be used to bypass ad blockers and show sustainable ads:

> *"I'm thinking of just like some sort of compliance certificate stuff thing where you say like, we're compliant to the like sustainable ad standard or, or something like that, that you know and then you could potentially have ad blocking that doesn't block the ads that meet this criteria because obviously loads of companies make their money by ads [...] maybe you get a badge, maybe you just, maybe it's a tag in the actual like ad itself that could bypass these ad blockers and you know, things like that."* (P2)

Five participants suggested to reduce the number or type of ad formats in use (3/9 participants), or set a limit on or require companies to compensate for the carbon emissions of their advertising (3/9 participants):

> "*So I think there should definitely be some sort of maximum of how much carbon an ad can use. And I think also limits on the frequency of ads. Like there should probably be like an upper limit of how much carbon ads should be able to use in general.*" (P8)

> *"Reducing advertisements. So there's not that much electricity usage in creating or rendering adverts. So I'd reduce the use of videos cuz that seems to be the problem to me. Little pictures and stills, I don't think they'll have that much effect on the environment, but it's more, it's mostly the videos in the frequency of, of the advertising."* (P6)

When it came to suggestions for raising awareness about the environmental impact of online advertising, one participant suggested this was the responsibility of users themselves and two participants suggested that companies should raise awareness of the issue for users (1 participant) or for other companies when working together collaboratively (1 participant):

"Feedback. Yeah, so there has to be feedback [...] *You know, those sort of little things have to be due diligence. Maybe that's the word to use, has to be done by company A then feed that back because the online ad company might not really have that on their minds, you know, that sustainability. But the company which is commissioning the project, which is company A should want to cover all bases to make sure that, you know, this project is sending the right message to the customers."* (P5)

In this connection, four participants emphasized the need to reduce emissions across the supply chain. One participant suggested that tracking was ineffective and wasteful, whereas the other three referred specifically to the production of advertisements:

"Well, if it's a high impact, you know, a video ad with actors, I would suppose that would come down to decisions on using locations nearer to home, minimizing that sort of impact. Try and keep the actual production as simple as possible." (P9)

One participant suggested users could take responsibility by reducing unnecessary storage from their personal devices (e.g., emails, unsubscribing from newsletters etc) or installing an adblocker.

In summary, participants suggested the environmental impact of online advertising could be reduced through adherence to some kind of regulation, either an official certification or standard, an informal/internal policy or guideline, through limits on the number or type of ads, or even carbon offsetting emissions. Participants also mentioned the need to reduce emissions across the supply chain, particularly those related to advertisements with higher production value (e.g., locations, filming, video or animated ads). The need to raise awareness about carbon emissions associated with online advertising was also considered important, although participants differed in who they thought should be responsible for these efforts.

People's perceptions of 'sustainable advertising' and the actors & actions involved

No participant had ever heard of the term 'sustainable advertising' and many participants could not articulate what they understood the term to mean, except that it would involve a reduction in carbon emissions. Offsetting emissions, committing to carbon neutrality, or minimizing or optimizing energy consumption to produce or serve/store ads were the most common interpretations followed by adherence to sustainable advertising practices (e.g., using local servers). The need for a standard or code of practice to guide the industry on how to create and distribute online advertising was mentioned in a number of ways, either as an official standard or guideline denoting sustainable advertising practices or indirectly through restrictions to file sizes or use of lower-emitting ad formats. Such a standard could be marketed to users.

All but one participant wanted to have more control over the sustainability of their online advertising experience, but saw challenges in how any of their potential solutions could be implemented (e.g., opting out of targeted advertising, controlling the types of number of ads they saw). When internet users considered any personal actions they could take to make online advertising more sustainable, the majority would consider blocking ads. Alternative options included reducing their interaction with online ads or supporting other funding models (e.g., subscriptions) to supplement content providers for any revenue loss.

Question 8: Have you ever heard of the term 'sustainable advertising'?

None of the participants had ever heard of the term 'sustainable advertising' related to online advertising. One participant associated the term with print advertising (e.g., using recycled paper, sustainable inks etc).

Question 9: What do you understand 'sustainable advertising' to mean?

As participants had never heard the term "sustainable advertising" prior to the interview, most participants could not articulate what they understood the term to mean. Four participants gave very general statements about minimizing the carbon footprint from advertising without further detail as to how this could be achieved:

> *"So it's related to advertising, you know, being sustainable, which means being cautious about how much carbon footprint you create during the advertising process or you know, the end product we should be try to minimize the carbon footprint. So I think it means basically just reduce carbon footprint whilst you advertise."* (P3)

Three participants referred to reducing or optimizing energy consumption, for instance, by optimizing energy consumption from more carbon intensive ad formats (e.g., video ads should be shortened; one participant) or by using green energy (one participant).

> *"Or we use, like, green power or something to run the these ads, so something like that."* (P7)

Four participants mentioned practices to offset carbon emissions, either by directly offsetting carbon emissions (three participants), contributing to sustainable causes (one participant) or the production and distribution being carbon neutral (two participants):

> "*I suppose it would mean advertising that will be zero carbon one way or another, whether they offset it, offset the carbon in or, so yeah, it'll be something to do sort of making it as zero carbon as possible. The production and the distribution. Distribution of the ad.*" (P9)

One participant interpreted sustainable advertising to involve calculating carbon emissions from producing and serving the advertisement and adhering to maximum limits on emissions and two participants suggested a commitment to a set of sustainable practices:

"I mean, I dunno if they're calculating like how much carbon is involved in the production of each ad and how much is emitted in serving it. But that's either it's like that where you have to like be under a certain minimum limit or oh sorry, maximum limit rather, or the other thing is you just sign up to like these sustainable practices, I'm not gonna fly out my models, I'm not gonna, you know, do X, Y and Z and I'll only serve it on local servers rather than like on a, across the world server over in China, things like that." (P2)

In summary, although all participants understood "sustainable advertising" to involve reductions in carbon emissions, most participants could not elaborate exactly how this was/would be achieved. Minimizing or optimizing energy consumption and offsetting emissions or committing to carbon neutrality were the most common interpretations. Two participants suggested adherence to sustainable practices or setting maximum limits on carbon emissions from online advertising.

Question 10: How do you think online advertising can be more sustainable?

The most common suggestions for how online advertising could be more sustainable were to use lower emitting ad formats (e.g., text-based; 4/9 participants) or implement file size restrictions to ad formats (e.g., video ads; 4/9 participants).

"maybe some limits on file size, things like that that would require more bytes to be transmitted back and forth each time. And then perhaps file format restrictions as well if something like video is just like out because it's too resource intensive." (P2)

Two participants recommended marketing a sustainable advertising code of practice, both in terms of having a non-technical (e.g., production) and technical standard (e.g., technical guidelines).

"One of it is to actually mark advertising as sustainable [...] advertising for instance, that sort of meets good code practice, advertising that sort of takes into account how much energy was produced in its actual creation and then how much energy it actually costs to

actually serve that advert to you [...] *if I were to see an advert which had a little icon just saying sustainably, you know, this advert"* (P1)

"... So it's kind of having a, like an ISO standard sort of thing [...] so you have the cybersecurity, you have the security information standards, all those things, having that standard also appended might help help all online advertisers have that standardized way to go about creating ads [...] So standard guides on one, how to create the ad first, how to reduce carbon emissions [in production] *... Two, in terms of media. So when I say media videos and all that, maybe having that standardized guide to say, well it shouldn't be, it should be encoded at this level.* [...] *in terms of the technical guides, there can be a matrix, you know, if the site is at this level, then ads should not pass this level because it means that ads over this quality or over this length, you just drag the whole ecosystem down. So those sort of little things might help."* (P5)

Other suggestions were carbon offsetting (one participant), reusing energy from data centers (one participant) and paying attention to use sustainable suppliers or reducing emissions from production (two participants).

"I think carbon offsetting is definitely something that would be a way to make them more sustainable. Like working out how to basically balance out the carbon that they are using to make those ads." (P8)

One participant elaborated on how emissions could be reduced from the serving of the ad:

"yeah, so things were things being served to you on more local servers, things being served to you offline rather than a unique server call each time or you know, lots of the ads stored locally. I'm not entirely sure how that would work. What else? Like probably served through newer server architecture that's more efficient like rather than old old style things." (P2)

To summarize, most participants considered file size restrictions for online advertisements or using what they perceived to be lower emitting ad formats (e.g., text-based vs. video) as

a way to curb carbon emissions from online advertising. Three participants elaborated on how carbon emissions could be reduced from the supply chain, for instance, by adhering to standards on reducing emissions from production or when serving the advertisement. Two participants suggested that having a standard or code of practice to help guide the creation and distribution of online advertising would help reduce emissions and such an approach could be marketed to users (eg., with a sustainable icon).

Question 11: As a 'consumer' of online advertising, is there anything you think you can do yourself to make online advertising sustainable?'?

 [note: one participant was not asked this question]

Almost all participants (6/8) mentioned using an adblocker as something they could do to make online advertising more sustainable and three participants also said they could reduce their interaction with ads (e.g., close the website, skip ads, avoid clicking on ads). Acknowledging that online advertising serves to compensate publishers for their content, two participants suggested they could support other funding models (e.g., subscriptions).

> "*the other thing you can do, I mean, which which if you want you can use an ad blocker, you know, which I have in the past, but websites tend to get quite irritated by people who use ad blockers and you tend to get, you tend to get quite a lot of reasonable messaging saying that, you know, we rely on ads for our survival. So if you're not going to use the website, do consider signing up, contributing to the website and the like, and that, I actually think that's totally fair.*" (P1)

One participant mentioned blocking ads as the only alternative owing to a lack of awareness of any industry bodies taking the initiative to make online advertising more sustainable or knowing how to block non-sustainable ads:

> "*Yeah, the only thing that I can think that would make a difference with me doing something today would be blocking it and I, because I'm not aware of any of these like industry bodies that are trying to make it more sustainable. I don't know who, which ad*

servers I would whitelist or you know, things like that and that's probably too much, probably too much research for what I think is an unknown gain." (P2)

One participant noted they could consider using a more sustainable search engine with the assumption that the search engine displayed more sustainable advertising:

"So what comes to my mind off the top of my head is that there are a few search engines that are somehow more sustainable, and if you use them, then I could imagine that they would also display specific advertising that is perhaps more sustainable, so that if I know these alternatives, I would switch back to them" (P7)

Two participants considered themselves as passive receivers of advertisements or felt like it was out of their control to make online advertising more sustainable, with one participant suggesting that increasing their awareness of the sustainability of ads could influence their purchasing decisions:

"I mean I could be more aware of the sustainability of the advert I'm seeing and whether I would choose to buy that product based on that. I think that's about the limit of it. But that's quite a tall ask I think." (P9)

In summary, to most participants, blocking ads or reducing their interaction with online ads were seen as the most common actions users could take to make online advertising more sustainable, and a few participants suggested alternative funding models to support content providers who would lose revenue from these actions.

Question 12: Would you like to have more control over the sustainability of the advertising you view or experience? If so, how? If not, why not?

 [note: one participant was not asked this question]

All but one participant did wish to have more control over the sustainability of the advertising they view or experience online (7/8 participants).

"Oh definitely. Yeah. Like anything that like reduces the environmental impact of the internet would be like a massive benefit both in terms of performance, things you know, run smoother as well as like you feel like you're not burning down the rainforest just by going about your regular online life." (P2)

"I think that would be quite good because if more and more people were to choose that, then it could change like the industry as a whole to be a lot more conscious and a lot more just aware of how things are made and how they are making things. So I suppose yeah, in that sense we would start to have some control about what we're viewing. So that would be a really nice function actually." (P4)

Three participants gave specific examples of how this could/should be achieved: not having targeted advertising (one participant), using paid subscriptions to not see advertisements (one participant) or being able to control how many ads they see (one participant).

The practicalities of any potential solutions were raised by three participants who were enthusiastic about having more control but did not understand how this could be achieved and/or communicated. Two of these participants likened such an initiative to being notified on webpages and making a selection like cookie choices:

"Yeah, yeah, I dunno how they would like explain it to a consumer, like which ads are more sustainable, which ones aren't as sustainable, but it would be cool, almost like the cookie choices you get to be able to get choices like that." (P8)

Only one participant stated that they had not thought about it or did not wish to have more control as they felt the sustainability of the product itself had more impact:

"You know, if it's a big budget advert with a film, then it's probably gonna be a big product that's selling millions and millions of units somewhere. And then how sustainable are the products? I think the sustainability of the advert, while important, it probably pales into insignificance next to that [...] I think I still say it's the product that's probably more important for sustainability than the actual advert itself." (P9)

To summarize, participants did want more control over the sustainability of their online advertising experience. While some participants gave examples of how they could gain more control, for instance, opting out of targeted advertising or controlling the sustainability of or number of ads they see, multiple participants brought up the practicalities of these solutions and the need for communication about sustainable advertising.

People's expectations of 'sustainable advertising' initiatives and trustworthy sustainability signals from brands/ publishers

Incorporating a label, disclaimer or dedicated message on a webpage or advertisement would help to signal to users that publishers and/or advertisers were using sustainable advertising, along with clear messaging about what the sustainability initiative was. For publishers, slightly more participants suggested the location of the label or disclaimer could be on the ad itself than on the webpage (e.g., a banner). Participants often oscillated between solutions that could be implemented by publishers and advertisers, suggesting a general lack of awareness of the online advertising ecosystem. Thus, potential messaging around sustainability initiatives should adequately reflect the efforts of both players to ensure the benefits are attributed to the relevant parties. A few participants did consider the role that ad blockers can play in working with publishers to filter sustainable advertisements.

To be perceived as trustworthy, all participants concurred that a sustainable advertising initiative would need to be associated with an independent, credible and reputable source or a known or established partner. Transparency would help participants evaluate the trustworthiness of an initiative, as would promotion of the initiative by a reputable outlet (e.g., news website). The absence of these aforementioned qualities would lead

participants to doubt or distrust a sustainable advertising initiative, and appearance alongside misleading or poor quality content could hurt its credibility.

Question 13: Publishers/content providers often show ads to help fund the creation of their content. How could a publisher/content provider communicate or signal to internet users like you that they are using sustainable advertising?

All participants indicated that applying some sort of label would be a good signal to users that publishers are using sustainable advertising, although participants were not aligned on whether such labels should appear on the website (e.g., as a banner, logo or seal, disclaimer or popup; three participants) on the ads themselves (e.g., a logo, label, or short text disclaimer; seven participants), or even embedded within the ad (e.g., at the start or end of a video advertisement; two participants).

> "I *suppose it can be an agreement with the publishers and advertisers to create like a, I don't know, a green circle or something in the corner of the adverts, you know, that becomes recognized as this is a sustainable advert.*" (P9)

> "*I suppose they could put up a banner or something on their site and just say that, you know, that that is their stipulation, that is their rule that they do allow ads, but this* [...] *is the only way in which they would do it.*" (P4)

Three participants indicated that the label would need to come from an independent or trusted source:

> "*And as well as that people being told by an independent body that the adverts you are seeing, you know, aren't being, aren't a drain on the environment as such.*" (P1)

> "*one's obviously having a logo, if there's like a logo for sustainable advertising that is quite like known then like having that would be useful*" (P8)

"the more established it is, the more they might understand it when it is somehow displayed" (P7)

A common theme across all suggestions was that participants acknowledged the need for communication about what sustainable advertising meant, either through a dedicated campaign that outlined to users what they were doing with regard to the sustainability of their advertising or as part of the messaging or label itself (e.g., text-based disclaimer, banner, popup).

"also kind of educate you by how can you help the company as well because you can be a part of it, maybe you can opt out of unnecessary communications or opt to receive certain ads if you like […] firstly just to explain what is […] sustainable advertising and then tell us what they're doing, what they've been doing and how you can help the company to achieve more as well." (P3)

Two participants considered the role that ad blockers could play in sustainable advertising, either by collaborating with publishers to allow sustainable ads to be shown or by notifying users with ad blockers that they only use sustainable advertising as an incentive for them to switch off their ad blocker.

"Now if there was an AdBlocker that blocked ads that it determined were unsustainable in terms of energy, that would be interesting if it allowed through adverts that were deemed to be sustainable […] You know, that would be one of the few instances in which I could actually see a website's cooperating with ad blocking companies […] you could sort of see there's a benefit there on sort of both sides in that adverts are still being shown but they're not being shown in a way that are going to annoy people who are actually visiting the site." (P1)

"if you're using an AdBlocker some website say "hey we'd love it if you turn this ad blocker off, we need this to survive". That would be a good opportunity to inform people that we're actually being responsible about this." (P2)

Other suggestions were to provide statistics to inform users about emissions (one participant), give users control over the types of advertisements they are shown (one participant) or take an initiative to offset carbon emissions any time an ad is viewed (i.e., plant a tree; one participant).

To summarize, there was a general consensus that incorporating a label, disclaimer or some form of dedicated communication or messaging on the webpage would help signal to users that a publisher was using sustainable advertising. Further, all participants acknowledged that these efforts should include clear messaging about what the sustainability initiative is. The location of the label or sustainability message could be on the webpage (e.g., a banner) or on or embedded within the ad itself, with slightly more participants suggesting to place it on the ad. Two participants considered how such an initiative would interact with ad blockers, either through a dedicated collaboration to only block non-sustainable ads, or to encourage users to switch off their ad blockers if the publisher committed to show only sustainable ads.

Question 14: Thinking about the advertising industry or brands. How could they communicate or signal that they are supporting/practicing sustainable advertising?

Most participants suggested a logo (e.g., badge, icon, seal), label or other modification (e.g., embedded within a video ad or the ad margin, green frame around the ad) to the ad itself would be an effective signal to users that advertisers are using sustainable advertising practices.

> "*It probably shouldn't be the dominant theme of the ad like, but just some sort of like text again some sort of icon, something that can easily be recognized as like this is how we are, we are being responsible here, we're being environmentally friendly with this advert.*" (P2)

Three participants suggested the most effective way for brands to signal their sustainable advertising initiative was to create a dedicated campaign, (ironically) by advertising their initiative, creating a press release, or including information on the brands' webpage:

> "*But I definitely think, yeah, the most effective way would be to have some sort of like press release or like campaign or like social media thing about it.*" (P8)

One participant again mentioned the partnership with ad blockers as a win-win for advertisers:

> "*having installed an AdBlocker that that does only allows through sustainable adverts, that in and of itself is a bit of a plus for the adverts that actually get through*" (P1)

A few participants sometimes oscillated between advertisers and publishers, making suggestions that would be implemented by a publisher rather than advertisers or brands (three participants):

> "*So I think maybe the publisher can also do something similar to label these things or just include in the video. So you, you learn this content whilst you learn the advertisement.*" (P3)

> "*... on the first page that you land on. You know, when you, you type it in the, the Google or, and and like New York Times and then you press it enter or you click on the link and it should come up then*" (P6)

> "*So if you actually get a web blocker, sorry, an AdBlocker that that websites can actually endorse, you know, that's also a positive for them in that they're going to be able to serve up ads that aren't annoying and, people are actually going to see the ads on their website. So for websites that do rely upon, you know, adverts for their income, I mean it's the sort of thing, it's in their interest to actually publicize.*" (P1)

Similar to solutions suggested for publishers, there was a consensus that some type of logo or label should be attached or incorporated into an ad to signal the advertisers are

supporting sustainable advertising. A third of participants also suggested brands run a dedicated communication campaign to signal their sustainability efforts. Some participants oscillated between solutions that would be implemented by advertisers and publishers that suggested a general lack of awareness of the online advertising ecosystem. This finding suggests that any potential messaging or sustainability initiative should adequately reflect the efforts of both players to ensure the benefits of the initiative are being attributed to the relevant parties.

Question 15: What would make you trust a sustainable advertising initiative or credential?

Without exception, the credibility and reputation of the source of a sustainability initiative or credential was considered important in determining its trustworthiness (9/9 participants).

> "*It's knowing who it came from. So if you were talking about, let's say for instance Budweiser. Budweiser does it, Budweiser does an advert, Budweiser has a little tick to show this advert is environmentally sustainable. Who put the tick there? Was it Budweiser or was it someone independent of Budweiser?* […] *But it's not just enough just to have the little tick mark. You have to be confident that the tick mark has come from somebody you can actually trust.*" (P1)

There was a consensus that the initiative would need to be from an independent body or regulator, or associated with a trusted or reputable organization that establishes itself as a credible or trustworthy source. For instance, some participants likened such an initiative to known labels such as the "V" for vegan, the "cruelty free" rabbit icon, and organizations such as Greenpeace who already have environmental credentials (two participants). Other participants suggested an independent industry group or regulator, or that the initiative has been independently verified.

"So someone who's credible and has authority over like the environment, someone you can trust. You can't have people just making up their own badges and saying this is, this is legit. You know, you need like a body to authorize it." (P6)

"So this kind of badges, it shouldn't be just produced by one publisher. It should be recognized, or accredited by the, the regulator so that you can refer back, oh, you see these badges, not just this company have it, but other companies like Amazon, eBay, or I don't know, like Best Buy and they all of these badges because they're all recognized by a regulator or by the regulator within the industry." (P3)

Two participants also mentioned that the sustainability initiative would gain more traction if it is mentioned and promoted by reputable and trusted sources:

"Yeah, things becoming like commonplace or having some sort of like industry coalition obviously makes things a lot more trustworthy or if it's an independent body, like start with the basics. You need to have a trustworthy name and it needs to sound like a real thing developed by serious people with serious standards or that like, you know, if you click in you can learn more about this, you can learn more about the body as well as like the other methods of like gaining trust in something like that. Which would be articles in like well regarded publications talking about like talking about this new standard or talking about this new method of delivering ads. Like I'm putting this on like if I see it in on like BBC News or the Guardian or, or The Verge or some CNN cnet" (P2)

Four participants emphasized that transparency was important, so that users could learn more about the sustainability initiative, not only in terms of what it meant but who was responsible and how the initiative was awarded or verified:

"it must be established in some form, that is, in a certain way. Of course, it must be made transparent what this seal of approval means, and it must be independently verified. So, if it somehow says, I don't know, the green leaf or I don't know is sustainable because the seal is green or something, then I want to know what does that mean? Who is behind it?

What's the basis of that for a company or a non-profit organization? How do they audit? What does the certification process mean? If it means the advertising is sustainable and we, um. So we give our seal to that, what does that even mean? What does an advertisement then have to fulfill in order to be labeled as sustainable? How often is that checked? Exactly. So just finding information on that." (P7)

A consensus from all participants was that a sustainable advertising initiative would need to be associated with an independent, credible and reputable source or an established or known partner to be perceived as trustworthy. A boost in trustworthiness could be achieved if the initiative was promoted by or appeared on other trustworthy or well-regarded outlets (two participants mentioned this). Transparency was also mentioned as being important to evaluate the trustworthiness of a sustainable advertising initiative (four participants).

Question 16: What would make you distrust a sustainable advertising initiative or credential?

[note: two participants were not asked this question]

The most common reasons participants stated they would distrust a sustainable advertising initiative were if it lacked transparency or the participant was unable to find out more information about the initiative (four participants) or if it was not associated with a trusted partner or independent source (four participants).

"just a badge that I don't see anywhere else. There's no source or no reference for me to learn. It's just a random badge then I think, I don't know what that is, don't know what it means. I can't really reference it. I can't really see anything more then I think I might just don't trust it at all." (P3)

"So in principle actually the opposite. So if it's completely unknown [...] if I search and I don't find anything about it or I don't know, if I search and everything I find about it on search engines is negative. If it's not clear how exactly that is checked, if there's somehow

no independent checking process, if somehow just such classic greenwashing red flags pop up like "we're planting a tree" per whatnot or something, but it's not really clear what's actually being done there, where the tree is being planted? What's the impact of that?" (P7)

"I don't know what the kind of like governing body for this would be or like what the kind of like almost like a supporting partner that's really credible. I think without that that would, so yeah, without kind of like some sort of credible supporting partner, I think that would make me feel suspicious as well." (P8)

Other cues would be if the sustainable advertising initiative made unbelievable claims (one participant), there was no independent verification of the claims (one participant), or if the initiative was able to be copied or scammed (one participant).

Two participants brought up the publisher content as a cue: if the content was considered untrustworthy or misleading (e.g., clickbait websites), this would reduce their trust of the sustainable advertising initiative:

"I suppose like the content that you're seeing is like less within the purview of the ad provider, but I'm, I'm thinking of like, I can't remember who does those like click bait ads at the end of lots of articles where it's like 10 ways to lose tummy fat and things like that […] yeah, that loses credibility when the actual content that is served is like below, below par and untrustworthy or misleading, intentionally misleading." (P2)

In summary, a lack of transparency or the absence of an association with an independent or trusted partner were seen as cues to distrust a sustainable advertising initiative. The quality of publisher content was also seen to play a role by two participants who suggested that sustainable advertisements on websites that published misleading or poor quality content could hurt the credibility of a sustainable advertising initiative.

People's perceptions of a sustainable advertising mock-up initiative

Participants were told that they would see an example of a sustainable advertising initiative and to share your thoughts on the initiative.

Question 17: Please share your thoughts on the following sustainable advertising initiative.

When shown a mock-up of a sustainable online advertising initiative delivered via an adblocker, most participants were confused about why an ad*blocking* product was showing any ads and even made users consider the case that showing *no* ads was actually more sustainable. As such, there was a need for clear messaging and communication about what made the initiative sustainable, as well as the relationship between ad blockers and publishers so that participants knew who to attribute the initiative to. The ad experience also needed to match participant's expectations about sustainability claims, for instance, fewer ads or lower-emitting ad formats. An incongruence between the sustainability of a product being advertised and a sustainable online advertising initiative could hurt the credibility and trustworthiness of the initiative.

Participants were shown a mock-up of a sustainable online advertising initiative that was associated with the use of an adblocker (ABP). The mock-up was a long-scroll page showing three static ads that adhered to the Acceptable Ads Standard, and participants were informed that the ads were sustainable in a pop-up message that appeared from the adblocker.

Figure 1. Mock-up of a sustainable advertising initiative with Adblock Plus.
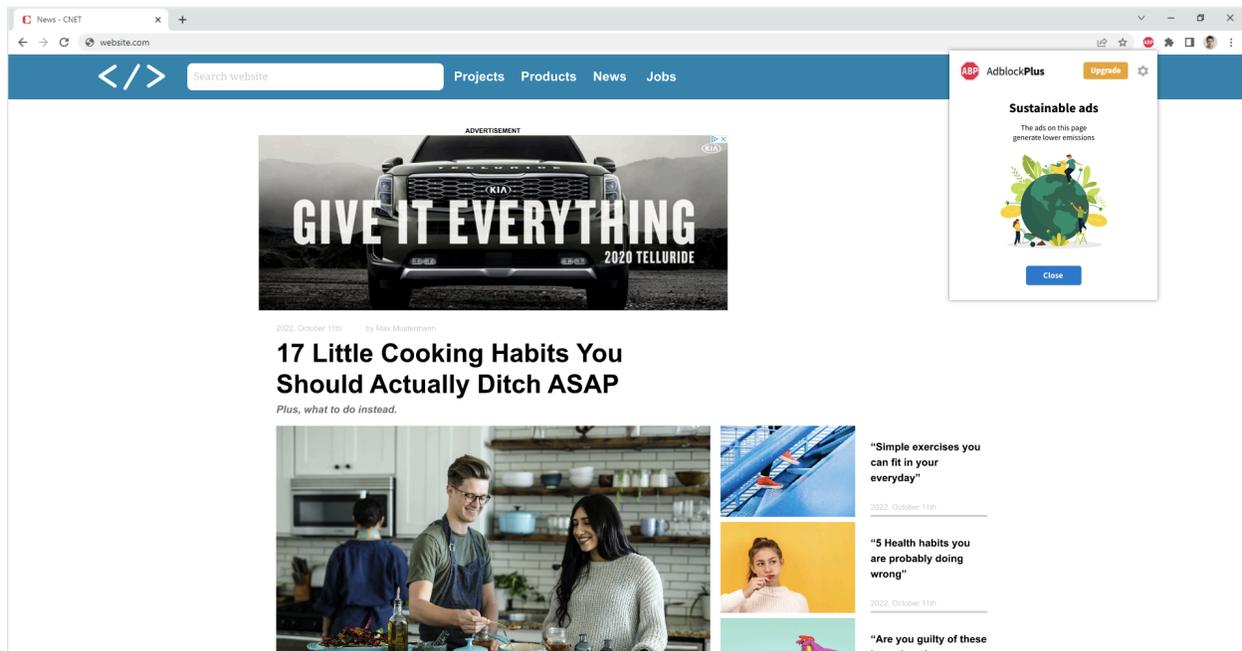
Participants were asked to share their thoughts on the sustainable online advertising initiative:

- What goes through your mind when you see this?

- What do you think of the initiative?

- What are your thoughts about the publisher of the website?

- What are your thoughts about the brand in the advertisement?

[note: one participant was not asked these questions]

Most participants mentioned their confusion at the incongruence between having an adblocker installed and seeing ads, even if they were more sustainable ads (5/8 participants). While some users were simply confused and wanted to know more about or understand the initiative, others were more critical and emphasized that there needs to be consent or agreement from users, user control, or clear messaging to help users understand the balance between the different players (e.g., publishers, ad blocker).

> *"Because for an AdBlocker to allow them, like that's, it's a big step for an AdBlocker and you'd want to like ensure that you have consent from the user that like, oh okay, how much less, how much more sustainable is it? Because the most sustainable thing from an environmental standpoint is no ads and then, but that's not financially sustainable. So what you're asking for essentially is some sort of like give and take where you're, it's not a negotiation, it's some sort of like relationship between you, the website you're visiting and your AdBlocker where you're saying actually like I am willing to view these ads if it helps the business and isn't too bad for the environment and you know, page load times and things like that. So all of these factors together, it's a negotiation and I definitely want to understand more."* (P2)

> "*Counterintuitive,* [...] *Adblock Plus now suggests to me or informs me that the advertising here is sustainable, irritates me a bit, because such an adblocker is more about turning off advertising. So I probably would have clicked away directly if I hadn't been so tuned into it, but would have thought okay, Adblock Plus does something more sustainable, so they offer something, so they have a sustainability claim or something. But not that. I wouldn't have thought that the ads on this page are sustainable, so to speak.*" (P7)

The need for more information to understand the initiative was mentioned by four participants. This also related to the need to clarify some of the confusion as to how and why the initiative related to the adblocker.

"I don't really know how they actually produce lower emission and I can see there's like not advertisement in the between, they're quite small though. They're not that big. So I, if that is the reason why they produce lower emission because they're, they don't take up much space. But I would like to learn more to be honest." (P3)

"Things haven't been explained to me [...] *in a way that I can like resolve things in my mind I suddenly start thinking, has it blocked video ads, has it blocked this type of thing, but let the other things through is this like essentially is this the website being good or is this the ad blocker letting through certain types of ads that are more sustainable?"* (P2)

One participant assumed the logo had been granted by an external company or body who provides some oversight on sustainable online advertising:

"I feel like it was granted something by, I, I feel like there is this company who's like, checks it over and people have to be granted this. It's not like an award, but just like this, you know, just saying, okay, this is what you've done and now you can use it on your website." (P4)

In this connection, participants did not know exactly who to attribute the initiative to:

"Yeah, I think I have a more positive impression about this publisher because they care for this ,select their advertisement partners here. They are more, they are more sustainable in advertising even though I don't really know how and would like to know, know more. But the first impression is, you know, they are actually partnering up with, you know, only advertising companies that produce lower emissions. So yeah, I think it's a positive thing." (P3)

So I don't know whether to attribute it to the publisher's goodwill or some sort of like I, I see the big upgrade badge as well and that makes me think like, oh maybe free users don't get to block all ads. Sometimes they see sustainable ads and things like that or quote unquote sustainable ads. But then that makes me skeptical of the adblock company because it just sounds like actually it's a, a ransom and then just trying to make

it, you know, what do you call it, greenwashing, just trying to greenwash it by saying these are sustainable where the most sustainable thing is no ads." (P2)

Four participants noticed that the ads that were shown were not those that they considered to be higher-emitting ads (e.g., video ads) and that there were few ads on the page which contributed to the credibility of the initiative.

"*So going through all the, going through the page, I think I spotted like three ads, so not too many ads within the content itself, which is good [...] So they're all static. [...] So I would say it wouldn't, it doesn't look like something that will cause stress on my computer and it would support that statement that it generates lower emissions.*" (P5)

However, the relationship between sustainable online advertising and the product being advertised was noticed by three participants who suggested sustainable online advertising for non-sustainable products hurt the credibility of the initiative:

"*Like a big car, sorry, huge car, the like, I think probably all of these things together added up to like some questionable credibility.*" (P2)

"*With a car company, I wouldn't necessarily think that they are particularly sustainable per se. It would seem a bit paradoxical to me if they somehow compensated for their advertising, because I would think that they compensated for everything else first [...] So that would of course be a bit of a question, I mean sure, small steps are good. But if a car company were to run sustainable advertising, I would think that this is probably greenwashing.*" (P7)

One participant also considered that sustainable online advertising appearing on an untrustworthy website could hurt the credibility of the initiative.

"*Yeah, but people might not, if it's on like an untrustworthy website, people might think the adblock plus sustainable ads is untrustworthy as well by association.*" (P6)

In summary, most participants focused on the location and source of the sustainable online advertising initiative, primarily because many participants were confused with the initiative being associated with an adblocker. Thus, participants wanted more information about how it was sustainable and what the relationship was between the adblocker and publisher, also to help them understand who to attribute the initiative to. Again, the issue of congruence with experience was mentioned by multiple participants, first, in terms of their ad experience (less ads, lower-emitting ads) and second, in relation to the congruence between the product being advertised and claims of sustainability.

People's perceptions of brands that use sustainable online advertising

Sustainable online advertising was perceived to have a positive impact on brands and demonstrated to internet users that brands took other things into consideration aside from revenue. Recognising that brands rely on advertising, a willingness or making an effort to become more sustainable was considered to be a positive signal. Nevertheless, it was important to some participants that sustainability advertising was part of a package of initiatives and congruent with the sustainability efforts or reputation of the brand to avoid attributions of greenwashing. Similarly, while the majority of participants would want to support brands who use sustainable advertising, it would not necessarily factor into purchasing decisions unless it was a distinguishing feature between brands with similar reputations. Ultimately, brand loyalty would depend on the brand having a good reputation.

Prior to answering the following questions, participants were reminded: online advertising also causes emissions. Putting this into perspective:1 ad impression is equal to the carbon emission of having a light bulb on for about 30 seconds, on average a internet user sees 30k ads per month, which would thus equal to having the light on for about 10 days.

Question 18: How does the use of sustainable online advertising affect your view on the promoted brand?

In general, participants thought that sustainable online advertising would have a positive impact on their perception of the brand (7/9, 77%), for instance, by signaling that the brand has made other considerations than to rely solely on revenue:

> *"Oh, it'd be a lot more positive. Yeah, it would just give that little extra kind of nod to the fact that they are just aware of what they're doing. Just this extra thought that they've put behind. So it's not, it would just go to show that it's not just about money, but there are other considerations that they've made along the way."* (P4)

However, most participants did not perceive such initiatives would have a dramatic effect on their perception of a brand, rather, it would move the bar a bit to the positive side which may translate to more positive views of the brand in future:

> *"Mentioning that it is sustainable gives the barometer kind of moves a bit. It's not like the defining decision and if I'm gonna look at that brand or click on the ad or anything, but it kind of gives me that little, it moves me a bit in the positive side of okay and dares me just a bit to the brand."* (P5)

Four users also recognised that brands rely on advertising and cutting advertising altogether was not an option. Rather, showing a willingness or making an effort to become more sustainable, such as reducing the length or amount of video advertisements, has clear positive effects on perceptions of a brand:

> *"Yeah, because they need to advertise, obviously, you know, companies rely on marketing and advertisements … But they also can choose between doing it responsibly, like, you know, using the sustainable advertisement, you know, follow the guidelines and anything or just neglect all of these facts and then keep doing your big advertisement. So I think if they actually choose to kind of minimize their carbon footprint. So yeah, I have more respect towards them."* (P3)

Two participants thought that their view of a brand would depend on the congruence between the sustainable advertising initiative and the sustainability efforts or reputation of the brand itself. Certain brands known to have poor reputations for their products (e.g., BP) who market their sustainable online advertising initiatives would not be perceived more positively and may lead to attributions of greenwashing:

> *"It can be positive PR for companies that already have some credibility there and negative reputational effects for companies that already people think of as harmful to the environment."* (P2)

Similarly, a third participant felt it would not change their impression of the brand unless it was part of a package, or part of a wider effort to become more sustainable across the supply chain. Another participant wanted more information about the sustainability effort to understand how it is being used.

One participant focused on how **not** taking action to reduce impact by creating more sustainable advertisements would have a negative effect on a brand (1/9), particularly as high-impact advertisements (e.g., video ads) were seen as having a negative effect on users' personal carbon footprints (e.g., device energy consumption).

One participant initially focused on the publisher as holding the responsibility for sustainable advertising as they are responsible for accepting different types of ads on their websites, and on advertisers who aim to produce lower emitting ad formats (e.g., shorter video ads).

In summary, sustainable online advertising efforts were perceived as having a positive impact on the promoted brand. However, sustainability online advertising should be part of a package of sustainability initiatives that support a positive reputation as a sustainable company or brand.

Question 19: Does the use of sustainable online advertising influence your loyalty? Why and why not?

Practicing sustainable online advertising would increase brand loyalty for most participants. Five of the nine participants said that sustainable online advertising would impact their brand loyalty, explicitly or implicitly, and would make them want to support the brand in future:

> *"I think because indirectly you would have that positive idea about them, I think it would maybe make you just unconsciously more likely to go ahead and use them. I think, just because you have that extra little plus, you know, the extra little check mark for them."* (P4)

> *"If I see a brand they're actively doing this, promoting this, I will have more respect and would want to support them more as well. So yeah, I think that by supporting them, I think that's showing the loyalty."* (P3)

> *"I do believe that it has an influence, because exactly as I said, somehow contributes to the positive image of a company. And I do believe that, well, people may then remember something like that, especially if it is perhaps not yet so common, is what everyone does. So yes, I remain loyal to the company, because they are committed to sustainability and I know that because, for example, of their sustainable online advertising."* (P7)

An additional two participants said the effect would also be positive, but it would depend on their preconception of the brand:

> *"It would make me think more positively of brands I already liked but it wouldn't affect my opinion of brands I already don't like."* (P2)

> *"It depends on the brand. They're brands and they're brands. They're brands that there are some things they do, you can just give them a second chance. There are some that you know, you wouldn't give them a second chance ... if it's a brand in my mind I'm trying*

to look for an excuse not to use them, then obviously that might just factor in into those feelings and I'll be like, hmm, okay, it's not really working for me." (P5)

Of the remaining two participants, one indicated that sustainable online advertising would not influence their brand loyalty and the other did not directly answer the question.

In summary, the majority of users would want to support brands who used sustainable online advertising as it contributes to a positive image for the brand. Nevertheless, sustainable online advertising in and of itself may not be enough to persuade users to be more loyal to a brand and will depend on the brand having a good reputation or positive preconceptions from a user.

Question 20: How does a brand's commitment to use sustainable online advertising influence your purchase decisions?

Despite sustainable online advertising being perceived positively by most users, it was less likely to directly influence purchasing decisions. Three users indicated that sustainable advertising initiatives would influence their purchasing decisions, or if not pushing them to use a product or service, boosting their positive impression such that they would consider using them in future:

"Again, because I support their, their philosophy, you know, their, their vision. So it tend, it will kind of make me tend to come back to, to purchase from them or shop more with them more, more frequently. So I think so yeah, it does make an impact." (P3)

"I think it would, I think it would improve it. I think it would affect it positively. I don't think it would push me all the way to being like, yes, I have to use them, but it would definitely boost how I see them and therefore like whether or not I would consider using them. Yeah." (P4)

Reputation again came up as an important factor that users considered when making purchasing decisions. Two users emphasized that it would depend on the sustainability

reputation of the brand in the first place. However, sustainable online advertising would be an additional factor that could sway their purchasing decisions if they were deciding between two brands that had similar or unknown sustainability reputations:

> *"I think it would influence my personal buying decision if it's a sustainable company anyway. So if I saw that I now had a choice between two rather sustainable companies and one of them uses sustainable advertising, for example, I would say those actually go a step further. They've thought about that as well. That would have a positive impact. And probably also, if I didn't have a sustainable alternative for my product now, so to speak, then that would also make an impact."* (P7)

Two users mentioned that sustainable online advertising initiatives that were associated with brands or products that had a negative sustainability reputation, or where the evidence for a sustainability initiative did not match reality (e.g., ad-cluttered websites), would be perceived negatively and would make them question the claims.

> *"If now, as I said, if it's more of a company where I would doubt that sustainability is particularly close to their heart, then I would, it would actually be a negative for me it would rather have a negative impact under certain circumstances in the sense that some greenwashing alarm lights would go on for me. And I would think something is wrong here."* (P7)

To have impact, users felt that sustainable online advertising should be part of a bigger package or story that supports a brands' sustainability reputation and users would like more communication about how online advertisements were sustainable:

> *"If you want to make a splash in the way that your adverts are environmentally sustainable, you're going to have to tell people in a bit of detail how it is you do it and what makes you different from everyone else in the way that you do."* (P1)

Three users felt that sustainable online advertising would have no impact on their purchasing decisions. Either they would continue buying the same amount of a product, or the initiative would not be sufficient to switch them from a brand that they prefer:

> *"I don't think it's going to do much to influence people. This online badge. I'm not sure. If you like something, you like something don't you? So I can't see a badge getting in the way of that."* (P6)

In summary, sustainable online advertising was perceived positively by users but users were more divided on whether or not such an initiative would influence their purchasing decisions. Brand reputation was again an important factor in determining whether users would be influenced by sustainable online advertisements, although it may be a factor that persuades users to purchase one brand over another given similar sustainability reputations. One third of users indicated it would have no effect on their purchasing decisions.

People's perceptions of publishers who use sustainable online advertising

All participants thought that choosing to show sustainable online advertising would have a positive impact on publishers and would likely increase their engagement with their websites and potentially even encourage them to pay more attention to the ads. Although content was of primary importance when engaging with a website, sustainable online advertising was seen as a unique selling point for first-time visitors to a website. It was important to participants that their expectations about sustainable advertising matched their experience (e.g., fewer ads, less ad clutter). Filtering for sustainable ads reflected positively on publishers as they were held responsible for deciding which ads are displayed on their websites.

Question 21: How would you perceive publishers who use sustainable online advertising practices?

[note: one participant was not asked this question]

As publishers were seen as responsible for selecting the ads placed on their website, their choice to filter ads that support or align with a sustainability vision reflected positively on a publisher as it demonstrated to users that they balanced revenue and their carbon footprint. All users felt the choice to show sustainable online advertisements would give a strong positive impression of the publisher. Only one user mentioned that their perception of the publisher would only change a little bit as they would focus their attention more on the advert or brand itself.

> *"So again, I do have, I do have respect towards them and, and I will support them as well."* (P3)

> *"I think I definitely view them as better because I think for website publishers it's actually quite a big, big business, advertisement is. So if they're making changes on that for the sake of sustainability, then it gives them quite a good view of the website"* (P8)

> *"You know, we need adverts but we don't want to overburden you with them and at the same time we don't want to burden you with adverts that are going to ruin the planet."* (P1)

> *"So if they said like we're committing to sustainable ads and they had exactly the same amount of slots, then that would be, yeah, very positive. It would affect my opinion of them positively."* (P2)

> *"Very well. Very well because for a publisher to use sustainable practices, websites will be very fantastic."* (P5)

However, three users pointed out that the sustainability message needed to be congruent with their preconception of the website and whether the message matched what the website did in practice:

> *"Yeah it, it depends, if they're responsible and then they decide to use sustainable ads, then that would definitely contribute to a positive impression."* (P2)

> *"Yeah, it depends how many sustainable ads they have on their site, right? Because if you've got 200 sustainable ads, that's probably worse than one non-sustainable ad."* (P2)

Even for publishers who were perceived as having a negative reputation (e.g., clickbait, many ads), one user mentioned that sustainable online advertising was nevertheless seen as a step in the right direction:

> *"If "[negatively perceived publisher]" would do it now, I'd be like "what"... , I'd probably still think it's cool, too, because that would still be better than [negatively perceived publisher] as it is now. That's a step in the right direction."* (P7)

Finally, the theme about sustainable online advertisements being part of a broader story or package was mentioned again by one user, who suggested that publishers could sell the "win-win" story to show they are balancing user needs, support for content providers, and sustainability:

> *"You do need to tell a story about this. It's not enough, for instance, just to say we serve up sustainable ads by itself. It's to sort of say the way we serve ads for you is a win-win for everyone and the planet. It's a win for us, it's a win for you. You get ads that aren't obtrusive and you also, we're not sort of reliant upon ads that are destroying the planet and you don't have to view them."* (P1)

In summary, all users perceived sustainable online advertising to have a positive impact on publishers, particularly if the ad experience matched their expectations about sustainable advertising (e.g., fewer ads, less ad clutter). Users also understood and supported publisher's needs for showing advertisements, and filtering for sustainable ads was seen to

reflect positively on publishers who were considered responsible for making the choice about which ads were selected for their websites.

Question 22: How would the use of sustainable advertising of a publisher affect your interaction with the corresponding website?

[note: one participant was not asked this question]

Six of the eight users stated that a publisher using sustainable online advertising would encourage them to visit or stay on a website more, especially if that website serves similar content to other websites that do not use sustainable online advertising:

> *"It might make me more likely to use that website, especially if it's a website that I really like and that maybe has a similar use to something that doesn't use sustainable advertising."* (P8)

> *"Yeah, it will improve my experience, my user experience would be great. Greater if sustainable advertising is used and if they used what you said, you know, that panel, that logo that says sustainable advertising, it encourages me to come visit frequently because I know that, well this site is trying to do their utmost best to help the environment."* (P5)

> *"I think it kind of raised my interest in learning more and then I will make comparisons to some traditional apps that don't have, are not really, you know, doing it sustainably."* (P3)

> *"So I'm happy, so the website gets to serve adverts, they're sustainable for everyone. I'm happy to view adverts so I'm supporting the website in a responsible way"* (P1)

Sustainable online advertising could also encourage first-time visitors to engage with the website more:

> *"Certainly in terms of a first visit to our website, yes, you know, people are going to have favorite websites. They're going to be pretty used to the websites. But certainly in terms of a first time user to a website, I mean let's, let's see. If I was visiting the New York Times,*

this was the first time and so if they said we only serve sustainable adverts, you know? Yeah, I would take that on board as a first time visitor". (P1)

Two users stated that the content of the website was considered to be the more important factor in keeping users engaging with a website and sustainable online advertising would rather add an additional positive impression to a favored website.

Using sustainable online advertisements could also have a positive effect on publisher revenue; three users explicitly stated that seeing sustainable online ads would encourage them to pay more attention to or even click on the ads, or to change their negative views about online advertising in general:

"It might encourage me to click on or pause and learn more about certain ads because I know, if I know that they are part of the sustainable advertising scheme, you know, then it can raise my interest to learn, let me see how they're doing and what they're advertising." (P3)

"The other aspect to it as well for me personally is that if I were told that this website only serves sustainable adverts, I would actually pay closer attention to them just to see in what way they might actually be sustainable. So I might actually look at the adverts just to see what it is about them that does make them seem sustainable." (P1)

"I would perhaps stay a little bit longer on the website because I would actually pay more attention to these ads. But apart from that, I wouldn't say that that would somehow have such a significant effect on the time that I interact with it. I might actually be more likely to click on an ad again." (P7)

"I think I would kind of. So I would probably be a bit more positive about advertising in general. So now advertising actually annoys me primarily and I click away everything that pops up somehow. And I really believe that this is environmentally friendly advertising, so to speak, even if the product that is advertised may not correspond to it, I would still be a bit more positive towards it." (P7)

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In summary, most users indicated that they would likely engage more with a website that uses sustainable online advertising and some users may even switch from other websites or apps that are not practicing sustainable online advertising. While some users mentioned content is an important or primary determinant of whether they engage with a website, sustainable online advertising could be a unique selling point that engages first-time visitors to a website. Perhaps most encouraging, multiple users mentioned that noticing sustainable online advertisements would encourage them to pay more attention to the ads on a website, suggesting that publishers may even generate greater ad revenue from such ads, at least in the short-term.