AD NET ZERO
ALL FOR NONE

# THE GLOBAL MEDIA SUSTAINABILITY FRAMEWORK


A voluntary global standard to calculate the carbon footprint of media

v 1.3

# Ad Net Zero compliance statement

Ad Net Zero is an international, cross-industry voluntary programme of businesses aimed at decarbonising advertising supply chains and encouraging growth of advertising that drives more sustainable choices and behaviours. Ad Net Zero represents the interests of the advertising industry.

It acts as a forum for legitimate contacts between supporters of the advertising industry. It is the policy of Ad Net Zero that it will not be used by any company, industry grouping or individual to further any anti-competitive or collusive conduct, or to engage in other activities that could violate any antitrust or competition law, regulation, rules or directives of any country, or otherwise impair full and competition.

Supporters acknowledge that being a supporter of Ad Net Zero is subject to the competition law rules and they agree to comply fully with those laws. Supporters agree that they will not use Ad Net Zero, directly or indirectly, (a) to reach or attempt to reach agreements or understandings with one or more of their competitors; (b) to obtain or attempt to obtain, or exchange or attempt to exchange, confidential or proprietary information regarding any other company other than in the context of a bona fide business; (c) to further any anti-competitive or collusive conduct; or (d) to engage in other activities that could violate any antitrust or competition law, regulation, rule or directives of any country or otherwise impair full and competition.

Organisations are not precluded from using competing, alternative, or supplementary sustainability calculation frameworks or methodologies in addition to or instead of the GMSF. Use of the GMSF does not require exclusive adoption. Use of simplified default approaches should be a fallback, where primary data is unavailable or prohibitively difficult to obtain, not a preferred methodology.

The GMSF is designed to be scalable and accessible to organisations of varying sizes and capabilities. Organisations with limited resources may adopt simplified approaches using Level 0 data or select elements of the Framework. No organisation should be disadvantaged in the market for choosing to implement the GMSF in a simplified manner. Organisations participating in GMSF development or data contribution processes do so under confidentiality protections.

# Publication history

Global Media Sustainability Framework Version 1.0 – June 2024
Global Media Sustainability Framework Version 1.1 – December 2024
Global Media Sustainability Framework Version 1.2 – June 2025
Global Media Sustainability Framework Version 1.3 – June 2026

# Contents



# Executive summary

## What is the Global Media Sustainability Framework?

The Global Media Sustainability Framework (GMSF) is a voluntary framework built on industry best practices and carbon accounting standards to help advertising businesses estimate Greenhouse Gas (GHG) emissions more accurately across media channels, countries, and their partners. It is a transparent methodology with consistent boundaries for calculation across channels, which industry carbon calculators can choose to incorporate into their tools to increase the consistency and the comparability of the media emissions calculations. The GMSF represents one approach to media emissions calculation amongst several recognised methodologies. Organisations may choose to adopt the GMSF wholly, in part, or may develop or use alternative approaches to emissions calculation.

It was created to support and facilitate the work of media directors at advertisers, media investment leads at agencies, sustainability specialists at media organisations, and sustainability experts at ad tech companies. More information on how specific stakeholders can use the Framework can be found in the Responsible Use of the Framework section of the Playbook. Leaders in the industry are encouraged to consider how this voluntary framework may be relevant to the individual needs and business objectives of their organisation.

## Why is the GMSF needed?

The GMSF Playbook is a key project within Ad Net Zero. Ad Net Zero is a global climate action programme working to help the advertising industry drive better growth through education, sustainability best practices and more consistent frameworks. Action 3 of Ad Net Zero's Five-Point Action Plan helps the industry to reduce carbon emissions from media planning and buying. Related to this is the importance of regulatory compliance, with many of Ad Net Zero's supporters citing a key need for a framework to help them more easily provide media and production emissions data to advertisers, allowing for each advertising campaign to have a CO2e figure that can be directly included in advertiser's GHG inventory.

This Playbook focuses on media, and makes a series of recommendations to establish transparency, consistency, and accuracy so that the industry can consider how to voluntarily act at an individual company level. It is important to note that addressing climate impact is just the first step in a long and multi-faceted sustainability journey.

Based on academic estimates of the IT industry and Digitisation, the estimated carbon footprint for advertising is in the 2-4% range of total global greenhouse gases. For some advertisers, media, marketing, and advertising activity can represent the single largest component of their total carbon footprint, based on data from Ad Net Zero supporters. Looking at marketing agency holding companies, the carbon footprint from media as a proportion of their total emissions can be as much as 55%, based on publicly reported data. Therefore, media emissions represent an important area of focus for sustainability action.

Source: Digital marketing's carbon footprint

# Important notice for users

While the GMSF is a voluntary framework, organisations should implement it in compliance with applicable competition and antitrust laws in their jurisdictions. Specifically, organisations should be aware that:

- Implementation should remain independent. Competitors should not coordinate or align their approaches with each other.
- Sensitive commercial information (cost structures, staffing, volumes) should not be exchanged in the context of GMSF implementation.
- Any data-sharing mechanisms should be structured to prevent coordinated purchasing or supplier discrimination.
- Organisations should consult legal counsel if GMSF implementation raises competition law questions.
- Organisations are solely responsible for ensuring their use of this Framework complies with all applicable laws.
- Adoption of the GMSF does not preclude or discourage the use of alternative emissions calculation methodologies.
- Corporate Overhead data sharing: When sharing Corporate Overhead Emissions data with counterparties (buyers, sellers, or third parties), organisations can individually disclose aggregated emissions data suitable for their specific reporting purposes.

# How the GMSF works for everyone in the media ecosystem

## GMSF - the methodology

The GMSF defines how GHG emissions can be calculated consistently across channels. It is a methodology, not a calculator. You access it through a GMSF-aligned calculator.

## Carbon calculators – voluntarily implement the methodology

Internal or third-party tools can integrate the GMSF methodology including unit operation definitions, boundaries, and data guidance.

### Buy side

*Advertisers, media agencies and calculator owners*

**Advertiser:**

- Work with GMSF-aligned calculators to get comparable campaign GHG emissions estimates
- Feed your emissions data into your wider GHG inventory and disclosure reporting

**Media agencies and calculator owners:**

- May use GMSF-aligned calculators to assess comparable campaign GHG emissions estimates
- Use the Data Request Form to collect consistent data from the supply chain and media owners
- Report campaign emissions to advertisers in a comparable format

### Supply chain

*Intermediaries across all channels (eg. Ad tech, TV distribution, OOH networks, broadcast/print infrastructure)*

- Share activity-based data on how the ad is carried, processed and transacted, so estimates move away from defaults values and become more accurate with granular data

### Sell side

*Broadcasters, publishers and platforms*

- May align emissions data to the GMSF; how it's referenced and supplied shapes every calculation
- Can use the emissions data sources and factors to estimate the footprint of your inventory
- May provide emissions data in alignment with GMSF definitions and sources to support comparable reporting

All roles and activities described are voluntary. Organisations may adopt elements of this framework as they see fit.

# How the GMSF has evolved

Each version has built on the last. Are you new to the GMSF? Start here to understand more about how the GMSF has evolved since 2024. The next slide gives more detail on GMSF v1.3.

## GMSF v1.0
**June 2024**

Established **channel workflows** and **boundaries** for **six media channels** aligned to the three major steps in a campaign's lifecycle: creation, distribution and consumption

## GMSF v1.1
**December 2024**

Released **formulae** for each channel sub-step (unit operation), setting out the processes and the key variables needed for calculation

## GMSF v1.2
**June 2025**

Released the first channel **Data Guidance** for **Digital,** turning the workflows and formulae into usable calculations

## GMSF v1.3
**June 2026**

Released **Data Guidance** for **TV, OOH** and **Print**, an updated Digital guidance, and methodologies for **Corporate Overhead Emissions** and **Data Uncertainty**

# What updates have been made to the GMSF v1.3?

With each iteration of the GMSF, our methodology becomes stronger, providing a more robust foundation for the industry. In this version:

- We have introduced **Data Guidance** for **TV, OOH** and **Print** with Audio and Cinema due to be added later in 2026. This is in addition to the Digital Data Guidance, previously released in June 2025 as part of v1.2 of the GMSF.
- **Digital Data Guidance** has also been updated. For programmatic buying we are proposing moving beyond ads.txt for greater accuracy, however the formalisation and adoption of this approach (carbon.json) will take time.
- We have added a methodology that applies to each channel to allocate **Corporate Overhead Emissions**, as well as a methodology to assess the **Data Uncertainty** of each channel estimate.

These updates mark a significant step forward in enabling more accurate, consistent, and actionable estimation of emissions across the major media channels. We now encourage the industry to use the GMSF and to feed back on areas for improvement, so we can continue to evolve the Framework with the industry over the coming years. We also encourage the industry to share emissions data when requested, to increase the accuracy across all variables.

Please note that future iterations of the GMSF will incorporate any revisions to the Greenhouse Gas Protocol to continue to be aligned with climate accounting standards.

The new updates can be found in the separate channel specific Implementation Guides. links to these documents can be found below:

**Channel Implementation Guides**

- Digital
- OOH
- TV
- Print
- Audio (coming soon)
- Cinema (coming soon)

# Which channel specific frameworks are ready and when were they created?

| | Digital | TV | OOH | Print | Audio | Cinema |
|---|---|---|---|---|---|---|
| **Channel Emissions Workflows** *Campaign steps identified within GMSF boundaries* | June 2024 | June 2024 | June 2024 | June 2024 | June 2024 | June 2024 |
| **Channel Emissions Formulae** *The calculation applied at each step* | June 2024 | June 2024 | June 2024 | June 2025 | H2 2026 | H2 2026 |
| **Emissions Data Request Form** *A consistent request for data from the supply chain and sell-side businesses* | June 2025 | June 2026 | June 2026 | June 2026 | H2 2026 | H2 2026 |
| **Emissions Data Hacks** *Recognised approach when data is missing or incomplete* | June 2025 | June 2026 | June 2026 | June 2026 | H2 2026 | H2 2026 |
| **Emissions Data Sources** *Freely available database including specific CO2e factors* | June 2025 | June 2026 | June 2026 | June 2026 | H2 2026 | H2 2026 |
| **Corporate Overhead** and **Data Uncertainty methodologies** | June 2026 | June 2026 | June 2026 | June 2026 | June 2026 | June 2026 |

# Audio and Cinema

We had originally intended Audio and Cinema to have full Implementation Guides ready for version 1.3 However, technical issues and resource constraints have meant that both channels' Implementation Guides will now be released in H2 2026. These Implementation Guides, as well as the associated Audio and Cinema Data Sources and Data Request Forms, will then be a part of version 1.4.

Some of the development work done in the previous editions of the GMSF, for Audio and Cinema, can be seen in their respective Channel Emissions Tables, with links to each at the end of this document.

# Possible ways to leverage GMSF based estimations

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| **The transformation must be taken in stages** | The infographic on the next slide outlines the key stages of the transformation and the criteria used to signal progression from one phase to the next. The first and most important stage is Benchmarking & Understanding. At this stage, data is collected but should not be used for reduction or optimisation, except in cases where clear inefficiencies are identified - for example, high-emitting behaviours associated with 'Made for Advertising' (MFA) media placements. |
| **Flawed comparisons should be avoided** | Media-related emissions data should be used to assess company-specific progress over time. At this stage we should consider media emissions data to be channel and provider-specific. Stakeholders and partners should encourage continuous improvement and should only consider tactical steps as media emissions data become more consistent. Use of media emissions data alone to change a media strategy is not advisable, and advertisers should consider the data in combination with business and marketing effectiveness objectives. |
| **Prioritise the elimination of waste** | At times, emissions reduction of a channel will be dependent on the supporting structures around it i.e. the electricity grid a channel runs from. Media sustainability leaders may want to consider where and how they can pursue emissions reductions in their value chain – both upstream or downstream – to help reduce their impact. Additionally, there is mounting evidence for unnecessary duplication in digital media that implies waste in the form of too many selling pathways. Media and sustainability leaders will need to reflect on their choice of, and influence on, these wider considerations. |

# What success looks like

## Understand, Benchmark & Report

- Establish an understanding of media's carbon impact
- Consider collecting emissions estimation from key markets, key channels, key partners reporting findings to stakeholders
- Consider the development of a future emissions monitoring plan


## Reduce & Challenge

- Consider actions from the Ad Net Zero Guide to Sustainable Media
- Review waste-eliminating steps
- Consider encouraging key partners to provide emissions data production and their own reductions

## Specify & Optimise

- Consider the specificity of data available and the scale of it (market coverage, total media investment coverage)
- Consider ways to optimise within channels to advance emissions reductions based on individual organisation goals and objectives

# What are the challenges being addressed?

**Background**

In 2023, many companies within the advertising industry expressed a need to develop a voluntary framework based on industry-informed best practices. After listening and much research, we determined this work could help alleviate some challenges and offer further opportunities identified in our research.

**Common challenges identified**

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| **Variability in estimation** | We heard from advertisers and national associations who shared the results of their A/B testing, which compared carbon emissions estimates from different providers. These results showed variability ranging from **6x to 20x difference in estimates**. |
| **Fragmentation of data requests** | We also heard that the marketplace was asking for different datapoints and in an inconsistent way, which inundated media suppliers with **multiple contradictory requests** that were hard to prioritise. |
| **Reporting requirements** | The largest organisations will soon be required to report emissions data as part of various market's climate disclosure rules. These new legal requirements are prompting media value chain participants to engage in data collection and reporting that will benefit from guidelines aligned with those in other sectors. In our 2025 feedback survey, 63% of supporters highlighted **regulatory compliance** as a key driving factor. |

**Approach**
From these three challenges, we determined that a voluntary industry framework was necessary to enhance transparency, consistency, and accuracy in support of climate action, and that the Framework would need to span three main areas:

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| **How it will work alongside existing climate standards** | A voluntary industry framework for media should be consistent with international standards, particularly the Greenhouse Gas Protocol, and with best practices, in order to better serve advertisers by aligning with how carbon accounting is conducted across other departments and sectors. |
| **How it will fit across the entire media landscape** | A voluntary industry framework for media should be pre-competitive and work across all relevant media channels without bias or prejudice to ensure that subsectors within media follow a consistent approach. |
| **How it will be global** | A voluntary industry framework for media should ideally stretch to all countries. The goal is to give stakeholders as much visibility as possible of the emissions from paid media campaigns globally. |

**In simple terms**
This framework provides a consistent way to calculate where emissions occur across media activity and a structured approach to calculate these emissions over time.

**Who was involved?**
We embarked on a process that has brought together 1,000+ industry stakeholders, from 300 organisations including advertisers, media agencies, media owners, ad tech partners, carbon calculators, and trade associations. This was all done in a pre-competitive space to voluntarily participate in research, working groups, and to feed back on our recommended approaches. These organisations represent views from over 40 markets.

We were inspired by the generous efforts and contributions across all stakeholder groups to help produce the GMSF and recognise that this is the start of an industry-wide journey for the ultimate benefit of the planet and society.

# What opportunities can the GMSF unlock?

**There are several opportunities that could arise from adopting the GMSF**

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| **Getting the most accurate data available** | The more granular the data, the lower the level of uncertainty in a company's reporting. The goal is to use activity-based, product-level data that reflects the media inventory sold to advertisers. This will not be delivered immediately by all entities, but we have defined different data levels, consistent with IPCC and GHG Protocol approaches used in other sectors, to encourage industry leaders to begin producing data that will eventually reach this level of granularity. In the absence of activity-based, product-level emissions data, there will still be a need for approximations. |
| **A consistent framework across different media channels** | The Channel Emissions Tables (CETs) in this document create a reference point and recommend what should be included for calculation in each media channel. They are a leaping off point for formula development and data collection. These CETs are underpinned by the core phases that a created ad takes in media; Creation, Distribution, and Consumption. It is important to note that this voluntary framework excludes emissions from the creative production of an ad and starts once the execution is created. |
| **A pathway to audited data and integration** | Given the growing importance of GHG reporting, we recognise that verification of data and formulae application is a natural development. We will be engaging auditing bodies as the starting point for the development of auditing guidance for product-level data within the media process, and for the correct implementation of the GMSF within industry carbon calculators. |

# Oversight and governance

**To validate the scientific integrity and the relevance of the work to industry objectives we established two governing groups:**

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| **Steer Team** | Responsible for ensuring that our work is relevant to media buyers and sellers and that approaches are developed without the influence of commercial interests. |
| **Climate Science Expert Group** | Responsible for ensuring that our work is consistent with GHG accounting practices across other sectors and is developed with scientific grounding and oversight. |

# Key messages for senior leaders?

**Managing vision and purpose in an industry-wide effort and transformation requires clarity, and there are three key messages to share:**

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| **This is an evolving journey** | The GMSF framework is strictly voluntary and open to all stakeholders in the media industry. It provides the tools to enhance accuracy and consistency in the carbon calculation of media campaigns. The methodology will evolve over time as audited, activity-based data becomes available and as companies innovate further (e.g., the use of AI). |
| **Materiality not morality** | The goal of this work is to develop a voluntary, industry framework that supports efforts to accurately quantify emissions from media campaigns to enable a more sustainable media industry. The Ad Net Zero Global Media Sustainability Framework does not challenge the fundamentals of media planning and buying – it offers another practical, tangible, and necessary metric to consider. |
| **Best practices with freedom of adoption** | The GMSF has been created from best practices voluntarily shared and workshopped to establish a pre-competitive framework that will be efficient, saving time and resources for stakeholders. The GMSF respects company freedom, and stakeholders have the liberty to endorse and adapt solutions relevant to their services. |

# Why this matters to advertisers

Energy volatility is increasing operating costs across data centres, production, distribution, and digital delivery.  Destructive weather is disrupting infrastructure and supply chains. Insurance premiums are rising in climate-exposed markets. These factors directly affect cost, reliability, and long-term planning.

So, organisations that understand where emissions occur across their media activity are better positioned to control costs, respond to stakeholder demands, manage regulatory exposure, and adapt to an evolving marketplace.

The Global Media Sustainability Framework provides a structured way to do that. It brings consistency to calculation, clarity to supplier expectations, and discipline to long-term operational planning.

In short: it helps future-proof media investment.

# Industry input and insights

# A shared vision that helped shape this work

Across the industry, we have gathered input and best practices to build a set of voluntary principles, solutions and pre-competitive standards. This work has included best practices relating to media sustainability. It's important to consider this, as each company reviews this work and determines how they may pursue its implementation.

These are the core elements of thinking that have helped to shape the development of this system of voluntary industry frameworks and tools. Taken together, they are intended to equip the industry with the means to improve the transparency, consistency, and accuracy of media carbon calculation.

### 1. Effective media, more sustainably

This work was crafted by media experts with input from climate science experts. The goal of this work is to provide support to the objective that core media goals are achieved more sustainably.

### 2. Audited activity-based emissions data is the ideal destination

The best practice for data is to be as close to actual carbon emissions as possible. Further, this best practice focuses on activity-based emissions related to media inventory or media products that are represented in the media campaigns. Finally, we recognise the need for the audit of media emissions calculations and reporting to drive the principles of accounting to accurately provide input for advertisers' scope 3 emissions.

### 3. Frameworks can promote innovation

The voluntary framework for media sustainability can provide a common foundation on definitions, modules for estimation, and communicating data granularity.. These are core to enhancing transparency, which may foster increased competition and innovation.

### 4. Expectations on sustainability should scale based on market share

Emissions reporting and the granular level of data produced should be cognisant of the size of the media organisation. These are principles in several regulatory and co-regulatory schema. Most notably, we see this represented in the Corporate Sustainability Reporting Directive (CSRD). These sensibilities can be a useful way to consider how media stakeholders produce data. Most importantly, small organisations, unable to produce emissions data based on size, should not be penalised, and in instances such as these, alternatives like averages and norms may be applied.

### 5.Interoperability and transparency are necessary for global operations

We endorse the multiplicity of providers and believe that this will ensure marketplace innovation. We also recognise that there are limitations to provider coverage, whether it is geographic or channel in nature, or in their scope of work with a marketer. To achieve near global coverage, for end users, we encourage industry stakeholders to consider how the GMSF can provide the means to ensure that outputs from different suppliers can be combined with limited manipulation.

### 6. Voluntary standards preserve freedom to adapt and a means to disclose

All the GMSF elements are voluntary and provide a foundational framework for individual organisations to consider when advancing their own goals of accurate, consistent, and rigorous calculation of media emissions. The voluntary nature of the Framework elements can be applied thoroughly, partially, or used simply to compare methodologies. We believe in giving industry participants choice in how to use each part of the Framework, and that in referencing the Framework, industry participants will have transparency at a minimum.

# Getting started – some insights and best practice

In the development of the GMSF, we've been fortunate to learn from key media leaders, to identify insights to share with those starting on their sustainability journeys.

## Top Tips

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| **Connect media sustainability to the broader business agenda** | Media leaders who have embarked on the sustainability agenda have tethered it to the broader organisation sustainability strategy, given that for many organisations media placement is categorised as scope 3 emissions (e.g. indirect emissions from business suppliers). As media emissions may be a smaller part of the overall footprint of an organisation, it's important to consider how media emissions estimation and reduction fits within the overall organisational sustainability strategy. Further, it is essential that advertisers consider executive buy-in from key roles such as the Chief Marketing Officer and the Chief Sustainability Officer. |
| **Understand where marketing and media fit in** | Understand where the marketing function fits within your larger enterprise and make sure to understand how media as a key marketing investment plays a role – ranging from contracting with agencies to purchasing media inventory. This top-down analysis helps to develop an understanding of emissions from the media function and can be an essential cornerstone in the media sustainability journey. |
| **Create a cross-company understanding of your goals** | Transparency of media sustainability goals and ambitions is core to managing a partner ecosystem that is diverse, ranging from advertisers and agencies to media sellers to technology and data providers. Media leaders have shared overall objectives and expectations with key media partners as a means of delivering on a range of needs spanning emissions data reporting to understanding media supplier's emissions reduction targets. |
| **Use data to benchmark your position** | Start off the process by developing an initial benchmark to discover what can be estimated and what your emissions currently are. It's important to establish an initial reference point and to ensure that the initial read identifies what can be estimated and to what level of accuracy. |

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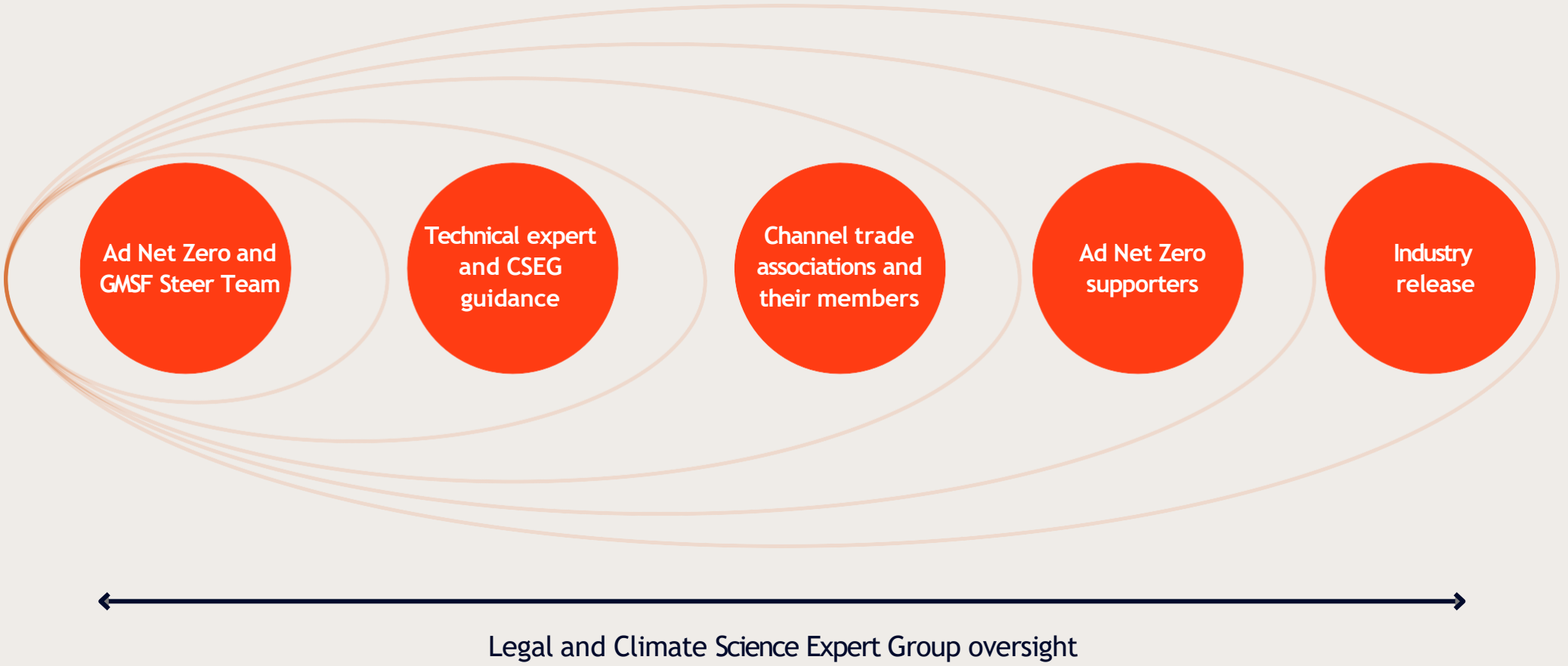
| **Identify 'quick wins' and tactical steps** | We've gathered some industry wisdom to help you kickstart your sustainability journey. Click here to access the Ad Net Zero Guide to Sustainable Media. |
| **Let materiality in investment and emissions help set priorities** | Focusing on significant areas for investment or emissions in terms of markets, channels, or partners can help establish a disciplined structure of where to focus and what outcomes to pursue. The leading ad buyers at marketers and agencies have used a framework to help determine areas for focused conversation that fit into a series of criteria relative to market, channels, partners, and if known, relative to size of emissions. |
| **Raise long-term ambitions** | Share long-term objectives with your key partners. This is not dissimilar to the way purchasing or procurement teams function in sharing their organisational objectives on a certain topic and ensuring that their supply partners can help drive transparency or in some cases support that objective, if appropriate. Being able to communicate mutual expectations is a way for partners to establish transparency. |
| **Challenge key partners** | Encourage others to understand their own sustainability work. Internally at an advertiser for instance, this could be a global media lead encouraging their market-level leaders to consider agency and media supplier relationships. Externally at a media agency for instance, this could be engaging with key media suppliers to consider individual organisational sustainability reporting. The common theme of this best practice is having transparent conversations on the media sustainability initiative with key partners and to ask how they can support a shared objective. |
| **Appropriately manage the media sustainability journey** | Media leaders who are sustainability minded have repeatedly shared that media must still be held to the commercial objective of reaching consumers and driving a sales response, and media sustainability should encourage you to consider the emissions of those activities, not to undermine the goals. Our best practice cohort use this tip as a reminder to avoid any misuse of the data and the tools at hand to unknowingly undermine or create unrealistic expectations of media supply partners. |
| **Seize the opportunity** | The industry has an opportunity to build cleaner, more efficient media systems that lower costs and strengthen resilience. We are building a bank of case studies where major brands are benefiting from using the GMSF and already have some early adopters. |

# Our process and workstreams

# GMSF development process visualisation



# Channel methodology development process

To create our proposals, we implement a process to balance both efficiency and rigour. The different contributors are defined below, as well as the crucial role each plays in the development of the GMSF.

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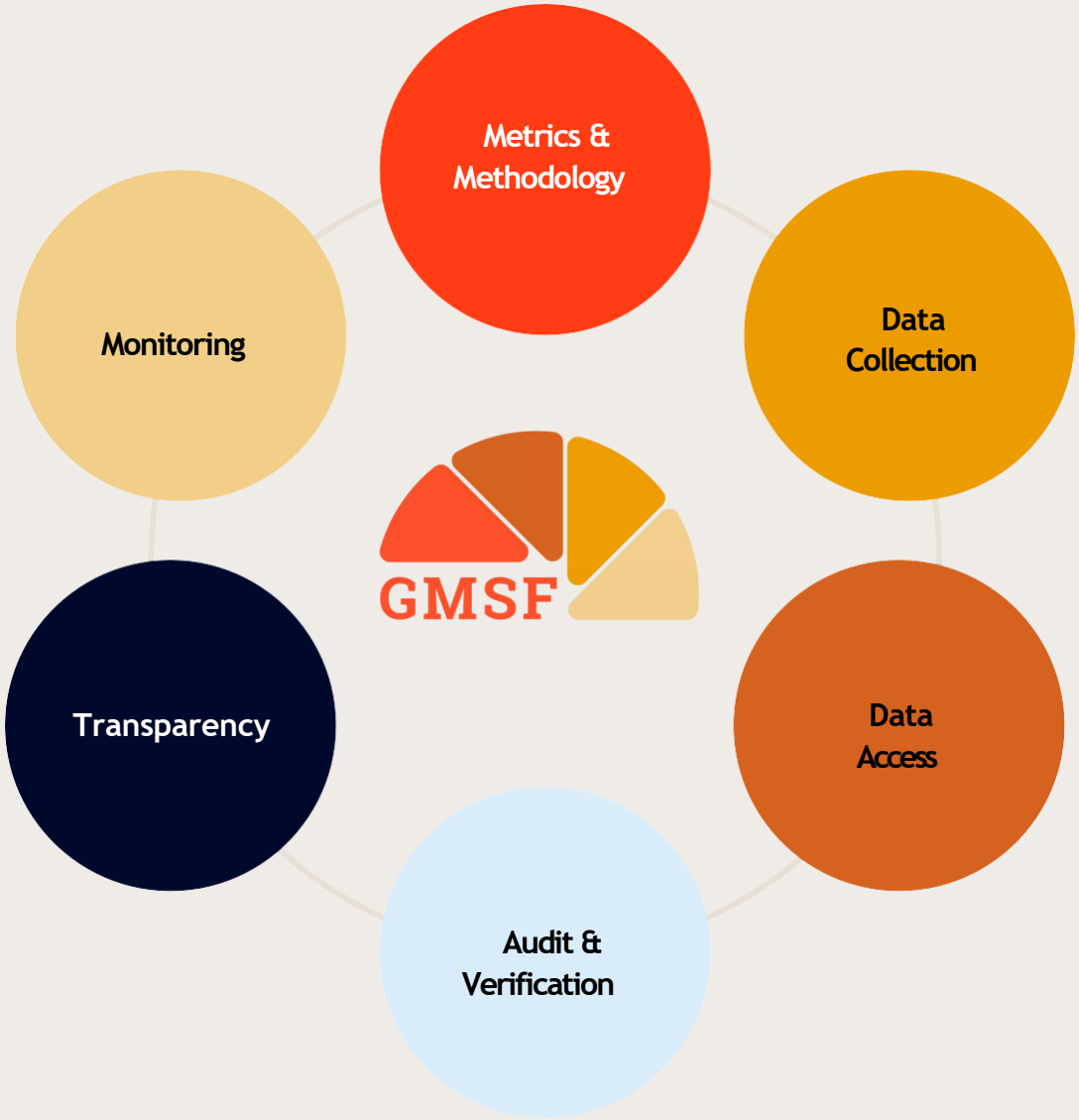
| **Steer Team review** | To ensure that recommendations help the media planning, buying, and reporting process, and that recommendations are consistent with industry practices. |
| **Climate Science Expert Group review** | To ensure that recommendations leverage sustainability best practices from other sectors, and that they adhere to environmental science standards. |
| **External legal counsel review** | To ensure that the Framework is voluntary and pre-competitive, and recommendations comply with competition law and promote transparency. |
| **Channel trade associations** | To ensure that media owners, publishers and the wider media supply chain are involved in the creation of channel level proposals and that they reflect current media delivery operations, levels of data availability, and industry best practice. |
| **Ad Net Zero supporters** | To ensure that we receive widespread feedback and gain support and understanding across our supporter base for our proposals, before releasing publicly. |
| **Industry release** | To ensure that all proposals are open source so that any company within the advertising industry can voluntarily adopt them as best practice. |

# Workstreams and how they coalesce

The recommendations and resources will work together to create transparency, accuracy, and rigour in how media emissions estimation and reporting are managed.



# Ongoing workstreams

## Metrics & Methodology : A consistent framework to calculate emissions across six media channels

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| **Context and purpose** | Variability in media emissions stems from the boundaries, the formulae used, and the source data. Advertising stakeholders will benefit from a common framework to enhance the comparability and compatibility of data. |
| **What questions does it help answer?** | • What are the boundaries for each media channel?<br>• What are the key functional unit steps in each phase?<br>• What is the unit for each functional step?<br>• What data is required for the calculation?<br>• What are the mathematical formulae? |
| **Where does this fit into the media process?** | • Pre-or-post campaign emissions reporting and GHG calculation.<br>• In-campaign planning or buying. |
| **Who can use it?** | • Media sellers may consider using the Framework to provide customers (agencies or advertisers) with post-activity reporting.<br>• Media ad tech solutions and media agencies may consider using the Framework to estimate campaigns during the development process.<br>• Media buyers (advertisers or agencies) may consider using the Framework to estimate campaigns after they are completed. |
| **Other considerations** | The methodologies will evolve over time as data becomes more granular, and accuracy and reliability improves as the correct implementation by industry calculators can be verified. |

# Data Collection: An efficient data request mechanism to collect first party emissions data from media sellers and value chain partners

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| **Context and purpose** | To facilitate the consistent collection of non-confidential data essential for media emissions calculation and reporting, there must be a common data request form that corresponds to the required inputs for each Channel Emissions Formula. This is a voluntary data form that media industry stakeholders may use for emissions reporting and/or emissions data requests. |
| **What questions does it help answer?** | • What first-party emissions data is needed to help estimate the environmental impact of a media placement?<br>• How can we efficiently and consistently collect and share the data needed for each Channel Emissions Formula? |
| **Where does this fit into the media process?** | This voluntary request form may be used during the following steps in the media cycle:<br>• At a set regular interval (e.g. end-of-year reporting).<br>• At a campaign-specific interval (e.g. pre or post campaign). |
| **Who can use it?** | • Media sellers may use this as a self-reporting template to answer media agency, advertiser, or sustainability solution provider requests (e.g. RFIs).<br>• Media buyers (agencies or advertisers) or sustainability solutions providers may use this form or its questions to request non-confidential sustainability metrics from media supply partners. |
| **Other considerations** | Organisations using this form should not publish company or commercially sensitive information or any other confidential information. Organisations should make sure that they are compliant with their own internal compliance processes to ensure data accuracy and confidentiality policies are adhered to |

# Carbon Calculator Transparency: A consistent form to disclose services, data sources, and scientific oversight of media sustainability service providers for greater transparency

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| **Context and purpose** | As the landscape of media sustainability solutions evolves, stakeholders will need to understand the coverage and methods they employ; end users may want to understand what functions they fulfil and what standards they use. |
| **What questions does it help answer?** | The Carbon Calculator Services Data Request Form is a voluntary disclosure form to help media sustainability solutions providers transparently communicate their services. Each organisation should make independent procurement decisions regarding which carbon calculator services to use, based on their own business needs and technical requirements. |
| **Where does this fit into the media process?** | This request form sits outside the media campaign cycle and could be used in the annual planning and partner selection cycle. Participation in this form is entirely voluntary. |
| **Who can use it?** | • Media sustainability solutions providers may use this form as a way of disclosing an overview of their services to their clients (advertisers, media agencies, media owners and publishers) proactively.<br>• Advertisers, media agencies, media owners and publishers may use this form to request disclosure from media sustainability solutions. |
| **Other considerations** | Organisations using this form should not publish company or commercially sensitive information or confidential information. Organisations should consult with their own internal compliance processes to ensure data accuracy and confidentiality policies are adhered to. |

# Monitoring: A way of understanding the adoption and use of the GMSF across industry stakeholders

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|---|---|
| **Context and purpose** | The creation of a company level feedback form helps us to understand the levels of voluntary adoption of key tools and steps, along with identifying areas for improvement, which helps to inform future GMSF updates and development. |
| **What questions does it help answer?** | • What elements of the voluntary GMSF has the partner chosen to adopt?<br>• What is the relative penetration of each voluntary GMSF recommendation, and which ones are most often adopted?<br>• Which elements of the GMSF need further development and improvement |
| **Where does this fit into the media process?** | This solution sits outside the media process and is designed to help Ad Net Zero learn about the effectiveness of our industry frameworks. |
| **Who can use it?** | All relevant media stakeholders will be invited to fill out this monitoring form |
| **Other considerations** | Organisations using this form should not publish company or commercially sensitive information or confidential information. Organisations should consult with their own internal compliance processes to ensure data accuracy and confidentiality policies are adhered to. |

# Future workstreams

## Data Access: Solutions to improve access to emissions related data through standardised data exchange protocols.

| | |
|---|---|
| **Context and Purpose** | This voluntary solution is meant to explore ways that emissions data can be supplied to media buyers in a standardised way, and how this may differ by media channel. |
| **What are our areas of focus?** | Specifically, Data Access will look at how other industries exchange data securely:<br>**Viable Solutions**: A landscape analysis to determine what is already in place in other industries, and what the advertising industry is already doing to support data collection in specific areas.<br>**Development and Implementation:** Exploration on how industry exchange mechanisms can be created and maintained, and the functionality required for successful implementation. |
| **Who is helping to develop this?** | Ad Net Zero will establish a working group of volunteers from across the industry, working closely with national trade associations to explore how data can be exchanged. Implementation of data exchange approaches is at each organisation's discretion and does not require participation in any centralised system. |
| **What is coming next?** | Proposals for the secure storing or exchange of data and a roadmap for development of these solutions |

# Audit and Verification: Establish trust and reliability in the emissions data and methodologies being provided to the industry

| | |
|---|---|
| **Context and Purpose** | This voluntary solution is meant to enable third party auditors to create an industry-supported audit specification that addresses the reliability of sustainability data being used. Participation in the audit and verification of tools and data is voluntary and for each business to decide on an individual basis. |
| **What are our areas of focus ?** | Specifically, audit and verification will ensure that industry-endorsed steps are taken to do the following:<br>**Verifying claims:** When responsible companies state they have implemented the GMSF, it can be verified to ensure this alignment has been accurately achieved<br>**Auditing data:** To ensure that emissions data supplied by the industry to support the GMSF can be trusted as accurate and transparent. |
| **Who is helping to develop this?** | Ad Net Zero will be setting up a working group of volunteers from external audit groups and relevant industry stakeholders to establish the critical media steps and data the industry needs validated to increase trust and reliability. |
| **What is coming next?** | A proposal for audit specifications, guidelines and a roadmap for implementation. |

# The building blocks for each channel

# The three phases of a media campaign which informed our framework boundaries and workflows

**A media campaign will likely involve three major phases:**

| | In-scope | Out-of-scope |
|---|---|---|
| **Creation** | Emissions from physical manipulation of creative assets for media placement.<br>Emissions from traffic out of creative. | Emissions from the creation and storage of the original advertising content [covered by production specific carbon calculators].<br>Emissions from the creation of programming content. |
| **Distribution** | Emissions from the steps associated with media selection.<br>Emissions from ad placement [inclusive of buy-side and sell-side steps]. | |
| **Consumption** | Emissions from direct energy consumed to receive ads.<br>Embodied emissions from creation and disposal of associated technology [as a proportion of total lifespan]. | Emissions from the media content that advertising sits next to, for example a film on Cinema, or a TV programme. |

These phases are common across all media channels and allow for industry stakeholders to treat each channel without bias.

# Update to Creation: Tech Manipulation > Post-Production Storage

In the previous version of the GMSF(v1.2), Post-Production Storage was included within the boundaries of calculation, as a sub-phase sitting within Tech Manipulation. The goal of the GMSF is to include all the key processes within the channel workflow and ensure that sources of emissions are not missed, particularly between production calculator tools, and those focussed on media. Since v1.2's release, we have been made aware that updated production carbon calculators, such as AdGreen, do now include Post-Production Storage.

With this new development, we have now moved this sub-phase out of the scope of the GMSF, alongside the previously discounted Asset Production. We encourage advertisers to use production carbon calculators to understand the impact of these processes.

# The components of each channel

| | |
|---|---|
| **Channel Emissions Workflow** | Graphical representation of the steps (or unit operations) an ad message takes, in line with the 3 phases and the boundaries established by the GMSF. |
| **Channel Emissions Formulae** | Mathematical calculation for each unit operation showing how to combine campaign data with the relevant emission factors and default values. |
| **Emissions Data Request Form** | A consistent RFI allowing the industry to implement the GMSF and a clear guide for the data required from the media supply chain. |
| **Emissions Data Hack** | GMSF recognised approach to deal with data shortcomings e.g. no data, insufficient data, unreliable data. |
| **Emissions Data Sources** | Publication and guidance on recommended data sources (including emissions factors) that are freely available, reviewed for reliability and accuracy. |

## Additional documentation to support each channel framework

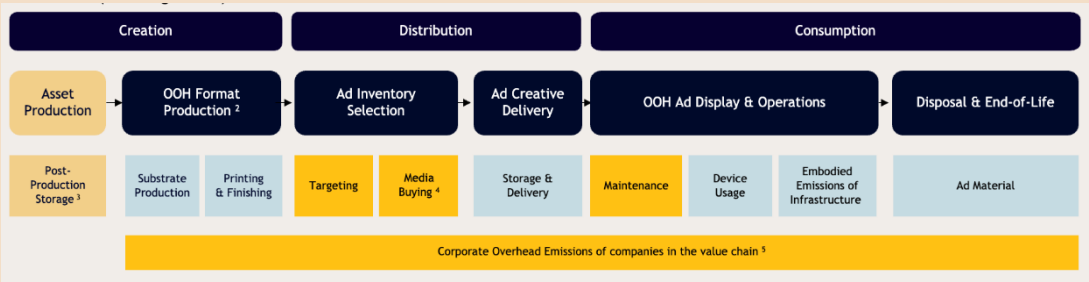
| | |
|---|---|
| **Channel Emissions Table** | A more detailed version of a workflow explaining the unit operations included within the GMSF boundaries for each channel, with a clear definition of the emissions and conceptual formulae for calculation. |

These 'Channel Steps' were originally developed as recommendations from working groups, which were then socialised with the wider industry, including media sustainability specialist companies. In total we consulted with over 300 companies.

# How the components of each channel connect

## Channel Emissions Workflow

Media campaigns go through 3 major lifecycle phases: creation, distribution and consumption, and several sub steps (or unit operations). These are defined in our channel specific workflows, which have clear boundaries to capture GHG emissions across different media channels.




## Channel Emissions Formulae

The unit operations use energy or resources, creating GHG emissions. These are represented by mathematical formulae which require three different data inputs.

Distribution_ Ad_Creative_Delivery[1] Classic OOH, manufacturing to storage =
total_mass_carried[2] format *(tonnes)*
x trip_distance manufacturing to storage[3], country *(km)*
x EF_transportation vehicle type, shared, manufacturing to storage *(kgCO2e / t.km)*

*Legend:*
- *required inputs*
- *default values*
- *emissions factors*

## Data Guidance

Makes the framework actionable.

*required inputs*

### Emissions Data Request Form

A form to collect campaign data

| Phase | Step & sub-step | | Data type | Parameter of operationalised formula | Expected unit |
|---|---|---|---|---|---|
| CREATION | Tech manipulation | Post-production storage | Required input | Total masters size of creative assets used for campaign | MB |
| | | | Required input | Copies stored on hard drives | (dimensionless) |
| | | | Required input | Copies stored on LTO | (dimensionless) |
| | | | Required input | Copies stored on cloud | (dimensionless) |
| | | | Required input | Countries of storage for cloud | |
| | | | Emission factor (in GMSF database) | Storage impact of hard drives | kgCO2e/kWh |
| | | | Emission factor (in GMSF database) | Storage impact of LTO | kgCO2e/kWh |
| | | | Emission factor (in GMSF database) | Storage impact in cloud | kgCO2e / MB |

*default values*

### Emissions Data Hacks

Defaults when data is missing

DEFAULT
(No data available)

Level 0
Level 1
Level 2
Level 3
Level 4

Increasing levels
MORE ACCURACY
MORE GRANULARITY

*emissions factors*

### Emissions Data Sources

Freely available database including CO2e factors

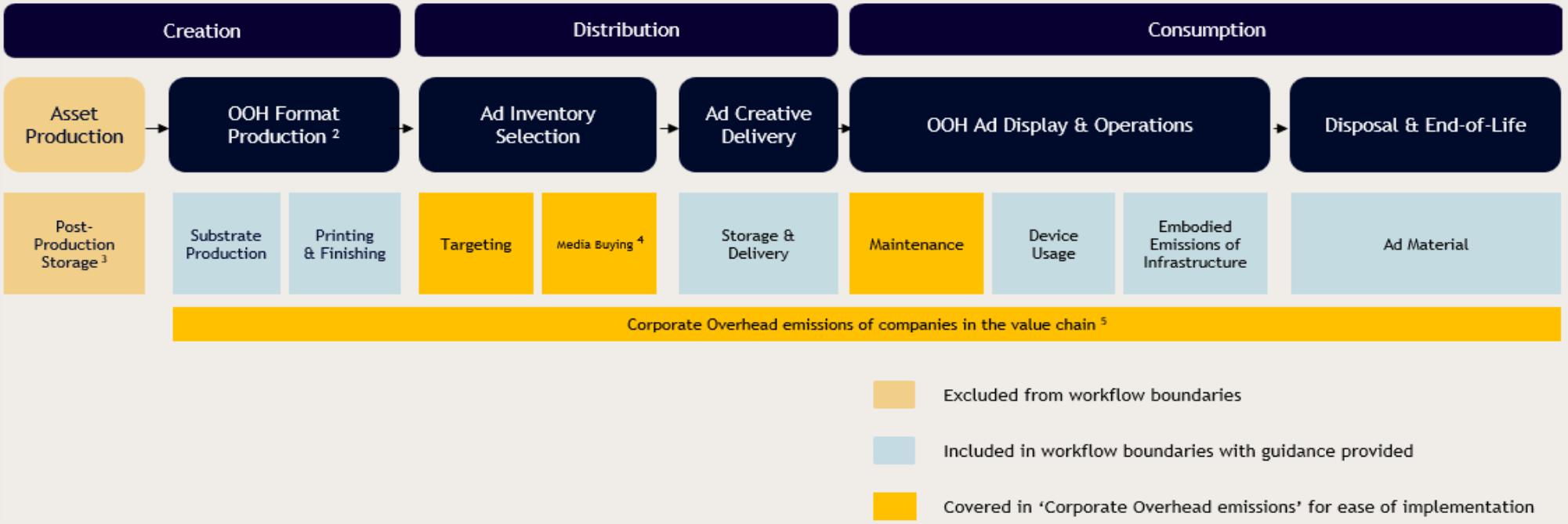
| Example EFs | | | |
|---|---|---|---|
| Name | Unit | Value | Source |
| trip_distance manufacturing to storage | Kilometres (km) | 200 | See GMSF OOH Emissions Factors |
| EF_transportation manufacturing to storage | kgCO2e / t.km | 7.92E-01 | |
| average_distance_fleet_per_format storage to sites | Vehicle.km | 0.7 | |
| EF_transportation storage to sites | kgCO2e / vehicle.km | 2,56E-01 | |

# Channel Emissions Workflow

Our workflows show the steps involved in delivering a media campaign, identifying the key elements that need to be considered when assessing the carbon footprint of a specific channel. Each workflow has consistent, clearly defined boundaries so emissions are comparable across channels.

## Classic Out-Of-Home (OOH): Channel Emissions Workflow

**Classic OOH (including 'Transit') [1]**



# Channel Emissions Formulae

Formulae are the mathematical expression of the Channel Emissions Workflow and are used to calculation the emissions from a media campaign. The GMSF formulae are conveyed in 2 different ways: Conceptual and Operational.

## Conceptual Formulae

In the Channel Implementation Guides, Conceptual Formulae are referenced as a historical record, which helps chart the history of our process. The goal of each Conceptual Formula was to include all the key variables needed to accurately model the different processes in the workflow. These formulae use precise mathematical notation—often referred to as *mathematical formalism*—to clearly express how each variable influences the system.

Transport: $\Sigma$ (i = 1 to n) (Di * EFVi)
i is the vehicle type; Di is the total distance( km) travelled to all display sites by the vehicle type; EFVi is the emissions factor for the vehicle type kg CO2e/km
installation: $\Sigma$ (i = 1 to n) (Xi * EFIi)
i is the format type; Xi is the number of format i; EFIi is the emissions factor for the installation of format i

## Operational Formulae

During the development of the GMSF, some of the variables in the Conceptual Formulae were adapted as follows:

- Some were considered not material and removed from the Operational Formulae.
- Multiple variables were combined to make the formulae easier to read and apply. For example, in the Digital Channel the effect of digital devices per second is represented by a single value that merges three factors from the original Conceptual Formula.

The Operational Formulae are intentionally more practical and streamlined so they can be more easily implemented across the value chain.

$$\text{Distribution\_Delivery}^{4}_{\text{physical OOH, storage to sites}} = \text{number\_placements}_{\text{format}}\ \textit{(dimensionless)} \times \text{average\_distance\_fleet\_per\_format}^{4}_{\text{format, storage to sites}}\ \textit{(vehicle.km)} \times \text{EF\_transportation}_{\text{vehicle type, dedicated, storage to site}}\ \textit{(kgCO2e / vehicle.km)}$$

# Why Data Guidance is so important

The formulae require detailed inputs, but market limitations often result in missing or inconsistent data. Data Guidance provides a structured approach to standardising emissions calculations, ensuring consistency, transparency, and practical implementation across the industry.

- **Bridges theory and practice** – It translates the original Conceptual Formulae into actionable methodologies by addressing data gaps and inconsistencies.
- **Standardises the methodology** – It enables consistent data collection by providing a standardised **Data Request Form** and aligns assumptions across stakeholders, ensuring consistency and comparability in emissions reporting.
- **Supports data availability constraints** – It establishes a tiered approach, allowing for emissions calculation at different levels of granularity and providing industry-approved defaults when necessary. We refer to industry-approved simplifications as **Emissions Data Hacks.**
- **Creates consistency** – By including a list of publicly available and best practice **Emissions Data Sources**, such as emission factors, we shrink the variance created by using different numbers for the same calculation.
- **Enhances implementation feasibility** – It creates a practical framework that enables companies to estimate and report emissions, even with incomplete data, while maintaining transparency on uncertainty levels.

By addressing these challenges,  ensures that emissions calculation is both reliable and scalable, enabling broader industry adoption and continuous improvement.

# Data Request Form

This form is a consistent RFI allowing the industry to implement the GMSF, guiding them through the data collection process, identifying the relevant owners/providers of the required first-party emissions data. A single output for each media channel that can be shared repeatedly with stakeholders.

Below is a snapshot of the Data Request Form showing how required inputs (in orange), and constants/defaults (in grey) are requested in order to correspond back to the Operational Formula related to a unit operation in a workflow.

| Phase | Step & sub-step | | Data type | Parameter of operationalised formula | Expected unit | Comments | Expected data owners | Data level (choose in list) | Value (fill) | Unit (fill) | Data source (fill) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DISTRIBUTION | Ad Space Selection | Real-time bidding | Required input | Number of active paths per impression | Integer / impressions | | Publishers / Ad tech companies | | | | |
| | | | Required input | Datacenters emissions per impression | kgCO2e / processed impression | | Publishers / Ad tech companies | | | | |
| | | | Industry default | Data transferred per active paths | MB / active paths | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Network emissions per impression per country | kgCO2e / MB | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | Ad Creative Delivery | Creative transmission | Required input | Total payload size per impression | MB / impressions | | Publishers / Ad tech companies | | | | |
| | | | Emission factor (in GMSF database) | CDN emissions intensity per data transfer per country | kgCO2e / MB | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Origin ad server emissions intensity per data transfer per country | kgCO2e / MB | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Network emissions per impression per country | kgCO2e / MB | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| CONSUMPTION | Device Display | User device render | Required input | View time per impression on laptop | s | | Publishers | | | | |
| | | | Required input | View time per impression on mobile | s | | Publishers | | | | |
| | | | Required input | View time per impression on tablet | s | | Publishers | | | | |
| | | | Required input | View time per impression on TV | s | | Publishers | | | | |
| | | | Emission factor (in GMSF database) | Embodied emissions intensity of laptop | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Embodied emissions intensity of mobile | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Embodied emissions intensity of tablet | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Embodied emissions intensity of TV | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Use phase intensity of device per country | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Energy intensity of mobile | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Energy intensity of tablet | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |
| | | | Emission factor (in GMSF database) | Energy intensity of TV | kgCO2e / s viewed | | N/A - GMSF value - change 'value' match Playbook wording | | | | |

The full data request form for each channel can be found at the end of this document.

# What type of data does the Data Request Form collect?

Every Operational Formula has 3 different types of data inputs

## Example formula

**Legend:**
a: asset of campaign
• required inputs
• default values
• emissions factors

Consumption Operational energy emissions $_{\text{physical OOH}}$ =
number_placements1 format, country (dimensionless)
x number_days format, country (dimensionless)
x daily_consumption2 format, country (kWh)
x drop-down_factor3
x EF_electricity[4] $_{\text{country}}$ (kgCO2e/kWh)

**Required inputs:**

Data that must be provided for a specific campaign, such as number of impressions, media units delivered, or actual energy usage. These inputs are essential for calculating emissions accurately on a case-by-case basis.

**Default values:**

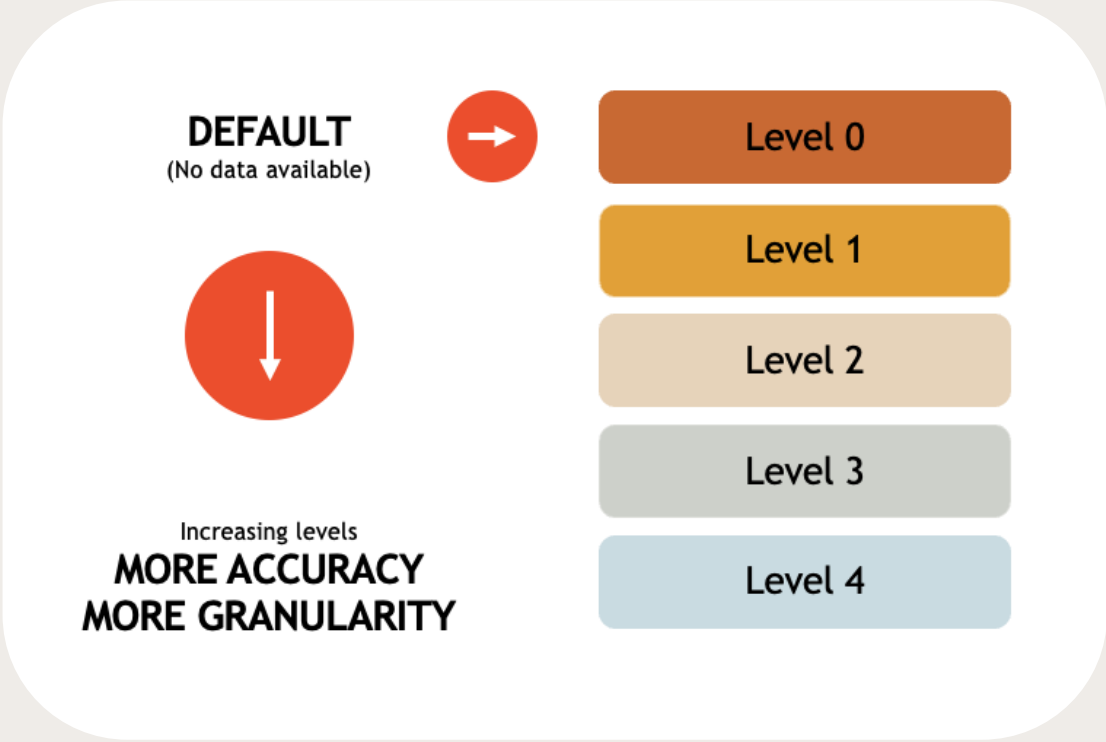
Intermediary values needed to power up the formulae, which in some instances may be specific to a particular country or region. These values were defined by channel technical experts during the GMSF process. Examples: default redundancy for cloud, data transferred per active path.

**Constants (LCA-based emissions factors):**

Conversion factors derived from well-established data sources as well as Lifecycle Assessment (LCA) studies that quantify emissions for standard activities, materials, or processes. It is important that the emission factors and their sources are clearly communicated.

# Emissions Data Hacks

A Data Hack is a GMSF recognised approach to deal with data shortcomings (e.g. no data, insufficient data, unreliable data). While the intention of a hack is to reduce complexity and eliminate any barrier to estimating emissions, the use of hacks generally means the level of accuracy will decrease. Hacks for less impactful activities will not have a material impact to the final resultant estimate, while hacks for high impact activities need to be called out as increasing the level of uncertainty in the final calculation. The purpose of the **data levels classification** is to call out which hacks/approximations lead to material uncertainties in the result. Data Hacks make the GMSF implementable in the current data environment, no matter what data barrier is encountered.




A Level “0” hack will enable the user to estimate emissions when only cost information is available (the vast majority of cases) or even when no data is available providing default values (e.g., RTB calls, file size) so that every unit operation can be transparently estimated.

Each additional level up from level 0 indicates more accurate, granular, or robust required data inputs. Depending on the unit operation and the relevant workflow and activities captured in that unit operation, the degree to which accuracy and granularity can increase will differ. Level 4 is achieved when reliable activity based data is used for each variable in a given formula, creating the most accurate estimate.

For some unit operations, there may just be Level 0 and Level 4 approaches intermediate approaches may not exist or may not meaningfully increase the certainty and accuracy of the estimate.

# Emissions Data Sources

An Emission Data Source is a science-based, auditable database of emission factors and other relevant factors used in carbon accounting that is created by well recognised climate science authorities (e.g., UN IPCC, USEPA, UK DEFRA, and France's ADEME), usually in the public domain. There are some proprietary data sources that are particularly relevant for embodied emissions factors for specific products, however the GMSF promotes the use of public data whenever possible.

An Emission Factor (EF) is any coefficient that converts data you have into kgCO2e emissions. There are several basic types of EFs used in the GMSF:

- **Operational Emission Factors** help define how much CO2e is released, that can be based on complex activities such as 'how many kWh of electricity is used in a particular location', or more general asks like 'the approximate average amount of CO2e emitted per $ on advertising spent' (a common, highly simplified approach).
- **Embodied Emission Factors** define how much CO2e is released in the manufacture of physical items used in the advertising process. For example, all of the emissions from producing the paper in a newsprint or billboard ad are estimated via a **Lifecycle Assessment (LCA)**. Less visible examples are all of the ICT (information and communication technology) equipment used across all ad channels. These EFs are generally based on "cradle-to-gate" LCAs that capture all the materials and activities required to make the object.
- **End of Life Emission Factors** define how much CO2e is released in the disposal of the physical items used in the advertising process. For example, the CO2e emissions from disposing (recycling, burning, landfilling) the paper in a newsprint or billboard ad, as well as all the other ICT and other goods used in advertising are estimated through these EFs.

Because the GMSF is a complete,"cradle-to-grave" GHG LCA for ad campaigns, all of these factors are required. **It is critical that the same EFs be used (and transparently documented by data level) by all GMSF practitioners to enable comparability.**

Happily, there are well-established, regularly updated EFs for virtually all common activities across sectors. The GMSF will provide actual EFs or at least the sources of recognised EFs (embodied EFs can be more challenging than operational EFs).

# Channel Emissions Table

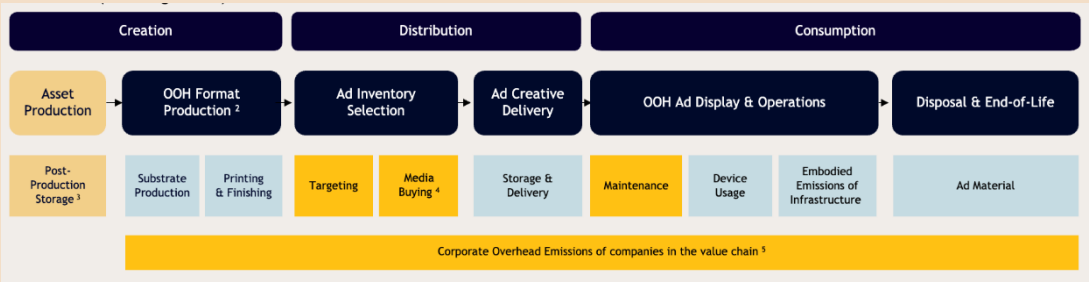
When first developing the GMSF, these tables were crucial in helping the industry understand the steps, processes and materiality of the various elements of a media campaign in each channel. They also served as a springboard for creating the Operational Formulae and acted as the foundations on which each channel's Data Guidance was then built. We have kept these tables for reference and links to the extended versions can be found at the end of this document.

| Phase | Step & sub-step | | Physical processes involved | Expected materiality | Formulae |
|---|---|---|---|---|---|
| CREATION | Tech Manipulation (Multivariant creative) | Creative storage | Additional server storage for multiple volumes of assets for the purpose of distribution. | Low | $\Sigma$ Number of assets (size of asset (kB)•time stored (yr) • carbon impact of storage (kgCO2e/kB/yr) • allocation factor for the campaign (%)) |
| | | Creative transcoding | Server processing for multiple volumes of assets for the purpose of distribution. | - | - |
| DISTRIBUTION | Ad Space Selection | Creative Selection & Placement | Planning of creative to go on specific inventory within a marketplace | - | - |
| | | Targeting | Digital services used for all targeting activities | - | - |
| | | Direct sale | Exchange of campaign booking between ad buyer and media seller / owner | Low | Same formula as real-time bidding. • If a segment of inventory is set aside exclusively for direct sale: only one activated path to be taken into account • If not: accounted as programmatic (total number of activated path). |
| | Ad Space Selection | Real-time bidding | Servers processing transmission through automated buying process (SSP/DSP...) | Low to medium | Impressions • Number of potential active paths per impression • Avails ratio • (1 + Requests ratio) • (1 + Responses ratio) • Time of calculation per bid (h) • Compute ratio allocated to bid processing (compute used by SSP/DSP incl. machine-learning) and reporting/analytics (%) * Total relevant infrastructure power incl. PUE (W) * Carbon intensity of electricity ( kgCO2e/kWh) • (1 + overhead of other mutualised server resources ratio) |
| | | | | Low to medium | Impressions • Number of potential active paths per impression • Avails ratio • (1 + Requests ratio) • (1 + Responses ratio) • Time of calculation per bid (h) • Compute ratio allocated to bid processing (compute used by SSP/DSP incl. machine-learning) and reporting/analytics (%) • EF manufacturing and EOL of total relevant infrastructure (kgCO2e) / Average lifetime of equipment (s) • (1 + overhead of other mutualised server resources ratio) |

# A reminder of how the components of each channel connect

## Channel Emissions Workflow

Media campaigns go through 3 major lifecycle phases: creation, distribution and consumption, and several sub steps (or unit operations). These are defined in our channel specific workflows, which have clear boundaries to capture GHG emissions across different media channels.




## Channel Emissions Formulae

The unit operations use energy or resources, creating GHG emissions. These are represented by mathematical formulae which require three different data inputs.

Distribution_ Ad_Creative_Delivery[1] Classic OOH, manufacturing to storage =
total_mass_carried[2] format *(tonnes)*
x trip_distance manufacturing to storage[3], country *(km)*
x EF_transportation vehicle type, shared, manufacturing to storage *(kgCO2e / t.km)*

*Legend:*
- *required inputs*
- *default values*
- *emissions factors*

## Data Guidance

Makes the Framework actionable.

*required inputs*

### Emissions Data Request Form

A form to collect campaign data

| Phase | Step & sub-step | | Data type | Parameter of operationalised formula | Expected unit |
|---|---|---|---|---|---|
| CREATION | Tech manipulation | Post-production storage | Required input | Total masters size of creative assets used for campaign | MB |
| | | | Required input | Copies stored on hard drives | (dimensionless) |
| | | | Required input | Copies stored on LTO | (dimensionless) |
| | | | Required input | Copies stored on cloud | (dimensionless) |
| | | | Required input | Countries of storage for cloud | |
| | | | Emission factor (in GMSF database) | Storage impact of hard drives | kgCO2e/kWh |
| | | | Emission factor (in GMSF database) | Storage impact of LTO | kgCO2e/kWh |
| | | | Emission factor (in GMSF database) | Storage impact in cloud | kgCO2e / MB |

*default values*

### Emissions Data Hacks

Defaults when data is missing

DEFAULT
(No data available)

Level 0
Level 1
Level 2
Level 3
Level 4

Increasing levels
MORE ACCURACY
MORE GRANULARITY

*emissions factors*

### Emissions Data Sources

Freely available database including CO2e factors

| Example EFs | | | |
|---|---|---|---|
| Name | Unit | Value | Source |
| trip_distance manufacturing to storage | Kilometres (km) | 200 | See GMSF OOH Emissions Factors |
| EF_transportation manufacturing to storage | kgCO2e / t.km | 7.92E-01 | |
| average_distance_fleet_per_format storage to sites | Vehicle.km | 0.7 | |
| EF_transportation storage to sites | kgCO2e / vehicle.km | 2,56E-01 | |

# Responsible use of the Framework

# Location-based and Market-based methodologies for electricity use

There are two methods for reporting of emissions from the use of electricity:

- **Location-based:** emissions associated with the electricity consumed, according to the average emission intensity of the local electrical grid and the direct use of no/low carbon energy sources.
- **Market-based:** emissions associated with the electricity that an organisation purchases, according to the contracts it has in place, such as supplier-specific tariffs and fuel mix, including renewable tariffs; Power Purchase Agreements (PPAs); application of Energy Attribute Certificates (EACs); Renewable Energy Certificates (RECs) and the grid residual mix emissions factor.

Both location-based and market-based methods are useful for organisations to identify emissions reductions opportunities through a combination of operational efficiency and responsible purchasing decisions. When estimating emissions of media channels with respect to electricity, the **location-based method must be used**. Users may also report results using the market-based method in addition to demonstrate how renewable energy purchased in local markets reduce overall emissions. Market-based method data must be documented to demonstrate it meets the Scope 2 Quality Criteria established within the GHG Protocol Scope 2 Guidance. The **location-based method is required as a minimum** in order to allow for greater consistency and comparability of results.

| Location-based | Market-based |
|---|---|
| Emissions associated with the electricity consumed, according to the average emission intensity of the local grid. | Emissions associated with the electricity that an organisation purchases, according to the contracts it has in place, such as: Power Purchase Agreements (PPAs); application of Energy Attribute Certificates (EACs) or Renewable Energy Certificates (RECs); and the grid residual mix emissions factor. |
| • Allow greater consistency and comparability of results.<br>• Method that shall be used when estimating emissions. | • Must be documented to demonstrate it meets the Scope 2 Quality Criteria established within the GHG Protocol Scope 2 Guidance.<br>• Method that can be used additionally to report to demonstrate how renewable energy has been applied to the value chain. |

# GMSF Corporate Overhead Emissions overview

Allocation of Corporate Overhead Emissions is universal across all advertising channels, based on the recognition that there are corporate overhead activities that enable the delivery of ad content to audiences that are not captured in the unit processes covered by the rest of the GMSF. These overhead activities include marketing/sales, client support teams, HR, legal, accounting and many applications of AI. Tools and data sets may be computationally intense to develop and activities such as business travel may also be material emissions sources, so the corporate overhead methodology is particularly useful in identifying emissions not captured elsewhere using the GMSF. In addition to these general categories, there are a few situations in which specific functions in the channel workflows are noted to be reflected in corporate overhead emissions allocation for ease of implementation.

Fortunately, this set of emissions is common outside of the advertising sector, so the GMSF approach follows the established standards and best practices to estimate these emissions in a way that is also practical.

The GMSF Corporate Overhead Emissions allocation methodology can be voluntarily applied to every organisation in the ad value chain and takes a "top down" approach, starting with each organisation's annual GHG inventory. The emissions identified elsewhere using the GMSF are subtracted from the total organisation emissions and that is the “Total Corporate Overhead Emissions" figure that is then allocated to the specific ad campaign being assessed according to proportional allocation methods, depending on available data. The data levels for corporate overhead include guidance on how to estimate these emissions.

Similar to the GMSF data levels that reflect different degrees of uncertainty in the estimates, there are data levels that reflect uncertainty in the allocation of Corporate Overhead Emissions.

There are other benefits to implementing this methodology, including encouraging organisations in the ad value chain to develop robust GHG inventories, which may be supported by third-party verification where individually appropriate. This will result in better quality data for the rest of the GMSF methodology and enable these organisations to better support their own individual reporting needs.

Organisations may use alternative methodologies, that are preferably GHG Protocol aligned, for corporate overhead allocation where appropriate to their circumstances. You can find more details on the GMSF Corporate Overhead Emissions Guidanceon the next page, and more details on required inputs and data levels in each channel Implementation Guide. When sharing Corporate Overhead Emissions data with counterparties (buyers, sellers, or third parties), organisations should only disclose information suitable for their individual reporting purposes.

# GMSF Corporate Overhead Emissions methodology

Corporate Overhead Emissions are:

- Emissions caused by processes that are not already captured in the unit process formulae.
- Generally organised into ‘fixed’ and ‘dedicated’ (that can vary by client and ad campaign).

**Methodology:**

1) Subtract all emissions that are already captured using the GMSF from the overall Corporate Overhead Emissions to estimate the Total Corporate Overhead Emissions (TCOE). The expectation is that all scope 1 and 2 emissions (e.g., associated with office buildings) and all the relevant scope 3 emissions (e.g., business travel, purchased goods and services for marketing/administration) will be included and accurate.

2) Allocate the TCOE using one of the following approaches, depending on what data is available and appropriate to the organisation's circumstances:

a. By labour (e.g., person hour worked; FTE) so there is a kg CO2e/person-hour figure; or
b. By revenue, so there is a kg CO2e/$ figure
c. By output (e.g., kg CO2e/1000 impressions)

3) Estimate either Corporate Overhead Emissions per ad campaign by labour or revenue or output including both the fixed and the dedicated types of resources.

4) Estimate the Corporate Overhead Emissions by multiplying the figures from steps 2 and 3.

Organisations are not required to disclose enterprise-level revenue, turnover, or cost data to external parties in order to implement the GMSF Corporate Overhead Emissions methodology. These calculations should be performed internally by each organisation using their own financial and emissions data. The result may be shared at a company’s individual discretion with clients, buyers or other relevant parties.

# GMSF Corporate Overhead Emissions challenges

There are several challenges to implementing overhead estimates including:

**Top line**: enterprise level GHG inventories may not exist, may not be complete or may not be third-party verified to show completeness and reliability.

**Bottom line**: emissions captured using the GMSF can be challenging to aggregate for each member of the value chain, particularly as this may be the first time they are doing so. While many categories easily fit into corporate overhead (e.g. travel, marketing), some activities can be hard to separate from activities reported elsewhere in the GMSF (e.g., using the same cloud infrastructure as overhead).

**Unitising/allocation:** there may be sensitivity around revenue and employment figures and sometimes accounting may reflect discounts, premiums, or regional differences.

**Visibility of the full supply chain:** there is sometimes poor visibility regarding the companies involved in a media supply chain, which makes it difficult to account for corporate overhead related emissions, both regarding the number of companies involved and the nature of the services the companies in the supply chain provide.

**How do different denominators work together:** the GMSF Corporate Overhead Emissions methodology allows for different denominators in the intensity metric (spend, output and FTE) which will need to be combined due to companies having the option to provide their data in different ways.

**Recognising the different types of companies in the media supply chain**: determining the relative size of overhead emissions for a company and services it provides is important to develop suitable Level 0 defaults, ranging from a large advertising agency, to a small ad tech company offering highly automated services.

To facilitate the estimation of Corporate Overhead Emissions captured using in the GMSF, the corporate overhead emissions by scope guidance is organised by emission scope 1, 2 and 3 to indicate which emissions categories are most likely to be included

# GMSF Corporate Overhead Emissions draft proposals

As elsewhere in the GMSF Level 0 defaults will be provided for Corporate Overhead Emissions when only the most basic data is available. Below is our draft approach for Level 0 and Level 2 aimed at stimulating additional comments and further development of our lower-level guidance, including Level 0 defaults for a wider range of company types, and Output and FTE based alternatives. An updated methodology, which considers the implementation challenges, will be included in the next version of the GMSF.

Currently we are proposing two spend-based options of '**high**' or **'low'**. A Company's size and overhead function (e.g., business travel, office space etc), and how automated their services should be considered when determining which of the current levels could apply.

**Level 0** - to arrive at the kgCO2e/$ default figure just for Corporate Overhead, two factors are estimated based on public EEIO spend factors, public GHG inventories and industry specific data:

**High overhead emissions case:**
Overall emissions for an advertising agency (US NAICS code 541810: Advertising Agencies) 0.129 kgCO2e/USD (USEPA Supply Chain Emission Factors v 1.2, 2019) (note that v1.4 value for 2023 is lower at 0.084, but given the increase in AI usage, we are using the higher level to be conservative and provide motivation to use higher data levels).

% of overall emissions from corporate overhead: 20%, based on public GHG reports, public data (eg financial reports) and other industry sources.

Resulting overhead emissions factor = 0.2 * 0.129 kgCO2e/USD = 0.0258 kgCO2e/USD Round to 0.026 kgCO2e/USD.

**Low overhead emissions case**:
Overall emissions for an ad tech company (US NAICS code 541810 – data processing and related services) 0.148 kgCO2e/USD (USEPA Supply Chain Emission Factors v 1.2, 2019) (note that v1.4 value for 2023 is lower at 0.089, but given the increase in AI usage, we are using the higher level to be conservative and provide motivation to use higher data levels)

% of overall emissions from corporate overhead: 5%, based on public GHG reports, public data (eg financial reports) and other industry sources.

Resulting overhead emissions factor = 0.05 * 0.148 kgCO2e/USD = 0.0074 kgCO2e/USD Round to 0.007 kgCO2e/USD.

**Level 2 -** Only the % of total GHG inventory is required, so the above % estimates are used.

**High overhead emissions case (e.g., agencies):**
% of overall emissions from corporate overhead: 20%, based on public GHG reports and other industry sources.
**Low overhead emissions case (e.g., ad tech)**:
% of overall emissions from corporate overhead: 5%, based on public GHG reports and other industry sources.

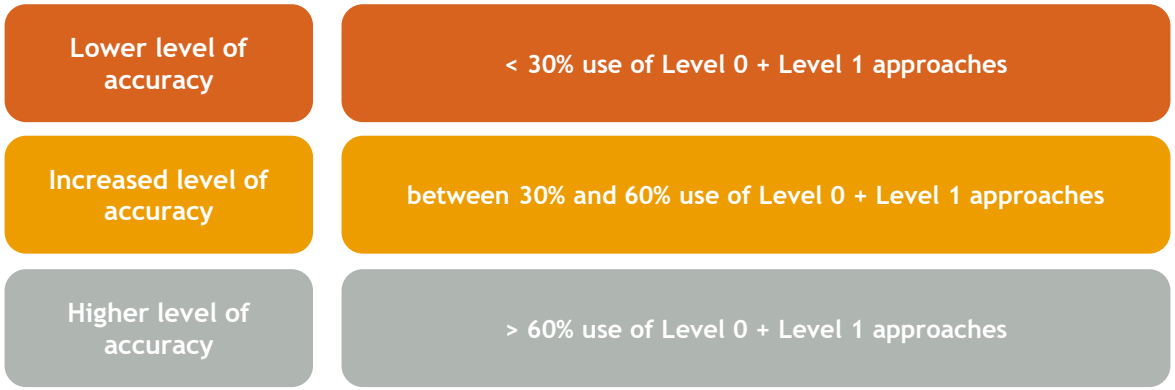
The future **Level 1** will provide default values by company types with materially differing GHG emission profiles, with alternative labour (e.g., person hour worked; FTE; geographic labour differences;) and output (e.g., kg CO2e/1,000 impressions) default-based options.

# Data Uncertainty

Assessing uncertainty is a key principle in carbon accounting and is important in the GMSF context for several reasons:

- It encourages practitioners to use the most accurate data available.
- It provides a roadmap for better data development.
- It provides context for users of GMSF based estimates.

The Data Uncertainty assessment in GMSF v1.3 is designed to be as simple as possible to implement by relying only on the percentage of Level 0 and Level 1 approaches used in the calculation. The overall level of uncertainty is classified based on that percentage as noted below, to provide transparency on the methodology used in each estimate.




In cases where, for a given function, there are multiple entities that report different data levels (e.g., different transportation providers), if over 50% of the data for the overall function is level 0 or 1, the full function should be included in the level 0 + level 1 count. Based on the data developed in the implementation of v1.3, future versions of the GMSF are intended to have a more sophisticated assessment of uncertainty, including weighted aggregations and EF uncertainty input.

While in future versions of the GMSF, we plan to have a more in-depth and accurate approach to assessing uncertainty (e.g., weighted by emissions contributions vs just the data level), tracking the frequency of use of the various data levels will likely continue to be a valuable metric to track progress in increasing the use of more accurate activity-based data.

You can find more details on the Data Uncertainty methodology in each channel Implementation Guide. Uncertainty classifications are designed for internal benchmarking, transparency, and continuous data improvement purposes only. Organisations with lower data granularity or higher uncertainty levels may have valid business, technical, or resource-related reasons for their approach.

# Boundaries, carbon intensity and reduction

The GMSF is intended to cover the full lifecycle of a media campaign - ‘cradle to grave’. This includes the devices displaying or playing the advertising, and considering the embodied emissions of infrastructure used throughout the supply chain.

Drawing emissions boundaries for each entity participating across complex ad campaign value chains can be challenging, which is why having accredited third parties verify each entity's boundaries under a given reporting requirement, such as ISO 14064, is always recommended. While the GMSF has defined the boundaries of the various workflows by channel, there may be a wide variety of entities that participate in these workflow activities, and their level and type of participation can also vary by ad campaign. It is therefore up to each entity in the value chain to define their own operations and boundaries to accurately account for the emissions from their activities for each specific campaign. Contracts and invoices for a specific ad campaign are often the most useful ways to define these boundaries and ensure that the emissions are reported correctly.

While the purpose of the GMSF is to simply create credible emissions estimates for specific ad campaigns by channel, the next set of questions (outside the scope of GMSF) are how to act on this information. Like cost effectiveness, there can be a question of "carbon effectiveness" - how effective is the media campaign for carbon emitted. Alongside effectiveness and econometrics, another useful metric is Carbon Intensity. This can be calculated by looking at the amount of carbon per a set number of impressions or impacts, which is consistent across channels.

Considering these metrics and others is voluntary, and is a decision for marketers, planners, and media buyers to make when reviewing how to achieve the best media outcomes as sustainably as possible.

You can find channel specific studies in the relevant channel Implementation Guide.

# AI and the GMSF

A critical emerging issue is how the use of AI impacts emissions from ad campaigns. When AI usage increases the energy usage, because both the operations and the equipment used for AI are often more energy intensive than conventional approaches, emissions can also increase. However, when AI increases efficiency, emissions can decrease. Given the significant energy requirements for AI increasing the use of fossil fuels in the overall energy mix, even macro level factors such as grid emission factors are subject to change.

The GMSF captures AI-related emissions through several mechanisms within the Framework.

- **Unit operation formulae**
  Where AI replaces or augments a traditional activity, the associated activity data and emissions factors should reflect the actual emissions generated by that activity. Depending on the use case, AI-enabled workflows may result in either higher or lower emissions than conventional approaches.

- **'Asset Manipulation' unit operations**
  Several channels within the GMSF include an 'Asset Manipulation' stage within the creation workflow. This acts as an umbrella for activities such as 'Asset Generation' - the AI-enabled editing, transformation, or enhancement of advertising assets after the initial master creative has been produced. Other steps, such as 'Creative Transcoding' in TV advertising, sit under this section today, and additional AI-specific methodologies may be incorporated as more robust data becomes available.

- **'Corporate Overhead Emissions' allocation**
  Many AI-related emissions are not directly tied to a single campaign activity and are therefore captured through the Corporate Overhead Emissions allocation methodology. This includes:

    - AI-enabled asset generation;
    - Experimentation and testing related to campaign delivery;
    - Infrastructure and maintenance activities; and
    - Other shared operational functions.

The Corporate Overhead Emissions methodology is currently one of the most important mechanisms for accounting for AI-related emissions within the Framework, as it ensures organisation-wide emissions are allocated appropriately across advertising activities.

The GMSF also recognises that AI's role within advertising is likely to expand beyond creative workflows into distribution, optimisation, and media delivery, and with AI as a potential new media channel itself. As industry practices and data maturity evolve, the Framework will continue to develop its treatment of AI-related emissions accordingly.

# Carbon accounting and regulation

# Carbon calculation principles

Principles for GHG emissions calculation vary between standards, but are generally underpinned by consistent themes, which should be considered and applied when considering the frameworks and formulae within this Global Media Sustainability Framework. The GMSF has been created in order to support several such principles including transparency, completeness and consistency. These principles enable users of the data, produced by following this standard, to have confidence as the data generated is aligned with standards and best practices that are generally followed in GHG accounting.

Users of this information likely rely on similar approaches to estimate the GHG emissions from other business activities, so having consistency across all data sources is important. The below principles are key to both enterprise level accounting (e.g. the GHG Protocol, ISO 14064) which all companies should be already reporting, and GHG lifecycle assessments (e.g. the GHG Protocol Product Life Cycle Accounting and Reporting Standard, ISO 14067), the focus of the Framework.

The GHG Protocol Policy and Action Standard (Chapter 4) lays out the following accounting and reporting principles:

**Relevance:** Ensure the GHG assessment appropriately reflects the GHG effects of the policy or action and serves the decision-making needs of users and stakeholders—both internal and external to the reporting entity. Users should apply the principle of relevance when selecting the desired level of accuracy and completeness among a range of methodological options.

**Completeness:** Include all significant GHG effects, sources, and sinks in the GHG assessment boundary. Disclose and justify any specific exclusions.

**Consistency:** Use consistent accounting approaches, data collection methods, and calculation methods based on established climate standards to allow for meaningful performance tracking over time. Transparently document any changes to the data, GHG assessment boundary, methods, or any other relevant factors in the time series. A key objective of this Framework is to provide an approach that is consistent with how advertisers estimate emissions for all of their other activities so that the emissions based on this Framework can be directly included into advertisers' scope 3 inventories.

**Transparency:** Provide clear and complete information for internal and external reviewers to assess the credibility and reliability of the results. Disclose all relevant methods, data sources, calculations, assumptions, and uncertainties. Disclose the processes, procedures, and limitations of the GHG assessment in a clear, factual, neutral, and understandable manner through an audit trail with clear documentation. The information should be sufficient to enable a party external to the GHG assessment process to derive the same results if provided with the same source data.

**Accuracy:** Ensure that the estimated change in GHG emissions and removals is systematically neither over nor under actual values, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users and stakeholders to make appropriate and informed decisions with reasonable confidence as to the integrity of the reported information. Accuracy should be pursued as far as possible, but once uncertainty can no longer be practically reduced, conservative estimates should be used.

# Regulation and reporting standards alignment

In providing feedback during the development of the GMSF, 63% of respondents from across the ad sector indicated that their primary goal in implementing the GMSF is compliance with contractual and/or regulatory requirements to report GHG emissions. Fortunately, the common foundation for all climate accounting standards and emerging regulatory requirements is the Greenhouse Gas Protocol (GHGP) and the GMSF is fully aligned with the GHGP.

A critical objective of the GMSF is to provide GHG emissions estimates for ad campaigns that can be directly incorporated into the current scope 3 subcategory "Purchased goods and services" section of enterprise level GHG inventory reporting particularly for advertisers, in compliance with all GHGP aligned regulations, international climate accounting standards (e.g., the ISO 14064 series), and best practices. Because of significant marketing and advertising spend, many advertisers have reported that the marketing function is a material part of their overall GHG inventory, in some cases it is the largest single line item, making the GMSF particularly relevant. The GMSF can also be valuable to other participants in the advertising value chain in both their enterprise level reporting and in providing reliable, transparent, and consistent estimates to their stakeholders at the ad campaign level.

It is helpful to note that while the GHGP has a strong focus on enterprise level reporting, there are related standards on how to conduct a GHGP compliant Lifecycle Assessment for products and services, which is the essence of the GMSF, by following the Greenhouse Gas Protocol Product Life Cycle Accounting and Reporting Standard (on which the ISO 14067 standard is also based). Terms in the GHGP such as "use of sold products" should not be confused with the term "use phase" (also called "operational emissions") used in LCA approaches like the GMSF which refer to emissions from the operation of the complete infrastructure needed to deliver an ad. These emissions are to be differentiated from the "embodied emissions" which are based on LCAs on the equipment/structures/infrastructure used in delivering content, and cover their manufacturing, transportation, maintenance, end of life emissions. A relatable example is www.cloudcarbonfootprint.org which starts with the simple formula: Total CO2e = operational emissions + embodied emissions.

As the GMSF is aligned with the GHGP, which is the basis for all current and emerging reporting requirements including the CSRD in the EU, the GMSF supports compliance with these requirements. The International Financial Reporting Standards (IFRS) Foundation created the International Sustainability Standards Board (ISSB) that created a climate-related disclosure standard (IFRS S2) that is now being adopted by many national (e.g., Australia, Brazil) and subnational (e.g., California) jurisdictions. As of 22 May 2026, a summary of the countries adopting IFRS S2 can be found here. The GMSF also supports compliance with these reporting requirements.

# Glossary

# Glossary of terms

| Term | Definition / Explanation |
|---|---|
| **Sustainability** | |
| **Climate change** | Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural, such as from large volcanic eruptions. But since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil, and gas. Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures. This leads to negative outcomes for people and businesses, such as more destructive storms. |
| **GHG Protocol** | Greenhouse Gas Protocol provides the world's most widely used greenhouse gas accounting standards for companies. GHG Protocol standards and guidance enable companies to estimate, manage and report greenhouse gas emissions from their operations and value chains. The GHG Protocol Product Lifecycle Accounting and Reporting Standard is the foundation of ISO 14067 and highly relevant to this Framework. Note that the GHGP and ISO are working together to harmonise standards, expected in 2027. |
| **Greenhouse Gases (GHG) and CO2e** | There are 6 primary greenhouse gases as defined by the Kyoto Protocol. These are Carbon Dioxide, Methane, Nitrous Oxide, Hydrofluorocarbons (HFCs), Perfluorocarbons, and Sulfur Hexafluoride. All of them critically influenced by human behaviour. Since these gases have different impacts, we convert them to a common unit: Carbon Dioxide equivalent or CO2e. The shorthand is "carbon" which is why we talk about decarbonisation. In terms of media activity, you may also see CO2e PM, which refers to the normalised impact, per thousand impressions from an ad campaign. |

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| **Intergovernmental Panel on Climate Change (IPCC)** | The IPCC is the United Nations' body for assessing the science related to climate change, whose primary responsibility is the preparation of reports assessing the state of knowledge of climate change. These include assessment reports, special reports and methodology reports. Note that the GHGP and ISO are working together to update harmonise standards into one set of standards, expected in 2027. |
| **International Organisation for Standardisation (ISO)** | An independent, non-governmental international organisation that brings global experts together to create internationally-agreed standards in various industries. The ISO 14000 family concerns environmental management. ISO 14064 is the standard that specifies how a company can create its GHG inventory and how that inventory can be verified by an accredited third party. ISO 14067 is the GHG Lifecycle Assessment standard which is most relevant to this Framework. |
| **LCA** | Lifecycle assessment (LCA), also known as lifecycle analysis, is a methodology for assessing environmental impacts associated with all the stages of the lifecycle of a commercial product, process, or service. The GMSF is in essence an LCA for the advertising process of the six major media channels. |
| **Science Based Targets initiative (SBTi)** | A corporate climate action NGO that develops standards, tools, and guidance which enable companies to set greenhouse gas emissions reductions targets in line with what is needed to keep global heating below catastrophic levels and reach net-zero by 2050 at latest, and have those targets validated. SBTi is spinning out a separate organisation to continue to validate company targets. |
| **Scope 1** | Covers all direct GHG emissions from sources that are owned or controlled by the company (e.g. company facilities, company vehicles). |
| **Scope 2** | Covers indirect GHG emissions from consumption of energy (e.g., electricity, heat, cooling, steam) generated outside of the organisational boundary of the company. |

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| **Scope 3** | GHG emissions from the production and extraction of purchased materials, fuels, and goods, as well as all other purchased services (e.g., IT services), transport-related activities (e.g. business travel, commuting) as well as outsourced activities, such as waste disposal – and most media emissions. |
| **Sustainability** | In 1987, the UN defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." The 17 UN Sustainable Development Goals in act since 2016 provide detailed descriptions and metrics for each aspect of sustainability. Climate Action, SDG 13, is one of the most relevant to the ad sector (sometimes "sustainability" and "climate" are used interchangeably in the ad sector), and the focus of this Framework. Responsible Consumption and Production, SDG 12, is also very relevant to the ad sector. |

## Legislation

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| **Corporate Social Responsibility (CSR)** | Corporate Social Responsibility is a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders. CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives, while at the same time addressing the expectations of shareholders and stakeholders. |
| **Corporate Sustainability Reporting Directive (CSRD)** | A directive by the European Union which strengthens the rules concerning the social and environmental information that companies must report. Large companies will now be required to report on sustainability. |
| **California Climate Reporting Requirements (SB 253 & SB 261)** | The US state of California has two requirements similar to CSRD to report GHG emissions, including how they impact financial risk. |
| **International Sustainability Standards Board (ISSB, part of International Financial Reporting Standards)** | ISSB is a key driving force for global reporting, aligned with financial reporting, so it is important to understand their structure, processes and what jurisdictions (like Australia, Brazil, Canada, Japan; a full list is provided by IFRS) are adopting the S2 standard on climate reporting in whole or adapting them. The S1 standard is the overall sustainability standard that will address topics in addition to climate. |
| **Pre-competitive collaboration** | An industry approach where stakeholders work together to establish common standards and tools without compromising their competitive positions. |

## Media

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| **Ad opportunity** | The avail or bid request the server receives and processes. |
| **Adtech (Advertising Technology)** | The software and tools that agencies, brands, publishers, and platforms use to target, deliver, and estimate their digital advertising campaigns. |
| **Avails ratio** | A metric estimating the proportion of available ad opportunities (avails) that result in actual ad impressions after accounting for filtering and optimisation processes. |
| **Demand Side Platform (DSP)** | A DSP is an advertising technology platform that allows media buyers to purchase advertising inventory from multiple SSPs and ad- exchanges via one centralised management platform. |
| **Made For Advertising (MFA)** | MFA websites are designed for the purpose of arbitrage and to maximise profits for their owners. MFA websites typically use click-bait and/or low-price point advertising to drive users to low quality content featuring excessive ad placements, auto-play video, and pop-up advertising. |
| **Programmatic advertising** | Programmatic advertising uses software, data, and technology to add automation to the media selling and buying process. |
| **Supply Side Platform (SSP)** | An SSP is an advertising technology platform that allows publishers to sell their inventory through one single point of contact to the demand side. |

## Framework

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| **Activity-based emissions data** | Data collected at the level of individual media activities or ad products, enabling more accurate emissions calculations than aggregated estimates. |
| **Activity-based product level data** | Data that directly represents the variables in the formulae (vs using estimates, approximations, proxies, or other types of "hacks"). |
| **Ad creative delivery** | Process of storing a creative on the ad server and then sending it to the user device. |
| **Ad delivery** | Emissions originating from the transmission of the Ad Creative assets from a CDN edge node, over network, but not including end-user device. The Ad Creative assets include all loaded assets required to generate the ad experience: videos, images, javascripts, 3D models, fonts, etc. This includes direct energy consumption by the data centres and the network infrastructure, as well as the hardware's embodied emissions (manufacturing and end-of-life emissions). When transmitting assets from a CDN edge node the calculation can use the user location to determine the carbon intensity of the electricity to apply. When transmitting assets from an Ad Server the calculation can consider both the data centre and the user location to determine the carbon intensity of the electricity to apply. |
| **Ad opportunity** | This is defined as the availability or bid request the server receives and processes. |
| **Ad inventory selection** | The process of matching media supply and demand and connecting media owners to media buyers. |
| **Asset generation** | Asset Generation refers to the changes made to advertising copy once the master version has already been produced. This includes areas such as Dynamic Creative Optimisation, or the use of AI to make personalised ads from an initial master. |
| **Channel Emissions Table** | The methodological structure outlining the functional units, data requirements, and boundaries used to calculate emissions for each media channel. |

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| **Channel Emissions Workflow** | A step-by-step depiction of the media campaign phases (Creation, Distribution, Consumption) that maps the pathways through which emissions occur. |
| **Channel Emissions Formula** | The set of mathematical expressions applied within the Framework to quantify emissions based on the inputs identified in the workflow. |
| **Creation, Delivery, and Consumption phases** | The three consistent phases of each media channel workflow in the GMSF.<br><br>Creation = Initial phase of a product's life cycle, including extraction of raw materials and manufacturing. In GMSF, refers to creation of a digital creative asset.<br><br>Distribution = Processes and logistics of delivering products from creation to end user, including emissions from media selection and ad unit delivery.<br><br>Consumption = Greenhouse gas emissions attributed to user devices when an ad creative is interacted with, e.g. viewed or listened to, including device use phase emissions and device embodied emissions. |
| **Data hacks** | Estimation techniques—using industry averages or "rules of thumb"—employed to approximate emissions when granular, primary data is not available. |
| **Data levels** | The GMSF classifies different levels of data with varying granularity, to note when there is a lack of activity-based product level data. This classification along with understanding how much of the data is primary (coming from specific activities) vs estimated (via "hacks" or other rules of thumb) helps users of the overall emissions data understand the level of uncertainty of the data. |
| **Direct sale** | Emissions originating from a direct buying process between ad buyer and media seller. This includes direct power consumption for the processing and transmission, as well as embodied emissions associated with the infrastructure manufacturing and end-of-life. Accounted for as programmatic unless a segment of inventory is set aside exclusively for direct sales. |

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| **Embodied emissions** | The greenhouse gas emissions generated during the manufacturing, transportation, installation, maintenance, and disposal of goods, sometimes also referred to as embodied emissions. In the context of the GMSF, embodied emissions have been included and amortised over the life of the device or system involved in media placement or consumption (generally expressed as average life, usage time, end of life). The lifetime depends on lifecycle assessment. |
| **Functional operation** | Key concept that defines the quantified performance of a studied product/service as a reference unit in a study. The output of the calculation represents the environmental impact of the functional unit. E.g. kg CO2e per 1000 impressions. |
| **Materiality** | Materiality is an important concept to guide where to focus the data gathering and calculation efforts and transparently note when emissions were not included. We consider the materiality threshold to be 5% in line with guidance from SBTi and the GHG Protocol. |
| **Post production storage** | Emissions originating from the storage of ad master bundles across local drives, LTO, and cloud. The masters bundle includes the different files and variants that result from the post-production process and may be used in campaigns. This includes direct energy consumption by the storage infrastructure, as well as the hardware's embodied emissions (manufacturing and end-of-life emissions). |
| **Real-time bidding** | Emissions originating from a real-time bidding (RTB) process. Real-time bidding (RTB) refers to a way of transacting media that allows an individual ad impression to be put up for auction in real-time. This is accomplished through a programmatic on-the-spot auction, similar to how financial markets operate. RTB lets buyers use their own data and targeting options to bid for each ad impression. Advertisers can take factors such as site, placement, price and user data into account when bidding on each impression. The winning bidder's ad is served, which is often customised on the fly to better tailor the message to the audience. This includes direct power consumption for the processing and transmission of requests, as well as embodied emissions associated with the infrastructure manufacturing, and end-of-life. |

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| **Scaling factors** | Multipliers applied within the emissions formulae to adjust for variables such as energy intensity or allocation percentages, thereby refining the final emissions calculation. |
| **System boundaries** | Specifies what is included or excluded of the calculations, following LCA principles as structured in the GHG Protocol Product Lifecycle Accounting and Reporting Standard. |
| **Targeting** | Emissions originating from any process of data collection for user or context qualification, data analysis and processing to use demographic, interest, behavioral, contextual, or keyword data to deliver ads to a specific audience or within relevant contexts. This process can be done through first-party or third-party data. This placeholder accounts for platforms like DMPs and the lifecycle emissions of data which are yet to be determined. |
| **Use phase emissions** | GHG emissions produced by energy consumption of digital infrastructure such as servers, networks, and user devices. |
| **Workflow** | Graphical detail of the steps an ad message takes throughout the 3 Phases, including buying, transmission and consumption. |

# Channel Implementation Guides and further resources

# Channel specific resources

## Digital

- Digital Implementation Guide
- Digital Emissions Data Sources
- Digital Data Request Form
- Digital Channel Emissions Table

## TV

- TV Implementation Guide
- TV Emissions Data Sources
- TV Data Request Form
- TV & Video Channel Emissions Table

## Out-of-Home

- Out-of-Home Implementation Guide
- Out-of-Home Emissions Data Sources
- Out-of-Home Data Request Form
- Out-of-Home Channel Emissions Table

# Channel specific resources

## Print

Print Implementation Guide
Print Emissions Data Sources
Print Data Request Form
Print Channel Emissions Table

## Audio

Audio Implementation Guide (Coming Soon)
Audio Emissions Data Sources (Coming Soon)
Audio Data Request Form (Coming Soon)
Audio Channel Emissions Table

## Cinema

Cinema Implementation Guide (Coming Soon)
Cinema Emissions Data Sources (Coming Soon)
Cinema Data Request Form (Coming Soon)
Cinema Channel Emissions Table

# Associated GMSF resources

GMSF Corporate Overheads Emissions Guidance

GMSF Supplier Emissions Data Request Form

GMSF Carbon Calculator Services Data Request Form

Frequently Asked Questions

Quick Start Guide

# Acknowledgements

We'd like to recognise all of the industry leaders who have contributed to this work. Without their willingness to voluntarily join meetings ranging from the Steer Team, the Climate Science Expert Group, the working groups or being part of an industry-wide consultation process, the continued development of the GMSF would not be possible. We would also like to thank Ad Net Zero's Global Supporters.

## GMSF Steer Team

## Climate Science Expert Group

# Industry contributors

# Industry contributors

# Ad Net Zero Global Supporters






























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## Ad Net Zero Compliance Statement

Ad Net Zero is an advertising industry climate action plan to decarbonise emissions in ad development, production, and media placement, and accurately promote more sustainable products, services and behaviours

It represents the interests of the advertising industry. It acts as a forum for legitimate contacts between supporters of the advertising industry. It is the policy of Ad Net Zero that it will not be used by any company, industry grouping or individuals to further any anti-competitive or collusive conduct, or to engage in other activities that could violate any antitrust or competition law, regulation, rules or directives of any country, or otherwise impair full and competition.

Supporters acknowledge that being a supporter of Ad Net Zero is subject to the competition law rules and they agree to comply fully with those laws. Supporters agree that they will not use Ad Net Zero, directly or indirectly, (a) to reach or attempt to reach agreements or understandings with one or more of their competitors; (b) to obtain or attempt to obtain, or exchange or attempt to exchange, confidential or proprietary information regarding any other company other than in the context of a bona fide business; (c) to further any anti-competitive or collusive conduct; or (d) to engage in other activities that could violate any antitrust or competition law, regulation, rule or directives of any country or otherwise impair full and competition.