REFERENCE FRAMEWORK FOR CALCULATING THE CARBON FOOTPRINT OF DIGITAL CAMPAIGNS: STEP BY STEP

SRI
ENGAGÉ POUR LE CLIMAT

CH4

CO₂

N₂O

"*While the signs of global warming (extreme temperatures, heat domes, floods, fires, etc.) are growing at an alarming rate and our society reels from the health crisis, people are increasingly questioning consumption and the role of advertising. Indeed, issues such as products that have a significant impact on the climate or incentives to over-consume were among the proposals of the Convention Citoyenne pour le Climat and gave rise to major debates. As a result of these discussions, la loi Climat et Résilience came into force this summer and our industry, as a whole, has chosen to assume its responsibility by taking action. With the structural digitization of the economy, of practices and therefore of our businesses, we must seize the challenge of greater digital sobriety and the role of the Filière Communication in changing society's behavior.*

It is indeed collectively that we must initiate a more innovative and balanced transformation cycle. At the SRI, we rely on our ability to engage our members to be part of this change. The public has high expectations regarding the carbon impact of economic players, particularly in the digital industry. That is why - in line with our 'SRI Engagé pour le Climat' roadmap - we have developed a reference framework for measuring the carbon footprint of digital campaigns. With this ambitious, contributory and scalable project, we want to involve the entire value chain in favor of sustainable and equitable growth in our market. This common base will allow all the players, whatever their size, to develop new standards and best practices so that we can jointly reduce our impact. The more of us that take part in this process, the greater its impact will be: let's continue to move forward together and be ambitious!"

Sylvia Tassan Toffola,
President of the SRI

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In its latest report, released in the summer of 2021, the IPCC states that human activity is «**unequivocally**» responsible for global warming, which is causing «rapid changes in the atmosphere, the oceans and the land.» It is therefore unquestionably the greenhouse gas (GHG) emissions from our human activities that are generating the warming that, in 2015, the 195 signatory countries of the Paris Agreement committed to containing below 2°C compared to the pre-industrial level.

WHAT IS THE CARBON FOOTPRINT?

Calculating a carbon footprint means **measuring the greenhouse gas emissions of a product or service** over its entire lifespan or, for a company, over its annual activities. There are many sources of greenhouse gas emissions: extraction of raw materials, energy consumption for heating, transportation, air conditioning, construction, animal husbandry, deforestation...
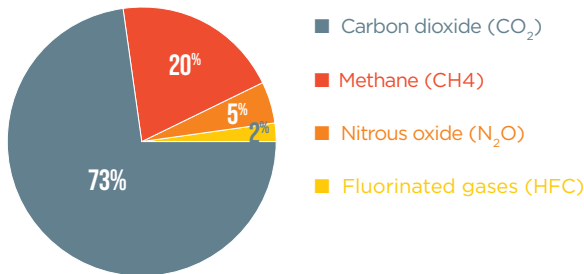
HOW IS THE CARBON FOOTPRINT MEASURED?

It is impossible to measure everything directly; estimates must be made and the unit of measurement and expression of the carbon footprint must be agreed upon. T**he common unit is the metric ton of CO_2 equivalent (t CO_2 e)**, which puts all GHGs on the same scale according to their global warming potential (GWP), i.e. their ability to warm the atmosphere. *For example, a GWP of 30 for methane means that 1 kg of methane will warm the atmosphere as much as 30 kg of CO2 in the century following its emission.* Because although CO_2 is the main greenhouse gas, it is not the only one:
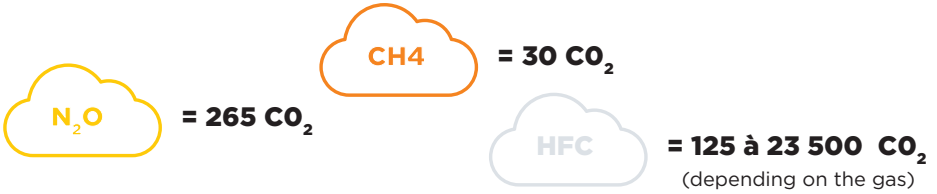
BREAKDOWN OF GLOBAL GHG EMISSIONS (INCLUDING LULUCF*) BY GAS
according to their 100-year global warming potential

- Carbon dioxide (CO_2) — 73%
- Methane (CH4) — 20%
- Nitrous oxide (N_2O) — 5%
- Fluorinated gases (HFC) — 2%

Source: IPCC 2014

* Land use, land-use change, and forestry

And each gas has a different warming potential:

N$_2$O = **265 CO$_2$**

CH4 = **30 CO$_2$**

HFC = **125 à 23 500 CO$_2$**
(depending on the gas)

Source: IPCC 2014

WHAT DO SCOPES 1, 2 AND 3 MEAN IN THE CALCULATION OF A COMPANY'S CARBON FOOTPRINT?

To account for a company's emissions, different emission items are studied according to the scope of the study:

■ **SCOPE 1** accounts for the GHG emissions directly emitted by the company: *combustion of fuel by the company's vehicle fleet, for example.*

■ **SCOPE 2** covers the indirect GHG emissions related to the site's energy consumption: *mainly the purchase of heat, cold or electricity.*

■ **SCOPE 3** includes the reporting company's upstream and downstream emissions: *transportation of goods, treatment of waste products, staff and visitor travel, fixed assets, purchases of goods and services, use and end of life of products.*

HOW IS A CARBON FOOTPRINT CALCULATED?

$$\text{CO}_2 \text{ emission} = \text{Quantity consumed} \times \text{Emission factor}$$

The quantity consumed is an activity data that is expressed in the unit of the product. *For example, liters for gasoline or fuel oil.*

Emission factors (EFs) give the amount emitted when a quantity of product is consumed. *For example, when we use one liter of gasoline, we emit 2.7 kg of CO_2.*

Source : Base Carbone, ADEME

Now that we have clarified the carbon impact principle, let's take a closer look at the footprint of a digital service such as advertising. Although transmission may seem 'invisible', the infrastructure, especially the network, is real, and the entire digital chain consumes resources and energy that generate greenhouse gases.

HOW TO FIGURE OUT THE GREENHOUSE GAS EMISSIONS OF ONLINE ADVERTISING?

Let's take the example of **displaying an ad on a website or a digital application**. The user calls up a service from their smartphone via the interface (application or website). A request to display an ad is sent through the 4G mobile network and the internet network and will collect the expected data from the datacenter, before making it follow the same path in reverse in order to display it on the user's smartphone screen:

Like any digital service, running advertising involves 3 parts:
- **The users** who receive the service on their terminals,
- **The networks** that deliver the information,
- **The servers** that store the data and respond to the requests via calculations.

The impact of this service therefore stems from the manufacturing, consumption and end-of-life impacts of the three parts involved in providing the service (otherwise known as the equipment life cycle). In this diagram, the sources of the carbon impact are shown in yellow:
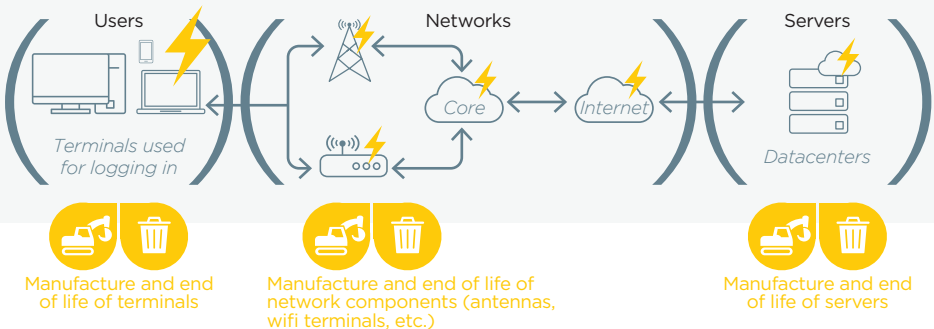
Thus, throughout the digital advertising chain, there are several players who each perform a function, whose activity or the tools they use generate the impact. The first stage of the process involves an advertiser or a media agency creating a campaign and producing the digital files. Then there is the media owner, who provides advertising space, and its digital sales house who sells the space. To organize the campaign, the media agency manages the distribution of the ads on the various media. Finally, at the end of the chain, the consumer / user views the advertising content.

The roles and operations with a potential carbon impact in the digital advertising chain can be summarized in the following table:

PLAYERS		FUNCTION	OPERATIONS WITH POTENTIAL CARBON IMPACTS
Advertisers, creative & media agencies	Technical service providers involved in the advertising value chain, for example: SSP, DSP, DMP, analytics tools and trackers.	• Creative & production of digital ads • Definition of the communication strategy (medium, format, target, volume)	• Production of advertisements (purchase and use of production equipment, travel, energy consumption, support function, etc.) • Online content storage (data center construction and consumption)
Website/app publisher		• Supply of advertising inventories on different formats	• Online data storage (server production and consumption) • Website maintenance • Other operations linked to running the website or app (support functions, travel, etc.)
Digital sales house		• Targeted delivery of ads to consumers	• **Data exchanges related to tracking, space allocation and ad delivery (network and server usage and production)** • **Operations related to the functions of the sales house**
Consumers Users		• Viewing advertising content	• **Consumption and manufacture of terminals** • **Consumption of terminals while ads are being loaded and viewed** • **Manufacture and end of life of terminals**

The functions specified in this table can sometimes be extended. For example, an internet sales house can, in certain cases, produce creative. This scenario has not been taken into account in defining the common base, which objective is to define what sales houses must include as a minimum when measuring the carbon footprint of a campaign.

HOW TO MEASURE CARBON FOOTPRINT?

For companies offering digital services, there are two complementary approaches to measuring their carbon footprint: **the service-based approach** (carbon footprint of the digital service) and **the organizational approach.** These two approaches do not meet the same need and are often used by companies in a complementary way.

Let's compare pros & cons of these two methodologies

💻 **« SERVICE » APPROACH**	🏢 **« ORGANIZATION » APPROACH**
Horizontal approach covering the entire ad delivery chain	**Vertical approach for each player in the delivery of an ad**
USE CASES • Create carbon calculators to **measure the impact** of different media and serve as a decision-making tool (internal target) • Integrate this impact in the sales proposition and in the pricing strategy **to engage customers** (external target) • Identify the action levers to **reduce and optimize** the emissions linked to the delivery of a campaign	• Draw up an **overall assessment of the emissions** of an internet sales house in order to be able to commit to an action plan to reduce the emissions where it is most significant. • Comply with the regulations and have results that can be directly delivered in the 'carbon footprint' format
➕ • Enable **operational decision-making tools** to reduce the impact of each campaign • **Segment the impact** by volume of impressions or by format type, for example, in order to engage and educate customers on the impact of their activities	• Provide a **global view** of the company's emissions and a basis for a strategy to reduce emissions throughout the company's value chain • Provide easy access of **data as** it is specific to the company (balance sheet, energy bills, etc.). Indirect emissions can be more easily estimated on a global volume. • Provide direct levers for reducing the footprint as they relate to the company's activities
➖ • Fewer direct levers for action to reduce the company's carbon footprint through the effect of scale (division of the organization's impact by the number of services)	• Breakdown by type of activity or service provided (e.g.: by type of media sold, by type of customer or campaign, by number of impressions, by target, etc.) is more difficult due to the global scope of assessment.

The SRI has adopted the service-based approach which measures the impact of a digital campaign as a whole, including its distribution to each terminal. Along with campaign reports, this horizontal approach gives a better view of the carbon emissions linked to the formats and the volume of distribution and their allocation.

In addition, sales houses can also carry out an analysis of their overall carbon footprint, using the vertical approach.

The common base includes both the methodology and the reference framework proposed by the SRI.

WHAT ARE THE OBJECTIVES?

■ Provide sales houses and the market in general with the **first common, reliable and transparent industry framework** with calculation methods, scope and modeling assumptions defined in a specific database. This framework provides a standardized process for the industry to engage in a consistent and ambitious manner.

■ Clarify the needs of the sales houses in defining their **RFPs and thus facilitate the tooling** of those with the fewest resources and/or the least advanced.

WHAT IS THE FORMAT USED?

The calculation focuses on **the carbon impact of online advertising delivery** in a 'services' approach. It can be used:

■ As a diagnostic tool (where is the carbon impact in the advertising distribution chain?).
■ As a tool for raising awareness and helping internal and customer decision-making.

■ As a monitoring tool for a reduction strategy of the impact of ad delivery.

Based on the 'service' approach, the scope of the campaign will be used as the unit for measuring impact: i.e., displaying an advertisement on X media with a target of Y impressions.

WHAT IS THE SCOPE OF OUR COMMON BASE?

Our common base will evaluate the parameters involved over the entire campaign. To make these choices, with the help of a sample group of sales houses sharing experiences, the ecological transition consulting firm, BL Evolution, has compared the literature to date on evaluation methods and will update when appropriate.
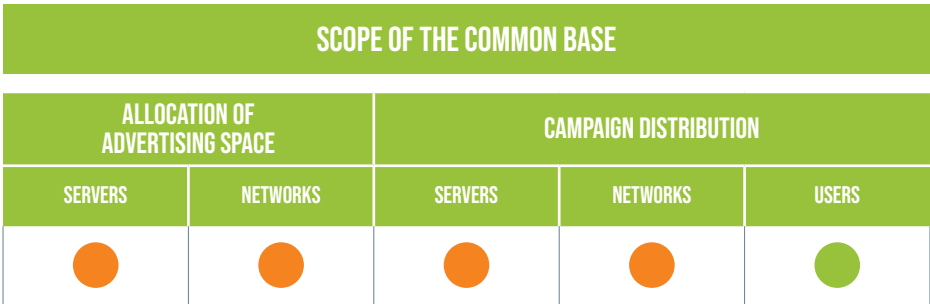
This is how GHG emissions for each stage in the digital advertising impact chain have been compared. There are two main parts :

- The first is the allocation of advertising space, both direct and programmatic, which, through various data exchanges, algorithms and bidding systems, assigns an advertising placement to a request.

- The second is the actual distribution of the campaign once the allocation has been made, including the use of the terminal (computer, tablet, smartphone…) by the user to view the ad.

Based on a comparative analysis of the scientific literature available to date and on interviews conducted with internet sales houses, BL Evolution has determined the most relevant scope to date for the common base proposed by the SRI. The attribution of impact for a digital service is a complex subject for which many studies are underway. We should keep abreast of developments, particularly as regards updates to the following data and reference reports:

- The Product Category Rules (PCR) published by ADEME for digital services (now specifically adapted for Internet service providers under the AGEC law)
- The new databases on the environmental impacts of digital services (work of the NégaOctet consortium, etc.)

The SRI will closely follow any updates on digital industry literature and is constantly open to industry and interprofessional dialogues in order to supplement and refine its model.

SCOPE OF THE COMMON BASE

ALLOCATION OF ADVERTISING SPACE		CAMPAIGN DISTRIBUTION		
SERVERS	NETWORKS	SERVERS	NETWORKS	USERS
🟠	🟠	🟠	🟠	🟢

🟠 Consideration of use only   🟢 Consideration of the entire life cycle

The life cycle of user terminals represents a very significant part of the impact of most digital services. It is therefore necessary to include it in the scope of this impact assessment, although it does not represent a direct reduction lever for all digital players, and in particular internet sales houses . Note that each of the upstream and downstream players can set up a process to measure and reduce their carbon footprint.

UNDERSTANDING THE MECHANICS OF CALCULATION

Here are the details of the calculation process that uses the data collected by each sales house, the characteristics of the digital ad files (in orange), any data on the use of terminals and on the place where the ads are viewed, the type of network… (in blue) and lastly, fixed data on the impact on equipment (in green).

The data processed in this computational mechanics are compiled in the SRI database. Some of the data in the database are fixed (common base fixed data); other data can be configured by each sales house. To better understand the details of how the database has been built, see Steps 1 and 2 below.

DATA TO BE ENTERED WHEN USING			LEVELS OF COLLECTION					
			DATA TO BE COLLECTED Level 1		**DATA FOR REFINEMENT** Level 2		**COMMON MODELED DATA** Level 3	
Format 1	Number of impressions	Allocation method	Weight 1	Average viewing time	% PC / % Tablet / % Mobile / % TV	% Wifi / % 4G	% France / % Intern.	Impact by equipment*	Impact of network and server usage**
Format 2	Number of impressions	Allocation method	Weight 2	Average viewing time	% PC / % Tablet / % Mobile / % TV	% Wifi / % 4G	% France / % Intern.	Impact by equipment*	Impact of network and server usage**
Format 3	Number of impressions	Allocation method	Weight 3	Average viewing time	% PC / % Tablet / % Mobile / % TV	% Wifi / % 4G	% France / % Intern.	Impact by equipment*	Impact of network and server usage**

* Manufacture, use, end of life   ** Allocation and distribution

This mechanism is designed to work in two stages: the collection of data to create the model and populate the database, and the use of the data in each campaign. Thus the gray boxes are to be filled in for each campaign measured (Step 3). They must be completed for each report, once the model has been created. The colored boxes are to be completed when you first build the tool (Steps 1 and 2). The information is collected and averaged over Levels 1, 2 or 3 according to the maturity of sales houses and the availability of indicators: orange for Level 1, blue for Level 2 and green for Level 3. If some of the data is not accessible, then the data provided in the database must be integrated.

THREE STEPS TO BUILD A CAMPAIGN IMPACT MEASUREMENT TOOL

To set up the tool, follow these 3 steps:

1 · COLLECT DATA	2 · CREATE A MEASUREMENT TOOL	3 · USE THE METRIC
Framing to define the purpose of the tool, its usage and the level of detail required for the collection of data	**Creation of an internal carbon footprint calculation tool** based on the database and models provided by the SRI	**Integration of campaign assessment** into the internal processes (e.g. integration into the upstream sales process)
List of the formats offered by the sales house: name, dimensions, file format and **data collection** based on the level of detail selected	**Operational teams getting started in using** the tool	**Regularly update** the tool with new formats (if any) and fresh / precise campaign reports
		Integrate the tool into a process **to improve carbon impact**

These three steps allow sales houses to frame their process or can be used as a model for drafting their RFP if an external vendor is needed to develop the tool.

STEP 1 - COLLECTING DATA

In order to determine the function, the format and the level of detail of the measurement tool, it is necessary to take some time to define it. This will allow each sales house, depending on its resources and its maturity with regard to collecting data, to go into more or less detail in the measurement and monitoring of an action plan.
There are 3 levels to collect data. The higher the degree of detail in the collection, the more support will be needed.

■ **Level 1** corresponds to the 'basic' collection (name/dimension/size/format/viewing time of the file) and can be done

completely autonomously using the data provided by the SRI in the common base.
■ **Level 2**, intended for sales houses that have already made progress in measurement (additional distribution data), can be done independently with an external service provider validating the data.
■ And **Level 3**, intended for the most mature sales houses, will allow you to dig deeper into the data linked to the servers and allocation mechanisms. This level will allow for iterative refinement of knowledge and thus the advancement of the SRI database and hence the growth of collective expertise.

Below is an example of a data collection matrix available in the common base:

LEVEL 1 - KEY DATA TO BE COLLECTED					
Formats used					
Format Category	Format name	Screen dimensions (in px)	File format (image, video, text, other)	Average file size (specify unit - e.g. MB)	Average viewing time (in seconds)
Video					
Classic					
Native					
Audio					
Other					

LEVEL 2 - DATA FOR REFINEMENT							
Audience device type*				Audience network type**		Audience location***	
Desktop (%)	Tablet (%)	Mobile (%)	TV (%)	Share of fixed networks (fiber, ADSL, etc.) (%)	Share of mobile networks (3G, 4G, etc.) (%)	Share of audience in France (%)	Share of audience int'l markets (%)

 * Optional, to be filled if a format is specific to a type of device or if the impressions breakdown by device is available. By default, the database model is based on national data.
 ** Optional, to be filled if the impressions breakdown by type of network used by the user to log on (fixed or mobile - 3G, 4G) is known. By default, the database model is based on national data.
*** Optional, to be filled if the geographical distribution of the audience is known. By default, the database suggests a hypothesis of a French audience.

The format adopted for the tool can be more or less complex: a simple Excel tool developed in-house or a more complex online tool requiring the use of an external provider.

Depending on volume of the campaigns processed by the sales house, an automated calculation tool may be recommended or absolutely necessary.

STEP 2 - CREATE A MEASUREMENT TOOL

Based on a synthesis of existing data in the scientific literature, the SRI database has been modeled by BL Evolution, a consulting firm in ecological transition. It integrates all the impact factors and models used to calculate the footprint of a campaign, for example, the electricity emission factor in France for the consumption of ad storage servers. This database will allow each sales house to develop its own calculation tool - or to fill in tools that are already on the market - on the basis of **standardized information that has been shared, discussed and agreed upon** by major sales houses or inter-professional organizations.

The database is made up of fixed data from the common base (which is regularly updated as a result of continuous monitoring and collective input from SRI members) and configurable data for the sales houses that opt for the finest level of information granularity (e.g. type of device used by the audience, share of the 4G mobile/wifi network, etc.) In this case, the SRI reference system should be used as the basis for creating the tool.

Below is an excerpt from the SRI database, which is available to sales houses (upon request) to help them create their carbon calculator. All data listed in Levels 2 and 3 have default values (modeled or derived from the literature) in the common base, which allows calculations to be made on a shared basis even without extensive collection.

	Impact categories	Associated impact	Taken into account	Data taken into account for modeling	Correspondence with the collection level of the methodological base*
Campaign distribution	Datacenters	Server consumption for storing the ad	✅	Ad content size by format	Level 1
				Average PUE of a data center	Level 3
				Energy efficiency of a foreign data center	Level 3
				Energy efficiency of a data center in France	Level 3
				Share of servers in France	Level 3
				Share of overseas servers	Level 3
		Manufacture, transportation, distribution and end of life of servers	❌	Electricity emission factor in France	Fixed datum from the common base
				Electricity emission factor - Overseas	Level 3
	Networks	Consumption of networks for the transmission of content to the end user	✅	Ad content size by format	Level 1
				Average share of wifi network use	Level 2
				Average share of 4G network use	Level 2
				Average wifi consumption by volume	Fixed datum from the common base
				Average 4G consumption by volume	
				Share of network traffic in France	
				Share of international network traffic	
				Electricity emission factor in France	
				Electricity emission factor - Overseas	Level 3
		Manufacture of networks and network access terminals	❌		

* Level 2 and/or 3 data are common base values by default if the collection level is 1

	Impact categories	Associated impact	Taken into account	Data taken into account for modeling	Correspondence with the collection level of the methodological base*
Campaign distribution	Users	Consumption of user terminals	✓	Average viewing time	Level 1
				Share of display on smartphone	Level 2
				Share of display on computer	Level 2
				Share of display on tablet	Level 2
				Share of display on TV	Level 2
				Average power smartphone online	Fixed datum from the common base
				Average power computer online	
				Average power tablet	
				Share of users in France	Level 2
				Share of users overseas	Level 2
				Electricity emission factor in France	Fixed datum from the common base
				Electricity emission factor - Overseas	Level 2
		Manufacture and end of life of user terminals	✓	Average smartphone lifespan	Fixed datum from the common base
				Average computer lifespan	
				Average tablet lifespan	
				Average impact of manufacturing a smartphone	
				Average impact of the life of a smartphone	
				Average impact of manufacturing a computer	
				Average impact of the life of a computer	
				Average impact of manufacturing a tablet	
				Average impact of the life of a tablet	

Level 2 and/or 3 data are common base values by default if the collection level is 1

When creating its tool, a sales house can ask the SRI for assistance in understanding the database. If the calculation tool is produced independently by a sales house, it is highly recommended that one employee be given more advanced training in carbon calculation. This could be followed by a validation phase using an external firm. An external firm could also validate the development of the tool.

Example of how a conventional carbon calculator works:
Note: the level of granularity of the output result will depend on the intended use of the calculator.

INPUT				OUTPUT		
Campaign	Volume of impressions	Allocation mode	Calculations based on the data collected by the sales house and the SRI common base models	Campaign impact:	50*	kgCO$_2$e
Format 1	100 000	RTB		Impact format 1 :	30*	kgCO$_2$e
Format 2	5 000	Direct		Impact format 2 :	20*	kgCO$_2$e

Dummy data

To ensure that the tool is used correctly, it is key that all the employees get involved in the process, specifically :
- **In raising their awareness** of climate and energy issues, with a focus on the specifics of digital industry.
- **By training them** in the use of the tool and the assumptions made in its design.

STEP 3 - USE THE METRIC

This step will take place once a sales house, an organization or a trade body has developed its calculation tool. It will then be able to **integrate the evaluation into its internal processes** according to the function chosen for the calculator, raising awareness, or a decision-making tool to help make choices before the campaign is launched, or as a post-campaign assessment for a carbon footprint.

	PRE-CAMPAIGN USE	POST-CAMPAIGN USE
External aim	Impact study of formats prior to the campaign to guide client's choices	Measure the actual impact of a campaign a posteriori to meet the client request / raise their awareness
Internal aim	Upstream impact study of formats to directly offer less impactful campaign formats	Measure the real impact of all the campaigns delivered for inclusion in a global carbon footprint

The calculator may of course be updated following internal improvement measures:

- New formats offered by the sales house that are added to the database.
- Regular review of the collected data and update on a defined frequency of major changes of the distribution data.
- Set up of a feedback process on the operational use of the tool: does it fulfil its objective ? Where is the impact? Identification of corrective actions to reduce this impact and consequent improvement of the tool.
- If necessary, assess the need to move to a higher level of precision in collecting data in order to implement reduction actions.

During this last step, the tool will be populated for each campaign, enabling tracking for each campaign and continuous improvement in data collection.

The collective work undertaken within the SRI is based on a philosophy of continuous improvement; the publication of these guidelines is only a first step towards defining best practices for the industry aimed at reducing our carbon footprint.

SUMMARY OF THE 3 STEPS INVOLVED IN DEVELOPING THE MEASUREMENT TOOL

1 - COLLECT DATA

↓

Framing to define the purpose of the tool, how it will be used and the level of detail required for the collection

↓

List of the formats offered by the sales house: name, dimensions, file format and **data collection** based on the level of detail selected

↓

At the end of this step:
Collection matrix completed with the list of formats and the data by format according to the collection level selected. This inventory could be carried out, for example, on the basis of a representative sample of campaigns delivered by the sales house.

2 - CREATE A MEASUREMENT TOOL

↓

Creation of an internal carbon footprint calculation tool based on the database and models provided by the SRI

↓

Operationa **teams start using** the tool

↓

At the end of this step:
Ready-to-use tool based on sales house data multiplied by emission and conversion factors from the database provided by the SRI

3 - USE THE METRIC

↓

Integration of campaign assessment into internal processes (e.g. : integration into the upstream sales process)

↓

Regularly update the tool with new formats and fresh campaign reports

↓

Integrate the tool into a process **to improve carbon impact**

↓

During this step:
Tool filled in for each campaign, tracking of campaign impact and continuous improvement of data collection

Example of Level 1 collection

Format category	Format name	Viewing time (sec)	Average file size (kB)
Classic	Pavé	4	100
Classic	Wide angle	4	100
Video	Instream	20	512 000

Data collected in Step 1

X SRI Database emission and conversion factors

SRI common base database

→ Impact of Campaign 1
...
→ Impact of Campaign n

= Tool/ calculation mechanism / Template to quantify the impact of each campaign

ABOUT THE SRI

The SRI (Syndicat des Régies Internet) is a French trade association regrouping 35 members, digital sales houses and sell-side adtech partners. The SRI and its members share their expertise and promote best practices for a responsible and sustainable digital advertising landscape. It also provides key information to understand the complexity of the digital advertising ecosystem, in particular through its report "l'Observatoire de l'e-pub". The SRI also promotes sustainable digital advertising practices, through the Label Digital Ad Trust and its roadmap «SRI Engagé pour le Climat».