

## Channel Emissions Framework and Formulae: OOH/DOOH/Transient Extended Version

Phase	Step & sub-step	Physical processes involved	Formulae	Expected materiality	
CREATION	Creative Production	Development of creative	Import kgCO2e from Production Calculator	-	
	Physical Production	Full LCA impact based on material supply chain, transformation, printing, creating finished product	$\sum (i = 1 \text{ to } n) (Xi * EFi)$ i is the format type; Xi is the number of formats produced; EFi is the weighted average emissions factor for format (kg CO2e/format) weighted average EF for format = %recycled material x EF of recycled format + %virgin material x EF of virgin material format	-	
DISTRIBUTION	Demand: Selection & Targeting	Creative selection	Process to select creative format	none	none
		Placement volume	Number of sites used for campaign	No material emissions from this step; output of this step (Number of sites and format type, number of days live) used in transportation, and operational utilities emissions estimates	none
		Geographic / Audience selection	Location of sites used for campaign	No material emissions from this step. Output of these step (Geographic location of sites) used in transportation emissions estimates	-
	Marketplace: Buying	Direct	Buying process from advertiser to media owner	insert from TV standard	-
		Indirect	Buying process through agency and/or specialist	insert from TV standard	-
		Programmatic	Buying process through SSP/DSP	insert from programmatic standard	-
	Installation: Storage & Delivery	Physical - storage	Transportation to storage from production Storage in warehouse	Transport: distance travelled km x EF for vehicle type kg CO2e/km x % of vehicle used for ad products Storage: (annual warehouse emissions kg CO2e/area of warehouse sq m) x area used for storage sq m x #days stored/365	genericized Source C
		Physical - transportation, installation	Transportation from storage to display locations Installation	Transport: $\sum (i = 1 \text{ to } n) (Di * EFVi)$ 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: $\sum (i = 1 \text{ to } n) (Xi * EFi)$ i is the format type; Xi is the number of format i; EFi is the emissions factor for the installation of format i	genericized Source C + installation generic formula
		Transient - transportation, installation	Transportation of mobile platforms to installation facility Installation	Transport: $\sum (i = 1 \text{ to } n) (Di * EFVi)$ i is the vehicle type; Di is the total distance (km) travelled to installation sites by the vehicle type; EFVi is the emissions factor for the vehicle type kg CO2e/km installation: $\sum (i = 1 \text{ to } n) (Xi * EFi)$ i is the format type; Xi is the number of format i; EFi is the emissions factor for the installation of format i, including the prorated operational emissions (annual emissions of installation facility * hours for installation per format type/total annual facility operational hours)	genericized Source C + installation generic formula
		Digital	Digital transmission to display device	none	none
CONSUMPTION	Display: Viewing	Transient (not dedicated to advertising)	Assume the advertising does not create any change to mobile platform deployment for other purposes	none	none
		Dedicated Transient--operations	Energy required to move dedicated ad vehicle	transport: $\sum (i = 1 \text{ to } n) (Di * EFVi)$ i is the vehicle type; Di is the total distance (km) travelled to installation sites by the vehicle type; EFVi is the emissions factor for the vehicle type kg CO2e/km	-
		Dedicated Transient--embedded	Embedded emissions from dedicated display vehicle	$\sum (i = 1 \text{ to } n) EEVi * (T/LTi)$ i is the vehicle type; EEVi is the total embedded emissions for the vehicle type kg CO2e; T is hours ad displayed; LTi is hours of total time of depreciation for vehicle type i	-
		Digital--operations	Energy consumed for digital display	kWh used during display time * location based emission factor for grid kg CO2e/kWh	-
		Digital--embedded	Embedded emissions from display structure	$\sum (i = 1 \text{ to } n) EEDi * (T/LTi)$ i is the display type; EEDi is the total embedded emissions for the display type kg CO2e; T is hours ad displayed; LTi is hours of total time of depreciation for display type i	-
		Physical--operations	Energy consumed for illumination, mechanical movement	kWh used during display time * location based emission factor for grid kg CO2e/kWh	-
		Physical--embedded	Embedded emissions from display structure	$\sum (i = 1 \text{ to } n) EEDSi * (T/LTi)$ i is the display type; EEDSi is the total embedded emissions for the display structure type kg CO2e; T is hours ad displayed; LTi is hours of total time of depreciation for display structure type i	-
	Disposal & End of Life	Transient (not dedicated) ad material	Disposal/end of life of material removed from mobile platform	$\sum (i = 1 \text{ to } n) (Mi * EFMi)$ i is the ad material type; Mi is the mass of the ad material kg; EFMi is the weighted average emissions factor for end of life action kg CO2e/kg EFMi = % * EFM-recycled + % * EFM-landfill + % * EFM-incineration	-
		Dedicated Transient mobile platform	Disposal/end of life for mobile platforms	$\sum (i = 1 \text{ to } n) DEVi * (T/LTi)$ i is the vehicle type; DEVi is the total end of life emissions for the vehicle type kg CO2e; T is hours ad displayed; LTi is hours of total time of depreciation for vehicle type i	-
		Physical - ad material	Disposal/end of life of material removed from display structures	$\sum (i = 1 \text{ to } n) (Mi * EFMi)$ i is the ad material type; Mi is the mass of the ad material kg; EFMi is the weighted average emissions factor for end of life action kg CO2e/kg EFMi = % * EFM-recycled + % * EFM-landfill + % * EFM-incineration	-
		Physical - display structure	Disposal/end of life of display structures	$\sum (i = 1 \text{ to } n) DEDi * (T/LTi)$ i is the display type; DEDi is the total end of life emissions for the display type kg CO2e; T is hours ad displayed; LTi is hours of total time of depreciation for display type i	-
		Digital display structure	Disposal/end of life of display structures	$\sum (i = 1 \text{ to } n) DEDSi * (T/LTi)$ i is the display type; DEDSi is the total end of life emissions for the display structure type kg CO2e; T is hours ad displayed; LTi is hours of total time of depreciation for display structure type i	-
ALL	Corporate overhead emissions allocation	Allocated organisational emissions attributed to the specific campaign across ALL entities in the campaign value chain	$\sum (i = 1 \text{ to } n) CEi * AFi$ i is the value chain entity (ranging from publisher to adtech to agency, covering ALL entities involved with the campaign); CEi is the total annual corporate emissions for entity i in kg CO2e; AFi is the allocation factor for the campaign which may be calculated as a % either of revenue of the campaign/total revenue of the entity or person hours for the campaign/total annual person hours of the entity	-	

### Key

- = Not yet applicable or to be investigated further

$\Sigma$  = The mathematical sign for a sum