This paper describes the calculation model for the CO₂ emissions of a game studio. The model is based on our best knowledge and we are happy to hear any feedback from the model to make it better in the future.

This is Open Source: the model is free to use, share and you can use it for your own work and so on. For your further modelling (e.g. excels), please reference this paper, as this model will be every now and then updated.

What are included in the model with prioritization colouring and underlining

(<u>two dark orange underlining – high importance</u> / <u>blue and underlined – quite important</u> / lilac line without underlining – nice to have, but not a priority):

- <u>Players (highly important!)</u>
- YouTube audience (highly important if having active YouTube channel(s))
- Work in the office:
 - Electricity and heating (highly important!)
 - Waste management of the office (nice to have)
 - Purchases: office equipment and necessities (partly important, partly nice to have)
 - Developing the game, so computers, servers, telephones (if there's something that does not come up with office's electricity usage) (somewhere between nice to have and important)
 - Commuting and post services if relevant to the company (nice to have)
- Work outside the office:
 - o <u>Working from home (highly important if people have been working from home)</u>
 - Flights (highly important!)
 - Other travel (nice to have colouring mainly because of the missing information about hotels)

When doing calculations – if you have to prioritize, we advise to prioritize the emission sources marked as high priority (players, office's electricity and heating, working from home and flights).

Office electricity and heating/cooling: If you can't get some figures because of the information being available from a landlord, please ask the landlord what the source of energy (renewable or not) is. Please let the person asking for calculations know about the unavailability of data, the source of the energy (renewable or not), and size of the office (m²).

Flying: Please note, that last couple of years (2020-2021, even 2022) you have probably travelled less – so it might be good idea to find out baseline for your flying by calculating emissions from 2019 flights.

Please note: This model is not part of some calculation protocol/standardised. However it will help to figure out the emissions and main sources, and what emission scopes are biggest in the company.

All the feedback is welcomed, please contact Elina from Neogames (elina@neogames.fi or 040 842 87 36).

Last update to this paper: October 20th, 2022

Version 0.9.





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Background information and side notes

Neogames Finland ry, in co-operation with Suomen Pelinkehittäjät ry, has created this model to support game developers to estimate their carbon dioxide emissions. It is free to use for all the companies interested in knowing more about their emissions.

For some emission sources there are good calculators in the internet to use – such as <u>ilmastolaskuri.fi</u> by WWF, which we advise in many cases to use (usable also in English). So if you prefer using some kind of online calculator, you can do that too.

If you can't get some figures because of the information being available from a landlord, make a note about that. Please ask the landlord the source of energy to know whether it is renewable or not.

To have a truthful baseline of flying emissions, we advise to calculate also flying emissions from 2019.

Defining the emission scopes based on this paper: https://www.ghgprotocol.org/sites/default/files/ghgp/standards_supporting/Diagram%20of%20scopes%2 Oand%20emissions%20across%20the%20value%20chain.pdf

<u> Players – mobile games</u>

Information	Where to	Processing it		Please note / which emission
needed	get it			scope
Players:	How much	How to calcu	late players' emissions MOBILE:	Scope 3 emissions
how much	do people	1. Hov	w much people play: DAU or MAU figures, 12	
do they	play: Player	mo	nths average -> we know how many people play	This model probably leads to
play, the	data	and	d the amount of devices	bigger emission figures that
device(s),		2. Dev	vice for playing: share of iOS and Android (and	really comes from players, as
hosting (and	Hosting:	oth	ers if there is some platform being big) -> we	probably not all the players
distribution	service	kno	ow how many people play with Android and how	have to recharge their phones
of games)	provider	ma	ny with Apple	every day due to playing.
	like AWS	3. Cho the	pose top-device from iOS and Android to make e calculations	However, as this model does not have calculations for
<u>HIGH</u>	Device(s):	4. Ass	sumption: every player plays the game that much	internet connection emissions,
PRIORITY	tech/player	the	y need to recharge the device once a day -> the	the bigger numbers
	data	ene	ergy that is needed for 0 %-> 100 % charge (+20%	compensate lack of that aspect.
		wa	ste)	
		5. Wh	nen calculating that every player, every day,	Battery voltage:
		rec	harge their device once a day from zero to full,	https://www2.deloitte.com/co
		γοι	u get kWh number	ntent/dam/Deloitte/global/Doc
			Battery voltage in use is around 3.7 – 3.8 V in	uments/Technology-Media-
			phone batteries.	lelecommunications/gx-tmt-
			Examples about betten, consisting and	pred15-smartphone-
			charging time:	batteries.pui
			iPhone 13 Pro Max: battery capacity 4352	About batteries and charging
			mAh. Estimated full charge time 2h 11 min	time:
			with 20W (0,02 kW) charger – so to 120 %	https://www.dxomark.com/ap
			recharge (estimating 20 % goes to waste)	ple-iphone-13-pro-battery-
			takes 2,62 hours.	review/ (times from table of
				"Time to full charge", not from
			Samsung Galaxy S21 Ultra 5G Snapdragon:	text)
			battery capacity 5000 mAh. Estimated full	Apple charger power:
			charge time 1h 28 min with 65W (0,065 kW)	https://www.breakinglatest.ne
			charger – so to 120 % recharge (estimating	ws/business/apple-iphone-13-
			20 % goes to waste) takes 1,76 hours.	pro-max-charging-power-
			Calculate together: number of players on	surprises apple inhone/
			that (e.g. iPhone or Samsung) device *	suprises-apple-ipriorie/
			charger (kW) * charging time in hours * 365	* Hosting (servers etc.): Please
			days a year (when doing vearly calculations	ask the data of hosting
			= energy (kWh) players use. (And do that to	emissions/electricity usage
			the possible other devices as well).	from your service provider.
				AWS has online carbon
		6. If y	ou know where the players are, you can choose	footprint calculator tool for its
		the	grid specifically. If not, USA grid is probably	customers.
		ave	erage, emission wise. So you need to get the	https://aws.amazon.com/aws-
		info	prmation about the grid's CO_2 emissions.	cost-management/aws-
		htt	ps://www.epa.gov/egrid helps with getting the	customer-carbon-tootprint-
		KW Eige	In any the CO_2 emissions of chosen grid together.	
			$403 \text{ kgC}\Omega_2$ emissions per kWb or 0.000/03 +CO ₂	
		Cal	culate together:	
		grid	d emissions (tCO ₂ /kWh) with energy players use	
		(kV	$Vh) = tCO_2/kWh from players$	
		7. Hos	sting*: how much energy does that require (kWh)	
		and	d in what grid that happens (CO $_2$ emissions per	
		kW	h) and add this on top of earlier calculation.	

<u>Players – PC and console games</u>

Information needed	Where to get it	Processing it	Please note / which emission scope
Players:	How much	How to calculate players' emissions PC AND CONSOLE:	Scope 3 emissions
how much	do people	1. Physical distribution:	
do they	play: Player	As we don't have an idea what is the most common	Overall note: we do not have the
play, the	data	way globally in waste management of physical	in the calculations. We do have
device(s),		copies, we don't have model to calculate CO2	some idea how to count that in, so
hosting (and	Hosting:	emissions of physical copies. Disc raw materials and	if you are interested to have
distribution	service	manufacturing emissions are estimated to be 0.28	network&router emissions
of games)	provider	kgCO2/unit*. Physical distribution emissions come	calculated too, contact Neogames
	like AWS	also from distribution and end of life management.	Finland.
	Device (a)	të sana kasa akontari dheteteri shara akon akon da tika	* Mavers, K., J. Koomey, R. Hall, M.
HIGH	Device(s):	If you have physical distribution, please include the	Bauer, C. France, and A. Webb.
PRIORIT	data	sales of physical copies to player emissions.	2014. The carbon footprint of
	uata	2 How much people play: DALL or MALL figures (if you	games distribution. Journal of
	Distribution:	don't have these figures**). 12 months average and	Industrial Ecology 19(3): 402–415
	if games are	gaming session lengths -> we know how many	information about player activity.
	distributed	people play and how much do they play. These	maybe just use sells * game length,
	in physical	should be available for you if people play logged in	or your own estimation.
	copies -	and online***.	*** Some people may play offline.
	distributor		For consoles good guess might be
		Device for playing****:	1070.
		PC: let's estimate that average PC runs with 200-300	****
		W when gaming. Screen 30-50 W. So overall about	Figures for PC: If your game is
		350 W.	needing a lot of power to run and
		Consolo:	used need more energy, check this:
		CONSOLE. PSS: 210 W/// PS4: 150 W/// PS3: 190 W/	https://www.forbes.com/sites/mic
		Xhox Series X [•] 220 W // Xhox One X [•] 180 W //	haelkanellos/2015/09/07/the-big-
		Xbox One: 120 W // Xbox One X: 100 W //	surprise-in-home-energy-
		Nintendo Switch: 18 W	consumption-gaming-
		Wii: 40 W	Figures for PC (used in calculation):
			https://www.maketecheasier.com/
		TV: 67 W	pcs-vs-laptops-vs-tablets-energy-
			efficient/
		VR:	Figures for console: https://energyusecalculator.com/el
		Headset 4,5 W	ectricity gameconsole.htm
		Please also calculate the computer (see PC	and for PlayStation 4 and 5:
		estimations above)	https://www.playstation.com/en-
		4 Calculate together:	gb/legal/ecodesign/
		number of players in a day * game length * devices	https://www.samsung.com/fi/tvs/u
		(kW) * 365 days of a year = energy (kWh) players	hd-4k-tv/tu6905-43-inch-crystal-
		use.	uhd-smart-tv-ue43tu6905kxxc/
			Higures for VR:
		5. If you know where the players are, you can choose	m/how-much-power-watts-does-a-
		the grid specifically. If not, USA grid is probably	vr-headset-use/
		average, emission wise. So you need to get the	
		information about the grid's CO_2 emissions.	***** Hosting (servers etc.): Please
		https://www.epa.gov/egrid helps with getting the	ask the data of hosting
		Kwn and the CO_2 emissions of chosen grid together.	your service provider. AWS has
		rigure is 0.000 ibs of CU_2 emissions per kWh (Which is 0.403 kgCO ₂ emissions per kWh or 0.000402 to 0.0	online carbon footprint calculator
		$r_{\rm SCO2}$ emissions per kwit of 0.000403 (CO ₂).	tool for its customers.
		grid emissions (tCO ₂ /kWh) with energy players use	https://aws.amazon.com/aws-cost-
		$(kWh) = tCO_2/kWh from players$	carbon-footprint-tool/
			<u></u>
		6. Hosting*****: how much energy does that require	
		(kWh) and in what grid that happens (CO $_2$ emissions	
		per kWh) and add this on top of earlier calculation.	

YouTube audience

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Viewing:	Watch time:	YouTube provides channel administration with following	Scope 3 emissions
(b)	rourube	top 10 countries	If you have active YouTube
(11),	Location	- top to countries	channel(c) with a lot of viewors
lecation		- watch time (hours) in those top 10 countries and	the emissions can be quite
(country)	Tourube	- device share in ton 10 countries	significant
(country)	Device [.]		Significant.
нідн	Own	Google has announced, that every YouTube video streamed	* YouTube streaming carbon
PRIORITY	estimation	has zero carbon footprint from Google data centers. This	footprint
(except in		means that there is no need for calculating streaming	https://www.youtube.com/ho
the case of		emissions, just the end device.*	wyoutubeworks/progress-
not having			impact/sustainability/
active		Calculate together:	
YouTube		watch time (in hours) * device consumption (kWh/h) *	
attendance)		emissions of the country's (or countries') grid (CO ₂ /kWh) =	
		the emissions of YouTube audience.	
		Estimations of device consumptions:	
		- Mobile around 2,8-2,9 W	
		- Tablet around 5 W	
		- TV (43") around 67 W	
		- PC around 300 W, laptop around 90 W (YouTube	
		does not say is it PC or laptop, just computer)	
		If you know where the viewers are, you can choose the grid	
		specifically. If not, USA grid is probably average, emission wise	
		So you need to get the information about the grid's CO_2	
		emissions. https://www.epa.gov/egrid helps with getting the	
		kWh and the CO ₂ emissions of chosen grid together. Figure is	
		0.889 lbs of CO ₂ emissions per kWh (which is 0.403 kgCO2	
		emissions per kWh or 0.000403 tCO2).	

Electricity and heating/cooling of the office

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Electricity	Landlord. If	You need to know:	Scope 2 emissions
usage of	the building	- the source of your electricity (is it renewable or	
the building	is own,	not?)	https://www.helen.fi/en/electricity/elec
- how much	there	 How much energy are you using? (kWh) 	prices/environmental-electricity and
electricity is	should be		https://www.helen.fi/en/company/ener
used (kWh)	some kind	If you are using renewable energy, according to Helen (energy	gy/energy-production/specific-
and what is	of manager	company in Helsinki area) the CO ₂ emissions would be 0	emissions-or-energy-production
the source	that has this	kg/kWh. This number can be used in other parts of Finland as	Average CO ₂ emissions per kWh:
(renewable	information.	well.	https://www.motiva.fi/ratkaisut/energia
etc.)			https://www.eea.europa.eu/data-and-
		In Finland, according to Motiva, CO_2 emissions from one kWh:	maps/indicators/overview-of-the-
HIGH		$0.089 \text{ kg CO}_2/\text{kWh} = 0.000089 \text{ t CO}_2/\text{kWh}.$	electricity-production-3/assessment
PRIORITY			Can't got this data from your
		In Europe, according to EEA, average CO ₂ emissions from one	landlord? Make a note and ask
		$kWh: 0.281 \text{ kg } CO_2/kWh = 0.000281 \text{ t } CO_2/kWh (2018).$	about the source of energy
		Vey een alee was this WM/h to CO, amissions calculatory	(renewable or not?)
		You can also use this kwn to CO_2 emissions calculator:	
		alculator	
Heating and	Landlord	You need to know:	Scone 2 emissions
cooling -	should have	- the source of the heating and cooling (is it	
source of	information	renewable?)	https://www.helen.fi/en/comp
the energy	about the	 How much are you using heating/cooling? (kWh) 	any/energy/energy-
(renewable	source of	, 6 6, 6 (,	production/specific-emissions-
etc.) and	heating and	District heating in Helsinki area (using Helen – usable in other	of-energy-production
how much	cooling.	parts of Finland as well):	
is used		CO_2 emissions of basic district heating are 0.177 kg CO_2 /kWh =	Can't get this data from your
(kWh).		0.000177 t CO ₂ /kWh.	landlord? Make a note and ask
		CO ₂ emissions for renewable district heating are 0 kg	about the source of energy
<u>HIGH</u>		CO2/kWh (if you are using 100 % renewable district heating –	(renewable or not?).
PRIORITY		according to Helen it is climate neutral).	
		District cooling:	
		According to Helen CO_2 emissions are $0 \ kg/kWh$	
		According to WWF Finland, the average CO_2 emissions are	
		$0.045 \text{ kg/kWh} = 0.000045 \text{ t} CO_2/\text{kWh}$ If you are not buying	
		cooling from Helen, use WWF's number.	
		If you are doing calculations outside Finland, please check if	
		there is some information from your local energy company, as	
		there might be differences in availability of renewable district	
		heating etc.	
		If you are using some other sources, like oil, see	
		https://www.forestresearch.gov.uk/tools-and-	
		resources/fthr/biomass-energy-resources/reference-	
		piomass/facts-figures/carbon-emissions-of-different-fuels/	

Office waste management

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Waste	Landlord	You need to know:	Scope 3 emissions
manageme	should have	 which wastes do you produce 	
nt – waste	information	 how much waste do you produce (you should be 	The weight of each waste type
types and	about the	able to find these figures from the waste bill) – per	can be found from the waste
amount of	amount of	waste category	bill.
the waste	each waste		
	type	As there is not up-to-date index figures to configure amount of	Can't get this data from your
NICE TO		waste to emissions in Helsinki area from our environmental	landlord? Make a note about
HAVE		agency, I advise using Ilmastolaskuri:	that. Fortunately this should
			not be that big part of game
		https://www.ilmastolaskuri.fi/ (Calculate the carbon footprint	studio's emissions.
		with free trial -> go to the fourth page and give the	
		information there -> go to the summary page to get the	
		figures)	
		If you have some index figures in your own area, please	
		calculate them together with the amount of waste you are	
		producing.	

Developing the games (servers etc. that are not part of your office calculations/player calculations)

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Developing	Probably	You need to know:	Scope 2 emissions
and	tech /	 the energy usage (kWh) 	
maintaining	service	 source of energy for those facilities 	
the game –	provider		
energy		PLEASE NOTE – here you should calculate those game related	
usage (kWh)		emissions that are not part of your office's energy usage (or	
of		home offices – that is later in this paper) or player emissions	
computers,		(hosting).	
servers,			
telephones,		If you are using renewable energy, according to Helen (energy	
data		company in Helsinki area) the CO ₂ emissions would be 0	
services and		CO ₂ /kWh.	
so on and			
source of		In Finland, according to Motiva, CO2 emissions from one kWh:	
energy		0.131 kg CO2/kWh = 0.000131 t CO2/kWh.	
<u>A PRIORITY</u>		In Europe, average CO ₂ emissions from one kWh: 0.281 kg	
		$CO_2/kWh = 0.000281 t CO_2/kWh.$ (2018).	
		You can use kWh to CO ₂ emissions calculator:	
		https://www.epa.gov/energy/greenhouse-gas-equivalencies-	
		<u>calculator</u>	

Purchases

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Purchases –	Probably	You need to know:	Scope 3 emissions
what is	administrati	 what you have purchased 	
purchased	on	 how much you have purchased 	Tech: numbers come from:
and how			WWF's Ilmastolaskuri
much		<u>IECH (DEVICES THAT WERE PURCHASED):</u>	coefficients
Table		For Finnish users: These can be calculated with WWF's	From it was if was the second
Tech		imastolaskuri. <u>https://www.imastolaskuri.n/ (</u> Calculate the	Furniture – If wanting to see
		the information there is go to the summary page to got the	numbers or pood information
APRIORITY		figuree)	about o g kitchon units
Othor		liguies	chock (they have average
purchases:		Estimations of different devices – including manufacturing and	carbon footprint for different
NICE TO		many cases transportation and recycling (not the use, which is	furniture).
HAVE		included in energy consumption in the office or at home). All	http://www.healthyworkstati
		numbers are per one device!	ons.com/resources/Environm
		- smartphone 58.5 kg of CO ₂ = 0.0585 t/CO_2	ent/FIRA.CarbonFootprint.pd
		- laptop 155.6 kg of $CO_2 = 0.1556 t/CO_2$	f
		- computer monitor	-
		 LCD 327.6 kg of CO₂ = 0.3276 t/CO₂ 	Please note, that different
		 LED 208 kg of CO₂ = 0.208 t/CO₂ 	sources and calculators have
		 tablet computer 162 kg of CO₂ = 0.162 t/CO₂ 	different coefficients, so if
		 printer 78 kg of CO₂ = 0.078 t/CO₂ 	you use, for example, WWF's
		 multipurpose device (printing, scanning) 410 kg of 	Ilmastolaskuri, and want also
		$CO_2 = 0.410 \text{ t/}CO_2$	to calculate the purchases
			with these coefficients given
		FOR OFFICE EQUIPMENT AND PAPER:	from different sources, the
		For Finnish users, WWF's Ilmastolaskuri is very good	results might be different.
		<u>https://www.ilmastolaskuri.fi/</u> (Calculate the carbon footprint	
		with free trial -> go to the third page and give the information	
		there -> go to the summary page to get the figures)	
		New furniture (not recycled!):	
		$- task chair 72 kg of CO_2 = 0.072 t/CO_2$	
		- visitor chair 36 kg of $CO_2 = 0.036 \text{ t/}CO_2$	
		- work station desk 45 kg of $CO_2 = 0.045 \text{ t/}CO_2$	
		- 6 people table 228 kg of $CO_2 = 0.228 t/CO_2$	
		- sofa 90 kg of $CO_2 = 0.09 t/CO_2$	
		- armchair 43 kg of $CO_2 = 0.043 \text{ t/}CO_2$	
		 bookcase 18 kg of CO₂ = 0.018 t/CO₂ 	
		 cabinet 48 kg of CO₂ = 0.048 t/CO₂ 	
		FOOD (IF YOU CAN AND IT IS RELEVANT):	
		If there is food available on the office for employees that has of course carbon footprint too. If you know, which items and how much is	
		purchased, you should be able to calculate CO ₂ -emission for that too.	
		Most of the calculators available calculate from personal point of view	
		(what is your diet), but this might work if you want to take this into	
		calculations:	
		https://myemissions.green/food-carbon-footprint-calculator/	
		Some figures useful for office environment	
		- black tea or coffee: $0.021 \text{ kg of } \text{CO}_2 = 0.000021 \text{ t/CO}_2 \text{ per cup}$	
		(source: Guardian's article)	
		- a large cappuccino: 0.235 kg of CO ₂ = 0.000235 t/CO ₂ per cup	
		(source: Guardian's article)	
		- bananas: 0.48 kg of $CO_2 = 0.00048 \text{ t/}CO_2$ per kilo of bananas	
		of apples (depending on transportation)	
		- milk: 0.8-1.3 kg of CO2 = $0.0008-0.0013$ t/CO ₂ per litre (in	
		Finland/Valio). Global average 2.5 kg $CO_2 = 0.0025 \text{ t/}CO_2 \text{ per}$	
		litre.	

Commuting, office car, post services

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
If relevant:	Administra-	COMMUTING:	Commuting, post services:
commuting	tion or HR	You need to have estimation of commuting needs of your	Scope 3 emissions
(estimation	or Service	employees to calculate this.	
how much	provider		Company car: Scope 1
your	-	If you are supporting your employees' commuting or know	emissions
employees		their commuting needs, this can be calculated on those	
commute),		assumptions. For Finnish users, WWF's Ilmastolaskuri helps	GHG emissions from typical
company		calculations a lot: https://www.ilmastolaskuri.fi/ (Calculate the	passenger vehicle:
car (how		carbon footprint with free trial -> go to the second page,	https://www.epa.gov/greenve
much		choose "Travel between home and workplace", and give the	hicles/greenhouse-gas-
kilometers		information there -> go to the summary page to get the	emissions-typical-passenger-
is it driven		figures)	vehicle
and what is			
the fuel),		USING COMPANY CAR:	
post		You need to know:	
services		- the kilometres the car has gone through last year	
(how much		- the fuel of the car	
is used, the			
company		WWF's Ilmastolaskuri (<u>https://www.ilmastolaskuri.fi</u>) can be	
providing		used for this too (the second page has also passenger car in	
the service)		there)	
NICE TO		First you need information how much fuel has been used by	
HAVE		driving the company car (if company has electric car, the	
		electricity used to reload car batteries should be on office's	
		electricity usage – if not, follow instructions from that part to	
		calculate kWh -> CO_2 emissions). If you don't have exact	
		information about that, but have figures or estimations of the	
		kilometres travelled, calculate the fuel usage: kilometres *	
		average fuel consumption of the vehicle.	
		When you have information about fuel usage, combine that	
		figure with emissions per litre:	
		Diesel: $0.002689 tCO_2 / litre$	
		Gasoline: 0.002348 tCO ₂ / litre	
		Calculate: fuel usage (litres) * emissions of the fuel per litre =	
		emissions.	
		POST SERVICES:	
		You need to know:	
		- who is the service provider for your post services	
		- how much are you using the service	
		There is no calculator for this – please ask from your post	
		services provider!	
		Finnish post service Posti provides information about CO_2	
		emissions to those who use OmaPosti And Posti actually	
		offsets 100 % of all the emissions in Finland	
1	1	1	

Working from home

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Working	HR	You need to know/figure out:	Scope 2 emissions
from home	(probably	 How many people have been working from home? 	
- especially	knows how	(can be split to smaller timescales if there is	As you probably don't know
if there has	many have	differences)	what kind of energy the
been most	been on	 How many days are those people working from 	employees have at their home,
of the	WFH mode	home?	it is good to use average grid
company or	and in	 What is the set at home? And working hours 	and its CO ₂ emissions in these
big part on	which set	 Display 35 W 	calculations. If you do know
WFH mode	up)	 Laptop 65 W 	more specifically, please use
		 8 hours per day 	more specific information.
<u>HIGH</u>		 Daily consumption per one employee with this set is 	Electricity from renewable
PRIORITY		0,8 kWh	sources has 0 kg of CO ₂ per
			kWh.
		Daily consumption per employee * number of	
		employees on WFH mode * days on WFH mode =	Average CO ₂ emissions per kWh
		remote work total energy	in Finland:
			https://www.motiva.fi/ratkaisu
		 How much CO₂ emissions comes from using one 	t/energiankaytto_suomessa/co
		kWh?	2-paastokertoimet
		Please find that information for your country if there	
		is specific information (In Finland	
		$0.089 \text{ kg CO}_2/\text{kWh} = 0.000089 \text{ t CO}_2/\text{kWh.}$). If you	
		can't find more information, use this calculator for	
		calculating the CO ₂ emissions of the total remote	
		work energy (kWh to CO ₂ emissions calculator:	
		https://www.epa.gov/energy/greenhouse-gas-	
		equivalencies-calculator)	
		remote work total energy * grid emissions = the	
		emissions from working from home	

<u> Travelling – flights</u>

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Flights –	Administrat	You need to know:	Scope 3 emissions
where have	ion or	 how much people have been flying (from your own 	
you been	service	administration or travel agency)	Please note that you have
flying and	provider	 we recommend calculating also 2019 flying 	probably not been flying
how much	(travel	emissions to have truthful picture about flying in	around that much 2021 than
	agency)	times without pandemic	usually – so your emissions
<u>HIGH</u>			from flying are smaller than
PRIORITY		There are multiple calculators to count CO ₂ emissions of flying	they'd normally be.
		(some airlines have their own too), here are couple:	
		https://www.icao.int/environmental- protection/carbonoffset/pages/default.aspx	
		https://calculator.carbonfootprint.com/calculator.aspx?tab=3	

Travelling – other travel

Information	Where to	Processing it	Please note / which emission
needed	get it		scope
Other travel	Administrat	TRAINS AND BUSSES:	Scope 3 emissions
– how	ion or		
much,	service	You need to know:	Staying in the hotel also
where, how	provider	 how travelling has been done by trains and busses 	produces emission (mainly with
	(travel		electricity usage), but
NICE TO	agency)	Couple of calculators with trains and busses:	unfortunately there is not
HAVE			some index number to use. It is
		https://calculator.carbonfootprint.com/calculator.aspx?tab=6	estimated that 6 % of carbon
			footprint of global tourism
		https://www.ilmastolaskuri.fi/ (Calculate the carbon footprint	comes from lodging
		with free trial -> go to the second page and give the	(sustainabletravel.org/issues/c
		information there -> go to the summary page to get the	arbon-footprint-tourism/)
		figures)	
		HOTELS:	
		Ask from the service provider if they could provide you the	
		CO ₂ emissions of the stay.	