

This tool calculates the CO_2 , CH_4 and N_2O emissions from the combustion of fuels in boilers, furnaces and other stationary combustion equipment. It can be used by organizations from any sector.

Most of the time, you need only supply information on the the type and amount of fuel burnt, as well as the industry sector. Emissions are then automatically calculated using default emission factors, choosen to reflect this information. You must select a sector before the CH_4 and N_2O emissions can be calculated.

Changing the tool

(i)

The tool works as is. If you have more specific information, you can supply custom emission factors or change the default global warming potentials on the Settings page.

Other tools can be downloaded from the GHG Protocol website

GHG Protocol Guide to Definitions												
This tool implements emission factors specific to many different types of fuels and sectors. To help you understand which emission factors most closely meet your needs, browse our definitions for our fuels and sectors:												
Fuels:												
Please select a fuel: Natural gas												
Natural gas should include: (1) Blended natural gas (sometimes also referred to as Town Gas or City Gas), a high calorific value gas obtained as a blend of natural gas with other gases; (2) City Gas, a high calorific value gas obtained as a blend of natural gas with other gases derived from other primary products, and usually distributed through the natural gas grid (eg coal seam methane); (3) Substitute natural gas, a high calorific value gas, manufactured by chemical conversion of a hydrocarbon fossil fuel, where the main raw materials are: natural gas, coal, oil and oil shale.												
Sectors:												
Please select a sector: Institutional												
Examples include health and education operations (e.g., schools and hospitals), public administration, insurance and financial services, real estate, and Research and Development.												
(Source: IPCC 2006 Guidelines for National Greenhouse Gas Inventories)												

Unit conversions

While this tool automatically converts data amongst different measurement units, it does not cover all possible units. To perform other conversions, the online tool at www.onlineconversion.com may be helpful.

() A note on heating values

Heating (or calorific) values are important if you input fuel consumption data using energy units (e.g., GJ or mmBtu of fuel burnt). Heating values measure the energy content of fuels and are expressed using either Higher Heating Values (HHVs; also know as Gross Calorific Values) or Lower Heating Values (LHVs; also known as Net Calorific Values). As a general rule, HHVs are used in Canada and the USA, and LHVs are used elsewhere; however, exceptions to this rule may occur. Before emissions can be calculated properly, the fuel consumption data and corresponding emission factors must be expressed in the same way - either on a HHV basis or on an LHV basis, but not both. So, you will be asked to indicate the heating value basis that underlies any energy data you supply. This will not happen when you supply fuel use data on a mass or volume basis.

Acknowledgements:

The emission factors used in this tool come from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.



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While the worksheets are largely self explanatory, for questions or suggestions on its contents, please contact



This tool works without the need to adjust its default settings. However, if you have more specific information, you can change the following:

I Global Warming Potentials (GWPs)

GWPs compare the climate impact of different greenhouse gases with that of CO_2 , and they are used to calculate emisisons in terms of CO_2 -equivalents. As scientific understanding advances, the GWP values of GHGs can change. By default, this tool uses the GWP values from the IPCC's Fifth Assessment Report (2014), but you can use other GWP sets:

 Please select a GWP set:
 2014 IPCC Fifth Assessment Report

 Note: The Fifth Assessment Report GWP values used in this tool exclude climate–carbon feedbacks for non-CO2 emissions. Use of the latest GWP values is recommended.

2 Custom emission factors

This tool uses default emission factors from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. If you want to use your own emission factors, please enter them below. Your emission factors can be accessed in the spreadsheet by selecting the 'My fuels' category.

		Em	ission fact	ors	Units of em	ission factors		Notes	
Fuel	Type of fuel	CO ₂	CH ₄	N ₂ O	Numerator (e.g., kg GHG)	Denominator (e.g., tonne fuel)	Heating value basis		
Natural gas	Fossil fuel	1,88496	0,000168	3,4E-06	Kilograms (kg)	metre3			



			User supplied data	GHG emissions (tonnes)							
Source ID	Sector	tor Fuel type / / / / / / / / / / / / / / / / / / /		Amount of Units fuel (e.g., kg or kWh)		Heating value basis	CO ₂	CH ₄	N ₂ O	All GHGs (tonnes CO ₂ e)	
Boiler	Institutional	Gaseous fossil	Natural gas	659400	metre3		1242,943	1,108E-01	2,216E-03	1246,632	
							Total GHG emission	ons from fossil fue	ls (tonnes CO ₂ e):	1246,632	
	Total CO ₂ emissions from biomass (tonnes):										



Activity Data The default emission factors are sourced from the US EPA Climate Leaders program or from the UK DEFRA (for air travel only).

		Mode	of			Activity Data					GHG Emissions				
Status	Source Description	Region Transp	Scop	Type of Activity Data			Total Weight of	Units of			Error Messages	Fossil Fuel CO2 CH4	N2O	Total GHG Emissions, exclude Biofuel CO2	Biofuel CO2 Emissions
					venicie Type (For air transport, see tootnote)	Distance Travelled	Freight # of Passenger	Measurement	Fuel Used	Fuel Amount Unit of Fuel Amount		(metric tonnes) (kilograms) (kilograms)	(metric tonnes CO2e)	(metric tonnes)
		Other Road	Scope 1	Fuel Use					Gasoline/Petrol	5250 Litre		11,926		11,928	
		Other Road	Scope 1	Fuel Use				-	On-Road Diesel Fuel	2850 Litre		7,628		7,628	
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Add Row									Total (metric tonnes CO2e)	19,553	0	0	19,553	0

* Please note the following distance categories when calculating air transport emissions. Domestic = < 463 km Short-Naul = 2463 <1108 km Long haul = 2108 km



How do I calculate scope 2 emissions?

x Emission Scope 2 = Activity **Emissions** Data Factor (EF) mt CO2e/ **MWh MWh** For every MWh... **MWh** Location-based Market-based Need an EF for each method. **EF** derived from **EF** represents what's generating contractual on the grid information, applied on a **MWh** basis



SCOPE 2 EMISSIONS in *tCO2e* = (Electricity consumed by Bukhara State University in 2023) * (Location based emission factor¹) / 1000 = 2021400KWh * 0.41805 / 1000 = 845.05 tCO2e

SCOPE 1 + SCOPE 2 EMISSIONS in *tCO2e* = 1266 + 845 = 2111 *tCO2e*

1 – Emission factor in Uzbekistan was retrieved from https://www.carbonfootprint.com/docs/2023_07_international_factors_release_11.xlsx