



WORKSHEET 2: CALCULATING YOUR GREENHOUSE GAS EMISSIONS FROM ELECTRICITY

This worksheet will assist you in working out your electricity greenhouse gas (GHG) emissions. Below you will find key emission factors and calculation methodologies that will assist you. Overleaf you will find tables to help you calculate emissions at sites with varying circumstances.

Data collection will vary for each site. A majority of your electricity information can be derived from electricity bills, which may be sent either to you directly or to your landlord. The two key components will be either of tenant light and power or base building power, where:

- **Tenant light and power (TL&P)** consists of electricity used for lighting, computers, unit air conditioners and other appliances in your tenanted area.
- **Base building power** is electricity used for shared services such as central air-conditioning, elevators, and lighting in lobbies and other shared spaces.

KEY DATA NEEDED

- Kilowatt hour (kWh) from utility bills and/or overall building data from landlords
- Square meters of occupied space
- If in a building with multiple tenants: total square meters of building and total square meters of communal floor space

The method you use to calculate your electricity GHG emissions will depend on the occupation situation at each site. Each site will generally fall into one of the following categories:

- **Sole-tenanted facility** (either leased or owned) where you, or your landlord, receives bills directly from an electricity provider indicating the amount of electricity used. No further quantification of activity data is needed. Only **Section 1** overleaf is required to calculate emissions for this site.
- **Co-tenanted facility (TLP and base)** where you are billed directly for your Tenant, light and power electricity use, and where base building energy is billed to the landlord. Both **Section 1 and Section 2** overleaf are required to calculate emissions for this site.
- **Co-tenanted facility (Total)** where the landlord receives building-wide electricity bills. In these situations you must calculate your kWh consumption based on the percentage of total leased building space that you occupy. Only **Section 2** overleaf is required to calculate emissions for this site.

CALCULATION PROCESS:

- 1a. In calculating emissions for your TLP or a sole tenanted site no further quantification of activity data is needed. This data can be entered directly in the **tenant light and power table (Section 1)** overleaf.
- 1b. In calculating your percentage of base building or total building energy use you must calculate the kWh's which are attributable to your organisation. This is done by working out the percentage of the buildings tenanted space that you occupy and entering that into the **base building power table (Section 2)** overleaf. If your facility also has TLP you must also include these emissions in Section 1.
2. Apply the NGA emission factor for the state in which your operations occur – see below for Victorian electricity factor, (**for both Sections 1 and 2**).
3. If you purchase GreenPower this can be deducted after your inventory is complete. Please refer to **Section 3** overleaf.

KEY EMISSION FACTORS

When calculating your emissions from electricity, you have 2 choices for emissions factors. The scope 2 emissions factor calculates the emissions from the electricity generator for the electricity that you consume. This is generally used in emissions reporting for government and other programs. However if you wish to incorporate lifecycle emissions, such as emissions from extracting the fuel, and transmission losses, then you can use the Scope 3 factor as well as the Scope 2 factor. This is what EPA does for its voluntary reporting of GHG emissions.

Source: Department of Climate Change NGA Factors Workbook, November 2008

Scope 2 emissions factor (Electricity emissions)

→ 1.22 kg CO₂-e/kWh for Victorian electricity users (see pages 18-19 for factors in states other than Victoria)

Scope 2 and 3 emissions factor (Lifecycle or full fuel cycle emissions)

→ 1.31 kg CO₂-e/kWh for Victorian electricity users (see pages 59-60 for factors in states other than Victoria)

NB NGA Factors Workbook is generally updated on an annual basis, therefore please ensure you are referring to the most recent edition

KEY RESOURCES:

Department of Climate Change, **National Greenhouse Accounts (NGA) Factors**, November 2008
 World Resources Institute and World Business Council for Sustainable Development, **Greenhouse Gas Protocol**, 2007
 EPA Victoria, **Greenhouse Inventory Management Plan 2006/07**

WORKSHEET 2: CALCULATING YOUR ELECTRICITY GREENHOUSE GAS EMISSIONS

SECTION 1: CALCULATING 'TENANT LIGHT AND POWER'/'SOLE TENANTED' ELECTRICITY GHG EMISSIONS

Enter total electricity use for entire sole tenanted site or TLP area.

Electricity use (kWh)	Emission factor	GHG emissions (kg CO ₂ -e)
	X	=

SECTION 2: CALCULATING 'BASE BUILDING'/'PERCENTAGE OF TOTAL BUILDING' ELECTRICITY GHG EMISSIONS

Step 1: Calculate total leased floor space of building

Total building floor space (m ²)	Shared floor space of building (m ²)	Total leased floor space (m ²)
	-	=

Step 2: Calculate company share of base/total building electricity use

Equation for calculating share of base (or total) building electricity

$$\frac{\text{Company leased floor space (m}^2\text{)}}{\text{Total building leased floor space (m}^2\text{)}} \times \text{Base (or total) building electricity use (kWh)} = \text{Company share of base (or total) building electricity use (kWh)}$$

Company leased floor space (m ²)	Total building leased floor space (m ²)	Company share of total leased area (%)	Base (or total) building electricity use (kWh)	Company share of base (or total) building electricity use (kWh)
	÷	=	X	=

Step 3: Calculate GHG Emissions

Company share of base building electricity use (kWh)	Emission factor	GHG emissions (kg CO ₂ -e)
	X	=

SECTION 3: CALCULATING GREENPOWER IMPACT ON EMISSIONS

If you purchase accredited GreenPower, then repeat the Section 1 calculation using the amount of GreenPower in kWh to obtain the GHG emissions mitigated by the use of renewable energy. This figure can then be deducted at the end of your GHG inventory to demonstrate the reduction. For an example see EPA Victoria's GHG inventory at <http://www.epa.vic.gov.au/climate-change/EPA-programs-initiatives.asp>.

$$\text{Total electricity use emissions (kg CO}_2\text{-e)} - \text{GreenPower electricity use emissions (kg CO}_2\text{-e)} = \text{Total GHG emissions (kg CO}_2\text{-e)}$$

*Be sure to check the percentage of GreenPower purchased. For example, if you have 20% GreenPower on a 100kWh purchase, then your GreenPower is 20 kWh.