

# GREENHOUSE GAS EMISSIONS INVENTORIES FOR SMEs

QUICK REFERENCE GUIDE

# **Greenhouse gas emissions inventories for SMEs**

Quick reference guide

## Copyright notice

Copyright © CPA Australia Ltd (ABN 64 008 392 452), 2022. All rights reserved.

Save and except for third party content, all content in these materials is owned or licensed by CPA Australia Ltd under forceable agreement.

Other than for the purposes of and subject to the conditions prescribed under the *Copyright Act 1968* (Cth) (or any other applicable legislation throughout the world), or as otherwise provided for in this copyright notice, no part of these materials may in any manner or any medium whether now existing or created in the future, (including but not limited to electronic, mechanical, microcopying, photocopying or recording) be reproduced, adapted, stored in a retrieval system or transmitted without the prior written permission of the copyright owner.

Modification of the materials for any other purpose than provided under this notice is a violation of CPA Australia Ltd's copyright and other proprietary rights. All trademarks, service marks and trade names are proprietary to CPA Australia Ltd. For permission to reproduce any material, a request in writing is to be made to the Legal Business Unit, CPA Australia Ltd, Level 20, 28 Freshwater Place, Southbank, Victoria 3006.

## Disclaimer

CPA Australia Ltd. has used reasonable care and skill in compiling the content of this material. However, CPA Australia Ltd makes no warranty as to the accuracy or completeness of any information in these materials.

The publishers, authors, editors and facilitators are not responsible for the results of any actions on the basis of information in this work, nor for any errors or omissions. None are engaged in rendering legal, accounting or other professional services.

They expressly disclaim all and any liability to any person, whether a purchaser of this publication or not, in respect of anything and the consequences of anything, done or omitted to be done by any such person in reliance, in whole or part, on the contents of this publication. The views expressed in this work are not the official or unanimous view of CPA Australia Ltd.

Further, as laws change frequently, all practitioners, readers, viewers and users are advised to undertake their own research or to seek professional advice to keep abreast of any reforms and developments in the law.

## Limitation of liability

To the extent permitted by applicable law, CPA Australia Ltd, its employees, agents and consultants exclude all liability for any loss or damage claims and expenses including but not limited to legal costs, indirect special or consequential loss or damage (including but not limited to, negligence) arising out of the information in the materials.

Where any law prohibits the exclusion of such liability, CPA Australia Ltd limits its liability to the resupply of the information.

For full terms of use, visit <http://www.cpaaustralia.com.au/utilities/terms>.

First published May 2022

© Commonwealth of Australia 2022

All legislative material herein is reproduced by permission but does not purport to be the official or authorised version/s. It is subject to Commonwealth of Australia copyright. The *Copyright Act 1968* (Cth) permits certain reproduction and publication of Commonwealth legislation and judgements. In particular, section 182A of the Act enables a complete copy to be made on or on behalf of a particular person. For reproduction or publication beyond that permitted by the Act, permission should be sought in writing. Requests should be addressed to Commonwealth Copyright Administration, Attorney-General's Department, Robert Garran Offices, National Circuit, Barton ACT 2600, or posted at <https://www.ag.gov.au/Pages/Copyright.aspx>.

# CONTENTS

---

|                                                      |   |
|------------------------------------------------------|---|
| 1. Establish inventory boundary                      | 1 |
| 2. Identify GHG emissions sources                    | 1 |
| 3. Select a GHG emissions calculation approach       | 2 |
| 4. Collect activity data and choose emission factors | 2 |
| Scope 1                                              | 2 |
| Scope 2                                              | 3 |
| Scope 3                                              | 3 |
| 5. Apply calculation tools                           | 3 |
| 6. Roll-up GHG emissions data to corporate level     | 3 |

This guide is provided to support the MY FIRM. MY FUTURE. eLearning module **Greenhouse Gas Accounting and Net Zero Commitments**. It provides a summary of the key steps to developing a greenhouse gas (GHG) emissions inventory aligned with the Greenhouse Gas Protocol. Listing your business's greenhouse gas emissions can assist you in identifying and reducing your emissions.

For more information, refer to the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol Corporate Standard) and *Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard* (Scope 3 Standard), which are produced by the World Resources Institute and the World Business Council for Sustainable Development.

## 1. ESTABLISH INVENTORY BOUNDARY

Before beginning to compile the inventory, a few decisions must be made about what it will encompass, including:

- **Time period:** The period the emissions inventory will cover, which is usually a full year, and follows the company's financial reporting cycle. A base year should also be identified to compare year-on-year changes.
- **Organisational boundary:** How emissions from an operation are allocated between organisations based on equity share, financial control and operational control. This can determine how things such as joint ventures, leased assets, investments and franchises are categorised in the operational boundaries below.
- **Operational boundary:** Which emissions are considered direct, meaning from sources that are owned or controlled by the company, or indirect, meaning as a consequence of the activities of the company but occurring at sources owned or controlled by another company.
- **Value chain:** Including value chain (Scope 3) emissions in the inventory is optional. However, organisations are increasingly recognising that these represent the largest proportion of their emissions and present the most significant opportunities to influence GHG reductions. The *Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard* provides further information on the benefits of including Scope 3 emissions.

## 2. IDENTIFY GHG EMISSIONS SOURCES

Consider which of the following emissions sources may be relevant to the entity.

### Scope 1 emissions (direct emissions):

- Stationary combustion – boilers, furnaces, burners, turbines, heaters, incinerators, engines, flares
- Mobile combustion – automobiles, trucks, buses, trains, airplanes, boats, ships, tractors, diggers, forklifts, lawnmowers
- Process emissions – physical or chemical processes such as CO<sub>2</sub> from the calcination step in cement manufacturing or catalytic cracking in petrochemical processing
- Fugitive emissions – vapours released from refrigeration and air conditioning units, coal piles, wastewater treatment, pits, cooling towers, gas processing facilities, or leaking joints, seals, packing or gaskets.

### Scope 2 emissions (indirect, energy-related emissions):

- Purchased electricity
- Acquired steam, heat or cooling from other sources.

### Scope 3 emissions (other indirect emissions, if including):

| Upstream emissions                                                                                                                                                                                                                                                                                                                                                                                                                              | Downstream emissions                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Purchased goods and services (including outsourced/contracted manufacturing)</li> <li>• Capital goods</li> <li>• Fuel- and energy-related activities not included in Scope 1 or 2</li> <li>• Upstream transportation and distribution</li> <li>• Waste generated in operations</li> <li>• Business travel</li> <li>• Employees commuting to and from work</li> <li>• Upstream leased assets</li> </ul> | <ul style="list-style-type: none"> <li>• Downstream transportation and distribution</li> <li>• Processing of sold products</li> <li>• Use of sold products</li> <li>• End-of-life treatment of sold products</li> <li>• Downstream leased assets</li> <li>• Franchises</li> <li>• Investments</li> </ul> |

- Refer to Table 5.4 and section 5.5 in the *Scope 3 Standard* for definitions and guidance on each of these categories.
- For each Scope 3 category, determine whether to include emissions based on the following criteria: **size** (anticipated) of contribution to footprint, **influence** over emissions by the reporting organisation, **risk** exposure, **stakeholder** interest, **outsourced** activities, identified in **sector-specific** guidance. Any categories that are excluded based on these criteria should have the justification documented.

### 3. SELECT A GHG EMISSIONS CALCULATION APPROACH

Companies should use the most accurate calculation approach available to them and that is appropriate for their reporting context. These include:

- **Direct measurement:** Monitoring concentration and flow rate (not common)
- **Mass balance or stoichiometric calculation:** Specific to a facility or process (mostly limited to process and fugitive Scope 1 emissions)
- **Application of documented emission factors:** Calculated ratios relating GHG emissions to a proxy measure of activity at an emissions source (most common and relevant for most purposes for SMEs).

### 4. COLLECT ACTIVITY DATA AND CHOOSE EMISSION FACTORS

Identify emission factors available for the sources identified in step 2 above.

#### SCOPE 1

Factors based on purchased quantities of commercial fuels such as natural gas and heating oil are available from public databases and references, including:

- National Greenhouse Accounts (NGA) Factors (Australia)
- Measuring Emissions: Emission Factors Workbook (New Zealand)
- IPCC Emission Factor Database (EFDB)
- United Kingdom Department for Business, Energy and Industrial Strategy (BEIS) Conversion Factors
- United States Environmental Protection Agency GHG Emission Factors Hub.

Factors and other information for process and fugitive emissions are often provided in sector-specific guidance and databases, such as for cement, steel, aluminium, food production and waste. A non-exhaustive list of these databases can be found on the [EFDB website](#).

## SCOPE 2

Factors are usually available for the local grid, including but not limited to the above references, as well as supplier-specific factors based on the specific energy product. Check with your supplier or country-specific guidance.

## SCOPE 3

Companies may use two types of data to calculate Scope 3 emissions:

- **Primary data:** Data provided by suppliers or other value chain partners related to specific activities and measured or calculated emissions.
- **Secondary data:** Industry-average data (e.g. from published databases, government statistics, literature studies, and industry associations), financial data, proxy data, and other generic data.

Primary data is preferable as it is specific to the actual activities and suppliers, but it is common practice to begin with secondary data to gain an overall picture of the Scope 3 inventory, then improve data quality in future iterations by seeking primary data for the largest contributors. Collecting primary data also enables the reporting organisation to track emissions reductions by its value chain partners over time.

Examples of both primary and secondary data and quality indicators are provided in Tables 7.4 and 7.6 in the *Scope 3 Standard*. Information on allocating these emissions based on outputs is also provided in section 8. Sector-specific guidance may also be available for many industries and can be found on the [GHG Protocol website](#).

## 5. APPLY CALCULATION TOOLS

This step is optional, as these calculations can technically be done by hand or with basic spreadsheets. Calculation of GHG emissions is generally done using this equation for each source:

$$\text{GHG emissions} = \text{Activity Data} \times \text{Emission Factor (EF)} \times \text{Global Warming Potential (GWP)}^*$$

\* Often, the GWP is integrated into the emission factor to determine the carbon dioxide equivalent (CO<sub>2</sub>e).

However, there are many tools available that provide step-by-step guidance and electronic worksheets to automate calculations, supporting the user to follow best practice methods.

The GHG Protocol provides a [GHG Emissions Calculation Tool](#) (Scope 1 and 2), [Scope 3 Evaluator](#), and a number of sector-specific and source-specific tools.

## 6. ROLL-UP GHG EMISSIONS DATA TO CORPORATE LEVEL

Finally, the entity will need to summarise the emissions data within each scope (e.g. Scopes 1–3), as well as potentially across multiple operations, divisions and countries. In the latter case, systems should be set up to ensure consistency between facilities and to reduce the risk of errors by multiple individuals collecting and compiling data. Making use of existing internal reporting processes and standardised reporting formats can support this.

*This guide was prepared by Small Mighty CSR on behalf of CPA Australia.*