## Welcome back

29 March 2021



# 01 RE-CAP

Module F: IPPU and AFOLU

### Module E: IPPU and AFOLU





# 02 Workbook

### Practical



### Workbook: Task #4

#### GTALCC GHG Accounting - Participant handbook

| Exercises |                           |  |
|-----------|---------------------------|--|
| Module B  | Calculating GHG emissions |  |
|           | Reviewing an inventory    |  |
| Module C  | Stationary energy         |  |
| Module D  | Transportation            |  |
| Module E  | Waste                     |  |
| Module F  | IPPU and AFOLU            |  |

| Tables  |                      |   |  |
|---------|----------------------|---|--|
| Table 1 | GHG emission sources |   |  |
| Table 2 | Fuel types           |   |  |
| Table 3 | GPC                  | - |  |
| Table 4 | Action plan          |   |  |

|               | Reference |
|---------------|-----------|
| GPC           |           |
| GWP           |           |
| Notation keys |           |
| Checklist     |           |

## GPC minimum requirements

#### Figure 2 Sources and scopes covered by the GPC

| Sectors and sub-sectors   |                           | Scope 1               | Scope 2           | Scope 3               |
|---|---------------------------|-----------------------|-------------------|-----------------------|
| STATIONARY ENERGY   |                           |                       |                   |                       |
| Residential buildings   |                           | 4                     | 4                 | 4                     |
| Commercial and institutional buildings and facilities           |                           | 4                     | 4                 | 4                     |
| Manufacturing industries and construction                       |                           | 4                     | 4                 | 1                     |
| Energy industries   |                           | 4                     | 4                 | 4                     |
| Energy generation supplied to the grid                          |                           | 1                     |                   |                       |
| Agriculture, forestry, and fishing activities                   |                           | 1                     | 4                 | 4                     |
| Non-specified sources   |                           | 4                     | 4                 | 4                     |
| Fugitive emissions from mining, processing, storage, ar         | nd transportation of coal | 1                     |                   |                       |
| Fugitive emissions from oil and natural gas systems             |                           | 1                     |                   |                       |
| TRANSPORTATION  |                           |                       |                   |                       |
| On-road   |                           | 4                     | 4                 | 4                     |
| Railways  |                           | 1                     | 4                 | 4                     |
| Waterborne navigation   |                           | 1                     | 4                 | 4                     |
| Aviation  |                           | 1                     | 1 - A             | 1                     |
| Off-road  |                           | 1                     | 1                 |                       |
| WASTE   |                           |                       |                   |                       |
| Disposal of solid waste generated in the city                   |                           | 1 - A                 |                   | 1                     |
| Disposal of solid waste generated outside the city              |                           | 1                     |                   |                       |
| Biological treatment of waste generated in the city             |                           | 1                     |                   | 1                     |
| Biological treatment of waste generated outside the o           | ťγ                        | 4                     |                   |                       |
| Incineration and open burning of waste generated in the         | ne city                   | 1 - A                 |                   | 1                     |
| Incineration and open burning of waste generated out            | tside the city            | 4                     |                   |                       |
| Wastewater generated in the city                                |                           | 1 - A                 |                   | 1                     |
| Wastewater generated outside the city                           |                           | 4                     |                   |                       |
| INDUSTRIAL PROCESSES AND PRODUCT U                              | SE (IPPU)                 |                       |                   |                       |
| Industrial processes  |                           | 4                     |                   |                       |
| Product use   |                           | 1                     |                   |                       |
| AGRICULTURE, FORESTRY AND OTHER LAN                             | ND USE (AFOLU)            |                       |                   |                       |
| Livestock   |                           | 1                     |                   |                       |
| Land  |                           | 1                     |                   |                       |
| Aggregate sources and non-CO <sub>2</sub> emission sources on I | and                       | 4                     |                   |                       |
| OTHER SCOPE 3   |                           |                       |                   |                       |
| Other Scope 3   |                           |                       |                   |                       |
| <ul> <li>Sources covered by the GPC</li> </ul>                  | Sources required for BA   | SIC reporting         |                   |                       |
| + Sources required for BASIC+ reporting                         | Sources required for ter  | ritorial total but no | t for BASIC/BASIC | + reporting (italics) |
| Sources included in Other Scope 3                               | Non-applicable emission   | ns                    |                   | and a second free     |

## Congratulations



# 03 Module G

CIRIS





## Module G CIRIS

01 Overview

### Overview

Excel-based reporting template and calculators

Captures all required data for a GPC and CRF compliant inventory

Available via CDP and on https://resourcecentre.c40.org CIRIS is:

- Accessible
- Easy to use
- Flexible
- Transparent
- Able to combine reporting and analytics



### Overview

#### User guide

| C4O<br>CITIES   |                                  |
|---|----------------------------------|
|   |                                  |
| Licor Guido   |                                  |
| A user guide for the City Inventory Ropo<br>Information System (CIRS): an Excel-bas<br>managing and reporting city greenhous<br>inventory data. | ring and<br>de tool for<br>r gas |
| VERIOR 1.2  |                                  |

#### Video tutorials



Resources

O1 Introducing the City Inventory Reporting and Information System (CIRIS)

Video tutorials

#### More

- II 01 Introducing the City Inventory Reporting and Information System (CIRIS)
- ▶ 02 City Inventory Reporting and Information System (CIRIS): User Guide
- ▶ 03 City Inventory Reporting and Information System (CIRIS): Compatible with the GPC
- O4 City Inventory Reporting and Information System (CIRIS): The use of notation keys

https://resourcecentre.c40.org/resources/reporting-ghg-emissions-inventories



01 Introducing the City Inventory Reporting and Information System (CIRIS)02 City Inventory Reporting and Information System (CIRIS): User Guide















## Module G CIRIS

03 Using CIRIS



| Introduction     | Set-up       | Inventory        | Calculators           | Results | Notes |
|------------------|--------------|------------------|-----------------------|---------|-------|
| City information | Data sources | Emission factors | IPPU Emission factors |         |       |

#### A. INVENTORY BOUNDARY (GPC CHAPTER 4.4, TABLE 4.1, PAGE 40)

| Boundary   | Information                                   | Reference(s)   |
|--|---|--|
| Name of city   | Autonomous City of Buenos Aires               |  |
| Country  | Argentina                                     |  |
| Region   | Latin America                                 |  |
| Inventory year (select from list)                        | 2013  | Calendar year: 1st of January 2013 to 31st of December 2013.   |
| Geographic boundary (select from list)                   | Administrative boundary of a local government | http://www.buenosaires.gob.ar/agenciaambiental/cambioclimatico/english-information-available-<br>here/ghgs-emission-report   |
| Heating degree days (HDD, °C)*                           |   |  |
| Cooling degree days (CDD, °C)*                           |   |  |
| Land area (km2) within city boundary                     | 202.04  | Source: General direction of legislative documentation (CEDOM)<br>http://www.cedom.gov.ar/es/ciudad/barrios/ciudad/ciudad.html   |
| Resident population within city boundary*                | 3079071                                       | Year 2013 projection by the Treasury Secretariat of Buenos Aires City Governement.<br>www.buenosaires.gob.ar/areas/hacienda/sis_estadistico/ir_2013_580.pdf  |
| GDP (US\$) of economic activity within city<br>boundary* | 79384000000                                   | Source: Treasury Secretariat converted to US Dollar based on exchange currency price in january 2014 = \$6,52 (National Bank).   |
| Type of economy (select from list)                       | Services                                      | Source: Treasury Secretariat - Statistics and Census General Direction (Anual report 2013)   |
| Climate (select from list)                               | Temperate, hot summer                         | http://people.eng.unimelb.edu.au/mpeel/koppen.html   |
| Other information  | 3,389,350 commuters                           | The City doubles its population daily because of the more than 3 million people that enter the City<br>for work, study and administrative process. Source: Estudio de Cohesión Social en la Región |

## Standard vs. Light

| GPC rof h | 10 500    |   | GHG Emissions Source                        |  | Notation         | Activity data              |                        |
|-----------|-----------|---|---|--|------------------|----------------------------|------------------------|
| Greierr   |           | Sub-category                                  | Activity                                    | Description                            | keys             | Amount Unit                | E                      |
| I.1.1     | 1         | Emissions from fuel combustion within the c   | tity boundary                               |  |                  |                            |                        |
| d Add     | 2         | Emissions from grid-supplied energy consum    | ned within the city boundary                |  |                  |                            | Standard – select only |
| d 1       | 3         | Transmission and distribution losses from gri | id-supplied energy                          |  | NE               |                            |                        |
| 2         |           |   |   |  |                  |                            | the number of rows you |
| 3         | ERCIAL AN | D INSTITUTIONAL BUILDINGS AND FACILITIE       | S (please use the sub-category column to re | eport emissions from commercial and in | stitutional use. | separately where possible) |                        |
| 4         |           |   |   |  |                  |                            | nood par sub catagory  |
| 5         |           |   | GHG Emissions Source                        |  | Notation         | Activity data              | need per sub-category. |
| 6         | p. 500    | Sub-category                                  | Activity                                    | Description                            | keys             | Amount Unit                |                        |
| 17        | 1         | Emissions from fuel combustion within the c   | ity boundary                                |  |                  |                            |                        |
|           |           |   |   |  |                  |                            |                        |
| 8         | 2         | Emissions from grid-supplied energy consum    | ned within the city boundary                |  |                  |                            |                        |

I.2 COMMERCIAL AND INSTITUTIONAL BUILDINGS AND FACILITIES (please use the sub-category column to report emissions from commercial and institutional use, separately where possible)

|                                  | 600(N)-     | 6     |  | GHG Emissions Source         |             | Notation | Activi | ty data       | Act     |
|----------------------------------|-------------|-------|--|------------------------------|-------------|----------|--------|---------------|---------|
|                                  | GPC ret No. | scope | Sub-category                               | Activity                     | Description | keys     | Amount | Unit          | EF unit |
|                                  | 1.2.1       | 1     | Emissions from fuel combustion within the  | ity boundary                 |             |          |        |               |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
| light = 20 rows                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
| LIGHT ZOTOWS                     | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
| and the difference of the second | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
| provided for each                | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
| sub-category                     | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
| sub category                     | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.1       | 1     | Please select                              | Please select                |             |          |        | Please select |         |
|                                  | 1.2.2       | 2     | Emissions from grid-supplied energy consum | ned within the city boundary |             |          |        |               |         |
|                                  | 122         | -     | Diance coloret                             | Disso calast                 | 1           |          |        | - · · ·       |         |

| Introduction     | Set-up       | Inventory        | Calculators           | Results | Notes |
|------------------|--------------|------------------|-----------------------|---------|-------|
| City information | Data sources | Emission factors | IPPU Emission factors |         |       |

#### DATA SOURCES (GPC CHAPTER 5.4, PAGE 48)

|   | Data  | Name of source   | Provider                             | Latest year | Period        | Frequency            | Scale                      |
|---|---|--|--------------------------------------|-------------|---------------|----------------------|----------------------------|
| 5 | EXAMPLE: Emission factors   | National emissions factor database   | Ministry of the Environment          | 2014        | Calendar year | Annual               | National                   |
| I | Natural gas stationary consumption  | Natural gas operational data - Distribution; ENARGAS                             | ENARGAS                              | 2015        | Calendar year | Other<br>(monthly)   | Local                      |
| 1 | Grid-supplied electricity stationary and<br>transport consumption of the City | Commercialization Division (Edenor S.A) and Environment<br>Division (Edesur S.A) | Edenor S.A. and Edesur S.A.          | 2015        | Calendar year | As required          | Local                      |
| 1 | Fuel consumptions transport and<br>manufacturing industries                   | Transport fuels sales; Secretariat of Energy                                     | Secretariat of Energy                | 2015        | Calendar year | Other<br>(monthly)   | Local                      |
| I | Fuels consumption power plants  | Monthly report - MEM - Detailed report; CAMMESA                                  | CAMMESA                              | 2015        | Calendar year | Other<br>(monthly)   | Other (by<br>energy plant) |
|   | Fuel consumptions municipal fleet   | General Director of DGMFMH   | DGMFMH                               | 2014        | Calendar year | As required          | Local                      |
| I | Fuel consumption of railways  | Statistics area, National Comission of Transport Regulation (CNRT)               | CNRT                                 | 2015        | Calendar year | As required          | Regional                   |
| : | Solid waste landfilled, and gases recovered for<br>energy or flared           | Statistics area, CEAMSE  | CEAMSE                               | 2015        | Calendar year | Other<br>(semestral) | Local                      |
| 1 | Wastewater treated  | AYSA   | Statistics area                      | 2013        | Calendar year | Annual               | Regional                   |
|   | Transmission and distribution losses  | Edenor S.A, Edesur S.A & CAMMESA Annual reports                                  | Edenor S.A, Edesur S.A & CAMMESA     | 2014        | Calendar year | Annual               | National                   |
| ( | CNG sold for transportation in the City                                       | Anual statistic report; Treasury Secretariat - GCBA                              | Treasury Secretariat - GCBA          | 2014        | Calendar year | Annual               | Local                      |
| I | Fuels emission factors  | 2006 IPCC Guidelines for National Greenhouse Gas Inventories                     | IPCC                                 | 2015        | Calendar year | Valid since<br>2006  | International              |
| ( | Grid emission factor  | CAMMESA Annual Report, SE grid EF calculator, APrA own<br>calculations           | CAMMESA, Secretaría de Energía, APrA | 2013        | Calendar year | Annual               | National                   |

| Introduction     | Set-up       | Inventory        | Calculators           | Results | Notes |
|------------------|--------------|------------------|-----------------------|---------|-------|
| City information | Data sources | Emission factors | IPPU Emission factors |         |       |

#### DATA SOURCES (GPC CHAPTER 5.4, PAGE 48)

| Data  | Name of source   | Provider                             | Latest year | Period        | Frequency            | Sca            |
|---|--|--------------------------------------|-------------|---------------|----------------------|----------------|
| EXAMPLE: Emission factors   | National emissions justes database                                     | Ministry of the Environment          | 2014        | Calendar year | Annual               | Natio          |
| Natural gas stationary consumption  | Natural gas operational data - Distribution: ENARGAS                   | ENARGAS                              | 2015        | Calendar year | Other<br>(monthly)   | Loc            |
| Grid-supplied electricity stationary and<br>transport consumption of the City | Con Name of source used for<br>Division (Edesur SA)                    | Edenor S.A. and Edesur S.A.          | 2015        | Calendar year | As required          | Loc            |
| Fuel consumptions transport and<br>manufacturing industries                   | Grop-Gown list<br>Transport fuels sales, Secretariat of Energy         | Secretariat of Energy                | 2015        | Calendar year | Other<br>(monthly)   | Loo            |
| Fuels consumption power plants  | Monthly report - MEM - Detailed report; CAMMESA                        | CAMMESA                              | 2015        | Calendar year | Other<br>(monthly)   | Othe<br>energy |
| Fuel consumptions municipal fleet   | General Director of DGMFMH   | DGMFMH                               | 2014        | Calendar year | As required          | Loc            |
| Fuel consumption of railways  | Statistics area, National Comission of Transport Regulation (CNRT)     | CNRT                                 | 2015        | Calendar year | As required          | Regi           |
| Solid waste landfilled, and gases recovered for<br>energy or flared           | Statistics area, CEAMSE  | CEAMSE                               | 2015        | Calendar year | Other<br>(semestral) | Loo            |
| Wastewater treated  | AYSA   | Statistics area                      | 2013        | Calendar year | Annual               | Regi           |
| Transmission and distribution losses  | Edenor S.A, Edesur S.A & CAMMESA Annual reports                        | Edenor S.A, Edesur S.A & CAMMESA     | 2014        | Calendar year | Annual               | Natio          |
| CNG sold for transportation in the City                                       | Anual statistic report; Treasury Secretariat - GCBA                    | Treasury Secretariat - GCBA          | 2014        | Calendar year | Annual               | Lo             |
| Fuels emission factors  | 2006 IPCC Guidelines for National Greenhouse Gas Inventories           | IPCC                                 | 2015        | Calendar year | Valid since<br>2006  | Interna        |
| Grid emission factor  | CAMMESA Annual Report, SE grid EF calculator, APrA own<br>calculations | CAMMESA, Secretaría de Energía, APrA | 2013        | Calendar year | Annual               | Nati           |

| Introduction     | Set-up       | Inventory        | Calculators              | Results | Notes |
|------------------|--------------|------------------|--------------------------|---------|-------|
| City information | Data sources | Emission factors | IPPU Emission<br>factors |         |       |

#### **EMISSION FACTORS**

|    | Fuel turne ex estivitu   | Unique identifier                                  | Turne | CIMID | Unite    |         |        | Emission factor  |                         |                     | Data quality | Vear |
|----|--|--|-------|-------|----------|---------|--------|------------------|-------------------------|---------------------|--------------|------|
|    | Fuel type or activity  | Unique identifier                                  | туре  | GWP   | Units    | CO2     | CH₄    | N <sub>2</sub> O | Total CO <sub>2</sub> e | CO <sub>2</sub> (b) | Data quality | rear |
| 25 | EXAMPLE: Natural gas   | EF_Natural gas                                     | CO2e  | 5AR   | kg / kWh | 0.4822  | 0.003  | 0.0029           | 0.4881                  | 0.09644             | Н            | 2014 |
|    | Electricity  | EF_grid  | GHG   | 4AR   | t / MWh  | 0.3316  | 0.0000 | 0.0000           |                         | 0                   | м            | 2013 |
|    | Gas (natural gas)  | EF_natural gas                                     | GHG   | 4AR   | t / TJ   | 56.1000 | 0.0010 | 0.0001           |                         | 0                   | L            | 2006 |
|    | Diesel Oil - Stationary<br>combustion                                      | EF_diesel oil - stationary<br>combustion           | GHG   | 4AR   | t / TJ   | 74.1000 | 0.0030 | 0.0006           |                         | 0                   | L            | 2006 |
|    | LPG - stationary combustion  | EF_LPG - stationary<br>combustion                  | GHG   | 4AR   | t / TJ   | 63.1000 | 0.0010 | 0.0001           |                         | 0                   | L            | 2006 |
|    | Kerosene - stationary<br>combustion  | EF_kerosene - stationary<br>combustion             | GHG   | 4AR   | t/TJ     | 71.5000 | 0.0030 | 0.0006           |                         | 0                   | L            | 2006 |
|    | Charcoal   | EF_charcoal - stationary<br>combustion             | GHG   | 4AR   | t/TJ     | 0.0000  | 0.2000 | 0.0040           |                         | 112                 | L            | 2006 |
|    | Wood   | EF_wood - stationary<br>combustion                 | GHG   | 4AR   | t/TJ     | 0.0000  | 0.0300 | 0.0040           |                         | 112                 | L            | 2006 |
|    | Diesel Oil - Mobile combustion<br>(exc. trains)                            | EF_diesel oil - mobile<br>combustion (exc. Trains) | GHG   | 4AR   | t / TJ   | 74.1000 | 0.0039 | 0.0039           |                         | 0                   | L            | 2006 |
|    | Diesel Oil - Trains combustion   | EF_diesel oil - Trains<br>combustion               | GHG   | 4AR   | t / TJ   | 74.1000 | 0.0042 | 0.0029           |                         | 0                   | L            | 2006 |
|    | Electricity generation within<br>Buenos Aires city supplied to<br>the grid | EF_electricity generation<br>Buenos Aires city     | GHG   | 4AR   | t / MWh  | 0.5520  | 0.0000 | 0.0000           |                         | 0                   | н            | 2013 |
|    | Motor gasoline (petrol)  | EF_Motor gasoline (petrol)                         | GHG   | 4AR   | t/TJ     | 69.3000 | 0.0025 | 0.0008           |                         | 0                   | L            | 2006 |
|    | Gas distribution   | EF_NG_distribution                                 | GHG   | 4AR   | t / m3   | 0.0000  | 0.0000 | NA               |                         | 0                   | L            | 2006 |
|    | Compressed Natural Gas   | EF_CNG   | GHG   | 4AR   | t / TJ   | 56.1000 | 0.0920 | 0.0030           |                         | 0                   | L            | 2006 |
|    | Fuel Oil   | EF_FO  | GHG   | 4AR   | t / TJ   | 77.4000 | 0.0030 | 0.0006           |                         | 0                   | L            | 2006 |
|    | Biodiesel  | EF_biodiesel                                       | GHG   | 4AR   | t/TJ     | 0.0000  | 0.0039 | 0.0039           |                         | 74.1                | L            | 2006 |
|    |  |  |       |       |          |         |        |                  |                         |                     |              |      |

| רופול  | Introduction                                       | Set-u   | ip    | Invent   | ory     | Calcula | itors            | Resul                   | lts                 | Note         | s    |
|--|--|---------|-------|----------|---------|---------|------------------|-------------------------|---------------------|--------------|------|
|  | City information                                   | Data so | urces | Emission | factors | facto   | ors              |                         |                     |              |      |
| EMISSION FACTORS   |  |         |       |          |         |         |                  |                         |                     |              |      |
|  |  |         |       |          |         |         | Emission facto   |                         |                     |              |      |
| Fuel type or activity  | Unique identifier                                  | Туре    | GWP   | Units    | CO,     | СН      | N <sub>2</sub> O | Total CO <sub>2</sub> e | CO <sub>2</sub> (b) | Data quality | Year |
| EXAIVIF LL. Natural gas  | EF_Naturar gas                                     | CO2e    | 5AR   | kg / kWh | 0.4822  | 0.003   | 0.0029           | 0.4881                  | 0.09644             | Н            | 2014 |
| Electricity  | EF_grid  | GHG     | 4AR   | t / MWh  | 0.3316  | 0.0000  | 0.0000           |                         | 0                   | м            | 2013 |
| Gas (natural gas)  | EF_natural gas                                     | GHG     | 4AR   | t/TJ     | 56.1000 | 0.0010  | 0.0001           |                         | 0                   | L            | 2006 |
| 1. Define em   | ission factor                                      | GHG     | 4AR   | t / TJ   | 74.1000 | 0.0030  | 0.0006           |                         | 0                   | L            | 2006 |
|  | reference  | GHG     | 4AR   | t / TJ   | 63.1000 | 0.0010  | 0.0001           |                         | 0                   | L            | 2006 |
| Kerosene - stationary<br>combustion  | EF_kerosene - stationary<br>combustion             | GHG     | 4AR   | t/TJ     | 71.5000 | 0.0030  | 0.0006           |                         | 0                   | L            | 2006 |
| Charcoal   | EF_charcoal - stationary<br>combustion             | GHG     | 4AR   | t/TJ     | 0.0000  | 0.2000  | 0.0040           |                         | 112                 | L            | 2006 |
| Wood   | EF_wood - stationary<br>combustion                 | GHG     | 4AR   | t / TJ   | 0.0000  | 0.0300  | 0.0040           |                         | 112                 | L            | 2006 |
| Diesel Oil - Mobile combustion<br>(exc. trains)                            | EF_diesel oil - mobile<br>combustion (exc. Trains) | GHG     | 4AR   | t/TJ     | 74.1000 | 0.0039  | 0.0039           |                         | 0                   | L            | 2006 |
| Diesel Oil - Trains combustion   | EF_diesel oil - Trains<br>combustion               | GHG     | 4AR   | t/TJ     | 74.1000 | 0.0042  | 0.0029           |                         | 0                   | L            | 2006 |
| Electricity generation within<br>Buenos Aires city supplied to<br>the grid | EF_electricity generation<br>Buenos Aires city     | GHG     | 4AR   | t / MWh  | 0.5520  | 0.0000  | 0.0000           |                         | 0                   | н            | 2013 |
| Motor gasoline (petrol)  | EF_Motor gasoline (petrol)                         | GHG     | 4AR   | t / TJ   | 69.3000 | 0.0025  | 0.0008           |                         | 0                   | L            | 2006 |
| Gas distribution   | EF_NG_distribution                                 | GHG     | 4AR   | t / m3   | 0.0000  | 0.0000  | NA               |                         | 0                   | L            | 2006 |
| Compressed Natural Gas   | EF_CNG   | GHG     | 4AR   | t / TJ   | 56.1000 | 0.0920  | 0.0030           |                         | 0                   | L            | 2006 |
| Fuel Oil   | EF_FO  | GHG     | 4AR   | t / TJ   | 77.4000 | 0.0030  | 0.0006           |                         | 0                   | L            | 2006 |
| Rigdiagal  | EE biodiesel                                       | GHG     | 448   | + / TI   | 0.0000  | 0.0030  | 0.0030           |                         | 74.1                | 1            | 2004 |

| Introduction     | Set-up       | Inventory        | Calculators              | Results | Notes |
|------------------|--------------|------------------|--------------------------|---------|-------|
| City information | Data sources | Emission factors | IPPU Emission<br>factors |         |       |

**EMISSION FACTORS** 

|  |  |       |         |          |         |        | Paulasian fasta  |        |         |   |      |
|--|--|-------|---------|----------|---------|--------|------------------|--------|---------|---|------|
|  | Unique identifier                                  | Туре  | GWP     | Units    | CO,     |        | N <sub>2</sub> O |        |         |   |      |
| EXAMPLE: Natural gas   | EF_Natural gas                                     | 020   | 5AR     | ka / swh | 0.4822  | 0.003  | 0.0029           | 0.4881 | 0.09644 | Н | 2014 |
| Electricity  | EF_grid  | GHG   | 4AR     | t / MWh  | 0.3316  | 0.0000 | 0.0000           |        | 0       | М | 2013 |
| Gas (natural gas)  | EF_natural gas                                     | GHG   | 4AR     | t / TJ   | 56.1000 | 0.0010 | 0.0001           |        | 0       | L | 2006 |
| Diesel Oil - Stationary<br>combustion                                      | EF_diesel oil - stationary<br>combustion           | °2. S | elect t | ype,™    | 74.1000 | 0.0030 | 0.0006           |        | 0       | L | 2006 |
| LPG - stationary combustion  | EF_LPG - stationary<br>combustion                  | GW    | P and u | units    | 63.1000 | 0.0010 | 0.0001           |        | 0       | L | 2006 |
| Kerosene - stationary<br>combustion  | EF_kerosene - stationary<br>combustion             | GHG   | 4AR     | t / TJ   | 71.5000 | 0.0030 | 0.0006           |        | 0       | L | 2006 |
| Charcoal   | EF_charcoal - stationary<br>combustion             | GHG   | 4AR     | t / TJ   | 0.0000  | 0.2000 | 0.0040           |        | 112     | L | 2006 |
| Wood   | EF_wood - stationary<br>combustion                 | GHG   | 4AR     | t / TJ   | 0.0000  | 0.0300 | 0.0040           |        | 112     | L | 2006 |
| Diesel Oil - Mobile combustion<br>(exc. trains)                            | EF_diesel oil - mobile<br>combustion (exc. Trains) | GHG   | 4AR     | t / TJ   | 74.1000 | 0.0039 | 0.0039           |        | 0       | L | 2006 |
| Diesel Oil - Trains combustion   | EF_diesel oil - Trains<br>combustion               | GHG   | 4AR     | t / TJ   | 74.1000 | 0.0042 | 0.0029           |        | 0       | L | 2006 |
| Electricity generation within<br>Buenos Aires city supplied to<br>the grid | EF_electricity generation<br>Buenos Aires city     | GHG   | 4AR     | t / MWh  | 0.5520  | 0.0000 | 0.0000           |        | 0       | н | 2013 |
| Motor gasoline (petrol)  | EF_Motor gasoline (petrol)                         | GHG   | 4AR     | t/TJ     | 69.3000 | 0.0025 | 0.0008           |        | 0       | L | 2006 |
| Gas distribution   | EF_NG_distribution                                 | GHG   | 4AR     | t / m3   | 0.0000  | 0.0000 | NA               |        | 0       | L | 2006 |
| Compressed Natural Gas   | EF_CNG   | GHG   | 4AR     | t / TJ   | 56.1000 | 0.0920 | 0.0030           |        | 0       | L | 2006 |
| Fuel Oil   | EF_FO  | GHG   | 4AR     | t / TJ   | 77.4000 | 0.0030 | 0.0006           |        | 0       | L | 2006 |
| Biodiesel  | EF_biodiesel                                       | GHG   | 4AR     | t / TJ   | 0.0000  | 0.0039 | 0.0039           |        | 74.1    | L | 2006 |
|  |  |       |         |          |         |        |                  |        |         |   |      |

|            | CIRIS  | Introduction                                       | Set-u    | p     | Invent   | tory         | Calcula<br>IPPU Emi | ators            | Resu                    | lts                 | Note         | s    |
|------------|--|--|----------|-------|----------|--------------|---------------------|------------------|-------------------------|---------------------|--------------|------|
|            |  | city mormation                                     | Data sol | urces | Emission | Tactors      | facto               | ors              |                         |                     |              |      |
|            | EMISSION FACTORS   |  |          |       |          |              |                     |                  |                         |                     |              |      |
|            |  |  |          |       |          |              |                     | Emission facto   |                         |                     |              |      |
|            |  |  |          | GWP   | Units    | CO2          | Сң                  | N <sub>2</sub> O | Total CO <sub>2</sub> e | CO <sub>2</sub> (b) | b ta quality |      |
| <b>2</b> 5 | EXAMPLE: Natural gas   | EF_Natural gas                                     | CO2e     | 5AR   | Ng / WWh | 0.4822       | 0.003               | 0.0029           | 0.4881                  | 0.0954              | Н            | 2014 |
|            | Electricity  | EF_grid  | GHG      | 4AR   | t / MWh  | 0.3316       | 0.0000              | 0.0000           |                         | 0                   | M            | 2013 |
|            | Gas (natural gas)  | EF_natural gas                                     | GHG      | 4AR   | t / TJ   | 56.1000      | 0.0010              | 0.0001           |                         | 0                   | L            | 2006 |
|            | Diesel Oil - Stationary<br>combustion                                      | EF_diesel oil - stationary<br>combustion           | GHG      | 4AR   | t / T.   | 74.1000      | 0.0030              | 0.0006           |                         | 0                   | L            | 2006 |
|            | LPG - stationary combustion  | EF_LPG - stationary<br>combustion                  | GHG      | 4AR   | t / T.   | <b>3. De</b> | etine en            | nission          | factors                 | 0                   | L            | 2006 |
|            | Kerosene - stationary<br>combustion  | EF_kerosene - stationary<br>combustion             | GHG      | 4AR   | t / T.   | (note 1      | tool cor            | iverts 1         | to tCO2                 | e) <sub>。</sub>     | L            | 2006 |
|            | Charcoal   | EF_charcoal - stationary<br>combustion             | GHG      | 4AR   | t / TJ   | 0.0000       | 0.2000              | 0.0040           |                         | 112                 | L            | 2006 |
|            | Wood   | EF_wood - stationary<br>combustion                 | GHG      | 4AR   | t / TJ   | 0.0000       | 0.0300              | 0.0040           |                         | 112                 | L            | 2006 |
|            | Diesel Oil - Mobile combustion<br>(exc. trains)                            | EF_diesel oil - mobile<br>combustion (exc. Trains) | GHG      | 4AR   | t / TJ   | 74.1000      | 0.0039              | 0.0039           |                         | 0                   | L            | 2006 |
|            | Diesel Oil - Trains combustion   | EF_diesel oil - Trains<br>combustion               | GHG      | 4AR   | t / TJ   | 74.1000      | 0.0042              | 0.0029           |                         | 0                   | L            | 2006 |
|            | Electricity generation within<br>Buenos Aires city supplied to<br>the grid | EF_electricity generation<br>Buenos Aires city     | GHG      | 4AR   | t / MWh  | 0.5520       | 0.0000              | 0.0000           |                         | 0                   | н            | 2013 |
|            | Motor gasoline (petrol)  | EF_Motor gasoline (petrol)                         | GHG      | 4AR   | t / TJ   | 69.3000      | 0.0025              | 0.0008           |                         | 0                   | L            | 2006 |
|            | Gas distribution   | EF_NG_distribution                                 | GHG      | 4AR   | t / m3   | 0.0000       | 0.0000              | NA               |                         | 0                   | L            | 2006 |
|            | Compressed Natural Gas   | EF_CNG   | GHG      | 4AR   | t / TJ   | 56.1000      | 0.0920              | 0.0030           |                         | 0                   | L            | 2006 |
|            | Fuel Oil   | EF_FO  | GHG      | 4AR   | t / TJ   | 77.4000      | 0.0030              | 0.0006           |                         | 0                   | L            | 2006 |
|            | Biodiesel  | EF_biodiesel                                       | GHG      | 4AR   | t / TJ   | 0.0000       | 0.0039              | 0.0039           |                         | 74.1                | L            | 2006 |
|            |  |  |          |       |          |              |                     | 1                |                         | 1                   |              |      |

| Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|--------------|----------------|-----------|-------------|---------|---------|
| Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

|   | I STATIONA    | RY ENERGY   | (GPC CHAPTER 6, F      | PAGE 54)                           |   |          |           |            |         |                  |          |               |  |                            |                  |
|---|---------------|-------------|------------------------|------------------------------------|---|----------|-----------|------------|---------|------------------|----------|---------------|--|----------------------------|------------------|
|   | I.1 RESIDENTI | AL BUILDING | S                      |                                    |   |          | Enter act | ivity data | l i     |                  |          |               | Select an emission factor                    |                            |                  |
|   | 000(1)        |             |                        | GHG                                | Emissions Source  | Notation | Activit   | ty data    | Activit | ty data unit cor | nverter  | Carles        | Emission foster                              |                            |                  |
|   | GPC ref No.   | Scope       | Sub-category           | Activity                           | Description   | keys     | Amount    | Unit       | EF unit | Default          | Override | Gas(es)       | Emission factor                              | Units                      | CO2              |
| 3 | 1.1.1         | 1           | Emissions from fuel co | mbustion within the cit            | y boundary  |          |           |            |         |                  |          |               |  | _                          |                  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Gas (natural gas)                  | Natural gas consumption by residential users reported by<br>the national body for gas regulation  |          | 42232     | τJ         |         |                  |          | CO2, CH4, N2O | EF_natural gas                               | tCO2e/TJ                   | 56.1             |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users  |          | 369       | τJ         |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary                          |                            |                  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Kerosene                           | Kerosene consumption by residential users   |          | 54        | GJ         | υT      | 1.00E-03         |          | CO2, CH4, N2O | Please select<br>EF_grid<br>EF_natural gas   |                            |                  |
| 1 | 1.1.2         | 2           | Emissions from grid-su | pplied energy consume              | d within the city boundary  |          |           |            |         |                  |          |               | EF_diesel oil - statio                       | nary combu                 | stion            |
|   | 1.1.2         | 2           | Residential (1.A.4.b)  | Electricity                        | Electricity consumption by residential users in a year period   |          | 4376246   | MWh        |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary<br>EF_kerosene - statio  | compustion<br>onary combu  | ustion           |
| 1 | 1.1.3         | 3           | Transmission and distr | ibution losses from grid           | -supplied energy  |          |           |            |         |                  |          |               | EF_charcoal - statio                         | nary combu                 | stion            |
|   | 1.1.3         | 3           | Residential (1.A.4.b)  | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |          | 646,504   | MWh        |         |                  |          | CO2, CH4, N2O | EF_wood - stationar<br>EF_diesel oil - mobil | y combustio<br>e combustic | on<br>on (exc. T |

#### Enter emissions data

| Feelenland data |                 | GHGs | (metric tonnes   | CO <sub>2</sub> e)       |                     |         | GHGs | (metric tonne    | s CO <sub>z</sub> e)     |                     | Data Quality  | Description of method(s) used or explanation for using  |                        | 6   |
|-----------------|-----------------|------|------------------|--------------------------|---------------------|---------|------|------------------|--------------------------|---------------------|---------------|---|------------------------|---|
| Emissions data  | CO <sub>2</sub> | CH4  | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | CO2     | СҢ   | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | AD            | notation key(s)   |                        | Source  |
|                 |                 |      |                  |                          |                     |         |      |                  |                          |                     |               |   |                        |   |
|                 |                 |      |                  |                          |                     | 2369215 | 1056 | 1259             | 2371529                  | 0                   | н             | Natural gas billed to residential sector (m3) multiplied by: NG<br>density (t/m3, national data), NCV (TI/t, IPCC 2006) and NG<br>emission factors (t_GHG/TI, IPCC 2006)  | Natural gas            | s operational data - Distribution; ENARGAS  |
|                 |                 |      |                  |                          |                     | 23254   | 9    | 11               | 23274                    | 0                   | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Please select<br>Natural gas operational data   |
|                 |                 |      |                  |                          |                     | 4       | 0    | 0                | 4                        | 0                   | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Commercialization Division (E<br>Transport fuels sales; Secret<br>Monthly report - MEM - Deta<br>General Director of DGMEME |
|                 |                 |      |                  |                          |                     |         |      |                  |                          |                     |               |   |                        | Statistics area. National Com   |
|                 |                 |      |                  |                          |                     | 1451380 | 891  | 1926             | 1454197                  | 0                   | Please select | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year  | Commercia<br>Environme | Statistics area, CEAMSE   |
|                 |                 |      |                  |                          |                     |         |      |                  |                          |                     |               | I.1.3 has not been estimated; not required for BASIC  |                        | AYSA  |
| /               |                 |      |                  | 214,829                  |                     | -       | -    | -                | 214829                   | -                   | Please select | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity and multiplied by national emission factor            | Edenor S.A             | Edenor S.A, Edesur S.A & CA<br>Anual statistic report; Treasu   |

| Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|--------------|----------------|-----------|-------------|---------|---------|
| Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

|   | I STATIONA    |              | (GPC CHAPTER 6, I             | PAGE 54)                  |   |          |           |             |         |                  |          |               |  |                            |                  |
|---|---------------|--------------|-------------------------------|---------------------------|---|----------|-----------|-------------|---------|------------------|----------|---------------|--|----------------------------|------------------|
|   | I.1 RESIDENTI | IAL BUILDING | S                             |                           |   |          | Enter act | tivity data | 1       |                  |          |               | Select an emission factor                    |                            |                  |
|   |               | -            |                               | GH                        | G Emissions Source  | Notation | Activi    | ty data     | Activi  | ty data unit cor | verter   | Curles)       | Endedan faster                               |                            |                  |
|   | GPC ret No.   | Scope        | Sub-category                  | Activity                  | Description   |          |           |             | EF unit | Default          | Override |               |  |                            | CO2              |
| 3 | 1.1.1         | 1            | Emissions from fuel co        | mbustion within the cit   | ty boundary   |          |           |             |         |                  |          |               |  |                            |                  |
|   | 1.1.1         | 1            | Residential (111.4.b)         | Gas (natural gas)         | Natural ges consumption by residential users reported by<br>the national body for gas regulation  |          | 42232     | TJ          |         |                  |          | CO2, CH4, N2O | EF_natural gas                               | tCO2e/TJ                   | 56.1             |
|   | 1.1.1         | 1            | Fesidential (LA.4.b)<br>1. Se | lect fue                  | LPG consumption by residential users  |          | 369       | TJ          |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary                          |                            |                  |
|   | 1.1.1         | 1            | Residential (1.A.4.b)         | Kerosene                  | Kerosene consumption by residential users   |          | 54        | GJ          | TJ      | 1.00E-03         |          | CO2, CH4, N2O | EF_grid<br>EF_natural gas                    |                            |                  |
| 1 | 1.1.2         | 2            | Emissions from grid-su        | upplied energy consume    | d within the city boundary  |          |           |             |         |                  |          |               | EF_diesel oil - statio                       | nary combu                 | istion           |
|   | 1.1.2         | 2            | Residential (1.A.4.b)         | Electricity               | Electricity consumption by residential users in a year period   |          | 4376246   | MWh         |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary<br>EF_kerosene - statio  | compustion<br>mary combu   | n<br>Ustion      |
| 1 | 1.1.3         | 3            | Transmission and dist         | ribution losses from grid | I-supplied energy   |          |           |             |         |                  |          |               | EF_charcoal - statio                         | nary combu                 | stion            |
|   | 1.1.3         | 3            | Residential (1.A.4.b)         | Electricity               | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |          | 646,504   | MWh         |         |                  |          | CO2, CH4, N2O | EF_wood - stationar<br>EF_diesel oil - mobil | y combustio<br>e combustic | on<br>on (exc. T |

| Textestana data |     | (metric tonnes   | ; CO <sub>2</sub> e)     |         |      |      |         |   |               |   |                        |   |
|-----------------|-----|------------------|--------------------------|---------|------|------|---------|---|---------------|---|------------------------|---|
| Emissions data  | CH4 | N <sub>2</sub> O | Total tCO <sub>2</sub> e |         |      |      |         |   |               |   |                        |   |
|                 |     |                  |                          |         |      |      |         |   |               |   |                        |   |
|                 |     |                  |                          | 2369215 | 1056 | 1259 | 2371529 | 0 | н             | Natural gas billed to residential sector (m3) multiplied by: NG<br>density (t/m3, national data), NCV (TJ/t, IPCC 2006) and NG<br>emission factors (t_GHG/TJ, IPCC 2006)  | Natural gas            | operational data - Distribution; ENARGAS  |
|                 |     |                  |                          | 23254   | 9    | 11   | 23274   | 0 | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Please select<br>Natural gas operational data -   |
|                 |     |                  |                          | 4       | 0    | 0    | 4       | 0 | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Commercialization Division (E<br>Transport fuels sales; Secreta<br>Monthly report - MEM - Detai<br>General Director of DGMEMH |
|                 |     |                  |                          |         |      |      |         |   |               |   |                        | Statistics area. National Cami  |
|                 |     |                  |                          | 1451380 | 891  | 1926 | 1454197 | 0 | Please select | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year  | Commercia<br>Environme | Statistics area, National Com   |
|                 |     |                  |                          |         |      |      |         |   |               | I.1.3 has not been estimated; not required for BASIC  |                        | AYSA  |
| /               |     |                  | 214,829                  | -       | -    | -    | 214829  | - | Please select | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity and multiplied by national emission factor            | Edenor S.A             | Edenor S.A, Edesur S.A & CAI<br>Anual statistic report; Treasur   |

|               |             |                        | Introduction              | Set-up  | Invent                | ory                |              | Calculate         | ors                         |                    | Results       |   | Notes                          |               |
|---------------|-------------|------------------------|---------------------------|---|-----------------------|--------------------|--------------|-------------------|-----------------------------|--------------------|---------------|---|--------------------------------|---------------|
| LI            | K           | 1 2                    | Stationary                | Transportation  | Was                   | te                 |              | IPPU              |                             |                    | AFOLU         | S                                       | Scope 3                        |               |
| STATIONAI     | RY ENERGY   | (GPC CHAPTER 6, I      | PAGE 54)                  |   |                       |                    |              |                   |                             |                    |               |   | -                              |               |
| .1 RESIDENTI/ | AL BUILDING | iS                     |                           |   |                       | Enter activ        | ity data     | I                 |                             |                    |               | Select an emission facto                | r                              |               |
| GPC ref No.   |             | Sub-category           | GHG                       | Emissions Source  | Notation              | Activity<br>Amount | data<br>Unit | Activi<br>EF unit | ty data unit com<br>Default | verter<br>Override | Gas(es)       | Emission factor                         | Units                          |               |
| 1.1.1         | 1           | Emissions from fuel co | ombustion within the c    | 2 Enter activity  | / data                |                    |              | 1                 |                             |                    |               |   |                                |               |
| 1.1.1         | 1           | Residential (1.A.4.b)  | Gas (natural gas)         | 2. Effect activity  | uutu                  | 42232              | TJ           |                   |                             |                    | CO2, CH4, N2O | EF_natural gas                          | tCO2e/TJ                       | 56            |
| 1.1.1         | 1           | Residential (1.A.4.b)  | Liquefied petroleum       | and select GH   | lGs                   | 369                | ТJ           |                   |                             |                    | CO2, CH4, N2O | EF_LPG - stationary                     |                                |               |
|               |             |                        | 0 (/                      | (convert uni  | its                   |                    |              |                   |                             |                    |               | Please select                           |                                |               |
|               |             | Decidential (1 A A b)  | Varasana                  | (convert an   |                       | -                  | <u></u>      |                   | 4 005 00                    |                    | CO2 CU4 N20   | EF_grid                                 |                                |               |
| 1.1.1         | 1           | Residential (1.M.4.D)  | Kerosene                  | if necessary  | <b>/</b> )            | 54                 | 65           | IJ                | 1.002-03                    |                    | CO2, CH4, N2O | EF_natural gas                          |                                |               |
| 1.1.2         | 2           | Emissions from grid-su | upplied energy consum     | d within the city boundary  |                       |                    |              |                   |                             |                    |               | EF_diesel oil - stat                    | tionary combu                  | istion        |
| 1.1.2         | 2           | Residential (1.A.4.b)  | Electricity               | Electricity consumption by residential users in a yes   | ar period             | 4376246            | MWh          |                   |                             |                    | CO2, CH4, N2O | EF_LPG - stationa                       | ry compustion<br>tionary combi | a<br>ustion   |
| 1.1.3         | 3           | Transmission and dist  | ribution losses from grid | I<br>I-supplied energy  |                       |                    |              | 1                 |                             |                    | 1             | EF_charcoal - stat                      | ionary combu                   | ustion        |
| 1.1.3         | 3           | Residential (1.A.4.b)  | Electricity               | High tension values include transmission and distri<br>consumption and losses; low tension technical and<br>technical losses reported by regional service provide | bution<br>non<br>ders | 646,504            | MWh          |                   |                             |                    | CO2, CH4, N2O | EF_wood - station<br>EF_diesel oil - mo | ary combustion                 | on<br>on (exc |

| ł | Enter emissions data |  |                  |                          |         |      |                |                      |   |               |   |                        |   |
|---|----------------------|--|------------------|--------------------------|---------|------|----------------|----------------------|---|---------------|---|------------------------|---|
| Т | Restante en dete     |  | (metric tonnes   | s CO <sub>2</sub> e)     |         | GHGs | (metric tonnes | s CO <sub>z</sub> e) |   | Data Quality  | Description of method(s) used or explanation for using  |                        |   |
| 1 | Emissions data       |  | N <sub>2</sub> O | Total tCO <sub>2</sub> e |         |      |                |                      |   |               |   |                        | Source  |
|   |                      |  |                  |                          |         |      |                |                      |   |               |   |                        |   |
|   |                      |  |                  |                          | 2369215 | 1056 | 1259           | 2371529              | 0 | н             | Natural gas billed to residential sector (m3) multiplied by: NG<br>density (t/m3, national data), NCV (TJ/t, IPCC 2006) and NG<br>emission factors (t_GHG/TJ, IPCC 2006)  | Natural gas            | operational data - Distribution; ENARGAS  |
|   |                      |  |                  |                          | 23254   | 9    | 11             | 23274                | 0 | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Please select<br>Natural gas operational data   |
|   |                      |  |                  |                          | 4       | 0    | 0              | 4                    | 0 | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Commercialization Division (E<br>Transport fuels sales; Secreta<br>Monthly report - MEM - Detai<br>General Director of DGMEMH |
|   |                      |  |                  |                          |         |      |                |                      |   |               |   |                        | Statistics area. National Comi  |
|   |                      |  |                  |                          | 1451380 | 891  | 1926           | 1454197              | 0 | Please select | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year  | Commercia<br>Environme | Statistics area, CEAMSE   |
|   |                      |  |                  |                          |         |      |                |                      |   |               | I.1.3 has not been estimated; not required for BASIC  |                        | AYSA  |
|   | 1                    |  |                  | 214,829                  | -       | -    | -              | 214829               | - | Please select | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity and multiplied by national emission factor            | Edenor S.A             | Edenor S.A, Edesur S.A & CA<br>Anual statistic report; Treasu   |

|              |             |                        | Introduction                       | Set-up  | Invent           | ory                |              | Calculators                               |                    | Results               |  | Notes                              |                |
|--------------|-------------|------------------------|------------------------------------|---|------------------|--------------------|--------------|---|--------------------|-----------------------|--|------------------------------------|----------------|
| LI           | ĸ           | 1 2                    | Stationary                         | Transportation  | Was              | te                 |              | IPPU                                      |                    | AFOLU                 |  | Scope 3                            |                |
| I STATIONA   | RY ENERGY   | (GPC CHAPTER 6,        | PAGE 54)                           |   |                  |                    |              |   |                    |                       |  | _                                  |                |
| I.1 RESIDENT | AL BUILDING | S                      |                                    |   |                  | Enter activ        | ity data     | I   |                    |                       | Select an emission fact                    | or                                 |                |
|              | Scope       | Sub-category           | GHG                                | Emissions Source<br>Description   | Notation<br>keys | Activity<br>Amount | data<br>Unit | Activity data unit com<br>EF unit Default | verter<br>Override | G. (18)               | Emission factor                            | nits                               | CO2            |
| 1.1.1        | 1           | Emissions from fuel of | ombustion within the cit           | y boundary  |                  |                    |              |   |                    |                       |  |                                    |                |
| 1.1.1        | 1           | Residential (1.A.4.b)  | Gas (natural gas)                  | Natural gas consumption by residential users reported by<br>the national body for gas regulation  |                  | 42232              | TJ           | 3. Select                                 | emi                | ssion                 | EF_natural gas                             | tCO2e/TJ                           | 56.1           |
| 1.1.1        | 1           | Residential (1.A.4.b)  | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users  |                  | 369                | TJ           | facto                                     | r fro              | <b>m</b> 2, 044, N201 | EF_LPG - stationary                        |                                    |                |
| l.1.1        | 1           | Residential (1.A.4.b)  | Kerosene                           | Kerosene consumption by residential users   |                  | 54                 | GJ           | drop-d                                    | own                | list                  | Please select<br>EF_grid<br>EF_natural gas |                                    |                |
| 1.1.2        | 2           | Emissions from grid-s  | upplied energy consume             | d within the city boundary  |                  |                    |              |   |                    |                       | EF_diesel oil - st                         | ationary combu                     | ustion         |
| 1.1.2        | 2           | Residential (1.A.4.b)  | Electricity                        | Electricity consumption by residential users in a year peri   | bd               | 4376246            | MWh          |   |                    | CO2, CH4, N2O         | EF_LPG - station<br>EF_kerosene - st       | ary combustior<br>ationary combu   | n<br>ustion    |
| 1.1.3        | 3           | Transmission and dis   | tribution losses from grid         | -supplied energy  |                  |                    |              |   |                    |                       | EF_charcoal - sta                          | tionary combu                      | ustion         |
| 1.1.3        | 3           | Residential (1.A.4.b)  | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |                  | 646,504            | MWh          |   |                    | CO2, CH4, N2O         | EF_wood - statio<br>EF_diesel oil - m      | nary combustion<br>bile combustion | on<br>on (exc. |

| Employing data |  | (metric tonnes   | s CO <sub>2</sub> e)     |         |      |      |         |   |               |   |                        |   |
|----------------|--|------------------|--------------------------|---------|------|------|---------|---|---------------|---|------------------------|---|
| Emissions data |  | N <sub>2</sub> O | Total tCO <sub>2</sub> e |         |      |      |         |   |               |   |                        |   |
|                |  |                  |                          |         |      |      |         |   |               |   |                        |   |
|                |  |                  |                          | 2369215 | 1056 | 1259 | 2371529 | 0 | н             | Natural gas billed to residential sector (m3) multiplied by: NG<br>density (t/m3, national data), NCV (Ti/t, IPCC 2006) and NG<br>emission factors (t_GHG/TJ, IPCC 2006)  | Natural gas            | operational data - Distribution; ENARGAS  |
|                |  |                  |                          | 23254   | 9    | 11   | 23274   | 0 | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Please select<br>Natural gas operational data -   |
|                |  |                  |                          | 4       | 0    | 0    | 4       | 0 | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Er            | Commercialization Division (E<br>Transport fuels sales; Secreta<br>Monthly report - MEM - Detai<br>General Director of DGMEMH |
|                |  |                  |                          |         |      |      |         |   |               |   |                        | Statistics area. National Com   |
|                |  |                  |                          | 1451380 | 891  | 1926 | 1454197 | 0 | Please select | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year  | Commercia<br>Environme | Statistics area, National Com<br>Statistics area, CEAMSE  |
|                |  |                  |                          |         |      |      |         |   |               | I.1.3 has not been estimated; not required for BASIC  |                        | AYSA  |
| 1              |  |                  | 214,829                  |         |      | -    | 214829  |   | Please select | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity and multiplied by national emission factor            | Edenor S.A             | Edenor S.A, Edesur S.A & CA<br>Anual statistic report; Treasu   |

| Г   |               | D           | ı c             | l                | ntroduction                          |   | Set-up                             |   | Inv              | vento                  | ory                   | C           | Calculat  | ors  |   | Results                             |  | Notes                       |                 |
|-----|---------------|-------------|-----------------|------------------|--------------------------------------|---|------------------------------------|---|------------------|------------------------|-----------------------|-------------|---|--|---|-------------------------------------|--|-----------------------------|-----------------|
| L   | LI            | K           | 12              |                  | Stationary                           | Tra   | nsportat                           | tion  | ١                | Naste                  | e                     |             | IPPU  |  |   | AFOLU                               | S  | cope 3                      |                 |
| 15  | TATIONA       | RY ENERG    | Y (GPC CHAF     | PTER 6, P        | AGE 54)                              |   |                                    |   |                  |                        |                       |             |   |  |   |                                     |  |                             |                 |
| 1.1 | RESIDENTIA    | AL BUILDING | GS              |                  |                                      |   |                                    |   |                  |                        | Enter activi          | y data      |   |  |   |                                     | Select an emission factor                  |                             |                 |
|     |               |             |                 |                  | GHG                                  | Emissions Source                              |                                    |   | Nota             | ation                  | Activity              | lata        | Activ   |  |   |                                     |  |                             |                 |
|     |               |             |                 |                  |                                      |   |                                    |   |                  |                        |                       |             | EF unit   | Default  | Override  |                                     |  |                             |                 |
|     | 1.1.1         | 1           | Emissions fr    | om fuel co       | mbustion within the city             | y boundary                                    |                                    |   |                  |                        |                       |             |   |  |   |                                     |  |                             |                 |
|     | 1.1.1         | 1           | Residential (   | 1.A.4.b)         | Gas (natural gas)                    | Natural gas consump<br>the national body for  | tion by residen<br>gas regulation  | ntial users reported b  | by               |                        | 42232                 | TJ          |   |  |   | CO2, CH4, N2O                       | EF_natural gas                             | tCO2e/TJ                    | 56.1            |
|     | 1.1.1         | 1           | Residential (   | 1.A.4.b)         | Liquefied petroleum<br>gases (LPG)   | LPG consumption by                            | residential use                    | ers   |                  |                        | 369                   | TJ          |   |  |   | CO2, CH4, N2O                       | EF_LPG - stationary                        | 1000 101                    |                 |
|     | 1.1.1         | 1           | Residential (   | 1.A.4.b)         | Kerosene                             | Kerosene consumptio                           | umption by residential users       |   |                  |                        | 54                    | GJ          | TJ  | 1.00E-03   |   | CO2, CH4, N2O                       | Please select<br>EF_grid<br>EF_natural gas |                             |                 |
|     | 1.1.2         | 2           | Emissions fr    | om grid-su       | pplied energy consume                | d within the city boun                        | darv                               |   |                  |                        |                       |             |   |  |   |                                     | EF_diesel oil - stat                       | onary comb                  | ustion          |
| _   | 11.2          | 2           | Residential (   | 1 A 4 b)         | Electricity                          | Electricity consumpti                         | on by residenti                    | ial users in a year ne  | riod             |                        | 4276246               | MOAD        |   |  |   | CO2 CH4 N20                         | EF_LPG - stationar                         | y combustio                 | n               |
| _   | 1.4.6         | 2           | inconcentrar (  |                  | Licetrary                            | and an    | on by resident                     | in overo in o year pe   |                  |                        | 4370240               |             |   |  |   | 002, 0114, 1420                     | EF_kerosene - stat                         | ionary comb                 | ustion          |
|     | 1.1.3         | 3           | Transmissio     | n and distr      | ibution losses from grid             | -supplied energy                              |                                    | and a state of the second s |                  |                        |                       |             |   |  |   |                                     | EF_charcoal - stati                        | onary comb                  | ustion          |
|     | 1.1.3         | З           | Residential (   | 1.A.4.b)         | Electricity                          | consumption and loss<br>technical losses repo | ses; low tensio<br>rted by regiona | ission and distribution<br>in technical and non<br>al service providers   | 'n               |                        | 646,504               | MWh         |   |  |   | CO2, CH4, N2O                       | EF_wood - stationa<br>EF_diesel oil - mob  | iry combusti<br>ile combust | on<br>ion (exc. |
|     | Enter emissio | ns data     |                 |                  |                                      |   |                                    |   |                  |                        |                       |             |   |  |   |                                     | EF diesel oil - Trai                       | ns combusti                 | an              |
|     | Emissions     | data        |                 | GHC              | is (metric tonnes CO <sub>2</sub> e) |   |                                    |   |                  |                        |                       | Data Qualit |   |  |   |                                     |  |                             |                 |
|     | LINISSIONS    | uata        | CO <sub>2</sub> | CH4              | N <sub>2</sub> O Total               | tCO <sub>2</sub> e CO (a)                     | CO2                                | CH4   | N <sub>2</sub> O | Total tCO <sub>2</sub> | e CO <sub>2</sub> (b) | AD          |   | not  | ation key(s)  |                                     |  |                             |                 |
|     |               |             |                 |                  |                                      |   | -                                  |   |                  |                        |                       |             |   |  |   |                                     |  |                             |                 |
|     |               |             |                 |                  |                                      |   | 2369215                            | 1056  | 1259             | 2371529                | 0                     | н           | Natural ga<br>density (t/<br>emission fi  | s billed to residen<br>m3, national data)<br>actors (t_GHG/TJ, | tial sector (m3)<br>I, NCV (TJ/t, IPC<br>IPCC 2006) | multiplied by: NG<br>C 2006) and NG | Natural gas operational da                 | ta - Distribution; I        | ENARGAS         |
|     | 1             |             |                 | 23,274 - 23274 - |                                      |   |                                    |   |                  |                        |                       | L           | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) |  |   |                                     |  | ecretariat of Ener          | ſġy             |
| 1   | _             |             |                 |                  |                                      |   |                                    |   |                  |                        |                       |             |   |  |   |                                     | 1  |                             | -               |

|         |           |                    | 23274   |  | L   | this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census)   | National Ene  | rgy Balance; Secretariat of Energy  |
|---------|-----------|--------------------|---|--|---|--|---|---|
| 4       | 0         | 0                  | 4   | 0  | L   | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census)  | National Ene  | Please select   |
|         |           |                    |   |  |   |  |   | Natural gas operational data -  |
| 1451380 | 891       | 1926               | 1454197   | 0  | Please select   | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year   | Commercial<br>Environmen  | Commercialization Division (E<br>Transport fuels sales: Secreta   |
|         |           |                    |   |  |   | I.1.3 has not been estimated; not required for BASIC   |   | Monthly report - MFM - Detai  |
| 214413  | 132       | 285                | 214829  | 0  | Please select   | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity and multiplied by national emission factor   | Edenor S.A,   | General Director of DGMFMH<br>Statistics area, National Comi  |
|         | 4 1451380 | 4 0<br>1451380 891 | 4         0         0           1451380         891         1926           214413         132         285 | -         -         -         23274           4         0         0         4           -         1451380         891         1926         1454197           -         -         -         -         -         -           -         214413         132         285         214829 | -     -     -     23274     -       4     0     0     4     0       4     0     0     4     0 | -         -         -         23274         -         L           4         0         0         4         0         L           1451380         891         1926         1454197         0         Please select           1451380         891         1926         1454197         0         Please select           1         132         285         214829         0         Please select | -     -     -     23274     -     L     this theil divided by the total population of the country (data from the National Institute of Statistics (NDEC) from the 2010 Census)       4     0     0     4     0     L     Estimated based on national consumption multiplied by a proxy based on the population of the country (data from the National Institute of Statistics (NDEC) from the 2010 Census)       -     -     -     4     0     L     Estimated based on national consumption multiplied by a proxy based on the population of the country (data from the National Institute of Statistics (NDEC) from the 2010 Census)       -     -     -     -     L     Estimated based on national consumption multiplied by a proxy based on the population of the country (data from the National Institute of Statistics (NDEC) from the 2010 Census)       -     -     -     -     -     -     -     -       -     1451380     891     1926     1454197     0     Please selet     Electricity consumed multiplied by the national emission factor of the grid for the activity data calendar year       -     -     -     -     -     -     -     -       214413     132     285     214829     0     Please selet     Electricity on multiplied by national emission factor of the grid-uppy electricity for each company) in the calendar year; percentage of high tension losses by company, applied to the bilied grid-uppy electricity and multiplied by national e | -     -     -     23274     -     L     this fuel divided by the total population of the country (data from the National Institute of Statistics (INDEC) from the 2010 Census)     National Ene       4     0     0     4     0     L     Estimated based on national consumption multiplied by a proxy based on the population within Buenos Aires city that utilizes this fuel divided by the total population within Buenos Aires city that utilizes this fuel divided by the total population of the country (data from the National Institute of Statistics (INDEC) from the 2010     National Ene       1     1451380     891     1926     1454197     0     Please select     Electricity consumed multiplied by the national emission factor     Commercial Environmen       1     1451380     891     1926     1454197     0     Please select     Electricity consumed multiplied by the national emission factor     Commercial Environmen       1     132     285     214829     0     Please select     Please select bild grid-supply eletricity (for each company, applied to total grid-supply eletricity and multiplied by national emission factor     Edenor S.A, supply eletricity and multiplied by national emission factor |

| Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|--------------|----------------|-----------|-------------|---------|---------|
| Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

|   |               | DV FNEDCV   |                        |                                    |   |          |           |            |         |                 |          |               |   |                            |                  |
|---|---------------|-------------|------------------------|------------------------------------|---|----------|-----------|------------|---------|-----------------|----------|---------------|---|----------------------------|------------------|
|   | ISTATIONA     | RY ENERGY   | GPC CHAPTER 6, 1       | PAGE 54)                           |   |          |           |            |         |                 |          |               |   |                            |                  |
|   | I.1 RESIDENTI | AL BUILDING | S                      |                                    |   |          | Enter act | ivity data |         |                 |          |               | Select an emission factor                     | I                          |                  |
|   | 600           | <b>6</b>    |                        | GHG                                | Emissions Source  | Notation | Activit   | ty data    | Activit | y data unit con | verter   | Control       |   |                            |                  |
|   | GPC ret No.   |             |                        |                                    |   |          |           |            | EF unit | Default         | Override |               |   |                            | CO2              |
| 3 | 1.1.1         | 1           | Emissions from fuel co | mbustion within the cit            | y boundary  |          |           |            |         |                 |          |               |   |                            |                  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Gas (natural gas)                  | Natural gas consumption by residential users reported by<br>the national body for gas regulation  |          | 42232     | TJ         |         |                 |          | CO2, CH4, N2O | EF_natural gas                                | tCO2e/TJ                   | 56.1             |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users  |          | 369       | τJ         |         |                 |          | CO2, CH4, N2O | EF_LPG - stationary                           |                            |                  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Kerosene                           | Kerosene consumption by residential users   |          | 54        | GJ         | τJ      | 1.00E-03        |          | CO2, CH4, N2O | Please select<br>EF_grid<br>EF_natural gas    |                            |                  |
| 1 | 1.1.2         | 2           | Emissions from grid-su | upplied energy consume             | d within the city boundary  |          |           |            |         |                 |          |               | EF_diesel oil - statio                        | nary combu                 | istion           |
|   | 1.1.2         | 2           | Residential (1.A.4.b)  | Electricity                        | Electricity consumption by residential users in a year period   |          | 4376246   | MWh        |         |                 |          | CO2, CH4, N2O | EF_LPG - stationary<br>EF_kerosene - static   | nary combustion            | n<br>ustion      |
| 1 | 1.1.3         | 3           | Transmission and dist  | ribution losses from grid          | -supplied energy  |          |           |            |         |                 |          |               | EF_charcoal - station                         | hary combu                 | stion            |
|   | 1.1.3         | 3           | Residential (1.A.4.b)  | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |          | 646,504   | MWh        |         |                 |          | CO2, CH4, N2O | EF_wood - stationary<br>EF_diesel oil - mobil | / combustio<br>e combustic | on<br>on (exc. T |

|                |       |   | is (metric tonn  | tes CO <sub>2</sub> e)   |                     |         | GHG  | s (metric tonne  | es CO <sub>z</sub> e)    |                     | Data Quality  |   |  |
|----------------|-------|---|------------------|--------------------------|---------------------|---------|------|------------------|--------------------------|---------------------|---------------|---|--|
| Emissions data |       |   | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | CO2     | CH4  | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | AD            |   |  |
|                | 1     | 1 | -                |                          |                     |         |      |                  |                          |                     |               |   |  |
|                |       |   |                  |                          |                     | 2369215 | 1056 | 1259             | 2371529                  | 0                   |               | Emissions data  | Net ural gas operational data - Distribution; ENAR                               |
| 1              |       |   |                  | 23,274                   |                     |         |      | -                | 23274                    |                     | cal           | automatically<br>culated if emission  | in onal Energy Balance; Secretariat of Energy                                    |
| Delete         | Cells |   |                  |                          |                     | 4       | 0    | 0                | 4                        | 0                   | f             | actor selected, or  | onal Energy Balance; Secretariat of Energy                                       |
|                |       |   |                  |                          |                     |         |      |                  |                          |                     | equ           | ual to manual entry   |  |
|                |       |   |                  |                          |                     | 1451380 | 891  | 1926             | 1454197                  | 0                   | Please sele   | Multiplied by the national emission factor<br>ivity data calendar year  | Commercialization Division (Edenor S.A) and<br>Environment Division (Edesur S.A) |
|                |       |   |                  |                          |                     |         |      |                  |                          |                     |               | I.1.3 has not been estimated; not required for BASIC  |  |
|                |       |   |                  |                          |                     | 214413  | 132  | 285              | 214829                   | 0                   | Please select | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity, and multihilad by actional emission factor | Edenor S.A, Edesur S.A & CAMMESA Annual repo                                     |

| Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|--------------|----------------|-----------|-------------|---------|---------|
| Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

|   | I STATIONA    | RY ENERGY   | (GPC CHAPTER 6, F      | PAGE 54)                           |   |          |           |             |         |                  |          |               |  |            |        |  |  |  |  |
|---|---------------|-------------|------------------------|------------------------------------|---|----------|-----------|-------------|---------|------------------|----------|---------------|--|------------|--------|--|--|--|--|
|   | I.1 RESIDENTI | AL BUILDING | S                      |                                    |   |          | Enter act | tivity data | I       |                  |          |               | Select an emission factor  |            |        |  |  |  |  |
|   |               |             |                        | GHC                                | G Emissions Source  | Notation | Activit   | ty data     | Activi  | ty data unit cor | werter   |               |  |            |        |  |  |  |  |
|   |               |             |                        |                                    |   |          |           |             | EF unit | Default          | Override |               |  |            | CO,    |  |  |  |  |
| 3 | 1.1.1         | 1           | Emissions from fuel co | mbustion within the cit            | ty boundary   |          |           |             |         |                  |          |               |  |            |        |  |  |  |  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Gas (natural gas)                  | Natural gas consumption by residential users reported by<br>the national body for gas regulation  |          | 42232     | TJ          |         |                  |          | CO2, CH4, N2O | EF_natural gas   | tCO2e/TJ   | 56.1   |  |  |  |  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users  |          | 369       | TJ          |         |                  |          | CO2, CH4, N2O | O EF_LPG - stationary  |            |        |  |  |  |  |
|   | 1.1.1         | 1           | Residential (1.A.4.b)  | Kerosene                           | Kerosene consumption by residential users   |          | 54        | GJ          | TJ      | 1.00E-03         |          | CO2, CH4, N2O | - Please select<br>EF_grid<br>EF_natural gas                                     |            |        |  |  |  |  |
| 1 | 1.1.2         | 2           | Emissions from grid-su | pplied energy consume              | d within the city boundary  |          |           |             |         |                  |          |               | EF_diesel oil - statio   | nary combu | istion |  |  |  |  |
|   | 1.1.2         | 2           | Residential (1.A.4.b)  | Electricity                        | Electricity consumption by residential users in a year period   |          | 4376246   | MWh         |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary combustion<br>EF_kerosene - stationary combustion            |            |        |  |  |  |  |
| 1 | 1.1.3         | 3           | Transmission and distr | ibution losses from grid           | l-supplied energy   |          |           |             |         |                  |          |               | EF_charcoal - statio   | nary combu | stion  |  |  |  |  |
|   | 1.1.3         | 3           | Residential (1.A.4.b)  | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |          | 646,504   | MWh         |         |                  |          | CO2, CH4, N2O | H4, N20 EF_wood - stationary combustion<br>EF_diesel oil - mobile combustion (ex |            |        |  |  |  |  |

| Enter emissions data |  |                  |                          |         |      |                 |                      |                     |              |   |   |
|----------------------|--|------------------|--------------------------|---------|------|-----------------|----------------------|---------------------|--------------|---|---|
| Parlada and data     |  | (metric tonnes   | CO <sub>2</sub> e)       |         | GHG  | s (metric tonne | s CO <sub>z</sub> e) | (                   | Data Quality | Description of method is used or explanation for u  | sing  |
| Emissions data       |  | N <sub>2</sub> O | Total tCO <sub>2</sub> e |         |      |                 |                      | CO <sub>2</sub> (b) | AD           | 1 Indicato  |   |
| -                    |  |                  |                          |         |      |                 |                      |                     |              | 4. multate  |   |
|                      |  |                  |                          | 2369215 | 1056 | 1259            | 2371529              | 0                   | н            | data quality 16) and  | :: NG<br>NG Natural gas operational data - Distribution; ENARGAS                        |
| 1                    |  |                  | 23,274                   |         |      | -               | 23274                |                     | L P          | Estimated based on national consumption multiplied by<br>I on within Buenos Aires day that ut<br>e total population of the country (c<br>lease select<br>titute of Statistics (INDEC) from the  | a proxy<br>lizes<br>ata National Energy Balance; Secretariat of Energy<br>2010          |
|                      |  |                  |                          | 4       | 0    | 0               | 4                    | 0                   | L            | A ational consumption multiplied by<br>ion within Buenos Aires city that ut<br>ie total population of the country (c<br>from the National Institute of Statistics (INDEC) from the<br>Census)   | a proxy<br>lizes<br>ata National Energy Balance; Secretariat of Energy<br>2010          |
| r                    |  |                  |                          |         |      |                 |                      |                     |              |   |   |
|                      |  |                  |                          | 1451380 | 891  | 1926            | 1454197              | 0                   | н            | Electricity consumed multiplied by the national emission<br>of the grid for the activity data calendar year   | factor Commercialization Division (Edenor S.A) and<br>Environment Division (Edesur S.A) |
|                      |  |                  |                          |         |      |                 |                      |                     |              | 1.1.3 has not been estimated; not required for BASIC  |   |
|                      |  |                  |                          | 214413  | 132  | 285             | 214829               | 0                   | н            | Percentages of low tension losses by company, applied t<br>billed grid-supply electricity (for each company) in the ca<br>year; percentage of high tension losses applied to total g<br>supply electricity and multiplied by national emission fa | o the<br>lendar<br>Edenor S.A, Edesur S.A & CAMMESA Annual reports<br>:tor              |

| CIPIC | Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|-------|--------------|----------------|-----------|-------------|---------|---------|
|       | Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

|   | I STATIONA   | RY ENERGY    | (GPC CHAPTER 6, F      | PAGE 54)                           |   |          |           |             |         |                  |          |               |   |                             |                  |  |  |  |  |
|---|--------------|--------------|------------------------|------------------------------------|---|----------|-----------|-------------|---------|------------------|----------|---------------|---|-----------------------------|------------------|--|--|--|--|
|   | I.1 RESIDENT | IAL BUILDING | S                      |                                    |   |          | Enter act | livity data | I       |                  |          |               | Select an emission factor   |                             |                  |  |  |  |  |
|   |              |              |                        | GHG                                | 6 Emissions Source  | Notation | Activi    | ty data     | Activi  | ty data unit cor | nverter  | Curles)       | Further Proton  |                             |                  |  |  |  |  |
|   |              |              |                        |                                    |   |          |           |             | EF unit | Default          | Override |               |   |                             |                  |  |  |  |  |
| 3 | 1.1.1        | 1            | Emissions from fuel co | mbustion within the cit            | y boundary  |          |           |             |         |                  |          |               |   |                             |                  |  |  |  |  |
|   | 1.1.1        | 1            | Residential (1.A.4.b)  | Gas (natural gas)                  | Natural gas consumption by residential users reported by<br>the national body for gas regulation  |          | 42232     | TJ          |         |                  |          | CO2, CH4, N2O | EF_natural gas  | tCO2e/TJ                    | 56.1             |  |  |  |  |
|   | 1.1.1        | 1            | Residential (1.A.4.b)  | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users  |          | 369       | TJ          |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary   |                             |                  |  |  |  |  |
|   | 1.1.1        | 1            | Residential (1.A.4.b)  | Kerosene                           | Kerosene consumption by residential users   |          | 54        | GJ          | TJ      | 1.00E-03         |          | CO2, CH4, N2O | Please select<br>EF_grid<br>EF_natural gas  | -                           |                  |  |  |  |  |
| 1 | 1.1.2        | 2            | Emissions from grid-su | pplied energy consume              | d within the city boundary  |          |           |             |         |                  |          |               | EF_diesel oil - statio  | nary combu                  | istion           |  |  |  |  |
|   | 1.1.2        | 2            | Residential (1.A.4.b)  | Electricity                        | Electricity consumption by residential users in a year period   |          | 4376246   | MWh         |         |                  |          | CO2, CH4, N2O | <ul> <li>EF_LPG - stationary combustion</li> <li>EF_kerosene - stationary combustion</li> </ul> |                             |                  |  |  |  |  |
| 1 | 1.1.3        | 3            | Transmission and dist  | ibution losses from grid           | l-supplied energy   |          |           |             |         |                  |          |               | EF_charcoal - statio  | nary combu                  | stion            |  |  |  |  |
|   | 1.1.3        | 3            | Residential (1.A.4.b)  | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |          | 646,504   | MWh         |         |                  |          | CO2, CH4, N2O | EF_wood - stationar<br>EF_diesel oil - mobi   | y combustic<br>le combustic | on<br>on (exc. T |  |  |  |  |

| Emissions data |     |                  |                          |                 |      |                  |                          |                     | Data Quality  | Description of method(s) used or explanation for using  |                          |   |
|----------------|-----|------------------|--------------------------|-----------------|------|------------------|--------------------------|---------------------|---------------|---|--------------------------|---|
| Linisions data | CH4 | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> | CH4  | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | AD            | notation key(s)   |                          |   |
|                |     |                  |                          |                 |      |                  |                          |                     |               |   |                          |   |
|                |     |                  |                          | 2369215         | 1056 | 1200 5           | 5. De                    | scrib               | е             | Natural gas billed to residential sector (m3) multiplied by: NG<br>density (t/m3, national data), NCV (TJ/t, IPCC 2006) and NG<br>emission factors (t_GHG/TJ, IPCC 2006)  | Natural gas              | operational data - Distribution; ENARGAS  |
| 1              |     |                  | 23,274                   |                 |      | m                | etho                     | dolo                | gy            | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Ene             | rgy Balance; Secretariat of Energy A  |
|                |     |                  |                          | 4               | 0    | 0                | 4                        | 0                   | L             | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes<br>this fuel divided by the total population of the country (data<br>from the National Institute of Statistics (INDEC) from the 2010<br>Census) | National Ene             | Please select   |
|                |     |                  |                          |                 |      |                  |                          |                     |               |   |                          | Natural gas operational data -  |
|                |     |                  |                          | 1451380         | 891  | 1926             | 1454197                  | 0                   | Please select | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year  | Commercial<br>Environmen | Commercialization Division (E<br>Transport fuels sales: Secreta                         |
|                |     |                  |                          |                 |      |                  |                          |                     |               | I.1.3 has not been estimated; not required for BASIC  |                          | Monthly report - MEM - Detai  |
|                |     |                  |                          | 214413          | 132  | 285              | 214829                   | 0                   | Please select | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity and multiplied by national emission factor            | Edenor S.A,              | General Director of DGMFMH<br>Statistics area, National Comi<br>Statistics area, CEAMSE |

Pater and states date

| CIPIC | Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|-------|--------------|----------------|-----------|-------------|---------|---------|
|       | Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

|   | I STATIONA    | RY ENERGY    | (GPC CHAPTER 6, I      | PAGE 54)                           |   |          |           |            |         |                  |          |               |  |            |        |  |  |  |  |  |
|---|---------------|--------------|------------------------|------------------------------------|---|----------|-----------|------------|---------|------------------|----------|---------------|--|------------|--------|--|--|--|--|--|
|   | I.1 RESIDENTI | IAL BUILDING | S                      |                                    |   |          | Enter act | ivity data |         |                  |          |               | Select an emission factor  |            |        |  |  |  |  |  |
|   |               |              |                        | GHG                                | Emissions Source  | Notation | Activit   | y data     | Activi  | ty data unit cor | werter   |               |  |            |        |  |  |  |  |  |
|   | GPC ref No.   |              |                        |                                    |   |          |           |            | EF unit | Default          | Override |               |  |            |        |  |  |  |  |  |
| 3 | 1.1.1         | 1            | Emissions from fuel co | mbustion within the cit            | y boundary  |          |           |            |         |                  |          |               |  |            |        |  |  |  |  |  |
|   | 1.1.1         | 1            | Residential (1.A.4.b)  | Gas (natural gas)                  | Natural gas consumption by residential users reported by<br>the national body for gas regulation  |          | 42232     | TJ         |         |                  |          | CO2, CH4, N2O | EF_natural gas   | tCO2e/TJ   | 56.1   |  |  |  |  |  |
|   | 1.1.1         | 1            | Residential (1.A.4.b)  | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users  |          | 369       | τJ         |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary  |            |        |  |  |  |  |  |
|   | 1.1.1         | 1            | Residential (1.A.4.b)  | Kerosene                           | Kerosene consumption by residential users   |          | 54        | GJ         | τJ      | 1.00E-03         |          | CO2, CH4, N2O | Please select<br>EF_grid<br>EF_natural gas                                   |            |        |  |  |  |  |  |
| 1 | 1.1.2         | 2            | Emissions from grid-su | upplied energy consume             | d within the city boundary  |          |           |            | 1       |                  | 1        |               | EF_diesel oil - statio   | nary combu | istion |  |  |  |  |  |
|   | 1.1.2         | 2            | Residential (1.A.4.b)  | Electricity                        | Electricity consumption by residential users in a year period   |          | 4376246   | MWh        |         |                  |          | CO2, CH4, N2O | EF_LPG - stationary combustion<br>EF_kerosene - stationary combustion        |            |        |  |  |  |  |  |
| 1 | 1.1.3         | 3            | Transmission and dist  | ribution losses from grid          | -supplied energy  |          |           |            |         |                  |          |               | EF_charcoal - statio   | nary combu | stion  |  |  |  |  |  |
|   | 1.1.3         | 3            | Residential (1.A.4.b)  | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non<br>technical losses reported by regional service providers |          | 646,504   | MWh        |         |                  |          | CO2, CH4, N2O | EF_wood - stationary combustion<br>EF_diesel oil - mobile combustion (exc. T |            |        |  |  |  |  |  |

| Source   |                           | Description of method(s) used or explanation for using  |    |                     |                          |                  |      |         |   | s CO <sub>2</sub> e)     | s (metric tonne  |     | Emissions data |
|--|---------------------------|---|----|---------------------|--------------------------|------------------|------|---------|---|--------------------------|------------------|-----|----------------|
| Source   |                           | notation key(s)   | AD | CO <sub>2</sub> (b) | Total tCO <sub>2</sub> e | N <sub>2</sub> O | СҢ   | CO2     |   | Total tCO <sub>2</sub> e | N <sub>2</sub> O | CH4 |                |
|  |                           |   |    |                     | 1                        |                  | 1    | I       | 1 | 1                        | 1                |     |                |
| operational data - Distribution; ENARGAS   | Natural gas o             | 6. Select data  | н  | 0                   | 2371529                  | 1259             | 1056 | 2369215 |   |                          |                  |     |                |
| Please select  | National Ene              | source from   | L  |                     | 23274                    |                  | -    | -       |   | 23,274                   |                  |     | 1              |
| Natural gas operational da<br>Commercialization Divisio                            |                           | drop-down list  | 1  |                     |                          |                  |      |         |   |                          |                  |     |                |
| Transport fuels sales; Sec<br>Monthly report - MEM - D<br>General Director of DGMF | National Ene              | Et  | L  | 0                   | 4                        | 0                | 0    | 4       |   |                          |                  |     |                |
| Statistics area, National C  |                           |   |    |                     |                          |                  |      |         |   |                          |                  |     |                |
| Statistics area, CEAMSE<br>AYSA  | Commerciali<br>Environmen | Electricity consumed multiplied by the national emission factor<br>of the grid for the activity data calendar year  | н  | 0                   | 1454197                  | 1926             | 891  | 1451380 |   |                          |                  |     |                |
| Edenor S.A. Edesur S.A.&   |                           | I.1.3 has not been estimated; not required for BASIC  |    |                     |                          |                  |      |         |   |                          |                  |     |                |
| Anual statistic report; Trea<br>Edesur S.A & CAMIMIESA ANNUAL REPORTS              | Edenor S.A, E             | Percentages of low tension losses by company, applied to the<br>billed grid-supply electricity (for each company) in the calendar<br>year; percentage of high tension losses applied to total grid-<br>supply electricity, and multifield by national emission factor | н  | 0                   | 214829                   | 285              | 132  | 214413  |   |                          |                  |     |                |

|   |              |            | _                      |                          |   |  |                   |                  |                      |                     |              |   |   |   |                           |   |                 |
|---|--------------|------------|------------------------|--------------------------|---|--|-------------------|------------------|----------------------|---------------------|--------------|---|---|---|---------------------------|---|-----------------|
|   |              | Р          |                        | Introduction             |   | Set-up                                 |                   | Ir               | iventory             |                     | Cal          | culators  |   | Results   |                           | Notes   |                 |
|   | LI           | ĸ          | 12                     | Stationary               | Tra   | ansportat                              | ion               |                  | Waste                |                     |              | IPPU  |   | AFOLU   |                           | Scope 3                                       |                 |
|   |              |            |                        |                          |   |  |                   |                  |                      |                     |              |   |   |   |                           |   |                 |
|   | I STATIONA   | RY ENERG   | Y (GPC CHAPTER 6,      | PAGE 54)                 |   |  |                   |                  |                      |                     |              |   |   |   |                           |   |                 |
|   | I.1 RESIDENT | AL BUILDIN | GS                     |                          |   |  |                   |                  | Er                   | ter activity o      | lata         |   |   | S   | elect an emiss            | ion factor                                    |                 |
|   | GPC ref No.  | Scope      | Sub-cat/gory           | GI                       | HG Em. Yons Source                          | Description                            |                   | М                | ation<br>(eys Amo    | Activity dat        | a<br>Unit I  | Activity data unit of                               | onverter<br>Override                        | Gar es)   | Emission f                | actor Unit                                    | <u> </u>        |
| 3 | 1.1.1        | 1          | Emissions from fuel of | ombustion within the     | city boundary                               |  |                   |                  |                      |                     |              |   |   |   |                           |   |                 |
|   | 1.1.1        | 1          | Residential (1.A.4.o)  | Gas (natural gas)        | Natural gas consum<br>the national body f   | ption by resident<br>or gas regulation | tial users report | ed by            | 422                  | 32                  | TJ           |   |   | CO2, CH4, N.O                                   | EF_natura                 | l gas   | 56.1            |
|   | 1.1.1        | 1          | eside <b>1</b> . Se    | elect fue                | el type                                     | y residential user                     | 5                 |                  | 36<br>2. F           | nte                 | r acti       | ivity da  | ta  | ് <b>3. Se</b>                                  | lect o                    | emission                                      |                 |
|   | 1.1.1        | 1          | Residential (1.A.4.b)  | Kerosene                 | Kerosene consump                            | tion by residentia                     | lusers            |                  | _                    |                     |              |   |   | со2, CH4, N20 fa                                | ctor                      | from  |                 |
|   |              |            |                        |                          |   |  |                   |                  | d                    | inu :               | selec        | t unus  |   | dro   | n da                      | wplict  | stion           |
| 1 | 1.1.2        | 2          | Emissions from grid-   | supplied energy consum   | ned within the city bou                     | indary                                 |                   |                  |                      | (cou                | overt        | units   | _   |   | h-no                      | ationary combustion                           | 1               |
|   | 1.1.2        | 2          | Residential (1.A.4.b)  | Electricity              | Electricity consump                         | tion by residentia                     | al users in a yea | r period         | 4376                 |                     |              | annes   |   | CO2, CH4, N20 E                                 | F_kerosen                 | e - stationary combu                          | ustion          |
| 1 | 1.1.3        | 3          | Transmission and dis   | tribution losses from gr | rid-supplied energy                         | In clude tree costs                    | sion and distrib  | ution            |                      | if n                | leces        | sarv)   | _   | E   | F_charcoa                 | I - stationary combus                         | stion           |
|   | 1.1.3        | 3          | Residential (1.A.4.b)  | Electricity              | High tension values<br>consumption and lo   | include transmis<br>osses; low tension | technical and     | non              | 646,                 | 104                 | MWb          | · · · · //  |   | CO2, CH4, N2O                                   | F_wood - s<br>F diesel oi | stationary combustio<br>Il - mobile combustio | n<br>on (exc. T |
|   |              |            |                        |                          | technical losses rep                        | orted by regional                      | service provide   | 215              |                      |                     |              |   |   | L F   | F diesel oi               | I - Trains combustio                          | n               |
|   | Enter emiss  | ions data  |                        |                          |   |  |                   |                  |                      |                     |              |   |   |   |                           |   |                 |
| ( |              |            | (                      | iHGs (metric tonnes CO   | e)  |  | GHG               | s (metric tonne  | s CO <sub>r</sub> e) |                     | Data Quality | Description of me                                   | thod(s) used or ex                          | planation for using                             |                           |   |                 |
|   | Emission     | is data    | CO2 CH4                | N <sub>2</sub> O To      | otal tCO <sub>2</sub> e CO <sub>2</sub> (b) | CO2                                    | CH4               | N <sub>2</sub> O | Total tCOze          | CO <sub>z</sub> (b) | AD           |   | notation key(s)                             |   |                           | Source  |                 |
|   |              |            |                        |                          |   |  |                   |                  |                      |                     |              | ltor  | sidential sector (n                         | a3) multiplied by: NG                           |                           |   |                 |
|   |              |            |                        |                          |   | 2369215                                | 1056              | 1259             | 2371529              | Я                   | India        | itiona  | l data), NCV (TJ/t,                         | IPCC 2006) and NG                               | Natural gas o             | orational data . Distribution                 | - ENADCAC       |
|   |              |            |                        |                          |   |  |                   |                  |                      | <b>4</b> .          | muit         |   | G/TJ, IPCC 2006)                            | and the local base and                          | 6 9                       | Solort da                                     | ta              |
|   |              |            |                        |                          |   |  |                   |                  |                      | dat                 | a du         |   | on within Buenos /                          | Aires city that utilizes                        | 0                         |   | La .            |
|   | · ·          |            |                        |                          | 23,274                                      | -                                      | -                 | -                | 23274                | uat                 | ayu          | from the National Inst                              | total population (<br>tute of Statistics () | of the country (data<br>INDEC) from the 2010    | SO                        | urce fror                                     | nat dat         |
|   | _            |            |                        |                          |   |  |                   |                  |                      |                     |              | Census)   |   |   |                           | Commercialization                             | Division        |
|   | E.           | ntor       | omissis                | ne data                  |   | Er                                     | nissi             | ons c            | lata                 |                     |              | Estin and based 5                                   | . Desc                                      | ribe  | dro                       | p-down l                                      | list            |
|   |              | nter       | emissic                | ms uata                  |   | 4                                      | tom               | ation            | 11.5                 |                     | L            | this fuel divided by the                            | total population (                          | of the country (data                            | itional Enc               | Monthly report - M                            | iEM - De        |
|   | dir          | octl       | v (if no               | omissio                  | n   | d                                      | uton              | Iduca            | ally                 |                     |              | Census)   | ethod                                       | ology   |                           | General Director of                           | DGMFN           |
|   | ull          | eun        | y (11 110              | CIII3310                 |   | calcul                                 | lated             | if er            | nissio               | n                   |              |   |   |   |                           | Statistics area, Nat                          | Ional Col       |
|   |              | fact       | ors avai               | lable)                   |   | 1451380                                | 891               | 1926             | 1454197              | 0                   | н            | Electricity consumed n<br>of the grid for the activ | nultiplied by the ni<br>vity data calendar  | ational emission factor<br>year                 | Commerciali<br>Environmen | AYSA  | NVIJE           |
|   |              |            |                        | /                        |   | fact                                   | or se             | electe           | ed, or               |                     |              | I.1.3 has not been esti                             | mated; not require                          | ed for BASIC                                    |                           | Edenor S.A, Edesur                            | r S.A & C       |
|   |              |            |                        |                          |   |  |                   |                  |                      |                     |              | Percentages of low ter<br>billed grid-supply elect  | ision losses by con<br>ricity (for each cor | npany, applied to the<br>mpany) in the calendar |                           | Anual statistic repo                          | ort; Treas      |
|   |              |            |                        |                          |   | equal                                  | to m              | ianua            | al ent               | ry                  | H H          | year; percentage of his<br>supply electricity and   | tension losses a<br>multiplied by natio     | pplied to total grid-<br>onal emission factor   | Edenor S.A, E             | desur 5.A & CAMINIESA Annui                   | ai reports      |

| Introduction | Set-up         | Inventory | Calculators | Results | Notes   |
|--------------|----------------|-----------|-------------|---------|---------|
| Stationary   | Transportation | Waste     | IPPU        | AFOLU   | Scope 3 |

#### I STATIONARY ENERGY (GPC CHAPTER 6, PAGE 54)

|   | I.1 RESIDENT | IAL BUILDING | S                        |                                    |  |          | Enter ac | ivity data |         |                  |          |               | Select an emission factor              |           |             |
|---|--------------|--------------|--------------------------|------------------------------------|--|----------|----------|------------|---------|------------------|----------|---------------|--|-----------|-------------|
|   | GPC ref No.  | Scope        |                          | GH                                 | G Emissions Source   | Notation | Activi   | ty data    | Activi  | ty data unit con | verter   | Gasles)       | Emission factor                        |           |             |
|   |              |              | Sub-category             | Activity                           | Description  | keys     | Amount   | Unit       | EF unit | Default          | Override | Gustest       | Emission factor                        | Units     | CO2         |
| 3 | 1.1.1        | 1            | Emissions from fuel com  | bustion within the city b          | oundary  |          |          |            |         |                  |          |               |  |           |             |
|   | 1.1.1        | 1            | Residential (1.A.4.b)    | Gas (natural gas)                  | Natural gas consumption by residential users reported by the<br>national body for gas regulation                   |          | 42232    | LΤ         |         |                  |          | CO2, CH4, N2O | EF_natural gas                         | tCO2e/TJ  | 56.1        |
|   | 1.1.1        | 1            | Residential (1.A.4.b)    | Liquefied petroleum<br>gases (LPG) | LPG consumption by residential users   |          | 369      | τJ         |         |                  |          | CO2, CH4, N2O | Please select                          | tCO2e/    | 0           |
|   | 1.1.1        | 1            | Residential (1.A.4.b)    | Kerosene                           | Kerosene consumption by residential users  | NO       | Se       | lect       | notat   | ion l            | key      | CO2, CH4, N2O | EF_kerosene - stationary<br>combustion | tCO2e/TJ  | 71.5        |
| 1 | 1.1.2        | 2            | Emissions from grid-sup  | plied energy consumed w            | ithin the city boundary  | IE       | fro      | m di       | on-d    | own              | list     |               | ·                                      |           |             |
|   | 1.1.2        | 2            | Residential (1.A.4.b)    | Electricity                        | Electricity consumption by residential users in a year period  | NE<br>C  | 4376246  | MWh        | op a    |                  |          | CO2, CH4, N2O | EF_grid                                | tCO2e/MWh | 0.331649585 |
| 1 | 1.1.3        | 3            | Transmission and distrib | oution losses from grid-su         | on losses from grid-supplied energy  |          |          |            |         |                  |          |               |  |           |             |
|   | 1.1.3        | 3            | Residential (1.A.4.b)    | Electricity                        | High tension values include transmission and distribution<br>consumption and losses; low tension technical and non | NE       | v        |            |         |                  |          |               |  |           |             |

#### Enter emissions data

| Facilitations data |                 | GHGs | (metric tonnes   | ; CO <sub>z</sub> e)     |                     |         | GHGs | (metric tonnes   | CO <sub>2</sub> e)       |                     | Data Quz .y | Description of method(s) used or explanation for using notation  | e   |
|--------------------|-----------------|------|------------------|--------------------------|---------------------|---------|------|------------------|--------------------------|---------------------|-------------|--|---|
| Emissions data     | CO <sub>2</sub> | CH4  | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | CO2     | CH4  | N <sub>2</sub> O | Total tCO <sub>2</sub> e | CO <sub>2</sub> (b) | AD          | key(s)   | Source  |
|                    |                 |      |                  |                          |                     |         |      |                  |                          |                     |             |  |   |
|                    |                 |      |                  |                          |                     | 2369215 | 1056 | 1259             | 2371529                  | 0                   | н           | Natural gas billed to residential sector (m3) multiplied by: NG<br>density (fr/m3, patienal data), NCV (TI/h, INCC 2006) and NC<br>emission factors (f. CH <u>C</u> /T), IPCC 2000   | Natural gas operational data - Distribution; ENARGAS                            |
| 1                  |                 |      |                  | 23,274                   |                     | -       | -    | -                | 23274                    | -                   | L           | Estima<br>Based<br>fueldi<br>Nation explanation  | National Energy Balance; Secretariat of Energy                                  |
|                    |                 |      |                  |                          |                     | 4       | 0    | 0                | 4                        | 0                   | L           | Estimated based on national consumption multiplied by a proxy<br>based on the population within Buenos Aires city that utilizes this<br>fuel divided by the total population of the country (data from the<br>National Institute of Statistics (INDEC) from the 2010 Census) | National Energy Balance; Secretariat of Energy                                  |
|                    |                 |      |                  |                          |                     |         |      |                  |                          |                     |             |  |   |
|                    |                 |      |                  |                          |                     | 1451380 | 891  | 1926             | 1454197                  | 0                   | н           | Electricity consumed multiplied by the national emission factor of<br>the grid for the activity data calendar year   | Commercialization Division (Edenor S.A) and Environmer<br>Division (Edesur S.A) |
|                    |                 |      |                  |                          |                     |         |      |                  |                          |                     |             | I.1.3 has not been estimated; not required for BASIC   |   |
|                    |                 |      |                  |                          |                     |         |      |                  |                          |                     | н           | Grid loss unknown. This is an optional sector for BASIC so emissions<br>are not estimated.   | Edenor S.A, Edesur S.A & CAMMESA Annual reports                                 |

#### **OVERVIEW** (GPC CHAPTER 4.4, TABLE 4.2, PAGE 41)

| NAME OF CITY:          | Rio de Janeiro, Brazil | POPULATION:         | 6,520,266 |
|------------------------|------------------------|---------------------|-----------|
| LEVEL:                 | BASIC+                 | LAND AREA (km2):    | 1,204     |
| <b>INVENTORY YEAR:</b> | 2017                   | GDP (US\$ million): | 98,338    |

|                   | HG Emissions Source (Py Sector)                   | Total GHGs (metric tonnes CO2e) |           |           |            |            |            |  |  |  |
|-------------------|---|---------------------------------|-----------|-----------|------------|------------|------------|--|--|--|
|                   |   | Scope 1                         | Scope 2   | Scope 3   | BASIC      | BASIC+     | BASIC+ S3  |  |  |  |
| STATIONARY ENERGY | Energy use (all emissions except I.4.4)           | 6,826,322                       | 1,900,982 | 210,787   | 8,727,304  | 8,938,092  | 8,938,092  |  |  |  |
| STATIONARY ENERGY | Energy generation supplied to the grid (I.4.4)    | 4,159,685                       |           |           |            |            |            |  |  |  |
| TRANSPORTATION    | (all II emissions)                                | 6,019,406                       | 33,346    | 1,319,210 | 6,052,752  | 7,371,963  | 7,371,963  |  |  |  |
| WASTE             | Waste generated in the city (III.X.1 and III.X.2) | 905,439                         |           | 2,339,735 | 3,245,174  | 3,245,174  | 3,245,174  |  |  |  |
| WASTE             | Waste generated outside city (III.X.3)            |                                 |           |           |            |            |            |  |  |  |
| IPPU              | (all IV emissions)                                | 2,692,440                       |           |           |            | 2,692,440  | 2,692,440  |  |  |  |
| AFOLU             | (all V emissions)                                 | 20,821                          |           |           |            | 20,821     | 20,821     |  |  |  |
| OTHER SCOPE 3     | (all VI emissions)                                |                                 |           |           |            |            |            |  |  |  |
| TOTAL             |   |                                 | 1,934,328 | 3,869,733 | 18,025,230 | 22,268,490 | 22,268,490 |  |  |  |

Territorial (scope 1) total

BASIC BASIC total + total

#### OVERVIEW (GPC CHAPTER 4.4, TABLE 4.2, PAGE 41)

| NAME OF CITY:<br>LEVEL:<br>INVENTORY YEAR: |   |           | POPULATION:<br>LAND AREA (km2):<br>GDP (US\$ million): |         |            | 7,390,900<br>3,329<br>26,500 |            |  |  |  |  |
|--|---|-----------|--|---------|------------|------------------------------|------------|--|--|--|--|
|  |   |           | Total GHGs (metric tonnes CO2e)                        |         |            |                              |            |  |  |  |  |
|  | GHG Emissions Source (By Sector)                  | Scope 1   | Scope 2  | Scope 3 | BASIC      | BASIC+                       | BASIC+ S3  |  |  |  |  |
|  | Energy use (all emissions except 1.4.4)           | 717,906   | 11,187,289   |         | 11,905,194 | 11,905,194                   | 11,905,194 |  |  |  |  |
| STATIONARY ENERGY                          | Energy generation supplied to the grid (I.4.4)    |           |  |         |            |                              |            |  |  |  |  |
| TRANSPORTATION                             | (all II emissions)                                | 265,384   |  |         | 265,384    | 265,384                      | 265,384    |  |  |  |  |
|  | Waste generated in the city (III.X.1 and III.X.2) | 2,052,858 |  |         | 2,052,858  | 2,052,858                    | 2,052,858  |  |  |  |  |
| WASTE                                      | Waste generated outside city (III.X.3)            |           |  |         |            |                              |            |  |  |  |  |
| IPPU                                       | (all IV emissions)                                |           |  |         |            |                              |            |  |  |  |  |
| AFOLU                                      | (all V emissions)                                 | 492,042   |  |         |            | 492,042                      | 492,042    |  |  |  |  |
| OTHER SCOPE 3                              | (all VI emissions)                                |           |  |         |            |                              |            |  |  |  |  |
| TOTAL                                      |   |           | 11,187,289   |         | 14,223,437 | 14,715,479                   | 14,715,479 |  |  |  |  |

| CDC         |   | Total GHGs (metric tonnes CO <sub>2</sub> e) |            |         |            |  |  |  |
|-------------|---|--|------------|---------|------------|--|--|--|
| GPC ref No. | GHG Emissions Source (By Sector and Sub-sector)                                 | Scope 1                                      | Scope 2    | Scope 3 | Total      |  |  |  |
| 1           | STATIONARY ENERGY   |  |            |         |            |  |  |  |
| 1.1         | Residential buildings   | 407,780                                      | 6,387,844  | NE      | 6,795,624  |  |  |  |
| 1.2         | Commercial and institutional buildings and facilities                           | 296,283                                      | 1,310,348  | NE      | 1,606,631  |  |  |  |
| 1.3         | Manufacturing industries and construction                                       | 11,053                                       | 3,489,097  | NE      | 3,500,149  |  |  |  |
| 1.4.1/2/3   | Energy industries   |  |            | NE      |            |  |  |  |
| 1.4.4       | Energy generation supplied to the grid  |  |            |         |            |  |  |  |
| 1.5         | Agriculture, forestry and fishing activities                                    | 2,789  | 1          | NE      | 2,790      |  |  |  |
| 1.6         | Non-specified sources   | NO   | NO         | NE      |            |  |  |  |
| 1.7         | Fugitive emissions from mining, processing, storage, and transportation of coal | NO   |            |         |            |  |  |  |
| 1.8         | Fugitive emissions from oil and natural gas systems                             | 0  |            |         | 0          |  |  |  |
| SUB-TOTAL   | (city induced framework only)   | 717,906                                      | 11,187,289 |         | 11,905,194 |  |  |  |
| Ш           | TRANSPORTATION  |  |            |         |            |  |  |  |
| II.1        | On-road transportation  | 265,384                                      | IE         | NE      | 265,384    |  |  |  |
| II.2        | Railways  | IE   | NO         | NE      |            |  |  |  |
| II.3        | Waterborne navigation   | IE   | NO         | NE      |            |  |  |  |
| 11.4        | Aviation  | IE   | NO         | NE      |            |  |  |  |
| 11.5        | Off-road transportation   | IE   | NO         | NE      |            |  |  |  |
| SUB-TOTAL   | (city induced framework only)   | 265,384                                      |            |         | 265,384    |  |  |  |
| ш           | WASTE   |  |            |         |            |  |  |  |
| III.1.1/2   | Solid waste generated in the city   | 953,736                                      |            | IE      | 953,736    |  |  |  |
| III.2.1/2   | Biological waste generated in the city  | NO   |            | NO      |            |  |  |  |
| III.3.1/2   | Incinerated and burned waste generated in the city                              | 123,000                                      |            | IE      | 123,000    |  |  |  |
| III.4.1/2   | Wastewater generated in the city  | 976,122                                      |            | IE      | 976,122    |  |  |  |
| III.1.3     | Solid waste generated outside the city  | NO   |            |         |            |  |  |  |
| III.2.3     | Biological waste generated outside the city                                     | NO   |            |         |            |  |  |  |
| III.3.3     | Incinerated and burned waste generated outside city                             | NO   |            |         |            |  |  |  |
| III.4.3     | Wastewater generated outside the city   | NO   |            |         |            |  |  |  |
| SUB-TOTAL   | (city induced framework only)   | 2,052,858                                    |            |         | 2,052,858  |  |  |  |
| IV          | INDUSTRIAL PROCESSES and PRODUCT USES   |  |            |         |            |  |  |  |
| IV.1        | Emissions from industrial processes occurring in the city boundary              | NE   |            |         |            |  |  |  |
| IV.2        | Emissions from product use occurring within the city boundary                   | NE   |            |         |            |  |  |  |
| SUB-TOTAL   | (city induced framework only)   |  |            |         |            |  |  |  |
| v           | AGRICULTURE, FORESTRY and OTHER LAND USE  |  |            |         |            |  |  |  |
| V.1         | Emissions from livestock  | 492,042                                      |            |         | 492,042    |  |  |  |
| V.2         | Emissions from land   | NE   |            |         |            |  |  |  |
| V.3         | Emissions from aggregate sources and non-CO2 emission sources on land           | NE   |            |         |            |  |  |  |
| SUB-TOTAL   | (city induced framework only)   | 492,042                                      |            |         | 492,042    |  |  |  |
| VI          | OTHER SCOPE 3   |  |            |         |            |  |  |  |
| VI.1        | Other Scope 3   |  |            | NE      |            |  |  |  |
| TOTAL       | (city induced framework only)   | 3,528,190                                    | 11,187,289 |         | 14,715,479 |  |  |  |

GPC GHG Summary Graphs



PASIC/PASIC: by subcostor and





#### 4.a. CRF Output Table

The Global Covenant of Mayors requires committed cities to report their inventories in the format of the new Common Reporting Framework (CRF). Use the following table to report your emissions from CIRIS in the format of the CRF to the 'City-wide GHG Emissions' section of the CDP-ICLEI Unified Reporting System.

|  | Direct Emissions (tCO2e) |                             | Indirect emissions from the use of<br>grid-supplied electricity, heat, steam<br>and/or cooling |                             | Emissions occurri<br>boundary as a<br>acti | ing outside the city<br>result of in-city<br>vities | Please explain any excluded sources, identify any emissions covered |
|--|--------------------------|-----------------------------|--|-----------------------------|--|---|---|
| Sectors and Sub-Sectors  | Emissions in<br>tCO2e    | Notation key<br>(if needed) | Emissions in<br>tCO2e  | Notation Key (if<br>needed) | Emissions in<br>tCO2e                      | Notation key (if<br>needed)                         | under an ETS and provide any other comments                         |
| Stationary energy > Residential buildings                        | 3,701,872                |                             | 2,365,743  |                             | -  | NE  |   |
| Stationary energy > Commercial buildings & facilities            | -                        | NO                          | 2,236,572  |                             | -  | NE  |   |
| Stationary energy > Institutional buildings & facilities         | -                        | NO                          |  | IE                          | -  | NE  |   |
| Stationary energy > Industrial buildings & facilities            | 4,565,432                |                             | -  | NO                          | -  | NE  |   |
| Stationary energy > Agriculture                                  | -                        | NO                          |  | NO                          | -  | NE  |   |
| Stationary energy > Fugitive emissions                           | 3,454                    |                             |  |                             |  | NE  |   |
| Fotal Stationary Energy  | 8,270,758                |                             | 4,602,315  |                             | -  | NE  |   |
| Fransportation > On-road   | -                        | NO                          | -  | NO                          | -  | NE  |   |
| Fransportation > Rail  | -                        | NO                          |  | NO                          | -  | NE  |   |
| ransportation > Waterborne navigation                            |                          | NO                          | -  | NO                          | -  | NE  |   |
| Fransportation > Aviation  | -                        | NO                          |  | NO                          | -  | NE  |   |
| ransportation > Off-road   | -                        | NO                          | -  | NO                          | -  | NE  |   |
| Fotal Transport  | -                        | NO                          |  | NO                          | -  | NE  |   |
| Waste > Solid waste disposal                                     |                          | NO                          |  |                             | -  | NO  |   |
| Waste > Biological treatment                                     |                          | NO                          |  |                             |  | NO  |   |
| Waste > Incineration and open burning                            | -                        | NO                          |  |                             | -  | NO  |   |
| Waste > Wastewater   |                          | NO                          |  |                             |  | NO  |   |
| Fotal Waste  | -                        | NO                          |  |                             | -  | NO  |   |
| PPU > Industrial process   |                          | NE                          |  |                             |  | NE  |   |
| PPU > Produce Use  | -                        | NE                          |  |                             |  | NE  |   |
| Total IPPU   | -                        | NE                          |  |                             | -  | NE  |   |
| AFOLU > Livestock  |                          | NE                          |  |                             |  | NE  |   |
| AFOLU > Land use   |                          | NE                          |  |                             |  | NE  |   |
| AFOLU > Other AFOLU  | -                        | NE                          |  |                             |  | NE  |   |
| Total AFOLU  | -                        | NE                          |  |                             | -  | NE  |   |
| Generation of grid-supplied energy > Electricity-only generation | 904,546                  |                             |  |                             |  | NE  |   |
| Seneration of grid-supplied energy > CHP generation              | -                        | IE                          |  |                             |  | NE  |   |
| Seneration of grid-supplied energy > Heat/cold generation        | -                        | NO                          |  |                             |  | NE  |   |
| Seneration of grid-supplied energy > Local renewable generation  |                          | NO                          |  |                             |  | NE  |   |
| Total Generation of grid-supplied energy                         | 904,546                  |                             |  |                             |  |   |   |
| Total Emissions (excluding generation of grid-supplied energy)   | 8,270,758                |                             | 4,602,315  |                             | -  | NE  |   |

|       | Introduction | Set-up | Inventory | Calculators | Results       | Notes      |
|-------|--------------|--------|-----------|-------------|---------------|------------|
| LIKIS | Summary      | Graphs | Overview  | Analysis    | Net emissions | GCoM - CRF |
|       |              |        |           |             |               |            |

#### NET EMISSIONS (GPC CHAPTER 4.3, PAGE 40)

If your city has a net emissions GHG reduction target, please use the tables below to record your emission credits and allocate these to a sector. The "Add" function allows you to select the required number of rows for each type of emission credit. The summary table will then show your city's net emissions according to the GPC framework. For more information, please refer to Chapter 4.3 in the GPC.

#### Scope 2 emissions based on market-based method

This reflects any electricity (or other gird-connected energy) products or programmes that city consumers (individuals, businesses and local government) participate in, generally provided by the electricity supplier(s) serving the city. See GPC Chapter 6.5.1 (Page 67) for a description on how to report this.

| Contractive Historyment or program type | Quantity  | of energy | Emissio | n factor | *00.0 | Allegate to contex |                    |  |  |
|---|---|-----------|---------|----------|-------|--------------------|--------------------|--|--|
| Contractuar instrument or program type  |   | Amount    | Units   | Amount   | Units | 10020              | Allocate to sector |  |  |
| 1                                       |   |           |         |          |       |                    |                    |  |  |
|   | IOTAL market-based scope 2 emissions (in tCO2e) |           |         |          |       |                    |                    |  |  |

#### Offset credit transactions

If offset credits are generated in the geographic boundary and sold, these should be documented in the first table and will be *added* to the reported inventory results. Any offsets purchased from outside the geographic boundary (e.g. to meet a city reduction target) should be reported in the second table and will be *deducted* from the reported inventory results.

#### Offset credits generated within the geographic boundary and sold

|   | Name of programme / description                        | Date of sale | tCO <sub>2</sub> e | Allocate to sector |
|---|--|--------------|--------------------|--------------------|
| d |  |              |                    |                    |
|   | TOTAL inboundary offset credit transactions (in tCO2e) |              |                    |                    |

#### Offset credits purchased from outside the geographic boundary

| Name of programme / description                             | Date of retirement | tCO2e | Allocate to sector |
|---|--------------------|-------|--------------------|
|   |                    |       |                    |
| TOTAL out of boundary offset credit transactions (in tCO2e) |                    |       |                    |

#### Renewable energy production or investments

This table records renewable energy generation (in MWh or kWh) produced within the geographic boundary, or reflecting an investment by the city outside the city boundary (e.g. offshore wind) that otherwise only indirectly impacts scope 2 emissions (through a lower grid average emission factor) and that would not be visible in scope 1 emissions for energy generation (due to their zero emissions).

| Technology type                             | Energy supplied to grid Amount Units                        |       | Located in % outside |          | Banchmark anorau cource | Emissio | n factor    | Correction | +00-0     | Allocate to conter |  |
|---|---|-------|----------------------|----------|-------------------------|---------|-------------|------------|-----------|--------------------|--|
| rechnology type                             |   |       | boundary?            | boundary | benchmark energy source | Amount  | Units       | (tCO2e)    | 10020     | Allocate to sector |  |
|   |   |       |                      |          |                         |         |             |            |           |                    |  |
| TOTAL renewable energy production or invest | 10TAL renewable energy production or investments (in tCO2e) |       |                      |          |                         |         |             |            |           |                    |  |
|   |   |       |                      |          |                         |         |             |            |           |                    |  |
| Results 🔒 Res                               | ults_Summ   | ary 🥤 | Results_G            | iraphs   | Results_Overview        | 🔒 Re    | sults_Analy | /sis       | Results_N | let emissions      | GIN GINE GINE GINE GINE GINE GINE GINE G |

### Demonstration



## Module G CIRIS

03

**Practical Part A** 

## Practical

|   | Task: Create a draft GHG inventory in CIRIS for your city                                   |
|---|---|
| 1 | Define your inventory boundary  |
| 2 | Define your data sources and emission factors   |
| 3 | Update Stationary energy with data from Table A. Use notation keys for all other activities |
| 4 | Update Transportation with data from Table B. Use notation keys for all other activities    |
| 5 | Update Waste with data from Table C. Use notation keys for all other activities             |
| 6 | Complete data quality assessment  |
| 7 | Review your results. Congratulations! You've completed a GPC inventory                      |

## Set-up: City information

Name of city / Country / Region

Inventory year

Geographic boundary

Land area (km<sup>2</sup>) / Population / GDP (US\$)

GPC reporting level

GHGs

GWP



MALAYSIA THIRD BIENNIAL UPDATE REPORT TO THE UNFCCC

Source: Malaysia Third Biennial Update Report to the UNFCCC

### Set-up: Data sources



### **Biennial Update Reports (BURs)**

Data: BUR3

Name of source: Malaysia Third Biennial Update Report to the UNFCCC

Provider: Ministry of Environment and Water

Latest year: 2016

Period: Calendar year

Frequency: Every two years

Scale: National

Link: https://unfccc.int/sites/default/files/resource/MAL AYSIA\_BUR3-UNFCCC\_Submission.pdf



THIRD BIENNIAL UPDATE REPORT TO THE UNFCCC

Source: Malaysia Third Biennial Update Report to the UNFCCC

## National Energy Balance (NEB)

Data: NEB 2017

Name of source: National Energy Balance 2017

Provider: Malaysia Energy Information Hub (MEIH), Energy Commission (EC) of Malaysia

Latest year: 2017

Period: Calendar year

Frequency: Every year

Scale: National

Link: https://meih.st.gov.my/



Source: https://meih.st.gov.my/documents/10620/f2f4c39b-4748-4c5d-b90a-fc36ba880264

## National Energy Balance (NEB)

Data: CDM 2017

Name of source: 2017 CDM Electricity Baseline for Malaysia

Provider: Malaysian Green Technology Corporation

Latest year: 2017

Period: Calendar year

Frequency: Every year

Scale: National

Link: https://www.mgtc.gov.my/wpcontent/uploads/2019/12/2017-CDM-Electricity-Baseline-Final-Report-Publication-Version.pdf



Source: Greentech 2017 CDM electricity baseline for Malaysia

## Set-up: Emission factors

|   |          | Fuel                    | CO2               | CH4              | N2O               | Source   |
|---|----------|-------------------------|-------------------|------------------|-------------------|----------|
|   | BUR3     | LPG                     | 63.1<br>tCO2/TJ   | 0.001<br>tCH4/TJ | 0.0001<br>tN2O/TJ | BUR3     |
| MALAYSIA<br>THIRD BIENNIAL UPDATE REPORT<br>TO THE UNFCCC |          | Natural gas             | 56.1<br>tCO2/TJ   | 0.001<br>tCH4/TJ | 0.0001<br>tN2O/TJ | BUR3     |
|   |          | Diesel (stationary)     | 74.1<br>tCO2/TJ   | 0.003<br>tCH4/TJ | 0.0006<br>tN2O/TJ | BUR3     |
| 2017 CDM  |          | Diesel (transportation) | 74.1<br>tCO2/TJ   | 0.039<br>tCH4/TJ | 0.0039<br>tN2O/TJ | BUR3     |
| ELECTRICITY<br>BASELINE<br>FOR MALAYSIA                   | CDM 2017 | Petrol / Gasoline       | 69.3<br>tCO2/TJ   | 0.033<br>tCH4/TJ | 0.0032<br>tN2O/TJ | BUR3     |
| Properties Multiplinis Grows Technology Organistics       |          | Electricity             | 0.585<br>tCO2/MWH |                  |                   | CDM 2017 |

### Table A: Stationary energy

|     | Sub-sector  | Activity    | AD        | Source   | EF  | Source   | GHG       | Source           |
|-----|---|-------------|-----------|----------|---|----------|-----------|------------------|
| l.1 | Residential buildings                                 | LPG         | 3 000 TJ  | NEB 2017 | 63.1 tCO2/TJ<br>0.001 tCH4/TJ<br>0.0001 tN2O/TJ | BUR3     |           |                  |
|     |   | Electricity | 6 000 TJ  | NEB 2017 | 0.585 tCO2/ <b>MWh</b>                          | CDM 2017 |           |                  |
| l.2 | Commercial and institutional buildings and facilities | LPG         | 2 000 TJ  | NEB 2017 | 63.1 tCO2/TJ<br>0.001 tCH4/TJ<br>0.0001 tN2O/TJ | BUR3     |           |                  |
|     |   | Electricity | 15 000 TJ | NED 2017 | 0.585 tCO2/ <b>MWh</b>                          | CDM 2017 |           |                  |
|     | Manufacturing industries<br>and construction          | Natural gas | 500 TJ    | NEB 2017 | 56.1 tCO2/TJ<br>0.001 tCH4/TJ<br>0.0001 tN2O/TJ | BUR3     |           |                  |
| 1.3 |   | Diesel      | 500 TJ    | NED 2017 | 74.1 tCO2/TJ<br>0.003 tCH4/TJ<br>0.0006 tN2O/TJ |          |           |                  |
|     |   | Electricity | 4 000 TJ  | NED 2017 | 0.585 tCO2/ <b>MWh</b>                          | CDM 2017 |           |                  |
| 1.8 | Fugitive emissions from oil and gas systems           | Natural gas | 500 TJ    | NEB 2017 |   |          | 671 tCO2e | CIRIS calculator |

### Table A: Stationary energy

|     | Sub-sector   | Activity    | AD        | Source   | EF  | Source   | GHG       | Source           |
|-----|--|-------------|-----------|----------|---|----------|-----------|------------------|
| I.1 | Residential buildings                                    | LPG         | 3 000 TJ  | NEB 2017 | 63.1 tCO2/TJ<br>0.001 tCH4/TJ<br>0.0001 tN2O/TJ   | BUR3     |           |                  |
|     |  | Electricity | 6 000 TJ  | NEB 2017 | 0.585 tCO2/MWh                                    | CDM 2017 |           |                  |
| 1.2 | Commercial and institutional<br>buildings and facilities | LPG         | 2 000 TJ  | NEB 2017 | 63.1 tCO2 TJ<br>0.001 tCH 4/TJ<br>0.0001 tN 2O/TJ | BUR3     |           |                  |
|     |  | Electricity | 15 000 TJ | NED 2017 | 0.585 tCC 2/ <b>MWh</b>                           | CDM 2017 |           |                  |
|     | Manufacturing industries<br>and construction             | Natural gas | 500 TJ    | NEB 2017 | 56.1 tCO2/TJ<br>0.001 iCF 4/TJ<br>0.0001 th 2O/TJ | BUR3     |           |                  |
| 1.3 |  | Diesel      | 500 TJ    | NED 2017 | 74.1/tCO2/TJ<br>0.003/CH4/TJ<br>0.0007/tN2O/TJ    |          |           |                  |
|     |  | Electricity | 4 000 TJ  | NED 2017 | 0.585,tCO2/ <b>MWh</b>                            | CDM 2017 |           |                  |
| I.8 | Fugitive emissions from oil and gas systems              | Natural gas | 500 TJ    | NEB 2017 |   |          | 671 tCO2e | CIRIS calculator |

If units AD ≠ units EF >>> use Activity data unit converter

## Table B: Transportation

|      | Sub-sector             | Fleet    | Method                | Activity          | AD         | Source             | EF  | Source   |
|------|------------------------|----------|-----------------------|-------------------|------------|--------------------|---|----------|
| II.1 | On-road transportation | Multiple | Fuel sales approach   | Diesel            | 15 000 TJ  | 15 000 TJ NEB 2017 |   | BUR3     |
|      |                        | Multiple | Fuel sales approach   | Petrol / Gasoline | 25 000 TJ  | NEB 2017           | 69.3 tCO2/TJ<br>0.033 tCH4/TJ<br>0.0032 tN2O/TJ | BUR3     |
| II.2 | Railways               | Public   | City-induced activity | Electricity       | 70 000 MWh | BUR3               | 0.585 tCO2/MWh                                  | CDM 2017 |

### Table 3: Waste

|       | Sub-sector                       | Treatment type           | Type of waste     | AD            | Source | EF | Source | GHG           | Source |
|-------|----------------------------------|--------------------------|-------------------|---------------|--------|----|--------|---------------|--------|
| III.1 | Solid waste                      | Landfill - MC            | All waste         | 60 000 tonnes |        |    |        | 400 000 tCO2e | CIRIS  |
| III.2 | Biological treatment             | All organic waste        | All organic waste | 140 tonnes    |        |    |        | 10 tCO2e      | CIRIS  |
| III.3 | Incineration and open<br>burning | Waste incineration       | All waste         | 5000 tonnes   |        |    |        | 2 000 tCO2e   | CIRIS  |
| 111.4 | Wastewater                       | Domestic waste-<br>water |                   |               |        |    |        | 150 000 tCO2e | CIRIS  |

Assume all waste is generated inboundary, but treated outside of the city boundary

## Results: Summary

| tCO2e | BASIC          | Scope 1   | Scope 2   | Scope 3 |  |
|-------|----------------|-----------|-----------|---------|--|
|       | Stationary     | 381.028   | 4.062.500 |         | 4.443.5  |
|       | Transportation | 2.911.523 | 40.950    |         | 2.952,473  |
| Ť     | Waste          |           |           | 552.010 | 552.010  |
|       | IPPU           |           |           |         | 0  |
|       | AFOLU          |           |           |         | 0  |
| Ŵ     | Other Scope 3  |           |           |         | 0  |
| 0     | TOTAL          |           | 7.948.011 |         | 0 1.000.000 2.000.000 3.000.000 4.000.000 5.000<br>tonnes CO2e |

## Congratulations





## Module G CIRIS

04

### **Practical Part B**

### Practical

Task: Create a draft GHG inventory in CIRIS for your city using your workbook data

- 1 Define your inventory boundary
- 2 Define your data sources and emission factors
- 3 Add **IPPU** and **AFOLU** with data from Module F. Use notation keys for all other activities
- 4 Update Stationary energy with data from Module C. Use notation keys for all other activities
- 5 Update Transportation with data from Module D. Use notation keys for all other activities
  - 6 Update Waste with data from Module E, choosing your preferred methodology (CIRIS, scaled national data, proxy city). Use notation keys for all other activities
- 7 Complete data quality assessment
- 8 Review your results. Do the results make sense to you? Are they what you expected?

### Table 4: IPPU and AFOLU

|      | Sub-sector  | Industry                                | Product use | AD | Source | EF | Source | GHG     | Source |
|------|-------------|---|-------------|----|--------|----|--------|---------|--------|
| IV.2 | Product use | Electronics<br>industry                 | -           |    |        |    |        | ? tCO2e | BUR3   |
|      |             | Product uses as subtitutes for ODS      | -           |    |        |    |        | ? tCO2e | BUR3   |
|      |             | Other product<br>manufacture and<br>use | -           |    |        |    |        | ? tCO2e | BUR3   |

|     | Sub-sector | Activity      | Description             | AD | Source | EF | Source | GHG     | Source |
|-----|------------|---------------|-------------------------|----|--------|----|--------|---------|--------|
| V.1 | Livestock  | All livestock | Enteric<br>fermentation |    |        |    |        | ? tCO2e | BUR3   |
|     |            | All livestock | Manure<br>management    |    |        |    |        | ? tCO2e | BUR3   |

!!! Don't forget to remove any default notation keys used

### Results: Summary



### Results: Summary

| ,                                | CUG Emissions Source (By Sector)                  | Total GHGs (metric tonnes CO2e) |           |         |           |           |           |  |  |
|----------------------------------|---|---------------------------------|-----------|---------|-----------|-----------|-----------|--|--|
|                                  | and emissions source (by sector)                  | Scope 1                         | Scope 2   | Scope 3 | BASIC     | BASIC+    | BASIC+ S3 |  |  |
| STATIONARY ENERGY                | Energy use (all emissions except I.4.4)           | 381.028                         | 4.062.500 |         | 4.443.528 | 4.443.528 | 4.443.528 |  |  |
| STATIONART ENERGT                | Energy generation supplied to the grid (I.4.4)    |                                 |           |         |           |           |           |  |  |
| TRANSPORTATION                   | (all II emissions)                                | 2.911.523                       | 40.950    |         | 2.952.473 | 2.952.473 | 2.952.473 |  |  |
| MACTE                            | Waste generated in the city (III.X.1 and III.X.2) |                                 |           | 552.010 | 552.010   | 552.010   | 552.010   |  |  |
| WASTE                            | Waste generated outside city (III.X.3)            |                                 |           |         |           |           |           |  |  |
| IPPU                             | (all IV emissions)                                | 203.512                         |           |         |           | 203.512   | 203.512   |  |  |
| AFOLU                            | (all V emissions)                                 | 27.210                          |           |         |           | 27.210    | 27.210    |  |  |
| OTHER SCOPE 3 (all VI emissions) |   |                                 |           |         |           |           |           |  |  |
| TOTAL                            |   |                                 | 4.103.450 | 552.010 | 7.948.011 | 8.178.733 | 8.178.733 |  |  |



### Practical

Task: Create a draft GHG inventory in CIRIS for your city using your workbook data

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- 2 Define your data sources and emission factors
- 3 Add IPPU and AFOLU with data from Module F. Use notation keys for all other activities
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- 5 Update Transportation with data from Module D. Use notation keys for all other activities
  - 6 Update Waste with data from Module E, choosing your preferred methodology (CIRIS, scaled national data, proxy city). Use notation keys for all other activities
- 7 Complete data quality assessment
- 8 Review your results. Do the results make sense to you? Are they what you expected?

# 03 SUMMARY

Module G: CIRIS





## The end

Next time: Inventory management