
User Manual

Footprint Manager of the State Government of Yucatan

Elaborated by:



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Content

Governor’s speech	6
Introduction	7
Background	8
Carbon Management Plan	8
Sustainable Footprint Initiative.....	8
General Objective	9
Carbon Footprint Manager	10
Greenhouse Gas Protocol	10
Scope and Limits	10
Methodology.....	11
Emissions Report.....	13
Emissions reported to the Carbon Footprint Manager	16
Emissions by Scope 1	16
Emissions by Scope 2	17
Access to the system	18
Link to the system	18
Use of the tool	19
General User	19
System architecture	19
Entering data.....	21
User Administrator	27
System Architecture.....	27
Administrator Setup	27
Year Setup	28
Conversion factor Setup	28
Emission factor Setup	28
User Setup	29
Administration synthesis	29
Submission Status	29
Validation	29
Results	31
Carbon Dashboard	31
Outputs	32
Logout	34
Governmental Reporting Mechanism	36
How to collect the information?.....	37

Figures

Figure 1 Commitment sign of the "Sustainable Footprint" Program	9
Figure 2 Stages of the Program "Sustainable Footprint"	9
Figure 3 Service of the Footprint Manager	11
Figure 4 GHG emissions according to its scope	13
Figure 5 Login Screen	18
Figure 6 Change password	19
Figure 7 System Architecture	20
Figure 8 Standard and synthesis sheets	20
Figure 9 Reports	21
Figure 10 Entering Data	22
Figure 11 Purchased energy data	22
Figure 12 Company vehicle data	23
Figure 13 Year Selection	23
Figure 14 Entering fuel and electricity data	24
Figure 15 Uploading Documents	25
Figure 16 Select file	25
Figure 17 Relevant file	26
Figure 18 Upload document	26
Figure 19 Comments	27
Figure 20 Administrator User Setup	27
Figure 21 Administrator Setup sheet	28
Figure 22 Administration synthesis	29
Figure 23 Submission information	30
Figure 24 Validation	30
Figure 25 Results Graphs	32
Figure 26 GHG emissions by scope	33
Figure 27 GHG emissions by scope	34
Figure 28 Log out	35
Figure 29 Entering data energy consumption	37
Figure 30 Entering data fuel consumption	38

Tables

Table 1 Example of calculation of equivalent CO ₂ emissions for mobile sources	14
Table 2 Examples of Global Warming Potential (GWP)	15
Table 3: Calculation of the equivalences of each gas in CO ₂ using the GWP.....	15
Table 4 Equivalencias de cada gas en CO ₂	15
Table 5 Calculation of indirect CO ₂ e emissions from electric power consumption	16

Governor's speech

The State Government of Yucatan shares the global concern about climate change and recognizes the need to participate in the effort to address and contain its effects. Therefore, to be a leading government in sustainable energy and mitigation of climate change, we have proposed to reduce greenhouse gas emissions that are generated directly or indirectly by the State Public Administration. This will only be achieved with the effort, support and commitment of all government institutions.

In this regard, it is essential to use a tool to monitor the performance of our emissions reductions, for which we have developed a Web Platform for the Monitoring of the Carbon Management Plan of the State Government of Yucatan.

This project would not have been possible without the support of the States & Regions Alliance-Future Fund, and in particular, we thank the governments of Ontario, Quebec, Scotland, South Australia and Wales and our colleagues from the States & Regions Alliance for contributing to the development of this project. This will contribute to reach the established mitigation goals of the State, as well as in the promotion of the transparency of results in the reduction of GHG emissions both locally and internationally.



Introduction

Yucatan has been recognized as one of the states in Mexico with the greatest initiative and commitment in the battle against climate change. An example of its leadership is the development and implementation of important public policy instruments, such as the Special Program of Climate Change Action of the State of Yucatan (PEACC), which has contributed to the analysis of the main sources of Greenhouse Gases (GHG) emissions and the delimitation of priority actions to achieve the gradual transformation of the State towards a sustainable low emission economy. Another great example is the definition of long-term goals (vision 2030), binding to national dispositions on mitigation and adaptation; as well as to the international agreements of the United Nations Framework Convention on Climate Change (UNFCCC).

In terms of mitigation, the energy sector has been identified as a key piece for large reductions of GHG emissions, being responsible for 55.27% of the total of the 10,866,538 tCO₂e emitted annually by the State. The government has promoted its attention through two aspects:

State Strategy for Sustainable Energy of the State of Yucatan



- This Instrument integrates the national energy reform and the environmental, social and economic conditions of the State to generate a roadmap that illustrates the sustainable growth of this sector, incorporating as central axes the promotion of investment in renewable energies and energy efficiency.

Yucatan's Carbon Management Plan



- It is a public policy mitigation instrument developed with the financial support of the British Embassy through the Prosperity Fund, and with technical assistance of Carbon Trust, an international organization. The objective of this instrument is to mitigate the impact of public management on climate change through energy efficiency practices and renewable energies.
- The main goal is to **reduce 10% of greenhouse gas emissions generated directly or indirectly by the use of energy from fossil fuels in the buildings of the public sector by 2020 with respect to 2015.**

Background

Carbon Management Plan

The Carbon Management Plan establishes actions to reduce the consumption of electric power in public buildings and the consumption of gasoline and diesel in the vehicle fleet of the state public administration in a period of five years. The identification of energy efficiency opportunities and the implementation of cost-effective measures will allow the state government to reduce 10% of the GHG emissions generated directly or indirectly using energy from fossil fuels in the public buildings by 2020.

This public policy instrument incorporates an analysis of the direct (Scope 1) and indirect (Scope 2) carbon emissions of 2015, derived from the fuel consumption of the state-owned vehicle fleet with an approximate value of 45,290 tons of CO₂e, and from the use of electricity in public buildings with a value of 38,966 tons of CO₂e. This led to the definition of a baseline of 84,257 tons of CO₂e, which percentage value of Scope 1 is 53.8% and 46.2 % of Scope 2.

Moreover, the annual costs associated with the use of fuel in the vehicle fleet and electricity consumption in buildings were calculated with the same base year. These costs ascended to 403,908.646 million pesos, equivalent to 63% of the cost for Scope 1 and 37% for Scope 2. The fuel consumption generated a cost of \$256, 120,383 million pesos and the electricity consumption a value of \$147, 788,263 million pesos.

One of the main highlights of the evaluation of energy consumption of public buildings and state-owned facilities is that facilities for the provision of drinking water, offices, hospitals, water treatment plants, schools (high school level), as well as sports units were identified as the main emitters of GHG.

To achieve the reduction of GHG emissions, the plan delimits the implementation of energy efficiency actions in coordination with 20 state government institutions, which were identified with the greatest contribution to GHG emissions. As well as the implementation of potential projects of renewable energy.

Sustainable Footprint Initiative

The State has formalized its commitment to reduce the emissions produced by the governmental sector, starting in 2017 with the implementation phase of the Carbon Management Plan through the "Sustainable Footprint: Actions that set the course of the planet" program sponsored by the constitutional Governor, Rolando Rodrigo Zapata Bello (figure 1)



Figure 1 Commitment sign of the "Sustainable Footprint" Program
Source: SEDUMA

This program promotes energy efficiency and the efficient use of material resources within public buildings through the implementation of 4 stages (figure 2) of work that include the training of public officials, the implementation of actions that reduce energy consumption at the institutional level and the efficient use of paper, as well as mechanisms for monitoring and evaluating results.

Through these actions, the state government seeks to highlight and potentiate the benefits of the efficient use of energy resources, as well as to promote the gradual transition towards the use of renewable energies within the public administration.



Figure 2 Stages of the Program "Sustainable Footprint"
Source: SEDUMA

General Objective

The objective of this document is to describe in detail the operation of the "Web Platform for Carbon Footprint Manager". The platform is a tool based on a Service Software (Saas, for its acronym in English) developed by the Carbon Trust under the name of Footprint Manager.

With this tool the Government of Yucatán will seek to estimate its CO₂ emissions to contribute to the national mitigation goals.

Carbon Footprint Manager

In accordance with the Greenhouse Gas (GHG) Protocol, the tool allows the calculation and registry of direct (Scope 1) and indirect (Scope 2) emissions.

The Footprint Manager calculates carbon emissions for the following sources:

- Purchased energy
- Government fleet of vehicles

Greenhouse Gas Protocol

The Greenhouse Gas Protocol (GHG Protocol) is the world's most used greenhouse gas accounting standard by governments and business leaders to understand, quantify and manage greenhouse gas emissions.

The GHG Reporting programs provide a platform to collect emissions data from different entities and help to integrate the measurement and reporting of emissions. Mexico is one of the 40 countries that has a mandatory GHG reporting system.

Under this scenario, the question that arises is: why is it important to establish an emissions reporting system? Therefore, it is established that it:

- Facilitates the formulation of realistic and effective policies by analysing emissions in different level (entity, sector or economy-wide).
- Supports policies and regulations such as emissions trading schemes that require very detailed data.
- Provides information to stakeholders to facilitate their participation.
- Reports national inventories to international organizations (United Nations Framework Convention on Climate Change.)

Scope and Limits

The Footprint Manager calculates the emissions of greenhouse gases from the buildings and processes of the centralized and decentralized public administration of the State Government of Yucatan, of which they have full authority to introduce and implement policies about real estate and processes. The tool will make it possible to manage data online, as well as to measure and monitor the environmental performance of its dependencies and its users (figure 3). In Carbon Trust's experience, organizations can reduce their energy costs up to 20% through regular energy monitoring and simple energy efficiency measures.



Figure 3 Service of the Footprint Manager
Fuente: The Carbon Trust

Methodology

The Footprint Manager is based on the methodology of the Greenhouse Gases Protocol, a recognized international accounting tool, accepted and used by governments and business leaders to understand, quantify and manage greenhouse gas (GHG) emissions.

Classification of the emissions according to their scope

Scope 1: Direct GHG emissions.

Companies report as Scope 1 the direct GHG emissions from their own or controlled sources. Direct GHG emissions are mainly the result of the following type of activities:

- Generation of electricity, heat or steam. These emissions result from the combustion of fuels in fixed sources: boilers, furnaces, turbines, etc.
- Physical or chemical processes. Most of these emissions result from the manufacture or processing of chemicals and materials, such as cement, aluminium, adipic acid, ammonia manufacturing, and waste processing.
- Transport of materials, products, waste and employees. These emissions result from the combustion of fuels in mobile sources that are owned or controlled by the company: trucks, trains, ships, airplanes, buses and automobiles.
- Fugitive emissions. These emissions result from intentional or unintentional releases, such as leaks in gaskets, seals or packaging of equipment; methane emissions from coal mines and hydrofluorocarbon emissions (HFCs) from air conditioning and refrigeration equipment; and methane leaks in gas transport.

Scope 2: Indirect GHG emissions

Companies report as Scope 2 the emissions produced by the generation of electricity, heat or steam acquired that is consumed in their operations or in their owned or controlled equipment. Scope 2 emissions are a special category of indirect emissions. For many

companies, the purchased electricity represents one of the most important sources of GHG emissions, and the most significant opportunity to reduce emissions. Accounting Scope 2 emissions allows companies to assess the risks and opportunities associated with the changing costs of electricity and GHG emissions. Another important reason why companies monitor these emissions is that the information may be required for some GHG programs.

Scope 3: Other GHG emissions

These indirect emissions are a consequence of the company's activities, but they are produced from sources that are not owned or controlled by the reporting company.

Some examples are:

- Production and extraction of purchased materials and fuels
- Activities related to transport from vehicles that do not belong or are not controlled by the reporting entity
- Activities related to electricity that are not included in scope 2
- Waste disposal
- Outsourced activities

"Footprint Manager" Scope

According to the methodology of the GHG Protocol, the "Footprint Manager" will allow the estimation of the emissions by Scope 1 and 2. The Scope 1, are those direct emissions by fuel consumption in the vehicle fleet of the public administration and Scope 2 are the indirect emissions from the purchase of electric power from the Federal Electricity Commission (CFE).

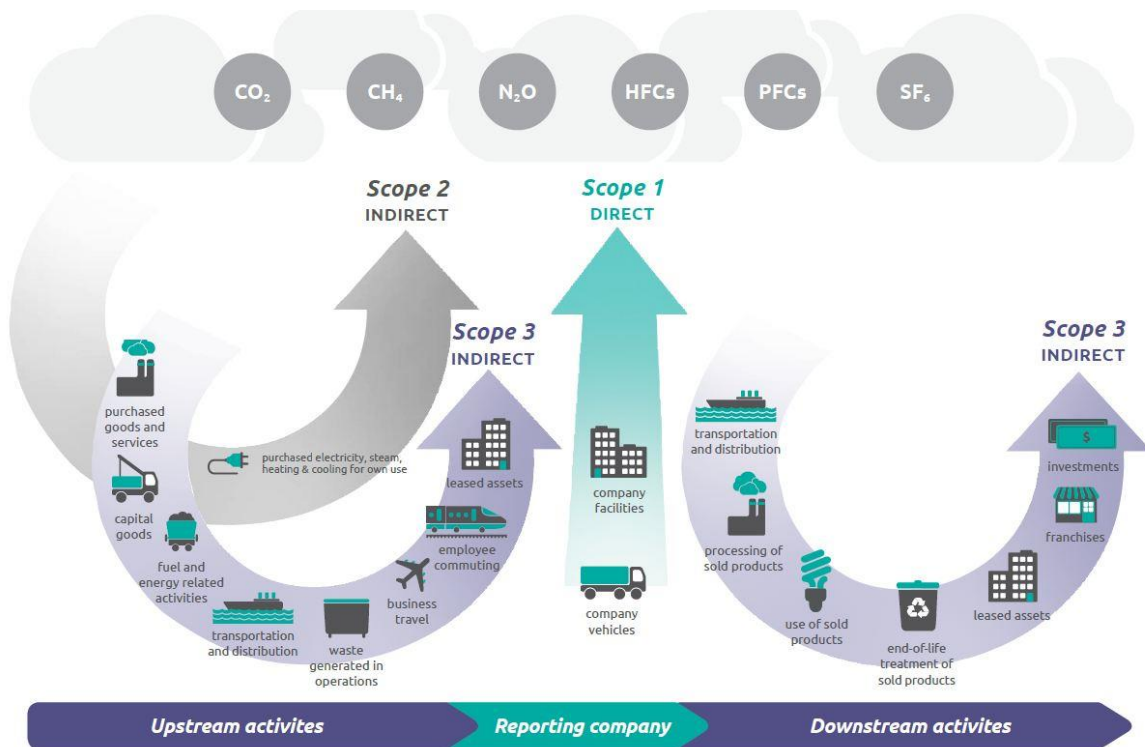


Figure 4 GHG emissions according to its scope
Source: GHG Protocol

Emissions Report

GHG emissions are calculated by multiplying the activity data, for example, litres of fuel multiplied by the emission factor that represent the activity in question (e.g. tons of CO₂ per litre of fuel). Unless otherwise is indicated, all the emissions factors used in the Footprint Manager come from official sources of the federal government published in the framework of the National Registry of Emissions (RENE).

Greenhouse gases are reported in units of carbon dioxide equivalent (CO₂e), to homologate the different GHGs in CO₂e the tool uses the Global Warming Potential (GWP). The GWP values used in the Footprint Manager, as well as the calorific powers are taken from the National Emissions Registry (RENE).

The "User's Guide to the National Emissions Registry"¹ presents the process to calculate the equivalent CO₂ emissions from mobile sources in the following way:

$$E_{CO_2} = VC \times PC \times FE_{CO_2}$$

$$E_{CH_4} = VC \times PC \times FE_{CH_4}$$

$$E_{N_2O} = VC \times PC \times FE_{N_2O}$$

Where:

E_{CO₂}: Emissions of carbon dioxide in tons (t)

¹ http://www.semarnat.gob.mx/sites/default/files/documentos/cicc/20160623_guia_rene.pdf

- E_{CH₄}**: Methane emissions in kilograms (kg)
- E_{N₂O}**: Nitrous oxide emissions in kilograms (kg)
- VC**: Fuel consumption per year in litres (l) or cubic meters (m³)
- PC**: calorific value of each fuel (MJ / l or MJ / m³)
- FE**: Emission factor of each gas (t / MJ or kg / MJ)

With data on the fuels of each dependency and the calorific value of the fuels, which can be obtained annually from the National Commission for the Efficient Use of Energy (CONUEE), the data are replaced in the formulas described above. Below is an example with generic data to illustrate the calculation. The example should not be considered as calculations for the dependencies of the State of Yucatan.

Table 1 Example of calculation of equivalent CO₂ emissions for mobile sources

$$E_{CO_2} = VC \times PC \times FE_{CO_2}$$

Fuels	VC	PC	FE _{CO₂} (tCO ₂ /MJ)	E _{CO₂} (tCO ₂)
Gasoline	4,500,000 (l)	32.216 (MJ/l)	0.0000693	10,046.56
Diesel	3,300,000 (l)	35.5374 (MJ/l)	0.0000741	8,689.96
Natural Gas	3,050,000 (m ³)	36.569 (MJ/m ³)	0.0000561	6,257.14
TOTAL				24,993.66

$$E_{CH_4} = VC \times PC \times FE_{CH_4}$$

Fuels	VC	PC	FE _{CH₄} (kgCH ₄ /MJ)	E _{CH₄} (kg CH ₄)
Gasoline	4,500,000 (l)	32.216 (MJ/l)	0.000025	3,624.30
Diesel	3,300,000 (l)	35.5374 (MJ/l)	0.0000039	457.37
Natural Gas	3,050,000 (m ³)	36.569 (MJ/m ³)	0.000092	10,261.26
TOTAL				14,342.93

$$E_{N_2O} = VC \times PC \times FE_{N_2O}$$

Fuels	VC	PC	FE _{N₂O} (kg N ₂ O/MJ)	E _{N₂O} (kg N ₂ O)
Gasoline	4,500,000 (l)	32.216 (MJ/l)	0.000008	1,159.78
Diesel	3,300,000 (l)	35.5374 (MJ/l)	0.0000039	457.37
Natural Gas	3,050,000 (m ³)	36.569 (MJ/m ³)	0.000003	334.61
TOTAL				1,951.75

Source: SEMARNAT

After transforming the units of kilograms to tons of each gas, the result is:

$$E_{CO_2} = 24,993.66 \text{ [t CO}_2\text{]} \quad E_{CH_4} = 14.34 \text{ [t CH}_4\text{]} \quad E_{N_2O} = 1.95 \text{ [t N}_2\text{O]}$$

Once the equivalences of each gas have been calculated, they are transformed into carbon dioxide equivalent (CO₂e), the following formulas will be used:

$$E_{CO_2e}(CO_2) = E_{CO_2}$$

$$E_{CO_2e}(CH_4) = E(CH_4) \times GWP_{CH_4}$$

$$E_{CO_2e}(N_2O) = E(N_2O) \times GWP_{N_2O}$$

Where:

GWP: Global Warming Potential.

E_{CO₂e}: Emissions of carbon dioxide equivalent of each gas in tons (CH₄, N₂O) (t)

The following table shows examples of the Global Warming Potential (GWP) of some gases

Table 2 Examples of Global Warming Potential (GWP)

Gas or Compounds	GWP to 100 years
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265

Source: SEMARNAT

Using the previous values of the GWP you will get the following results:

Table 3: Calculation of the equivalences of each gas in CO₂ using the GWP

	E _{CO₂} (t CO ₂)	GWP _{CO₂}	E _{CO₂} e(CO ₂) (t)
$E_{CO_2} e(CO_2) = E_{CO_2}$	24,993.66	1	24,993.66
	E _{CH₄} (t CH ₄)	GWP _{CH₄}	E _{CO₂} e(CH ₄) (t)
$E_{CO_2} e(CH_4) = E(CH_4) * GWP_{CH_4}$	14.34	28	401.52
	E _{N₂O} (t N ₂ O)	GWP _{N₂O}	E _{CO₂} e(N ₂ O) (t)
$E_{CO_2} e(N_2O) = E(N_2O) * GWP_{N_2O}$	1.95	265	516.75

Source: SEMARNAT

Once these values have been obtained, the equivalences of each gas will be added, resulting in the total of CO₂ equivalent of all the fuels used by the mobile sources:

Table 4 Equivalencias de cada gas en CO₂

E _{CO₂} e(CO ₂) (t)	E _{CO₂} e(CH ₄) (t)	E _{CO₂} e(N ₂ O) (t)	E _{CO₂} e total (t)
24,993.66	401.52	516.75	25,911.93

Source: SEMARNAT

The final result is 25,911.93 tCO₂e generated in a year for a mobile source.

To determine the indirect CO₂e emission derived from the electric energy consumption, the following formula will be applied:

$$E_{CO_2} e = W_{Elect} \times FE_{Elect}$$

Where:

E_{CO₂} e: is the equivalent carbon emission from the electric energy consumption in tons (t)

W_{Elect}: is the annual electricity consumption in Megawatts-hour (MWh)

FE_{Elect}: it is the emission factor for electricity consumption, tons of CO₂ per Megawatts-hour (tCO₂/MWh).

When the supplier of electricity is the Federal Electricity Commission (CFE), the emission factor for electricity consumption changes annually and must be consulted through the SEMARNAT page before doing the corresponding calculations. Given the case that the electric power supplier is different from the one already mentioned, the emission factor that must be used is provided by the supplier.

To carry out the application of this formula it is necessary to previously compile the amount of electricity consumed. In this way the data is grouped and replaced in the corresponding formula:

Table 5 Calculation of indirect CO₂e emissions from electric power consumption

W _{Elect} (MWh)	FE _{Elect} (tCO ₂ / MWh)	E _{CO₂e} (t)
55,921.00	0.46	25,499.976

Source: SEMARNAT

The final result is **25,499,976 tCO₂e** generated in a year by the consumption of electricity.

Emissions reported to the Carbon Footprint Manager

Emissions by Scope 1

Use for stationary fuel sources

Stationary fuel sources refer to the direct combustion of fuels in stationary sources within the sites of an organization. For example, natural gas burned in boilers, diesel burned in generators, etc. These are sources of direct GHG emissions from Scope 1.

The Mexican government, through the National Institute of Ecology and Climate Change (INECC), in collaboration with the Mexican Petroleum Institute (IMP), publishes the "Emission factors for different types of fossil and alternative fuels consumed in Mexico"². The objective is to determine the emission factors, based on their carbon content per unit of energy, of the main fuels consumed in Mexico in the energy, transport, industrial, commercial and residential sectors, including: gasoline (magna and premium), diesel (automotive, industrial and marine), fuel oil (light and heavy), coal (thermal and steel), petroleum coke, coal coke, natural gas, propane gas, butane gas, diesel, waste gas, liquefied petroleum gas used in transportation and industry and those used in aviation.

Natural Gas

Natural gas is one of the most common sources of emissions for organizations. GHG emissions are obtained using the following formula:

$$\text{Natural gas CO}_2\text{e (tons)} = \text{Natural gas consumed (kWh, m}^3\text{, tons)} \times \text{Natural gas emission factor (kg CO}_2\text{e / kWh, m}^3\text{, tons)}$$

² https://www.gob.mx/cms/uploads/attachment/file/110131/CGCCDBC_2014_FE_tipos_combustibles_fosiles.pdf

Other fuels

GHG emissions for other on-site fuel sources (eg, fuel oil, diesel, coal) are calculated in the same way as natural gas.

Fuels in mobile sources (Company vehicles)

The emissions of the company's vehicles arise from the combustion of liquid fuels in vehicles that are owned or operated by the organization. These are sources of direct GHG emissions from Scope 1.

GHG emissions are calculated as follows:

Fuel CO_{2e} (tons) = Consumed Fuel (litres, tons, m³, kWh) x Fuel emission factor (kg CO_{2e} / litres, tons, m³, kWh)

Emissions by Scope 2

Purchased energy

The purchased energy consists of the electricity consumed in government agencies and entities. These are sources of indirect GHG emissions from Scope 2. Scope 2 emissions are energy emissions that are generated elsewhere but are purchased and consumed in the operations of the reporting organization.

Electricity

The GHG emissions of purchased electricity are calculated using the following formula:

Electricity CO_{2e} (tons) = Consumed Electricity (kWh) x Country-specific electricity emission factor (kg CO_{2e} / kWh)

Access to the system

To access the tool "Footprint Manager" of the State of Yucatan, use the following link:

Link to the system

<https://yucatangob.ctfootprintmanager.com/en/>

Once you have accessed the link the initial screen will be shown as follows (figure 5):



Figure 5 Login Screen

In this section, the user must enter their *Username* and *Password*, which were provided via email.

When entering the corresponding data, you must **click** on *Login*.

Once you have logged in, you can change your Password using the User Option located on the far-right side of the panel, as shown in figure 6.

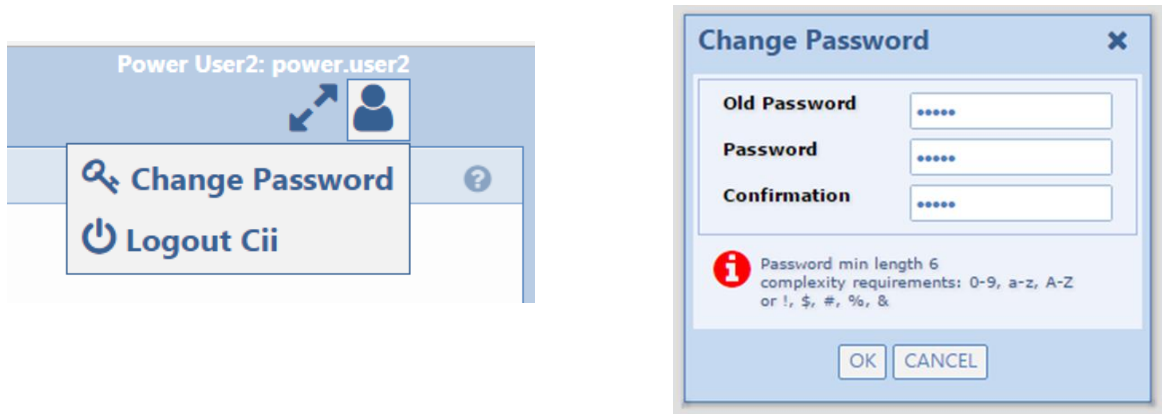


Figure 6 Change password

Use of the tool

The platform has two types of users:

- General User: He/She will be responsible of feeding the platform with the energy information of the properties assigned to the corresponding unit. This user has limited access to the exclusive pages of the dependency at his charge to upload the corresponding information.
- Administrator User: Is responsible for reviewing and approving the information stored in the tool. He has access to all the elements of the tool.

This section is divided into two parts: the first part will describe the use of the tool for the General User and the second part will serve the Administrator User.

General User

In this section, the use of the tool for general users will be described.

System architecture

In figure 7 you can see how the system is structured.

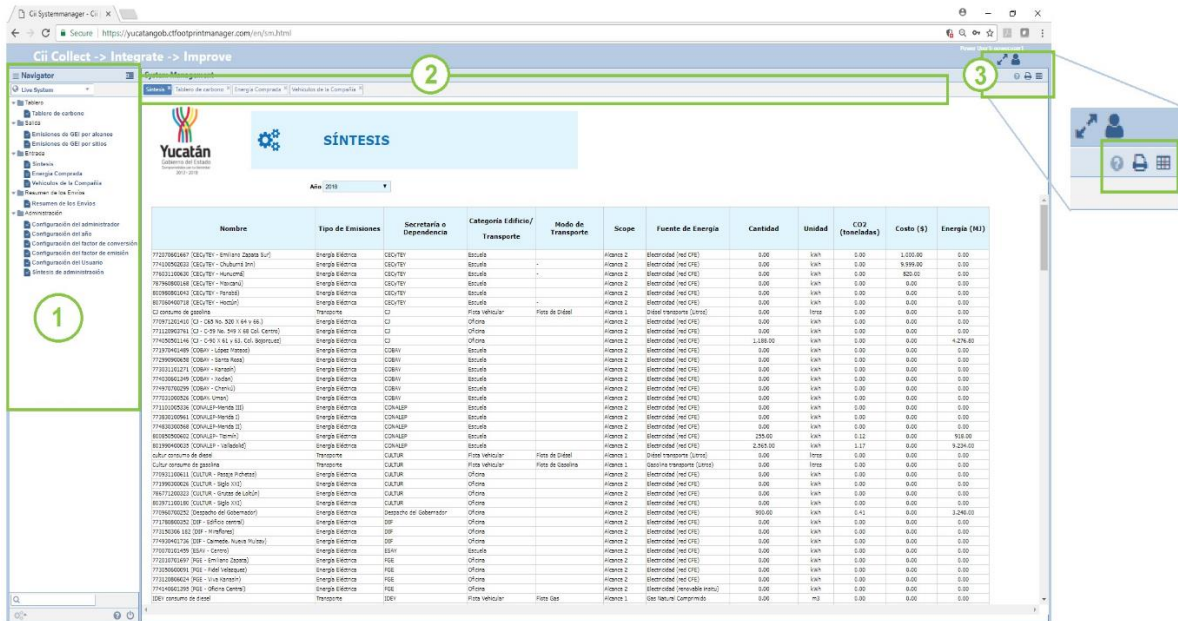


Figure 7 System Architecture

In number 1, there is the Navigation Panel, in which all the elements available to the user are presented. This includes:

- Dashboard and Outputs for viewing results.
- Input sheets for data entry
- Overview and Status for tracking data entry progress

Number 2, Double clicking on a sheet opens it in this bar and displays the contents in the viewing panel.

- As sheets are opened they will be display along this bar
- User can switch between open sheets by clicking on tabs
- Sheets can be closed by clicking on the 'X' symbol on the tab on this bar.

Number 3 illustrates the icons that will help to export and save the information in EXCEL and PDF files. Some sheets have these icons to export graphs or tables.

There are two standard sheets (purchased energy and company vehicles) for the data collection and a summary to collect the uploaded data (figure 8).



Figure 8 Standard and synthesis sheets

Synthesis: summarizes your data for easy export to create your own reports

Purchased Energy: In this sheet you must enter the data of the consumed energy in the properties of your dependency.

Company vehicles: in this sheet you must enter the data of the fuels used in the vehicles of your dependency.

There are 3 reports to enable you to analyse and examine your data (figure 9)



Figure 9 Reports

Carbon Board: Provides overview of carbon emissions

GHG emissions by scope: Provide a breakdown of carbon emissions by Scopes.

GHG emissions by activities: Provide a breakdown of carbon emissions by Activities.

Entering data

This section will show the main actions to enter the data of purchased energy and fuel used by the vehicles of the dependencies.

For this section you should take into consideration the following:

Do not forget to press the enter key every time you enter a data, or the tool will not record it

On the left side of the screen you will see the available options of the Navigation Panel, you have to double "click" on the Purchased Energy Sheet and the following screen will open (figure 10).

System Management

Energía Comprada

Yucatán
Gobierno del Estado
Comprometidos con la Sostenibilidad
2012-2018

Organización: 774820001311 (INCCOPV - Av. Itzaes s/ 59 y 59A)

Año: 2016

Región	Total al año (kWh)	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	2016	Emisiones (kgCO ₂ e)
Electricidad (red CFE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Comentarios

Documentos

Sumisión
Una vez que todos los datos y pruebas se hayan confirmado para el año, presione el 'Botón'.

Guardar comentario

Figure 10 Entering Data

To capture the data the user must follow the next steps:

1. Search your "Site"

For the purchased energy data (kWh), you must:

- Use the dropdown menu to locate your site (Yucatán -> Dependency -> Category -> site) (figure 11)
 - Yucatán
 - Secretary or Dependency (ex. CONALEP)
 - Building/Transportation (ex. school)
 - Site (i.e. 774830300568 (CONALEP Mérida II))

Secure | https://yucatangob.ctfootprintmanager.com/en/sm.html

Cii Collect -> Integrate -> Improve

System Management

Energía Comprada

Yucatán
Gobierno del Estado
Comprometidos con la Sostenibilidad
2012-2018

Organización: Yucatan

Año: Yucatan

- CECyTEY
- CJ
- COBAY
- CONALEP
 - Escuela
 - 771101005336 (CONALEP-Merida III)
 - 773830100961 (CONALEP-Merida I)
 - 774830300568 (CONALEP-Merida II)
 - 800850500602 (CONALEP- Tizimin)

Energía Comprada

Electricidad

Figure 11 Purchased energy data

To enter the data of the company vehicles, you must:

- Use the dropdown menu to locate your site (Yucatan -> Dependency -> Category -> site) (figure 12)
 - Yucatán
 - Secretary or Dependency (ex. INCA Y)
 - Building/Transport (ex. Vehicle fleet)
 - Site (ex. INCA Y)

Combustible	Unidades	Total al año							
Periodo de reporte	Unidades	2016	Ene	Feb	Mar	Abr	May	Jun	
Diésel transporte	litros	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Figure 12 Company vehicle data

In this section you can change the site and period of report of all the entry sheets. However, it is important to note that only those sites that the Administrator User has assigned to each user can be chosen. If you are only responsible for one site, then you will not be able to see any other site in the list.

2. Selection of the year

- Use the dropdown menu to locate the data entry year as shown in the following figure (figure 13).

Figure 13 Year Selection

3. Entering Data

In this section you can upload the energy information corresponding to your activity. It is important to mention that to enter the information you must:

1. Do not forget to press the "enter" key every time you enter data or the tool will not record them.
2. When the cell is **gray**, changes can be made. If the cell is **white**, it means that it is a saved data and no changes can be made, unless actions are taken to "open" the cell, these will be explained throughout the manual.

The data is entered for each electric bill and fuel consumption in the corresponding reporting period.

For the entry of electricity / fuel data you must follow the following steps (figure 14):

- I. Select the month of the electric bill (kWh) / fuel bill (litres).
- II. Enter the consumption for each bill
- III. **Press the "enter" key to save the data**
- IV. Do not use commas (,) to separate thousands. For example: **2500** not 2,500.
- V. Points (.) Are used to represent decimals, not commas (,)

Región	Total al año (kWh)	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago
Periodo de reporte	2016	255.00							
Electricidad (red CFE)	255.00	255.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 14 Entering fuel and electricity data

Once the data has been typed and the "enter" key has been pressed, the tool will still be available to make changes to any month of the year but only if the colour of the cell is in **grey**.

In case it is necessary to make a change, place the cursor in the cell of the month that needs the change, enter the data and press "enter" to save the new number.

4. Upload documents

A Document Support box is provided to upload the evidence that supports the numbers that are captured. Documents (e.g invoices, receipts, notes) are required to validate the entered

data into the system. The documents can be in the following formats, .jpg, .pdf, .doc, and .xls.

To enter the documents, you must:

- I. Click on the icon to upload information (figure 15)

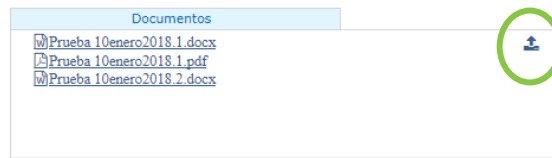


Figure 15 Uploading Documents

- II. Click on choose file/select file (figure 16)

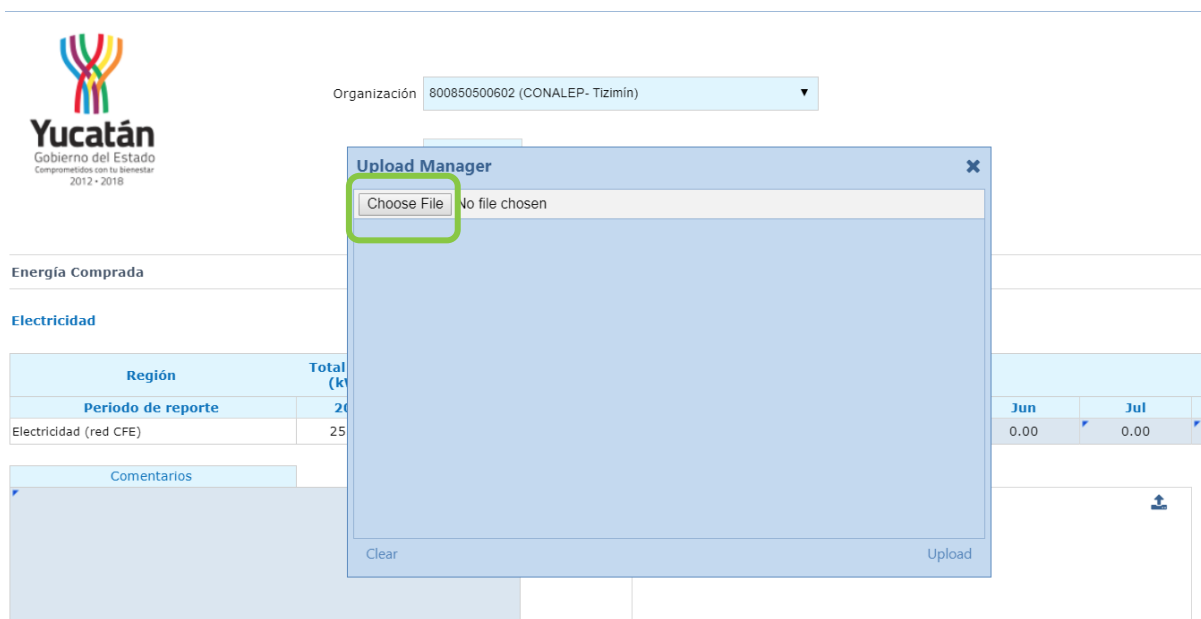


Figure 16 Select file

- III. Find the relevant file and click on “open” (figure 17)

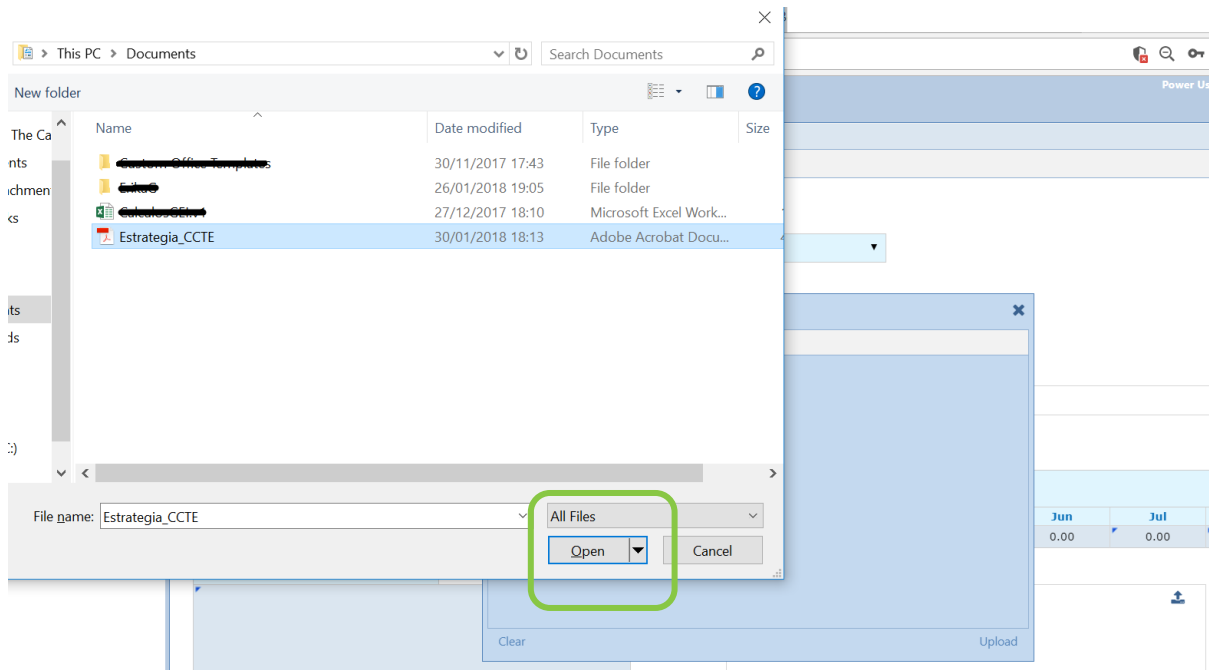


Figure 17 Relevant file

IV. Click on “upload” (figure 18)

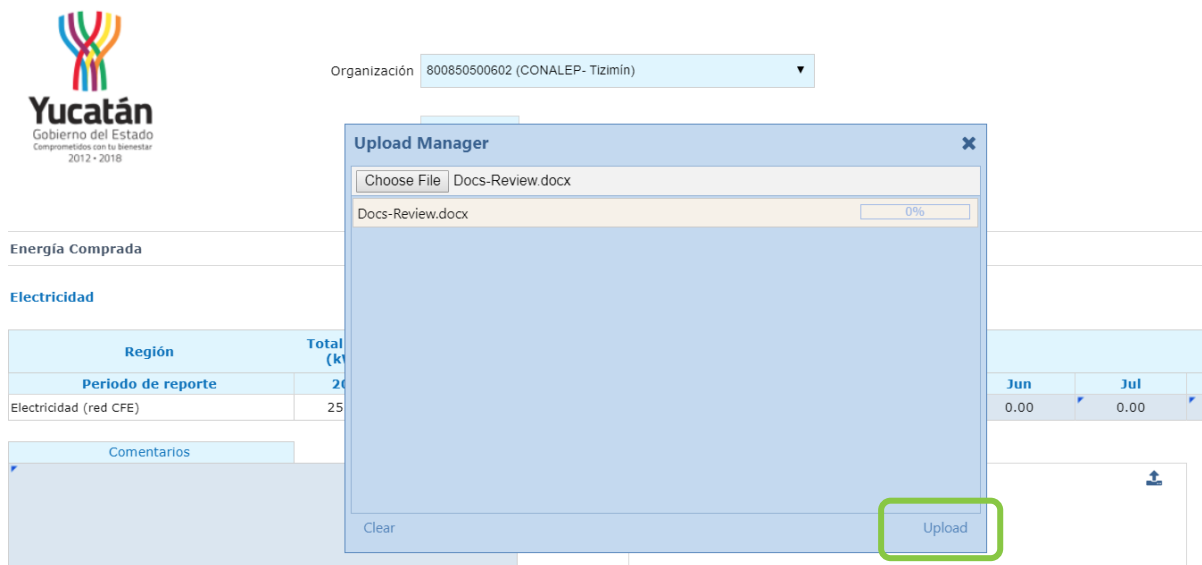


Figure 18 Upload document

5. Comments

A Comments box is provided to allow you to explain the variation of data of the numbers that are captured.

Use the comment box to explain some inconsistency in the data, justify the entered data and other matters for the administration to be informed (see figure 19).

- I. Click inside the comment box.
- II. Enter the comment, specify the comment period.
- III. Press "Save comment".

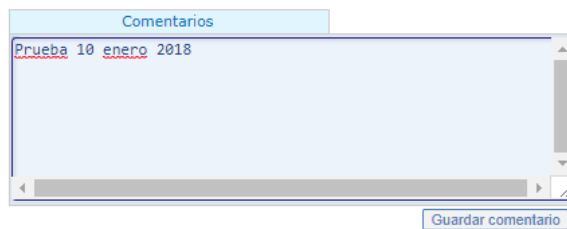


Figure 19 Comments

The method of data entry is the same on nearly all sheets

- Purchased Energy (kWh)
- Company Cars (fuels of the company cars in liters)

User Administrator

In this section we will describe the use of the tool for administrator users. This user has **unlimited access** to the tool, he can also use the descriptions above to enter data, as well as other actions described below.

System Architecture

For **administrators**, there are five configuration sheets and one administrative synthesis sheet (figure 20). For better functionality of the tool it is recommended to make changes as long as they are strictly necessary.

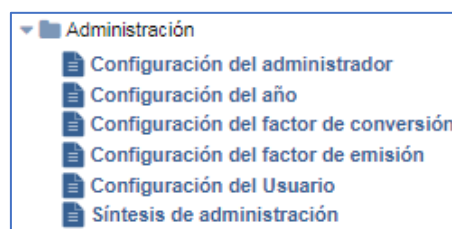


Figure 20 Administrator User Setup

Administrator Setup

This section shows the summary of all the sites hosted on the platform, with the description of the information that should be entered in each site. This sheet contains different indications and actions (figure 21):

1. In the Type of Emissions box, the type of emissions to be reported is selected for each activity, either Electricity or Transport.
2. For the Transport section, the user has to select Mode of Transportation, either Diesel Fleet or Gasoline Fleet.
3. In the Energy Source section, the user must select the sites where the energy is consumed. In the drop-down menu you can select the supplier of the electric power: Electricity (CFE network), Electricity (cogeneration), Electricity (Other) and Electricity (renewable in situ). In the case of Transport: Gasoline transport (litres) and Diesel transport (litres). For this version of the tool, it is relevant to consider that the current configuration must be maintained with respect to the electric power coming from the **Electricity (CFE grid)**.
4. In this section, the Administrator User must enter the **Cost** of energy (electricity and fuels) data on an annual basis.
5. This page has a drop-down menu to select the Year that will be configured
6. Once configured with the needs of the client, it is possible to block the configuration in order to avoid any error of entry or in the operation of the tool.

Región	Secretaría o Dependencia	Categoría Edificio / Transporte	Nombre	Tipo de Emisiones		Fuente de Energía	Costo (\$)	
				Energía Eléctrica	Transporte			
Yucatan	CECyTEY	Escuela	772070601667 (CECyTEY - Emiliano Zapata Sur)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CECyTEY	Escuela	774100502030 (CECyTEY - Chuburná Inn)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	36984562.00	
Yucatan	CECyTEY	Escuela	776031100630 (CECyTEY - Hunucmá)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CECyTEY	Escuela	787960800168 (CECyTEY - Maxcanú)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CECyTEY	Escuela	800980801043 (CECyTEY - Panabá)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CECyTEY	Escuela	807060400718 (CECyTEY - Hochtún)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CJ	Flota Vehicular	CJ consumo de gasolina	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Flota de Gasolina	Gasolina transporte (Litros)	0.00
Yucatan	CJ	Flota Vehicular	CJ consumo de diesel	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Flota de Diesel	Diesel transporte (Litros)	1569874.00
Yucatan	CJ	Oficina	770971201410 (CJ - C65 No. 520 X 64 y 66.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CJ	Oficina	771120903761 (CJ - C-99 No. 549 X 68 Col. Centro)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	CJ	Oficina	774050501146 (CJ - C-90 X 61 y 63. Col. Bejorquez)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	COBAY	Escuela	771970401489 (COBAY - López Mateos)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	
Yucatan	COBAY	Escuela	772990500658 (COBAY - Santa Rosa)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Electricidad (red CFE)	0.00	

Figure 21 Administrator Setup sheet

Year Setup

In this section the topics related to the reporting year of the sites in the tool will be configured, from the activation of the years to be reported to the name of the months that will be used for the report. Likewise, the sheet has the action of "Block Configuration".

Conversion factor Setup

In this section you can configure the values of the conversion factors for each type of energy used to calculate the tool's emissions. The sheet has the "open" button to make changes and the "Save" to save the changes.

Emission factor Setup

In this section you can configure the values of the emission factors by type of energy source (Electricity (network CFE), Electricity (cogeneration), Electricity (Other) and Electricity

(renewable in situ)) and Mode of Transportation (Gasoline transport) (litres) and Diesel transport (litres) used to calculate the emissions of the tool. These can be selected from the drop-down menu in the upper half of the sheet. The sheet has the **“open”** button to make changes and the **“Save”** to save the changes.

User Setup

In this sheet you will find all contact information of the users who will upload the corresponding energetic information of all the sites in the tool.

Administration synthesis

It provides a summary of all energy data "uploaded" to the platform with their respective emissions and cost calculations. This data can be exported month by month by selecting the month of your choice with the drop-down menu as shown in figure 22.

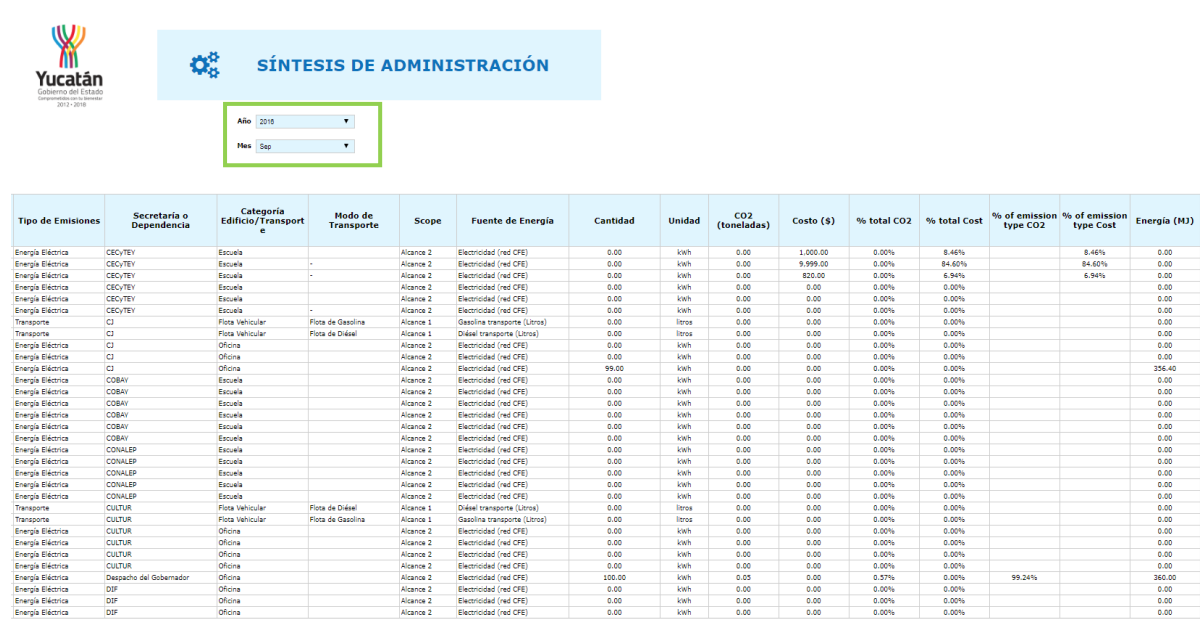


Figure 22 Administration synthesis

Submission Status

It provides a summary of the complete or incomplete status of the information entered for all sites, as well as the day of delivery, the contact of the person in charge of uploading the information and the date of approval of the information.


Validation

The data must be sent for each site and for each type of consumption (electricity, fuel) before the deadline agreed with the administrator.


Once the data entry for the full year has been completed, the user should follow these steps:

- Click on the button (✓) to send (figure 23).

- Once the data has been sent, the administrator will review and then approve or reject the data (figure 24).
- If the data is rejected, the administrator will include the reason (s) for rejection.
- The data for that site must be forwarded
- Once rejected, the administrator must reopen the information entry process (figure 23).


 Organización: INCA Y consumo de diesel
 Año: 2016

									Emisiones (kgCO ₂ e)
Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	2016
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Documentos: 




Sumisión
 Una vez que todos los datos y pruebas se hayan confirmado para el año, presione el "Botón".


Figure 23 Submission information

Sumisión
 Una vez que todos los datos y pruebas se hayan confirmado para el año, presione el "Botón".
 2018-01-23
 User2

Aprobación (gerente general)
 Si está satisfecho con los datos enviados, presione el botón "confirmar". Si los datos enviados necesitan cambios, presione el botón "cancelar". Esto notificará al administrador de envíos para revisar y volver a enviar los datos del sitio.
 

Si necesita rechazar el envío, ingrese el motivo y guárdelo antes de presionar el botón con la cruz y envíe el correo electrónico al administrador de información.

Missing Data in May


Reabrir el proceso de envío
 Reabrir 

Figure 24 Validation

Results

The tool offers a range of analysis graphs that present their results in a clear and easy way to follow. These results will also allow the user to explore and deeply analyse the different elements of its dependency. The results provide a summary by Scope and Activity; and also allow the comparison of specific sites within the dependency from multiple points of view to obtain a better understanding of their environmental profiles.

The main results of using the tool to report and measure the energy consumption of the dependencies are:

Cost Reduction: Energy is a significant and growing cost for many organizations, by reducing their consumption it provides significant cost savings.

Emission Reduction: By reducing energy consumption, CO₂ emissions will also be reduced, helping the State to achieve its sustainability objectives.

Facilitate compliance: The service facilitates the preparation of data delivery required by the Sustainable Footprint Initiative and at some point, by the RENE, among others.

Data Validation: Monitoring energy means being able to easily track performance and validate energy consumption, as well as observe inconsistencies within the energy consumption of the dependencies.

Improve Reputation: Being able to demonstrate an effective state management to minimize financial and physical risks and improve reputation as a leader in the country.

Commitment of the supply chain and dependencies: The Footprint Manager is a great platform to generate a broader commitment on energy efficiency, good management of resources and the environmental sustainability of your State.

As the data is typed by **pressing the "enter" key**, results can be viewed and analysed through the Carbon Dashboard and Outputs sheets.

Carbon Dashboard

In this section you can obtain a summary of the GHG emission charts by Scope of each site and year of election. The graphics can be exported in PDF format with the icon located in the upper right corner of the screen. This sheet has visualization actions to analyze the results of the entered data (figure 25):

1. In the drop-down menus you can select the year and the site to see the corresponding graphs.
2. The total GHG emissions are presented by the selected site and year.
3. In this cell you can enter a percentage of emissions target for the selected site and year in order to observe and contrast the progress that has been made throughout the selected year.

4. When selecting each of the circles located on the left side of the legends: Scope 1, Scope 2, Act (Current), Plan and Target (Target), the selected element will disappear to have a clearer view of the other remaining element (s) of the corresponding graph. This allows the user to observe the advance or retreat made in the selected site and year
5. The graph is observed for each Scope and GHG emissions of the selected site and year by month.

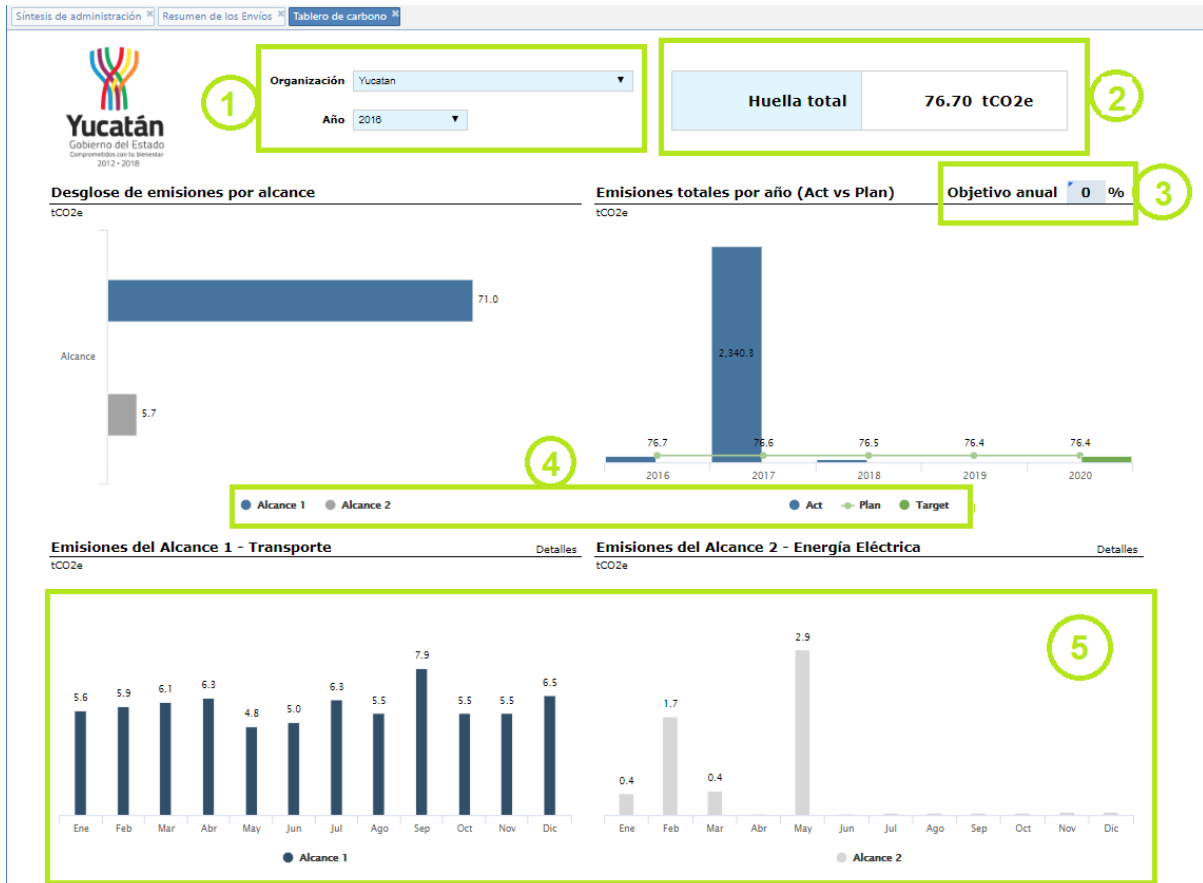


Figure 25 Results Graphs

Outputs

In this section we can see the graphs of GHG Emissions by scope and by sites. The presentation of the different graphs of this section is shown in figure 26.

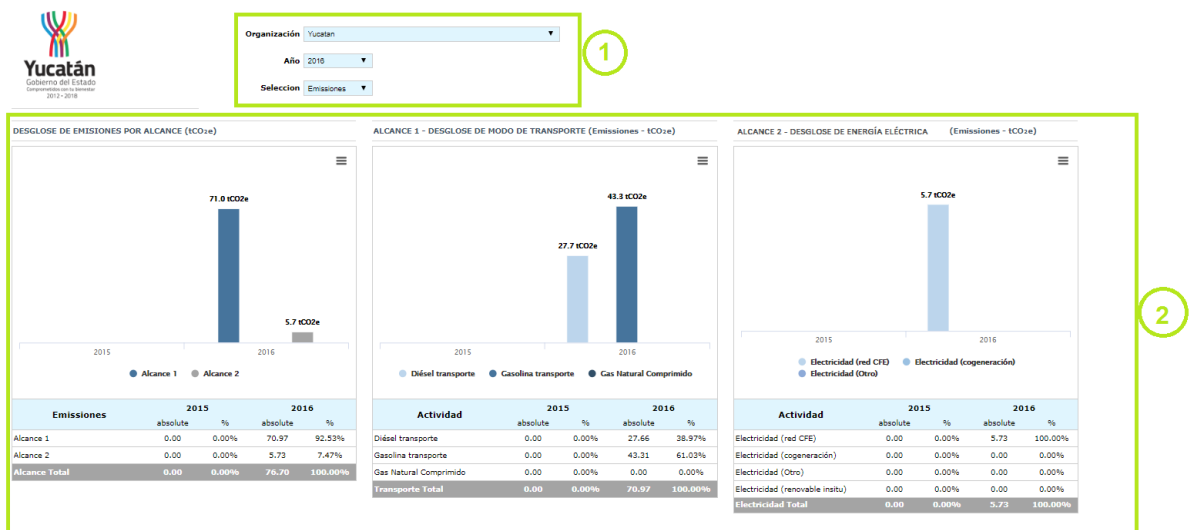


Figure 26 GHG emissions by scope

In the **number 1** of the previous figure there are three drop-down menus indicating the options of the Organization (sites), Year and type of graph to be obtained (emissions, energy and cost).

In **number 2**, The user will observe the different graphs and data corresponding to the summary of emissions by scope. This could be observed as a whole and separately from the site, year and type of graphic that has been selected.

Figure 27 shows the GHG emissions by sites to visualize the progress with respect to the decrease and / or increase of the emissions of each site, likewise, a comparison between some of them could be observed.

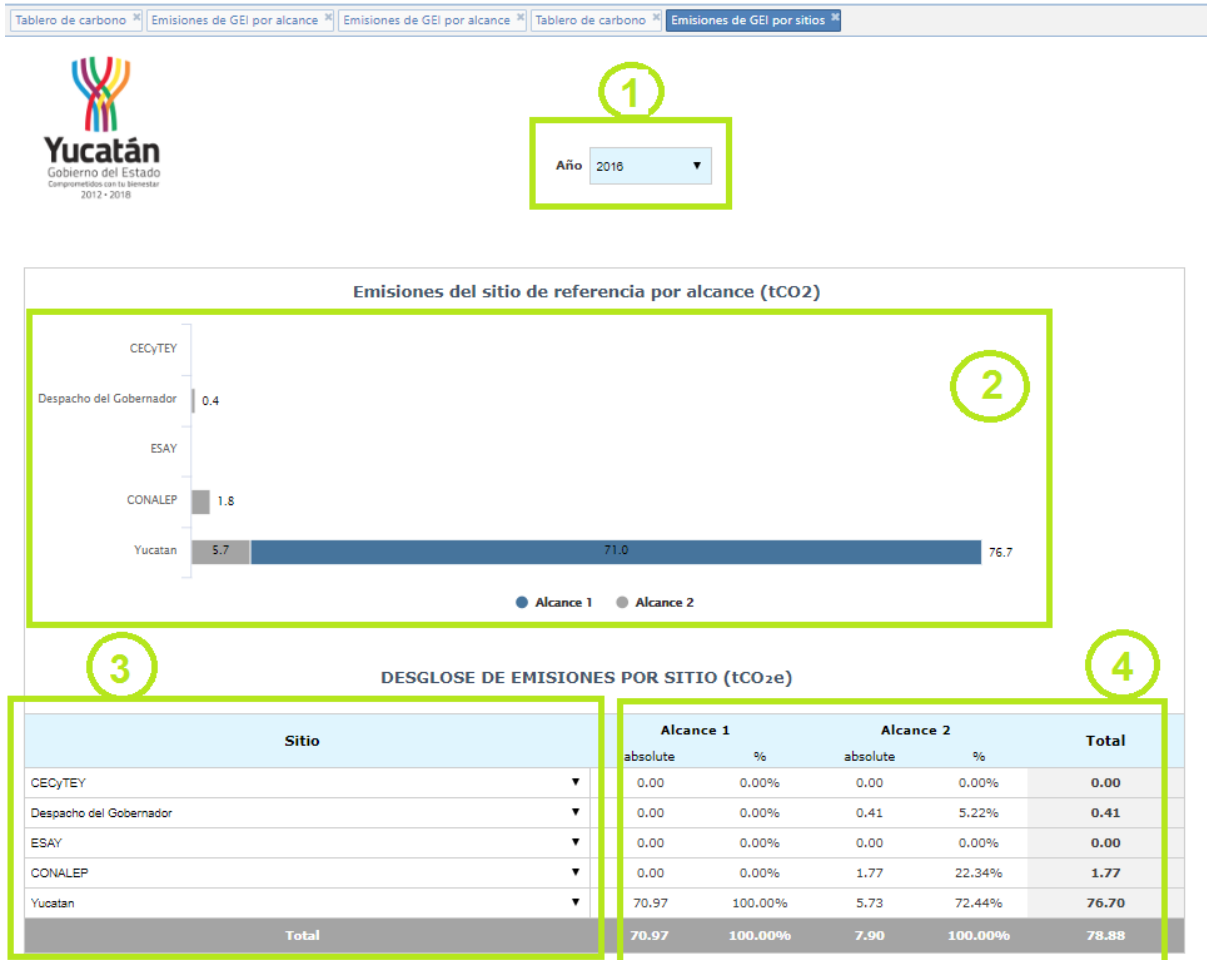


Figure 27 GHG emissions by scope

In **number 1** you can select the year to analyse the data and graphs of the selected sites.

Number 2 shows a graph in with the selected sites to observe the relationship between their emissions (Scopes 1 and 2.)

In **number 3**, there are five drop-down menus to select the sites that will be compared with their GHG emissions of Scopes 1 and 2.

Number 4 presents the GHG emissions data of Scopes 1 and 2 for the selected sites.

Logout

Once the data has been saved, the user can exit by using the icon on the upper right corner as shown in figure 28.

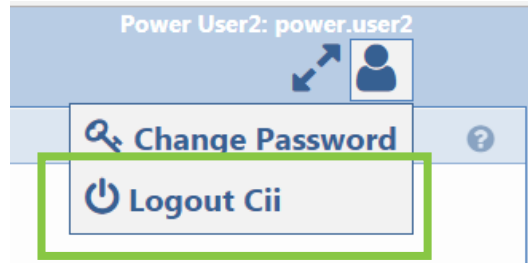


Figure 28 Log out

Governmental Reporting Mechanism

The version 1 of the Footprint Manager of the State Government of Yucatan, will allow to report emissions from centralized and decentralized dependencies with potential of reduction identified in the Carbon Management Plan, these are listed below:

Dependency	Acronym
Colegio de Estudios Científicos y Tecnológicos del Estado de Yucatán	CECyTEY
Colegio de Bachilleres del Estado de Yucatán	COBAY
Colegio Nacional de Educación Profesional Técnica	CONALEP
Patronato de la Unidades de Servicios Culturales y Turísticos del Estado de Yucatán	CULTUR
Sistema para el Desarrollo Integral de la Familia en Yucatán	DIF
Escuela Superior de Artes de Yucatán	ESAY
Fiscalía General del Estado	FGE
Instituto del Deporte del Estado de Yucatán	IDEY
Instituto de Educación para Adultos del Estado de Yucatán	IEAEY
Instituto de Infraestructura Carretera de Yucatán	INCA Y
Instituto para la Construcción y Conservación de Obra Pública en Yucatán	INCCOPY
Instituto de Seguridad Social de los Trabajadores del Estado de Yucatán	ISSTEY
Instituto de Vivienda del Estado de Yucatán	IVEY
Instituto Yucateco de Emprendedores	IYEM
Junta de Agua Potable y Alcantarillado de Yucatán	JAPAY
Secretaría de Administración y Finanzas	SAF
Secretaría de la Contraloría General	SECOGEY
Secretaría de la Cultura y las Artes	SEDECULTA
Secretaría de Desarrollo Rural	SEDER
Secretaría de Desarrollo Social	SEDESOL
Secretaría de Desarrollo Urbano y Medio Ambiente	SEDUMA
Secretaría de Fomento Económico	SEFOE
Secretaría de Fomento Turístico	SEFOTUR
Secretaría de la Juventud	SEJUVE
Secretaría de Obras Públicas	SOP
Secretaría de Seguridad Pública	SSP
Secretaría de Salud	SS
Secretaría del Trabajo y Previsión Social	STPS

Each of these dependencies will have a username and a password, with which they will be able to access the platform remotely through the following link:

<https://yucatangob.ctfootprintmanager.com/en/>

How to collect the information?

Those responsible for registering the information in each dependency will record the electric consumption of the institution in KWh within the first five calendar days from the final payment date of the last receipt and will be reported according to the period of consumption, as exemplified in the following figure.

AVISO RECIBO

Comisión Federal de Electricidad
DIRECCIÓN DE OPERACIÓN

Número de Servicio: **774 980 304 125**

Total a pagar: **\$2,686.00**
(DOS MIL SEISCIENTOS OCHENTA Y SEIS PESOS 00/100 M.N.)

1 **Fecha límite de pago:**
23 ENE 16

Ruta: **68DW1B026841140** 2 **Periodo:** **08 DIC 15 A 08 ENE 16**

Función	Nº. Medidor	Lectura actual	Lectura anterior	Diferencia	Totales
kWh	04E0M0	63137	62001	1076	11076.9
KW	04E0M0	17	0	17	17
kVAhm	04E0M0	22319	22059	260	260

Mes	Días de mes	Consumo prom. diario	Energía kWh	Precio \$/kWh	Importe \$
			1,076	1,8390	1,976.76

Mes	Factor de proporción	Demanda máxima kW	Precio \$/kW	Importe \$	Factor de potencia
	1.0000	335.06	335.06		97.2

Mes	Demanda máxima kW	Consumo total kWh	FP %	FC %	Precio medio
ENE 15	12,421	12,421			1,7885
FEB 15	12,474	12,474			1,7894
MAR 15	11,443	11,443			1,7982
ABR 15	12,085	12,085			1,8103
MAY 15	3,252	3,252			2,6368
JUN 15	17,681	17,681			1,7957
JUL 15	4,753	4,753			1,8679
AGO 15	12,104	12,104			1,8147
SEP 15	1,253	1,253			2,0711
OCT 15	626	626			2,3673
NOV 15	97	97			5,2721
DEC 15	139	139			4,4380
ENE 16	1,076	1,076			2,1517

Conceptos	\$ Importe
Energía	2,313.82
2% Baja Tensión	46.27
Bonificación Factor de Potencia	44.84
Subtotal	2,315.25
IVA 16%	370.44
Facturación del Periodo	2,685.69
Adeudo Anterior	659.86
Su Pago	669.00
Total	\$2,686.55

Estado de cuenta

TOTAL DE CAJA

- Example
1. Period to upload the information on the platform: from January 23 to January 28
 2. Month to report: December 2015
 3. Energy consumption to report: 1,076 kWh

Figure 29 Entering data energy consumption

To register the fuel consumption, the government's vehicle fleet, is classified into two types: 1) gasoline (Magna or Premium) and 2) Diesel. To facilitate the management of the information, it is recommended to request from the supplier or suppliers a monthly summary of the consumption by type of fuel type, this information must be captured in the first five days of the reported month.

Regimen Fiscal: Régimen General de Ley Personas Morales

Facturado a:	Transacciones entre: 21/11/2016 y 27/11/2016
00000206 SECRETARIA DE ADMINISTRACION Y FINANZAS CALLE 59 SIN COL.CENTRO CP. 97000 Yucatan, Mexico	
NO. DE CERTIFICADO	
PAGO EN UNA SOLA EXTENSION	
No.Aprobación: 1200989	Año Aprobación: 2016
Factura: 907164	Serie: J
Método de Pago: 99 Otros	

Fecha	Hora	Numero	Estacion	Producto	Precio	Cant.Unid.	Importe	IVA	Total
Tarjeta	22/11/2016	13:32:00	4824	Combustibles Yucatán Mérida (Chichil)	Magna (32011)	54.5144L,ltro	559.76	102.35	762.11
						54.5144	559.76	102.35	762.11
Tarjeta	22/11/2016	10:16:00	12283	Corporativo Gasolero (Dofny)	Magna (32011)	45.9968L,ltro	556.70	96.37	643.07
Tarjeta	25/11/2016	13:58:00	8018	Comb. de Yucatán (Suc. Pensiones)	Magna (32011)	35.0977L,ltro	424.77	65.90	490.67
						81.0965	981.47	162.27	1,133.74
Tarjeta	22/11/2016	7:52:00	3275	Combustibles de Yucatán (Circuit)	Magna (32011)	25.1477L,ltro	304.35	47.22	351.57
Tarjeta	25/11/2016	6:47:00	854	Combustibles de Yucatán (Suc. Centro)	Magna (32011)	37.5972L,ltro	455.02	70.59	525.61
Tarjeta	27/11/2016	13:13:00	5075	Comb. de Yucatán (Suc. JPI)	Magna (32011)	1.8327L,ltro	19.76	3.06	22.82
						64.3776	779.13	120.87	900.00
Tarjeta	25/11/2016	8:39:00	12540	Corporativo Gasolero (Canel)	Magna (32011)	24.0041L,ltro	290.51	45.07	335.58
						24.0041	290.51	45.07	335.58
Tarjeta	27/11/2016	9:29:00	5295	Dieselers de Mérida	Magna (32011)	42.9184L,ltro	519.42	80.58	600.00
						42.9184	519.42	80.58	600.00
Tarjeta	25/11/2016	20:56:00	3275	Combustibles de Yucatán (Circuit)	Magna (32011)	26.0277L,ltro	315.00	48.87	363.87
						26.0277	315.00	48.87	363.87
Tarjeta	25/11/2016	9:14:00	3275	Combustibles de Yucatán (Circuit)	Magna (32011)	42.2640L,ltro	511.50	79.35	590.85
						42.2640	511.50	79.35	590.85
Tarjeta	25/11/2016	8:59:00	12540	Corporativo Gasolero (Canel)	Magna (32011)	41.5469L,ltro	502.82	78.01	580.83
						41.5469	502.82	78.01	580.83
Tarjeta	23/11/2016	4:49:00	4792	Comb. de Yucatán (Suc. Lindavista)	Magna (32011)	55.5274L,ltro	672.02	104.26	776.28
Tarjeta	23/11/2016	14:12:00	4374	E.S. Poniente Mérida (Derech)	Magna (32011)	39.4596L,ltro	477.55	74.09	551.65
						94.9870	1,149.57	178.35	1,327.92
Consumos al 16.00 %						2,981.4100L,ltro	36,082.50	5,687.72	41,800.22
Total						2,981.4100	36,082.50	5,687.72	41,800.22

Total en Letras: CUARENTA Y UN MIL SEISCIENTOS OCHENTA PESOS 32 / 100 MIL.

Figure 30 Entering data fuel consumption

Example

1. Month to report: November 2016
2. Type of fuel: Gasoline
3. Total consumption: 2,961.41 l.

Reports

The information of the consumption of electric energy and fuels registered in the Footprint Manager will allow the generation of monthly GHG emissions reports for each dependency mentioned in the previous section. It should be noted that due to the type of tariff and its respective electricity billing in some public buildings the information captured on the platform will be bimonthly.

The results obtained monthly from the Footprint Manager will be compiled and processed in the Planning and Policies for Sustainability Directorate of the Ministry of Urban Development and Environment, who will be responsible for publishing and disseminating this information on a half-yearly basis through a governmental report that will be available on the climate change platform: www.ccpy.gob.mx. This report will be updated every six months.

This report will publish the monthly emissions of 2018 and of subsequent years, it will be compared with the emissions of the baseline year (2015). The advances will be presented by the total tons of CO₂e direct emissions for the fuel consumption in the government's vehicle fleet (Scope 1), as well as the total indirect emissions for electricity consumption (Scope 2). Likewise, the total monthly emissions of the government sector will be reported, as well as by each governmental institution.

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