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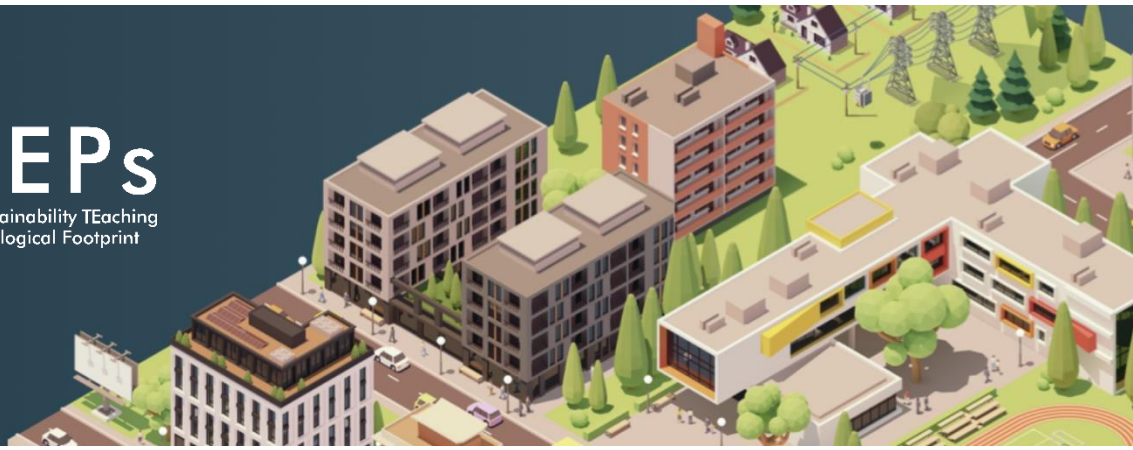
EUSTEPs

Enhancing Universities' Sustainability TEaching and Practices through Ecological Footprint



University Footprint Calculator

User Manual

October 2022

How to cite this document:

Mancini, M.S., Galli, A., Bacelar Nicolau, P., Caeiro, S., Galanis, N., Gigliotti, M., Madeira, C., Malandrakis, G., Mapar, M., Moreno Pires, S., Niccolucci, V., Nicolau, M., Papadopoulou, A., Patrizi, N., Pulselli, F.M., Shaffer, M., Theodossiou, N., Wambersie, L., Williams, R. (2022). *"EUSTEPs University Footprint Calculator – User Manual".* ERASMUS+, KA203 2019-2022, Agreement No. 2019-1-ELO1-KA203-062941.

EUSTEPs is a project carried out, under the leadership of Aristotle University of Thessaloniki, by the strategic partnership between four European Universities and non-governmental organization Global Footprint Network, the official home of the Ecological Footprint methodology and applications.

Co-funded by the Erasmus+ Programme of the European Union

"EUSTEPs: Enhancing Universities' Sustainability Teaching and Practices through Ecological Footprint", KA 203, Strategic Partnership in Higher Education 2019-2022, Agreement No. 2019-1-EL01-KA203-062941.

ΙΔΡΥΜΑ ΚΡΑΤΙΚΩΝ ΥΠΟΤΡΟΦΙΩΝ IKY

Contents

1. The EUSTEPs Project

EUSTEPs – **E**nhancing **U**niversities' **S**ustainability **Te**aching and **P**ractice**s** through Ecological Footprint - is a three-year (2019-2022) project funded by the ERASMUS+ program and directed by the Greek State Scholarship Foundation (IKY). The project is carried out by a strategic partnership between four European Universities – Aristotle University of Thessaloniki (AUTh-Greece), University of Aveiro (UAv-Portugal), Universidade Aberta (UAb-Portugal), and University of Siena (UNISI-Italy) – and the Non-Governmental Organization (NGO), Global Footprint Network (USA).

By recognizing the key role that Higher Education Institutions (HEIs) play in conveying proper knowledge of sustainability issues, EUSTEPs aims at empowering Universities to become pro-active sustainability agents and practice what they preach. With this goal, the project designed and developed an online, open-access University Footprint Calculator to monitor and manage the natural resources and the ecosystem services demanded by HEIs' activities and operations through a standardized methodological approach. This tool was created through a participatory approach, and by leveraging the shared experiences and skills of the four partner Universities involved in the project and the expertise of Global Footprint Network.

2. Scope of the Calculator

The EUSTEPs University Footprint Calculator (hereafter the Calculator) is an open-access digital tool that allows HEIs[1] to monitor and manage their consumption of natural resources and ecosystem services via a standardized methodological approach – Ecological Footprint (EF) Accounting – specifically tailored for use at the HEI level. This Calculator allows each HEI to monitor and manage its use of the natural resources and ecosystem services necessary for running the activities and operations needed to provide education, conduct research and raise awareness in the civil society. The Calculator helps HEIs become transformative agents of sustainability by identifying which major drivers contribute to the ecological impact of their operations, as well as their efficiency in the use of resources and ecosystem services.

The Calculator can also be used to streamline the collection and management of data required to assess the scale and significance of Footprint results. It is expected to prompt fruitful discussions about the changes and actions needed for improving the sustainability of HEIs by involving the whole HEI community in an institution-wide sustainability dialogue.

Ultimately, through the use of the Calculator, HEIs can identify which drivers negatively affect their sustainability and initiate the process of reducing their ecological impact, thus contributing mainly to three of the seventeen Sustainable Development Goals (SDGs) – SDGs 11 (Sustainable cities & communities), 12 (Responsible consumption & production), and 13 (Climate action).

Since its release in April 2022, the Calculator has been freely available and accessible to any University around the globe at eusteps.footprintcalculator.org. However, since the EUSTEPs project is a European-funded project, a library of country-specific conversion factors and Footprint intensities are used in the Calculator, which are relative to the European Union (EU-27) countries plus the United Kingdom. This does not prevent Universities outside the EU from using the Calculator, but they will be limited in that they will have to select an EU country as the location and thus allow for a certain degree of approximation in their final results.

Future expansions of the library behind the Calculator are already on the scope, and HEIs interested in such geographical expansion are welcome to contact Global Footprint Network at info@footprintnetwork.org.

[1] Within EUSTEPs, Higher Education Institutions include Universities, Academic Institutes, as well as High Specializations and Technical schools. In this document, the term "University" is often used as a synonym of Higher Education Institutions (HEIs).

3. Intended users

The Calculator is intended to be used by the management and/or administrative bodies of any HEI, possibly an office dealing with environmental or sustainability practices (e.g., an HEI's Sustainability Office, if available), which has access to technical and specific information and relative data about the Institution as a whole, as well that of its different Departments, Units, and Offices.

Besides this primary target audience, anyone else may use the Calculator: University professors, for instance, might want to use it to try assessing the Footprint of their Institution, although they might experience difficulties in collecting all the necessary data. This is why the ideal users are administration/management staff who has access to data, or the University's sustainability officer(s) if available.

3.1. User roles

The Calculator can be accessed by either creating an account on the platform or without registration (see **Section 6. How to access the Calculator**). There are 2 main types of users of the Calculator:

- **User**: this role is automatically assigned to the users who self-register into the Calculator with an account and a password. This role functions as a private account with access to the full functionalities of the Calculator (all of which are explained in this document).
- **Guest**: this role is automatically assigned when users access the calculator without registering for an account. This user can use the calculator by entering and editing data; the user can also see the results but cannot save or download the results (see **Section 6.1 Access without registration**).

4. The landing page

The Calculator can be accessed[2] from the 'Resources' menu on the EUSTEPs website (eusteps.eu), or directly at eusteps.footprintcalculator.org. The landing page is automatically set to the English language and displays information about the EUSTEPs project's funding agency/program, a brief description of the Project, and the logos of all the project partners.

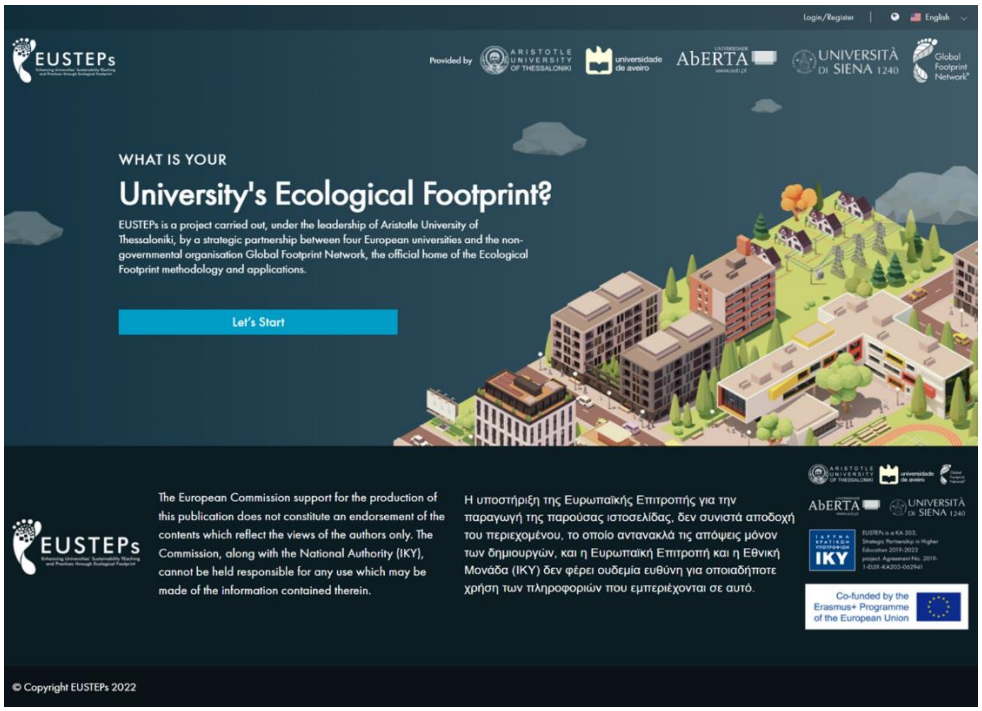


***Figure 1: The EUSTEPs University Footprint Calculator landing page**. Available at: eusteps.footprintcalculator.org*

5. Language selection

The Calculator is available in 4 languages: English, Greek, Italian, and Portuguese. To select the desired language, click on the button available on the upper right of the web page to display the available languages.

Users can select a different language at any point in time while using the Calculator without losing any data or results. The file of data and results available for download (in .csv format) will be in the language selected at the time of download, except for the heading rows, which are provided in English only.

Additional languages will be possibly implemented in the future.

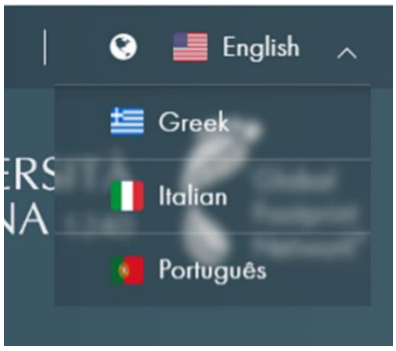


Figure 2: The language menu.

[2] To run the Calculator, it is suggested to use the following browsers: Chrome and Mozilla Firefox +++. Other browsers might experience some issues in using the calculator.

6. How to access the Calculator

The users can access the calculator in two ways: without registration and with registration.

6.1. Access without registration

The Calculator is freely accessible to everyone, and users can access it without registering an account on the platform. However, this option prevents users from benefiting few important functionalities of the tool. Some of the limitations of not creating an account are:

- The account dashboard, which allows users to save calculations and results, is not available, thus preventing users from keeping track of their University's Footprint results over time;
- Inputted data will be temporarily saved as the user progresses to the 'Results' page, but once the Calculator is closed, both input data and results will be lost. If, for any reason, the user is being disconnected from the Calculator or he/she closes the session by mistake, data is not saved and will have to be re-entered from start the next time the Calculator is accessed.

To use the Calculator without registration, users must scroll past the account fields and click on the "**Continue without Registration**" button. Users accessing the Calculator without registration are automatically assigned the role of "Guest" users.

After clicking on the button, the user is directed to the Calculator home page to fill out the input data.

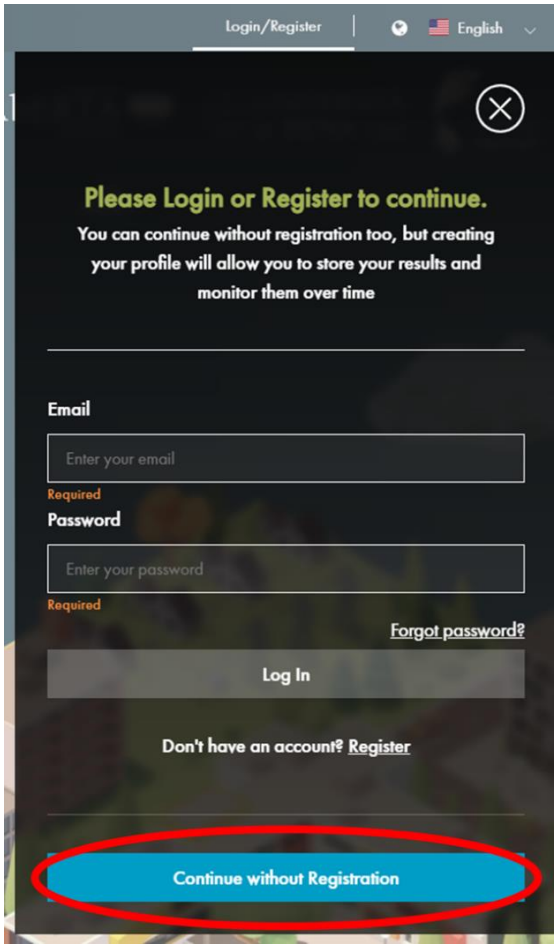


Figure 3: The log in/registration panel. *Access the Calculator without registration by clicking the blue button.*

6.2. Access with registration

For the best experience, users are encouraged to register and create an account/personal profile (see Figures 4a and 4b). Users who register have access to additional useful features, including saving data and results while progressing and keeping track of all previous calculations.

When accessing the Calculator for the first time, users are asked to register by entering personal information (i.e., first and last name, organization, country and email), choosing a password, and agreeing to the Privacy Policy. Users may, optionally, choose to subscribe to the EUSTEPs project newsletter during the registration process.

To access the Calculator in the future, users can simply use the credentials previously registered (email and password) in the account fields.

All the functionalities explained in this document are included for users who register with an account.

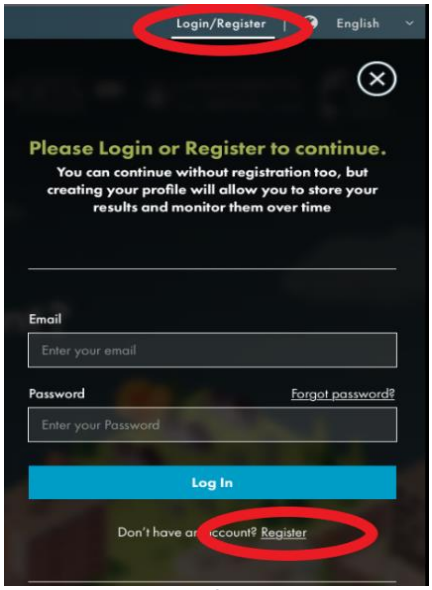


Figure 4a: The log in/registration panel. *First time users may create an account by clicking the "Register" link.*

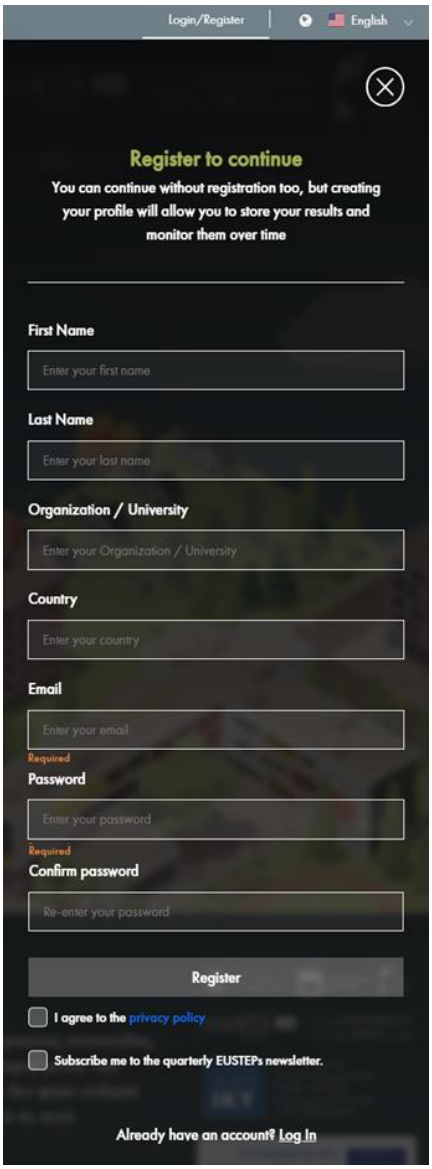


Figure 4b: The registration panel displayed to first-time registrants.

7. Calculator Home Page

Once logged in, users are presented with the Calculator Home Page, where they can start a new calculation session. Figure 5 shows how the Home Page displays when a user is logged into the Calculator.

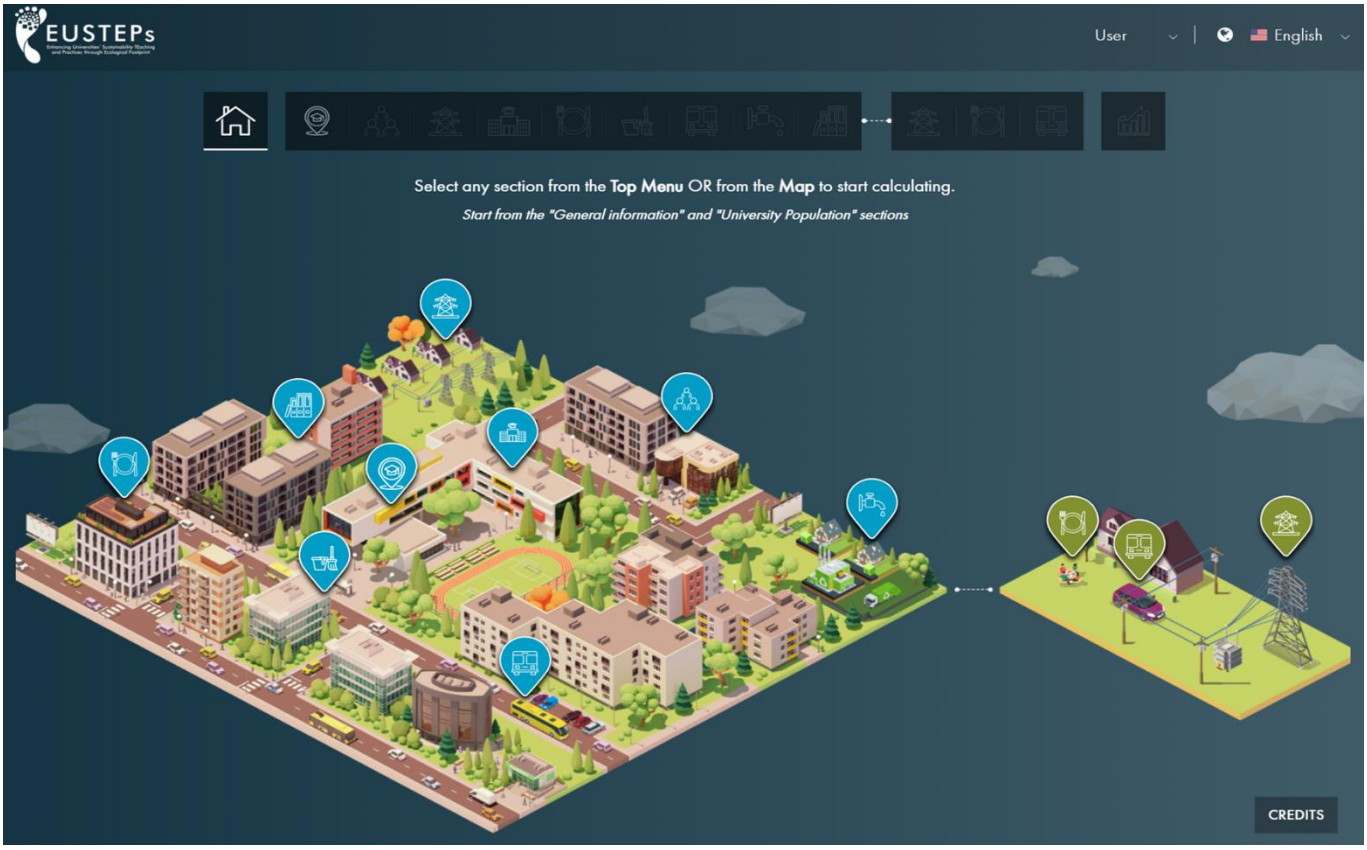


***Figure 5: The Calculator home page**, which displays the areas under the Direct Responsibility and Indirect Responsibility of the University.*

At the top of the page is a menu with buttons redirecting to each section of the Calculator (Figure 6). Below, two maps mimic a University campus's facilities and buildings (the large map on the left) and a house from which students and staff commute to the University - as well as eat and consume energy indipendently from the University - (the small map on the right). Similarly to the top menu, the pinpoints on the maps direct users to the various Calculator sections.

When starting a new calculation, the Calculator requires users – for calculation reasons behind the tool – to start with the General Information section, followed by the Population section. Once these two sections are completed, all other are unlock and data can be entered (Figure 6) in any order the user prefers.

***Figure 6: Top menu.** From left to right: **Home page** button, the nine buttons related to the activities under the University's **direct control** (general information, University population, energy consumption, buildings, feeding staff and students, cleaning services, travels, water consumption and waste, and materials and equipment), the three buttons related to the activities under the University's **indirect control** (energy at home, food at home, and commuting), and lastly, the **Results page** button.*

7.1. General structure of the calculator

The University Footprint Calculator is organized into two main sections, which distinguish the actions of consumption under the **Direct Control of the University administration** from the actions under the **University administration's Indirect Control.**

7.1.1. Direct control of the University administration

This part of the Calculator groups together the services, operations, and infrastructure necessary for the University's education, research, and administration activities. These services are directly managed and/or controlled by the University's administration, which is responsible for making decisions relating to them. Such services include:

- **Energy use** for running the University's infrastructure and facilities;
- **University buildings and recreational areas** in which facilities are located;
- **Feeding staff and students** with food provided in University canteens and cafeterias;
- **Cleaning services** at the Campus**;**
- **Travels** within and away from the University for teaching, research, or administrative purposes;
- **Water use and waste management** at the University's premises;
- **Materials and equipment** 's key purchasing**.**

On the Calculator home page, the Direct Control component is represented by the bigger map on the left (Figure 5).

7.1.2. Indirect control of the University administration

The Indirect Control area deals with actions and consumption activities by the University's staff and students that take place outside the University's premises, but that are still related to studying, research, or teaching programs. Such activities are not under the direct control of the University administration, which can only have a minimal (and indirect) influence on them. These include:

- **Commuting** from home to the University (and vice versa) depends on individual choices and options for travel to reach the place of work or study;
- **Energy at home & internet connectivity** When staff and students work or study from home, they consume electricity and heating energy, and use internet traffic data for working, browsing and researching on internet for education or teaching purposes;
- **Food at home** , which is consumed outside the University specifically when studying or working from home.

On the Calculator home page, this component is represented by the detached smaller map on the right (Figure 5).

7.2. The personal dashboard

Registered users can find their personal dashboard on the top right corner of the screen (Figure 7). Hover over the account **name** to display a drop-down menu showing the account settings. The User mode will have the menu settings as shown in Figure 7, while the Guest mode (i.e. not registered users) will have a reduced menu, showing the 'Share Results' and 'Logout' buttons only. See **User roles section 3.1**.

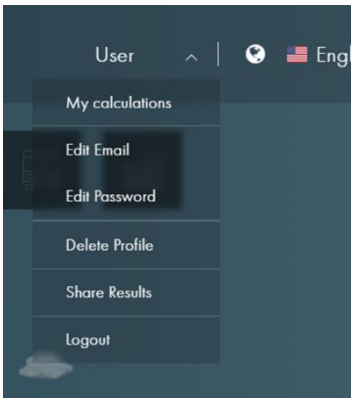


***Figure 7: The Calculator dashboard**. Access user settings*

For the User mode, the following settings are included in the dashboard:

- **My calculations:** all saved calculations can be found here (Figure 8). Each calculation is identified by the University name and the calculation data year, which is automatically imported from the   General information section. The status column indicates the calculation's percentage of completion (i.e., In Progress x% or Complete 100%) and the calendar date on which it was started. The three action buttons to the right of each calculation allow users to (from left to right, Figure 9):
    - access a saved calculation session to edit data and/or visualize results;
    - download input calculation data and results (while clicking on this button, a compressed folder containing two files in *.csv format – one with the input data and one with Footprint results broken down by land type and activity sections – will be downloaded to the computer);
    - delete a calculation session.

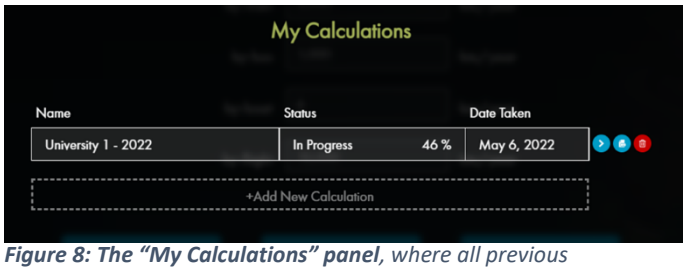


***Figure 8: The "My Calculations" panel**, where all previous calculations can be accessed*

***Figure 9:** Action buttons displayed alongside each calculation*

- **Edit email:** change the email associated with the account;
- **Edit password:** change the password associated with the account;
- **Invite users:** invite other users to create their own accounts to access the Calculator;
- **Delete profile:** delete the account from the Calculator;
- **Share results:** share Calculator results obtained with EUSTEPs partners;
- **Logout:** log out from the current Calculator session.

8. How to use the Calculator

This section explains how to use each section of the Calculator in detail.

8.1. General instructions

Below are general instructions for the use of the Calculator:

- Upon starting a new session, users are required to complete the "General Information" section followed by the "University Population" section (see Figure 6). Once these two sections have been completed and saved, data may be entered in any order in the remaining sections. A tick mark will be displayed over the top menu button once a section is completed. This also implies that any section of the Calculator – except for the "General Information" and "University Population" sections – can be skipped if data should be missing and yet the Calculator will provide results for those that are completed.
- From the home page, users may browse all sections of the Calculator by clicking on the map pinpoints or the top menu buttons. Within each page, when data is entered in the required fields, inputs must first be saved by clicking on the Save button, then users may click on the Next button to advance to the next section (or click any button on the top menu to move to the desired section) (see Figure 10). **IMPORTANT**: once inputted, data is NOT automatically saved; as such, if users click on the 'Next' button without having saved it before, data will be lost.

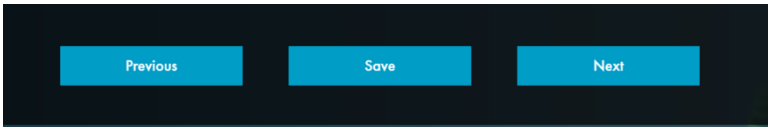


***Figure 10: The action buttons at the bottom of each page**. Click on the Save button to save entered data before moving to the next section.*

8.2. Direct control

The nine buttons directly after the Home button (see Figure 6) relate to the sections under Direct Control of the University. The following paragraphs describe how to move through these sections step by step.

8.2.1.  General information

Enter key general information about the University for one specific calendar year.

- ***Country***: from the drop-down menu, select the country in which the University is located.
- ***Name of the Higher Education Institution (HEI)***: enter the name of the Institution.
- ***Calendar year of data***: enter the solar year during which all data for the following sections was collected and reported. The "Solar Year" for the Calculator is one full calendar year, from January 1st to December 31st.
- ***Number of annual publications in peer-review journals:*** enter the number of papers published by all University staff in peer-review journals during the chosen year of reference. This information can be easily retrieved from online systems, such as scopus.com.
- ***Number of annual graduations:*** enter the number of students who graduated during the year of reference, or alternatively in the related academic year (see  University Population section for details and more info).
- ***Total funds received for research during the year of reference:*** enter the total amount of funds received from any financial institution (including national research grants) during the year of reference, or alternatively in the related academic year.

Click on the Save button at the bottom of the page, and then the Next button to move to the next section.

8.2.2. University Population

In this section, users are required to provide information on the population actively attending or working at the University, including both students and staff.

- ***Number of students enrolled in the year of reference**:* enter the number of students enrolled in the calendar year indicated in the previous "General Information" section.
    - If the number of enrolled students is counted by Academic year, rather than by solar year, enter the Academic year that ended in the solar year of reference. For example, if the solar year of reference is 2019, the Academic year during which to count students is 2018-2019.

  Within the Calculator, students are defined as **undergraduate and postgraduate students who are studying for Higher Education programs such as Bachelor's, Master's, Doctoral, or other equivalent degrees or components of those programs**. In addition, student count might include **students on placements**, and **visiting/exchange students who are studying for programs that result in credits at your Institution** (e.g. incoming students)[3].

  It should **NOT** include:
  - Exchange students who are currently studying at another Institution (e.g., outgoing exchange students, who are not currently studying for credits at your Institution);
  - Students who are not currently active;
  - Postdoctoral students.

- ***Average ECTS for a full-time student in one Academic year**:* The European Credit Transfer and Accumulation System (ECTS) is a tool of the European Higher Education Area for making studies and courses more transparent. ECTS credits represent defined learning outcomes and their associated workload. Each ECTS is generally considered equivalent to 25 hours in between frontal lessons, exercise, home study, etc. Enter the number of ECTS that a full-time student can expect to get in one academic year, calculated as the average among all University courses and across all years of study.

- ***Number of FTE staff contracted for the reference year**:* enter the number of staff working at the University on a full-time basis (Full-Time Equivalent – FTE). Staff categories include all academic and non-academic individuals who are working for the University and hired for a wage, salary, fee, or payment to perform work for the University. It also includes people working for core University services that have been outsourced (for example, cleaners, janitors, caterers, and gardeners hired to provide relevant services through an external company). The Full-Time Equivalent for an employee can be calculated as the total number of hours worked during the year divided by the number of working hours of a full-time person. More precisely, the categories to include under staff are:
    - Senior Academic Staff (e.g., full-time professors, deans, chancellors, rectors, presidents, vice-chancellors, deputy vice-chancellors, chairs);
    - Academic Staff (meaning individuals employed in an academic post (e.g. lecturer, reader, professor) who teach, research, or do both (e.g., assistant and associate professors, research only staff, post-doctoral researchers, invited teachers/educators/professors if they have a contract);
    - Non-Academic Staff, including administrative, operational, and technical staff (e.g., research assistants, clinicians of all types, technicians, and staff that support the general infrastructure of the Institution).

- ***Definition of the full-time equivalent in your University:*** enter the definition of a full-time equivalent (FTE), expressed as the number of working hours per person per year.

[3] Please note that the definitions of students and staff to include/not to include in the Calculator are solely intended as a guide to help HEIs follow the same classification/approach and obtain comparable results. However, each HEI might decide to use different definitions based on their preferences and/or own classifications already used in other types of analysis.

Click on the Save button at the bottom of the page, and then the Next button to move to the next section.

8.2.3.   Energy use

This section collects data on the annual energy consumption of the University, including electricity, heating, and hot water, as well as annual data on energy production from multiple renewable resources in place at the University. Data should be collected from the periodic bills of each utility referring to the year of reference and totaling the bills to calculate the annual amount. The section is comprised of two pages:

On page 1, enter annual data related to:

- **Annual electricity consumption**: enter the University's annual consumption in kilowatt hours (kWh) by totaling the periodic bills of that period;
- **The heating and hot water system**: calculate the University's annual energy consumption for heating and hot water by adding up the periodic bills. Only enter data related to the specific applicable energy sources – and the related unit of measure – for the fields listed: natural gas[4] (m^3), LPG (liters), Heating oil (liters), Biofuels (liters), Biomass (tons). Fields for sources that are not applicable can be left blank.

For both utilities (electricity and heating and hot water), energy consumption bills should be entered either as the University's total consumption (thus summing up all the energy bills for which the University is paying) or broken down by the University's different buildings. In this latter case, buildings to consider are:

- **Teaching and administrative buildings**: Buildings hosting teaching classrooms, laboratories, lecture halls, auditoriums, libraries, professors' and researchers' rooms, and study rooms, as well as administrative and management offices;
- **Dormitories**: any building in which students reside and for which the University pays the bills;
- **Canteen/cafeterias**: buildings in which any food service is offered to students;
- **Other**: any other building not listed above.

After clicking the 'Save' button at the end of the page, the second page will appear.

On page 2, enter annual data related to the University's self-generation of electricity from alternative sources, which complements the energy from the national grid. If self-generation systems are not in place, select 'No'. If the University does generate its own electricity and the user responds 'Yes', a list of alternative sources opens up, including photovoltaic, wind, geothermal, and hydroelectric sources, as well as the consumption of diesel in self-generators. Enter the annual data which corresponds to each source.

Click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section.

[4] The consumption of natural gas is usually measured in 2 ways: cubic meter (mc), which is the consumption of gas measured at specific external conditions (pressure and temperature), and the Standard cubic meter (Smc), which is the volume at standard conditions of pressure and temperature (usually 1atm and 20°C respectively). This latter measure, the **Standard cubic meters,** is the one usually taken into account in all assessments, including the GHG and energy reporting at national level. So, also for the University Footprint Calculator, it is required to consider the standard cubic meter consumed.

8.2.4. University buildings and recreational areas

This section collects data on the physical space, or surface area, of the University built areas. Unit of measurement is expressed in m^2.

Users have the option to enter data for either the **whole entity** or by **building and area type** by clicking on the button "Or add Details":

- **Whole entity**: input data for the surface of the entire University by adding up the surfaces of all buildings, paved areas, and green areas. Unit of measure must be expressed in m^2;
- **Add Details**: if data is available, users can input data related to single areas expressed in m^2, which include:
  - **Teaching and administrative buildings:** buildings hosting teaching classrooms, laboratories, lecture halls, auditoriums, libraries, professors' and researchers' rooms, and study rooms, as well as administrative and management offices;
  - **Dormitories**: any building hosting the students' residencies;
  - **Canteens**: buildings in which any food service is offered to students;
  - **Parking lots**: all University parking areas;
  - **Roads**: any paved ground owned or managed by the University which connects different buildings;
  - **Green Areas**: any botanical garden, park, forest, farm, or crop owned or managed by the University;
  - **Blue areas**: any areas occupied by water surfaces (e.g., wetlands, lakes, rivers, ponds) owned or managed by the University;
  - **Other**: any other area occupied by the infrastructure owned or managed by the University and not included above;

Click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section.

8.2.5. Feeding staff and students

This section collects data on the food supplied either directly by a specific University service or by any third-party service provider subcontracted by the University for feeding its population within the university premises. Food may be served in canteens, restaurants, cafes, dining halls, or any other location at which the University is providing food.

To input data on food, users are required to collect raw data on all the food items offered in one year and classify them in one of the 12 macro-categories of the COICOP[5] classification. **Annex 1 – Food Macro-categories description and details** provides detailed information on what to include in each macro-category. Depending on the category, users are asked to provide data on:

- **The total quantity of each macro-category supplied in the year of reference**: the quantities must be expressed in tons of food for solid food (including oils and dairies) and in liters for beverages (alcoholic and non-alcoholic). In each macro-category, users should sum up the quantities of each food item to calculate the total for each category;
- **The method of production:** it is expressed as the percentage (%) of the total food provided within the University premises that is produced via **organic practices**. This data is not required for the categories of Fish, Product Not Elsewhere Classified (NEC), and beverages;
- **The origin of the food**: it is expressed as the percentage (%) of the total provided food that is sourced locally, meaning within 60 km of the University's location. This data is not required for the categories of Product NEC, and beverages;

[5] The Classification Of Individual Consumption According to Purpose (COICOP) is the internationally agreed classification system for reporting household consumption expenditures. It is published by the United Nations Statistics Division for use in expenditures classification, National Accounts, Household Budget Survey and the Consumer Price Index.

- **The type of packaging of beverages** (alcoholic and non-alcoholic): it is expressed as the percentage (%) of **Plastic and Aluminum** (e.g., plastic bottles, cans), **glass** (e.g., glass bottles), and **draughts** (e.g., tap water, draught beer). **Please note** that data on the packaging should fit in these three modes only, so answers must add up to 100%. Should other types of packaging be used, users may account for those types in one of the existing categories.

Click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section.

8.2.6.   Cleaning services

This section collects data on the cleaning services in all infrastructures of the University, which are either directly supplied by a specific University unit or by a third party subcontracted by the University for such services.

Users can input data either as the "Total annual hours dedicated to cleaning" **or alternatively** as the "Annual budget assigned to the cleaning service provider":

- **Total annual hours dedicated to cleaning**: this data information refers to the total annual hours spent on cleaning services. The Footprint associated with cleaning services is calculated based on unique Footprint intensities related to the cleaning trolley and time. Please refer to **Annex 2 – Constants parameters for the calculation behind the Calculator** for the specific conversion factors; or alternatively
- **Annual budget assigned to the cleaning service provider**: should annual hours data be unavailable, users have the option to click on "or add annual budget" and input data on the annual budget (or the monetary information in the national currency) spent on cleaning services. In this case, the Footprint of cleaning services is calculated based on the average annual hourly cost of the cleaning service by country. Please refer to **Annex 2 – Constants parameters for the calculation behind the Calculator** for the specific conversion factors.

Click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section.

8.2.7.   Travels

This section collects data on the University Population's travels (including both staff and students, see the related definitions in   University Population) for teaching, studying, research, and administrative purposes, whose expenditures are entirely covered by the University, either because they are directly paid by the University (or associated Institutions) or because they are subject to full reimbursement by the University.

The Travels section is comprised of two pages, which collect data about Travels completed using vehicles owned or rented by the University (Page 1), or by means of other transportation modes (Page 2).

- *University owned or rented vehicles* (Page 1 of 2)
  On this page, data is collected on the vehicles owned or rented by the University. Users must collect and add data on the annual fuel consumption of all owned and/or rented vehicles – expressed in liters – for four fuel types: gasoline, diesel, methane, and LPG.

- *Staff and/or students' mobility for teaching, studying, research, and administrative purposes* (Page 2 of 2)
  On this second page, data is collected on the distance covered by the University population through private vehicles or public transportation, which includes different modes such as car, train, bus, boat, and flight.

Users must collect and add the distances – expressed in kilometers – of each individual trip taken through each mode of transportation by staff and students. Users should pay attention to whether the raw data they enter is round-trip or one-way; in the case of one-way, the distance should be doubled if completed using the same mode of transport.

Please note that daily commuting to/from the work- or study-place should not be entered here but rather under the Indirect Control section of the Calculator (see Commuting).

Click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section.

8.2.8. Water use and waste management

This section collects University data on two types of utilities: i) the consumption of water (and related wastewater), and ii) the production of (multiple types of) waste. Consequently, this section is made up of two pages: Page 1 on water consumption and Page 2 on waste production.

- *Water consumption* (Page 1)

  Page 1 is used for collecting data about the annual consumption of water and wastewater[6], both expressed in m^3. Data should be collected from the periodic bills in the reference year (as chosen in the General Information section) and added up to calculate the annual amount.

  Data can be entered as the total consumption of the whole University (by summing up all water bills which the University pays) or can be entered in detail as consumption by building type. In the latter case, users can click on the button "or add details." The building types to enter data are teaching and administrative buildings, dormitories, cafeterias, and others. When users enter detailed data for the different buildings, the total value is automatically updated as the sum of the detailed fields. For a description of these buildings, see **section 8.2.3**. Energy use .

  Once water consumption data is entered, click on the 'Save' button and then the 'Next' button to move to Page 2.

- *Waste production (Page 2)*

  Page 2 collects data on the annual production of wastes, expressed in tons per year. Data should be collected from any document the University may have available on this matter (e.g., detailed periodic bills, internal recording of waste production, or reports on the subject), which refers to the year of reference (as chosen in the General Information section). Data on waste production may be entered as the total production of all wastes or broken down into the different waste types. In the latter case, users can click on "add detailed data" and input data for each waste type, which includes Plastic, Paper, Glass/can, Organic, Waste Electrical and Electronic Equipment (WEEE), and Undifferentiated.

  Regardless of whether users have data on the total waste volume or the volume by waste type, they can input data either for the whole University or broken down by the buildings where waste is produced. In the latter case, users can click on "or add details." The building types to enter data are teaching and administrative buildings, dormitories, cafeterias, and others. For a description of these building types, see **section 8.2.3**. Energy use .

Users may input data **either** under the Total for all fields **or** under the detailed building subcategories for all fields. If users opt to enter details on subcategories, data must be entered for every subcategory.

[6] The volume of wastewater produced is usually between 90% and 95% of the water use volume (Defra/DEC 2012). If the wastewater quantity is provided as input data, the Calculator uses that value. However, should users leave the wastewater field empty, the Calculator automatically applies a factor of 0.9 (90%) to the quantity of water consumption to get a value for wastewater.

Once all waste production data has been entered, click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section.

8.2.9.   Materials and equipment

This section collects data on the use of University funds to purchase specific categories of Materials and equipment in the reference year. The categories for which data is required – i.e., the total amount of money spent in the reference year and expressed in the national currency – are:

- **Furniture and furnishings**: it includes desks, chairs, closets, filing cabinets, whiteboards, blackboards, shelves, bookcases/bookshelves, furnishing for the dormitories, and the alike;
- **Electronic equipment**: it includes laptops, computers, tablets, printers, scanners, cameras, and all other electronic devices;
- **Newspapers, books, and stationery:** it includes all paper and printed materials purchased for research, study, teaching, or administrative purposes, as well as the tools needed for desk and writing work (i.e., pens, pencils, text markers, rubbers, staplers, adhesive tapes, clips, paper notebooks, various binders). This category **excludes** the white/virgin paper purchased for writing, and printing.

In addition, two more categories of materials are included in this section, for which data is required as the number of items (not as money spent):

- **Reams of A4 paper**: users are required to input the total number of reams of paper in format A4 (29.7x21 cm) purchased in the year of reference. A paper ream is a pack of paper that usually contains 500 sheets per package;
- **Ream of A3 paper:** users are required to input the total number of reams of paper in format A3 (29.7x42 cm) purchased in the year of reference. A paper ream is a pack of paper that usually contains 500 sheets per package.

Once all data about the Materials and equipment has been entered, click on the 'Save' button at the bottom of the page, and then the 'Next' button to move to the next section, or any button on the top menu to jump to another section.

IMPORTANT: if users are not interested in finding out the Ecological Footprint results of the sections under the *Indirect Control* of the Calculator (i.e. Energy@Home & Internet Connectivity, Food@Home, and Commuting), they can simply skip the related buttons and directly jump to the Results section.

8.3. Indirect control

Following the order of sections on the top menu, the last three buttons point to the three sections under the *Indirect Control* of the University (Figures 5 and 6). For each section of indirect control, users can choose to calculate the Ecological Footprint of the activities for which the University has sole indirect responsibility using either a Tier 1 or a Tier 2 method.

8.3.1. Tier 1 and Tier 2 calculation methods

To calculate the Ecological Footprint of the activities listed within the *Indirect Control* section of the Calculator, the Calculator allows users to choose between two calculation methods – Tier 1 and Tier 2 - depending on data availability:

— **Tier 1** applies a default calculation that the Calculator automatically performs without the need of manually inputting any data by the users. This method should be selected when data collected through specific surveys is not available (if available, see Tier 2). The default calculation allocates a portion or the whole daily per capita

consumption Footprint in each country – calculated by Global Footprint Network (GFN) for housing (for the **energy consumption at home** section), personal transportation (for the **mobility to commute** section), and food (for the **food consumption outside the University** section) – to the university according to the share of the work (for staff) or study (for student) time spent at home.

— **Tier 2** relies on specific data that the administration collects among a representative sample of staff and students; such sample should represent the proportion of males and females in the University's overall population. Possible survey templates to be used in data collection can be found in **Annex 3 – Template Surveys for the Indirect Responsibility Tier 2**. Once surveys are collected from all the interviewees, data of the same field must be summed and the average calculated, differentiating between the group of staff and the group of students. Average data can then be inputted into the related fields in the Calculator. The Calculator allocates the data to the total number of students and staff - based on the information given in **section 8.2.2 University population**. The calculation assumes that for students the work/study load spans over 4 weeks in a month and a total of 10 months in a year, while for staff the workload spans over 4 weeks in a month, during a total of 11 months in a year.

8.3.2. Energy at home & internet connectivity

This section calculates the Ecological Footprint of energy consumed at home as well as the use of internet by staff and students when they work or study from home.

First, users need to choose between the Tier 1 or Tier 2 calculation method for this section.

- **Tier 1**: If Tier 1 is selected, click on the 'Save' button and then on the 'Next' button to move to the following section.
- **Tier 2**: Tier 2 requires specific data to be entered, which University administrators should have collected from a sample of staff and students ahead of time. Select Tier 2 and click on the 'Save' button, then click on the 'Next' button. At this point, the Calculator is comprised of two pages, on which the list of questions is displayed for the group of staff and the group of students.

  On page 1, enter annual data related to:

  - **Annual electricity consumption at home:** enter data on the annual consumption of electricity (expressed in kilowatt-hours) occurring in the private houses of students and staff in the year of reference. Input the average calculated from the collected data for both the student group and the staff group;
  - **Annual energy consumption for heating and hot water at home:** enter data on the annual consumption of energy for both heating and hot water (combined) by selecting the applicable sources – and the related unit of measure - for the fields listed: Natural gas (m^3), LPG (liters), Heating oil (liters), Biofuels (liters), Biomass (tons);
  - **Average number of hours spent at home for working/studying in a week:** enter the average number of hours spent working (in the case of staff) and studying (in the case of students) from home in a week;
  - **Number of people living at home:** enter the average number of people living in the same house

  On page 2, enter annual data on the time spent on the internet for the purposes of working and studying. Indicate the average number of hours calculated from the data collected on the group of staff and the group of students. Internet use purposes include:

  - **Online teaching/classes and videoconferences**: enter the average number of hours spent on the internet in a week for teaching (in the case of staff) or attending (in the case of students) classes online, including live conferences, training, and workshop attendance;
  - **Emailing/messaging**: enter the average number of weekly hours staff and students spend sending, receiving, or checking University-related emails or other types of online messages;

- **Conducting research**: enter the average number of weekly hours staff and students spend conducting research by browsing online resources;
- **Streaming videos**: enter the average number of weekly hours staff and students spend watching online recorded videos for working and studying purposes;
- **Social media**: enter the average number of weekly hours staff and students spend working and studying on social media (if any).

Once all data is entered, click on the 'Save' button and then on the 'Next' button to move to the following section.

8.3.3.   Food at home

This section calculates the Ecological Footprint which can be contributed to food consumed at home in a week.

First, choose between the Tier 1 or Tier 2 calculation method for this section:

- **Tier 1**: If Tier 1 is selected, click on the 'Save' button and then on the 'Next' button to move to the following section.
- **Tier 2**: Tier 2 requires specific data to be entered, which University administrators should have collected from a sample of staff and students ahead of time. The Calculator allocates the weekly quantity of food consumed to the number of hours spent at home working or studying, as indicated in the energy at home section. After selecting the Tier 2 method, click on the 'Save' button and then on the 'Next' button.

  The list of food macro-categories is displayed for the group of staff and the group of students. For each macro-category of food, users are required to provide data on:

  - **The quantity:** enter the average per capita quantity of consumption of each macro-category in a week for the group of staff and the group of students. The quantities must be expressed in kilograms (kg) of food (for solid food) and liters for beverages (alcoholic and non-alcoholic) and should be calculated from the data collected from the staff and student surveys. Please refer to **Annex 1 – Food Macro-categories description and details** for a detailed description of the food macro-categories;
  - **The method of production:** enter the average percentage (%) of the total provided food that is produced via **organic practices**. This data is not required for the categories of Fish, Product NEC, and beverages;
  - **The origin of the food**: enter the average percentage (%) of the total provided food that is sourced locally, meaning within 60 km from the University's location. This data is not required for the categories of Product NEC and beverages;
  - **The type of packaging of beverages:** enter the average percentage (%) of **Plastic and Aluminum** (e.g., plastic bottles, cans, etc.), **glass** (e.g., glass bottles), and **draughts** (e.g., tap water, draught beer, etc.) consumed by staff and students. **Please note** that data on the packaging should fit in these three modes only, so answers must add up to 100%. Should other types of packaging be used, users may account for those types in one of the existing categories.

Once all data is entered, click on the 'Save' button and then on the 'Next' button to move to the following section.

8.3.4.   Commuting

This section calculates the Ecological Footprint which can be contributed to individual staff and student modes of commuting from home to the University.

Three calculation methods are available in this section. First, choose between the Tier 1, Tier 1bis, or Tier 2 method of calculation for this section:

- **Tier 1**: If Tier 1 is selected, click on the 'Save' button and then on the 'Next' button to move to the following section.
- **Tier 1bis** *(Applicable to long-distance learning Universities)*: this option is an alternative to Tier 1 and should be selected when only University staff commute to the workplace (e.g., University buildings), while students do not commute because teaching and classes are solely offered online. This might be the case for **distance-learning Universities**. When this option is selected, click on the 'Save' button and then on the 'Next' button.
- **Tier 2**: Tier 2 requires specific data to be entered, which University administrators should have collected from a sample of staff and students ahead of time. When the Tier 2 method is selected, click on the 'Save' button and then on the 'Next' button. Tier 2 requires data on the average per-capita distance covered weekly (round trip), by both a student and a staff person, by the following modes of transportation:
  - **Walk**: enter the average weekly distance covered commuting by foot;
  - **Bike**: enter the average weekly distance covered by bicycle or other non-motor bikes (e.g., push scooter) commuters;
  - **Motorbike**: enter the average weekly distance (round trip) covered by motorbike/motorcycle commuters;
  - **Private car**: enter the average weekly distance (round trip) covered to commute via any type of car;
  - **Bus**: enter the average weekly distance (round trip) covered by public bus commuters;
  - **Commuter rail**: enter the average weekly distance (round trip) covered to commute via rails connecting an urban center to adjacent suburbs (e.g., regional train, suburban rails);
  - **Transit rail**: enter the average weekly distance (round trip) covered to commute via rails that stay within an urban center (e.g., subways, elevated railways, metros, streetcars, trolleys, and tramways);
  - **Boat**: enter the average weekly distance (round trip) covered to commute via any type of boat (e.g., ferryboats).

Once all data has been entered, click on the 'Save' button and then on the 'Next' button to move to the next section.

9. Ecological Footprint results

The University Footprint Calculator has been developed as a dynamic tool; as such it allows users to monitor Ecological Footprint results as each single section is completed. At the bottom of each page, a ribbon shows the Footprint value of the section in progress, as well as the Total Footprint value given by the sum of all the sections completed up to that point. Additionally, a colored bar at the bottom shows the Footprint of all the completed sections as a percentage contribution to the total Footprint results (Figure 11).

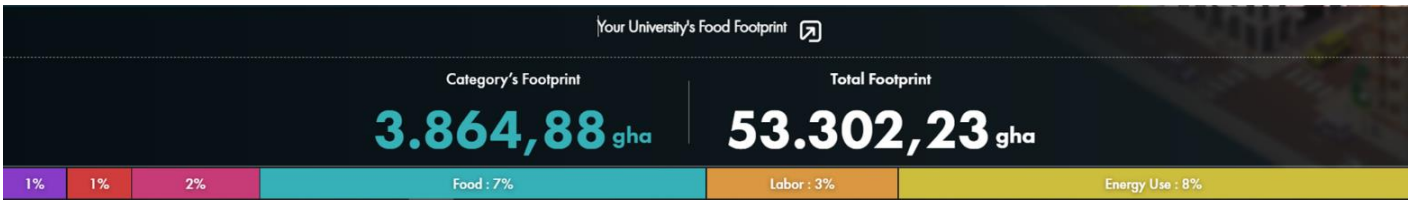


Figure 11: Ribbon bar at the bottom of each page of the Calculator showing the Footprint results in progress*. The colored value on the left is the Footprint value of the specific category in progress The category is also visible in the title at the top of the ribbon bar (in this figure, it's the Food category). The white value on the right is the total Ecological Footprint value as the sum of all completed categories. The colored bar on the bottom, which evolves in a dynamic way as data is entered, shows the percentage share of all completed categories on the total value, each color corresponding to a specific category.*

9.1. The Footprint Results page

The overall 'Results' page can be accessed either from the arrow icon at the top of the ribbon bar in each section or from the far right button in the top menu (Figure 12).

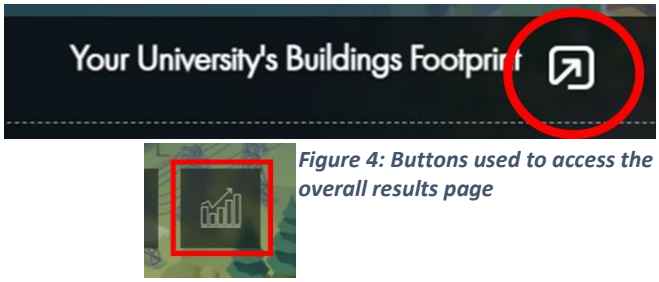


Figure 4: Buttons used to access the overall results page

The Results page shows the Ecological Footprint of the University based on the data entered in each category. Results are provided and visualized in multiple ways, with each one providing different information.

At the top of the results page, Ecological Footprint results intended as measures of the University's efficiency are provided; these indicators refer to the efficiency in using resources for providing education and conducting research (Figure 13). Such results can be used to compare the Ecological Footprint of a University through time:

- **Footprint per student** *and* **per staff**: it indicates the quantity of natural resources and ecosystem services used by the University per individual receiving (student) or providing (staff) education, respectively. This type of results is particularly useful when comparing the Footprint intensity of a University over time (or against other Universities) as the number of students and staff varies, making the comparison of total Footprint values of little value.
- **Footprint per number of graduations:** it indicates the quantity of natural resources and ecosystem services a University requires for a student to graduate. Monitoring this result annually allows a University to understand how efficiently it uses natural resources and ecosystem services when educating students.
- **Footprint per number of publications:** indicates the quantity of natural resources and ecosystem services a University requires to publish a peer-review Journal article in the year of reference. Monitoring this result annually allows a University to understand how efficient its staff is in using natural resources and ecosystem services to produce research published in peer-reviewed publications.
- **Footprint per thousand euro of funds received**: it indicates the quantity of natural resources and ecosystem services used by the University per euro of research funds received. Monitoring this result annually allows a University to understand how resource- and ecosystem services-intensive are the activities for which the University received financial support.

The **Total Ecological Footprint of the University** is then provided as the last value on the right side of the results bar (see Figure 13) indicating the overall Footprint impact of the University under assessment. This value indicates the total natural resources and ecosystem services required by the University for its operations and activities conducted in the year of reference. The Ecological Footprint of a University is expressed in global hectares (gha), a hectare-

equivalent unit of bioproductive area needed to provide those resources and services, and thus to support activities and operations. The total value is given by the sum of the total Ecological Footprint of the Direct Control and the total Ecological Footprint of the Indirect Control.

Figure 13: The Ecological Footprint results displayed at the top of the Results page.

Footprint results are then shown in a bar graph broken down by activities/operations and separated as the Direct and Indirect responsibilities of the University administration domain (see Figure 14). This breakdown looks at how the total Footprint spans across all the various activities and operations maintained by the University, under both Direct and Indirect controls. Such results help University administrators understand which areas have the greatest impacts and thus require major attention to be managed or conducted differently. Within each activity, Footprint results are provided for each sub-component making up that activity, thus providing further details to understand specific driver and intervention points.

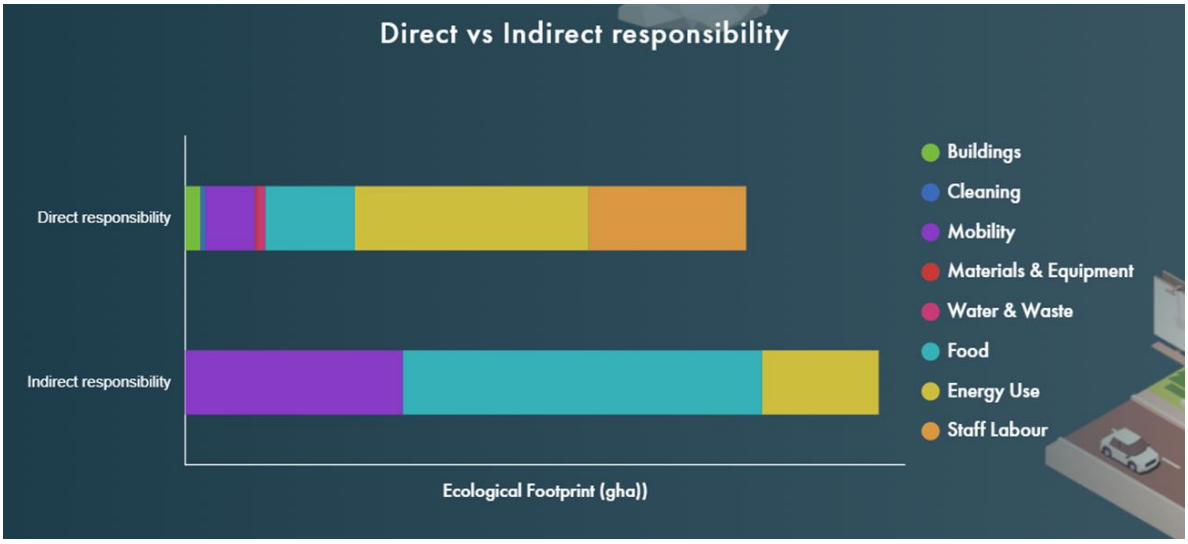


***Figure 14: Bar graph showing the Ecological Footprint of the University**, broken down by responsibility (Direct vs. Indirect) and activities.*

Beneath the bar graph, a toggle button allows users to look in detail at the Direct and Indirect Footprint results (see Figures 15 and 16). The Footprint values of the Direct and Indirect components are shown next to the overall Footprint value of the University. The detailed bar chart beneath these results shows the Footprint results for each section broken down by category and by land types.

***Figure 15: Toggle button set on Direct responsibility** and the related bar graph showing the Footprint results of its categories*

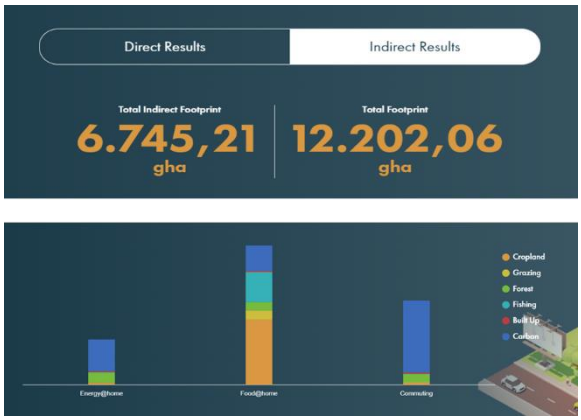


***Figure 16: Toggle button set on Indirect responsibility** and the related bar graph showing the Footprint results of its categories*

Finally, a menu displays buttons related to each consumption activity. By clicking on each one, the graphs related to each section's Footprint are shown (see Figures 17 and 18).

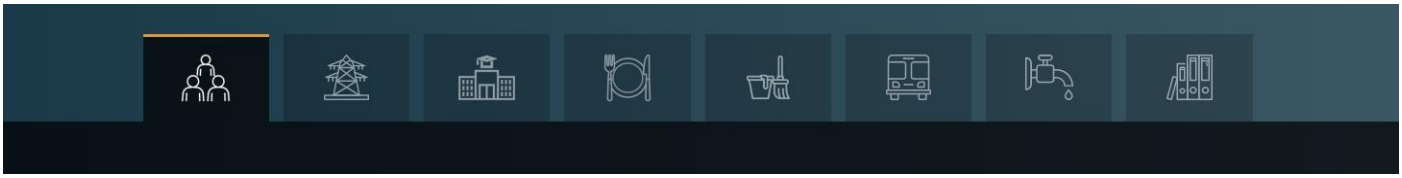


Figure 17: Buttons related to the activities under the University's direct control (University population, Energy consumption, Buildings, Feeding staff and students, Cleaning services, Travels, Water consumption and waste, and Materials and equipment), displaying the specific results in each of them.

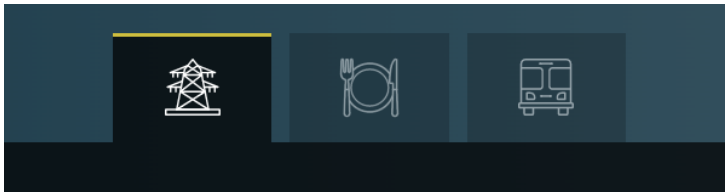


Figure 18: Buttons related to the three activities under the University's indirect control (Energy at home, Food at home, and Commuting), displaying the specific results in each of them.

10. Annex 1 – Food Macro-categories description and details

MACRO-CATEGORY	DESCRIPTION
Bread and Cereals	**01.1.1 Bread and cereals** – Rice in all forms; – Maize, wheat, barley, oats, rye and other cereals in the form of grain, flour, or meal; – Bread and other bakery products (crispbread, rusks, toasted bread, biscuits, gingerbread, wafers, waffles, crumpets, muffins, croissants, cakes, tarts, pies, quiches, pizzas, etc.); – Mixes and doughs for the preparation of bakery products; – Pasta products in all forms; couscous; – Cereal preparations (cornflakes, oatflakes, etc.) and other cereal products (malt, malt flour, malt extract, potato starch, tapioca, sago, cassava starch and other starches). **Includes**: Farinaceous-based products prepared with meat, fish, seafood, cheese, vegetables or fruit. **Excludes**: Meat pies (01.1.2 Meat); fish pies (01.1.3 Fish and seafood); sweetcorn (01.1.7 Vegetables).
Meat	**01.1.2 Meat** – Fresh, chilled or frozen meat of: - Bovine animals, swine, sheep and goat; - Horse, mule, donkey, camel and the like; - Poultry (chicken, duck, goose, turkey, guinea fowl); - Hare, rabbit and game (antelope, deer, boar, pheasant, grouse, pigeon, quail, etc.); – Fresh, chilled or frozen edible offal; – Dried, salted or smoked meat and edible offal (sausages, salami, bacon, ham, paˆ te´ , etc.); – Other preserved or processed meat and meatbased preparations (canned meat, meat extracts, meat juices, meat pies, etc.). **Includes**: meat and edible offal of marine mammals (seals, walruses, whales, etc.) and exotic animals (kangaroo, ostrich, alligator, etc.); animals and poultry purchased live for consumption as food. **Excludes**: land and sea snails (01.1.3 Fish and Seafood); lard and other edible animal fats (01.1.5 Oils and fats animal based); soups, broths and stocks containing meat (01.1.9 Product n.e.c.).
Fish and Seafood	**01.1.3 Fish and seafood** – Fresh, chilled or frozen fish; – Fresh, chilled or frozen seafood (crustaceans, molluscs and other shellfish, sea snails); – Dried, smoked or salted fish and seafood; – Other preserved or processed fish and seafood and fish and seafood-based preparations (canned fish and seafood, caviar and other hard roes, fish pies, etc.). **Includes**: Land crabs, land snails and frogs; fish and seafood purchased live for consumption as food. **Excludes**: Soups, broths and stocks containing fish and seafood (01.1.9).
Milk, cheese, and eggs	**01.1.4 Milk, cheese and eggs** – Raw milk; pasteurized or sterilized milk; – Condensed, evaporated or powdered milk; – Yoghurt, cream, milk-based desserts, milk-based beverages and other similar milk-based products; – Cheese and curd; – Eggs and egg products made wholly from eggs. **Includes**: Milk, cream and yoghurt containing sugar, cocoa, fruit or flavourings; dairy products not based on milk such as soya milk. **Excludes**: Butter and butter products (01.1.5 Oils and Fats plant-based).
Oils and fats, plant-based	**01.1.5a Oils and fats, plant-based** – Butter and butter products (butter oil, ghee, etc.); – Margarine (including ‘‘diet’’ margarine) and other vegetable fats (including peanut butter); – Edible oils (olive oil, corn oil, sunflower-seed oil, cottonseed oil, soybean oil, groundnut oil, walnut oil, etc.);
Oils and Fats, animal-based	**01.1.5b Oils and fats, animal-base** – Edible animal fats (lard, etc.). **Excludes**: cod or halibut liver oil (06.1.1).

MACROCATEGORY	DESCRIPTION
Fruit	**01.1.6 Fruit** – Fresh, chilled or frozen fruit; – Dried fruit, fruit peel, fruit kernels, nuts and edible seeds; – Preserved fruit and fruit-based products. **Includes**: Melons and watermelons. Sesame and sesame seeds, coconuts, oil palm fruits, cottonseed **Excludes**: Vegetables cultivated for their fruit such as aubergines, cucumbers and tomatoes (01.1.7); jams, marmalades, compotes, jellies, fruit pure´es and pastes (01.1.8); parts of plants preserved in sugar (01.1.8); fruit juices and syrups (01.2.2).
Vegetables	**01.1.7 Vegetables** – Fresh, chilled, frozen or dried vegetables cultivated for their leaves or stalks (asparagus, broccoli, cauliflower, endives, fennel, spinach, etc.), for their fruit (aubergines, cucumbers, courgettes, green peppers, pumpkins, tomatoes, etc.), and for their roots (beetroots, carrots, onions, parsnips, radishes, turnips, etc.); – Fresh or chilled potatoes and other tuber vegetables (manioc, arrowroot, cassava, sweet potatoes, etc.); – Preserved or processed vegetables and vegetable-based products; – Products of tuber vegetables (flours, meals, flakes, pure´ es, chips and crisps) including frozen preparations such as chipped potatoes. **Includes**: Olives; garlic; pulses; sweetcorn; sea fennel and other edible seaweed; mushrooms and other edible fungi. **Excludes**: Potato starch, tapioca, sago and other starches (01.1.1 Bread and Cereals); soups, broths and stocks containing vegetables (01.1.9 Product n.e.c.); culinary herbs (parsley, rosemary, thyme, etc.) and spices (pepper, pimento, ginger, etc.) (01.1.9 Product n.e.c.); vegetable juices (01.2.2 Non-Alcoholic beverages).
Sugar, jam, honey, chocolate, confectionery	**01.1.8 Sugar, jam, honey, chocolate and confectionery** – Cane or beet sugar, unrefined or refined, powdered, crystallized or in lumps; – Jams, marmalades, compotes, jellies, fruit purees and pastes, natural and artificial honey, maple syrup, molasses and parts of plants preserved in sugar; – Chocolate in bars or slabs, chewing gum, sweets, toffees, pastilles and other confectionery products; – Cocoa-based foods and cocoa-based dessert preparations; – Edible ice, ice cream and sorbet. **Includes**: Artificial sugar substitutes. **Excludes**: Cocoa and chocolate-based powder (01.2.1).
Food products not else classified (n.e.c.)	**01.1.9 Food products n.e.c** – Salt, spices (pepper, pimento, ginger, etc.), culinary herbs (parsley, rosemary, thyme, etc.), sauces, condiments, seasonings (mustard, mayonnaise, ketchup, soy sauce, etc.), vinegar; – Paste of tomatoes and tomatoes peeled – Prepared baking powders, baker's yeast, dessert preparations, soups, broths, stocks, culinary ingredients, etc.; – Homogenized baby food and dietary preparations irrespective of the composition; – Homogenized vegetable preparations, homogenized cooked fruit – Soya sauce, soya paste, soya curd **Excludes**: Milk-based desserts (01.1.4); soya milk (01.1.4); artificial sugar substitutes (01.1.8); cocoa-based dessert preparations (01.1.8).
Non-alcoholic beverages (liters)	**01.2.1 Coffee, tea and cocoa** – Coffee, whether or not decaffeinated, roasted or ground, including instant coffee; – Tea, mate´ and other plant products for infusions; – Cocoa, whether or not sweetened, and chocolate-based powder. **Includes**: Cocoa-based beverage preparations; coffee and tea substitutes; extracts and essences of coffee and tea. **Excludes**: Chocolate in bars or slabs (01.1.8); cocoa-based food and cocoa-based dessert preparations (01.1.8). **01.2.2 Mineral waters, soft drinks, fruit and vegetable juices (ND)** – Mineral or spring waters; all drinking water sold in containers; – Soft drinks such as sodas, lemonades and colas; – Fruit and vegetable juices; – Syrups and concentrates for the preparation of beverages. **Excludes**: Non-alcoholic beverages which are generally alcoholic such as non-alcoholic beer (02.1).
Alcoholic beverages (liters)	**02.1.1 Spirits** – Eaux-de-vie, liqueurs and other spirits. **Includes**: Mead; aperitifs other than wine-based aperitifs (02.1.2). **02.1.2 Wine** – Wine, cider and perry, including sake; – Wine-based aperitifs, fortified wines, champagne and other sparkling wines. **02.1.3 Beer** – All kinds of beer such as ale, lager and porter. **Includes**: Low-alcoholic beer and non-alcoholic beer; shandy.

11. Annex 2 – Constants parameters for the calculation behind the Calculator

CALCULATOR SECTION	TYPE OF CONVERSION FACTORS	SOURCE	AUTHORS	Link (if any)
University Population – Labor Footprint	National average Footprint values by categories of household consumption	National Footprint account by Consumption Land Use Matrix (CLUM) from MRIO-based CLUM results for GTAP10 year 2014	Global Footprint Network	
Energy Use (Direct Responsibility and Indirect Responsibility Tier 2)	National Electricity Carbon Intensity	National Footprint Account (2021 ed.)	Global Footprint Network	
	Heating & Hot Water carbon intensity (kg CO_2 unit^{-1})	Natural gas (methane)	EPA 2020	https://www.epa.gov/sites/production/files/2020-12/documents/stationaryemissions.pdf
		LPG (propane)	EPA 2020	https://www.epa.gov/sites/production/files/2020-12/documents/stationaryemissions.pdf
		Heating oil	UK POST, 2016 (Parliamentary Office for Science and Technology). Carbon Footprint of heat generation	https://researchbriefings.files.parliament.uk/documents/POST-PN-0523/POST-PN-0523.pdf
		Biofuels	2020 Government greenhouse gas conversion factors for company reporting, The Department for Business, Energy and Industrial Strategy, UK	https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020
		Biomass	EPA 2020	https://www.epa.gov/sites/production/files/2020-12/documents/stationaryemissions.pdf
	Electricity self-generation (kg CO_2 unit^{-1})	Solar panel (photovoltaic - PV)	UK POST (Parliamentary Office for Science and Technology)	http://www.geni.org/globalenergy/library/technical-articles/carbon-capture/parliamentary-office-of-science-and-technology/carbon-footprint-of-electricity-generation/file_9270.pdf
		Wind	UK POST (Parliamentary Office for Science and Technology)	http://www.geni.org/globalenergy/library/technical-articles/carbon-capture/parliamentary-office-of-science-and-technology/carbon-footprint-of-electricity-generation/file_9270.pdf
		Geothermal	US EIA (Energy Information Administration)	https://www.eia.gov/tools/faqs/faq.php?id=74&t=11
		Hydroelectric	UK POST (Parliamentary Office for Science and Technology)	http://www.geni.org/globalenergy/library/technical-articles/carbon-capture/parliamentary-office-of-science-and-technology/carbon-footprint-of-electricity-generation/file_9270.pdf
		Diesel	assumed equal to petroleum from thermoelectric generator	

CALCULATOR SECTION	TYPE OF CONVERSION FACTORS	SOURCE	AUTHORS	Link (if any)
Energy Use (Indirect Responsibility)	Carbon Footprint of Internet Connectivity (CO_2 emissions per hour of connectivity for various uses (g CO_2/hr))	Literature review	Obringer, R., Rachunok, B., Maia-Silva, D., Arbabzadeh, M., Nateghi, R., & Madani, K. (2021). The overlooked environmental footprint of increasing Internet use. Resources, Conservation and Recycling, 167, 105389	
Buildings	Equivalence Factors (EQFs) and Yield Factors (YFs)	National Footprint Accounts (2021 ed.)	Global Footprint Network	
Feeding Staff and Students (Direct responsibility and Indirect responsibility Tier 2)	Footprint Intensities by COICOP categories (gha/kg)	Global Footprint Network internal elaboration	○ Food Footprint MRIO 2014 ○ FAOSTAT food balance sheets ○ NFA World (2021 ed.)	
	Organic to conventional ratio per food macro-categories	Global Footprint Network internal elaboration of literature review	Clune, S., Crossin, E., & Verghese, K. (2017). Systematic review of greenhouse gas emissions for different fresh food categories. Journal of Cleaner Production, 140, 766-783	
	Weighted Average Distance of imported food per food macro-categories per EU countries	Global Footprint Network internal elaboration	○ NFA-MRIO analysis (Global Footprint Network) ○ Trade and the Greenhouse Gas Emissions from International Freight Transport. Available at: http://www.nber.org/papers/w17117.pdf	
	Carbon Footprint intensities of drinks packaging	Global Footprint Network	NFA world (2021 ed.)	
Cleaning service	Footprint intensity of cleaning trolley - manufacture of materials (gha/hour)	Literature review	Martinez-Rocamora et al., 2016. Ecological Indicators 69, 66-77	https://www.sciencedirect.com/science/article/pii/S1470160X16301777?casa_token=-Px7XYoDSEUAAAAA:9rbjc2NwLFTiJTUygcQLP0w4hKG7NAaqqnUN4OKZ9yCMbrtAbGuVYZUdtFXmG-iFEUcfMqZuOKbB
	Hourly cost of the cleaning service	Web sourcing and internal elaboration	National currency/hour	https://londoncleaningsystem.co.uk/how-much-do-cleaners-get-paid-in-the-eu/

CALCULATOR SECTION	TYPE OF CONVERSION FACTORS	SOURCE	AUTHORS	Link (if any)
Travels (Direct Responsibility and Indirect Responsibility Tier2)	Fuel emissions (kg CO_2/liter)	Internal elaboration of IPCC and OECD/IEA data	- IPCC, 2006. Guidelines for National Greenhouse Gases Inventories. Vol2. Ch.3. - OECD/IEA, 2004. Energy statistics Manual	
	Carbon Footprint intensities for public transportations (kg CO_2/pkm)	Internal analysis and web sourcing	- Global Footprint Network - 2020 Government greenhouse gas conversion factors for company reporting, The Department for Business, Energy and Industrial Strategy, UK - Business Travel Emission Factors Table 8 - Air travel data	- https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020 - https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf
Water & Waste	Water supply (kWh/m^3)	Literature review	Majid et al., 2020	Majid, A., Cardenes, I., Zorn, C., Russell, T., Colquhoun, K., Bañares-Alcantara, R., & Hall, J. W. (2020). An analysis of electricity consumption patterns in the water and wastewater sectors in South East England, UK. Water, 12(1), 225.
	Wastewater treatment (kWh/m^3)	Literature review	Wakeel et al., 2016	Wakeel, M., Chen, B., Hayat, T., Alsaedi, A., & Ahmad, B. (2016). Energy consumption for water use cycles in different countries: A review. Applied Energy, 178, 868-885.
	Energy consumption of waste treatments (kg CO_{2eq}/ton)	Web sourcing	DEFRA/DEC 2012	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69554/pb13773-ghg-conversion-factors-2012.pdf
Materials and Equipment	Footprint intensities of paper materials (gha/ton)	NFA 2021 - data World 2017	Global Footprint Network	
	Footprint intensities of purchased furniture and materials (gha/national currency)	NFA-MRIO analysis	Global Footprint Network	

12. Annex 3 – Template Surveys for the Indirect Responsibility Tier 2

Commuting

Please enter the following data from the sample of staff and students interviewed		
Please enter the average weekly distance (km) traveled per person from home to the University	Student	Staff
Input data	*km traveled*	*km traveled*
By walking		
By bike		
By motorbike		
By private car		
By bus		
By commuter rail - between a central city and adjacent suburbs (also called regional rail or suburban rail)		
By transit rail - rails typically within an urban center, such as subways, elevated railways, metropolitan railways (metro), streetcars, trolley cars, and tramways		
By boat		

Energy consumption at home

Please enter the following data from the sample of staff and students interviewed			
Input data	Unit of measure	Student	Staff
Annual electricity consumption at home	kWh		
Annual energy consumption for heating and hot water at home	Natural gas - m^3		
	LPG / Heating Oil / Biofuels - liter		
	Biomass - ton		
Average number of hours spent at home for working/studying in a week	#		
Number of people living at home	#		
On average, how many weekly hours do you spend working/studying on the internet at home for the following purposes:			
Online teaching/classes and videoconferences	# weekly hours		
Conducting research	# weekly hours		
Other uses (emailing/messaging, streaming videos, social media, etc.)	# weekly hours		

Food consumption at home

Please enter the following data from the sample of staff and students interviewed			
	Unit of measure	Student	Staff
Average number of hours spent working/studying at home in a week	hour/week		

Enter the weekly consumption (in kg) of the following food categories at home						
Students						
Food categories	quantity (kg)	% organic	% local	% draught	% glass packaged	% plastic /aluminium packaged
Bread and Cereals						
Meat						
Fish and Seafood						
Milk, cheese, and eggs						
Oils and fats, plant-based						
Oils and Fats, animal-based						
Fruit						
Vegetables						
Sugar, jam, honey, chocolate, confectionery						
Food products n.e.c.						
Non-alcoholic beverages						
Alcoholic beverages						
Staff						
Food categories	quantity (kg)	% organic	% local	% draught	% glass packaged	% plastic /aluminium packaged
Bread and Cereals						
Meat						
Fish and Seafood						
Milk, cheese, and eggs						
Oils and fats, plant-based						
Oils and Fats, animal-based						
Fruit						
Vegetables						
Sugar, jam, honey, chocolate, confectionery						
Food products n.e.c.						
Non-alcoholic beverages						
Alcoholic beverages						