**Data collection guide**

The aim of this guide is to facilitate the data collection step. The educational value of this step is significant, as students are proactively involved in their research and must act on their own initiative. Therefore the aim of this document is not to provide students with information directly, but rather to help them should they encounter any difficulties along the way. The form and quality of information provided will have a notable effect on resulting reflections.

# Energy

# The energy category focuses on the establishment's energy consumption over a school year. Initially data on electricity and heating consumption will be collected. For a complete approach, consumptions linked to air conditioning (refrigerant gas leaks) and different gases used in chemistry laboratories will also be added. It is simplest for students to request energy bill invoices. However in certain cases, the establishment does not directly pay for energy consumptions and such expenses are managed by the Department or Region, so they'll have to find the person who can provide such information.

If you are unable to find full details (a few months or a few buildings only), you will need to estimate missing data and in doing so you must take into consideration the months in which the establishment is open and buildings are occupied. Be aware that often there are marked differences in consumption levels during winter months and the rest of the year, heating costs in particular; be sure to take this into account in estimations.

 If after all our research you are still unable to obtain this information, you can estimate data by looking up average consumption rates of establishments similar to yours. We must always remember that each time we do not use real consumption data, the uncertainty of our carbon assessment becomes greater.

## Data to be obtained:

For an entry level approach:

* annual power consumption in kWh
* annual quantity of boiler fuel consumption (heating oil, gas or wood according to the establishment) in kWh

Supplements for the complete approach :

* type of gas used for air conditioning
* annual quantity of fuel consumed in chemistry laboratories (bunsen burners, etc.)

## Contact person: middle/ high school bursar

For middle schools : department person of reference

For high schools : regional authority person of reference

# Catering

In the catering category, students must calculate emissions linked to **meals served at the establishment, lunch mostly, but also including dinner in the case of boarding facilities.** In certain establishments, data on food sold in canteens and vending machines will also be collected.

Regarding meals, there are several ways of estimating emissions; data collection methods will differ according to the desired level of accuracy and available time. Therefore, the first step is to reflect on collected data.

## Choice of methodology:

* Step 1: **Choosing a calculation method**

The calculator provides **3 different methods** for calculating the greenhouse gas emissions of meals, ranging from the least to the most accurate (the least to the most complicated). Please note that these methods are exclusive: you must choose one or the other, otherwise you risk counting the same emissions twice:

* **Method 1** : Calculation using the “**Average meal**” emission factor

Greenhouse gas emissions from meals are calculated using the emission factor of 1 average meal multiplied by the number of meals per year (for all people in the establishment). Therefore students must simply find out the **number of meals** served in an entire year.

Advantage : Data collection is easy: simply count the number of meals per year for all people at the establishment.

Disadvantages: The emission factor for 1 average meal enables us to estimate catering emissions over a year and therefore to compare it with other sources of emission (energy, travel, etc.), but it does not provide in-depth and more accurate information on which habits (what kind of meal, what food) affect emissions the most.

* **Method 2** : Calculation according to emissions factors: **"vegetarian meal", meal "with white meat" "with red meat"**

Greenhouse gas emissions from meals can also be calculated more accurately using three specific emission factors for each type of meal: vegetarian, with white meat and with red meat. We can note that a vegetarian meal produces less greenhouse gas emissions compared to a white meat based meal, which in turn produces fewer emissions than a red meat based meal. Here students must find the **number of each kind of meal** served during an entire year.

Advantage : Emission factors correspond to the average emissions of each meal type. Therefore detailed results enable us to find which kinds of meal are the biggest emitters and to reflect on consumption practices at the establishment.

Disadvantages: Data collection is more precise and therefore not as simple as in case 1, although it is still feasible.

* **Method 3** : Full calculation from **transport of ingredients to catering waste management.**

This third method is more detailed and we'll try to break down each activity linked to school catering, including transport and end-of-life. Detailing these activities enables us to identify which steps in the production chain produce the most emissions. Here, students must **work together with building management and the school catering service** to obtain accurate information. The number of meals must be recorded (vegetarian, white meat, red meat) and completed with information on the transport of dishes to the canteen and waste management (organic, as well as plastic plates and covers, paper cups, etc.).

Advantage : Detailing these activities enables a broader scope of action: the impact of changing the supplier, means of transport or waste management could be assessed (incineration or composting for example).

Disadvantages: For this method to be truly precise, students, building management and the school catering service must work hard. It could be carried out later on, to refine results obtained from methods 1 and 2.

* Step 2: Data collection

The simplest way of obtaining this information is to ask the school canteen chef or management service. If the catering service is provided by an external company, the management of your establishment should be able to provide you with the contact details of someone who can give you answers.

If information collected by building management refers to a shorter period of time (a week or a month), you can estimate meals for the rest of the year, obviously bearing in mind that the shorter the period the more uncertain your carbon assessment will be.

If you are finding it difficult to find information, no doubt you'll need to use a relatively simple questionnaire:

* Method 1 : “*How many times do you eat at the canteen per week?” (Answer from 0 to 5 times)*
* Method 2 : *“If you eat at the canteen, how many of the following kinds of meal do you eat per week:*
	+ *Vegetarian meal (Answer from 0 to 5 times)*
	+ *Meal with red meat (Answer from 0 to 5 times)*
	+ *Meal with white meat (Answer from 0 to 5 times)"*

***A few tips for processing questionnaires***

Once your questionnaire is ready, you can choose whether to send it to students and/or staff by email, or to run the survey in person: you are free to choose based on how much available time you have and different response rates you obtain!

A questionnaire is never filled in by everyone it is sent to and this must be taken into consideration for the purpose of calculations. An initial hypothesis can be put forward, stating that the response rate of participants is not affected by the kind of meal they choose. Therefore it can be considered that the profile of people who did not answer the questionnaire is similar to those who answered it. For example, if only 50% of people who come to the establishment answer the questionnaire, it can be estimated that emissions linked to what they eat represent 50% of the establishment's transport emissions. To estimate total emissions, we just need to produce a cross product and multiply obtained emissions by 100% then divide them by 50%, to multiply them by two.

 The general formula is:

$$total emissions= emissions of answers to questionnaire ×\frac{number of people in the establishment}{number of answers to questionnaire} $$

Please note that the less respondents answer your questionnaire, the greater the uncertainty of your result. Therefore in order to apply this hypothesis, you must still obtain a minimum of answers to the survey for the results to be representative. In general it is important to exceed a minimum threshold of 30%.

Method 3 : This method requires you to obtain a lot of information on delivery and waste treatment methods. Not only will it be necessary to examine invoices, you may need to ask questions to service companies involved in each step of the process.

## Data to be obtained:

Entry level approach:

* number of meals or number of meals for each type of meal

Complete approach:

* number of km and method of transport of foodstuffs used to prepare meals
* management methods of different kinds of waste produced by school catering activities

## Staff : middle/ high school bursar, canteen chef.

# Travel

The travel category focuses on emissions linked to home-establishment travel of students, teachers and non-teaching staff, as well as school trips if any take place.

Therefore the aim for pupils is to record the total number of journeys by a large number of people and to add all these journeys up so that they can be entered in the calculator. Students must record **distances travelled in km** using **different means of conveyance** (car, train, bus, underground, scooter, etc.) **for the entire year**.

The simplest way to collect these data is to prepare **questionnaires** for students and staff, to find out how they travel to and from the establishment. To streamline the questionnaire, find out information about a "typical journey" and multiply these journeys by the number of days on which lessons are held in the year. If you feel that journeys differ considerably from one day to the next, you could collect information on a "typical week" and multiply the number of weeks of lessons in the year. (Cf. here above the paragraph “A few tips for processing questionnaires”.)

Example of questionnaire:

Making a good questionnaire is no easy task. On the one hand it must be easy to fill out and on the other, it should enable you to obtain useful information. It is an exercise that must be thought through, to find the right and pertinent words. So we encourage you to prepare it yourselves, but to submit it to your teacher or any adults involved, for validation.
 If you find it difficult to create your own questionnaire, we propose the one here below.

The difficulty of this questionnaire lies in the fact that we need to find out about each means of conveyance, as each one emits different levels of greenhouse gas emissions. Many of these details are not necessarily included in the questionnaire, so it is always a good idea to ask respondents to provide an average of their journeys over a month, or to mention any common occurrences, like car sharing or route differences in the morning and evening.

1. *What is the distance of the route you travel from the establishment to your home (one route):*

*1-a) Walking or cycling: (in km)*

*1-b) By train or underground: (in km)*

*1-c) By bus : (in km)*

*1-d) By car: (in km)*

*1-e) By scooter : (in km)*

/!\ In most cases you'll need to create five different questionnaires.

Instructions to be provided with questionnaire:
You can use Google Maps when answering the questionnaire, to calculate different distances.

If your habits change from week to week, fill out the form with your average journeys each month.

If your morning and evening routes are different (for example in the morning you travel by car but you take the bus home in the evening), fill out half of the kilometres travelled for each route so that when multiplied by the number of journeys, we will include total km travelled for each means of transport. *Example : I travel 10km by car in the morning and 12km by bus in the evening, so I enter 6km under question 1-c) and 5km under question 1-d), so that when you answer the next question by stating you make 10 journeys per week, you'll have 10x6km = 60km for your return bus journeys and 10\*5km = 50km for your car journeys from home.*

If you car share with other people (students or adults), divide the number of kilometres by the number of people travelling to your establishment.

1. *How many times do you make this journey (home-establishment) per week?*
* *Twice (weekday boarding, return trip home weekends)*
* *10 times (= 1 return trip each weekday, morning and evening)*
* *12 times (= 1 return trip weekdays, morning and evening, and 1 return trip per week at midday)*
* *14 (2 return trips per week at midday)*
* *16 (3 return trips per week at midday)*
* *18 (4 return trips per week at midday)*
* *20 (return trip every weekday at midday)*
* *Other/ Open-ended answer*

Instructions to be given:

If your habits change from week to week, fill out the form with your average journeys each month.

After the questionnaire, you will receive a table similar to the one below. All you need to do is enter the total (in blue) of kilometres travelled per week for each means of transport.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Km walking or cycling | km by train or underground | km by bus | Number of journeys | Total number of km by bike | Total number of km by underground | Total number of km by bus |
| Person A | Answer a | Answer b | Answer c | answer d |  a x d | b x d | c x d |
| Person B | 2 | 3 | 0 | 10 | 20 | 30 | 0 |
| Person C |  |  |  |  |  |  |  |

## Data to be obtained:

For an entry level approach:

* number of km travelled per means of transport by students

More for a complete approach :

* number of km travelled per means of transport by teachers and non-teaching staff
* number of km travelled per means of transport for school trips

## Contact person: none.

# Suppliers

In the Suppliers category, all the material bought for the school year is entered. These are mostly consumables or short-life products that will be used during the year and will have to be bought again next year.

## Data to be obtained:

For an entry level approach:

* Books (number)
* office equipment (pencils, pens, printer cartridges, etc.): (Amount purchased in euros)
* Paper ream (number)

More for a complete approach :

* The purchase of electronic and chemical goods (usable for example for scientific subjects):
	+ AAA alkaline batteries (number)
* AA alkaline batteries (number)
* hydrochloric acid (litre)
* Sulphuric acid (litre)
* The purchase of sports items:
	+ Basketballs (number)
	+ Footballs (number)
	+ Volleyballs (number)
	+ Rugby balls (number)

## Contact person: middle/ high school bursar.

# Fixed assets

Certain objects emit large amounts of greenhouse gas emissions during construction and over a number of years; examples include buildings, tables or laptops. To prevent calculated emissions from being too high the year of purchase/ construction and very low the following years, they are amortised over a certain period of time (often the expected duration of the object), which is called the holding time.

A concrete example with a PC. We estimate that the amortisation period of a computer spans 5 years, which means that on average, a new computer is purchased every 5 years. During the first five years after the purchase of a computer, ⅕ of emissions linked to its manufacture will be counted, each year. At the end of the 6th year, emissions linked to the manufacture of the computer will have been fully amortised (five times ⅕, everything is on record!), and so it will no longer be considered in our carbon assessment.

Conversely, if the computer is broken at the end of the third year, its amortisation must still be booked until the 5th year, even if the computer is no longer used!

In this category, students must obtain 2 kinds of complementary information:

* Not just the **type of object** (emission factor included in calculation for each type of object/ construction)
* but also **the purchase date** to find out whether they must still be included in the assessment or not.

For the sake of simplicity, we have set the amortisation period for fixed assets to 20 years (buildings and car parks) and 5 years for movable assets (tables, computers, photocopiers, etc.).

## Data to be obtained:

For an entry level approach : focus is on **buildings and car parks** only. So we try to obtain **surface area**, **construction and types of materials used.**

You can start data collection by finding the date of construction; if the building is already more than twenty years old, additional information will not be necessary as it will not be taken into account in the carbon assessment.

For buildings:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Construction material (cement, bricks, woods, prefabricated) | Surface area | Date of construction |
| Building 1  |  |  | XX |
| Building 2 (expl: Cellar)... |  |  |  |

For car parks:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Type of parking : (cement, tarmac, semi-rigid) | Surface area | Date of construction |
| Car park 1  |  |  | XX |
| Car park 2 |  |  |  |

Additional for complete approach: we can add **furniture** and **IT hardware,** which are also considered durable assets depreciated over five years:

|  |  |
| --- | --- |
|  | Number of objects purchased for the establishment less than five years ago |
| Tables |  |
| Chairs |  |
| PCs |  |
| Tablets |  |
| Photocopiers |  |
| Projectors |  |
| Printer |  |

## Staff : middle/ high school bursar, principal, IT manager.

The department or region was undoubtedly tasked with building the establishment and as such should have some information for you.

It is simpler to demand the list of supplies purchased over the last 5 years, so as to correctly manage amortisation.

Tips: If staff are unable to provide information for the entire establishment, visit places where you may be able to find the material you need: teacher's room, documentation and information centre, IT room, etc. Record everything as though it were purchased 2 years ago.

# List of staff

|  |  |  |  |
| --- | --- | --- | --- |
|  **CATEGORY** | **DATA** | **EASIEST SOURCE OF INFORMATION** | **RESOURCE PERSONS** |
| Energy | kWh of electricity, or fuel consumed | Bills | Building manager, maintenance department, local authorities |
| Food service | menus, number of meals | Menus, interview, survey | Chief cook, restaurant manager |
| Travel | n. of km by transportation mode | Survey | -  |
| Supplies | N. of products purchased | invoices, purchase orders, inventory | Office manager |
| Fixed assets | N. of product + Date of construction | Interview | Local authority, district property manager, building owner |