# Benchmark Tool Guideline

1 First step is to enter the information of your Care Home in order to calculate the four performance indicators[1] (EUI 1 to EUI 4). Hence you only have to fill in all the blue cells.

**Please fill in blue cells with data for your institution:**

| | |
|---|---|
| Total energy consumption per year in kWh | |
| Total heating energy consumption per year in kWh | |
| Heating Degree Days | |
| Heated area in m2 | |
| Year of construction | |
| Number of residents | |
| Number of employees | |

- **Total energy consumption per year in kWh**: Here you must introduce the annual consumption of your Care Home. First you must gather all your invoices of Electricity, Gas (Propane, butane), Natural Gas, Fuel, District Heating, Biomass, etc., and **convert all of them into kWh** then add it and enter. There are conversion tables available in the internet; also some of the invoices contain the conversion ratio you must use.
- **Total heating energy consumption per year in kWh**: There are countries and/or Care Home that have a separated counter for heating consumption, hence one just have to get that value and introduce here. Unfortunately, in the majority of the cases, there is not such a separated counter, so one must estimate this value. The best way is to check what type of energy source is used for heating (space and water):
    - Normally Natural Gas or Fuel oil is used mostly for heating, so you can consider this to be the value for "Total heating energy consumption". Same goes for District heating and Biomass. Nevertheless if you know that some fuel or natural gas is being used for other purposes than heating, you can estimate a percentage of the total value and enter the absolute value in the cell.
    - If you have an electric heating system, you have to calculate a value of its use by checking the Power of the system, estimate how many hours it is ON per year, and multiply those two numbers (do this for each electric heating device and you have your annual heating consumption).
- **Heating Degree Days**: This information can be collected on some Weather sites. Instead you can calculate it by yourself. Heating Degree Days is the difference of the exterior temperature in a country and a reference temperature. Our reference temperature used was 15 °C, hence you can check the average temperature in a month and do the following: if your average temperature was below 15 °C you must calculate the difference between them and multiply for the number of days in that month. You do this for all months; add all the results, and you have the annual "Heating Degree Days" to introduce in this cell. Here is an example:

[1] Performance Indicator is a ratio between a certain type of consumption and a determined variable per year, which will enable comparison between Care Homes.

| Coimbra (PT) 2010 | Monthly Avg. Temperature | Reference Temperature | Difference | Number of Days | Heating Degree Days |
|---|---|---|---|---|---|
| **Jan** | 8 | 15 | 7 | 31 | 217 |
| **Fev** | 8 | 15 | 7 | 29 | 203 |
| **Mar** | 11 | 15 | 4 | 31 | 124 |
| **Apr** | 15 | 15 | 0 | 30 | 0 |
| **May** | 15 | 15 | 0 | 31 | 0 |
| **Jun** | 19 | 15 | -4 | 30 | 0 |
| **Jul** | 22 | 15 | -7 | 31 | 0 |
| **Aug** | 23 | 15 | -8 | 31 | 0 |
| **Sep** | 20,5 | 15 | -5,5 | 30 | 0 |
| **Out** | 15,5 | 15 | -0,5 | 31 | 0 |
| **Nov** | 11,5 | 15 | 3,5 | 30 | 105 |
| **Dec** | 8,5 | 15 | 6,5 | 31 | 202 |
| | | | | **Annual HDD** | **851** |

- **Heated area in m$^2$**: Introduce the interior area (in square meters) of the Care Home. If there are areas you know that are never heated (such as a garage or an attic) please make an estimation of their area and subtract from total net area.
- **Year of construction**: Write the four digit year when the building was built (XXXX).
- **Number of residents**: Enter the number of residents that live 24hours/day in the Care Home.
- **Number of employees**: Enter the number of employees (manager, staff members, maintenance staff, cleaning and kitchen staff, etc.) that have a contract with the institution.

**Note**: Please use the comma for decimal values!

2 Second step is to understand the output of the Benchmark Tool.

| b0 | b1 | b2 | b3 | b4 | b5 |
|---|---|---|---|---|---|
| 335,810050 | 0,032906 | -0,038686 | -0,072097 | 0,887328 | 1,234848 |

There are four performance indicators in which your Care Home will be compared. All of them have their coefficients presented in the tool. These correspond to each variable considered in the multivariable linear regression model used, and were obtained from all information gathered for 100 European Care Homes.

- b1 – Heating Degree Days
- b2 – Area
- b3 – Year of Construction
- b4 – Number of Residents
- b5 – Number of Employees

Next, for each performance indicator, we have a green cell and an orange cell. The green one outputs the value of the indicator that your Care Home should have, concerning the information you entered and our database. The orange one gives the real value that you indeed have calculated with the data you have input in the blue cells in step 1.

| | | |
|---|---|---|
| Expected | kWh/m2/yr | |
| Real | kWh/m2/year | |

This tool outputs a graphic comparing the “expected” benchmark value (green) and the real value (orange). If the green graph is higher than the orange one, then it means that your Care Home is consuming less energy than it was supposed to, regarding that indicator and concerning our database of 100 European Care Homes. If the orange graph is higher than the green one, then it means that there is work to do because your Care Home has a higher consumption level than it should in that particular indicator.