

Supported by

Intelligent Energy  **Europe**

Energy saving concepts for the European ceramic industry

CERAMIN



Contract number
EIE/06/222/SI2.444565

**Guide of verification methodology and
calculation rules**

The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Communities. The European Commission is not responsible for any use that may be made of the information contained therein.



Guide of Verification Methodology

Part I: Course of data collection

At each national partner

1. Every enterprise that takes part provides a data collection for the base year
2. Every enterprise that takes part provides a data collection for the comp. year

Both data collections of the respective enterprise have to contain at least all information marked as mandatory in the framed text below. The respective national partner archives both data collections by one NUMBER OF ENTERPRISE, which allocates the respective enterprise.

- ↪ The respective national partner is responsible, that the allocation of an enterprise and the NUMBER OF ENTERPRISE is dealt as confidential. The national partner is only allowed to inform third parties after getting a written permission by the respective enterprise.
- ↪ The reported data should (if not **CASE 2** applies) fulfil the following directives, proved by verification
 - DIRECTIVE 2003/87/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC [Link]
 - COMMISSION DECISION of 29 January 2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council [Link]

Both of these directives have to have a pendant in the national right and legislative of each partner country

CASE 1: The data **are verified** by national or rather European rules:

The enterprise has the possibility of getting the label without further proving.

CASE 2: The data **are NOT verified** by national or rather European rules.

The respective enterprise has to accept a **verifying procedure** before getting the label (-if it is among the enterprises who are invited to get the label). This procedure will be defined in more detail → “Verification Questionnaire” (D5)



The national partner collects the following data from the reports or the company and transmits them to the project coordinator, at least two sets per company (*base and comp. year*):

COUNTRY

NUMBER OF ENTERPRISE

NUMBER OF PLANT (if an enterprise consists of more than one plant, and distinctive numbers of net production and energy consumption are available you should enter these data in different data records. Then the following data refer to the NUMBER OF PLANT.)

DESCRIPTION OF PLANT (e.g. “whole enterprise”-*if the enterprise consists of only one plant*, “roof tile production”, “extruded tiles line”, “plant 2”)

YEAR OF REPORT

BRANCH (choice from a list)

TYPE OF YEAR OF REPORT (Base or Comp)

NETTO-PRODUCTION in [t * 1000/a]

TYPE OF FUEL 1

QUANTITY OF FUEL 1 in [t/a or 1000 Nm³/a]

LOWER CALORIFIC VALUE 1 in [GJ/t] or [GJ/1000Nm³]

ENERGY-CONSUMPTION 1 in [GJ*1000/a] -*calculated*

TYPE OF FUEL 2

QUANTITY OF FUEL 2 in [t/a or 1000 Nm³/a]

LOWER CALORIFIC VALUE 2 in [GJ/t or GJ/1000Nm³]

ENERGY-CONSUMPTION 2 in [GJ*1000/a] -*calculated*

TYPE OF FUEL 3

QUANTITY OF FUEL 3 in [t/a or 1000 Nm³/a]

LOWER CALORIFIC VALUE 3 in [GJ/t or GJ/1000Nm³]

ENERGY-CONSUMPTION 3 in [GJ*1000/a] -*calculated*



TYPE OF FUEL **4**

QUANTITY OF FUEL **4** in [t/a or 1000 Nm³/a]

LOWER CALORIFIC VALUE **4** in [GJ/t or GJ/1000Nm³]

ENERGY-CONSUMPTION **4** in [GJ*1000/a] *-calculated*

TYPE OF FUEL **5**

QUANTITY OF FUEL **5** in [t/a or 1000 Nm³/a]

LOWER CALORIFIC VALUE **5** in [GJ/t or GJ/1000Nm³]

ENERGY-CONSUMPTION **5** in [GJ*1000/a] *-calculated*

QUANTITY OF ORGANIC CARBON IN THE BODY (TOC) in [t/a]

ENERGY-BENEFIT from **TOC** in [GJ*1000/a] *-calculated with a calorific value of 32,9 GJ/t_[TOC]*

TYPE OF KILN (Choice from a list of kiln types, e.g. “roller kiln”, “tunnel kiln” or “more then one”, “not in list”)

DESCRIPTION OF THE KILN(S) (free text to describe the kiln(s) – mandatory if you have chosen for TYPE OF KILN; “more then one” or “not in list”)




LAST_UPDATE_CONCERNING_ENERGY_CONSUMPTION (List of Years)

MAXIMUM TEMPERATURE in [°C]

TIME_COLD_TO_COLD in [h]

DAYS_OF_PRODUCTION_PER_YEAR

DESCRIPTION OF TECHNOLOGY (Please give a short description about the technology used in the plant)

-  Underlined fields are mandatory
-  the red marked fields define each data record
-  Each plant (in most cases an enterprise will just consists of one plant!) needs at least one data record with the TYPE OF YEAR OF REPORT „Base“ and one data record with the TYPE OF YEAR OF REPORT „Comp“.



At the project coordinator

- ↪ The project coordinator calculates the energy mitigation according to the rules published in [Appendix A].
- ↪ In addition the absolute specific energy consumption is calculated.
- ↪ The results will be published anonymous to all participants from the industry (and maybe to the public).

At each national partner

Each first quarter of participants of one branch from all countries concerning energy mitigation will be ask from the national partner whether they want to be awarded with the label and are willing to be published as good practice example and therefore allow a closer look at their means of energy mitigation.

Each national partner can create his own national championship(s) (without labelling) if he wants.



Part II:

Calculation rules and Definitions

1. Definition of the specific energy use

$$\text{specific energy used} = \frac{\text{energy used [MJ / a]}}{\text{net Production [tons / a]}} \left[\frac{\text{MJ}}{\text{ton}} \right]$$

net Production: saleable products without scrap.

Energy used: total amount of yearly energy input, scrap or saleable products being produced

2. Checking the utilisation ratio of the factory

$$\frac{\text{net Production}_{\text{baseyear}} [\text{tons / a}]}{\text{net Production}_{\text{comp. year}} [\text{tons / a}]} \geq 0,8 \quad []$$

Calculation example:

$$\frac{\text{net Production}_{\text{baseyear}} [\text{tons / a}]}{\text{net Production}_{\text{comp. year}} [\text{tons / a}]} = \frac{20.000 [\text{tons / a}]}{23.000 [\text{tons / a}]} = 0,87 \quad []$$

The result of the quotient of net production in base by comparison year should not be smaller than 0,8. It can be greater than one, of course.

3. Calculating the energy savings

$$\text{Energy Mitigation} = \frac{\text{SpecificEnergyuse}_{\text{baseyear}} - \text{SpecificEnergyuse}_{\text{comp. year}} [\text{MJ / ton}]}{\Omega} \quad [\text{MJ / ton}]$$

Difference between compared years	1	2	3	4	5	6	7	8	9	10	11	12
Omega Ω	1	1,5	2	2,5	3	3,5	3,6	3,7	3,8	3,9	4	4



A: Calculation example

Base year: 1998
 Comp. year: 2005
 Omega: from 7 years = 3,6

$$\text{Energy Mitigation} = \frac{2.500[MJ / ton] - 2.000[MJ / ton]}{\Omega (2005 - 1998)} = \frac{500}{3,6} [MJ / ton] = 138,8 [MJ / ton]$$

B: Calculation example

Base year: 2003
 Comp. year: 2005
 Omega: from 2 years = 1,5

$$\text{Energy Mitigation} = \frac{2.500[MJ / ton] - 2.000[MJ / ton]}{\Omega (2005 - 2003)} = \frac{500}{1,5} [MJ / ton] = 333 [MJ / ton]$$

General explanation:

The same amount of energy saved has a higher value if the compared years are closer to each other. Ω shall never be smaller than 1.

The expert team has agreed on the **Quotient Ω** .

All stated definitions have to apply.