



IEE/11/949/SI2.615946 - IND-ECO

Deliverable D 2.3: Benchmark definition

Date: December 20th, 2013

ICPI

0. Introduction

The IND-ECO project aims at achieving **two main objectives**:

1. to obtain initial primary energy savings by its end
2. to create favourable conditions for much more investments by 2020

The WORK PROGRAMME is divided in 8 inter-related work packages.

For **Work Package 2 Inventory and benchmarking** IND-ECO Project have the following main objectives:

- To check energy consumption in the tanning and footwear sectors;
- To identify efficiency areas and technical improvement opportunities;
- To build companies capacity to plan and support the energy efficiency process.

This work-package consists in activities aiming at:

- ✓ raising companies' awareness of energy consumptions and environmental impacts;
- ✓ focusing on energy consumption of the involved sectors (tanning, and footwear);
- ✓ allowing involved companies to know their consumptions and CO2 emissions and their position relative to the benchmark;
- ✓ defining a starting position to evaluate investment opportunities and to assess the achieved results.

These activities will be developed under the following WP2' tasks:

- 2.1. Task organization
- 2.2. Sector-specific inventories
- 2.3. Benchmark definition
- 2.4. Energy audit and benchmarking [1]

In order to realise the sector - specific inventories, firstly were defined the questionnaires, these were translated in 6 languages and for both sectors, footwear and tannery, were made available to fill-in online on the platform developed by CTCP.

1. Sector-specific inventories

The questionnaires were uploaded directly by companies or by the project partners who discussed and contacted them by phone or e-mail in order to collect data.

For each country technical centres or associations verified and anonymised the online uploaded inventory data.

Questionnaires collection: have been collected and uploaded on CTCP platform a total number of 276 questionnaires, representing about 83% from the revised number proposed in Porto Meeting (Decision 2.2).[2]

The intermediary data were presented to the project partners during the 12 Months Meeting in Porto, Portugal and 18 Months Meeting in Milan, Italy.

The situation of questionnaires collection is presented in Table 1 and Figure 1.

Table 1. QUESTIONNAIRES COLLECTION

COUNTRY	No. of inventories FOOTWEAR		No. of inventories TANNERIES		TOTAL	
	<i>Proposed</i>	<i>Realised</i>	<i>Proposed</i>	<i>Realised</i>	<i>Proposed</i>	<i>Realised</i>
ITALY	20	11	70	43	90	54
PORTUGAL	70	76	3	-	73	76
ROMANIA	40	39	6	5	46	44
BULGARIA	36	36	4	1	40	37
SPAIN	35	36	10	15	45	51
UNITED KINGDOM	6	2	13	11	19	13
COTANCE	-	-	20	1	20	1
TOTAL	207	200	126	76	333	276

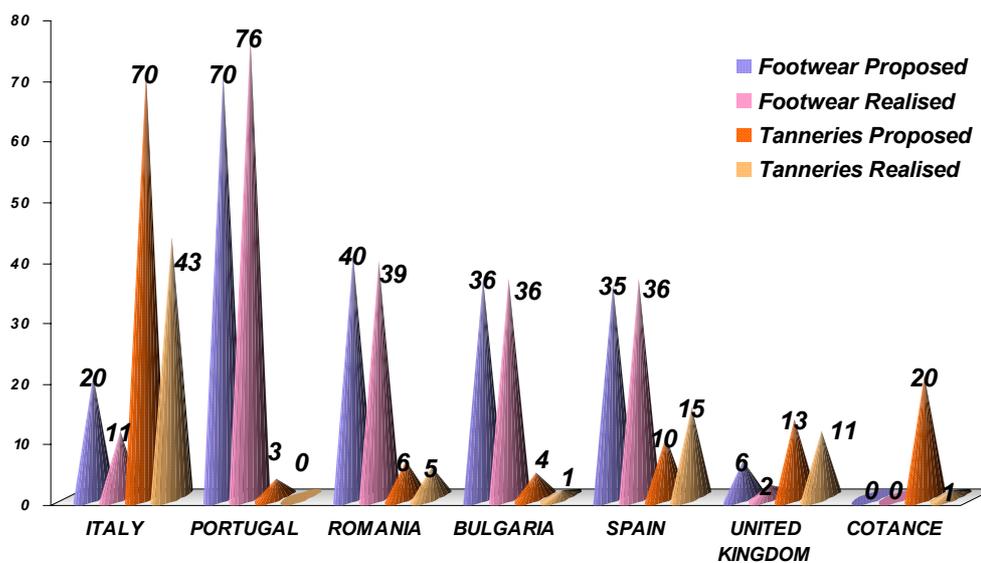


Figure 1. Questionnaires collection

2. Benchmark definition preparation

In order to establish the basic elements and calculation methodologies for benchmark definition in both sectors, a literature collection study was performed and presented to the partners.

The following definition and data were acquired for tanning and footwear sectors.

2.1. Benchmark & Benchmarking

Based on a literature review some definition of benchmark / benchmarking definitions could be:

Benchmark Reference numerical value, top, of an activity in relation to which you can observe, judge, measure another similar activity as an object and subject to study. It is the stationary point of the observer, in terms of value and position, throughout the study period.

Benchmarking

Concept of rules and continuous learning, based on criteria, key indicators and set of actions which orient you to the best practice compared to reference numerical value, accepting changes that are necessary.

According to the “Energy performance benchmarking on best practices in Canadian textiles wet processing” document, the benchmarks in are “intended to be used as baselines against which plants can compare their relative performances. To serve as realistic performance targets, their values are set at the 75th percentile in each of the three dimensions: energy use and intensity, technical best practices and energy management practices. A benchmark at the 75th percentile is a calculated value, where 75 percent of participating plants underperformed and 25 percent of plants outperformed the benchmark”. In this context a technical “Best practice” is defined as a production system or efficiency measure that results in an overall reduction in energy intensity. [3]



Benchmarking “implies the comparison of the energy efficiency and CO₂ emissions of individual installations *based on a point reference, often “best available technology” (BAT)*. However, data for individual facilities are often confidential because of anti-trust regulations or other concerns. Moreover, data collection is resource and time consuming”. [4]

Benchmarking - “It is the comparative evaluation between the organisation and the relevant sector previous and current energy performance”. [5]

Benchmarking “is a vital tool in assessing the performance of an installation, process or system, by verifying against external or internal energy usage levels or energy efficient methods

Benchmark at its simplest, is a reference point. In business, **benchmarking** is the process used by an organisation to evaluate various aspects of their processes in relation to best practice, usually within their own sector. The process has been described as:

- ‘benchmarking is about making comparisons with other companies and then learning the lessons which those companies each show up’ (The European Benchmarking Code of Conduct)
- ‘benchmarking is the practice of being humble enough to admit that someone else is better at something, and being wise enough to learn how to be as good as them and even better’ (American Productivity and Quality Center).

Data confidentiality may be important in certain cases (e.g. where energy is a significant part of the cost of production). Therefore, it is essential to take into account the views of the participating companies and sector associations to safeguard the confidentiality of company data and to ensure the user-friendliness of the instruments. Confidentiality can be protected by:

- agreement
- presenting data in a way that protects the confidential data (e.g. presenting data and targets aggregated for several installations or products)
- having data collated by a trusted third party (e.g. trade organisation, government agency).” [6]

2.2. Benchmark calculation methodology in IND-ECO project

In the frame of IND ECO Project a need for clarification raised on the system boundaries to be adopted for the calculation of energy consumptions. It has been clarified that in both sectors, energy consumptions have to be evaluated within the factory borders (the so called “gate to gate” approach. No energetic consumptions outside the factory shall be considered. Process phases subcontracted to third parties will be taken into consideration in benchmark definition but not in the definition of improvement areas for single companies. [2]

Sectorial and process-related benchmarks will be defined, according to quantitative and qualitative analyses and to inputs received.

The basic elements and calculation methodologies for benchmark definition in both sectors were agreed (during Porto Meeting) on expressing the consumption as:

TANNING SECTOR

Product specific energy consumption: primary kwh consumed/square meter of finished leather

FOOTWEAR SECTOR

Product specific energy consumption: primary kwh consumed/pair of shoes

Factors that partners agree to be influencing the energy consumption (and therefore to be considered for benchmarks definition) include:

For Tanning sector:

- type of leather produced (animal type and destination of use);
- type and kind of process cycle applied & raw material processed;
- process phases carried out within the company.

For footwear sector product as a function of:

- destinations/end-user
- utilization
- assembling technology
- uppers' material.

Based on these is produced the present Deliverable 2.3 “*Benchmark for energy performances in tanning and footwear industries*”.

3. Benchmark definition for Tanning sector

For the tanning sector have been collected and uploaded on CTCP platform 76 inventories from Italy, Spain, UK, Bulgaria and Romania. In order to ensure the data confidentiality all inventories were anonymised.

Taking into consideration the basic elements and the calculation methodologies for benchmark definition established in Porto, (during 12 Months Meeting) for tanning sector the following data have been obtained: (Table 2)

BENCHMARK - TANNERIES (*Preliminary data*)

Crt. No.	Type of leather produced	Raw material	Production cycle applied	Energy specific consumption
1.	Finished leather	Bovine hides	raw to finish	16,47 kwh/sqm
2.	Wet-blue	Bovine hides	raw to wet-blue	1,8 – 3,2 kwh/sqm
3.	Finished leather	Bovine	wet-blue to finish	6,02 - 9,24 kwh/sqm
4.	Finished leather	Bovine	crust to finish	4,07 kwh/sqm
5.	Vegetable tanned leather (different from sole leather)	Bovine hides	raw to finish	6,98 kwh/sqm
6.	Vegetable tanned Leather (sole leather only)	Bovine hides	raw to finish	1,89 kwh/kgs
7.	Finished leather	Calf skins	raw to finish	8,15 kwh/sqm
8.	Finished leather	Calf	wet-blue to finish	6,44 kwh/sqm
9.	Fur	Sheep skins	raw to finish	14,70 - 16,85 kwh/sqm
10.	Skin	Sheep skins	pickle to finish	7,94 kwh/sqm

These preliminary data will be refined after discussion with all partners of IND-ECO project and will be used in the Task 2.4: Audits in the tanning companies where should be involved about 43 tanneries.



References:

[1] *IND-ECO Project, 2012*

[2] *IND ECO 12 Months Meeting Minutes (Porto, May 9th - 10th 2013)*

[3] *Energy performance benchmarking on best practices in Canadian textiles wet processing, 2007, pg.3 , ISBN 978-0-662-45396-3*

[4] *Tracking Industrial Energy Efficiency and CO2 Emissions, OECD/IEA, 2007, pg.32*

[5] *EIE EMS-Textile project*

[6] *European Commission "Reference Document on Best Available Techniques for Energy Efficiency" 2009*