

**CO<sub>2</sub> EMISSIONS REDUCTION FROM TANNERIES AND FOOTWEAR  
MANUFACTURE INDUSTRY FROM ROMANIA. REALITIES AND  
TENDENCIES**

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This paper is presenting the objectives and partial results of the project IEE / 11 / 949 / SI2 615946 IND-ECO which is running under the Intelligent Energy Europe – Executive Agency for Competitiveness and Innovation EACI umbrella. A number of 16 entities representing leather and footwear European and national employers' associations, manufacturers, research institutes from Italy, Belgium, UK, Spain, Portugal, Romania and Bulgaria has formed a consortium with the purpose of reducing energy consumption and CO<sub>2</sub> emissions at the level of EU countries.

Keywords: energy efficiency, tannery, footwear

**IND-ECO PROJECT PRESENTATION**

The European umbrella association and national associations from most relevant countries for leather-footwear industry, technical centres, engineering companies and manufacturers lead by UNIC, Italy join together in a very well balanced and representative partnership.

General objectives of the IND-ECO project consortium are:

- deepening the knowledge on energy performances and CO<sub>2</sub> emissions to define benchmarks for assessing specific energy performances and to identify improvement areas.
- increasing awareness, knowledge and organisational skills of companies on energy efficiency to allow them to seize opportunities, to adopt tools, technologies and financial facilities to access capitals.
- contributing to overcome barriers (those listed in “Energy efficiency plan 2011) to energy efficiency investments (lack of information and lack of access to capital) by working on technical and economic/financial frameworks together with European and national associations and relevant key actors.
- supporting companies to plan and carry out investments in energy efficiency by the end of the project and to plan new investments to be realised by 2020.
- develop a clusters-based approach for investments especially those to be realised by 2020.
- contributing to develop the demand of energy efficient equipment, machines and plants and to increase the turnover of the mechanic industry.
- ensuring a high-quality development, implementation and monitoring of project activities and investments plan through a monitoring and auditing approach.
- making the tools and results widely available through European and national associations, clusters, companies and other stakeholders

### Main Objectives of the Project

Main targets of the project are:

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

**Specific objectives of the project** are as it follows:

- inventory of energy consumption; benchmark realisation at the level of the leather and footwear manufacture industries;
- verification of energy consumption. Identification of the vulnerable areas which need improvements;
- identification of the financial solutions providers – bank loans for energy investments;
- building a technical and technological solutions database for the energy consumption reduction;
- elaboration of the investments plans;
- project results dissemination and access to the databases created in the project.

### The Structure of the Project's Work Programme (WP)

The structure of the IND-ECO work programme (WP) is presented in figure 1.

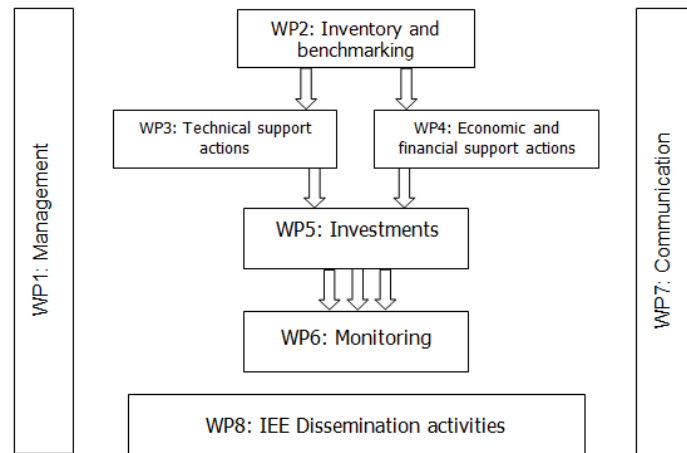


Figure 1. The structure of the IND-ECO work programme (WP)

### Benchmark

WP.2 has planned activities which are targeting:

- 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 CO<sub>2</sub> emissions and their position relative to the benchmark
- defining a starting position to evaluate investment opportunities and to assess the achieved results.

Based on the analysis of the inventories received from the companies it was established the next preliminary values for the benchmarking for tanneries and footwear manufacturers (table no.1 – tanneries, table no.2 footwear manufacturers).

Table 1. Benchmark values for tanneries

No.	Type of leather produced	Raw material	Production cycle applied	Energy specific consumption	Unit
1	Finished leather	Bovine hides	Raw to finish	16.47	Kwh/m <sup>2</sup>
2	Wet-blue	Bovine hides	Raw to wet-blue	1.8-3.2	Kwh/m <sup>2</sup>
3	Finished leather	Bovine	Wet-blue to finish	6.02-9.24	Kwh/m <sup>2</sup>
4	Finished leather	Bovine	Crust to finish	4.07	Kwh/m <sup>2</sup>
5	Vegetable tanned leather (different from sole leather)	Bovine hides	Raw to finish	6.98	Kwh/m <sup>2</sup>
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/m <sup>2</sup>
8	Finished leather	Calf	Wet-blue to finish	6.44	Kwh/m <sup>2</sup>
9	Fur	Sheep skins	Raw to finish	14.70-16.85	Kwh/m <sup>2</sup>
10	Skin	Sheep skins	Pickle to finish	7.94	Kwh/m <sup>2</sup>

Table 2. Benchmark values for footwear companies

Indicator	Total production		Cutting and/or stitching partial or totally subcontracted		Cutting & stitching Romania
	Romania	EU	Romania	EU	
Average Kwh/pair	0.5-3.9	0.7-3.9	2.2-5.6	0.8-3.6	-
Kg CO <sub>2</sub> /pair	0.3-2.3	0.3-1.9	1.1-2.9	0.4-1.7	-
Maximum Kwh/pair	6.3	0.4	6.3	0.2	2.6
Maximum CO <sub>2</sub> /pair	3.7	0.2	3.2	0.1	1.5
Minimum Kwh/pair	0.4	9.3	2.0	6.3	0.4
Minimum CO <sub>2</sub> /pair	0.2	4.6	1.0	3.1	0.2
Number of companies	25	108	5	57	5

### Energetic Audit

The energetic audit of 67 leather and footwear companies was realized according to the schedule, the results being in the analysis process. Based on these

audits, the benchmark values previously established will be revised. In the same time, based on the results, the further action direction will be established.

### **Technical Solutions**

The **Technical support actions** (WP3), thanks to a scouting activity, also based on WP2 results, will make available knowledge, technological solutions, agreements with technologies providers and their associations and other facilities aimed at making easier the access of companies to technical solutions. An energy efficient solutions data base will be made and implemented with at least 150 recommended solutions identified thanks to the scouting. It will be available on the project site. Till this moment it was realised the database where are uploaded the companies which are offering equipment or technical solutions having as objective energy efficiency increasing.

### **Financial Solutions**

**Economical and financial support actions** (WP4), aims to improve the access of companies (in particular of SMEs) to capitals. Were identified at the local and European level the financial institutions and economical programs which are offering loans focused on energy efficiency improvement.

### **Investments (WP5)**

Intends to finalise the work done during WP2, 3 and 4 allowing to achieve, by the end of the project and by 2020, the quantitative targets in terms of energy saving and CO<sub>2</sub> emissions reduction. It was realised a model for the investments evaluation from the energetic field, which, starting from the bank's standard, is permitting the simulation of the economical results regarding each specific investment case.

### **Communication (WP7)**

The partners from IND-ECO project will share knowledge, solutions and results with tanning and footwear companies, other industry associations and other stakeholders.

## **CONCLUSIONS**

In the next period till the end of the project, the European leather industry tanneries and footwear companies will have a functional instrument for the energy efficiency increasing,

Starting from the energetic audit of the company, it will permit choosing of the best technical and financial solutions, will realize the investment plans which will facilitate an approach according to the state of the art of the technology achieved at the moment,

Total energy saving of 16,7 mio primary Kwh is envisaged till the end of the project.

## **REFERENCES**

\*\*\*, <http://www.ind-ecoefficiency.eu/index.php>