



Comments from ECOS (on behalf of European environmental NGOs) on the draft tasks 1, 2 and 3 of the EuP preparatory study on Machine Tools (lot ENTR 5)

July 2010

ECOS would like to highlight two major weaknesses of this study (that have been confirmed by other stakeholders during the 1st stakeholder meeting): the lack of credibility of some of the collected data and the ambiguity in the scope definition.

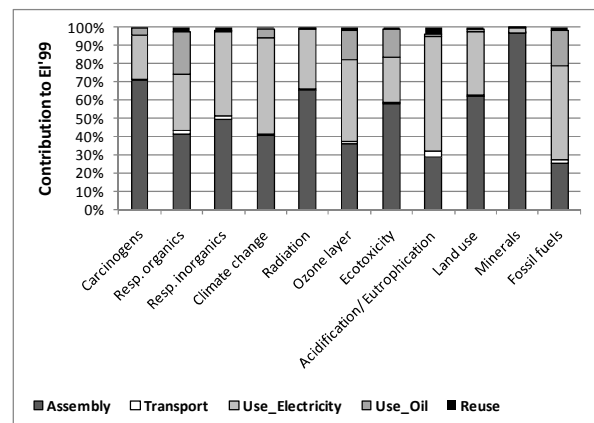
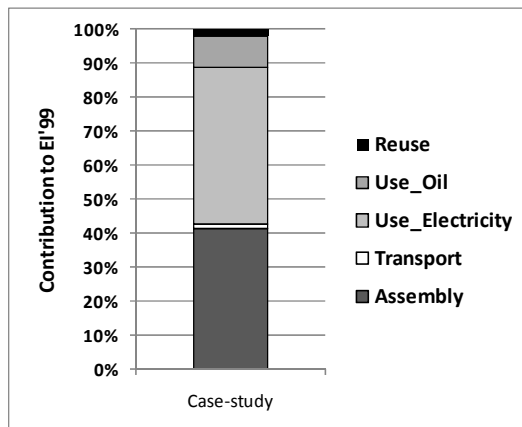
TASK 1

a) Unclear scope

A top 20 ranking is presented, but the data is used in very questionable manner resulting in some quantifications where the actual energy consumption is not taken into account (only the sales volume times the improvement potential, which can look big but in an absolute value of energy savings have limited sense).

b) Focus on energy consumption

Many of the assumptions presented for the Environmental Screening of Machine Tools where based on the SRI proposal, and fails to include more elaborated input. There is for instance a clear tendency to only take into account the energy consumption. These conclusions derive only from the LCA presented in the SRI proposal (limited to metal cutting machines with very similar technological solutions and based on same usage patterns). Other studies should be taken into account, such as a study made in Portugal¹ on forming machines, where very detailed LCAs were performed and are summarised on the figure below. This study suggests that even if energy in use is the biggest impact, the production phase still amount for a considerable part of the overall impact.



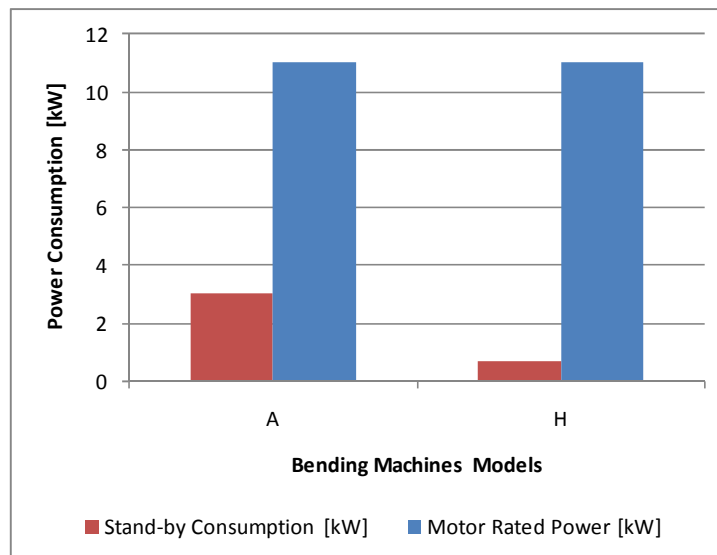
Environmental profile and relative contributions of life-cycle phases to the global environmental impact of the press-brake under redesign, based on the Eco-Indicator 99

c) Modular approach

The idea of considering a modular approach can lead to wrong conclusions and miss some important aspects:

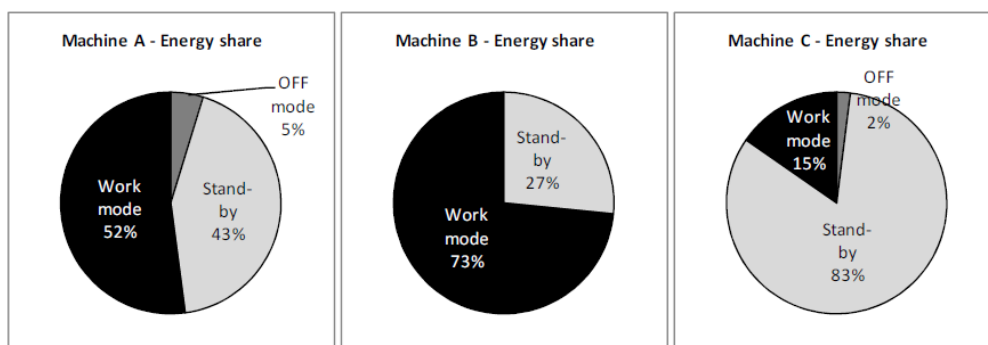
1. How to compare different configurations on the same machine? (ex: all electrical to hydraulic drive system)
2. How to assess the influence of new solutions on the whole machine impact? (ex: Implementation of “smart” control technologies, intelligent monitoring...)

We can find totally different solutions for the same machine, if we only consider the modules and their optimisation. A modular approach does not enable comparison between completely different approaches for a same machine. In the above-mentioned study¹, press brakes with different technological drive solutions were studied: all electrical (B) and hydraulic based (A), see figure below. Each configuration may use the best performing modules, however when comparing the two solutions different results were found.



Power consumption during stand-by mode and motor rated power for two machines.
A: hydraulic; B: all electric equipment, working in the maximum loading capacity range of 100-170 Ton.

The characterization of the actual usage of the press-brakes was essential to understand the total energy consumption figures acquired. The influence of usage scenarios (based on on-site studies acquired at industrial lead-users in Portugal) is shown below:



TASK 3

From the draft task 3, what stands out is the clear need for legislation. It is obvious that the machine tool sector lacks the direct motivation to significantly improve its energy efficiency, since the selection of machine tools is traditionally based on quality and productivity considerations.

Only regulatory efforts could drive progress in the highly fragmented machine tool market. The European Union should therefore stimulate efforts in this direction. In this perception, a voluntary initiative from industry will probably fail to deliver.

This opportunity should be considered as a driver for innovation; eco-efficient machines are key for European competitiveness and will respond to the developing needs in terms of energy-efficient manufacturing technologies of final clients.

Notes:

¹ LCA details

- Hydraulic press-brake of standard construction from 2006, made in Portugal.
- maximum bending capacity of 110 ton and a maximum bending length of 3 m
- Main motor rated at 7,5 kW.
- weighs about 7 ton
- The structural parts are made of different types of steel, mostly structural steel and carbon steel, with some aluminium, polymer and composites present in small parts.
 - Assembly: includes materials and manufacturing processes associated to all structural parts, main motor, hydraulic pump, valves and electric cabinet. Secondary metals were used whenever applicable;
 - Transport: considers the worst-case scenario, corresponding to the sales share for non-European market (30% total), composed of about 260 Km by road transportation and about 9000 Km water transportation, in average;
 - Use: a useful product lifetime of 15 years was assumed, based on technology relevance. Hydraulic oil and electricity have been accounted with a yearly consumption of 120 l and 5475 kWh, respectively.
 - preventive maintenance plan foreseen, while electricity input value was accounted assuming a yearly machine usage of 2000 hrs in a manual-intensive mode.
 - The main inputs in the use phase, electricity and oil, were distinguished as different use-phases, to assist the analysis of their individual impact.
 - Final disposal: a reuse scenario was considered, as this is the most probable scenario. This includes 400 Km of road transportation and 9700 Km of water transportation, assuming a transfer from Portugal to a potential second-hand user located in third world countries.