Environmental Impact of the Internet Infrastructure

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1.1. Abstract

The objective of the study was to assess the life cycle environmental impacts of the Internet Infrastructure in terms of the related primary energy consumption and the emissions of criteria pollutants. The production and use phases of the Internet related equipment were assessed using two approaches to Life Cycle Assessment: Process Life Cycle Assessment and Input-Output Life Cycle Assessment.

2. 1. General

The process and the Input-Output LCA show that the PCs (control units and screens) are dominating the system energy use and CO_2 emissions. The use phase plays a dominant role, but the embodied energy consumption during infrastructure plays a significant role (see figure 1).

The use phase could become far less important if, for instance, notebooks and flat screens were used in a more systematic way. The electricity consumption of these devices is much lower than for the commonly used computers and screens.

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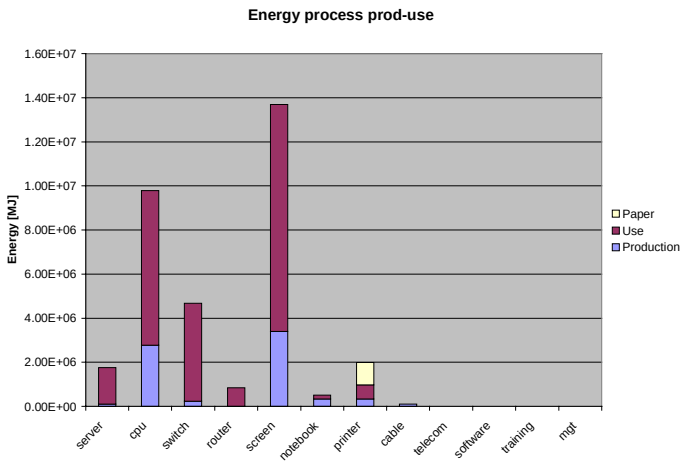

Fig. 1: Primary energy consumption evaluated with a process LCA. The control unit (cpu) and the screens are dominating. The use phase is more important than the production phase.

The analysis further expands the boundaries by considering the environmental burdens of non-hardware input requirements, such as software, training or management. These so-called "costs of ownership" indeed dominate the overall expenses related to the EPFL PC network. Their environmental impacts have been evaluated using an Input-Output LCA method. It comes out that the related impacts are significant. Thus, the reduction of the costs of ownership, such as increased of the operating system stability, can significantly reduce both cost and total environmental footprint.

3. Bibliography

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