

Challenging the pursuit of Moore's Law: ICT sustainability in the cloud computing era

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Abstract: In this paper we investigate the sustainability of Information and Communication Technologies (ICT) from an environmental point of view. In particular we concentrate on two items, the ICT life cycle (manufacturing, operating and disposing, also known as e-waste) and on the potential role of an ICT stakeholders' network. Computers and networks are mainly based on electronic products, and the industrial process for producing them is one of the most complex and costly in terms of "material intensity". Is this process sustainable? On the other side, the emerging "cloud computing" concentrates central processing and storage capability in a few gigantic data centres: does this contribute to the decrease or increase of power consumption (and climate change)? How can we address the issue of e-waste? By computer return and recycling? New design principles? Open hardware? By developing smart software applications? We propose a stakeholders' network for ICT that can be useful to investigate possible strategies for addressing these challenges.

Keywords: Cloud computing, e-Waste, Material intensity, Open hardware, Smart software applications, Stakeholders' network.