

Will there be enough energy for computing

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Background

Mark Mills the CEO of the Digital Power Co gave an interesting talk last semester at the Energy Seminar about the exponential increase in the bytes representing computing output. He suggested that this fast growth was triggered by the adoption of the mobile phone, the iPhone in particular, and the ability that mobile software gave individuals to monitor and control their environment.

While the ability to be in touch at all times may appear to be liberating it comes at a heavy cost in energy because we have not conquered Carnot's Law – about two thirds of the fuel needed to make electricity (mobile phone can only consume electricity, not natural gas!) and the wasted energy has to be dumped into the atmosphere.

The loss in efficiency is not overcome by using more fuel – just the opposite. The loss gets bigger and bigger as demand grows. In practical terms this means that we are adding server farms at an increasing and unsustainable rate. Unfortunately, people are largely unaware of the heavy energy demands. They are mostly indifferent to the fact energy is needed whenever someone creates another wi-fi connection or the uses of software that references itself at regular intervals. It is all out of sight and it is happening at a furious rate in every country around the globe.