

Energy efficiency strategies in telecommunication access networks

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The carbon footprint of communication networks is growing fast: their worldwide electricity consumption is growing at a rate of 10% per year. By way of comparison, the overall growth of electricity consumption is only around 3% per year. The growing electricity use in communication networks is fueled by an exponential demand growth, as the global data traffic volume doubles every 18 months.

Most of the carbon footprint in networks comes from the use phase, so in order to reduce the network footprint we need to focus on energy efficiency, i.e. reduce the energy consumed per transported bit. Since about 80% of the communication network power is consumed in the access network the part of the network closest to the end users my PhD research is focused on this part of both fiber and wireless networks.

The ultimate goal of my research is to see how much energy can be saved in the access network by applying various proposed solutions, such as sleep modes (switching off parts of devices or complete devices when they are not being used) and functionality consolidation (moving functionality to a centralized location where it can be performed more efficiently) and further improving a few of them.