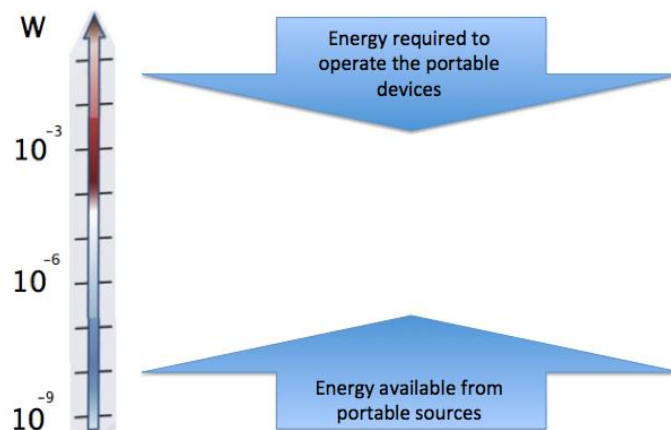


Toward Zero-Power ICT

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It is a common understanding that ICT is the key engine of growth in modern society. Most importantly ICT is becoming strategic to improve energy efficiency by managing energy demand and use. The energy consumption and carbon dioxide emission from the expanding ICT use, however, is unsustainable. New methods are required to make ICT technology more energy efficient but also the development of new self-powered, energy-harvesting technologies that would enable micro- and nano-scale systems that consume ZEROPOWER through the harvesting of waste energy from the environment are required. Such technologies provide an opportunity for Europe to lead and generate significant economic benefit whilst simultaneously addressing climate change, healthcare and manufacturing efficiency benefits. Developing ZEROPOWER energy harvesting technology will be key for Europe to meet many of the Europe 2020 targets¹.



In this talk we will briefly address the two sides of the ICT-Energy problem: the decrease of energy dissipation in present ICT devices and the increase of energy efficiency in harvesting technologies². We need to solve these two problems in order to bridge the gap between energy demand and energy request in mobile ICT devices.

Both tasks require advances on the very same scientific topic: the management of energy transformation processes at nanoscale.

¹ ZEROPOWER Strategic Research Agenda, Nanoenergy Letters, 4, p.6, 2012

² L. Gammaitoni, There's plenty of energy at the bottom (micro and nano scale nonlinear noise harvesting), Contemporary Physics, 53, 2, p. 119-135, 2012