

**2014 Indo-American Frontiers of Engineering
Symposium**



Green Approaches to Communications

Session Co-Chairs:

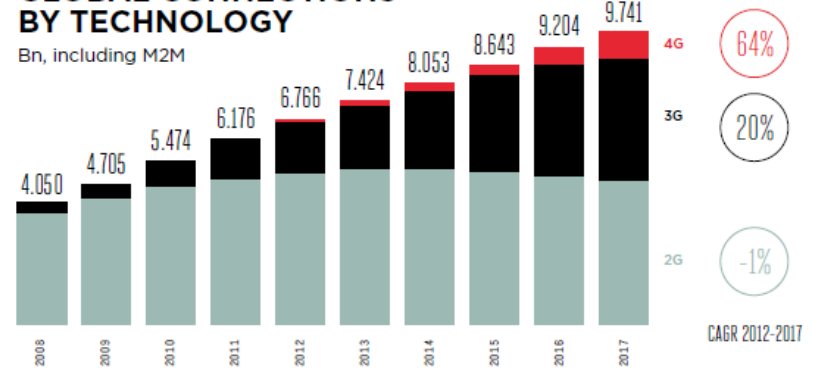
Kirk W. Cameron (Virginia Tech, USA) and
Kumar N. Sivarajan (Tejas Networks Ltd., India)

Crossing the Energy Barrier



GLOBAL CONNECTIONS BY TECHNOLOGY

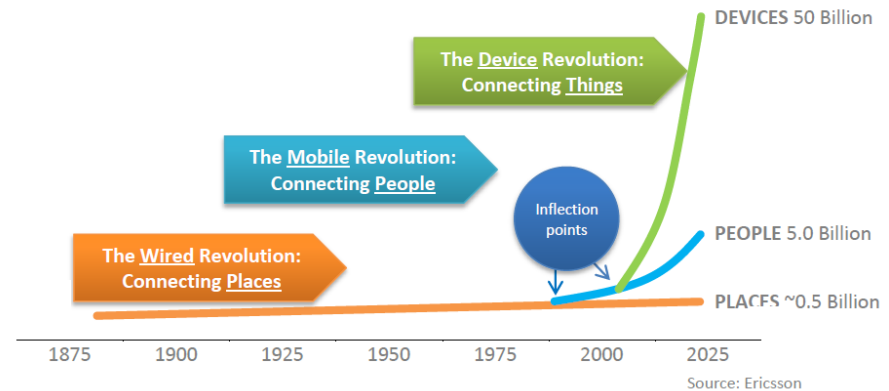
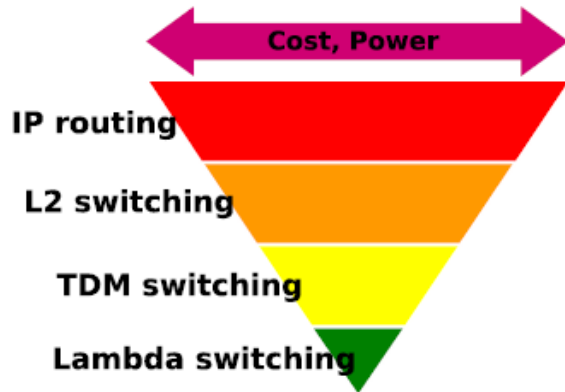
Bn, including M2M



Source: GSMA Wireless Intelligence, Machina Research, A.T. Kearney Analysis

Mobile data growing at 66% CAGR driven by user demand for new services

4G/LTE Network deployments accelerating to meet data needs



Predominance of data leads to energy intensive packet processing in CPUs

M2M will aggravate energy needs, drive demand for greater energy efficiency

New Approaches in Wireless Networks

Power-optimized Mobile Handsets

- Dominance of data processing has made the mobile CPU the dominant power consumer
- Vijay Reddi's talk emphasizes the critical need for energy-efficient CPU designs in future mobiles

Energy-efficient Cellular Architectures

- Current 2G, 3G and LTE standards focused on spectral efficiency, not energy efficiency
- Radhakrishna Ganti analyses the tradeoffs between spectral and energy efficiency, and discusses new techniques for an energy-optimized cellular infrastructure

Software Power Management

- In an app-driven world, software power management is essential to realize energy-efficient mobile devices
- Joseph Turner talks about superior commercial software designs to reduce energy waste

Energy Harvesting in Wireless Sensors

- Energy harvesting leads to maintenance-free, energy-aware wireless sensor networks
- Neelesh Mehta delves into the design aspects of opportunistic multi-hop relaying in cooperative energy-harvesting wireless networks and hybrid wireless sensor networks