Between 10 and 20% of electricity consumption from the ICT* sector in 2030?

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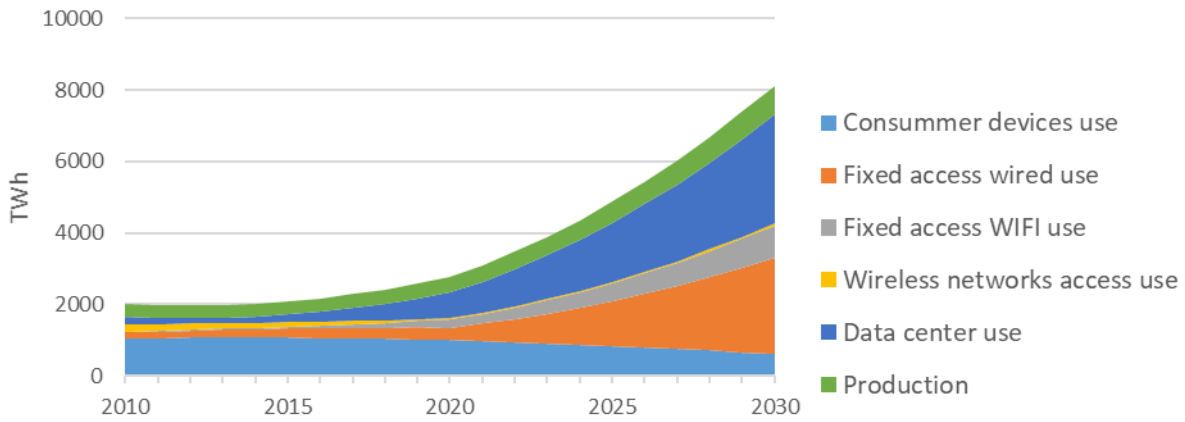
Disruptive changes, but rather difficult to establish market projections

Currently, ICTs account for between 5% and 9% of total electricity consumption, and their development suggests a deep transformation of energy systems, from smart networks to customer management or decentralised energy exchanges.

Digitalization is driving several types of "disruptive" changes within the energy sector and all of which can have both negative and positive impacts on energy transitions. On the negative side, one can note **the very rapid growth in** electricity consumption, which has been observed and is predicted in relation to information and communication technologies, including new blockchain-type applications (especially in their cryptocurrency version).

On the positive side, the new possibilities offered to utilities for **decentralised production management, storage, energy efficiency, demand flexibility, and "transfers of use" to** electric vehicles can already be identified as potential "game changers". Moreover, the development of **the blockchain could turn out to be a real disruption** in the management of market transactions and in the possibility of handling decentralised energy exchanges. Finally**, digitalization can significantly** improve efficiency in industrial production, logistics and the circular economy (perspective of a Fourth Industrial Revolution).

Consumption linked to ICTs



Source: Andrae

**Information and Communication Technology*

Overall market impact projections are impossible to establish today given the uncertainties, but one can nevertheless review potential futures based on some robust expectations. As for **consumption dynamics, uncertainties are high** since sources estimate the share of consumption at between 5 and 9% of total power; similarly, the growth rate is estimated at between 6 and 9%/year; at this latter rate, the share of ICTs may rise up to 20% of total electricity consumption in 2030. However, this projection does not account for potential improvements in efficiency, even though cryptocurrencies - which are extraordinarily consumptive - are only one particular instance of the blockchain. There would also remain to consider the potential impacts of the Internet of Things on energy consumption...

On the possible transformations of energy systems, **some projections appear robust**. In particular, the management of **smart grids** at all scales, from the continental to the most local level should allow for new "local production-efficiency-flexibility-storage-new uses" optimisations. Likewise, **Big Data and blockchain** will have a strong impact on utilities' customer management, markets mechanisms, and decentralised energy exchanges.

On some aspects, however, one remains in a "miracle or mirage?" type of uncertainty with also grey areas. This is the case for fully connected buildings, the emergence of new ethical consumer behavior or the *prosumer*, and even the real impact of smart meters on energy consumption.

Further reading:

- Induced consumption and ITCs' frugality:
  - FP7 - iMinds, *Overview of ICT energy consumption*, 2013
  - Académie des technologies, *Impact des TIC sur la consommation d'énergie à travers le monde*, 2014
  - A. Andrae, T. Elder, *On Global Electricity Usage of Communication Technology: Trends to 2030,* Challenges, 2015
- The impacts of digitalization on the electricity and utilities sector:
  - World Economic Forum, *The Future of Electricity New Technologies, Transforming the Grid Edge, 2017*
- Smart grids and blockchain:
  - Hadjsaid et al., *Smart (Electricity) Grids for Smart Cities: Assessing Roles and Societal Impacts, proceedings of the IEEE*
  - J.Abdela, K. Shuaib, *Peer to Peer Distributed Energy Trading in Smart Grids: A Survey, energies 2018*