

Data and Energy Demand

Growth in the number of connected devices, the number and type of services and the levels of data traffic, processing and storage mean that the energy used to power the Internet is growing substantially. DEMAND researchers have investigated these trends, focusing especially on how and why data traffic is growing.

Demand for data is embedded in everyday practices

DEMAND research (Morley et al. 2018) shows that flows of data traffic have become central to a range of social practices such as waking up in the morning, waiting for the bus, watching TV and spending time with family at home. It is not always recognised that the demand for data comes with significant energy costs, and that the more data that flows, the greater the energy consumed.

Morley et al. explain that the growth in data demand has potentially significant implications for peak electricity consumption if current trends continue. Analysing time-use diaries and volumes of data traffic, they show that peak data demand currently occurs later in the evening than peak electricity demand. But as practices such as watching TV online develop, and as mobile phones are used in more data intensive ways, there is likely to be an impact on peak electricity demand. Knowing about the demand for data and when this occurs is relevant for efforts to manage and reduce peak electricity demand.



Morley, J., K. Widdicks and M. Hazas (2018) 'Digitalisation, energy and data demand: the impact of internet traffic on overall and peak electricity consumption' in Energy Research & Social Science 38: 128-137

DEMAND Research Insight #15: [On-demand TV viewing](#). DEMAND website. www.demand.ac.uk

Making demand 'behind the scenes'

DEMAND research shows that some demands for data are generated behind the scenes and without any direct form of user or consumer involvement. For example, Kris de Decker (2017) explains that automatic software updates contribute significantly to increases in energy demand - not only because of the communications networks and data centres involved, but also because of the bandwidth requirement for each download. As he explains, software providers tend to upgrade their customers at the same time, creating spikes in data traffic. Mike Hazas (2015) also notes that service providers, like Netflix, send out upgrades that allow users to view content in higher definitions. This leads to higher volumes of data traffic and increases in energy demand. Yet, the time people spend watching online TV or videos does not necessarily go up.

One practical implication is that rather than focusing on the energy efficiency of digital infrastructures, policy makers would do well to understand and if possible reduce the growing demand for data.

De Decker, Kris (2017) ['Rebooting Energy Demand: automatic software updates'](#). DEMAND website.

Hazas, Mike (2015) ['Society pushes to go faster, but data binges carry environmental costs'](#) in *The Conversation*, Jan 26, 2015.

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