DIGITAL TECHNOLOGY AND ENVIRONMENT IN A FEW FIGURES

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WHAT IS DIGITAL TECHNOLOGY?

A digital equipment, by definition, is an equipment that manipulates digitized data, i.e. binary.

"Digital technology" includes all human activities enabled by this equipment, associated with fields as diverse as communication, shopping, services, hobbies, culture, entertainment, video, music, office automation, use of massive data, calculations, etc.

Digital equipment, according to greenit.fr[1], are classified in 3 categories ranging from the general public to businesses.

Terminal	Network	Datacenter
Smartphones	Boxes for individuals + companies	Servers
Mobile phones	WIFI access point	Other computer equipment
Wired phones	Active network equipment (routers)	
Tablets	Core network	
Laptops	Powerline devices	
Desktop computers		
Screens		
Video projectors		

Terminal	Network	Datacenter
TV boxes (set-top box)		
TVs		
Game consoles		
Printers		
Connected objects		

SCATTERED AND DIFFICULT TO ESTIMATE DATA

The number of devices currently in use is difficult to estimate. Sales figures are available through trade databases, but items are grouped by typology (also called nomenclatures) and only describe trade. To estimate the number of devices actually in use, their lifetime comes into play[1]. A simpler source comes from the declarations of households in polls or surveys[3][4]. Finally, these figures can be corroborated by the number of subscriptions (internet box, telephone packages, etc.) and the metadata transmitted to companies by the terminals (during all internet connections). The figures presented here are therefore an estimate from Greenit's "Global Digital Footprint" report[1], according to an inventory methodology based on sales and lifetime figures, and data collection from public and private companies.

THE ENVIRONMENTAL FOOTPRINT OF GLOBAL DIGITAL

In 2019[1], worldwide, digital technology represents 34 billion pieces of equipment (eq.) for 4.1 billion users (8 eq/user) excluding small accessories, or 223 million tons of material.

- User terminals: 3.5 billion smartphones, 3.8 billion other phones, 3.1 billion display devices (TV, screens, video-projects), 19 billion connected objects (in fact, depending on the study, between 3 and 30 billion).
- Networks: 1.1 billion DSL/fiber boxes, 10 million 2G to 5G base stations, 200 million other active WAN (wide area network) and LAN (local area network) network equipment.
- Datacenter: 67 million servers.

> Footprint relative to the global footprint of humanity (*terminal manufacturing phase* - **all equipment manufacturing phase**)
>
> - 4.2% less primary energy consumption, i.e. 6,800 TWh (30% - **35%**)
> - 3.8% greenhouse gas emissions, i.e. 1400 million tons of CO2 equivalent *(39%* - **44%**)

> The environmental footprint of digital technology is thought to be major and concentrated in the manufacturing phase, in terms of consumption of fresh water and abiotic resources, although poorly quantified.

This represents about 5.5% of global electricity consumption.

DIGITAL TECHNOLOGY IN FRANCE

In 2020[7], in France, there will be 631 million pieces of equipment used by 58 million people, that is to say about 11 pieces of equipment per user if we consider the total population and 15 if we only consider the 15-70 years old bracket. Excluding the physical network core (cables, optical fibers, etc.), their mass represents about 7 million tons.

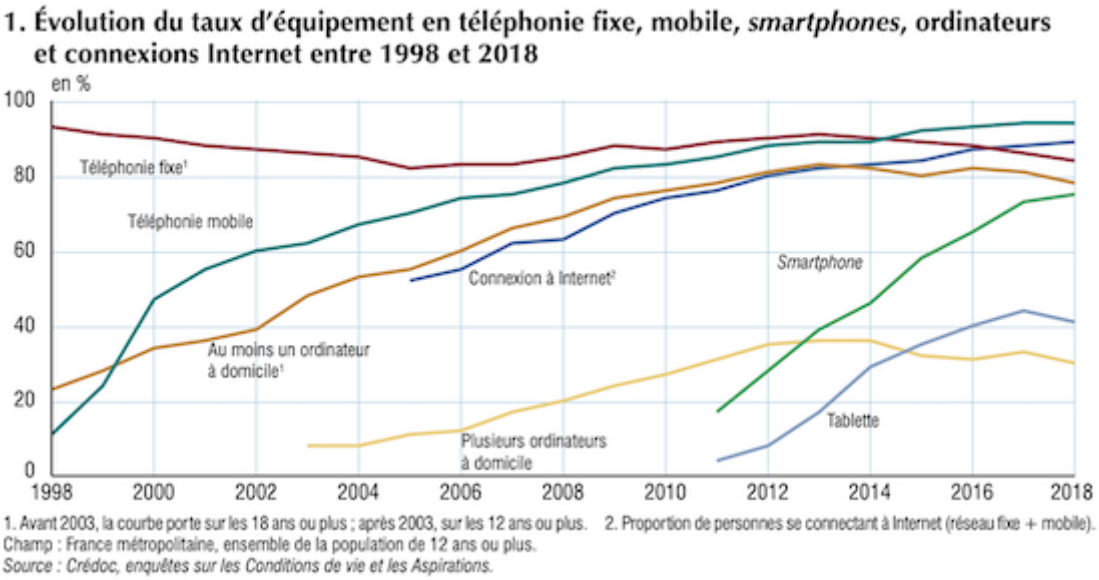
The user base (terminals) includes 116 million computers and monitors, 98 million smartphones, 87 million televisions, 23 million tablets, 15 million video game consoles, 14.5 million printers, 180 million connected objects (watches, speakers, home automation, etc.).

In 2019, French digital technology consumption represents about 40 TWh of electricity, or 8.3% of the French total (473TWh).

In France, energy consumption during the use phase (everything that happens to the equipment between its initial delivery and its disposal) is less carbon intensive than in the world, changing the proportions of environmental impacts between the manufacturing and use phases.

> In 2020, the French digital footprint relative to France's total footprint: (Terminal manufacturing phase - All equipment manufacturing phase)
>
> - 6.2% primary energy consumption, i.e. 180 TWh of primary energy (*37%* - **64%**)
> - 3.2% global warming, i.e. 24 million tons of CO2eq (*76%* - **86%**)
>
> Per person (58 million users), this represents each day:
>
> - 8.5 kWh of primary energy, i.e. 1 electric radiator of 1000 Watts turned on for 8 hours
> - 1.13 kg of greenhouse gases or 6 km by car

According to the report "L'économie et la société à l'ère du numérique" by Insee page 135 [4], in 2017, 84% of French households (17 out of 20) have access to the internet at home. See figure 1 below:



> According to the Digital 2019 France report [5], on average, French people spend a day...
>
> - 4h38 on the internet,
> - 1h17 on social networks
> - 2h59 video consumption (tv, streaming, vod)
> - 0h37 music streaming

AN OPPORTUNITY FOR THE ENVIRONMENT?

According to the 2019 Digital Barometer[3],

> Only 38% of the people surveyed in 2019 think that digital technologies represent an opportunity for the environment. Thus, 80% of French people agree with the idea of reducing the impact of their equipment on the environment (for example by keeping it longer or buying second-hand or reconditioned equipment) and 69% with the idea of reducing the impact of their uses (for example by preferring to download content rather than streaming). Similarly, a majority of the population says they are willing to accept a price premium of around 5% to reduce the power consumption of their computer and to encourage recycling.

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