Cigref
SUCCEED WITH DIGITAL

Energy crisis
How digital departments contribute to reducing energy consumption in France

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Acknowledgements

Contents

Background

In an environment where economic and political actors are increasingly taking climate urgency and environmental planning into consideration, the unprecedented geopolitical situation brought about by the war in Ukraine has demonstrated the challenge that energy dependency poses. France and Europe are preparing to face an unprecedented energy crisis in the coming months. In France, the whole of society— both businesses and private individuals—is being **urged to take measures to save energy, electricity in particular**. In this context, the Government is strongly encouraging all sectors to take steps to reduce **electricity consumption by 10% over the next two years** and **reduce electricity consumption should demand peak over the course of the coming winter**. The digital sector is no exception, and the Minister for Digital Transition and Telecommunications, Jean-Noël Barrot, formally called on our ecosystem to do its part at the end of July 2022. According to a study by ADEME (the French Environment and Energy Management Agency)[1], "*on average, in service companies, administrations and local authorities, the electricity consumption of IT equipment represents 24.7% of total electricity consumption.*" Digital technology's share is not negligible; every action counts!

In response to this request, Cigref set up a task force led by **Christophe Boutonnet**, Deputy Director of Digital at the **Environment, Energy, Territories and Sea Ministries,** to identify measures that digital departments could take **to eliminate IT systems' non-priority electricity consumption, either temporarily or permanently, especially should demand peak this coming winter**. Reflections on reducing energy consumption and the environmental impact of **digital technology in the medium and long term** will continue in various transversal Cigref activities throughout the year as a continuation of the work already produced, such as with the "100 best practices to support digital sobriety approaches in organisations",[2] published in 2020, which may also be a more detailed source of operational practices.

In this document, the actions to take have been referenced according to companies' three main sources of digital energy consumption: **User equipment, Data centres (on premises), and Networks.**

These actions are then divided into two categories:

- **"Eco-gesture"-type actions** that should be done every day, some of which are already being monitored over time by organisations as part of their "digital responsibility" approach,
- **Actions to be taken in peak demand**, which correspond to the "EcoWatt" alerts allowing consumption to be shifted when the electricity network is tense (orange alert) or very tense with a

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[1] ADEME, "Consommation énergétique des équipements informatiques en milieu professionnel*", 2015*: *https://librairie.ademe.fr/urbanisme-et-batiment/2431-livre-blanc-consommation-energetique-des-equipements-informatiques-en-milieu-professionnel.html*

[2] Cigref, in partnership with The Shift Project, "Digital Sobriety: a responsible corporate approach", 2020: https://www.cigref.fr/digital-sobriety-a-responsible-corporate-approach

risk of blackouts (red alert). The "MonEcoWatt" service[3] developed by RTE in partnership with the French Environment and Energy Management Agency (ADEME) provides real-time information on national electricity consumption and suggests a number of eco-actions to take, particularly during periods of tension on the electricity network (8 a.m. - 1 p.m. and 6 p.m. - 8 p.m.). An alert system[4] informs users in advance of periods of high tension on the electricity network and the risk of power cuts. A dedicated mobile application is planned for release in early winter.

Finally, an **inventory of energy consumption data** from public sources is included in the appendix. It identifies the main consumption items for IT infrastructure and equipment. Since the consumption data for equipment and infrastructure still lacks consistency, this inventory reflects orders of magnitude with lingering rates of uncertainty. It can help to make broad-based assessments but does not allow for precise measurements at this stage.

Nota bene: Each organisation should adjust the measures in this framework to their size and context, since not all organisations have the same data centre equipment or hosting issues. This framework only covers the equipment and infrastructures that fall under the control of IT departments. Thus, it excludes the management of tertiary buildings (which fall under the responsibility of the organisation's general services) and the scope of cloud computing. The measures apply to both on-site and remote work.

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[3] https://www.monecowatt.fr/
[4] https://www.monecowatt.fr/inscription-alerte-vigilance-coupure/

Best practice guidelines for reducing the consumption of digital equipment and infrastructure

1. The user environment

User equipment consumes a large share of its energy while inactive, and ADEME says that "*by better managing standby mode and switching off this equipment when not in use, we can reduce their energy consumption by 40%.*"[5]

Equipment

Eco-gestures in everyday life

- Always switch off equipment, whether shared or used only by you, in the evenings and at weekends (screens, printers, photocopiers, etc.). Where possible, try to set up systems that make it easier to switch off multiple pieces of equipment at the same time.
- Optimise computer shutdowns and set default standby times.
- Set up power-saving functions on computers and mobile phones.
- Limit or mutualise printing.
- Set up fast standby for printers and copiers during the day[6].
- Have devices (computers, tablets, smartphones, etc.) use Wi-Fi instead of 4G or 5G.

In case of tension on the power grid (EcoWatt orange or red)

- Charge laptops overnight and work on battery power without charging during peak hours. If the laptops have docking stations that combine a power supply, network connection, mouse and keyboard and additional screen, do not use the dock and work off a Wi-Fi network, if possible.
- Turn off additional screens and use the laptop screen only.
- Switch off and unplug equipment and appliances that micro-consume (replicators, chargers, appliances on standby, etc.).

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[5] ADEME, *Consommation énergétique des équipements informatiques en milieu professionnel,* p.41, 2015: https://librairie.ademe.fr/cadic/2440/livre-blanc-consommation-energetique-equipements-informatique-2015.pdf
[6] According to an ADEME study (2020), "*a photocopier consumes 80% of its energy in standby mode. Putting copiers and printers on standby is more efficient than turning them off and on again.*"

Digital uses and settings

Eco-gestures in everyday life

- Use document sharing services instead of email to send files.
- Fine-tune and deep-configure workstations' overall energy consumption: for example, set applications to use dark backgrounds rather than bright white backgrounds, reduce default light intensity etc.
- Since data storage also has a large-scale energy cost, it is important to delete unnecessary data (local, network and cloud-based e-mails and files) on a daily basis.

In case of tension on the power grid (EcoWatt orange or red)

- Turn off cameras during web conferences in a sensible way (only turn on the camera when speaking).
- Where feasible, use the telephone network to participate in web conferences (depending on the number of participants, administration capacity, sound quality, etc.).
- Use Wi-Fi to participate in web conferences via mobile phone.
- In general, limit the consumption of video streams.

Management and communication with employees

- Regularly communicate with users on the measures taken and how they are adjusted according to the situation.
- Encourage employees to subscribe to EcoWatt to stay informed and do their part during orange or red alerts.
- Remind people of digital eco-gestures by widely communicating on internal documents that may have already been produced by the organisation or by the ecosystem (see bibliography).
- Share measures of workstations' energy consumption in particular, targeting certain activities and tracking changes in consumption trends (by day, by month, etc.).

2. Data centres

Infrastructure

Daily/starting now

- Turn on the power saving option on physical servers.

- Optimise capacity planning by increasing the server load. This optimisation also helps to identify obsolete or unused applications and possibly close certain bays, thus saving energy.
- Re-use waste heat from data centres, where possible.
- Gradually increase server rooms' set point temperatures, referring to the ASHRAE standards[7] and the "Code of Conduct for Energy Efficiency in Data Centres"[8] which, depending on the class of the equipment, estimates temperatures of up to 27° - 35°.
- Choose equipment that meets ASHRAE standards and/or complies with the Code of Conduct for Energy Efficiency in Data Centres.
- Use and monitor variable frequency drives (VFDs) to optimise data centre cooling.
- Group servers in as few rooms as possible to optimise air conditioning.

In case of tension on the power grid (EcoWatt orange or red)

- Optimise calculation loads by scheduling them at night or during off-peak periods.

Applications

Daily/starting now

- Decommission obsolete applications and update the server repository.
- Apply eco-design principles to digital products and services to limit the need for energy resources from both user devices and hosting infrastructures.
- Optimise the application production plan.

In case of tension on the power grid (EcoWatt orange or red)

- Avoid campaigns that require high computing power (e.g., AI algorithms, big data).
- After consultation with the business units, assess the possibility of closing certain applications or functionalities.
- Once you have grouped applications through capacity planning optimisation, where possible, shut down the servers with the least sensitive applications.

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[7] American Society of Heating, Refrigerating and Air-Conditioning Engineers
[8] https://e3p.jrc.ec.europa.eu/publications/2022-best-practice-guidelines-eu-code-conduct-data-centre-energy-efficiency

3. Network

Daily/starting now

- Always use Wi-Fi instead of 4G with mobile phones. Use wired networks for computers, where possible.

In case of tension on the power grid (EcoWatt orange or red)

- Limit bandwidth by restricting data streams, especially video streams, as much as possible. At a minimum, reduce the resolution of images and video playback.

Inventory of energy consumption data of digital equipment and infrastructure

The data collected are all from public sources. Most of the average consumption data in kWh/year and per equipment are taken from the **ADEME - Arcep** report "*Evaluation de l'impact Environnemental du Numérique en France et Analyse prospective*"[9] (2022), which is very rich and well documented and based on an estimate of the number of devices **used for professional purposes** in France. Other sources also mentioned in this report are the European Commission's "*ICT impact study, Final report*"[10] (2020) and the ADEME study "*Consommation énergétique des équipements informatiques en milieu professionnel*[11]" (2015), which aims to measure the energy consumption of thousands of pieces of IT equipment under real conditions of use.

The unit power data is derived from various cross-referenced sources and should be considered with the utmost caution, taking into account the specificities and models of each equipment. Moreover, the unit power, which corresponds to peak power, does not accurately reflect the average consumption/year in kWh, since equipment does not run at full capacity all the time. **This data must therefore be put into perspective according to how each organisation actually uses** its IT assets.

	Unit power	Average consumption per equipment (for professional use)
Computer equipment		
Desktop computer	200 - 400 W	54 - 256 kWh/year
Desktop computer in standby[12]	/	18 - 85 kWh/year
Laptop	50 - 100 W	38 - 58 kWh/year
Laptop on standby[13]	/	13 -19 kWh/year
Smartphone	10 W	2 - 5 kWh/year
Landline telephone	5 W	40 kWh/year
Tablet	30 W	5 kWh/year
Docking station	130 – 180 W	1.28 kWh/year
Smartphone charger	5 - 30 W	2 - 11 kWh/year
Computer charger	65 W	/
Screen (between 24 - 39 inches)	30 W	70 kWh/year
Printer	130 - 900 W	71 - 441 kWh/year
Printer standby	/	23 - 145 kWh/year

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[9] https://librairie.ademe.fr/cadic/6700/impact-environnemental-numerique-rapport2.pdf

[10] European Commission, *ICT Impact study, Final report, prepared by VHK and Viegand Maagøe for the European Commission*, July 2020

[11] https://librairie.ademe.fr/cadic/2440/livre-blanc-consommation-energetique-equipements-informatique-2015.pdf

[12] The consumption in "standby mode" is based on the assumption that in standby mode consumption is divided by three.

[13] *Same*

Internet router	7 - 17 W	105 - 300 kWh/year
Infrastructure		
Physical server	88 - 291 W	1,500 kWh/year
Virtual server	8.5 W	70 kWh/year

Resources

- ADEME - ARCEP, "Evaluation de l'impact Environnemental du Numérique en France et Analyse prospective", 2022: https://librairie.ademe.fr/cadic/6700/impact-environnemental-numerique-rapport2.pdf
- ADEME, "Eco-responsable au bureau : actions efficaces et bonnes résolutions", 2020: https://librairie.ademe.fr/cadic/174/guide-pratique-ecoresponsable-au-bureau.pdf?modal=false
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Cigref
SUCCEED WITH DIGITAL

Achieving digital success to help promote the economic growth and competitiveness of its members, who are major French corporations and public administrations, and users of digital solutions and services

Cigref is a network of major French corporations and public administrations set up with a view to developing its members' capability to acquire and master digital technology. It is a unifying player in the digital society, thanks to its high-quality thinking and the extent to which it represents its members. Cigref is a not-for-profit body in accordance with the French law of 1901, created in 1970.

To achieve its mission, Cigref counts on three business units, which make it unique.

Belonging

Cigref speaks with one voice on behalf of major French corporations and public administrations on the subject of digital technology. Its members share their experiences of the use of technology in working groups in order to elicit best practices.

Intelligence

Cigref takes part in group discussions of the economic and societal issues raised by information technologies. Founded nearly 50 years ago, making it one of the oldest digital associations in France, it draws its legitimacy from both its history and its understanding of technical topics, giving it a solid platform of skills and know-how, the foundation stones of digital technology.

Influence

Cigref ensures that its member companies' legitimate interests are known and respected. As an independent forum in which practitioners and actors can discuss and create, it is a benchmark recognised by its whole ecosystem.