Green IT Framework

74 key best practices for more responsible digital technology

GreenIT.fr
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greenIT.fr

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PREFACE

As humanity's digital footprint grows faster than any other indicator, it is becoming urgent to accelerate the convergence between ecological and digital transitions.

A more sustainable and responsible use of digital technology is possible. Members of the Green IT Club have been experimenting with this convergence for nearly 10 years in their respective companies.

There is no longer any question of identifying the main actions and methods. This work has already been done. The urgent task now is to disseminate these key actions as quickly and as widely as possible.

This is the purpose of this reference document, which proposes 74 simple but very effective actions to implement to reduce the environmental and economic footprint of an information system while improving its social performance.

The members of the Green IT Club who participated in updating this standard are:

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ABOUT THE CLUB

THE CLUB AND ITS AMBITIONS

Created in 2014, the Green IT Club brings together French-speaking Green IT and responsible digital project leaders – CSR, innovation and Green IT managers – from private and public organizations.

Reserved for user organizations, it allows its members to meet three major objectives:

- exchange in complete peace;
- collaborate to meet the needs of their Green IT and responsible digital projects;
- while creating a strong consensus around shared good practices.

The club has multiple ambitions:

- Advance members' skills;
- Help them position themselves with quantified and objective benchmarks *(annual benchmark);*
- Share energy, risks, and costs;
- Structure individual approaches around shared principles;
- Promote members' initiatives;

Beyond the services provided to its members, the Green IT Club aims to represent user organizations on the subject of responsible digital technology and to inform the market with an objective and honest approach.

THE MEMBERS

- **Bank of France**
- **Bolloré Logistics**
- **Bel Group BIC**
- **Group**
- **ESG Group**
- **GreenIT.fr**
- **L'Occitane in Provence**
- **Greater Paris Metropolis**
- **SFIL**
- **City of Nanterre**

The members of the Green IT Club represent major French public and private organizations that are pioneers in the implementation of an information system that is more respectful of the planet and human beings, and less costly.

These companies also design digital services that they offer to their customers in compliance with these more sustainable specifications.

The Club's member organizations total tens of thousands of users located worldwide, with a predominance in France and Europe. They also represent millions of euros in Green IT budgets. As such, the Green IT Club can legitimately speak on behalf of Green IT project leaders within user organizations.

The Club is managed by GreenIT.fr, which initiated the project, in a collegial manner: all decisions are made jointly.

INTRODUCTION

“ You *can only improve what you can measure .”* — Lord Kelvin

Large private and public organizations have been initiating a Green IT approach for many years. These individual initiatives have enabled organizations to achieve an initial level of performance and maturity, including appointing managers to lead this practice and legitimizing it with senior management by demonstrating initial attractive returns on investment (ROI), from both an economic, environmental, and social perspective.

In 2015, the most advanced organizations felt the need to share their expertise and feedback from the field in order to reach a second level in terms of Green IT maturity and performance. This was the initial objective of the first edition of this framework.
The second and third versions pursue the same goal.

Beyond an obvious increase in skills, this pooling aims above all to:

- create a benchmark of good practices that achieves consensus;
- prioritize best practices to increase the effectiveness of Green IT policies implemented in operation;
- have a common basis for standardly assessing the Green IT maturity and performance of organizations, in particular to identify the highest priority areas for progress.

In other words, this document aims to:

- accelerate the adoption of the good practices it presents;
- industrialize existing approaches;
- converge towards a common reference.

This third edition of the Green IT framework is supplemented by:

- a public *checklist* distributed under CC-by-NC-ND license (see club.greenit.fr) ;
- a method for assessing the Green IT maturity of an organization (p. 13) ;
- a methodological guide (p. 8).

HOW TO USE THIS REFERENCE?

CLASSIFICATION OF BEST PRACTICES

To facilitate navigation within the repository, we have organized best practices according to a taxonomy based on two dimensions:

- large area of responsibility;
- technical sub-domain;

Ultimately, this reference framework is organized as follows:

1. Cross-cutting approaches

- 1. Responsible purchasing
- 2. Duration and end of life
- 3. Governance

2. User

- 4. Workstation
- 5. Telephony
- 6. Printing
- 7. Tools and uses of the workstation

3. Company

- 8. Software
- 9. Digital services and business applications
- 10. Computer centers
- 11. Network

IDENTIFICATION OF GOOD PRACTICES

Each best practice is assigned an identifier. It is preceded by a "#" sign. This identifier is not a classification number. It is therefore normal that the best practice identifiers are not listed in ascending or descending order.

This identifier is essential for:

- ensure monitoring of good practice over time, regardless of the taxonomy chosen to present good practices;
- allow the creation of subsets of this repository;
- allow good practices to be numbered while ensuring that the same good practice is always referred to, regardless of the numbering system.

PRESENTATION OF BEST PRACTICES

Each good practice is presented in the form of a summary sheet whose structure is always identical.

A subtitle places the good practice by Area of responsibility > Sub-area technical.

Icons and symbols allow you to identify at a glance:

- the degree of urgency / priority of implementation
- the environmental impacts that this good practice can reduce
- ease/difficulty of implementation
- the logo corresponding to the ecolabels associated with good practice.

Other information is systematically offered, including:

- the benchmark indicator (KPI) for this good practice
- the potential for reducing impact, or improving each of the 3 axes of sustainable development:
  - Social: improvement of working conditions
  - Environment: reduction of environmental impacts
  - Economy: cost reduction

Other information may be given in addition to the description of the good practice.

LEGEND OF THE ICONS

Type of impact avoided or improved

This icon identifies good practices that avoid or limit the depletion of non-renewable natural resources.

This icon identifies good practices that avoid or limit the emission of greenhouse gases responsible for global warming and resulting in local climate disruption.

This icon identifies good practices that avoid or limit the depletion of freshwater stocks (aquifers). Freshwater can be considered a non-renewable natural resource.

when aquifers recharge less quickly than human use . Moreover, fresh water is, along with oxygen, the most vital natural resource for human survival.

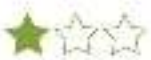
This icon identifies good practices that avoid or limit the production of waste and/or pollution associated with this waste or the manufacturing process (which themselves create waste and pollution).

This icon identifies good practices that improve human well-being on a social, health and societal level.

Priority

This good practice should be implemented as a priority. Good practices are considered a priority when they have significant potential to reduce the ecological footprint and are easy to implement, or when they are essential for the implementation of other key good practices.

These best practices have a medium potential for reducing the resource footprint, but they are relatively easy to implement. They therefore offer a good compromise between time spent and results obtained.



Although this good practice helps to limit resource requirements, the potential for savings is low or the difficulty of implementation is significant.

Difficulty of implementation

Implementing this best practice is quick, risk-free and does not require any particular expertise.

Any specialist in Green IT or in the related field can implement this best practice.

Implementing this best practice requires a high level of expertise, is time-consuming or involves high complexity.

Environmental, social and economic leverage

For each of the pillars of sustainable development – environment, social, economy, also called the “3Ps” (People, Planet, Profit) – we indicate the intensity of the expected leverage effect.

Strong

This figure indicates that the leverage effect of this good practice is strong. That is, it is capable of significantly reducing environmental and/or economic impacts and/or significantly improving working conditions.

AVERAGE

This figure indicates that the leverage effect of this good practice is average. That is, it is capable of reducing environmental and/or economic impacts and/or improving working conditions.

Weak

This figure indicates that the leverage effect of this good practice is low or non-existent. This good practice does not significantly reduce environmental and/or economic impacts and/or does not significantly improve working conditions.

ASSESS YOUR MATURITY AND ITS PERFORMANCE

HOW TO ASSESS YOUR GREEN IT MATURITY AND PERFORMANCE

The assessment process used with this framework is the standard *Capability Maturity Model (CMM)* , which is widely used in the IT industry. It describes the level of implementation of various systems and processes. It is also possible to use KPIs *(Key Performance Indicators) :* regularly collecting these indicators within the organization allows their evolution to be tracked over time and acted upon accordingly.

These systems allow us to judge a level of maturity, but not a level of performance or efficiency. We developed them based on recognized quality standards and eco-labels.

Although all the ingredients are present to make this evaluation system an ecolabel, it is not one. Indeed, an ecolabel requires a significant human, legal, and technical infrastructure to ensure the impartiality, relevance, and transparency of the analysis leading to the award of a label.

Since the publication of the previous version of this standard, several labels have emerged.
However, no clear consensus seems to be emerging at the moment and their rapid emergence can only attest to commitment and not results.

Calculation system

Level	Description
1: Initial	This level is the most basic. The processes are virtually unknown and unpredictable. No success factors are identified. Project success remains uncertain.
2: Reproducible	The project's progress is beginning to be mastered. The implementation methods implemented make it possible to ensure the repetition of a virtually identical project.
3: Defined	Project processes are clearly identified and defined. All project stakeholders have a clear understanding of this.
4: Mastered	The progress of the project is measured both in quantitative terms as a qualifier. The gaps are analyzed.
5: Optimized	We are now at the final stage of the improvement process. continues, the processes are regularly reviewed and adapted to the latest publications.

This evaluation system therefore has two objectives:

- allow you to objectively assess the level of maturity achieved;
- encourage you to progress over time.

SUMMARY

Cross-cutting approaches

> Responsible purchasing

#641 - Powering the information system with electricity from a renewable energy source

Cross-functional approaches > Responsible purchasing

Impacts

It is possible to improve the energy mix that powers its information system by increasing the proportion of electricity from renewable primary energy.

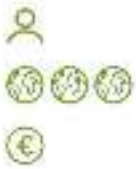
One method is to purchase certificates guaranteeing the renewable origin of your electricity. The price is slightly higher, but it helps encourage the development of the renewable energy sector. However, since the amount of renewable energy available is finite, these certificates guaranteeing the origin are not an end in itself.

Various suppliers are committed to supplying you with renewable energy, either exclusively or partially: Enercoop, Direct Energie's Green Electricity offer, Planète Oui, Poweo, Grenoble Gaz Electricité, etc.

Priority

Difficulty of placing in work

Potential



KPI

% of electricity from primary energy renewable

#646 - Prioritize purchasing reconditioned equipment

Cross-functional approaches > Responsible purchasing

Impacts

Across the entire life cycle of IT equipment, manufacturing concentrates environmental impacts. Purchasing refurbished equipment rather than new hardware is a particularly effective way to reduce environmental impacts while also achieving a positive social impact: refurbishment creates jobs, often integration.

Many companies offer this type of equipment. For equal quality, preference should be given to those involved in the social and solidarity economy (SSE). From a social perspective, this allows for the employment of adapted businesses (which is included in the calculation of the 6% of disabled people made mandatory by Law No. 2005-102 of February 11, 2015).

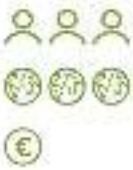
From an environmental perspective, refurbished equipment is equipment that is not manufactured. And from an economic perspective , the cost is lower for an equivalent service.

There is a need to raise awareness among buyers and users to adopt these new processes and uses. This good practice is very suitable for small structures (micro-enterprises, associations, individuals, etc.), it still remains marginal within large companies.

Priority

Difficulty of placing in work

Potential



KPI

% of the reconditioned fleet

#651 - Generalize environmental clauses in equipment tenders

Cross-functional approaches > Responsible purchasing

Impacts

The systematic inclusion of environmental requirements in calls for tender is a simple and very effective action to implement in encouraging manufacturers to offer eco-designed equipment and to properly manage its end of life.

Action is needed on two levels:

- The manufacturer's approach and the best practices it applies to reduce its impacts.
- The equipment itself.

The manufacturer's commitment can be assessed through certain now common certifications: ISO 14001, SA 8000 certification, etc.

The environmental performance of the equipment should, as far as possible, be summarized by an ecolabel. This may be supplemented with specific technical requirements (e.g., a removable battery for a laptop).

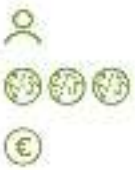
The selected labels can:

- either be discriminatory when the label is required (integrated into the conditions of execution of the contract)
- either have a significant weighting in the technical rating of the product.

Priority

Difficulty of placing in work

Potential



KPI

% of calls for tender including environmental clauses

#652 - Generalize the integration of societal clauses in markets

Cross-functional approaches > Responsible purchasing

Impacts

The objective of this good practice is to promote, through IT services markets, the return to employment of people who are far from it, for material or intellectual services .

On the one hand, it is possible to promote the employment of people who only have access to employment through the involvement of specialized work support structures: ESAT (Establishment and service of assistance through work), EA (Adapted Enterprise), EI (Insertion Enterprise) - See GESAT network. Among the possible types of operation:

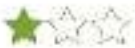
- Establish a market reserved primarily for the disabled or for integration. For example: digitization, post-production work (enveloping, sorting), recycling, etc.
- Favor the choice of an EESS (social and solidarity economy enterprise) for specific markets. The management of WEEE by an EESS is particularly well suited to limiting our environmental impact (reconditioning/ reuse) while participating in the creation of jobs for a disadvantaged public.

On the other hand, the implementation of integration clauses is compatible with intellectual services markets which may require highly qualified audiences.

Target audience:

long-term job seekers, active solidarity income recipients who are job seekers, minimum social security recipients, people recognized as disabled workers, young people who left school without qualifications or without professional experience, young graduates who have been unemployed for more than a year, qualified seniors who are long-term job seekers, people covered by an integration through economic activity scheme

Priority



Difficulty of placing in work

Potential

KPI

% of markets integrating at least 3% of people in integration

Principle of action:
the insertion clauses are based on an appropriate regulatory system, they are included in the conditions of execution of the contract. (Example for public contracts with article 14 conditions of execution and article 53 conditions of award).
The successful bidder undertakes to meet the integration requirements requested by the client. In the event of non-compliance, penalties are calculated at €60 per hour not completed. This system can only be applied to a contract with a significant financial volume. For example: a request for integration hiring for €4 million in turnover.

Public Procurement Code or ordinance of 2005 (updated June 2015) Art 14 and Art 53. The law of February 11, 2005 (Law for equal rights and opportunities) requires companies with more than 20 employees to hire at least 6% of disabled workers.

To find out more:
http://www.reseau-gesat.com

#621 - Integrating good eco-design and accessibility practices when purchasing external services

Cross-functional approaches > Responsible purchasing

Impacts

As Facebook, LinkedIn, Microsoft, IBM, and many other leading companies have shown , eco-designing online services can significantly reduce the physical infrastructure needed to run them . LinkedIn, for example, reduced the number of servers needed to run its website by a factor of 112.

mobile and IBM by 100 the number of servers needed to run one of its decision-making applications.

For applications and websites, there is a standard* recognized by the industry. Therefore, simply ask the service providers responsible for design, production, and hosting to apply the best practices of this standard. This requirement can be included as an appendix to the technical specifications.

A few additional lines in a contractual document are enough to initiate a software eco-design process.

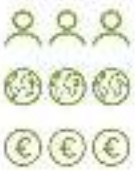
The possible additional cost – around 4 to 5% of the initial budget – is largely offset by the gains in terms of the number of servers, electricity consumption and bandwidth.

* Web eco-design: 115 best practices

Priority

Difficulty of placing in work

Potential



KPI

% of calls for tender incorporating ecodesign requirements and accessibility

Cross-cutting approaches

> Lifespan and end of life

#438 - Implement and optimize selective sorting of consumables

Cross-cutting approaches > Lifespan and end of life

Impacts

The objective of this good practice is to limit the impact of company waste (paper, toner, batteries, etc.) by promoting the recycling and reuse of the raw materials they contain.

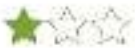
Entrusted to actors of the social and solidarity economy (SSE), collection and processing can add to this environmental approach a strong societal axis by promoting integration through economic activity.

Implementation is simple. All you need to do is place receptacles suitable for the type of waste in strategic locations:

- "Leaf hook" cardboard or any other device for collecting office paper without creasing it, in offices or near printing equipment.
- Dedicated bin for bulk collection.
- etc.

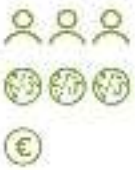
Ensure regular collection by a suitable organization or one provided for in the company's cleaning contract.

Priority



Difficulty of placing in work

Potential



KPI

% collected by type of waste (weight of paper collected vs. weight of paper purchased, for example)

#470 - Promote the refurbishment of functional equipment via a social and solidarity economy or adapted economy company

Cross-cutting approaches > Lifespan and end of life

Impacts

In the life cycle analysis of a computer workstation, manufacturing is the stage that has the greatest environmental impact. Therefore, refurbishing functional equipment is one of the most effective ways to reduce the environmental impact of equipment.

This involves deliberately prioritizing the reconditioning and reuse of workstations in order to give them a second life with associations, schools or individuals wishing to equip themselves at a lower cost.

Principle of action:
Choosing a social economy company is a solidarity-based business for which the reuse of computer workstations is a priority.

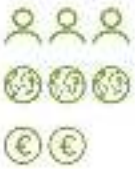
These structures are either:

- Integration companies that promote the reception of people who are far from employment in order to help them gain skills and make them independent in the job market (e.g.: Ateliers sans Frontiére, Ateliers du Bocage)
- Adapted companies specializing in the employment of disabled workers. (e.g.: Ateliers du Bocage) Some of these structures offer a quality of service equivalent to that of large industrial groups in terms of certification, traceability and recycling channels .

Priority

Difficulty of placing in work

Potential



KPI

% of the fleet reconditioned by an ESS player (number of pieces of equipment)

#608 - Prefer reconditioning for reuse rather than recycling

Cross-cutting approaches > Lifespan and end of life

Impacts

Extending the lifespan of equipment helps limit the environmental footprint resulting from the manufacture of new equipment and the impacts associated with end of life.

This good practice consists of upgrading the equipment as much as is reasonably possible, in particular by:

- adding memory sticks, replacing faulty HDDs
- with SSDs , keyboard keys if necessary, fans if too noisy or faulty.

On smartphones and tablets, replace screens if broken or scratched, change cases if cracked, change panels.

Extending the lifespan automatically leads to a reduction in environmental impacts, particularly those associated with the manufacture of new equipment and the end of life of replaced equipment.

From a social perspective, reconditioning can be entrusted to adapted companies or ESATs. This promotes the social and solidarity economy. From an economic perspective, it avoids the purchase of new and expensive equipment, which has the effect of optimizing expenses.

The fight against waste gives meaning to the IT strategy: employees and customers appreciate these measures.

Priority

Difficulty of placing in work

Potential

KPI

% of refurbished and recycled IT equipment

#644 - Require reconditioners to be transparent about their outlets

Cross-cutting approaches > Lifespan and end of life

Impacts

Outlets: all the players taking back equipment previously sent to reconditioners.

Not all WEEE service providers have the same ethics. As a result , 70% of WEEE worldwide is trafficked. Entrusting the management of your WEEE to an approved eco-organization provides the assurance of traceability and the guarantee of a certified supply chain.

To date, eco-organizations have been directing users toward equipment destruction channels without prioritizing reuse and the use of labor. Solutions incorporating these requirements remain to be addressed on a case-by-case basis. Therefore, only electronic waste should be entrusted to them . Functional equipment should be reconditioned through another channel.

Eco-organizations are non-profit organizations. They are private law companies entrusted with a public interest mission by the public authorities, which grant them accreditation.

Depending on the dedicated channels, producers subject to EPR (Extended Producer Responsibility) can choose to transfer their obligations for managing the waste concerned, in this case professional WEEE, to the eco-organization approved in this area. This transfer of obligations takes place in exchange for financial compensation corresponding to the cost of managing said waste.

To go further:
WEEE Directive

Priority

Difficulty of placing in work

Potential

KPI

% of WEEE (kg or units) handled by an eco-organization

#647 - Systematize the collection of WEEE and consumables

Cross-cutting approaches > Lifespan and end of life

Impacts

The objective of this best practice is to manage the end-of-life of equipment and consumables to ensure that their disposal complies with regulations and respects the environment. Indeed, the impact on the environment and the health of local populations is disastrous when this waste is not treated properly.

Generally, the supplier (or broker) remains quite vague about the end of life of the consumables and equipment collected.

However, a recent study shows that 60 to 90% of end-of-life IT equipment is subject to intense traffic worldwide.

It is essential to consider a second life (reconditioning) for electronic equipment before categorizing it as waste to be destroyed.

The general resources and purchasing departments must require the traceability of end-of-life equipment and consumables.

They must also ensure that their disposal is handled by waste professionals. Consider including binding clauses in contracts.

Priority

Difficulty of placing in work

Potential

KPI

% (mass) of consumables and WEEE collected

#650 - Reassign equipment internally

Cross-cutting approaches > Lifespan and end of life

Impacts

When the capabilities of the computer hardware (PC, laptop, tablet, smartphone) become insufficient to accomplish certain tasks for a particular user profile (e.g., developers), it is possible to reassign the equipment to other, less demanding user categories (e.g., administrative agents). This avoids the systematic renewal of hardware, generating savings and a significant reduction in environmental impacts. To implement this good practice, we start by establishing profiles based on user needs (for example, 3 profiles: office use, business application use, developer and expert use).

This allows a piece of equipment to be used multiple times within the company. It involves adjusting equipment as needed rather than leveling up (a practice that is simpler to manage but clearly inflationary), creating a stable, adjusted, and therefore sustainable environment.

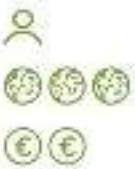
Tools :

- Evaluation of applications useful to each profile.
- Table associating a machine type with each profile.
- Tool for regularly scanning workstations to remove software that has become obsolete for the user.

Priority

Difficulty of placing in work

Potential



KPI

Average lifespan of equipment in the organization or average cost price of a position/year

Cross-cutting approaches

> Governance and management

#700 - Appoint and train a manager
Green IT / Responsible digital technology

Cross-functional approaches > Governance and management

Impacts

Full-time or part-time, this person manages and leads the company's Responsible Digital strategy. They coordinate Green IT initiatives with the IT department and responsible digital service design with business lines.

She approaches digital technology from the perspective of environmental, social and economic issues to build an (eco)responsible information system and help the company move towards more sustainable models thanks to digital technology.

She develops, applies and develops the company's Sustainable Development strategy (CSR/RSE) at the information system level, in conjunction with the Director of Information Systems (DSI/CIO), the Director of Sustainable Development (DDD/SDO), and the company's executive committee.

She supports business departments to help them make the most of digital technology as part of the responsible design of the company's digital products and services.

Resource:
"Green IT Manager" job description from the nomenclature of CIGREF IS professions

Priority

Difficulty of placing in work

Potential

KPI

Charge dedicated to the Green IT manager (% FTE)

#701 - Dedicate a specific budget to Green IT

Cross-functional approaches > Governance and management

Impacts

Creating a responsible Green IT/digital policy and implementing an action plan requires more than just man-time.

For example, audits and environmental footprint assessments must be carried out. Constantly evolving legislation —particularly regarding electronic waste—also requires the assistance of legal experts. Finally, in some cases, it may be advisable to call upon specialized tools and experts. In most of these situations, the Green IT manager must have a budget to cover these services.

When properly implemented, a Green IT policy can save far more money than it costs. It is therefore necessary to initially invest in corrective actions. The percentage of the IT /CSR budget allocated to this practice is a good indicator of the company's maturity and commitment to the issue.

Priority

Difficulty of placing in work

Potential

KPI

% of the IT department budget

#702 - Define a strategy and an action plan Green IT

Cross-functional approaches > Governance and management

Impacts

The first action when implementing a Green IT / responsible digital approach in a company consists of making an overall assessment of the environmental footprint of the information system and its maturity in terms of best practices.

By comparing this information with the values of other companies, we can then identify areas for improvement, quantify the potential impact of corrective actions and estimate an overall gain in terms of reducing environmental impacts.

Creating the strategy involves aligning this action plan, the associated indicators and quantified objectives with the company's CSR strategy. Some companies choose to focus on the use phase of the information system and/or on a single environmental indicator (e.g., greenhouse gas emissions). Others, particularly in the tertiary sector, rely on the Green IT strategy to improve all CSR indicators: social performance through refurbishment by stakeholders in the social and solidarity economy (SSE) and the adapted economy (EA), reducing environmental impacts by extending the lifespan of terminals, etc.

Priority

Difficulty of placing in work

Potential

KPI

Yes = 100%, No = 0%

#703 - Define Green IT indicators (KPIs)

Cross-functional approaches > Governance and management

Impacts

It is impossible to properly monitor a Green IT strategy without implementing quantified indicators. One of the objectives of this framework is to provide these indicators for each area of the information system.

Two levels of granularity are required:

- micro indicators to be able to make operational decisions.
- macro indicators to be able to contribute to the company's overall CSR *reporting* .

Several types of indicators can be used to explain:

- environmental performance (kg of WEEE/year/user for example). environmental footprint (tonnes
- of CO2 equivalent/year/ user). maturity (implementation or not of good practices aimed at
- reducing the footprint).

Priority

Difficulty of placing in work

Potential

KPI

Number of green IT KPIs / Number of good practices

#704 - Aligning the Green IT strategy with the company's CSR strategy

Cross-functional approaches > Governance and management

Impacts

It's essential to align Green IT indicators with those of the company as a whole. This is the best way to effectively contribute to the company's social, environmental, and economic strategy. This alignment also allows you to demonstrate the impact of the approach and create a common vocabulary with other stakeholders: the company's CSR/SD managers and representatives/correspondents, etc.

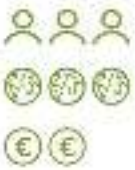
With this in mind, the Green IT Club has aligned the main indicators of the Responsible Digital Benchmark with those most commonly used by the CSR departments of member organizations:

- primary energy.
- climate change (greenhouse gas emissions).
- waste.
- water.

Priority

Difficulty of placing in work

Potential



KPI

Yes = 100%, No = 0% or number of indicators in common

#705 - Regularly assess the environmental footprint of the IS

Cross-functional approaches > Governance and management

Impacts

Since we can only improve what we know how to measure, it is essential that the company regularly evaluates the environmental footprint of its information system to identify the main sources of reduction of environmental impacts.

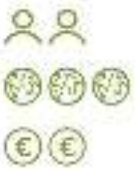
In addition to greenhouse gases (GHG), this assessment must also cover water, energy (including gray energy), and waste in order to avoid pollution transfers.

Ideally, the depletion of non-renewable natural resources and the impact on biodiversity, among other things, should also be taken into consideration .

Priority

Difficulty of placing in work

Potential



KPI

Yes = 100%, No = 0%

#706 - Create an internal network of referents Green IT and train them

Cross-functional approaches > Governance and management

Impacts

A Green IT manager alone cannot instill this dynamic within a large company. The best way to achieve this is to create a network of Green IT representatives/ correspondents whose goal is to drive this practice at their level and raise awareness among their colleagues on the subject.

For this approach to work, it is imperative to train Green IT referents/correspondents and ensure that they have truly acquired the fundamental knowledge that they will need to pass on in turn. It is with this objective that the Green IT Club offers training and certification.

It is also important to provide this network of correspondents with animation tools: e-mailing campaigns, animations, awareness-raising materials, etc.

Priority

Difficulty of placing in work

Potential

KPI

Number of referents

Green IT / number of employees

IT Director

#801 - Train product teams in ecodesign and/or LCA

Cross-functional approaches > Governance and management

Impacts

To acquire the knowledge necessary to understand the approach, team training is essential. Ecodesign and LCA concepts can thus be applied to product development. This also helps raise awareness of digital sobriety among teams that have the greatest impact .

The following profiles can be mentioned as profiles to be trained:

- Product owners
- Business analysts
- Project managers
- IT Architects

Priority

Difficulty of placing in work

Potential

KPI

% of people trained in the teams products

Label

IT Architects

User

> Workstation

#207 - Upgrade equipment rather than replace it

User > Workstation

Impacts

Whether laptop or desktop, professional workstations are designed to make it easy to replace key components such as the storage unit (hard drive or SSD) and RAM.

From both economic and environmental perspectives, it's more beneficial to boost aging equipment than to replace it with new equipment. Simply adding RAM is usually enough to extend the lifespan of a workstation by 1 to 2 years. For laptops , you can complete the process by replacing the hard drive with an SSD.

To ensure that this best practice can be implemented, it may be wise to add some technical requirements when calling for tenders, including:

- ease of disassembly and the ability to access key components,
- and the ability to expand RAM capacity and replace other key components.

Priority

Difficulty of placing in work

Potential

KPI

% of workstation fleet upgraded rather than renewed and duration

of the elongation

#321 - Put workstations to sleep at night and turn them off on weekends

User > Workstation

Impacts

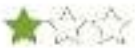
In a 24-hour day, a workstation is generally not used for more than 8 hours. It is therefore necessary to put it on standby during the lunch break and especially in the evening.

This saves almost 2/3 of the electricity consumption during working days compared to a workstation that remains on 24 hours a day. On weekends, it is better to physically turn off the workstation to force it to restart.

Standby power consumption is very low and the associated energy savings are almost the same as with the unit switched off. Additionally, restarting ensures better operating system stability and increased performance. However, unlike a complete shutdown, this power-saving mode makes it easier to maintain workstations overnight and allows the user to recover their work environment where they left it.

It is possible to use fleet administration tools such as Microsoft's SCCM and *power management* tools such as those from Avob, Cisco, Verdiem, etc. to force the shutdown or standby of all IP equipment: workstations, screens, printers, etc.

Priority



Difficulty of placing in work

Potential

KPI

% of the workstation fleet switched off or put into

stays up in the evening and on weekends

#324 - Adapt the workstation configuration to what is strictly necessary for business use

User > Workstation

Impacts

Not all users in a business need the same workstation. For example, office applications require less RAM and processor power than 3D modeling and CAD. Similarly, graphic designers will need a larger graphics card than a standard workstation and more local storage capacity.

To avoid unnecessary economic and environmental impacts , it is therefore relevant to define configurations adapted to uses rather than aligning all positions with the strongest requirement.

This definition of workstation profiles will also facilitate, in a second step, the internal reassignment of first-hand equipment (see #650).

Priority

Difficulty of placing in work

Potential

KPI

% of workstations adapted to uses

#511 - Extend the duration of equipment provision

User > Workstation

Impacts

The most effective way to reduce the environmental and economic impacts of workstation equipment—desktops, monitors, and laptops—is to extend their working lifespan. Indeed, the majority of environmental impacts (depletion of non- renewable natural resources, pollution, climate change, etc.) occur during the extraction of minerals, their transformation into electronic components, and the end of their life.

It is therefore necessary to manufacture less and extend the lifespan of existing equipment.

Extending the duration of workstation staffing begins with clearly stating this desire and demonstrating its positive impact, both from an environmental and economic point of view .

Many good practices can then support this approach:

- not systematically migrating to new software versions, adding RAM if necessary (see #207), purchasing
- warranty extensions,
-
- extend the accounting depreciation period (> 5 years),
- etc.

Priority

Difficulty of placing in work

Potential

KPI

Average lifespan by type of equipment

#602 - Favor eco-labeled computers TCO, or failing that EPEAT GOLD

User > Workstation

Impacts

When purchasing a workstation *(desktop* and screen, *laptop),* it is preferable to choose eco-labeled TCO equipment (and failing that EPEAT Gold).

TCO Certified is the only digital ecolabel that incorporates social criteria, such as working conditions at the manufacturer or its subcontractors. With a few exceptions, all other ecolabels focus exclusively on the environmental dimension.

For laptops, additionally check and require that the equipment's battery is removable and easily replaceable by the user.

Another possible eco-label is EPEAT Gold, but it only takes into account environmental criteria.

For further information:

www.epeat.net

www.tcodevelopment.com

Priority

Difficulty of placing in work

Potential

KPI

% of eco-labeled TCO workstations

Labels

EPEAT, TCO

#603 - Favor used equipment before considering new equipment

User > Workstation

Impacts

Before purchasing new workstations, it is best to prioritize the reassignment of internal equipment. For example, a central unit assigned to a technical workstation will be reassigned to an office profile after refurbishment (erasing the hard drive data and resetting the software). Secondly , consider purchasing refurbished used equipment. A refurbished screen or central unit is

generally 60% to 80% cheaper than the same equipment new.

The Ordi 3.0 label (http://www.ordi3-0.fr/) makes it easy to identify companies that adhere to strict specifications for restoration work. A list of companies is available online.

See files #650 and #608.

Priority

Difficulty of placing in work

Potential

KPI

% of the stock of refurbished workstations

#604 - Separate the renewal of central units from other equipment

User > Workstation

Impacts

When renewing your equipment, separate the renewal of central units *(desktop)* from that of other equipment such as the screen, keyboard, mouse, external hard drive, etc.

This good practice also applies to laptops , *for* which it is necessary to avoid renewing associated peripherals such as the additional screen, docking station, keyboard, mouse, etc.

The lifespan of screens is often 2 to 3 times longer than that of *desktops / laptops* and other peripherals (docking station, keyboard, mouse, chargers, bags, etc.) are virtually indestructible.

This good practice significantly reduces environmental impacts – particularly those associated with manufacturing

and at the end of the equipment's life – while saving the company significant money. And the user retains their familiar environment.

Priority

Difficulty of placing in work

Potential

KPI

% of the workstation fleet *(desktop / laptop)* renewed alone

#800 - Limit the number of screens

User > Workstation

Impacts

Dual monitors have been widely deployed in offices in recent years. Yet, monitors represent one of the biggest impacts of manufacturing equipment.

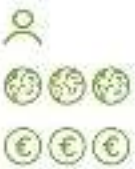
A simple way to reduce the impact of equipment is therefore not to systematize the dual screen for user environments of office profiles.

For more technical profiles, it will be necessary to assess whether the dual screen is essential.

Priority

Difficulty of placing in work

Potential



KPI

Average number of screens per user

User

> Telephony

#217 - Limit the number of telephone terminals

User > Telephony

Impacts

Although landline phones have a long lifespan and their environmental footprint is low compared to other information system equipment, they often outnumber users. Moreover, landline phones are increasingly less used because they are often redundant .

with mobiles (especially since the appearance of unlimited mobile plans).

It therefore becomes reasonable to eliminate landline phones in favor of a software solution: *softphone* and/or videoconferencing tool .

The majority of users prefer *softphones* / ToIP such as Lync (Microsoft), Webex, Skype, Zoom, etc.

In addition to being economically and environmentally beneficial , this best practice provides users with an additional service . It allows users to share their screens and documents, and see their interlocutor. It's also accessible anywhere, whether traveling or working remotely.

Priority

Difficulty of placing in work

Potential

KPI

Average number of landlines or mobile phones per user

#235 - Deploy BYOD *(Bring Your Own Device)* for certain categories of users

User > Telephony

Impacts

BYOD involves giving certain employees the option to use their personal equipment *(laptop,* tablet, or *smartphone)* for work. This approach is appreciated by employees, who can then choose their favorite or familiar equipment or operating system.

BYOD makes economic sense. A single device is sufficient instead of two: one for business use and one for personal use. The savings are shared contractually between the company and the employee. Everyone benefits.

The environmental footprint is greatly reduced because there is only one device to manufacture and operate instead of two.

Certain precautions must be taken for obvious security reasons . The company must implement a system to ensure complete isolation between the private and professional environments. There are many solutions available on the market for this purpose.

The legal framework will also need to be clarified in detail. Thus, two alternatives can be considered: Reverse BYOD, i.e., the provision of a professional
→ phone allowing personal use, Dual-SIM phones.

→

Be careful, however, about employees' right to disconnect.

For PCs, BYOD is often associated with virtualization. The operating system, business software, and data are hosted on a central company server, and the employee's personal PC only displays the screen image of the applications.

Priority

Difficulty of placing in work

Potential

KPI

% of PCs, *smartphones,* tablets in BYOD mode

For *smartphones,* MDM (Mobile Device Management) software is installed by the company on the workstations. It guarantees secure access to the professional environment and offers classic office functions: directory, calendar, messaging, reading of email attachments, intranet access, etc.

The full cost of a Mobile Device Management (MDM) solution can be significant. The larger the fleet, the greater the return on investment.
favorable.

#610 - Set a maximum SAR (Specific Absorption Rate) level of 0.6 W/kg

User > Telephony

Impacts

In 2011, the World Health Organization (WHO) classified electromagnetic radiofrequency fields emitted by connected mobile devices (phones, smartphones, tablets, etc.) as " *potentially carcinogenic ."* In 2015, France passed the " *Law on sobriety, transparency, information and consultation regarding exposure to electromagnetic waves ,"* Law No. 2015-136. This law requires the application of precautionary and sobriety principles with regard to electromagnetic wave emissions (relay antennas, cell phones and smartphones, internet boxes, etc.).

When purchasing equipment that emits electromagnetic waves – telephone, smartphone, tablet, etc. but also many active network elements – it is interesting

to apply the precautionary principle by setting a maximum SAR (Specific Absorption Rate) level.

SAR is a measurement of electromagnetic radiation expressed in volts per meter (V/m) or watts per kilogram (W/kg) for a space of 10g of human tissue. The first measurement is mainly used for GSM relay antennas and Wi-Fi hotspots. The second measurement is mainly used for user terminals.

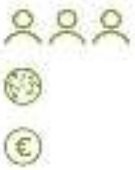
Regarding antennas, the Council of Europe recommends limiting power to 0.6 volts per meter (V/m). Regarding terminals, in France, the legal maximum is 2 watts/kg, compared to 1.6 watts/kg in the USA.

The SAR varies by a factor of 5 between the most and least emitting devices. Given current phone performance, it is not unreasonable to aim for a maximum SAR of 0.5 W/kg.

Priority

Difficulty of placing in work

Potential



KPI

Fleet average SAR in Watts/kg

#611 - Reusing telephone equipment

User > Telephony

Impacts

Reusing is one of the most effective ways to reduce the environmental impact of phones and other *smartphones.* Their initial use (first-hand) in a business is short: 24 to 36 months. However, these devices operate without problems for more than 5 years. Refurbishing most often involves resetting the operating system and replacing the casing and/or screen.

For the company, this reuse is a good opportunity to reduce the overall cost per subscription (because the returned mobiles have a value) while improving the environmental impact associated with the equipment.

All major operators now have a take-back program, and most are able to offer reuse rather than recycling. Alternatively, social and solidarity economy (SSE) stakeholders provide this type of service. Calling on them allows for the introduction of a social dimension to economic and environmental initiatives .

You can require quantified information from the operator on the number of items of equipment taken back, the type of treatment undergone, and the destination of the equipment returned to the market.

Priority

Difficulty of placing in work

Potential

KPI

% of equipment taken back and reconditioned

User

> Printing

#214 - Set default printers to eco mode

User > Print

Impacts

Setting printers to default eco mode, i.e. double-sided, monochrome and draft mode, halves the amount of paper and toner used compared to single-sided printing in standard quality.

Simple to implement and inexpensive, this good practice can nevertheless generate significant savings and significantly reduce the nuisances associated with printing.

In fact, it is the manufacturing of paper and toner that concentrates the environmental impacts.

The double-sided mode can be difficult for some users to understand, so it's worth training them on how to use this feature. We can use this training to highlight the benefits: half the weight to carry, etc.

To go further, also think about: choosing a default

- font that uses less ink
- eco-design your standard document templates layout the documents
- before making them available

Priority

Difficulty of placing in work

Potential

KPI

% of printer fleet configured by default in eco mode

#215 - Raising user awareness of the key actions of eco-responsible printing

User > Print

Impacts

More than in any other area of the information system, users are the key to a controlled printing policy.

Indeed, while computers can be shut down remotely, it is impossible to judge for the user whether or not it is worth printing a document. It is therefore crucial to raise awareness among users about the impacts of printing and, in particular, to highlight the impact of their efforts on an individual and collective scale.

Awareness is facilitated if the company has set clear objectives (number of pages per day and per employee, % of color printing , % of double-sided printing, etc.).

To engage users, some large French companies have decided to index a portion of their annual employee profit-sharing bonuses to their ability to reduce their paper consumption. These companies then redistribute a portion of the financial savings generated to users who play the game. This highly effective approach has enabled some of these organizations to achieve fewer than 4 pages per day per employee!

Beyond awareness, many actions can be undertaken: promoting the transfer of skills between young recruits and older employees, studying the potentially positive effect of collaborative work tools and/or online document sharing, dematerializing certain documents in the form of structured data that is easier to handle and less impactful, promoting multifunction badge printers (#433), etc.

Priority

Difficulty of placing in work

Potential

KPI

Pages/day/user and/or % color prints

#315 - Buy recycled and certified paper Blue Angel or FSC, avoid PEFC

User > Print

Impacts

A sheet of recycled paper requires 6 times fewer chemicals and 25 times less fresh water to produce (WWF). This type of paper should therefore be preferred for all prints that do not require perfect graphics.

Recycling quality is very important. In particular, avoid chlorine-bleached paper. To make your life easier, only buy recycled paper certified by Blue Angel, or failing that, FSC. Avoid the fake PEFC ecolabel.

Recycled paper can be more expensive than paper made from virgin fibers. To gain adoption, it may be necessary to include it as part of a broader approach to cost control for economically viable printing.

For further information:

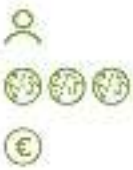
FSC: https://fr.fsc.org

Blue Angel: https://www.blauer-engel.de

Priority

Difficulty of placing in work

Potential



KPI

% of FSC or Blue Angel recycled paper (compared to the total amount of paper used)

Labels

Blue Angel, FSC

#316 - Reconditioning used toners via a social and solidarity economy or adapted economy company

User > Print

Impacts

Printing consumables—paper and toner—are the largest source of greenhouse gas emissions over the entire lifecycle of a print job. Toner itself is composed almost entirely of carbon. Reducing greenhouse gas emissions from printing consumables therefore requires reducing the amount of paper and toner used.

However, it can also be interesting to work on the container.

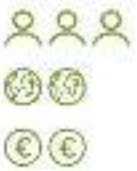
Rather than purchasing non-refillable toner cartridges (which is the case for most supplied by the printer manufacturer), opt for refillable cartridges. This is good for the environment, but more importantly, it allows you to use local providers from the social and solidarity economy (ESS) or ESAT (Etablissement et service d'aide par le travail) to refill cartridges.

This best practice therefore improves both the environmental and social impact of printing. Not to mention the savings made on consumables, since a refilled toner cartridge costs less than a new one of the same capacity.

Priority

Difficulty of placing in work

Potential



KPI

% of refillable cartridge/toner in ESAT

#433 - Consolidate the printer fleet on multifunction devices with identification system

User > Print

Impacts

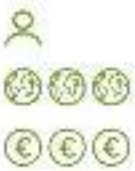
Consolidating printing resources to networked multi-function printers (MFPs) is the most effective way to reduce the number of pages printed per user and the number of printing resources (individual printers, fax machines, scanners, photocopiers). This best practice should therefore be implemented as a priority.

However, a preliminary study is essential to determine the type of equipment and locations suitable for use. Furthermore, the addition of an identification system (magnetic card / PIN code) is strongly recommended to ensure the confidentiality of prints and reduce their volume.

Priority

Difficulty of placing in work

Potential



KPI

Number of users per printing device (including individual printers)

#614 - Buy or rent Blue Angel-certified printers (or EPEAT if not)

User > Print

Impacts

Blue Angel RAL-UZ 122 is the leading ecolabel for printers. It covers all environmental issues throughout the equipment's life cycle.

These devices are not more expensive to purchase but allow for significant savings during the usage phase, in particular by allowing eco mode to be activated by default: draft, monochrome, etc.

Blue Angel RAL UZ-122 also addresses health issues . In particular, it defines a maximum threshold for the emission of micro-particles of toner (carcinogenic) to protect employees.

EPEAT offers a better coverage than Blue Angel in terms of number of devices, but Blue Angel remains the most demanding ecolabel.

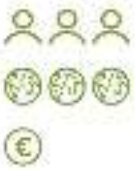
In addition to the use of an eco-label, it may be wise to add some technical requirements during the call for tenders, in particular that the color toners be separated to replace only the toner corresponding to the exhausted color.

To go further:
www.blauerengel.de/en/
www.epeat.net/

Priority

Difficulty of placing in work

Potential



KPI

% of eco-labeled printing equipment
Blue Angel (and/or EPEAT)

Label

Blue Angel, EPEAT

#615 - Buy Blue Angel certified paper or, failing that, FSC, avoid PEFC

User > Print

Impacts

Ideally, only recycled paper should be used. Alternatively, virgin paper made from cellulose fibers sourced from sustainably managed forests offers a better environmental impact than conventional office paper. Indeed, the resource manager is committed to preserving biodiversity and, of course, replanting felled trees to reclaim the released carbon.

Many other social and societal commitments are also required.

You should favor the Blue Angel and FSC eco-labels, and definitely avoid using PEFC, which is not an eco-label. For the same quality, Blue Angel or FSC-certified paper is almost no more expensive than ordinary paper. Often, you just need to organize yourself to order in volume to completely erase the difference in purchase price.

For further information:

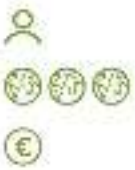
FSC: https://fr.fsc.org

Blue Angel (RAL UZ 72): https://www.blauer- engel.de/en/products/office/printing-paper-2014 and https://www.blauer-engel.de/en/products/office/printing-papers-2011

Priority

Difficulty of placing in work

Potential



KPI

% of total weight purchased certified Blue Angel and/or FSC

Label

Blue Angel, FSC

#617 - Collecting white office paper without creasing it

User > Print

Impacts

Graphic paper – white A4 sheets used in office paper – is much easier to recycle if it is sorted separately from other paper and cardboard and if it is not crumpled. In particular, it can be deinked more easily and with fewer chemicals .

While the collection and recycling of bulk paper and cardboard often represents a cost to be borne by organizations, correctly sorted and uncreased graphic paper represents a raw material of choice that some recyclers buy from companies.

It is therefore important to sort this paper separately, for example by designating a specific bin in each office, rather than throwing it in the bin intended for recyclable materials (plastic, paper, cardboard, etc.). A simple bin with a flat opening of a few centimeters allows for separate collection.

Priority

Difficulty of placing in work

Potential

KPI

Kg collected per year and per user

#618 - Favor suppliers who offer reconditioned printing equipment

User > Print

Impacts

Some manufacturers, such as Canon and Konica-Minolta, extend the lifespan of multifunction printers (MFPs) leased to businesses under Managed Printing Service contracts . This criterion can therefore be added when selecting a supplier.

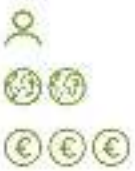
Although the manufacturing of these devices does not represent the main impact of printing (it is the manufacturing of paper), this approach should not be neglected when it is possible to implement it.

More and more suppliers are offering equipment for rent that appears to be new but is actually second-hand. For the *average user,* it's virtually impossible to tell the difference between refurbished and new equipment.

Priority

Difficulty of placing in work

Potential



KPI

% of the fleet of reconditioned printers (check with the supplier in the case rental)

User

> Tools and use of the workstation

#210 - Raise awareness among users who leave their workstations on unnecessarily

User > Workstation tools and uses

Impacts

Turning off (or putting on standby) your workstation when it is not in use is a simple and particularly effective action to reduce the energy consumption of the information system.

In France, by reducing energy consumption, we are mainly reducing the consumption of fresh water associated with manufacturing

electricity (approximately 10 liters per kWh of electricity) as well as the quantity of radioactive waste produced.

Depending on the company's culture, an awareness-raising campaign may be enough to sustainably change the behavior of some users. This campaign must highlight environmental and economic issues while demonstrating the impact of this best practice on both the individual and the company.

When awareness-raising action is not sufficient, integrating this indicator into the calculation of the variable part of employee profit-sharing is particularly effective.

Finally, it is possible to use fleet administration tools such as Microsoft's SCCM and " *power management"* tools to force the shutdown or sleep mode of recalcitrant workstations.

Priority

Difficulty of placing in work

Potential

KPI

% of workstations switched off at night

and the weekend

#904 - Communicate with users and train them on Green IT best practices

User > Workstation tools and uses

Impacts

Users are the critical link in implementing Green IT best practices within an organization. It is therefore important to integrate them as much as possible into the Green IT approach.

One way to ensure this is to conduct awareness campaigns within the company on the impacts of digital technology. It's also wise to train users in these best practices to ensure the transition to responsible digital technology is effective.

Priority

Difficulty of placing in work

Potential

KPI

% of users made aware and/or trained

#670 - Set up document sharing folders

User > Workstation tools and uses

Impacts

This best practice involves making a folder containing documents, stored on the company network or online, accessible to a group of people who may need them. Only those with access rights to these folders will be able to access them.

Setting up document sharing folders (or collaborative workspaces) helps avoid sending large attachments and duplicating documents on different workstations or in different folders.

It also allows people to exchange and communicate their writing and documents while collaborating with their colleagues. This collective writing allows for cooperative and collaborative work.

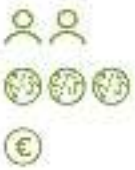
Please note that, depending on the person, access rights to files may be limited to reading documents to avoid inappropriate modifications.

For large files or for sharing outside the organization, there are repository services for transferring large files.

Priority

Difficulty of placing in work

Potential



KPI

Input storage volume (TB)

#671 - Streamline your email usage

User > Workstation tools and uses

Impacts

Emails have become a source of stress for employees who receive between 25 and more than 100 emails per day.

In addition to this harmful health impact, our emails have an environmental impact. Contrary to popular belief, it's not their storage, but rather the writing, reading, and transporting of emails that contribute most to increasing the environmental footprint of the information system.

Based on these observations, a few simple changes in usage can greatly improve the situation: Limit as much as possible the number of emails sent

- each day.
- The email should communicate useful and important information to the recipient (very effective).
- Reduce the number of recipients: only use the *"reply to all"* function if necessary.
- Do not use email as a substitute for telephone or physical contact.
- If necessary, favor the use of an instant messaging system .

To achieve this, you need to set aside specific time slots for email processing and only deviate from them in emergencies.

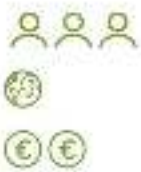
Without forgetting basic good practices: Do not print your

- emails to read them.
- Send mail in text format.
- Replace the "image" signature with simple text.
- Clean your email regularly and avoid storing attachments unnecessarily.
- Do not use messaging as a storage or archiving space: avoid attachments when you can replace them with a link (see #670) (very effective).
- Unsubscribe from threads, newsletters, and other unnecessary notification systems (effective).
- Delete all unnecessary emails (not very effective).

Priority

Difficulty of placing in work

Potential



KPI

Number of emails sent / user / day

#672 - Apply good design and accessibility practices to the organization's graphic charters

User > Workstation tools and uses

Impacts

To reduce the environmental impact of printing while improving the accessibility of company documents, it may be worthwhile to take a responsible design approach to the company's graphic charter and its implementation in the form of office document templates.

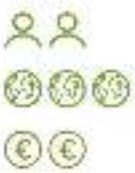
Environmentally, a solid color covering 25% of the page contains enough ink or toner to print text across the entire page. Many basic knowledge of this type (font to use, high contrast, etc.) must be taken into account when (re)designing the company's graphic charter.

On a social level, most of the color codes used do not correspond to accessibility standards and therefore cannot be used by colorblind and visually impaired people. Worse, in terms of structure, most office documents do not respect basic instructions that could make them accessible to blind people and dyslexics (a well-structured document becomes accessible by changing a simple font. But it is still necessary to use styles to simplify this manipulation, which can otherwise become very tedious).

Priority

Difficulty of placing in work

Potential



KPI

File size

graphics

Business

> Software

#625 - Maintaining computers to prevent them from slowing down and becoming unstable

Business > Software

Impacts





The gradual instability and slowdown of Windows workstations is almost always due to a lack of operating system maintenance. Simple and safe actions can improve user comfort and delay the need for hardware upgrades.

Effective actions include:

- reboot the machines.
- clear temporary files (browser, system, etc.)
- clean the registry.
- Defragment the hard drive and registry. Remove certain programs
- from startup.
- etc.

Tools like CCleaner and Piriform's Agomo allow you to maintain an entire fleet of workstations from a centralized console.

A computer with poorly maintained software may require up to 25% more power (RAM, CPU power, hard drive speed, etc.) to deliver the same performance as a less powerful but well-maintained computer.

Priority

Difficulty of placing in work

Potential

KPI

% of the workstation fleet maintained at least once a month

#626 - Regularly uninstall unused software

Business > Software

Impacts

Several studies (HP, 1E, etc.) show that almost all companies purchase more licenses than they use.

On average, 10% of software purchased and installed goes unused . In addition to the licensing cost—an average of $415—there are also update and maintenance costs. That's a waste of between $145 and $155 per year per user, just for maintenance.

Beyond the cost, the more software installed unnecessarily , the more likely it is to slow down the workstation , forcing users to request renewals.

It is therefore important to regularly audit unused software and uninstall it.

Tools like 1E's AppClarity make it easy to list unused software and uninstall it.

This best practice also applies to server operating systems. Several studies and feedback show that a customized installation of the operating system based on the specific needs of the application can require up to 15% less power. On the scale of several thousand physical servers, this means hundreds of machines can be shut down.

Priority

Difficulty of placing in work

Potential

KPI

Number of licenses used / total number of licenses

#627 - Update software only when necessary

Business > Software

Impacts

Contrary to popular belief, the majority of users do not want their current version of software to be replaced with a newer one. They prefer to stick with their old habits and do not want to make the effort of adapting to a new interface.

Until recently, a new version of software was released every 2 to 3 years and required twice as much resources to run (RAM, CPU, etc.). Each new version therefore led to premature desktop renewal. Fortunately, this trend is slowing down.

However, it is essential to update software to correct security flaws and ensure good stability.

This best practice therefore invites you to sort between "cosmetic" updates, functional updates of no interest to your business, and security updates considered essential.

Priority

Difficulty of placing in work

Potential

KPI

Average number of versions between those used in the company and those available for sale

Business

> Digital services and business applications

#415 - Implementing good digital accessibility practices

Business > Digital services and business applications

Impacts

Digital accessibility consists of making software (web exclusively*) usable by people with disabilities : visual (visual impairment, blindness), motor (inability to use a mouse, etc.), cognitive (difficulty analyzing a screen that is too complex, etc.), auditory or “Dys” illnesses: dyslexia, dysphasia, etc.

This approach must:

- be integrated into the website specifications. be implemented within the
- projects managed, designed, produced and hosted internally and externally (provide service providers with the best practices benchmark and support them in the process).

For this integration to be successful, it is necessary to raise awareness among all stakeholders (project management, ergonomists, communicators, project managers, developers, etc.) and train technical experts responsible for relaying this skill to the teams. Regular analysis of the applications developed helps to anchor best practices in a sustainable manner.

Benefits:

- Better overall ergonomics
- On the HR front: integrating disabled employees
- On the *business* side : addressing customers with disabilities

Reference documents from the W3C work specifically addressing WCAG accessibility:

- RGAA
- Accessiweb

**The main recommendations available on this subject focus mainly on the web (WCAG/ RGAA). They are therefore less appropriate for other services.*

Priority

Difficulty of placing in work

Potential

KPI

% of accessible websites and web applications (define a minimum level among
Bronze, Silver, Gold)

#622 - Optimize print states and outputs

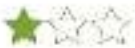
Business > Digital services and business applications

Impacts

Eco-designing a digital service is far from just about lines of code. This approach also considers the externalities of the software, particularly the output states. When these are designed and coded, it is essential to take into account best practices associated with printing: generating a PDF rather than a paper printout, posting the most recent documents online, easily accessing archives, double-sided printing in draft mode, etc.

This best practice should be systematically integrated into a website. Printing any page often produces disastrous results (many pages, missing information, the presence of useless information, etc.). Providing users with the functionality to prepare for printing will give a better experience of the site but will be more virtuous for prints.

Priority



Difficulty of placing in work

Potential

KPI

% of applications whose exit states are optimized

#623 - Implementing good ecodesign practices

Business > Digital services and business applications

Impacts

The eco-design approach aims to reduce the environmental footprint of digital services from the outset.

It must be implemented within projects managed, designed, carried out and hosted internally and externally (providing service providers with the best practices framework and supporting them in the process). The efficiency achieved can contribute to significantly reducing the physical infrastructure required for the operation of the information system.

To ensure the implementation of this approach, it is necessary to raise awareness among all stakeholders (project owners, architects, project managers, developers, etc.) and train technical experts, who are in turn responsible for passing on this expertise to the teams. In addition, regular analysis of digital services helps to anchor best practices in a sustainable manner.

For further information:

- " Web *eco-design: 115 best practices ",* Eyrolles Collective Responsible Digital
- Design: collectif.greenit.fr

Priority

Difficulty of placing in work

Potential

KPI

% of eco-designed and accessible applications

#624 - Favor a modular application architecture

Business > Digital services and business applications

Impacts

A modular application architecture allows software to be enhanced with an extension system.

Popularized by *open source* software , this approach often provides greater scalability, reduced costs for corrective and evolutionary maintenance, and more efficient code. While the software's functional coverage may evolve, it is better to implement the basic features in a kernel and supplement them with extensions as needed.

Most software that has achieved global success is based on this architecture. These include the Linux operating system , the Apache web server, and browsers like Chrome, Firefox, Internet Explorer, and Edge, which offer extension systems.

Implementing this best practice requires investing in the functional design stage and ensuring effective dialogue between the stakeholders responsible for functional design and technical architecture. This project must therefore be approached primarily as a change management project that aims to re-establish genuine dialogue between the project's stakeholders.

Please note:

According to a study by Cast Software, 70% of features requested by users are never or rarely used, which represents 70% of dead code that will nevertheless need to be reviewed (see #628) and maintained.

Priority

Difficulty of placing in work

Potential

KPI

% of applications based on an architecture modular

#628 - Systematize code review after developments

Business > Digital services and business applications

Impacts

Code review involves having your code reread in order to detect any potential defects, both in substance (does this code work and does it properly embody the intended functionality?) and in form (clarity, readability, compliance with standards, etc.).

The main goal of code review is the same as other software quality assurance methods: to find defects in the code as early as possible to limit the technical debt of the software.

The benefits of code review are well established: according to studies compiled by Caperas Jones on more than 12,000 projects, collective code review can detect an average of 65% of defects, 50% for peer review, while automatic tests only detect an average of 30%.

In a responsible digital service design approach, code review is primarily useful for reducing the cost of the service, but also, to a lesser extent, the associated environmental footprint by optimizing the efficiency of the software.

Zoom in on...

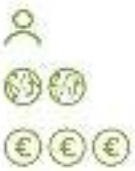
Technical debt (all software defects to be corrected) could represent up to 70% of the total cost of a software.

According to Cast Software's The Crash Report 2011-2012 study, it would be on average $3.6 per line of code.

Priority

Difficulty of placing in work

Potential



KPI

% of defects detected

Business

> Computer centers

#219 - Enable power saving features of modern processors

Business > Computer Centers

Impacts

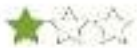
Over the course of a day or a week, server workloads fluctuate rapidly depending on the number of connected users. There are peak hours and long periods of low activity.

However, we often find that the *data center* 's power consumption is relatively stable throughout the day. However, recent processors from major manufacturers (INTEL, AMD) include numerous energy-saving devices. They allow computing power to be adapted to the load, for example by varying the core clock speed, stopping or restarting a core, etc. But they still need to be used.

At INTEL, these technologies are called: *Speed Step Technology, Clock Modulation, Turbo Boost,* etc.

They can be enabled by adjusting BIOS, OS, or even hypervisor settings .

Priority



Difficulty of placing in work

Potential

KPI

% of configured servers

#223 - Require minimum energy efficiency for non-IT equipment in rooms

Business > Computer Centers

Impacts

Even if it is not directly its domain, IT must be vigilant in the choice of non-IT equipment in rooms, in particular equipment responsible for producing and distributing cold (coolers, air conditioners) and that responsible for rectifying and distributing electricity (inverters in particular) , especially since they have a very long lifespan (>15 years).

First, reasonable sizing is necessary because underutilized equipment has very low efficiency. Second, choosing the cheapest equipment can have disastrous consequences on energy costs and therefore on the total cost of ownership (TCO) over the entire lifetime.

Suppliers routinely publish energy efficiency indicators. They should be used. For example, you might require: Category A for a wall-mounted air conditioner, an EER ratio > 3.2 for an air conditioning cabinet, efficiency > 94% for an inverter, etc.

Priority

Difficulty of placing in work

Potential

KPI

% of equipment purchased with efficiency

minimum energy (to be specified)

#224 - Optimizing the architecture and layout of rooms

Business > Computer Centers

Impacts

A room's IT equipment is constantly evolving. Older equipment is replaced, and new hardware arrives, often with different environmental characteristics.

Energy efficiency risks gradually deteriorating if it is not constantly maintained. This involves ensuring over time:

- good air circulation in false floors
- replacing certain tiles and hunting for unnecessary hot or cold air leaks
- maintenance of hot and cold aisles (for example by installing partitions on incomplete *racks)*
- the addition of flexible partitions on partially filled rooms to reduce the volume of air to be air-conditioned.

A medium-term vision of the correct layout of the room is necessary, to maintain optimum efficiency as new equipment arrives.

Priority

Difficulty of placing in work

Potential

KPI

PUE or % of m2 optimized DC

#227 - Adapting the physical architecture of servers to their use

Business > Computer Centers

Impacts

Data center managers generally prefer to administer virtualized standard configurations, which can be prepared in advance of new projects and then dynamically allocated to applications.

There are, however, cases where using a dedicated computing architecture for a specific problem can optimize performance, cost, and energy efficiency.

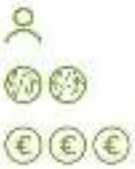
The creation of a specific architecture must result from an in-depth study of the need in order to provide the project with the best result. These architectures are often used for all tasks that require very high computing power, (collaborative work tools, weather forecasts, molecular modeling, physical or financial simulations, etc.).

It may also be appropriate to test new, highly innovative server ranges on a real scale, such as those based on ARM architectures, which are much more energy efficient and can meet specific use cases , or even "physicalization" type architectures .

Priority

Difficulty of placing in work

Potential



KPI

% of the fleet with a usage-specific configuration

Focus on physicalization

Contrary to virtualization, this approach aims to concentrate a very large number of physical micro-servers in a single rack. HP, for example, offers " ***Moonshot*** " **configurations that integrate up to 1,800 servers per *rack,* with a promise of 65% gains in energy efficiency and 90% in space usage.**

#231 - Reuse thermal energy produced by the data center

Business > Computer Centers

Impacts

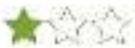
It is possible to reuse the heat produced by the *data center,* instead of venting it into the atmosphere.

The most common solution is to use this energy to heat the company's few tertiary premises located near the center.

But more ambitious operations are possible. Examples include:

- heating of all the company's buildings (Roubaix) supplying the urban heating network
- (Marne-la-Vallée) supplying a hot water network (Amsterdam) supplying a
- tropical greenhouse (Clichy) supplying a swimming pool (Butte-aux-
- cailles in Paris).
-

Priority



Difficulty of placing in work

Potential

KPI

Energy reused / total energy consumed by the room (over a full year)

#250 - Implement regular monitoring of data center energy indicators

Business > Computer Centers

Impacts

Whether the *data center* is managed internally or outsourced to an external operator, it is essential to continuously measure and improve its environmental performance.

Since April 2016, ISO/IEC has published several international standards that now provide a harmonized framework for various energy performance indicators for data centers, such as PUE *(Power Usage Effectiveness).*

A multitude of publications, standards, and best practices exist on the subject. A white paper, the result of collaborative work between the Green-IT Alliance, France Datacenter, and Gimélec, offers an operational tool that deciphers existing standards and best practices, while explaining how to calculate KPIs and how to measure the associated parameters.

Examples include: PUE, which measures

- the energy efficiency of the infrastructure used for IT production,
- the REF *(Renewable Energy Factor)* which measures the share of renewable energy consumed by the *data center,*
- The COP *(Coefficient Of Performance)* which measures the efficiency of cold production.

These measures are of paramount importance, particularly in a context where the share of electricity consumed by CdC (data centers) and SdS (server rooms) represents 3.6% of the electricity consumed in Switzerland (in 2019). In addition, the average potential for improving the energy efficiency (PUE) of these centers corresponds to almost 46% of their electricity consumption. (EnergieSchweiz April 2021.

RechenzentrenStromverbrauchEffizienzpotenziale)

To learn more: https://
www.apl-datacenter.com/wp-content/uploads/2017/07/
white-paper-energy- environmental-performance-
indicators-of-data-centers.pdf

Priority

Difficulty of placing in work

Potential

KPI

PUE

#312 - Favor operators who have ratified the European code of good conduct for data centers

Business > Computer Centers

Impacts

The European Code of Conduct for Data Centres *(EU CoC for Data Centres)* was created in response to the increase in energy consumption in data centres and the need to reduce their environmental, economic and energy impacts.

The objective is to inform and raise awareness among *data center* operators and owners in order to reduce energy consumption in a cost-effective manner and without hindering the essential function of *data centers.* The Code of Conduct aims to achieve

this objective by improving the understanding of energy demand within the data center, by raising public awareness.

In the appendix, it provides a guide to best practices and a number of indicators for assessing the current energy efficiency of its IT center(s).

For more information:
https://ec.europa.eu/jrc/en/energy-efficiency/code-conduct/data centers

Namely

By ratifying this code, the operator certifies that it applies a minimum list of good practices, or that it has a short-term implementation plan for some of them.
It also undertakes to provide a certain number of indicators proposed in the guide.

Priority

Difficulty of placing in work

Potential

KPI

% of DC or m2 of DC
or kW IT managed by suppliers having signed
the CoC

#517 - Confine server room bays

Business > Computer Centers

Impacts

The containment of the bays makes it possible to significantly reduce the energy required for air conditioning.

There are two solutions:

- **Fresh air containment :** The volume of air to be cooled is reduced and channeled precisely toward the servers. 100% of the fresh air will pass through the racks. The room's architecture may provide for this from the outset, but it can also be implemented retrospectively by adding partitions around the cold aisle.

- **Hot air containment :** a technique used, for example, by APC, in its closed "cubes", where server *racks* that draw in fresh outside air alternate with *racks*

  air conditioners that cool the hot air and expel it cool to the outside of the cubes.

Containment is becoming essential for high- density server *racks* because conventional air conditioning techniques are no longer sufficient.

Priority

Difficulty of placing in work

Potential

KPI

% of confined *racks*

#631 - Favor IT equipment that complies with ASHRAE class A3-A4 requirements

Business > Computer Centers

Impacts

ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) publishes standards that provide benchmarks for data centers and their equipment and are included in the European Code of Conduct.

These standards are followed by computer hardware manufacturers who are expanding the temperature and humidity ranges for their equipment, thus reducing the energy required for air conditioning.

- Thus, A2-classified equipment must be able to operate between 10°C and 35°C (temperature at the air inlet of the fans) and in a relative humidity of between 20% and 80%.
- For class A3, the scale becomes: between 5°C and 40°C and between 8% and 85% humidity.
- For class A4, the scale becomes; between 5°C and 45°C and between 8% and 90% humidity.

These standards also apply to technical rooms containing network equipment and located in industrial or commercial buildings . Purchasing rugged equipment (class A4) can eliminate the need for air conditioning and allow for simple ventilation.

Priority

Difficulty of placing in work

Potential

KPI

% of confined *racks*

Label

ASHRAE Class A3 to A4

#634 - Virtualize underutilized physical servers to consolidate them

Business > Computer Centers

Impacts

The traditional approach of IT project managers was to define a technical architecture dedicated to their application.
This approach has become counterproductive with the rapid growth in machine power. A server dedicated to a single application becomes underutilized.

Virtualization techniques have provided a solution to this problem. They allow multiple operating systems and applications to run on the same physical server, as if they were running on separate machines.

Virtualization is very effective for existing applications, especially if the servers are older. It saves space, hardware, and energy quite dramatically. It is also highly recommended for new applications that can be developed natively in this more agile, cost-effective, and environmentally friendly environment.

In addition to these benefits, virtualization also offers ease of installation, deployment and migration of applications.

Priority

Difficulty of placing in work

Potential

KPI

% of virtualized servers

#635 - Mastering storage capacities

Business > Computer Centers

Impacts

Although data and document storage does not represent a major source of environmental impacts on the scale of the information system, it is an area that is progressing rapidly.

There are three techniques to effectively reduce physical storage capacity:

1. Deduplication: This
involves storing a document or document fragment only once. For example, a 10MB PowerPoint file emailed to 20 colleagues is stored only once on the server side.

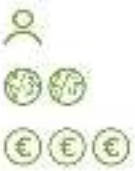
2. *Thin provisioning:* Software
is tricked into believing it has been allocated more storage than it actually has. This approach allows the right amount of physical storage to be used despite software requirements (minimum system requirements).

3. Hierarchical data management: management rules
indicate to the storage array which media is suitable depending on the stage of the data life cycle.
For example, on the day of its publication, an annual report is stored on a very fast medium (SSD), but 6 months later, it ends up on a 4 TB capacity hard drive. This reduces the economic and ecological cost of data storage.

Priority

Difficulty of placing in work

Potential



KPI

GB / user / year

#636 - Implement a strict procedure for provisioning and deprovisioning IT equipment

Business > Computer Centers

Impacts

While the arrival of new equipment is most often well anticipated by all stakeholders, as it is linked to a business project expected by internal and external customers, the shutdown of old machines is always more difficult to organize for various reasons: end of the deployment of the new system which is dragging on, maintenance of a secondary application with a few users, switching of project teams to another subject, etc. However, it is essential for the data center manager to properly manage the end of life of the equipment, otherwise there will be a quantity of useless equipment which continues to consume energy and which must be air-conditioned.

A strict *deprovisioning* procedure must be put in place with identified stakeholders, schedules to be respected and reminders in the event of delays.

The figure

Several reports show that approximately 15% of deployed virtual machines are useless, yet they monopolize a portion of the physical servers on which they run.

Priority

Difficulty of placing in work

Potential

KPI

Yes = 100%, No = 0%

#637 - Promote *free cooling* as much as possible

Business > Computer Centers

Impacts

Conventional air conditioning systems operate in a closed circuit. Hot air is collected from the servers and reinjected into the room after cooling. This is very energy-intensive.

Free *cooling* has brought considerable progress. It involves using ambient outside air to cool a room whenever the outside temperature drops below 20°C. Depending on local climate conditions, this technique can reduce the energy required for air conditioning by 50 to 70%.

All modern *data centers* use this technology. For an older *data center , free cooling* should be systematically considered when replacing end-of-life air conditioning equipment. If its installation is too complex, there is an alternative, *free- chilling,* which can be simpler to implement. It uses a water circuit that circulates through an external cooling tower when the temperature is low enough. The cold water thus obtained can, for example, be used to cool the air in the room via an exchanger.

Priority

Difficulty of placing in work

Potential

KPI

% of data centers

of the company using natural cooling

#638 - Organize bays into hot and cold aisles

Business > Computer Centers

Impacts





One of the basics of good air conditioning is ensuring efficient circulation of fresh air in the room, in particular by:

- avoiding mixing between hot and cold air. Bringing cold air as close
- as possible to the bays and extracting hot air as close as possible to the bay outlets.

Ideally, 100% of the fresh air should pass through the IT equipment and 100% of the hot air should be discharged directly to the air conditioners. Any mixing of fresh and hot air will reduce efficiency.

To achieve this result, a simple first step is to organize the *racks* into hot and cold aisles.

- Fresh air comes out of the raised floor in the middle of the cold
- aisle. The computer equipment is all oriented in the *rack.*
  so that their fans drive fresh air from the cold aisle to the hot aisle.

- The air extractors are located above the hot aisle.

Please note:

- Accessories exist to integrate atypical equipment (ventilation from bottom to top for example).
- Empty *rack* locations must be sealed to prevent losses.

There is regular maintenance work to be carried out, taking into account the departure and entry of new IT equipment, to guarantee the effectiveness of the system over time.

Priority

Difficulty of placing in work

Potential

KPI

% of DC organized in hot aisles cold aisles

#639 - Increase operating temperature above 24°C

Business > Computer Centers

Impacts

According to *the American Society of Heating, Refrigerating and Air Conditioning Engineers* (ASHRAE), a data center reduces its electricity bill by 4% for every 2°C increase in the setpoint temperature inside its computer rooms.

In addition to increasing the setpoint temperature, expanding the temperature and humidity range also helps reduce electricity bills. More generally, expanding the temperature and humidity range helps reduce electricity bills. Indeed , if servers operate at more variable temperatures and humidity levels, it is less frequently necessary to treat indoor air.

ASHRAE therefore proposes a set of specifications that manufacturers of IT, network, and telecom equipment can follow for this purpose. Classified into four categories—A1 to A4—the equipment is then more or less tolerant in terms of temperature and maximum humidity levels and the rate of variation of these two parameters. Equipment in classes A3 and A4 allows *free cooling* to be practiced in France more than 80% of the time.

Point of attention

Beware of equipment that claims to be ASHRAE 3 certified 98% of the time. In practice, they are only at one level. ASHRAE 2.

Learn more:

http://tc99.ashraetcs.org/documents/ASHRAE%20Netw orking%20Thermal Guidelines.pdf

Priority

Difficulty of placing in work

Potential

KPI

Set temperature

#640 - Favor modular architecture

Business > Computer Centers

Impacts

Large computer rooms often have poor energy efficiency for two main reasons:

- It is difficult to guarantee a good fill rate over time , which can make the volume of air to be air-conditioned disproportionate to the IT equipment actually installed.
- Air conditioning settings should be set on the most demanding equipment, even if they represent only a small proportion of the total.

Dividing the *data center* into smaller, autonomous modules allows:

- to group together in the same room equipment presenting the most demanding environmental constraints (and thus safely reduce the air conditioning load for the others)
- to avoid air conditioning empty modules and only open them gradually, depending on the arrival of new IT equipment.

It facilitates the maintenance of good energy efficiency over time.

This approach is possible even if the *data center* is old.
or new.

Priority

Difficulty of placing in work

Potential

KPI

% of modular DC m2

Business

> Network

#327 - Enable power saving functions of active network equipment (switch, etc.)

Company > Network

Impacts

The network is the information system component whose power consumption is increasing the most sharply compared to other major areas. This is mainly because the network is the only area in which very little effort has been made to date to reduce power consumption, whereas this is a near-standard approach for workstations , printing equipment, and data centers.

It is possible to put unused devices (or unused ports) to sleep via the equipment settings.

Remote monitoring systems facilitate the deployment of this good practice.

Priority

Difficulty of placing in work

Potential

KPI

% of equipment on which energy saving functions are activated

#900 - Adapt the size of the network to real needs and to what is just necessary

Company > Network

Impacts

The manufacturing of network equipment (e.g., copper wires) has a significant impact.
Avoiding oversizing networks helps limit their impact on resources and power consumption.

Priority

Difficulty of placing in work

Potential

KPI

% network port used, % network used

#901 - Purchase network equipment compatible with the *Energy-Efficient* protocol *Ethernet*

Company > Network

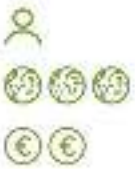
Impacts

The IEEE-802.3az protocol significantly reduces power consumption during periods of low activity, particularly by putting unnecessary ports into sleep mode.

Priority

Difficulty of placing in work

Potential



KPI

% of network equipment with the *Energy-* protocol *Efficient Ethernet*

#902 - Purchase network equipment that meets ASHRAE class requirements A3-A4

Company > Network

Impacts

ASHRAE standards require a certain tolerance for temperature and humidity variation.

- Thus, A2-classified equipment must be able to operate between 10°C and 35°C (temperature at the air inlet of the fans) and in a relative humidity of between 20% and 80%.
- For class A3, the scale becomes: between 5°C and 40°C and between 8% and 85% humidity.
- For class A4, the scale becomes between 5°C and 45°C and between 8% and 90% humidity.

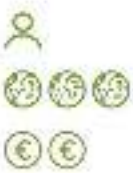
NB: The least tolerant material (lowest ASHRAE class) will dictate the conditions of the entire room.

The ranges given above correspond to the 2011 ASHRAE standard.

Priority

Difficulty of placing in work

Potential



KPI

% of network equipment meeting requirements
ASHRAE Class A3-A4

#903 - Promote the least energy-intensive telecommunications networks

Company > Network

Impacts

Transmitting information over airwaves is more energy-intensive than over wires. Furthermore, installing functional Ethernet cabling has been mandatory in France since 2009* and recommended in Switzerland**.
during the construction or transformation of a building. The

Cable manufacturing has already had an impact, so it is better to use them (without adding impacts due to wave emission).

On a human level, being continuously connected and solicited can generate significant stress and have a definite impact on employee efficiency and productivity. Not to mention that electromagnetic waves also have a potential impact on health. Use only the Ethernet network in offices

allows you to connect at chosen times and limit these continuous requests. *Laptops* can connect to the Ethernet network via connectors present in offices.
For *smartphones,* it is possible to put a Wi-Fi point in rest areas/cafés for example.

Finally, remember that the flow rate is always better with a wired connection.

** Article R111-1 of the construction code*
*** KBOB Recommendation / Universal Communication Cabling (UCC) / Edition 3 / March 2012*

Priority

Difficulty of placing in work

Potential

KPI

Power consumption per unit of data transferred