General guidelines
NZI for IT

Introduction

The digital sector – including device production, data sharing, computing and storage capacity – has seen its energy and resource consumption boom, while the opposite would seem to be required to limit global warming to less than 2°C above pre-industrial levels. Accounting for 2.1% to 3.9%[1] of global greenhouse gas (GHG) emissions and 2.5% of France's carbon footprint in 2020, it stands out for its upward trend, of +6% per year in France[2]. If the trend continues, the carbon footprint of the digital sector in France could increase by 45% between 2020 and 2030[3]. In a broader lifecycle analysis, GHG emissions represent only part of the environmental impact of digital technology: the sector is exerting increasing pressure on mineral and fossil resources, water use and waste[4]. Lastly, growing demand for electricity and non-recyclable critical metals could come into competition with the increased needs from the low-carbon transition[5].

The sector is sometimes promoted as a provider of solutions to the climate crisis, capable of reducing the greenhouse gas emissions of other sectors. **This calls for a further investigation of the decarbonisation potential of digital technology and of the steps the sector should take to contribute to the net zero emissions objective.**

These Guidelines extend the Net Zero Initiative (NZI) benchmark initiated by Carbone 4 by adapting it to the digital sector. Twenty organisations and experts from the sector including digital companies, specialised consultancies and investment funds, network operators, institutions, academics and NGOs pledged to use the the NZI for IT Guidelines. Companies that sign the NZI for IT code of conduct acknowledge the relevance of its findings and use the proposed methodologies to adopt climate strategies commensurate with current environmental challenges.

Entreprises signataires

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[1] Charlotte Freitag et al, *The real climate and transformative impact of ICT: A critique of estimates, trends, and regulations*, 2021

[2] The Shift Project, *Lean ICT: pour une sobriété du numérique*, 2018 and *Impact environnemental du numérique : tendances à 5 ans et gouvernance de la 5G*, 2021; ARCEP-ADEME, *Evaluation environnementale des équipements et infrastructures numériques en France*, 2022.

[3] ARCEP-ADEME, *Environmental assessment of digital equipment and infrastructure in France*, 2022

[4] ARCEP-ADEME, *Evaluation environnementale des équipements et infrastructures numériques en France*, 2022; Green IT, *Le numérique en Europe : une approche des impacts environnementaux par l'analyse du cycle de vie*, 2020; AFP, *En Europe, une hostilité émergente contre les centres de données*, 2022; Marion Cohen and Antoine Gonthier, *Economie, ressources naturelles et pollutions*, 2020

[5] CGDD, *Les ressources minérales critiques énergies bas carbone*, 2023; IRIS, *Un retour des stocks stratégiques de métaux critiques dans la dynamique de transition bas carbone?*, 2023; Carbone 4, *Guerre et transformation bas-carbone: d'une dépendance des énergies fossiles vers celle des métaux?*, 2022

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I. Two categories of digital products and services with distinct climate issues

Digital solutions can be differentiated by their functions, forming 2 groups with different decarbonisation levers.

1. The first category (hereinafter referred to as "category A") refers to **solutions that promote a digital consumption for its sake**: this is the case for all screens that support entertainment, and in particular the viewing of online recreational videos, whether they come from streaming websites, mobile phone applications or video game consoles. This category A has seen very strong growth in recent years[6]. **These products have neither the aim nor the ability to contribute to the decarbonisation of other uses**. Like all other products & services, they should start by questioning the relevance and conditions of their development in a world constrained by the compliance with a 1.5°C or 2°C carbon budget. Furthermore, their *own* contribution to decarbonisation can only, and must only, be achieved through efforts to reduce their induced emissions (pillar A of the NZI reference framework).

2. The second category (hereinafter referred to as "category B") refers to **digital solutions** aimed at *digitising* or connecting another type of product, services or solution. Today's economy is heavily reliant on the support of these digital solutions, which enable players to communicate and operate increasingly faster (emails, automated processes, digitised transactions, etc.), a logic that decarbonisation calls into question.

    Category B, which is largely based on data production and processing, includes solutions for measuring, managing and optimising a number of physical flows. Examples include systems for optimising buildings energy consumption, eco-driving systems integrated into vehicles, and platforms facilitating access to soft or shared mobility. Under **certain conditions, the solutions in this category offer potential help in reducing greenhouse gas emissions**. For these solutions, the challenges of decarbonisation therefore go beyond Pillar A: there is also a challenge of avoided emissions, Pillar B of the NZI reference framework. The difficulty, however, lies in measuring the reduction in emissions they actually achieve.

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[6] While data traffic is responsible for 55% of the global energy impact of digital technology, online video flows accounted for 80% of this traffic in 2018 and 80% of the increase in their annual volume. It should be noted that these video flows by type of use are made up of streaming platforms for films or series (34%), pornography (27%), Tubes on Demand (21%), and videos exchanged on social networks via smartphones (21%) - see The Shift Project, *Climate: the unsustainable use of online video, 2019*

The digital revolution is often presented or considered as the ally of ecology, due to the decarbonising potential of certain solutions belonging to category B[7]. However, when we look at the negative externalities associated with the sector as a whole (categories A and B), we see that its emissions and other pollution are significant and growing. In fact, **the emissions that could be avoided by certain category B solutions are over-compensated by the growth of certain uses (particularly in category A) that have no environmental virtue**.

II. How can digital companies contribute to global net zero?

Like any other sector, the digital sector must contribute to the pursuit of the goal of global net zero: any digital company, whether it produces category A or B goods and services, must be accountable for its climate strategy and follow science-based rules of action to limit its GHG emissions. To do so, the company can take a two-stage approach.

1. Firstly, a company should ensure that its solutions are compatible with a low-carbon world (forward-looking analysis and pillar B of the NZI framework),
2. Secondly, it must reduce its own emissions and contribute to the development of carbon sinks (pillars A and C of the NZI guidelines).

1. Ensuring that the purpose of one's activities is compatible with a low-carbon world: analysing the business model and Pillar B

The need to re-benchmark the various economic sectors within the physical limits of the planet means that each company must first question the purpose of its activities to ensure that they are compatible with a low-carbon world.

▶ Given the pressure that the sector is exerting on greenhouse gas emissions, mineral and water resources, as well as on the demand for electricity, **every digital company must ask itself the question of the relevance of the uses of its products in a transitioning world.** This analysis of the nature of its activities is the only way to ensure that they meet the imperative of sufficiency, i.e. "a situation in which limited resources are put at the service of reasonable needs"[8]. It implies upstream reflection on the **sustainability of the business model** in a low-carbon world.

▶ For companies marketing **category B** solutions that **help to reduce emissions from their ecosystem,** the analysis can go a step further: they can assess the ability of their existing or future solutions to contribute to decarbonising activities.

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[7] Remote working, collaborative platforms, e-commerce, so-called "dematerialized" uses (books, films, music), "intelligent" buildings and cities, etc., would all help to reduce our consumption of resources and the resulting pollution. See Marion Cohen and Antoine Gonthier, *Économie, ressources naturelles et pollutions,* 2020

[8] Definition proposed by the economist Eloi Laurent in an interview with France Inter in September 2022

As we will see in Chapter 3, several tools can be used to assess the compatibility of a company's business model with a low-carbon world (for categories A and B), and to measure the emissions avoided by its products and services (for category B only).

2. Reducing one's own emissions and helping to develop carbon sinks

Once it has ensured that its products are aligned with a low-carbon world, a digital company, whether Category A or B, must reduce **the externalities of its products as much as possible.**

▶ **Reducing one's own emissions (known as *induced* emissions, or pillar A) must be a key part of the** climate strategy of digital sector companies. They must follow science-based emissions reduction trajectories aligned with those of their sector to meet the Paris Agreement.

As mentioned above, category A solutions – whose purpose is a digital consumption per se (and video viewing in particular) – should focus their efforts on **reducing their induced emissions in absolute terms,** because of their growing emissions and inability to reduce emissions of other sectors.

The key obstacle to an adequate reporting by companies in the sector lies in digital value chains that are intricate, geographically fragmented, and suffer from a **lack of transparency** from the sector's largest players[9].

▶ Finally, like all economic players, companies in the digital sector (categories A and B) must **help to reduce global emissions by contributing to developing global carbon sinks (pillar C of the NZI guidelines).**

However, with the exception of IT solutions dedicated to improving agriculture and/or forestry, digital technology has no immediate link with the value chains of the land and forestry sectors: its players can only contribute to the effort by funding carbon sequestration projects outside their value chain.

Remember that these contributions in no way "offset" the emissions of these companies, and **do not replace** the essential reduction actions under pillar A.

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[9] From an accounting point of view, it can be difficult to provide keys for converting the consumption of digital products and services into quantities of GHGs emitted. This is because it is difficult to identify relevant units of need (*functional units* in carbon accounting) that are close to the underlying physical reality (e.g. what physical quantities should be attached to the viewing of a streaming video in order to properly reflect the response to the need? Is the need simply a volume of data, a bit rate for a certain duration or something else?) because digital equipment is subject to numerous threshold effects that decouple its consumption of energy and materials from the quantity of services rendered. In fact, on a small scale, there is a non-linearity between the power consumption of network equipment and the data flows passing through this equipment. On a large scale, it seems reasonable to imagine that this effect will be eliminated, but then we come up against the problem of network infrastructures: capacity sizing is linked to the peak load and not to the average load. The 'weight of the peak' therefore adds emissions that are difficult to include in the carbon bill of VoD system users. Furthermore, the superimposition of invisible flows mobilised to provide a digital service obscures the physical reality that supports them (see Carbone 4, *Les matières de l'immatériel: exist-t-il des risques d'approvisionnement en matières premières pour les entreprises du numérique? 2023*). Finally, business models and the distribution of value do not encourage a systemic approach (e.g. *over-the-top* services or OTTs - see *Transitioning towards sustainable digital business models*, ECDF Working Paper Series #005, Hugues Ferreboeuf, 2022)

III. Tools for a low-carbon strategy in the digital sector

To build an effective and ambitious climate strategy, companies of the digital sector must have the analytical tools to meet the objectives set out in the previous chapter. The following tools can already be used to help the sector's companies make an effective contribution to global net zero.

1) **All digital players, category A and B, must first reflect on the purpose of their activities to ensure that they are able to operate within the physical limits of the planet and in compliance with the Paris Agreement.**

- Companies marketing **Category A and B** solutions can analyse **the resilience of their business model and solutions portfolio** by projecting them into a low-carbon world using **forward-looking scenario analysis**. These aim to identify the risks and opportunities associated with the low-carbon transition, and are an exercise recommended by the CSRD[10] [11].

- **Category B companies** can also assess the relevance of a solution, or a portfolio of solutions, in a world in transition using **Pillar B** tools.

  - The Paris Agreement Compatibility Score (**SCAP**)[12] developed by NZI can be used to **assess the compatibility of existing products and services with a low-carbon world**. By analysing a solution or portfolio of solutions, it can answer two questions: do my solutions contribute to low-carbon practices, and do my solutions help to decarbonise the function I am addressing?

  - Category B companies can also carry out an analysis to **measure the emissions that their new solutions can help to avoid for customers and end users**. Digital solutions aimed at optimising systems (sensors feeding *machine learning* algorithms to optimise data centre cooling, for example), eliminating travel thanks to remote work, or better matching supply and demand (as-a-service solutions and usage economy platforms), are conducive to calculating avoided emissions. However, a **number of methodological challenges need to be rigorously addressed: quantifying rebound and indirect effects, and defining the** baseline **situation** are critical[13].

These tools open up two possibilities for digital businesses:
- modify their existing products and services to make them more suitable for a low-carbon world, through new uses or new markets;
- consider and direct their production towards the creation of new products and services that will be resilient in this global transition**,** and will replace those that are less relevant or at high risk of transition.

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[10] *Corporate Sustainability Reporting Directive*
[11] Scenario-based prospective analyses aim to identify the risks and opportunities of the low-carbon transition
[12] *NZI, Proposal for a new climate indicator,* 2022
[13] These aspects are dealt with on pp. XX to XX of the Methodology

2) Secondly, **companies (categories A and B) must take an interest in measuring and reducing the negative externalities of their products and services**. As a reminder, according to the SBTi, the majority of companies - and the economy as a whole, all sectors combined - must reduce their emissions by at least 90% by 2050 compared with 2020 in order to limit global warming to 1.5°C compared with the pre-industrial era[14].

- To reduce its externalities, the company must seek to **reduce its own emissions** (pillar A).

- To do so, it needs to **use standard science-based methodologies** appropriate for digital technology. This will enable it to measure its carbon footprint, submit its reduction targets to SBTi and adopt an appropriate reduction action plan.

- But it is not enough. **Analysing the purpose of the digital solutions is also necessary. It can consist in** checking the compatibility of its portfolio of products with a low-carbon world, and/or assessing the decarbonisation potential in its products' customer sectors (pillar B).

▶ When they cannot reduce emissions in their value chain, companies (**categories A and B**) can **fund projects that contribute to reducing emissions and developing carbon sinks outside their value chain (pillar C).**

- Digital companies must support projects outside their value chain that are consistent with their financial resources and/or their level of current or past emissions (for example via an internal carbon price compatible with a 1.5°C objective).

- Under no circumstances can these contributions be considered a compensation for induced emissions and give way to declarations of carbon neutrality.

- If companies do not adopt a global reduction trajectory compatible with the Paris Agreement, their investments in "offsetting" are tantamount to an attempt to grant themselves a right to exist in a low-carbon world without having made the necessary transformations. These practices are formally condemned by the GHG Protocol, the SBTi and the NZI.

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[14] SBTi, *Net Zero Standard V.1.1,* April 2023

▶ **For all category A and B digital companies, communication must be unambiguous, sincere and faithful to** their effective efforts to reduce their environmental impact and their low-carbon transition strategy. This means respecting the four principles listed below.

- **A company should refrain from declaring hypothetical "climate" virtues or benefits associated with its products and services if it has not conducted specific studies** using appropriate methodologies that can attest to these emission reductions. It is up to any company that has produced a solution to demonstrate any positive environmental impacts using scientific methods.

- Given the collective interest in accessing the data of digital players to measure the environmental impacts of the sector and inform decision-making, companies must **demonstrate a reasonable level of transparency** to facilitate inventories of the carbon impacts of their activities.

- For products and services that have no emission reduction or avoidance potential, it is **important to be transparent about their impact over their entire life cycle**, and under no circumstances to communicate that they are "green", messages that help to make invisible the pressures exerted by these solutions on mineral resources and the climate[15].

- Finally, **declarations of emissions avoided** by Category B digital solutions must be **grounded in appropriate calculations,** account for **rebound effects and describe the reference situation**.

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[15] As pointed out in The 10 Principles of NZI, giving customers a bogus "zero emissions" carbon bill reflects a lack of rigorous accounting and helps to maintain confusion about the real impact of climate change

They co-authored the principles

Backmarket, Bureau Veritas, Constellation, IJO, Isai, Octo Technology, Orange, OVHcloud, Vusion Group

Net Zero Initiative, 2024

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