ezeep by ThinPrint

Whitepaper

A Paper-Free Future?

The Environmental Impact of the Workplace of the Future

Contents

Introduction

For decades we have been striving toward the paperless office, have we perhaps exaggerated?

To begin with, paperless processes are of course absolutely worthwhile and avoiding changes in the media format has great potential for increasing productivity. Turning the clock backwards here will instantly lead to catastrophe. However, there are still many things for many companies to do on the way to digitization.

Nevertheless, is it fair to demonize printing in general?

Many people have the feeling that printing a few pages of paper causes dramatic damage to the environment. In the process, many advances in the printing and paper industry as well as the development of jobs are ignored and truisms from decades ago repeated throughout the office.

Print 2025

The analyst group Quocirca published a study in the Global Print 2025 Market Insight that provides a solid look into the future of the printing industry[1]. The study, which was conducted with print industry executives and end users, looks at how the workplace will evolve over the next few years. It shows a mixed picture of optimism, tempered with the realization that manufacturers and distributors must strategically adapt to succeed in an increasingly digital landscape.

One of the key findings is the expectation that more than half of the workforce will be made up of mobile employees by 2025. In addition, 84% of companies rated security as a top priority, with cloud and corporate mobility closely following. 64% of respondents believe that printed documents will continue to be important in 2025.

While millennials shape today's digital workplace and move into leadership roles, Generation Z, born between the late 1980s and early 1990s, is becoming increasingly important in shaping the future workplace. Together, millennials and Generation Z demand workplace technologies that reflect the mobility and simplicity of their personal lives. The modern digital generation appreciates the ability to collaborate securely from anywhere, anytime on any device.

But what does that mean for traditional printing in the workplace?

1 Print 2025: Millennials Matter

The “Millennials Matter” report shows that, contrary to popular belief, decision-makers continue to place great importance on paper documents up to 2025. At the same time, they will demand significant improvements in cloud and mobile printing solutions. While printing will not disappear, the role it plays in the digital workplace will undoubtedly change. The study shows that a total of 77% of millennials believe that printing will continue to be important in 2025 compared with only 54% of those aged 45-54 years. More than half of millennials believe that office printing will even increase by 2025. 55% expect an increase in mobile printing. Overall, 63% of millennials believe that printed documents are more durable than their digital counterparts.

Opportunities and Risks of a Changing Workplace

In organizations, the number of mobile devices is increasing. The importance of paper documents in the workplace will therefore continue to decline as digital alternatives to paper-based processes become more prevalent.

The study shows that mobile and cloud printing as well as security are the areas where end users expect more performance. These areas can provide significant opportunities for the print industry. Printing companies looking to take advantage of these needs must invest in software and become trusted partners who help customers with digital projects and provide analytical insight into workflow efficiency.

The Global Print 2025 Report provides a detailed analysis of the future opportunities and challenges of the global print market, as well as strategic recommendations for companies in the printing industry that want to be successful in this rapidly changing environment.

Paper as an Alleged Crime Against the Environment

Especially in times of changing environmental conditions and ideas about behavior, paper consumption and the associated environmental impact of the manufacturing process fall into disrepute. But perhaps quite wrongly? Paper has various ecological characteristics: it is compostable, recyclable and comes from a renewable resource.

Much of the raw material for the European paper industry comes from sustainable, traceable and controlled sources within Europe. Controlled means that at least as much wood grows as is cut down and the cycle of growing and harvesting is closely monitored. What is interesting is that only a small portion of logging is for the paper industry. According to the FAO, 55% of global logging is used for energy production and 25% in the construction industry. Only 11% involves use in the paper industry.[2]

Paper is based on wood, a renewable and reusable material. With around 1% of global greenhouse gas emissions, the value chain of paper and print media contributes only a little to global CO_2 emissions. As an example, the average energy consumption in 2014 per ton of paper was about 8,300 megajoules, which equates to CO_2 emissions of about 700 kg. On average, a person in Europe consumes 200 kg of paper annually. Around 500 kilowatt hours of electricity are needed to produce this amount of paper. This is comparable to a car journey of almost 1,000 km.

Many paper fibers can be reused several times before they can no longer be bound into a single sheet. In Europe, the recycling rate for paper in 2013 was 72%, i.e., 72 tons of wastepaper was used for the production of 100 tons of paper.[3] Recycling paper significantly increases raw material efficiency.

With between 0.7-1 kilograms of CO_2 equivalents per kilogram of paper, recycled paper causes less emissions than virgin fiber paper at around 1.2 kilograms.

In Europe, the number of cycles a paper fiber goes through during its lifetime is 3.4 times on average.

2 Food and Agriculture Organization of the United Nations, 2015. Global Forest Resources Assessment 2015, How are the World's Forests Changing?

3 European Declaration on Paper Recycling, Monitoring Report 2014

In 2000, the German Environment Agency (Umweltbundesamt) published a life cycle assessment study on graphic paper, which made it clear that it is much more environmentally friendly to produce paper from waste-paper fibers. The results included, among other things, the environmental benefits of secondary fibers over primary fiber paper.[4]

The amount of water required for the production of paper from wastepaper is two to six times lower than for making paper from wood. The volume of waste is reduced, and the total energy requirement is three to four times lower than that for making paper from wood.

The Printing Process

Next to paper consumption, choosing the printer plays a crucial role in terms of sustainability. This has a major influence on the environmental impact and pollution. The comparison of laser and inkjet printers is of central importance here.

What inkjet printers have over laser printers is lower power consumption. Modern inkjet printers do a lot and are no longer environmentally harmful. Modern inkjet printer technologies reduce energy consumption by up to 84 percent, because the inkjet does not have to heat up compared to a laser printer and it consumes less power during operation. A standard laser printer uses about 1,300 watts, while modern inkjet printers use only 15 watts.

A modern inkjet printer prints several thousand pages with one cartridge set. A capacity that a laser printer hardly reaches. It's important to remember that ink cartridges can also be refilled, which is environmentally friendly and cost-effective and saves production costs and packaging materials.

For green-minded companies, the inkjet printer has another advantage: not only does it consume less power than a laser printer, it also doesn't emit particulate matter, which research in recent years has found to be responsible for harming users' health.

4 German Environment Agency, 2015

Regardless of the printing technology, green electricity and the energy-saving mode are already available. Especially in offices where the printer is running all day, the environmentally friendly energy source has a positive impact quickly. Once there is a break in printing and the power save mode is activated, it also has the advantage of eliminating automatic print head cleaning which consumes unnecessary ink.

But since every office is empty on some days, the printer should also be switched off on non-working days.

In addition, CO_2 can be reduced if the duplex feature of the printer is used. If, for example, 500 pages of paper are printed, double-sided printing uses only half as much paper as a 500-sheet pack, and emissions of 1.1 to 1.5 kilograms of CO_2 are avoided.

If a printed sheet of paper is then stored longer in the filing system, for example in the office after printing, or perhaps even in the archive, this has a positive effect on the CO_2 storage effect of this sheet.

The Ecological Footprint of Electronic Media

While the speed of electronic communication is beyond question, the environmental footprint it leaves behind is increasingly under scrutiny. The high energy consumption of digital media will continue to increase with new technologies. Many companies advise their employees and customers to replace communications in favor of the paperless office. But how does the supposed improvement really help? The focus should be on which combination of the two forms of media has the least impact on the environment, while at the same time best fulfilling social and economic needs. Many companies, such as banks, telecommunications companies and public authorities, are increasingly shifting their communications to the electronic sector. For paper communication, consumers often have to accept additional charges.

However, in our multimedia world, responsibly produced paper is one of the most sustainable ways to communicate. Electronic media have a considerable energy consumption and negative environmental impact, which are often underestimated. Ecofys illustrates this in a compilation of the world's greenhouse gas emissions from 2010. The causes of global greenhouse gas emissions are 31% electricity and heat, 29% industry (of which 1% is paper), 22% agriculture, 15% transport and 3% other.[5]

The energy used to send an email with a 400 KB attachment to 20 people corresponds to the useful life of a 20 watt energy-saving bulb of 100 minutes. 100 Google searches equate to 20 grams of CO_2 emissions. The energy used in a typical use of the Google search engine is about 180 watt hours per month. This corresponds to the useful life of an energy-saving bulb for 10 hours.

From this follows the general statement that depending on the use and choice of the medium, either print or online media can be ecologically more advantageous. Online media are not environmentally friendly across the board.

The life cycle assessment depends on how the influencing factors change. Duration and frequency of use play an important role. How long does a user sit in front of a laptop and read an online newspaper? How many books does a user read each year? How many people use a particular medium?

If, for example, you read an online newspaper 30 minutes a day, it has the same impact on the environment as a printed newspaper.

An American study calculated the power consumption per transmitted gigabyte of data at 13 kWh. The production of the electricity causes CO_2 emissions of approximately 7 kg. According to the EPA, the average US power plant emits 1.2 pounds of carbon dioxide equivalent (called CO_2e) per kilowatt hour produced.[6]

If the 13 kWh of CO_2 emissions are multiplied by the 1.2 pounds, you get 15.6 pounds of CO_2 to transfer 1 GB of data. These 15.6 pounds correspond to 7.07 kg. If one million users each download a typical page with 1.4 MB, the total is 1,367 GB of data. At 15.6 pounds per gigabyte, that's more than 10 tons of CO_2e.

Mobile data based on 3G/4G is up to five times more polluting. That translates into 77 pounds of CO_2 per gigabyte. If now one million mobile users download a 1.4 MB page on the 3G network, that's almost 52 tons of CO_2.

This value corresponds only to the power consumption and CO_2 emissions during the use of the mobile device. The values of the manufacturing process are not included.

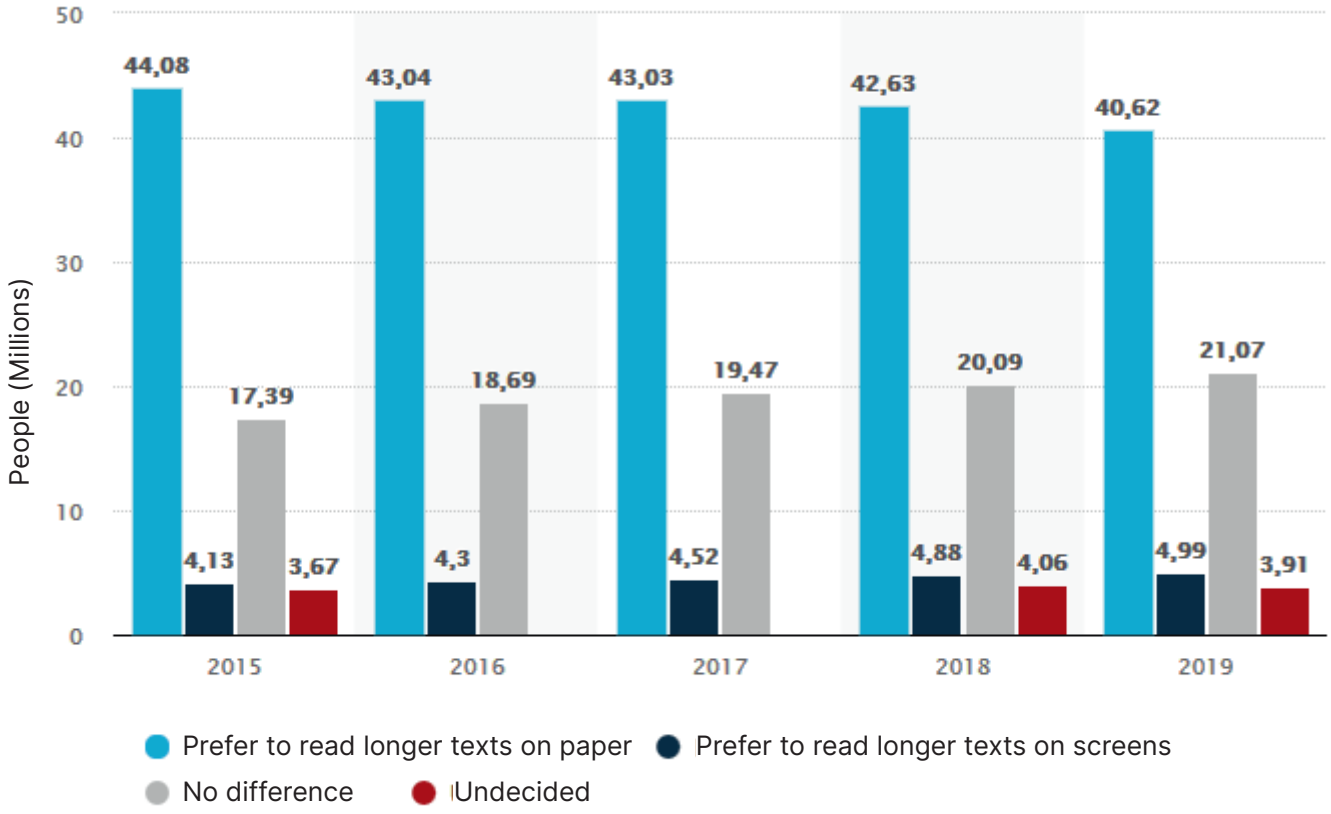
Making a laptop with a 17-inch screen requires 240 kg of fossil fuels, 22 kg of chemicals, and 1,500 kg of water. This results in a raw material consumption of 1.8 tons.

5 Ecofys, World GHG Emissions Flow Chart, 2010
6 A List Apart: **https://alistapart.com/article/sustainable-web-design/**

Electronic waste is now one of the fastest growing components of waste generation. The number of discarded electronic products has skyrocketed worldwide and is now up to 50 million tons per year. According to IDC and NPD research, around 400 million PCs and TV sets are disposed of worldwide each year.

Workplace Ergonomics

Besides the purely environmental consideration of the differences between paper and electronic media, the mental and physical effects are also worth mentioning.



According to Statista, nearly 43 million Germans in 2018 prefer to read longer texts on paper, while just under 5 million prefer reading them on screen.[7]

Modern studies show that reading texts on paper has many advantages and, unlike screens, promotes a better understanding of content.

7 Statista

The human brain understands and interprets texts much like landscapes. An open book has a clear page layout, which allows us to better orient ourselves in it than on a screen or in an e-book. Many people often miss the haptic feedback and the deliberate turning from page to page when reading online texts, which is why information in digital form is less well retained. The study by Danish researcher Jakob Nielsen has examined many people reading on screens. He came to the realization that people only scan websites. We just hop from cue to cue, without delving into the content.[8] Furthermore, glowing screens and constant scrolling strain our attention and working memory. While advertisements are often shown on online sites, and links to other topics attract attention, print media are generally readable without any distractions.

Another noteworthy aspect is the required change of scenery for the eyes. In the office, if employees can occasionally look away from the screen and look at a sheet of paper, it increases the concentration of many employees and prevents long-term eye problems. A changing contrast and a different seating position promote the ability to absorb. Also, the possibility of a change of location to read the texts can bring benefits for employees.

8 Nielsen Norman Group: F-Shaped Pattern of Reading on the Web: Misunderstood, But Still Relevant (Even on Mobile)

Conclusion

The more important a document is, the more it is expected to be delivered in paper form. We live in an increasingly digital world where electronic documents exist alongside paper versions.

Communication strategies must not only be geared to cost efficiency, but must also take into account consumer needs. Thus, paper communication brings numerous advantages. In addition to environmental compatibility, workplace ergonomics are also important. Texts that are printed on paper, according to numerous studies, are better processed in the brain of the reader.

However, the differences between printed paper and electronic solutions should not be limited to the cognitive processing of the texts. In terms of environmental sustainability, things like frequency, duration and intensity of use play a crucial role. Significant differences arise in the choice of electronic device and the quality of the paper. Just because a medium can be consumed online does not mean that it is automatically better. It is advisable, despite all the prejudices that should be demystified, to print out documents on both sides. In addition, a separate waste paper collection helps to save costs. The use of recycled paper continues to expand, and the grayish recycled pages of the past are now history. Recycled fibers are now sustainable and environmentally friendly.

The CO_2 footprint can also be reduced by choosing a suitable printing solution. ezeep for example compensates for the CO_2 emissions caused by its customers' printing through a range of measures. For our printing service, we select service providers who themselves work climate-neutrally. In addition, we support the work of justdiggit.org. The organization is dedicated to the replanting of degraded, drought-affected landscapes and thus has a positive effect on climate change.

You can find more information at: **www.ezeep.com/co2-neutral-printing**.

Bibliography

A List Apart: **https://alistapart.com/article/sustainable-web-design/**

Ecofys, World GHG Emissions Flow Chart, 2010: **https://ingmarschumacher.files.wordpress.com/2013/05/asn-ecofys-2013-world-ghg-emissions-flow-chart-2010.pdf**

Ecofys, Subsidies and costs of EU energy: **https://ec.europa.eu/energy/sites/ener/files/documents/ECOFYS%202014%20Subsidies%20and%20costs%20of%20EU%20energy_11_Nov.pdf**

European Recovered Paper Council: European Declaration on Paper Recycling, Monitoring Report 2014

FAO, 2015. Global Forest Resources Assessment 2015, How are the World's Forests Changing?

Fernandes, Louella, Quocirca: Millenials Matter in Print 2025: **https://www.print2025.com/millennial-decision-makers-attitude-print-workplace/**

Nielsen Norman Group: F-Shaped Pattern of Reading on the Web: Misunderstood, But Still Relevant (Even on Mobile)

Statista: **https://de.statista.com/statistik/daten/studie/265252/umfrage/bildschirm-oder-papier-lesen-laengerer-texte/** *(Statista, 2019)*

Umweltbundesamt (German Environment Agency): **https://www.umweltbundesamt.de/daten/ressourcen-abfall/verwertung-entsorgung-ausgewaehlter-abfallarten/altpapier#textpart-4**