Electronic Communication

Busting The Environmental Myths!

The Facts

As global demand for resources continues to grow, a sustainable future will depend on products with a circular life cycle, that is, highly recycled products that are made with renewable raw materials and energy.

Paper is well-positioned for the circular economy given its unique sustainable characteristics. So why are many companies, government agencies and media organizations encouraging us to "go green" by switching from paper to electronic communications? Clearly, these appeals to help the environment by eliminating paper-based communication are driven by the desire to cut costs, misguided marketing strategies, or both – not on sound science.

Paper is made with a renewable natural resource – trees that are purpose-grown, harvested and re-grown in sustainably managed forests. It is produced using mostly renewable, carbon-neutral bioenergy in a process that uses a lot of water but actually consumes very little of it. And paper is recycled more than any other material.

In contrast, electronic communication requires environmentally invasive drilling and mining for the finite raw materials needed to manufacture electronic devices and the massive server farms that support them. These devices and server farms are powered mostly by fossil fuel energy, and very few smartphones, tablets, laptops and computers get recycled.

The Myth: The environmental footprint of digital technology is relatively small.

The Fact: The environmental footprint of digital technology is largely underestimated by its users, given the miniaturization of equipment and the "invisibility" of the infrastructures used.[1]

By 2023, North America will have 345 million internet users (up from 328 million in 2018), 5 billion networked devices/connections (up from 3 billion in 2018), and 25% of all mobile-connected networked devices.[2]

Previous calculations of ICT's share of global greenhouse emissions, estimated at 1.8-2.8%, likely fall short of the sector's real climate impact as they only show a partial picture. These prior estimates do not account for the full life cycle and supply chain of ICT products and infrastructure, such as the energy expended in manufacturing the products and equipment; the carbon cost associated with all of their components and the operational carbon footprint of the companies behind them; the energy consumed when using the equipment; and also their disposal after they have fulfilled their purpose. ICT's true proportion of global greenhouse gas emissions could be around 2.1-3.9%, which are greater than those of the aviation industry, which are around 2% of global emissions.[3]

The energy consumption required for digital technologies is increasing by 9% each year.[4] Depending on the level of energy efficiency achieved, ICT could use as much as 51% of global electricity in 2030 and contribute up to 23% of globally released greenhouse gas emissions.[5]

Data centers are one of the most energy-intensive building types, consuming 10 to 50 times the energy per floor space of a typical commercial office building. Collectively, these spaces account for approximately 2% of the total U.S. electricity use, and as the country's use of information technology grows, data center and server energy use is expected to grow too.[6]

Global internet traffic surged by over 40% in 2020. This growth comes on top of the past decade already-rising demand for digital services: since 2010, the number of internet users worldwide has doubled, while global internet traffic has increased 15-fold, or around 30% per year.[7]

Several trends are shaping future data network electricity use. Global internet traffic more than doubled between 2017 and 2020, and could double again by 2023 if current trends are sustained. The nature of data transmission is changing rapidly, with mobile device traffic growing at triple the rate (+50%) of wired and Wi-Fi-only devices such as laptops and desktop computers (+17%). This shift towards greater mobile network use may also have significant implications for data transmission network energy usage, given that mobile networks have considerably higher electricity intensities (kWh/GB) than fixed-line networks at current traffic levels and network utilization.[7]

The Myth: Electronic communication generates very little waste.

The Fact: E-waste is a vast and growing problem.

The majority of Americans (97%) now own a cellphone of some kind. The share of Americans that own a smartphone is now 85%, up from just 35% in 2011.[8]

Nearly three-quarters of U.S. adults now own desktop or laptop computers, roughly half now own tablets.[8]

Since technologies change quickly, many users change devices regularly; often before they actually break. Average replacement cycles are becoming shorter. The average smartphone lifecycle in the USA, China and major EU economies does not usually exceed 18 to 24 months.[9]

The world generated 53.6 million metric tons (Mt) of electronic waste in 2019, and only 17.4% of this was officially documented as properly collected and recycled. The amount recycled grew 1.8 Mt since 2014, but total e-waste generation increased by 9.2 Mt. This indicates that the recycling activities are not keeping pace with the global growth of e-waste.[10]

The U.S. and Canada annually generate 7.7 million metric tons (Mt) of electronic waste or 20.9 kilograms (kg) per capita. Of that 7.7 Mt, the U.S. generates 7 Mt and Canada generates 0.7 Mt. Only 15% of e-waste in North America is recycled.[10]

Increasing levels of e-waste, improper and unsafe treatment, and disposal through incineration or in landfills pose significant challenges to the environment, human health, and to the achievement of the U.N Sustainable Development Goals.[10]

Recent studies have continued to highlight the dangers to human health from exposure to well-studied toxins. Research has found that unregulated e-waste is associated with increasing numbers of adverse health effects. These include adverse birth outcomes (Zhang Y et al. 2018), altered neurodevelopment (Huo X et al. 2019b), adverse learning outcomes (Soetrisno et al. 2020), DNA damage (Alabi OA et al. 2012.), adverse cardiovascular effects (Cong X et al. 2018), adverse respiratory effects (Amoabeng Nti AA et al. 2020), adverse effects on the immune system (Huo X et al. 2019b), skin diseases (Decharat S et al. 2019; Seith et al. 2019), hearing loss (Xu L et al. 2020), and cancer (Davis JM et al. 2019).[10]

E-waste contains precious metals including gold, silver, copper, platinum and palladium; valuable bulky materials such as iron and aluminum along with plastics that can be recycled. It also contains rare earth and scarce metals as well as hazardous materials such as mercury, lead, cadmium, fluorocarbons or various flame retardants.[10]

The increasing need for raw materials (especially for rare earth and minor elements) and unregulated e-waste recycling operations in developing and underdeveloped counties contribute to the growing concerns for e-waste management.[10]

The Myth: "Go green, go paperless" marketing helps consumers make wise environmental choices.

The Fact: Broad, unsubstantiated environmental claims about electronic communication mislead consumers.

A study by Two Sides North America found that half the leading U.S. banks, utilities and telecommunications companies were making unsubstantiated claims about the environmental benefits of electronic billing. In response, Two Sides initiated a campaign to educate senior executives on the sustainability of print and paper and to encourage them to abandon misleading environmental claims. As of December 31, 2022, more than 170 major North American corporations and other organizations (over 900 globally) had removed or changed unsubstantiated and misleading anti-paper environmental claims.[11]

Marketing claims like "go green, go paperless" do not meet environmental marketing standards established by the U.S. Federal Trade Commission[12], the Competition Bureau of Canada[13], the UN Environment Programme[14], the International Organization for Standardization (ISO 14021)[15], the World Federation of Advertisers[16] and others. These standards disallow generic environmental marketing claims such as "green" and "environmentally friendly," and require that all environmental marketing claims are truthful, not misleading, and supported by reliable scientific evidence.

A 2022 Two Sides North America study found that 65% of U.S. consumers who have seen anti-paper greenwashing messages from their service providers were influenced to switch from paper to electronic communications, posing a serious financial risk to the U.S. paper, printing and mail sector and threatening the economic security of more than 7 million Americans whose livelihoods depend on paper.[17]

Sources

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