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ESG in the Metaverse: An Opportunity to Rethink Sustainability

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At times the real-world can feel too set in its ways to change. Can the metaverse serve as an opportunity to wipe the slate clean and start over? If so, what would you consider? How would you create it with environmental, social, and governance (ESG) principles in mind?

This article explores how the metaverse might allow companies and people a chance to answer these types of questions today.

Environmental Sustainability in the Metaverse

The metaverse's ease of access and use (i.e., plugging in a gaming system or turning on a laptop) can make its environmental impact seem minimal to consumers. To the experts behind the scenes, however, the metaverse's [environmental impact](#) is enormous.

To truly understand the scope of the metaverse's environmental footprint, we must untangle the coils of fiber optic cables, look up to cellular towers, and feel the heat emanating from computer servers and data centers. We must look to the electricity, water, air, heat, metals, minerals, and rare earth elements that support and bear the burden of the metaverse. Assessing these individual elements helps to uncover the metaverse's potentially enormous environmental impact.

Lawmakers and regulators have long recognized the importance of increased environmental awareness among private industry. The Environmental Protection Agency, since its inception in 1970, has been challenged with [striking a balance](#) between environmental protection, society's needs, and economic development. The modern world of technology only intensifies that challenge by introducing concepts like non-fungible tokens (NFTs), virtual twinning platforms, cloud computing, and multi-player gaming—all important components within the metaverse.

The metaverse's promise to create a world where individuals are always connected to their digital twins will undoubtedly upend efforts to increase environmental protection. As the metaverse expands, so does its carbon footprint.

Metaverse Emissions

The cloud alone has a greater carbon footprint than the airline industry, and Intel predicted that the metaverse needs at least a [1000 times increase](#) in computing power along with improved and additional infrastructure. How can the industry build a sustainable future when its current infrastructure and operation is seemingly unsustainable?

Within the metaverse's current infrastructure, virtual twinning platforms utilize massive amounts of energy and electricity to recreate the nearly infinite diversity of the real world. The American Council for an Energy-Efficient Economy estimated in 2012 that it [takes 5.12kWh of electricity per gigabyte of transferred data](#). The Department of Energy [estimates](#) that the average U.S. power plant expends 0.855 pounds of carbon dioxide for a single kWh generated. Already-existing gaming systems, for example—played by more than two billion people worldwide—face an ecological plight that will undoubtedly be compounded in the metaverse, with high end gamers [contributing](#) as much as 2,000 pounds of carbon emissions into the atmosphere each year.

While twinning platforms and gaming have been the subject of ecocriticism, arguably no metaverse component has been more heavily criticized than NFTs. NFTs are minted (or converted) by blockchain technology, paid for with cryptocurrency, and have become the predominant means for conveying digital art and virtual land. On average, the current blockchain transaction [consumes](#) 60% more energy than 100,000 credit card transactions; and an average Bitcoin transaction [consumes](#) 14 times more energy.

Current Efforts to Decarbonize Technology

Most large technology companies have expressed strong commitments to eliminating carbon emissions. Some companies are already [meeting](#) 100% of their electricity needs through renewable energy power purchase agreements. Others [have announced](#) robust sustainability goals centered around reduced carbon emissions.

Gaming and technology companies within the metaverse have also committed to carbon footprint reduction. For example, Ethereum, a blockchain technology company, advertises itself as a “green blockchain,” and recently [upgraded its systems](#) to reduce energy consumption. NFT companies are taking steps to reduce the number of blockchain transactions. And the [Playing for the Planet Alliance](#) has made [commitments](#) that include integrating green activations in games, reducing emissions, and supporting the global environmental agenda through initiatives to plant millions of trees and reduce plastic in their products.

Challenges to an Environmentally Sustainable Metaverse

Despite efforts to increase and promote sustainability within the virtual metaverse, the physical world presents many challenges. Regulatory uncertainty in the US and abroad, greenwashing, and conflict materials all pose significant challenges to environmental sustainability.

Regulatory Uncertainty in Global Climate Policy

As environmental responsibility and sustainability take center stage, private industry finds itself in a conundrum—which regulation takes precedence?

Data localization requirements, requiring customer data to be processed and stored on in-country infrastructure, may persuade companies to overlook sustainability goals and instead keep their less efficient data centers. For more general information, see [Privacy & Data Security Practice Center](#).

Localization requirements could force companies to site their data centers in markets where renewable energy is difficult to procure or where operating conditions (e.g., heat, humidity, grid intermittency) create reduced efficiencies or rely on carbon-intensive back-up generation.

US antitrust laws may hinder competitors from working collaboratively on sustainability. Collaboration often offers solutions that are unavailable to individual companies because they lack the necessary capital or real estate.

Yet, Federal Trade Commission Chair, Lina Khan, recently [responded](#) to a question at a Senate hearing by asserting that there is no ESG exemption to antitrust laws. A coalition, including 19 state attorneys general, sent a [letter](#) to an investment company in August 2022 expressing concern that “coordinated conduct with other financial institutions to impose net zero raises antitrust concerns.” These concerns add to the tangled web of regulations that the metaverse will need to consider and address.

Greenwashing

Greenwashing occurs when an entity makes an unsubstantiated claim about environmental sustainability, intending to convince consumers that something is more environmentally protective than it is. Greenwashing often occurs through selective disclosure or symbolic actions:

- “Selective disclosure” means that a company highlights its potential environmental benefits, while excluding the disclosure of its negative attributes.
- “Symbolic actions” means that a company makes a gesture, like using green packaging, without actually engaging in environmental sustainability efforts.

Enforcement actions and civil suits alleging greenwashing are increasing both domestically and abroad. For years, the FTC has been policing corporate [greenwashing](#), and the Commission is poised to update their guidance on environmental claims—the Green Guides—[later this year](#). The Securities and Exchange Commission recently launched the [Climate and ESG Task Force](#) “to identify potential violations including material gaps or misstatements in issuers’ disclosure of climate risks under existing rules.” And the Department of Justice has [announced](#) that DOJ will consider “all prior misconduct” for companies facing investigation, substantially increasing the risks for companies making sustainability claims.

This increase in enforcement—during a potentially transformative time within the metaverse—requires any sustainability claims within the metaverse to be genuine, specific, and contextual. For example, claims that purchases within the metaverse benefit the environment because it doesn't require physical production must be presented within the context that considers the emissions necessary to power the metaverse.

Conflict Materials

The technology and infrastructure for the metaverse depends on significant supplies of certain metals and minerals. Conflict minerals such as tin, tantalum, tungsten, gold, and cobalt are key components in IT products, yet they are connected to armed conflicts and human rights abuses such as forced labor and child labor, violence, and widespread environmental degradation.

A [report](#) by the International Institute for Sustainable Development, analyzes the supply chains for these metals and minerals. According to the report, the [mineral excavation process](#) uses toxic substances, which exposes workers who aren't provided protective equipment and negatively impacts soil, water, and human health. The risk to human rights and the environment have prompted governments to regulate through [illegal mining laws](#), which the metaverse must navigate as its demand for minerals increases.

For more information on conflict minerals, see [Practical Guidance: ESG Social Considerations](#).

Sustainable Benefits Within the Metaverse

The challenges facing the metaverse and its heavy dependence on energy and electricity are not the end of the metaverse's sustainability story—the metaverse offers several environmental benefits.

Virtual reality offers consumers the opportunity to reduce emissions by substituting physical goods with virtual goods and real-world presence with digital interactions. It is feasible that customers could adjust their budgets for certain physical products to more sustainable, virtual products.

The metaverse offers significant environmental benefits for industries like fast-fashion and online markets, which can contribute to overproduction and overconsumption. A sizeable portion of [online sales](#) were returned in the U.S. resulting in returns that double transportation miles, packaging, and stocking—all challenges the metaverse has the potential to reduce.

Whether to work, the seven wonders of the world, or a retail store to purchase products, the metaverse aims to offer these experiences without travel and the associated global emissions. In 2021, air travel accounted for over [2% of global emissions](#). We have since learned that many business meetings can be conducted virtually. The metaverse promises to enhance these experiences by recreating many of the same benefits as in-person meetings without the emissions of travel.

Perhaps the most important environmental benefit of the metaverse is its ability to leverage technology to improve the identification and implementation of carbon reduction plans. Digital twin platforms provide a panoramic view of the physical world that allows for optimization of sustainability efforts. Digital twins also make it possible to make [predictions](#) on environmental impacts.

Whether the metaverse lives up to its promise to create a world where individuals are always connected to their digital twins, or falls short due to infrastructure and other hurdles, its impact on climate change, and particularly carbon emissions, is a concern.

The metaverse has already found its way to the US court system and its presence will likely grow as it grapples with the seemingly infinite environmental challenges that lie ahead. The legal community will continue to be instrumental in navigating these issues.

Social Responsibility in the Metaverse

The metaverse presents an opportunity for companies to create a different, better approach to accessibility, diversity, inclusion, and equity. But what does that look like and what are the potential benefits and costs?

Advantages: Increased Connection, Community & Education

- Companies are increasing [interactions](#) with stakeholders on a more personal level and with fewer limitations on time and distance.
- Companies have the opportunity to [create](#) a more accessible, inclusive, and equitable metaverse since more people report feeling included in the metaverse than in real life.
- Institutions can provide medically safer, Covid-free interactions.
- Educational institutions can provide immersive [educational opportunities](#) such as a surgeon practicing on virtual patients, or primary school students virtually traveling to ancient Rome to experience history.

Challenges: Structural Limitations

Modeling software and 3D graphics, networking and communication protocols, and artificial intelligence and machine learning algorithms [continue](#) to be subject to various limitations, privacy laws, and technical issues. For example, 3D graphics and modeling software may not be able to create highly detailed and realistic virtual environments that capture diverse and different backgrounds and experiences from the physical world. Indeed, biases embedded in AI and machine learning are already well-documented and cannot be ignored.

Since the metaverse is still in its early stages, companies have the potential to create an improved, more accessible world. However, companies may want to consider the following policies and practices:

- Companies should consider creating and enforcing practices related to responsible technology and data collection in order to mitigate potential legal risks of data accumulation about the behavior of their users and their demographics (e.g., income group, age, gender, and skin color).
- Companies should consider creating incident response plans for data security breaches and revising data processing agreements with third party vendors/service providers. For more general information, see [Privacy & Data Security Practice Center](#).
- Companies engaged in the metaverse should consider the [accessibility](#) of their products. For instance, using the metaverse is [expensive](#), and electricity bills, bandwidth equipment, and micro-transactions in the metaverse can be considered cost prohibitive and pose as barriers to inclusivity. The metaverse requires a significant amount of data to be transmitted between users and devices in real time in order to create a seamless and immersive experience, which can be a challenge in areas with limited or unreliable internet connectivity.

Governance - Minding Company Operations in the Metaverse

The final pillar of "ESG", "governance", has garnered less attention than the "E" and "S." Still, it is important to understand because poor [corporate governance](#) has played a part in some large corporate scandals. The "G" relates to the rules and procedures that an entity, like a corporation, implements to guide decisions and determine rights and responsibilities among various stakeholders inside and outside of the organization.

Investors and consumers have shown more interest in a company's governance factors to better evaluate how decisions are being made about environmental and social factors. In response to increased interest and the importance of consistent governance policies in the physical world and in the metaverse, some companies are adding C-suite level [metaverse officers](#) to oversee the company's metaverse expansion and impact.

In addition, the metaverse provides companies with the opportunity to increase stakeholder transparency by engaging with them in an immersive virtual space. For instance, a company could allow stakeholders to visit its metaverse processing center to see how the center impacts its community. With the increased attention on supply level transparency, a company could provide detailed virtual experiences into the lifecycle of a product or service.

The metaverse is undoubtedly providing more opportunities for companies to communicate governance related topics to its customers. An opportunity that should be heeded to ensure consistent messaging between the metaverse and the physical world.

Conclusion

Given the increased focus on ESG issues, companies should heed their ESG impact in the real world and the metaverse. Now is the time: companies can take advantage of the nascent and malleable nature of the metaverse to help drive what the metaverse can do for them and its customers.