KPMG

Shaping the metaverse towards sustainability

The conundrum of a more digital and sustainable world

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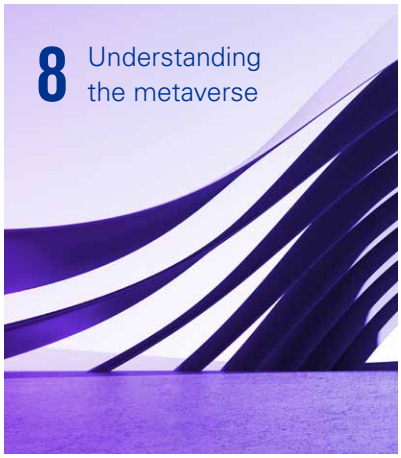
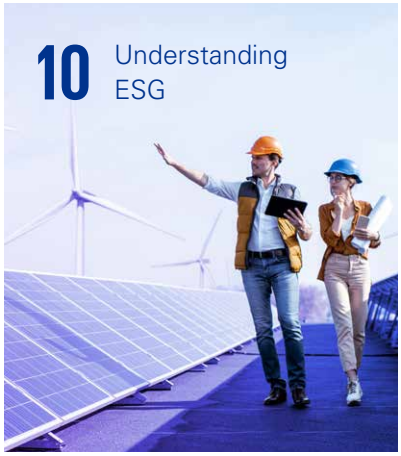
What's inside



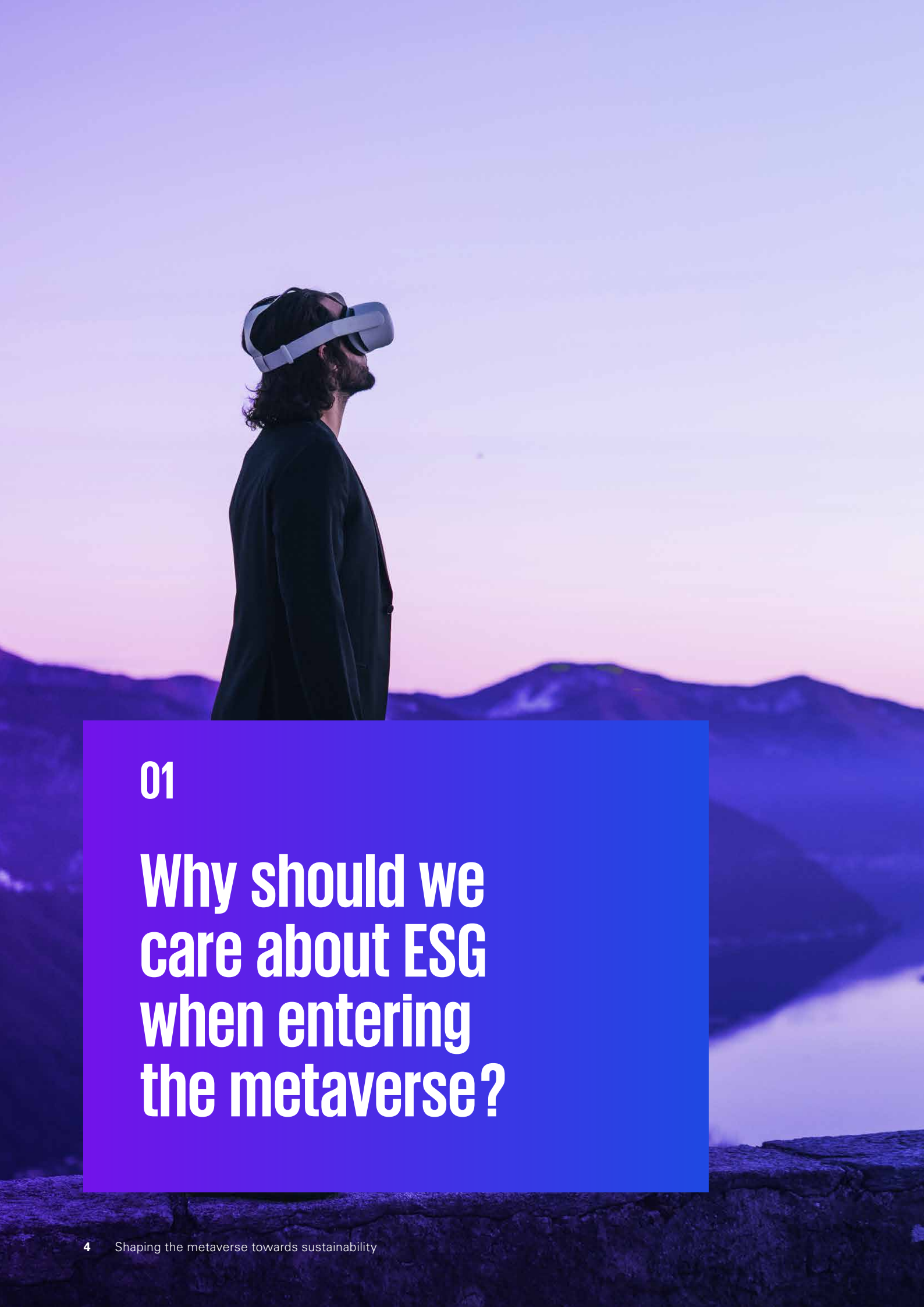


Executive Summary

The metaverse is a key technological trend in the 2020s and a large concept that is still in its defining phase.

Through this thought leadership we aim to provide a nuanced perspective on how the metaverse might impact the worlds ability to become sustainable. Combining our own knowledge with insights from a series of industry leaders and experts, this thought leadership provides an initial insight into ESG considerations when starting the metaverse journey, and outlines the steps recommended by our experts.

Organizations and executives should think ESG into the metaverse, to help ensure that the metaverse develops towards a greener and more socially sustainable internet.



01

Why should we care about ESG when entering the metaverse?

The metaverse is a central technology trend in the 2020s, having sky-rocketed in societal awareness.[4,6] It is currently estimated that it is a 2–12 trillion USD opportunity.[5] Similarly, sustainability has become an increasing market-, and consumer trend, with the market value for sustainability and green tech expected to reach 51.09 billion USD by 2029.[2]

It is therefore relevant to consider the overlap between these trends, and which possibilities and challenges the markets present for each other.

ESG is both a huge driver and blocker for the metaverse's eventual conception, with high media coverage focused on areas such as estimated energy consumption. With reported estimates at a 30% increase in emissions, should 30% of gamers migrate from web 2.0 to 3.0.[3]

ESG and the metaverse engage in a complex synergy. Organizations embarking on the metaverse journey should keep ESG considerations in mind – both to avoid pitfalls, understand potential developments, but also to grasp all its opportunities.

> **Conversations about sustainability and the metaverse are very relevant, because the concerns about energy consumption and conservation as well as about the environmental impact, may prove to be both a big driver and blocker of the metaverse**

Daria Krivonos
CEO, Copenhagen Institute for Futures Studies

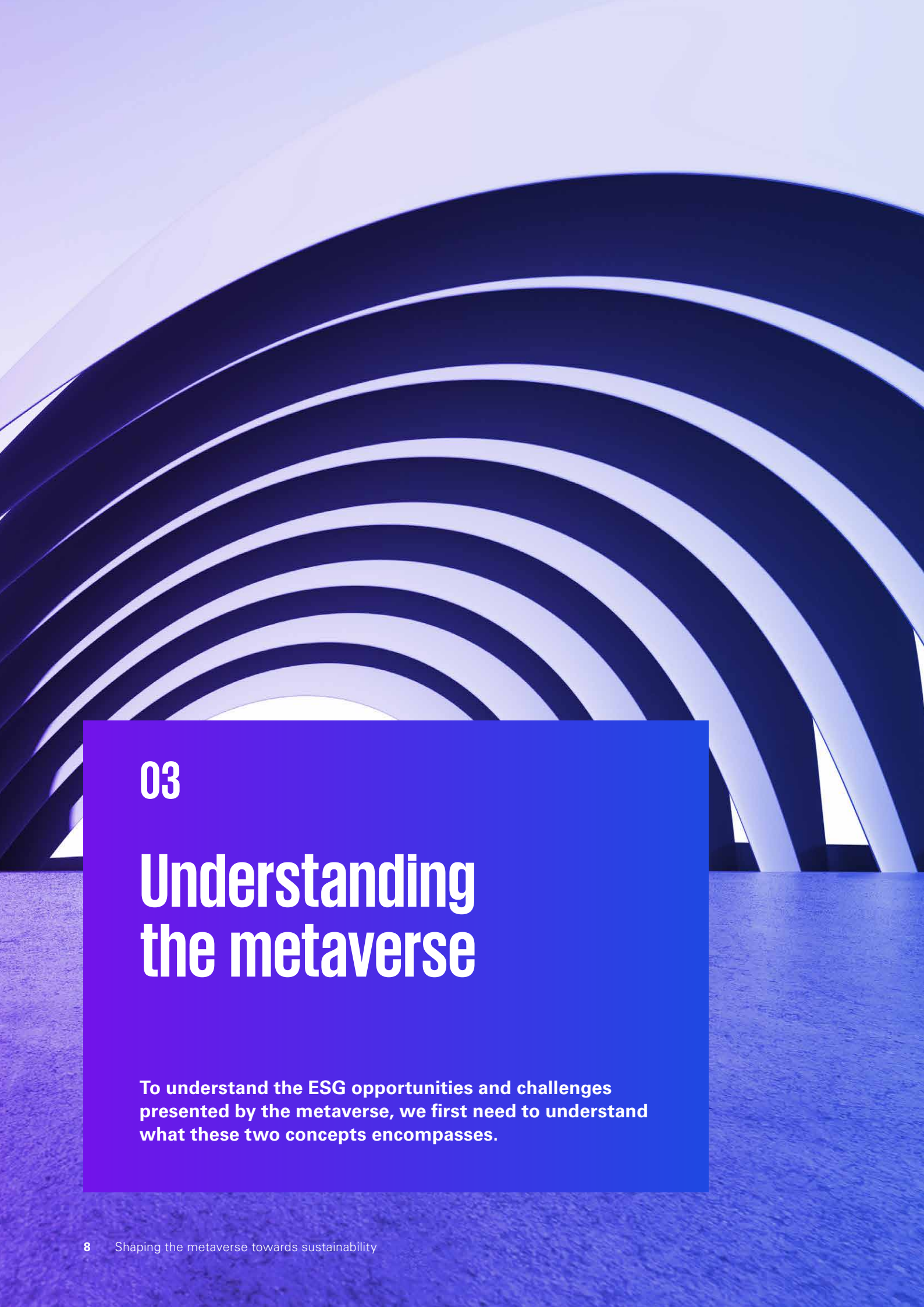
02

Methodology

This thought leadership sets out to give our readers an overview of the key impact areas between ESG and the metaverse. Herein, the first steps organizations and management should take when considering starting on this journey.

Four interviews with six external business experts from various technological fields pertaining to the metaverse shine light on the three pillars of ESG. Further, three interviews were conducted with three internal KPMG experts in the metaverse and ESG from Denmark and Japan.

These interviews, combined with current research, was used as the background information within the Thought Leadership, wherein key quotes from the interview's were selected. The interviews were coded based on key themes, and subsequently focused into subjects relating to environmental, social or governance factors.



03

Understanding the metaverse

To understand the ESG opportunities and challenges presented by the metaverse, we first need to understand what these two concepts encompasses.

The metaverse is still in its defining phase. The metaverse discussed in this paper is not the metaverse that currently exists – it is still being designed.

> **The metaverse is basically the next iteration of the internet, and it is through XR technologies, augmented reality, virtual reality and mixed reality, that we'll have a gateway to this new internet.**
>
> **Mads Troelsgaard**
> CEO, SynergyXR

It can be understood as a spatial internet, that is both conceptualized through the fully immersive VR experience, or the overlay of physical and virtual in such a way that:

"… it's very hard to distinguish whether this was a physical item, physical person, or a physical location that you were at, or a virtual one."
Christian Moser,
Head of Digital Experience, Zühlke

This will impact how we work together, communicate, and knowledge share. However, it is not the movement of the analogue into the digital. As Bent Dalager, Nordic Head of NewTech in KPMG, states: *"This is not about digitalizing what we already are doing in the analogue world, but it's about being an individual in a digital world, which is completely different."*

In essence there is no need to design screws for wall-hangings in the digital world, rather, its about moving human experience into a digital immersion.

The metaverse is not primarily focused on gamers, it is much rather a re-conceptualization of ownership, transactions, and infrastructure into the online world.

The metaverse is the next iteration of a spatial internet, wherein we move life and the individual into the digital, along with ownership, transactions, and infrastructure.

04

Understanding ESG

The metaverse opens up a vast field of opportunities, and if used correctly it can help us curb our emissions and create more productivity at the same time.

Esben Hansen
Head of ESG Hub, KPMG in Denmark

ESG can be understood as the re-conceptualization of sustainability.

The methodology focuses on creating equal weight on its three pillars – Environmental, Social and Governance.

This allows investors, regulators, and organizations to give each area the attention needed to create impact, and facilitates easier decision-making and reporting.

Environmental factors are those that concerns itself with society's impact on the environment, herein i.e. biodiversity and emissions.

Social factors are focused on the impact society and organizations have on their relationships with employees, suppliers, and other stakeholders. This factor often concerns itself with diversity, equality, inclusion, and well-being.

Governance relates to how organizations deals with a company's leadership, executive pay, audits, internal controls, and shareholder rights.

ESG has a large overlay with the metaverse, when it comes to how we interact with the real world, eachother and the metaverse itself.

05

Will the metaverse be a challenge or solution for the emissions agenda?

You can visualize the production process, so that it becomes much easier to optimize or understand how a production process works. You can do a whole simulation of a factory before you even build it.

Christian Moser
Head of Digital Experience, Zühlke

One of the biggest blockers for the metaverse has been the large media coverage regarding the estimated increases in emissions and waste resulting from the metaverse. Commonly mentioned is a study finding, that training several common large AI models had nearly five times the lifetime emissions of the average American car.[6]

While experts note it is likely to create emissions, this does not encapsulate the entirety of the metaverse. While AI could be a part of the metaverse, the underlying technology is much more complex. While the metaverse will create emissions, it may also create reductions in the form of waste, materials and emissions. It can reduce the need for global movement. People will no longer need to fly to international meetings, travel to go on vacation, or move physical products across the globe.

It is also worth considering that the metaverse is still being developed to its full potential and over time will need to become more sustainable in order for it to be adopted and utilized on a greater scale.

One developing metaverse technology is Ethereum, which has been seen as one of its highest emitters, together with blockchain technology. Until September 2022 Ethereum used almost as much electricity as Chile, yet by moving to a new model, proof-of-stake, their emission are expected to reduce by more than 99%.[1]

This shows that a buildable, more sustainable metaverse is possible, if the correct investments are made. As CEO of Khora, Simon Lajboschitz states: *"Metaverse and blockchain could overlap, but does not have to. Based on current technology the emission would be less if there is less blockchain (in the metaverse experience)."*

An overall increase in electronic CO_2 emissions could therefore be seen as acceptable, if it could bring significant reductions across industries emissions.

The issues will be the transition period from web 2.0 to web 3.0, where emissions are expected to be at the highest. Rarely, is new technology replaced overnight, and it can be expected that for a period of time both web 2.0 and web 3.0 would be running simultaneously, increasing the overall emissions. However, this should reach a break-even point eventually, if we do not end in a poor sub-optimum.

We can find ourselves in a really poor sub-optimum – if just enough people engage in the metaverse to keep it running, but not enough for the investors to actually follow suit and develop sustainable scalable solutions. In this case we may wind up in something that is more energy consuming, because of absent commercial interest, where not enough effort had been made in trying to reduce the energy intensity

Sofie Hvitved
Senior Advisor & Head of Media,
Copenhagen Institute for Futures Studies

More, if closed-gardens metaverses arises due to lacking organizational standardization by big tech, or due to regulation, then the economies of scale in regards to emission might not be achieved either. Once more leading to heavier metaverse emissions, than might be necessary.

"There needs to be some kind of standardization going on where they are agreeing on the protocols. As an example: I have bought this chair here. I must be able to move the chair between the different instances of the metaverse."
Bent Dalager
Nordic Head of NewTech at KPMG in Denmark

The environmental impact of the metaverse may rely heavily on how big tech and regulation shape metaverse borders, and how much consumers push investors to invest in green tech solutions to reduce the CO_2 impact of the metaverse.

Ethereum's emissions are estimated to be reduced by more than

99%

06

How to have a higher social impact

There are several opportunities within the metaverse, when one starts exploring its impact possibilities within Social factors in ESG. Within social parameters the metaverse presents three key impact areas; Equality and the democratization of knowledge, mental health, and empathy training.

Firstly, the metaverse will break with traditional mobility borders in relation to travel, work and social life. No longer will workforces be limited within their regions, opening up for virtual migration of workforces:

> **You're no longer bound to your physical location. As long as you have an internet connection and an access device.**

Christian Moser
Head of Digital Experience, Zühlke

Similarly, students will no longer be bound locally, but be able to attend their preferred schools internationally. This would lead to more democratization of knowledge globally and create more equality in education worldwide in the long term.

Correspondingly, this can also benefit those who are physically disabled, hospitalized, or even incarcerated through a new-found mobility.

The metaverse can also do away with scarcity of materials. The cost of products would become arbitrary as physical goods are made digital. This should long-term equalize both educational and work opportunities, as well as level-out living standards globally.

Secondly, there are similarly opportunities within mental health in the metaverse:

"One third of schizophrenia are treatment resistant to medicated treatment options, so some hear constant voices so we can do therapy that 'hacks' or 'tricks' the brain with VR simulations and suddenly they can have a conversation with the voice that they hear."
Simon Lajboschitz
CEO, Khora

It offers opportunities for a new rise of help to the mentally ill and self-help solutions. Less fragile individuals would be able to enter programs aimed at helping them with i.e.: phobias, social anxiety, stress, and chronic pain. Such programs would ease the use and access for individuals in need of help, and allow for a society more able to accommodate mental health dilemmas.

Lastly, empathy training through simulations in the metaverse are much more effective.

"Soft skills like diversity training and empathy training are already proven to be four times faster and four times more effective in virtual reality, because people feel more emotionally connected to the content. And that's simply because they're able to train in simulated environments."
Corey Morris
CMO, SynergyXR

And this might be needed within the metaverse, as AI is typically build on historical data containing high bias towards specific groups in society. While people will be able to choose the algorithms they engage with, it requires an active choice for participants to circumvent this potential inherent bias.

The metaverse presents new possibilities for migration, for treatment of mental health issues and for sensitivity training. However, we as a society have to be aware, not to perpetuate the historic biases, that might become transferred into the metaverse.

07

How should the metaverse be regulated?

The internet has been the wild wild west of our era. It is not only because the internet moves fast, and regulation moves slow. It is also because people think that a 'company should regulate themselves, the market is a free thing, we should not touch it.

Simon Lajboschitz
CEO, Khora

One of the most important questions raised on the metaverse is how it will be regulated, as this will largely impact its final form. Here one of the questions organizations and consumers are raising is data privacy.

With the introduction of the GDPR in the EU, there's been an increased focus on how organizations gather and store private data. The metaverse would exasperate such questions – if you upload your whole life into the virtual, then how are you protected against misuse of this data?

"Data privacy is something that needs to be designed early on in these platforms. What I currently see is that between the Western world and the Eastern world, there is really like a wall, especially to China. The Chinese government, they have a lot of restrictions so I think that we're expected in the Eastern world that will be like an isolated metaverse platforms"
Christian Moser
Head of Digital Experience, Zühlke

It will be considerably difficult to globally maintain the same standards, as different local regulators will influence the metaverses development. Further to social bias, considerations from organizations should also lie in mitigating unconscionable regulation, created by biased coders and developers in the metaverse.

I think we definitely need governmental regulation. But I think where we are right now, and what's happening in Europe, is a good thing. But it's still unfair, as there's a risk of isolating Europe in this whole regulation, because it comes from the EU.

Mads Troelsgaard
CEO, SynergyXR

Depending on the agreed worldwide regulation, there will therefore be the possibilities for more or less open metaverses, with certain geographical areas engaging in walled-gardens to enforce their own local regulations.

An important element will not only be early privacy regulation, but also the education and protection of the vulnerable – in particular how we introduce the metaverse and its issues in school education.

"The technology undoubtedly harbors potential, but it also carries a myriad of risks, it is therefore up to us as users and the regulators, as well as the big tech, who currently are in the driver's seat in terms of investments and capital, to make sure that we do not repeat the mistakes we made in web 2.0. Because, as the saying goes 'fool me once, shame on you, fool me twice, shame on us', because we did it knowingly".
Sofie Hvitved
Senior Advisor & Head of Media,
Copenhagen Institute for Futures Studies

While the metaverse offers new opportunities for the way we approach environmental and social issues, it requires regulation – whether from governmental institutions or organizations, to protect users and create safe spaces. This will be the deciding factor on whether the metaverse will be an open platform or a walled garden.

08

First steps on the metaverse and ESG Journey

How do you then start the metaverse journey while being considerate of the ESG opportunities and challenges inherent in this new web? Well, the expert recommendation is clear: **Get started early with the initial learnings to set yourself up for long-term success.**

1. **Don't trust your gut feeling** – there is no intuition when entering the metaverse. Instead start by slowly internally testing and trying the metaverse to understand its functionality. Instead of Teams meetings, try holding VR meetings – it's fun.

2. **Find experts that can educate you**, and help you understand the intricacies of the metaverse, and remember it is not the movement of the analogue to the digital, it's the digitalization of being.

3. **Identify a use case and innovate around this** – do not just follow the hype of the metaverse, but find an issue that can create value and solve a problem. Leverage data and analytics to find maximum impacts areas, and how to best achieve results. This is where you as an organization can find the commercial value long-term.

4. **Consider the ESG aspects of your solutions** to understand how you are helping shape the metaverse towards a more sustainable future by accounting for your potential impact and biases.

5. **Lastly, set some clear and concrete targets**, to ensure you can measure your development, and succeed with your strategy.

Overall as a company navigating the metaverse you are a fundamental part of shaping it, and its development. If you enter it and innovate with its ESG possibilities and challenges in mind, you will also help shape it towards sustainability

External Experts

Simon Max Bloch Lajboschitz
Co-founder and CEO at Khora

Over the last 6 ½ years Simon has done almost 400 VR and AR project across industries; focusing on health care, mental care, culture and arts, training and visualization, and marketing.

Khora is an award-winning Virtual Reality (VR) and Augmented Reality (AR) production studio based in Copenhagen, creating cutting edge content within multiple application areas.

Christian Moser
Head of Digital Experience at Zühlke

With a background in software engineering and design, Christian has worked within the metaverse for the last 8 years to combine technology and practice to seamlessly implement ideas.

As a solution partner, Zühlke inspires their customers and turn visions and ideas into real-life results. They combine their knowledge of engineering and IT, to implement projects quickly and reliably – and sometimes in unusual ways

Mads Troelsgaard
Co-founder and CEO at SynergyXR

Mads has been working with the metaverse for over a decade, building up VR and AR environments and applications worlds, for some of the largest organizations.

Corey Morris
CMO at SynergyXR

Corey has 10 years of experience within tech, and has delved into the world of the metaverse over the last 2 years at SynergyXR.

SynergyXR is a cloud platform that lets companies train employees, deliver maintenance and offer remote support across all XR devices without having to write a single line of code.

Daria Krivonos
CEO at Copenhagen Institute for Futures Studies

Daria has worked at CIFS for the last 4 years, working to facilitate the multidisciplinary think-tank and advisory, working with mega trends, foresight, scenarios and long term strategy.

Sofie Hvitved
Senior Advisor & Head of Media
at Copenhagen Institute for Futures Studies

Sofie has been working on how people communicate in digital virtual space since 2001, since she has delved into the concept of the metaverse for the last 1 ½ years.

Copenhagen Institute for Futures Studies is an independent, non-profit futures think tank. They equip and inspire individuals and organizations, decision-makers and the public, to act on the future, today.

Internal Experts

Bent Dalager
Partner, NewTech
KPMG in Denmark

Bent Dalager is part of the KPMG tech network, a member in the Emerging Tech Committee as well as heading the digitalization group in the IT Association in Denmark.

Toshihiro Fujiyama
Associate Partner, Technology Transformation
KPMG in Japan

Toshihiro has worked over 20 years with how emerging technologies impact the digital transformation in organizations.

Esben Hansen
Director, ESG Hub
KPMG in Denmark

Esben has worked as a consultant within ESG for more than 10 years, working holistically to help organizations meet new market trends and regulations.

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Contact us to learn more

If your want to know more about the metaverse or ESG, KPMG can help you. Please do not hesitate to contact our experts or contact the Danish ESG Hub at ESGHub@kpmg.com

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