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Nature Bytes Back
Nature-related risks and opportunities in the technology, media and telco sector
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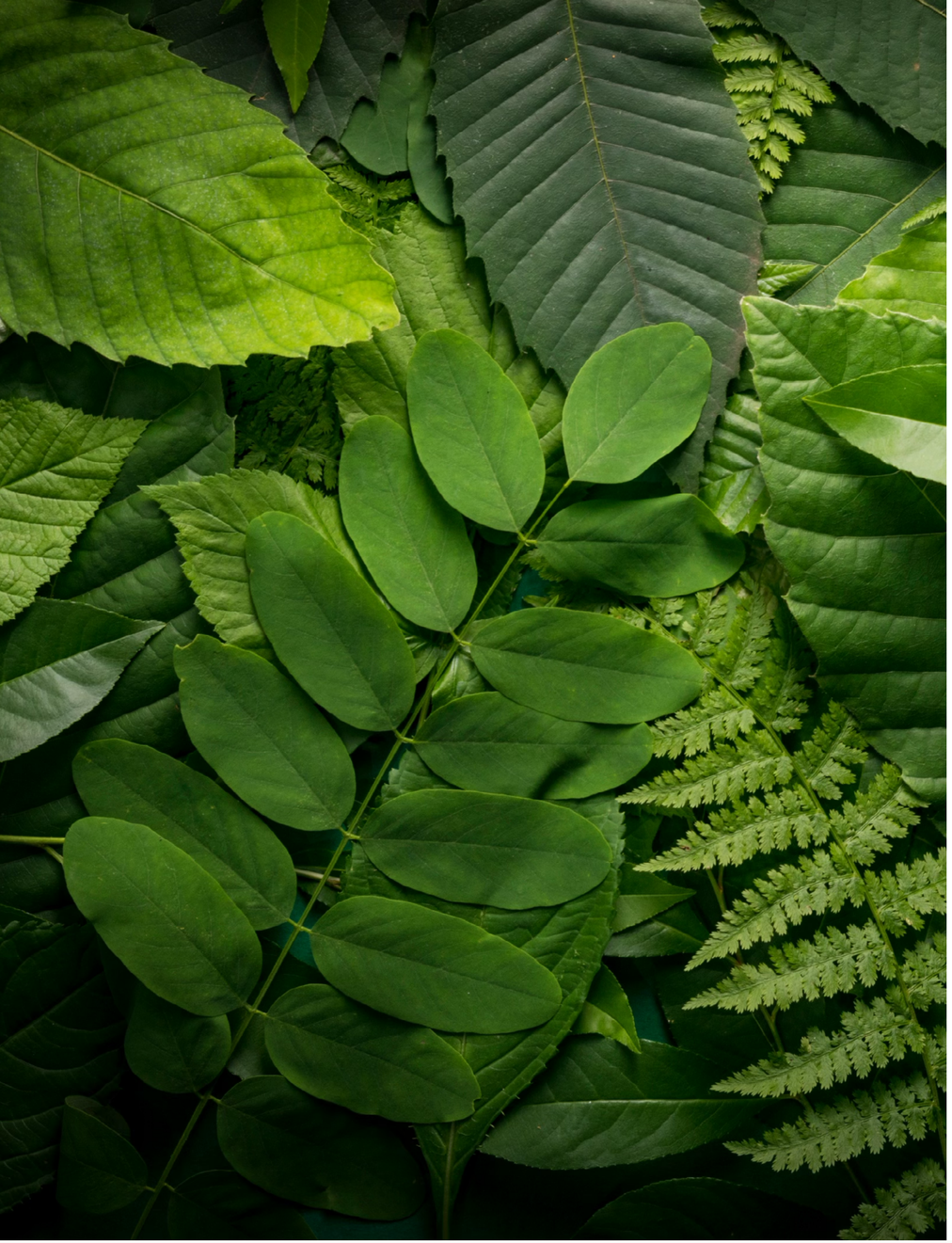

Contents

A note from Deloitte

We often talk about the things we can do to fight climate change, but rarely do we take into account the role nature has to play in this battle. Biodiversity loss has been ranked amongst the greatest threats facing humanity over the next ten years. But nature is resilient. It is a force that grows back stronger in the face of exploitation and adversity. In fact, nature has already shown its strength over the last 100 years under the context of constant human-induced destruction.

Nature is fighting back, evident from the increasing frequency and severity of global forest fires, hurricanes, and devastating instances of flooding and torrential rainfalls – too often triggered by mass deforestation, improper agricultural practices and fossil fuel burning. Humanity is now faced with a small and rapidly closing window to address the twin climate-nature crises. It's time we view nature not as a supplier, but as a business partner. With this in mind, our 'Nature Bytes Back' report looks deep into the many ways the Technology, Media and Telco sector can play a pivotal role to drive the transition towards nature positive, through impact and influence.

> Humanity is now faced with a small and rapidly closing window to address the twin climate-nature crises.

Acknowledgements

We would like to extend our gratitude to the interviewees who generously shared their insight and experiences with us during the research for this report. We are grateful to the leaders from AWS, BBC, BT, Cambridge Consultants, Colt, Experian, NTT, Openreach, Telecom Plus, VMO2 and Deloitte experts. Thank you all for your invaluable contribution to this report.

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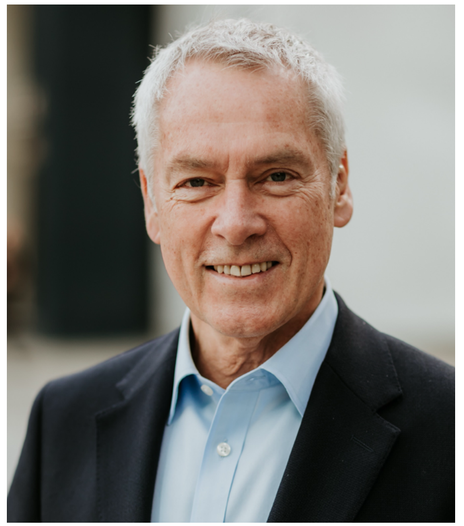
Foreword

Sustainability is a business imperative in 2023. Companies are increasingly recognising the impact that they have on the planet through their carbon emissions, resource use and, for IT companies, their use of cloud services and associated energy. However, there has been a significant elephant in the room: the preservation of nature and biodiversity. We know that the natural world has been deteriorating over the past decades, but this issue has not been addressed the way it should have been. Popular narratives of poaching and illegal hunting would lead you to believe that the responsibility for this decline falls with a small group of malicious actors. We now know that, like climate change, biodiversity deterioration is something that we all hold some responsibility for through our choices of consumption and through the business models of the global economy.

This report examines the nature footprints of companies in the tech, media, and telecoms sector (TMT). Features of these advanced industries place significant strain on the hydrosphere, natural resources and can be linked to land use change which is detrimental to wild species. Conversely, digital tech has the potential to address many of the issues facing biodiversity globally.

techUK is pleased to partner with Deloitte to draw attention to this new front in the battle for our planet's future, exploring the role of disclosures, industry standards and novel technologies in mitigating the pressure that TMT are placing on the natural world.



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Executive Summary

Executive Summary

More than half of global GDP is moderately or highly dependent on nature and its services. Although climate action is growing at pace in the sector, Technology, Media and Telecommunications (TMT) companies are only just beginning to understand the key dependencies their extended value chains have on nature.

From direct utilisation of natural materials in their supply chains to the impact of a companies' operations on the natural world, identifying the nature-based risks and opportunities and reacting accordingly will require a new application of an existing skill set, a change that organisations must urgently embrace.

This report outlines the relationship between TMT companies and nature, specifically the opportunities and risks arising as a result of their reliance on nature and biodiversity, alongside our recommendations on what actions companies can take.

The TMT industry should be looking to align to upcoming nature regulations and frameworks, integrate nature into current climate strategies and assess what opportunities they could seize in order to become a leader in the delivery of nature-based offerings, therefore benefitting from first-mover advantage.

Nature-related risks are often linked to climate-related risks and can have financial and reputational consequences to businesses if not addressed. The main nature-related risks faced by TMT companies, and highlighted in this report, are:

- Heavy reliance on water for operations, contributing to water scarcity and risking operational disruption;
- Deforestation and degradation of natural habitats leading to the introduction of new policies;
- Poor disposal of equipment and limited circularity efforts contributing to rising landfills, resulting in reputation damage or risk of fines from upcoming regulations; and
- Climate change linked extreme weather events damaging infrastructure and resulting in costly downtime.

TMT companies have the opportunity to make a positive impact on nature, and/or expand their commercial offering, through:

- Developing and investing in nature-based solutions (NbS), or methods of monitoring and verifying NbS;
- Partnering with companies focused on nature and conservation to create solutions that accelerate their work;
- Moving towards circular business models to reduce e-waste and enter the market for refurbished consumer and business devices; and
- Developing educational media on the importance of nature conservation and influencing positive behavioural changes.

Introduction

Introduction

There is increasing consensus on the urgent need to transition to a net zero future, as the window of opportunity to secure a sustainable future is rapidly closing.[1] However, climate change is not the only environmental challenge facing business and society. Human activity has caused damage to nature and biodiversity worldwide, increasing the risk of devastating consequences to the planet and its inhabitants.[2] As a result of human activity, ecosystems are collapsing, biodiversity is in rapid decline, water supplies are polluted, and soils are declining in quality.

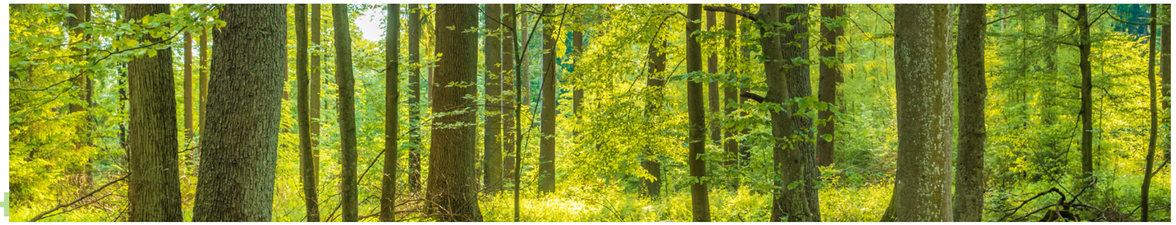
With more than half of global GDP moderately or highly dependent on nature and its services, the rapid decline of biodiversity presents a growing risk to businesses that rely on nature.[3] As a result, policy, regulation and stakeholder expectations are shifting towards the vision of a nature-positive future. The term 'nature-positive' envisages a world where nature and biodiversity loss is halted by 2030, allowing wild species and ecosystems to thrive rather than decline. However, for nature-positive to be achieved, companies and governments must begin to take action to recognise their nature footprint and work towards a positive relationship with nature and biodiversity.[4]

Policy, regulation and stakeholder expectations are shifting towards a nature-positive future.

The scope of this report

This report covers the nature-related risks and opportunities that are faced by companies in the technology, media and telecommunications sectors, which we refer to throughout as the "TMT industry". Whilst this report covers the TMT industry, many of the findings will be relevant across multiple industries, and our recommendations on how to approach this emerging topic are often relevant to all.

The content of this report is based on information compiled from open source data, various academic sources and our own research into nature-related activity across the FTSE350. Additionally, we conducted interviews with a series of sustainability leaders across a number of TMT companies, whose insights we have paraphrased and anonymised throughout. The report outlines why companies in the TMT sectors must take immediate action on nature through identifying their nature-related risks and opportunities. We then provide recommendations on how businesses can address these risks and opportunities to build long term resilience and value.



Why are we talking about nature?

Why are we talking about nature?

> Too often, digital technology is positioned in opposition to nature. We must harness technology's contribution to and enhance our relationship with nature.

> It must become more widely acknowledged that we cannot achieve net zero without action on nature.

1.1 The climate-nature nexus

Climate change, nature and biodiversity loss are closely linked and mutually reinforcing. Tackling climate change and protecting nature and biodiversity must go hand in hand. Climate-related extreme weather events, including severe droughts and flash flooding, result in changes in temperature or rainfall. The subsequent destruction of and disruption to rainforests, oceans, forests and grasslands has consequences for wild species and ecosystem services, such as fresh water availability and nutrient regulation.

Climate change is the second biggest cause of biodiversity loss in oceans and the fourth biggest cause of biodiversity loss on land, threatening over one million animal and plant species with extinction.[5] This loss of ecosystems and habitats exacerbates climate change, as degraded carbon stores release more carbon dioxide into the atmosphere, further accelerating global warming.[6]

At present, many climate change mitigation and adaption strategies are devised and executed with limited or no consideration for nature. Alongside this, most companies are struggling to allocate necessary time and resources to the development of a separate strategy for addressing nature risks and opportunities. However, wider recognition of the link between climate and nature presents an opportunity for companies to develop sustainability strategies that address both climate and nature in tandem. Doing so enables more effective decision making that can advance progress towards both net zero and nature-positive goals.

Nature-based solutions (NbS) are solutions that use nature to address a host of socio-environmental challenges through the protection, restoration or management of ecosystems.[7] This integrated approach tackles both nature and biodiversity loss as well as climate-related risks. Protecting, restoring and expanding natural ecosystems, improving renewable energy solutions and reducing natural ecosystem degradation are strategies that will help achieve climate targets and nature conservation.[8]

1.2 Current business response to nature and biodiversity

While the need for climate action from businesses is widely acknowledged, nature is a much newer topic on the agenda. Despite nature's pivotal importance, too few companies currently have a strategy in place. The Carbon Disclosure Project (CDP), a leading voluntary climate disclosure platform, found that of the 8,850+ companies who received biodiversity-related questions, 87 per cent chose to respond. However, of these, at least half are not taking tangible action.[9] Similarly, the Shan Shui Conservation Centre completed a corporate biodiversity reporting evaluation in 2021. They sampled 188 companies listed on the Shanghai and Shenzhen stock exchanges to determine how many mention biodiversity in their annual and sustainability reports. The study showed that only eight per cent of these companies mention biodiversity.[10]

Deloitte completed an assessment of FTSE350 companies to identify how many mention biodiversity, nature or TNFD* in their most recent annual reports. Overall, FTSE100 companies demonstrated more consideration for nature or biodiversity than those in the following FTSE250. 68 per cent of FTSE100 companies mentioned nature and/or biodiversity in their annual reports. Only four of these were TMT companies, out of the 13 TMT companies in the FTSE100. Nine per cent of FTSE100 companies mentioned TNFD in total and none of these were TMT companies, highlighting the action the industry needs to take.

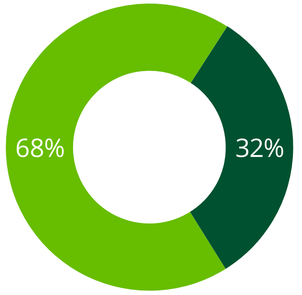
Of the FTSE350 companies, 28 per cent (101 companies) mentioned nature and biodiversity, yet only 16 of these companies were in the TMT industry and only one per cent (four companies) mentioned TNFD.[11]

This demonstrates that the TMT industry may be lagging versus other private enterprises. When compared to other industries, such as consumer goods or energy, the operations of TMT companies have a naturally lower impact on nature due to their predominant focus on providing a service, rather than a physical product. As a result, nature-based risks facing the TMT industry are less significant than those facing alternate industries, whilst the opportunities nature presents are potentially far greater but not well recognised.

> Companies in the TMT sector should aim to consider nature and the TNFD across their value chains to become market leaders in nature forward strategies.

* Please refer to page 12 for an introduction to and overview of the TNFD.

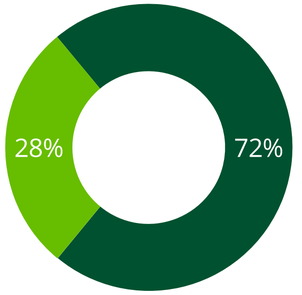
FTSE100 Companies



Four of the companies that mentioned nature were TMT companies

Nature mentioned
Nature not mentioned

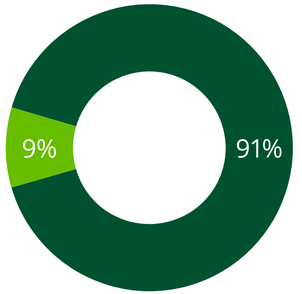
FTSE350 Companies



16 of the companies that mentioned nature were TMT companies

Nature mentioned
Nature not mentioned

FTSE100 Companies



None of the companies that mentioned TNFD were TMT companies

TNFD mentioned
TNFD not mentioned

1.3 The evolving regulatory landscape

We are starting to see a focus on nature within governments and markets, swiftly following growing climate regulations. As a result, there is increasing regulatory pressure for organisations to understand and disclose nature-related risks associated with their business. Regulation is important to provide guidance and standardisation on how businesses can best direct their efforts towards nature. For example how to identify which nature-related risks they are faced with. Nature regulations may appear daunting, with many businesses still feeling as though they have not yet fully got to grips with the climate-related challenges they face. However, the new regulatory agenda for nature offers an opportunity to shape strategic planning around sustainability and develop reputational advantages, particularly given the requirements for greater transparency of business activities.

The Taskforce on Nature Related Financial Disclosures (TNFD) is currently developing a risk management and disclosure framework for reporting on nature-related risks, with version 0.4 of the beta framework released in March 2023 for market consultation. The TNFD is becoming the established global framework for how businesses should consider nature. This report uses the TNFD framework throughout as a reference for definitions on nature-related dependencies, impacts, risks and opportunities and guidelines for the recommendations we propose to the TMT sector.[12]

The below table outlines current or upcoming regulations and frameworks relating to nature that will be useful to guide business decision making.

Regulations/ Frameworks	Stage of development	Purpose	Link to nature
The Taskforce on Nature Related Financial Disclosures (TNFD) *(upcoming)*	TNFD released the fourth (and final) beta version of its framework (Version 0.4) at the end of March 2023 and will publish final recommendations in September 2023 for companies to voluntarily implement.	TNFD will ensure companies are focusing on nature-related disclosures through implementing the locate, evaluate, assess, prepare (LEAP) framework;[13] considering their supply chain/value chain and focusing on traceability, sustainability and circularity. As with the TCFD (Task Force on Climate-related Financial Disclosures), it seems likely that the TNFD will soon become leading practice, or even mandatory.	TNFD will allow companies to understand their nature-related risks and dependencies through implementing a risk management and disclosure framework. This will help direct financial flows away from nature-negative outcomes, towards nature-positive outcomes.
EU Taxonomy	*Entered into force in 2020.* The EU Commission has taken a phased-in approach for organisations to report. The Taxonomy has established and developed the activities and criteria for the first two of six environmental objectives: climate change mitigation and adaptation. It has an open public consultation to establish the activities, technical criteria and do no significant harm (DNSH) for the remaining four objectives.	Classification system to establish a clear definition of an environmentally sustainable economic activity. The aim is to prevent greenwashing, and support flows of capital to sectors that align with the Paris Agreement. The EU Taxonomy covers 6 environmental objectives, including the protection and restoration of biodiversity. To be considered "Taxonomy-aligned", or "sustainable", an activity must contribute to at least one of the six environment areas, not significant harm (DNSH) to the other objectives and meet a set of minimum safeguards.[14]	EU Taxonomy has six objectives, two of which directly relate to nature: the protection and restoration of nature and biodiversity and the sustainable use and protection of water and marine resources. Its other objectives that focus on climate change and pollution will have positive knock-on effects to protecting nature and biodiversity.

Why are we talking about nature?

Regulations/ Frameworks	Stage of development	Purpose	Link to nature
Corporate Sustainability Reporting Directive (CSRD)	*Entered into force in 2023.* • From 2024, the CSRD is applicable for companies which are already subject to the Non-Financial Reporting Disclosures (NFRD). • From 2025, applicable for all large EU companies. • From 2026, applicable for listed SMEs, small and non-complex credit institutions and captive insurance companies within the EU.	CSRD is a cornerstone of the EU Green Deal that aims to create a sustainable economy in the EU. The directive strengthens the rules concerning the social and environmental information that companies have to report upon. The rules will ensure that investors and stakeholders have access to the information they need to assess investment risks rising from climate change and other sustainability issues.	Companies subject to the CSRD must report according to the European Sustainability Reporting Standards (ESRS), including on environmental matters that encompass nature and biodiversity, including UK companies.
Kunming-Montreal Global Biodiversity Framework (GBF)	Adopted during COP15, the United Nations Biodiversity Conference (2022).	The GBF supports the Sustainable Development Goals and aims to implement actions to bring transformational change to society's relationship with biodiversity. It gives businesses the opportunity to successfully contribute to the GBF through considering transparency and awareness of their impact on nature, reducing their adverse effects on nature, and implementing good practices.[15]	The GBF has four long term goals (to 2050) and 23 shorter term targets (to 2030). These targets are split into biodiversity conservation and restoration, nature's contribution to people, access and benefit sharing and tools and solutions for mainstreaming and implementation. The framework sets the global biodiversity action agenda for the next decade.[16]

Regulation is important to provide guidance and standardisation on how businesses can best direct their efforts towards nature, for example how to identify which nature-related risks they are faced with.

Why are we talking about nature?

Regulations/ Frameworks	Stage of development	Purpose	Link to nature
Science Based Targets Network (SBTN)	The framework was introduced in 2020 and SBTN's nature targets will be released in 2023. In May 2023, SBTN also released the world's first corporate Science-Based Targets for Nature, setting a global standard for nature. This will provide science-backed guidance for companies to address the complex issues surrounding nature and biodiversity and help them take measurable actions to mitigate their impacts.	SBTN is a collaboration of over 60 leading global organisations to provide companies with science-based guidance, building on the momentum of the Science Based Targets Initiative (SBTi) so they can act and move towards environmental sustainability. The SBTN is part of the Global Commons Alliance, which brings together powerful leadership, technology, science, innovation, and communication to transform the world's economic systems and protect the global commons.[17]	SBTN are developing science-based targets for nature to include freshwater, land and ocean biodiversity. These targets will be directed at companies fuelling nature loss to ensure a more measurable pathway of action.[17] Additionally, SBTi has developed guidance for Forest, Land and Agriculture (FLAG), the world's first method for companies in land-intensive sectors to set science-based targets that include land-based emissions and removals.[18] This is an example of how nature is beginning to become a focus area.

The regulations and frameworks in this table are applicable to all companies that aim to provide clear information to stakeholders on their risks and opportunities related to nature, including those in the TMT industry. TMT companies can look to respond to and utilise these frameworks by considering the specific application to their business models and demonstrating their long-term outlook in responding to climate change and considering nature.

Please note the table above is up to date for June 2023; please check for regulatory updates due to the fast changing nature of the regulatory landscape.

1.4 TMT and nature – an underestimated link

Nature risk is often associated with other sub-sectors, such as consumer goods and food systems, whose operations and supply chains have both clear dependencies and impacts on nature. However, just like the relationship between climate and nature, the relationship between the TMT industry and nature must not be overlooked. Direct nature-based impacts, dependencies and risks arise from the operations and supply chains of TMT companies.

For example, TMT companies impact on nature through the use of raw materials and natural resources, such as water and metals, relating to both hardware production and the running of operations. The development of large-scale infrastructure, and resulting resource requirements, also has direct nature impacts. These are just a few examples of an increasingly recognised reliance on nature by organisations within the TMT sector.

Despite these nature-based impacts, dependencies and risks, the way in which TMT companies can have potentially the largest impact on nature is through harnessing the nature-related opportunities, using data, infrastructure and platforms as an enabler for positive change. Whilst these opportunities enable TMT companies to become a driver in the transition to a nature-positive future, they also provide the potential to create commercial business opportunities. The World Economic Forum estimates that a nature positive economy can unlock $10 trillion of business opportunities by transforming food, infrastructure and energy.[19]

The TMT industry is central to the operations of almost all other industries, making it well placed to tap into commercial opportunities related to nature and begin to shape new markets, rather than simply responding to existing problems. TMT companies have already been identified as a global decarbonising force and have the opportunity to do the same for the development of products or services that benefit nature and drive the nature-positive agenda. We look at the specific risks and opportunities faced by TMT companies in sections two and three of this report.

The TNFD defines biodiversity impacts, dependencies, risks and opportunities as:

- **Nature dependencies**: "Location-specific aspects of ecosystem services that an organization relies on for their business processes to function, including ecosystems' ability to regulate water flow, water quality and hazards like fires and floods, providing suitable habitats for pollinators, and sequestering carbon in terrestrial, freshwater and marine realms."
- **Nature impacts**: "Changes in the state of nature, which may result in changes to the capacity of nature to provide social and economic functions. Impacts can be positive or negative. They can be the result of an organisations or another party's actions and can be direct, indirect or cumulative."
- **Nature risks**: "Potential threats posed to an organisation linked to their and wider society's dependencies on nature and nature impacts. These can derive from physical, transition and systemic risks."
- **Nature opportunities**: "Nature-related opportunities are generated through impacts and dependencies on nature, and can occur:
  - when organisations avoid, reduce, mitigate or manage nature-related risks, for example, connected to the loss of nature and ecosystem services that the organisation and society depend on; and
  - through the strategic transformation of business models, products, services, markets and investments that actively work to reverse the loss of nature, including by restoration, regeneration of nature and implementation of nature-based solutions."[20]

The nature-based risks facing the TMT industry

The nature-based risks facing the TMT industry

As described earlier, nature-related risks are closely linked to climate-related risks, with nature having the capability to further compound existing climate risks and vice versa. A failure to identify and respond to both climate and nature-related risks could have significant financial consequences under new regulatory regimes. This includes leaving companies less able to gain access to capital, attract and retain customers and employees, and/or struggling to adhere to regulations, increasing their exposure to financial penalties and reputational risk.

The TNFD categorises nature-related risks into physical, transition and systemic risks. TMT companies must be aware of their physical risk exposure relating to their dependencies on nature and the nature risks that arise as a result of their climate-related risks. Transition risks encompass the policy, legal, market, technological and reputational risks relating to nature, and must be accounted for. Systemic risks are characterised by tipping points such as species loss or the complete depletion of natural resources, and must also be accounted for in TMT company strategies.

Of course, companies in the TMT sector are hugely diverse, ranging from telco providers through to software developers, from IT manufacturers through to media production and distribution companies, and from fibre optic cable network operators through to publishing houses. This means that the risks they face are similarly diverse. In the next section of this report, we bring to life the types of risks that are likely to apply to different types of organisations.

Systemic risks are characterised by tipping points such as species loss or the complete depletion of natural resources, and must also be accounted for in TMT company strategies.

2.1 Risks and dependencies of technology companies

Technology's dependency on water

Many technology companies have a heavy reliance on water within their operations or supply chains. Projected increases in demand for water, coupled with rising temperatures and extreme weather events caused by climate change, increase the risks of water shortages and has led to the introduction of water restrictions in some geographies.[21] Data centres, which are essential for cloud services, rely on vast quantities of water to maintain operations. For example, Google reports to have used over four billion gallons of water across their global data centres in 2021.[22]

In recent months, generative Artificial Intelligence (AI) tools, such as Chat GPT, have been capturing the world's attention. This exponential growth in the use of AI brings with it a rapidly increasing demand for data storage and processing. It has been forecasted that on its current course, generative AI data centre server and operating costs will exceed $76 billion by 2028 for technology companies hosting AI platforms, more than twice the estimated annual operating cost of Amazon's cloud service, AWS.[23]

Due to their complexity, the creation and use of AI models is also expected to be more intensive on both water and energy than other forms of computing. One study estimates that training GPT-3 in Microsoft's state-of-the-art US data centres could have consumed 700,000 litres of freshwater, the equivalent of approximately 4,500 baths.[24]

Its critical that technology companies consider the environmental impacts of the large-scale use of AI technologies, taking actions to mitigate the impact on the natural world as the use of AI continues to grow.

Growing demand for data centres provides data centre companies with a huge commercial opportunity, whilst also intensifying the already high dependence these facilities place on water supplies. Failure to adapt data centres to minimise water use could result in significant operational risks, including downtime (estimated to cost as much as $5,000 per minute).[25] As data centres are critical for many industries which rely on data processing, storage and network infrastructure, downtime can have large reputational consequences when services to businesses and consumers are impacted.[26]

A sustainability leader we interviewed identified the risk of water scarcity issues for local communities and biodiversity as a result of their data centre water use. They are looking to utilise solutions for data centre cooling without relying on water in the future, both to mitigate the risks of relying on water and to minimise the resulting negative impact of their water requirements.

Case study

Hyperscale Cloud providers, such as Microsoft, Google and Amazon, are building some of the world's most efficient data centres. Microsoft is committed to a water positive future, with a goal to reduce water waste in data centre operations by 95 per cent by 2024.[27]

Microsoft is also directing investment into projects and start-ups that use technology to limit water waste, such as leak detection projects in distribution networks and transmission mains. They have also created the Water Risk Monetizer, a water risk analysis and financial modeling tool that translates water scarcity risks into financial terms, giving businesses more data to factor water risk into their decision making.[28]

The nature-based risks facing the TMT industry

Manufacturing technical products and components relies heavily on water. For example, over 15 million litres of water are used each day in a typical semiconductor manufacturing facility.[29] This is an issue for Taiwan, which currently produces 90 per cent of the worlds semiconductors and is prone to droughts which are intensifying with climate change, destroying local ecosystems. In 2021, the Taiwanese government stopped irrigation to 74,000 hectares of farmland to ensure there was enough water supplied to technology companies. Environmental policies like this negatively impact rural biodiversity and constitute land use change with long term consequences for biodiversity and local communities (e.g. ecosystem loss, soil degradation and loss of water-based habitats).[30]

There could be huge future impacts to the supply chains of technology companies who rely on a continual supply of water in order to manufacture critical components, such as semiconductors. In addition to the nature impact, water shortages exacerbated by climate change, rising temperatures and over-use can disrupt business activities, reducing productivity, impacting the ability to respond to customer demand and therefore having negative commercial and reputational impacts to businesses.

The challenge of e-waste

E-waste continues to be one of the fastest growing waste streams in the world, with production estimated to reach 120 million tonnes annually by 2050.[31] Many technology companies are introducing product recycling, takeback and refurbishment schemes in an attempt to address the problem of e-waste. However, despite more efforts being made to manage this unprecedented volume of waste, its disposal is still not well managed. This leads to landfill build up, where chemicals leech into soils and water sources, damaging ecosystems. Failure to make considerations for the correct disposal of waste electrical and electronic equipment (WEEE) could have an impact on a company's reputation or lead to fines as a result of evolving regulations.

A sustainability leader we interviewed is working to improve the circularity of their equipment and limit their use of rare earth materials. They have begun innovative pilot testing on bioleaching to determine if there is an environmentally sound way of extracting precious earth metals.

2.2 Risks and dependencies of media companies

The impact of production

Production processes can affect the stability of ecosystems, with impacts such as deforestation and soil erosion impacting land geomorphology, soil fertility and composition, and by extension the viability of wildlife habitats. The direct nature impacts of filming include disruption of local wildlife through sound and light pollution, trampling of vegetation, construction of sets and waste generation. The production of the film Mad Max (2015), for example, is alleged to have caused damage to sand dune environments on the Namibian coastland, endangering cacti and local reptiles, despite permits.[32]

In response to this, many authorities responsible for wild areas are creating new policies and bureaucracy for media companies. In New Zealand, the Department of conservation established a code of practice for filming on land under conservation. Similarly, the Namibia Filming Commission manages permits for filming, requiring companies to pay for rehabilitation of areas damaged in the production process.[33] Permits can help mitigate the impact media companies have on the environment, but the impacts are rarely fully negated.[34] These permits and conditions must be a common consideration for media companies moving forward.

Deforestation for production materials also causes biodiversity loss. The production industry commonly uses a lightweight plywood for filmset construction. Sourced from rainforests, the extraction of this plywood for a single sound stage is likely to be responsible for destroying 4,000 hectares of rainforest, an area equivalent to about 150 tennis courts.[35] The conversion of dense, wet and shaded rainforest to degraded and sun exposed land through selective clearing increases the risk of wildfires, threatening the remaining biodiversity and human populations in the area, and initiating further carbon release from the ecosystem.

Poor waste disposal of production equipment can contribute to landfill build up, litter natural habitats and cause chemical leeching, all of which destroy nature and biodiversity. For example, the production crew of Pirates of the Caribbean: Dead Men Tell No Tales allegedly dumped chemical waste into a creek whilst filming in Queensland, Australia, potentially tainting local water and affecting water-based biodiversity.[36]

Commercial implications

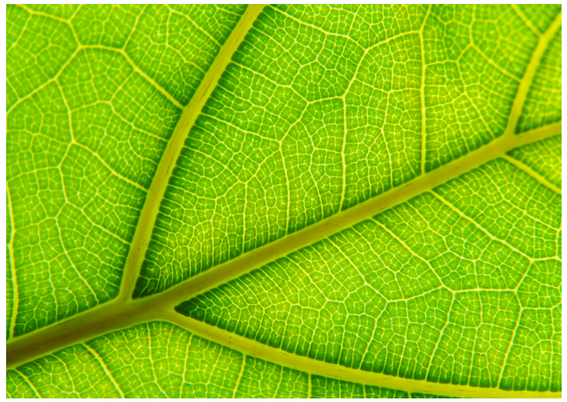
Continued exploitation of wild resources and degradation of habitats in the ways we have highlighted could have a significant reputational impact for businesses. As consumer concern increases, the public will prioritise environmentally conscious brands when making viewing or purchasing decisions. For example, a recent survey found that 40 per cent of UK adults have chosen brands that have environmentally sustainable practices or values.[37] When it comes to content type, progressive organisations are recognising the magnetism of climate and nature-related programming, an example being Netflix's David Attenborough: A Life on Our Planet. However, highlighting nature decline without also developing robust strategies to identify and mitigate risks within a company's own operations/supply chain opens companies up to claims of greenwashing.

A sustainability leader we interviewed identified their key nature risks as deforestation in sourcing of materials, supply chain disruptions caused by extreme weather events and client preferences putting pressure on the improvements of materials sourcing.

2.3 Risks and dependencies of telco companies

The impact of infrastructure

Submarine communication cables provide the pathway for more than 95 per cent of international data, making them essential to both telcos and their customers. The impacts of these cables on deep ocean marine life are not fully understood, giving rise to the possibility that significant nature impacts could be identified in the future, leading to increasing policies that must be adhered to.[38] It is known that the electromagnetic fields that pass through submarine communication cables can distort the natural geomagnetic field that marine organisms rely on to navigate.[39] Hammerhead sharks are one example of marine species which use magnetism to catch prey and navigate.



Similarly, there are nature risks associated with the impact of 5G networks as their impact is not currently known. Research indicates that the nesting and breeding of birds can be disturbed by high-frequency electromagnetic radiation from cell towers, whilst this distribution also extends to bees and other insects.[40] Telco companies can begin to assess locations where 5G networks operate and the wildlife within them, improving their understanding of these nature risks. Subsequently, companies must avoid installing 5G towers in areas with endangered species and areas with species abundance to avoid further nature and biodiversity disturbance.

One of our interviewees highlighted that changing regulations on an international, national, or local scale can impact the cost of operations as infrastructure would have to be assessed, updated and perhaps relocated to ensure nature consideration.

The risk of disruption

Conversely, nature-related physical risks can impact telcos and risk service disruption. Extreme weather events, such as storms, or seismic events, such as earthquakes, can cause significant damage and disruption to above-ground cabling, and resultantly the operations of telcos. Whilst damage can be costly to repair, the highest cost occurs through the downtime that may impact businesses, individuals and essential public services, such as the police service. Long periods of downtime can have a significant impact on the reputation of telco companies, altering the confidence of stakeholders and demonstrating a lack of operational resilience.

Whilst damage can be costly to repair, the highest cost occurs through the downtime that may impact businesses, individuals and essential public services, such as the police service.

The sustainability leaders we interviewed all collectively understood the importance of nature, with one company implementing the TNFD framework to understand the impacts of nature across their supply chains such as through battery use or the implementation of cables. Another sustainability leader identified the importance of regulations such as Green Taxonomy in their nature decisions and highlighted that they choose to focus on nature opportunities rather than negatives.

How TMT companies can harness opportunities relating to nature

How TMT companies can harness opportunities relating to nature

Whilst the nature-related risks faced by TMT companies are becoming increasingly well defined, TMT companies are also uniquely placed to harness opportunities that have a positive impact on nature and biodiversity. This could be through the industry's large-scale influence on business and society, through the development of technology that reduces society's impact on nature or the adoption of technologies by other industries that accelerate efforts towards nature-positive business models. Responding to these opportunities enables TMT companies to either expand their commercial offering or their ability to make a positive impact.

3.1 Opportunities and solutions for tech companies

Solutions to monitor and protect nature

Possibly the largest commercial opportunity for technology companies is the development of technology solutions that enable us to monitor, protect and restore the natural environment. The current nature tech market is estimated to be worth approximately $2 billion and is expected to grow to $6 billion in less than 10 years.[41] This highlights the huge commercial opportunity for technology companies to utilise existing technologies to expand their commercial offerings and accelerate the path towards a net zero and nature-positive aligned future. Examples include harnessing artificial intelligence (AI), satellite imagery, geospatial mapping and drones to automatically detect land-use changes, or to monitor and control invasive species and diseases in ecosystems.

Tools to verify and scale Nature-based Solutions

Another way that nature tech can be used is to enable, verify and scale NbS (Nature-based Solutions). There is a growing interest in NbS as a key tool to support global sustainable development and enable the net zero transition. However, the quality and integrity of some of these solutions can be challenged. A relevant example of this is carbon offsets. It was recently alleged that more than 90 per cent of certified rainforest carbon offsets do not represent genuine carbon reductions.[42] For NbS to be to be truly impactful, they must be able to be measured, monitored and verified, an area in which technology can play a large role.

How TMT companies can harness opportunities relating to nature

Technology companies can contribute to monitoring, reporting and verifying (MRV) of climate/biodiversity benefits through satellite imagery or LiDAR (laser imaging, detection and ranging), the use of blockchain technology in carbon transactions and registries to increase transparency, and the use of drone technology to accelerate reforestation and other nature interventions. As the world begins to rely more heavily on NbS, such as carbon offsets, the market is likely to both continue to grow and become more regulated.

As this happens, it is expected that demand for technology solutions that can trace and verify NbS will also increase, meaning companies that are developing or investing in NbS can become market leaders and set a strong precedent for demonstrating the importance of nature.

Commercial opportunities related to nature

Commercial opportunities are particularly prevalent in technology solutions that can enable other industries to track and reduce their impact on nature. For example, the food industry is linked to 60 per cent of global damage to biodiversity through intensive agricultural and land use practices that leads to desertification and reduces soil fertility.[43] Technology can enable traceability and visibility across multiple tiers of supply chains, detect landscape changes such as deforestation, and help increase the productivity of agriculture whilst minimising its impact on biodiversity, all of which can contribute to enabling the food industry to transition towards a nature-positive future.

Technology is revolutionising ecology and conservation practices, changing the way data is collected. Drones, location specific mobile apps, satellite imagery and geospatial data presents conservationists with an accurate view of habitat decline of species within an area. Using geographic information systems, this data can then be monitored to identify patterns and trends, enabling conservationists to efficiently allocate resources and improve their response.[44]

"Nature could create **$10 trillion** in business opportunity and **359 million new jobs** by 2030."[45]

How TMT companies can harness opportunities relating to nature

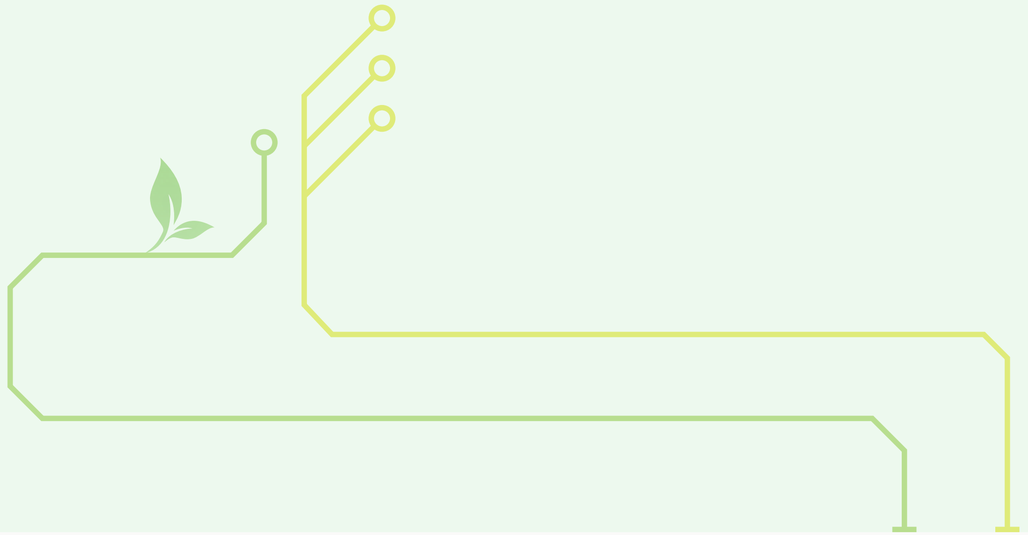
One of the sustainability leaders we interviewed highlighted that within the next 5 years there will be a huge rise in developments of nature-tech solutions to meet global nature targets for 2030. Monitoring is seen as the most obvious solution for tech companies to focus on, through including AI, blockchain and data science. However, more innovation is needed as biodiversity is difficult to measure. Currently, metrics and frameworks need clear definitions to understand the components of biodiversity that can be tracked before tech-solutions can be developed. Technologies that directly intervene in nature and biodiversity conservation, such as drones that can plant trees or tech that identifies illegal wildlife tracking, can be implemented to shine a light on activities that are directly destroying nature, helping to understand businesses direct impacts on nature. Tech can also be used to help transition business operations to nature-positive by improving supply chains, through finding new materials that do not rely on nature, or agri-tech work that focuses on precision agriculture or indoor farming, for example.

One of our interviewees identified that there are huge gaps in the conservation sector where technology can intervene, and the need for new green skills for tech is evident in supporting the nature agenda. They stated that 2020-2030 is the decade for nature consideration, where innovation must occur now to make a real impact as technological developments take years to create and implement. Partnerships should be encouraged for the development of nature-tech solutions where tech companies consult nature experts, NGOs and other private companies to ensure they 'get it right'.

Case study

Google Earth Engine enables planetary-scale earth data science and analysis which can be used across land management, monitoring and conservation efforts.

Unilever is currently working with Google Earth to increase transparency and accountability within the palm oil supply chain, whilst also enabling them to better detect deforestation and prioritise areas in need of urgent protection.[46] Earth Engine also remains free of charge for non-commercial use. For example, Global Forest Watch uses Earth Engine to measure and visualise changes to the world's forests, with alerts of new threats in near real time.



3.2 Opportunities and solutions for media companies

The power of media

Mass media is a powerful force in educational, social and environmental movements. As such, media companies have a unique opportunity to promote values and behaviours that help create a more sustainable planet, with considerations for biodiversity and nature. For example, the Sky Ocean Rescue campaign is reported to have reached over 47 million people, with eight million saying they changed the ways they use at least one single-use plastic item as a result. Meanwhile, the BBC Blue Planet series influenced 62 per cent its 11 million viewers to change their behaviours to more sustainable practices.[47] Through harnessing the power of storytelling, media companies are able to have a significant influence on consumer behaviour and decision making, with widespread resulting impacts. Media companies can look to leverage this impact, whether this be through introducing nature-related campaigns and series or putting the spotlight on nature and its importance during non-nature specific television. Organisations should take careful consideration to avoid giving a platform to misinformation around environmental issues, including nature.

One of the sustainability leaders we interviewed told us that they are using mathematical models and regressions to conduct impact analysis on their wildlife programming and the impacts it has on viewer behaviour across demographics, a strategy that could be replicated by other companies to understand the impact of educational media. They found that viewers had less knowledge on nature and biodiversity compared to climate change, as to be expected considering the specific focus on climate in recent years.

Commercial opportunities relating to nature

Whilst the impact opportunities are widespread, commercial opportunities may also arise from integrating environmentalism into everyday content. As consumers continue to adopt sustainable lifestyles and amplify green products, many brands are looking to share their sustainability credentials through reputable platforms.[48]

Media companies who signal their commitment to environmental issues could develop partnerships with third party brands with strong sustainability credentials, providing an optimal platform for advertising and amplifying their message.

This also provides a further opportunity to influence customer behaviour by signposting which third party brands to promote and work with. Thus, amplifying green brands or products whilst creating an incentive for others to take action to minimise their environmental impact. Doing so could open up further opportunities to work with brands who see an increased value in being promoted on the companies' platforms, due to their public sustainability credentials.

The opportunity for responsible production

Industry leaders in the media space also have the potential to become leaders in sustainable production, paving the way for their smaller counterparts through tailored sectoral carbon action plans for productions, such as those pioneered by Sky, ITV and the BBC.[49]

Responsible production that encompasses net zero, circularity and nature are essential for media companies to minimise impacts, such as e-waste, which have detrimental effects on nature and biodiversity. This helps biodiversity and nature conservation by reducing emissions, which in turn decreases the frequency and severity of environmental hazards. Responsible production can also have positive knock-on effects of increasing viewers, attracting investment, meeting regulations and creating sustainable behavioural change.[50] Media companies harnessing the opportunity to create a blueprint for their peers to follow in considering nature and biodiversity helps them to be market leaders whilst responding to regulatory requirements, such as TNFD.

Case study

The BAFTA Albert Consortium, an association of the UK's largest production companies has made achieving the Albert certification mandatory for new commissions and re-commissions of content since January 2022.

This will minimise the carbon footprint of media companies and provide free sustainability training for employees. Under this certification media companies need to submit carbon action plans before beginning production.[51] ITV are also setting a leading example in sustainable production with their zero waste by 2030 strategy where they will ban single-use plastics in operations and production supply chains by 2050 alongside requiring Albert certifications for all ITV shows.

3.3 Opportunities and solutions for telco companies

The benefit of partnerships

Telco companies can consider nature throughout their value chains through partnerships, investment in nature-based solutions or utilising technology to move towards a nature-positive world.

In 2022, Vodafone and WWF announced a partnership to reduce Vodafone's emissions to net zero by 2040 and to eliminate e-waste, with huge positive impacts for biodiversity. Preventing the extraction of raw materials such as copper, cobalt or lithium in mobile phone production reduces the destruction of natural habitats caused by mining operations.

Existing partnerships focusing on nature and circularity emphasise how reusing or refurbishing smartphones can prevent leeching of toxic chemicals, protecting local soil and water ecosystem.[52] Purchasing a refurbished phone saves 50kg CO_2 emissions, lowering production emissions by 87 per cent for production and saving 76.9kg of extracted natural resources. Focusing on circularity also protects nature and biodiversity by reducing the amount of land converted to landfill, protecting soils and habitats for wildlife.[53]

The business case for circularity

Moving towards electronic circularity creates commercial opportunities for telcos as it is a strategy that not only benefits nature and biodiversity, but also responds to consumer preferences that are shifting towards more sustainable products. Focusing on circularity can reduce costs to the consumer, advance efforts to a net zero and nature-positive future and enable companies to tap into the second hand or refurbishment market, expanding their offerings and increasing their competitive advantage in a fast-growing market.

> Preventing the extraction of raw materials, such as copper, cobalt or lithium, in mobile phone production reduces the destruction of natural habitats caused by mining operations.

Collaboration for Nature-based Solutions

Telcos can invest in and deploy NbS, particularly via partnerships with organisations that specialise in nature. For example, Orange's Nature fund for natural ecosystem restoration that focuses on directly or indirectly investing in carbon sequestration projects around the world through afforestation, reforestation, and restoration of natural ecosystems.[54] The importance of partnerships was a common theme among TMT companies we interviewed, alongside the understanding that more investment is needed in nature-based solutions. Partnerships present a great opportunity for TMT companies to invest in, understand and benefit from NbS by using the expertise of organisations specialised in nature. Doing so enables telcos to achieve more and drive further impact than if they were to embark on generating solutions relating to nature alone.

Repositioning existing infrastructure for nature

Telco companies can also contribute to conserving the environment and monitoring land use change through the use of their existing infrastructure. For example, the internet of things (IoT) and 5G can be used to identify forest fires, monitor the health of landscapes and geolocate endangered species. Meanwhile, the same technology can be used to accelerate sustainable agriculture through data collection. This is key as soil degradation from agriculture is threatening agricultural productivity, whilst also limiting the availability of healthy soil to act as a carbon sink.[55] Telco companies must continue to consider how their existing infrastructure and capabilities can be utilised to accelerate the efforts of others, such as monitoring and conservation.

> Investment in NbS is essential for us and our peers to be part of the global solution to meet net zero goals and move towards a nature-positive future.

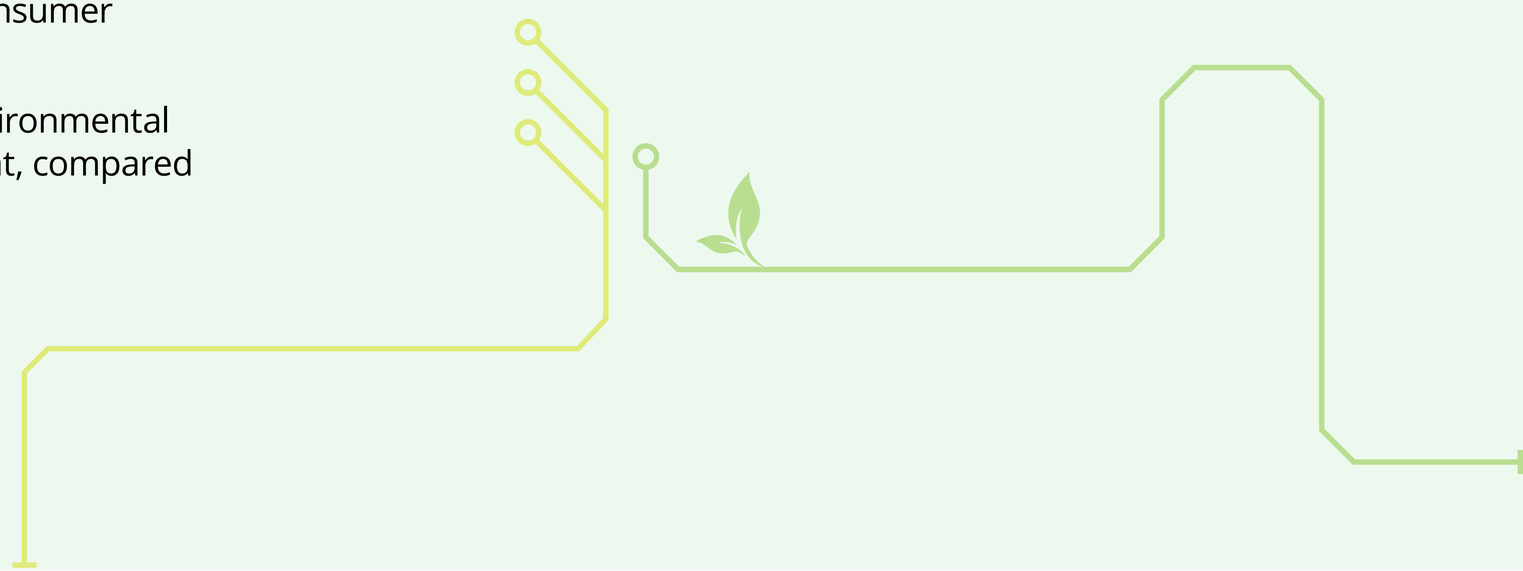
Case study

In 2021, BackMarket, an online platform for buying, selling and servicing refurbished tech products, raised $335 million in a funding round, with the company valued at $3.2 billion at the time.

This demonstrates the growing value of the second-hand consumer goods market.[56]

Backmarket commissioned an independent study of the environmental impact of the refurbished tech industry. The study found that, compared to new devices, refurbished devices drive an:

- **89.6%** reduction in CO_2 emissions
- **94.1%** reduction in raw material use
- **94.5%** reduction in water use
- **92.6%** reduction in e-waste[57]



How should your business be responding?

How should your business be responding?

Mobilising at the scale and pace needed for a nature-positive future can feel challenging. This is particularly the case alongside the ever-expanding field of broader sustainability regulations and expectations competing with resource and budget allocation. However, it is clear that the current focus on nature and biodiversity is not a passing trend. Companies should consider how they will address this issue with the same rigour and determination as that of climate challenges. TMT companies must integrate nature considerations into their sustainability strategies with the same momentum as other ESG agendas to make efficient use of internal resources.

As previously mentioned, the relationship between climate and nature provides the opportunity for both issues to be addressed through one unified strategy. Developing a biodiversity strategy, and integrating it into your current sustainability strategy, will enable businesses to seize the opportunity to be a leader and shape the market on this increasingly relevant topic, enhancing their profile, credibility and commercial offering.

As companies within the TMT industry continue to explore the role they can play in helping to create a more nature positive future, it is key to ensure that these projects, products and services place the voice, wisdom and insight of Indigenous Knowledge at their heart.

Whilst Indigenous peoples make up less than 5% of the world's population, they protect and steward an estimated 80-95% of the earth's biodiversity.[58] Throughout history, measured on a geological scale of several millennia, Indigenous peoples have managed their environments and adapted to "the shifting of land masses, rising and falling of seas, climate change, fire, arrival of exotic plants and animals, and many other landscape influences."[59]

Integrating contemporary non-Indigenous ecology tools and technologies with traditional Indigenous Knowledge systems will enable, a richer and more holistic understanding of the landscape to be achieved and, ultimately, better technology tools and services to be developed. This will bring dividends to the environment and create economic efficiencies in its application across technology companies.

Additionally, companies can expand their ability to address nature-related risks by working alongside peers and industry associations to develop opportunities for collective action. For example, for many telco companies some of the biggest impacts on nature occur multiple tiers down the supply chain, making it difficult for individual companies to both assess and address these impacts and risks. Industry associations, such as the GSMA (Global System for Mobile Communications), considering nature as a priority would enable the telco sector to address suppliers collectively.

How should your business be responding?

TNFD is expected to become a market-leading framework for nature-related disclosures, in line with expectations of organisations, investors and regulators. TNFD is likely to follow the same path as TCFD, starting as a voluntary framework before likely being adopted as a mandatory regulation in certain geographies. Therefore, companies already aligning with the TCFDs recommendations will likely be in a good place to begin TNFD piloting.

Companies can expand their ability to address nature-related risks by working alongside peers and industry associations to develop opportunities for collective action.

In the meantime, here are a few steps you can take to help prepare for upcoming regulation and work towards a nature-positive future:

- Conduct a TNFD pilot or readiness assessment to test how the draft framework applies to your organisation, as well as to help you identify and understand your nature-related risks and opportunities. The step-based approach is an excellent starting point in your nature positive journey and will provide a foundation on which to help you prepare for the full suite of incoming regulation. Firms are recommended to start piloting the framework now ahead of market adoption in September 2023. Encourage customers, investors and clients to do the same.
- Familiarise yourself with the LEAP process, voluntary guidance developed by the TNFD on how to approach nature-related risk management. This approach can be used to assess the interactions of your assets and operations with nature, develop a sense of materiality of the topic and help you to prepare a strategic response.[60]
- Set science based targets, strategies and include risk management strategies for nature that are linked to the science-based targets and transition planning.
- Identify and publicly commit to clear time-bound nature goals and targets, utilising frameworks such as TNFD and SBTN. Embed these goals into existing business processes.
- Facilitate policy and market-based solutions that focus on nature and biodiversity, such as payments for ecosystem services.

Whilst this report has focused on the TMT industry, trends and regulation demonstrate that nature and biodiversity must be a high agenda topic for all industries. Risks and opportunities faced by all companies may differ to those specific to TMT companies. However, our recommendations remain the same. Consider aligning to the TNFD framework, identifying nature-based risks and how they could be mitigated, and assess what opportunities your business could seize in order to become a leader in the delivery of nature-based offerings. As the focus on nature within the public agenda continues to rise, there is no better time than now to begin to identify, measure and manage nature-related risks and opportunities.

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Endnotes

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