GSMA

Nature Guidance
for the Mobile Industry

GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

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1 About this guidance

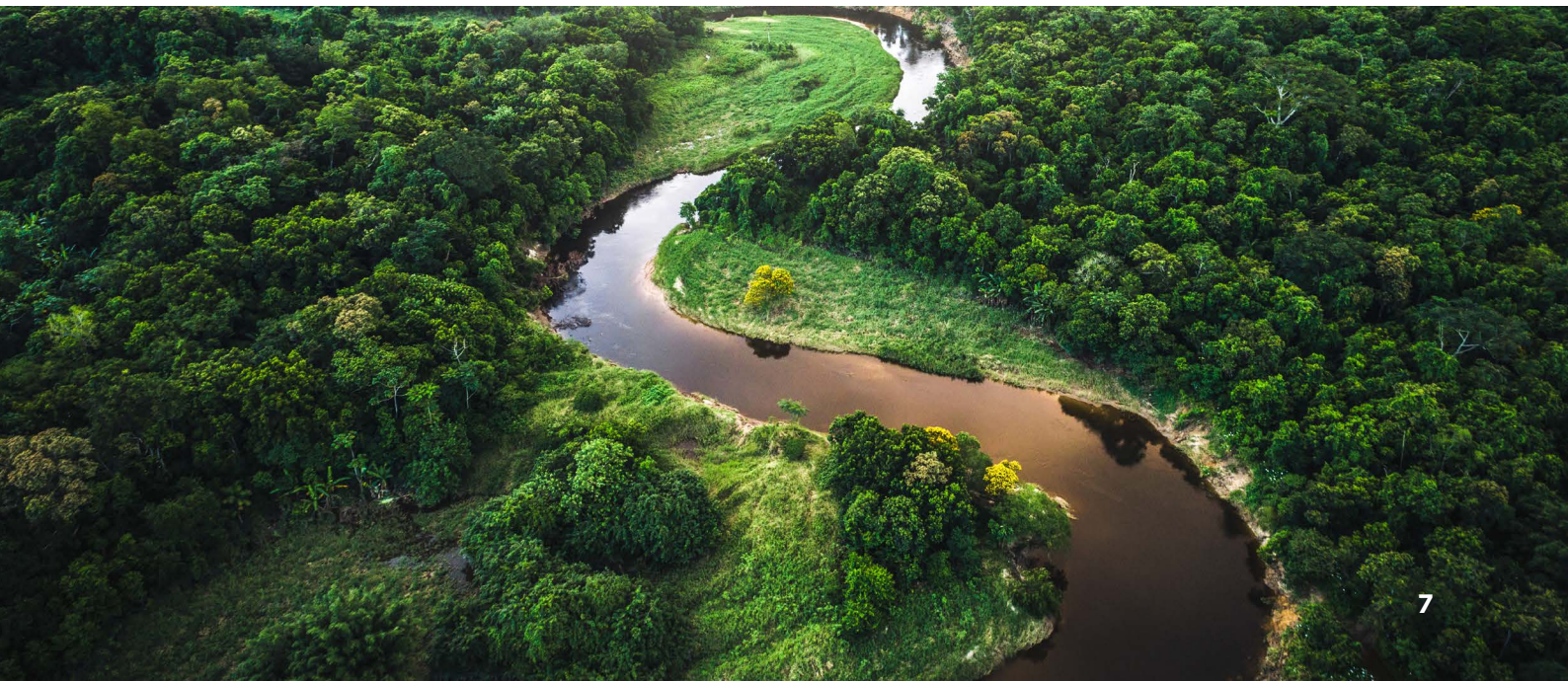
1.1 Why this guidance has been created

Environmental factors have traditionally been part of sustainable corporate reporting, but there is growing awareness of the broader impacts businesses have on nature as well as the impacts that nature can have on businesses. This shift is driven by:

- Accelerating nature degradation, biodiversity loss and the alarming reality of the sixth mass extinction, which is now threatening human reliance on ecosystem services.
- Campaigns by civil society, including consumer boycotts that have raised attention to nature issues, such as linking palm oil use to orangutan habitat destruction.
- The development of international agreements like the Kunming-Montreal Global Biodiversity Framework, where close to 200 nations committed to halt and reverse nature loss by 2030.
- The development of frameworks and standards to target nature protection and restoration for businesses.
- Regulatory changes by governments to better understand business impacts, dependencies and the associated risks and opportunities related to nature.
- Extreme weather events and other changes to ecosystem services (e.g. freshwater availability) that can affect businesses such as through supply chain disruptions.

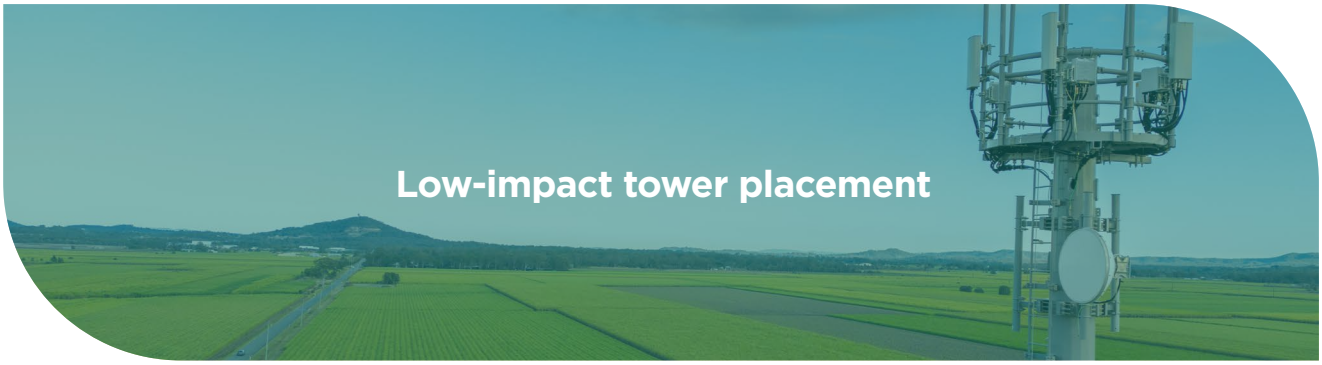
As these issues gain attention on the global stage, companies have a unique opportunity to respond by enhancing and restoring nature, demonstrating their responsibility and leadership.

This guidance addresses both the ‘why’ and the ‘how’ of nature assessments for mobile operators. It explains the reasoning behind taking action and offers practical recommendations for initiating and integrating a corporate nature strategy. The authors aimed to simplify the complex topic of nature assessment, making it as accessible and actionable as possible, while balancing clear, prescriptive steps with the flexibility to accommodate companies with different levels of experience and ambition in this area.



1.2 What role the mobile sector can play

Companies in the mobile sector are particularly well-placed to take decisive action on nature. Operators face many similar environmental challenges owing to a common supply chain and the industry's expertise in innovation, data management and digital technologies positions it to develop and implement solutions that can monitor, protect and restore natural ecosystems (GSMA, 2024a)[1]. For instance, the sector can prioritise:



Mobile operators can expand collaboration with suppliers to reduce upstream environmental impacts – for example, from raw material extraction and processing. Additionally, operators can support nature conservation and restoration measures in sensitive and biodiverse ecosystems, as several are already.

[1] GSMA. 2024a. The Nature Tech Nexus: Bridging biodiversity and business. Available at www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/gsma_resources/the-nature-tech-nexus-bridging-biodiversity-and-business/

1.3 How to use the guidance

Mobile operators' direct operation activities are the primary focus of this guidance, while value chain activities are covered in distinct sub-sections throughout the document.

Fundamental concepts of nature-business interactions
To help newcomers, Chapter 2 provides essential information to explain the business case for engaging with nature and introduces key concepts like impacts, dependencies, risks and opportunities related to nature.

Initiating the corporate nature journey and assessing materiality
Chapter 3 outlines a phased approach for progressing on nature-related actions. It starts with assessing readiness (section 3.1, Initiate phase) and moves to the crucial step of materiality assessment (section 3.2, Determine phase), recommending tools and priority topics for guidance.

Nature impact, dependencies and risk assessment
Where materiality is confirmed, the following phase dives into the qualitative and quantitative assessment of nature impacts and dependencies, where specific metrics are proposed to support this process, and the connection is made to reporting obligations under the various frameworks (section 3.3, Progress phase).

Reporting and nature target-setting
Building on the metrics information, the following phase addresses the next logical part of the journey, target-setting, with some examples once again laid out to make advice as tangible as possible (section 3.4, Accelerate phase).

Delivering nature actions and becoming a leader in the nature journey
The final phase explains how a company can implement on-ground actions, set up monitoring processes and scale and deepen an established nature programme (section 3.5, Lead phase).

Integrating nature in the business strategy
In the short concluding chapter (Chapter 4), the guidance zooms out from the detail of nature assessment to make connections to more general advice for companies wishing to embed nature into their wider business strategy.

2 General guidance on nature assessment for the mobile industry

2.1 The importance of nature for business

Figure 1 | The importance of nature for business

Why is nature critical for all businesses?
Simply, we based our economy on nature and are part of it.

55% of global GDP depends heavily on nature
For example, pollinators make crop production possible, while soil microorganisms are critical for soil fertility. That amounts to $41.7 trilion, to put things in perspective. Swiss Re, 2020[2]

Earth has experienced five mass extinctions. We are in the sixth
10-100x: this is the increase in the speed of the current extinction rate compared to the average extinction rate of the last 10 million years. The global economy as it exists will soon be unable to thrive. IPBES, 2019[3]

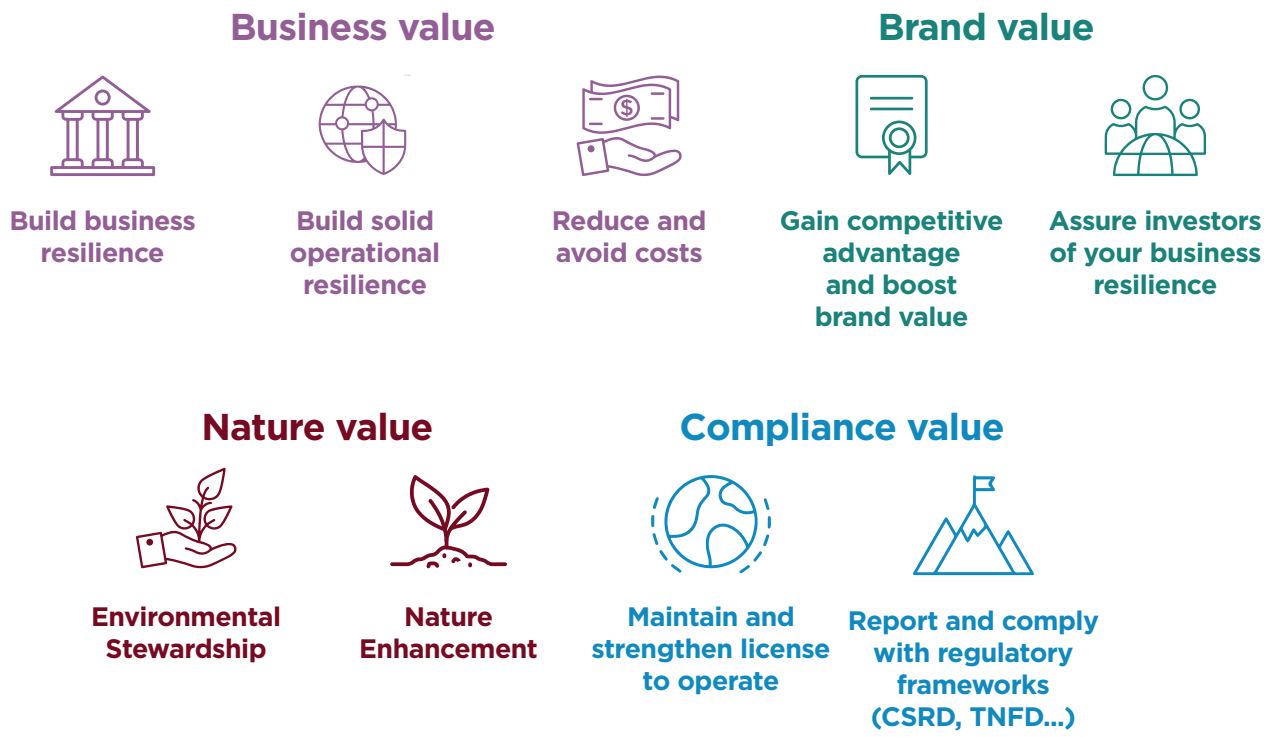
We can still act!
"All the models tell us the same thing; we still have the possibility of stabilising and even reversing the curve of biodiversity loss if we take urgent and unprecedented conservation action. WWF, 2020[4]

Nature is fundamental to the corporate world because it underpins the essential ecosystem services that businesses rely on (Figure 1). In the mobile industry, nature impacts are evident throughout the value chain:

- energy consumption of fixed/mobile networks or data centres can contribute to climate change (Godlovitch et al, 2021)[5].
- e-waste and other waste types such as waste oil for diesel-powered towers.
- water use for cooling purposes in data centres can increase water pressures.
- infrastructure construction can result in the use and fragmentation[6] of natural or semi-natural habitats.
- upstream and downstream impacts can be related to manufacturing, mining, management of used products and waste, among others.

2 Swiss Re. (2020, September 23). Biodiversity and ecosystem services: The foundation of our economy – New Swiss Re Index reveals biodiversity's crucial role in the global economy. Retrieved from www.swissre.com/media/press-release/nr-20200923-biodiversity-and-ecosystems-services.html
3 IPBES. 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. doi.org/10.5281/zenodo.3831673
4 WWF. (2020). Living Planet Report 2020: Bending the curve of biodiversity loss (R. E. A. Almond, M. Grooten, and T. Petersen, Eds.). World Wildlife Fund. Retrieved from www.worldwildlife.org/publications/living-planet-report-2020
5 Godlovitch, I., Louguet, A., Baischew, D., Wissner, M. and Pirlot, A. (2021). Environmental impact of electronic communications. Study for BEREC. Available at www.berec.europa.eu/en/document-categories/berec/reports/external-sustainability-study-on-environmental-impact-of-electronic-communications
6 **Fragmentation:** A set of processes by which habitat loss results in the division of continuous habitats into a greater number of smaller patches of lesser total area and isolated from each other by a matrix of dissimilar habitats.

Figure 2 | The value of integrating nature into business strategy



These activities affect ecosystems and biodiversity, which in turn has an impact on resource availability and environmental stability. Moreover, ecosystems provide services (like in the case of the mobile operator sector), water purification, flood regulation and soil structure and stability which prevents erosion and reduces surface run-off. These services are crucial for various business operations and create dependencies.

Companies that integrate nature into their strategies are future-proofing by mitigating risks, enhancing their reputation and gaining competitive advantages by aligning with consumer and regulatory demands for sustainability (World Economic Forum, 2020)[7]. Acting on nature can also bring cost savings and increased revenue (Taskforce on Nature Markets, 2022)[8] (Figure 2).

- In Europe, the EU's Corporate Sustainability Reporting Directive (CSRD)[9] requires companies to report on sustainability matters affecting their performance and impacts on society and the environment. Similarly, the Task Force on Nature-related Financial Disclosures (TNFD) provides a framework for reporting nature-related risks and opportunities.

- In Latin America, Asia and the USA, regulatory frameworks are evolving to include these perspectives, recognising that environmental sustainability is key to economic resilience. In Brazil, the Central Bank mandates integrating environmental risks into financial management. This shift towards double materiality underscores that sustainable business practices are crucial for long-term success and resilience in a complex, interconnected world.

7 World Economic Forum. (2020). The Nature of Risk: A Framework for Understanding Nature-Related Risk to Business. Geneva: World Economic Forum. Available at: www.weforum.org/reports/the-nature-of-risk-a-framework-for-understanding-nature-related-risk-to-business

8 Taskforce on Nature Markets. (2022). Global Nature Markets Landscaping Study. Available at uploads-ssl.webflow.com/623a362e6b1a3e2eb749839c/638f463b2d6c475a6a32e5f6_GlobalNatureMarketsLandscapingStudy.pdf

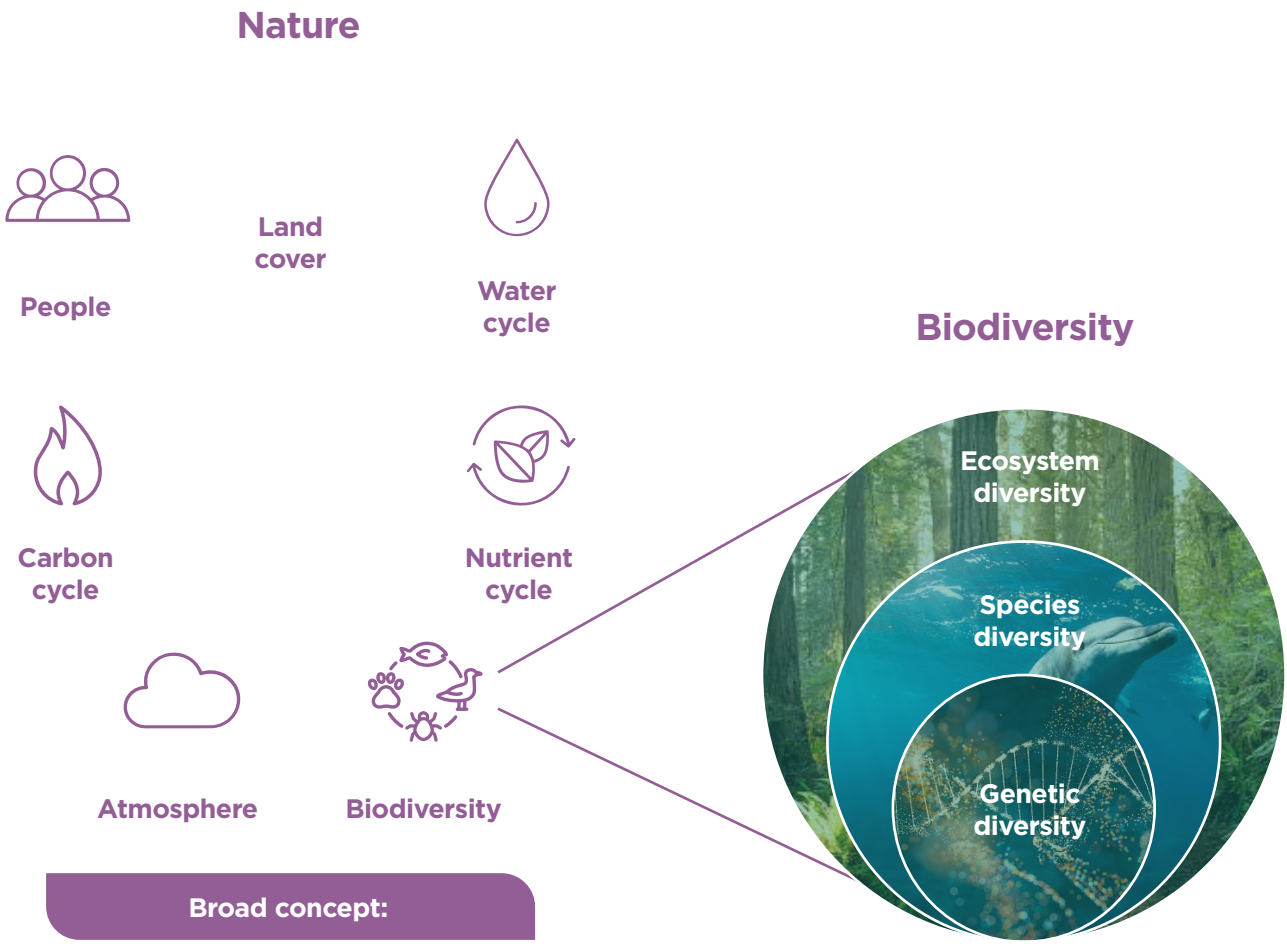
9 CSRD (Corporate Sustainability Reporting). 2023. Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (Text with EEA relevance). Available at eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022L2464

2.2 Business and nature interactions

2.2.1 Nature impacts and dependencies in the mobile industry

Figure 3 | The relationship between nature and biodiversity

Nature and biodiversity are often used interchangeably and, while they are closely related, they describe different concepts (Figure 3).



Broad concept:

Refers to the entire physical world and all its systems, including living organisms, non-living elements and the processes that occur within the environment.

The seven elements here are part of a broader list which can change depending on the definition of nature used.

Specific concept:

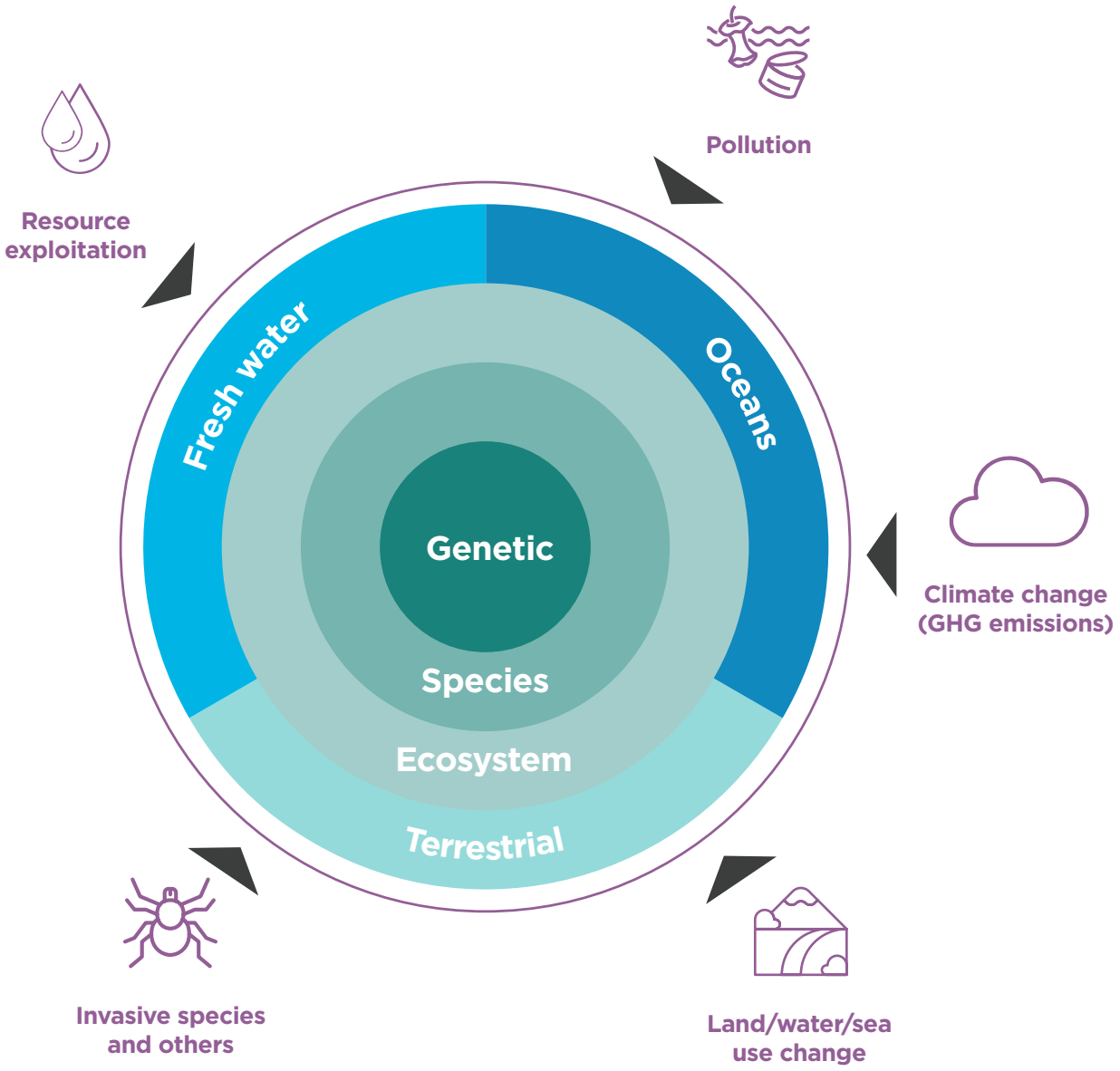
Encompasses everything from ecosystems diversity, species diversity and genetic diversity contributing to the planet's overall health and functionality.

Nature impacts can be described according to five 'pressures' (IPBES, 2019)[10] (Figure 4). These impacts can be direct, such as habitat destruction from construction, or indirect, such as pollution due to spillage and mineral resource depletion.

Nature dependencies, on the other hand, are the ways in which an operator relies on ecosystem services and natural resources for its operations. These include water for cooling data centres and raw materials for manufacturing devices.

Nature impact and dependencies are intrinsically linked; while operators rely on healthy ecosystems to function, their activities can degrade these ecosystems, creating a feedback loop that can threaten their sustainability. Recognising and managing both nature impacts and dependencies is essential for the mobile industry's long-term viability and environmental responsibility.

Figure 4 | Addressing nature loss requires tackling the five main pressures

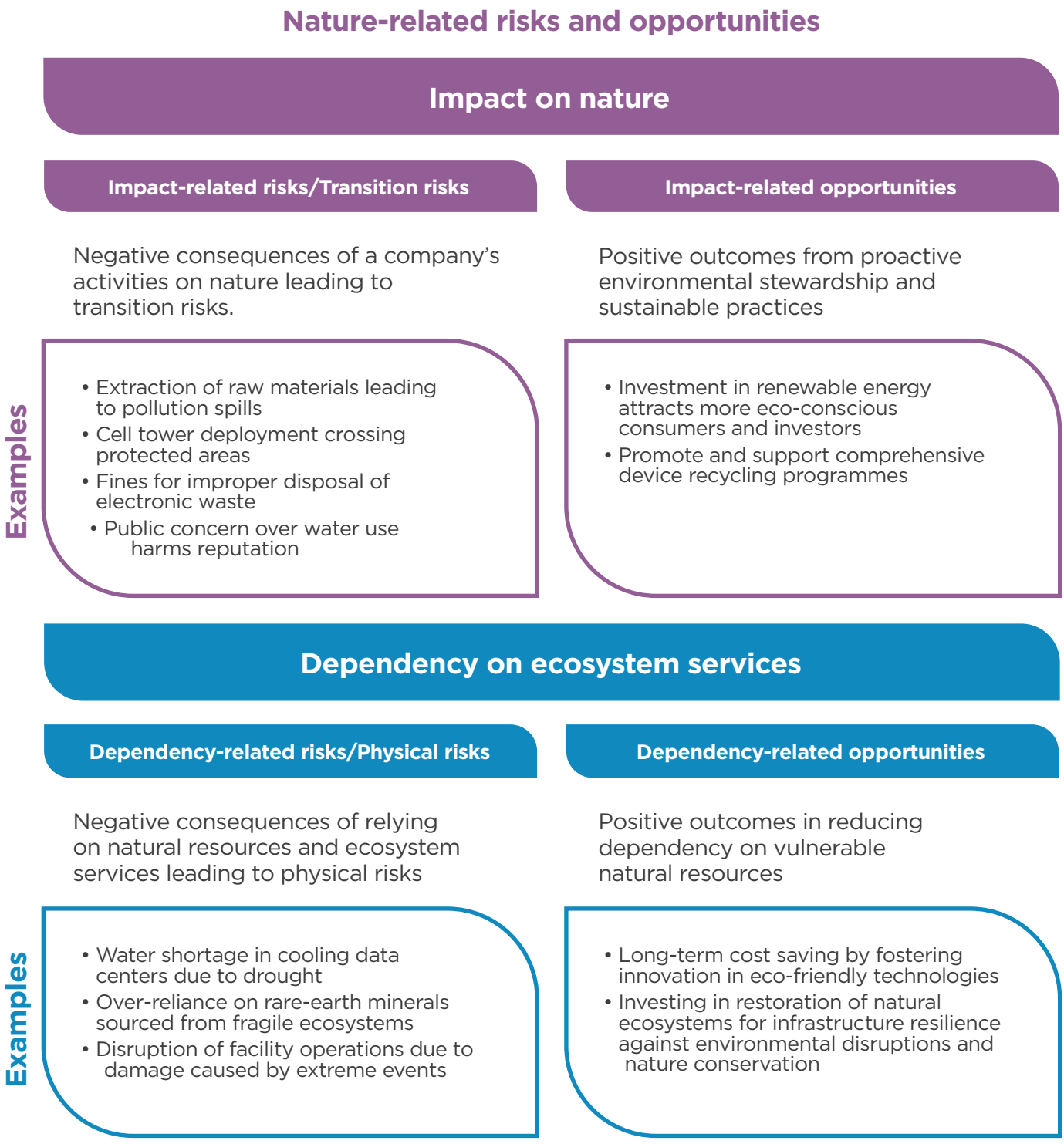


[10] IPBES. 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. doi.org/10.5281/zenodo.3831673

2.2.2 Nature-related risks and opportunities in the mobile industry

Nature-related risks are potential adverse effects that arise from an operator's interaction with the natural environment, including both its impacts on nature and its dependencies on ecosystem services (UNDP, 2021)[11]. These risks can be categorised into nature impact-related risks and nature dependency-related risks (Figure 5).

Figure 5 | Examples of nature-related risks and opportunities



[11] UNDP. 2021. Reporting on nature-related risks, impacts and dependencies. Available at g20sfwg.org/wp-content/uploads/2021/08/2021-UNEP-UNDP.-Reporting-on-Nature-related-Risks-Impacts-Dependencies.pdf

2.3 Evolution of nature reporting

The regulatory landscape for climate disclosure has evolved significantly over the past decade, emphasising the interconnectedness of climate- and nature-related risks. Since the publication of the TCFD recommendations in 2017, reporting on climate-related risks and opportunities has become widely recognised best practice. This has led to increased voluntary and mandatory disclosures worldwide, with many countries introducing nature-related disclosure requirements for businesses and financial institutions (Table 1).

The disclosures seek to align with the Global Biodiversity Framework (GBF), an international strategy adopted during the Convention on Biological Diversity meeting in December 2022[12]. Officially known as the Kunming-Montreal Global Biodiversity Framework, it is designed to address the ongoing global biodiversity crisis, aiming to halt and reverse biodiversity loss and conserve at least 30% of the world's land and ocean areas by 2030.

Table 1 | Key frameworks for assessing and reporting on nature impact and dependencies

Framework	Taskforce on Nature-related Financial Disclosures (TNFD)	Corporate Sustainability Reporting Directive (CSRD)	CDP	Science-Based Targets for Nature (SBTN)
Focus	Nature-related financial risks and opportunities	Sustainability reporting by companies	Global disclosure of environmental impact	Setting science-based targets for nature
Purpose	Guide companies in assessing and disclosing nature-related risks	Enhance corporate transparency and accountability in sustainability reporting	Conservation and sustainable use of biodiversity	Provide a framework for companies to set targets to protect and restore nature
Scope	Global	European Union	Global	Global
Target audience	Corporations, financial	All large and listed companies in the EU	Governments, businesses, NGOs	Corporations, NGOs, governments
Key requirements/ components	Risk assessment and disclosure of nature dependencies and impacts	Double materiality approach	Eight questions on biodiversity (separate questionnaire for water)	Develop measurable targets for nature
Implementation timeline	Recommendations published in 2023	Recommendations published in 2024	Climate change questionnaire adapted in 2022. Full questionnaire to be published	Framework in development, ongoing updates
Alignment with other frameworks	Aligns with TCFD	Aligns with the EU Taxonomy, SFDR and TCFD	Aligns with IFRS and ESRS mostly	Aligns with existing SBTi framework
Reporting obligations	Voluntary, but increasingly expected by investors	Mandatory for applicable companies in the EU	Voluntary	Voluntary

[12] CBD (Convention on Biological Diversity). 2022. Kunming-Montreal Global Biodiversity Framework. Available at www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf

2.4 Current sectoral approaches to nature assessment

Out of the frameworks in Table 1, this guidance provides deeper insights into the TNFD and CSRD because they are the two most prominent voluntary and/or mandatory frameworks respectively addressing nature, due to their overlap.

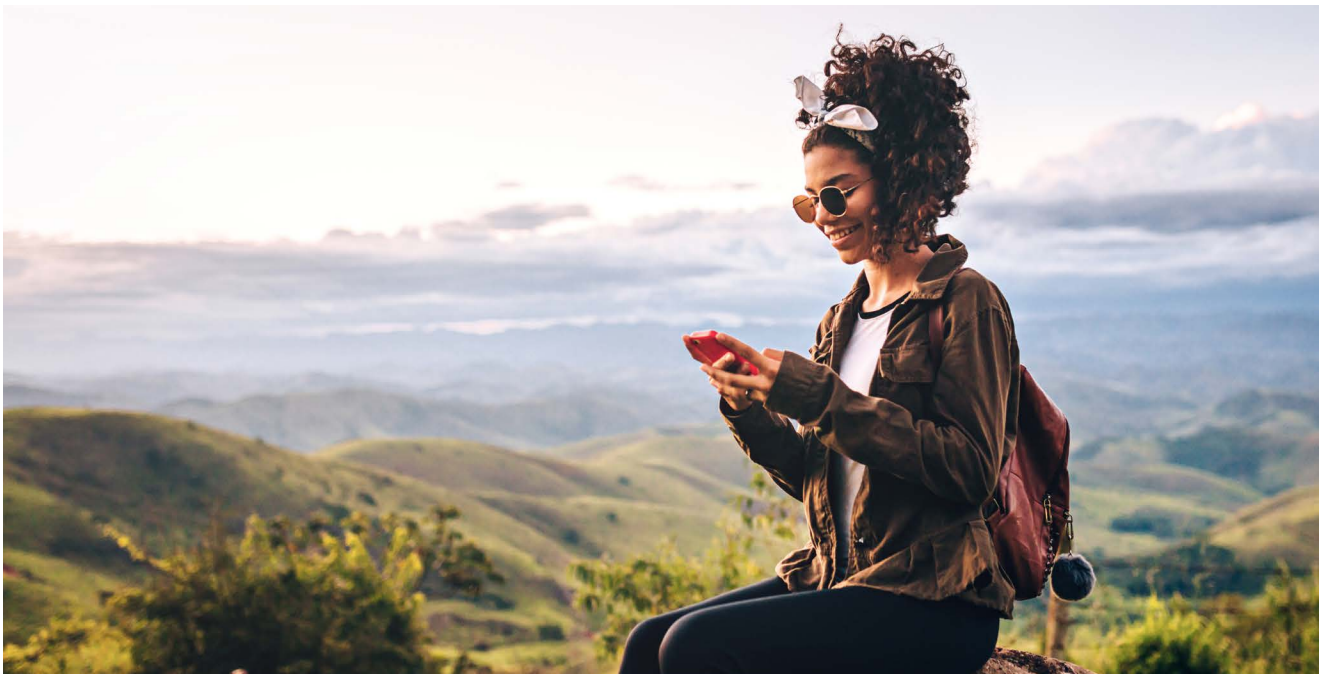
Currently, only the TNFD provides sectoral approaches, but does not have an approach for the ICT or telecommunications sector. This guidance is intended to fill this gap to provide support to telecommunication companies wishing to conduct a nature assessment until such time as an internationally recognised sectoral approach is developed.

The TNFD, building on the Task Force on Climate-Related Financial Disclosures (TCFD), offers 14 recommendations for clear, consistent disclosures, including transition plans that detail the impact of risks and opportunities on business models and value chains. It has developed several key general and sector-specific guidance documents to help organisations minimise their impact and dependence on nature.

The main TNFD Recommendations provide the foundational framework for nature-related disclosures. The Recommendations are structured around four pillars: governance, strategy, risk and impact management, and metrics and targets (TNFD, 2023)[13].

The TNFD's LEAP approach helps organisations operationalise the recommendations using the LEAP framework (Locate, Evaluate, Assess, Prepare). It offers practical steps for conducting comprehensive assessments and preparing disclosures that companies are advised to follow when seeking alignment with TNFD and alignment with CSRD.

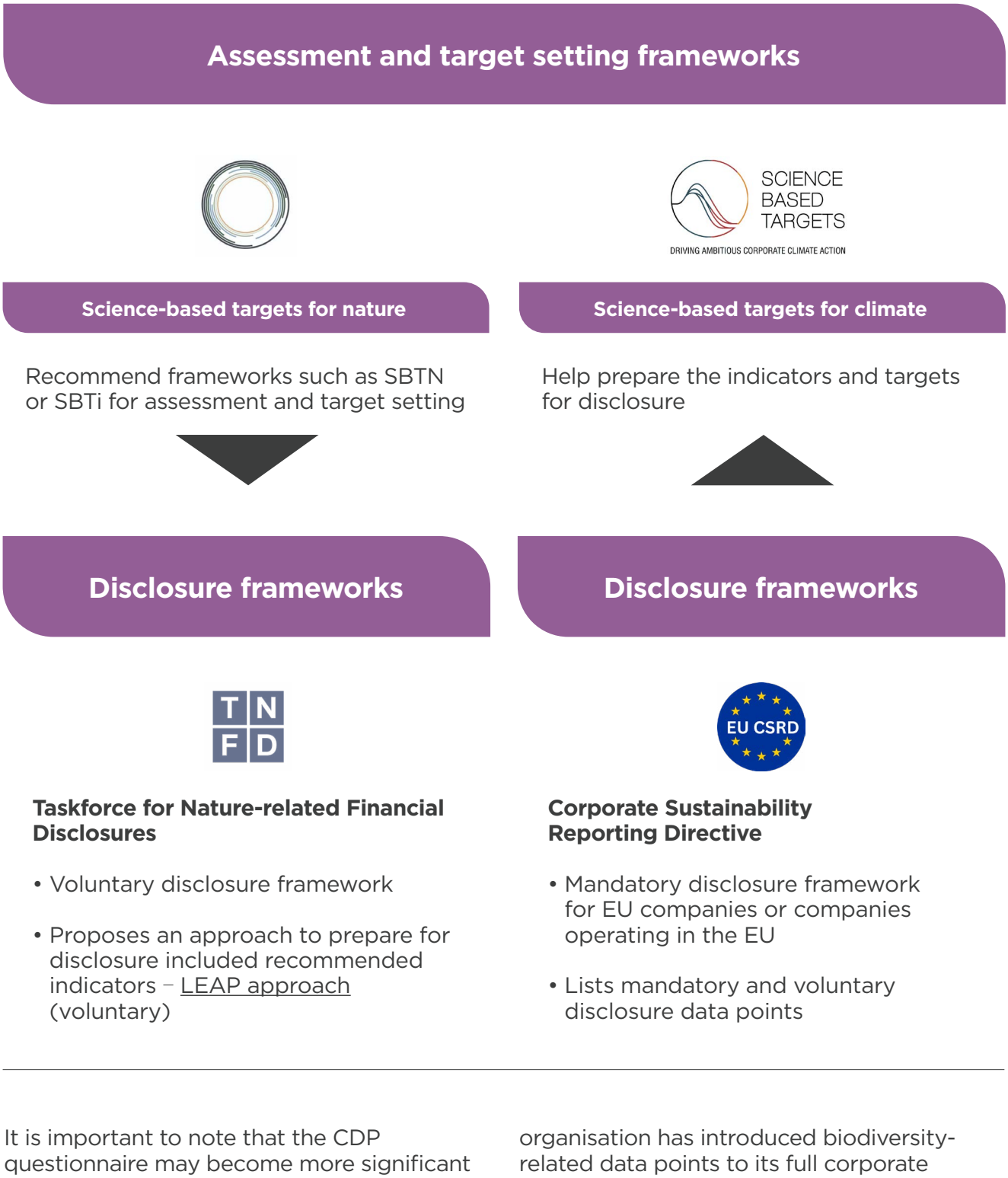
Please note that LEAP is an internal due diligence assessment process. Use of LEAP is optional and is for companies that do not currently have a process for nature-related issues. If processes already exist, a mobile network operator can make the disclosures recommended by the TNFD without using LEAP.



[13] TNFD (Task Force for Nature-related Disclosure), 2023. Recommendations of the TNFD. Available at tnfd.global/recommendations-of-the-tnfd/

The Science-Based Targets Network's (SBTN) process involves assessing current impacts, setting measurable and time-bound targets based on scientific evidence and taking action to reduce negative impacts on nature. The SBTN's approach aligns with global standards and frameworks, such as those developed by the TNFD, facilitating coherent and credible reporting (Figure 6).

Figure 6 | SBTi and SBTN help prepare for regulatory and voluntary disclosures



It is important to note that the CDP questionnaire may become more significant for nature reporting in future because the organisation has introduced biodiversity-related data points to its full corporate questionnaire (unscored in 2024).

Case Study: KDDI

Programme:
Integrating nature into business strategy through reporting[14]

Overview
KDDI, Japan's first telecommunications carrier, has released a TNFD report concerning natural capital, including biodiversity. This initiative aligns with KDDI's corporate philosophy, VISION 2030, which aims to address social issues through business activities. Biodiversity is one of the three pillars of the KDDI GREEN PLAN, KDDI's environmental conservation plan.

Problem statement
KDDI acknowledges that biodiversity loss is a significant environmental challenge linked to the depletion of natural capital. A lack of proactive measures in this area could heighten risks throughout its value chain. Nevertheless, KDDI is confident that it can address environmental issues and foster sustainable growth by leveraging various communication technologies in its business operations.

Solution
- In line with this perspective, KDDI is aligned to the principles of the TNFD and publishes TNFD reports. These documents outline the company's recognition of and approach to severe sustainability issues such as climate change, ecosystem destruction, human rights issues and widening wealth gaps. The report provides basic concepts, risk analyses and

[14] www.kddi.com/english/corporate/sustainability/efforts-environment/biodiversity/

several ongoing initiatives undertaken in collaboration with stakeholders, including international organisations, rating agencies, task forces creating disclosure frameworks, investors, customers, business partners and company employees to mitigate these risks.

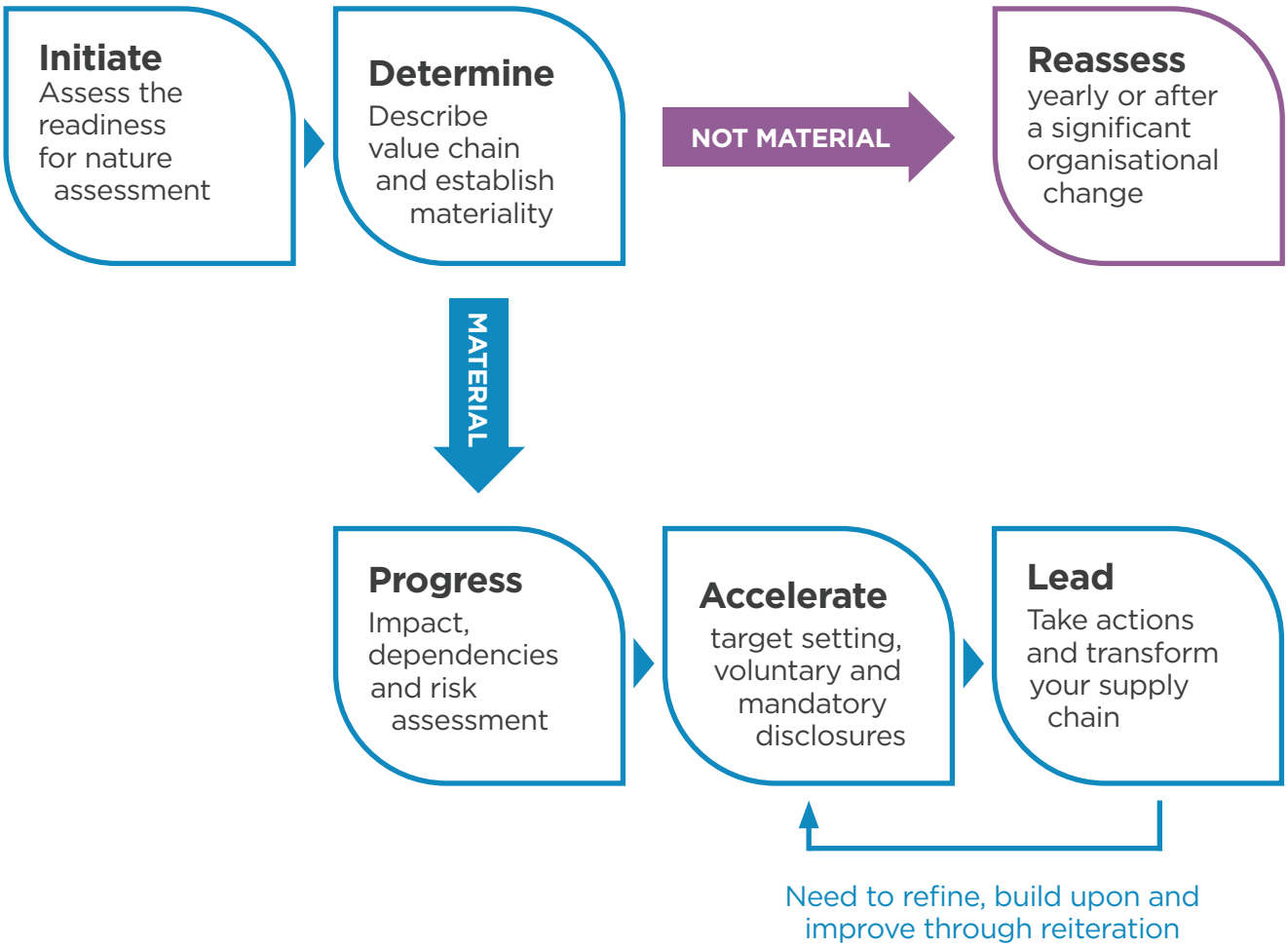
- The report details a step-by-step analysis of the impact of infrastructure construction on ecosystems and cases of advancing natural environmental protection using communication technology. It also highlights systems in place to address potential natural disasters.

Impact
By actively disclosing such information, KDDI aims to promote sustainable management that seeks the sustainable growth of society and enhancement of corporate value alongside its partners and stakeholders. This effort contributes to evolving 'Enhancing the power to connect,' as outlined in VISION 2030, enabling the creation of a society where everyone can realise their aspirations.

Conclusion
KDDI's commitment to integrating nature and biodiversity into business strategy and decision-making through the TNFD report demonstrates its dedication to addressing environmental challenges and promoting sustainable growth. By collaborating with various stakeholders and using communication technologies, KDDI aims to mitigate risks and contribute to the conservation of natural capital, ultimately enhancing corporate value and societal well-being.

3 Foundations for a nature-positive mobile industry

Figure 7 | Conceptual framework of the phased approach to integrate nature into corporate strategies



Nature is often perceived as a complex and resource-intensive topic to address, but the key is to start with high-impact areas first rather than trying to address every potential issue simultaneously. The approach to tackling nature topics in corporate strategies should be iterative and build up in complexity.

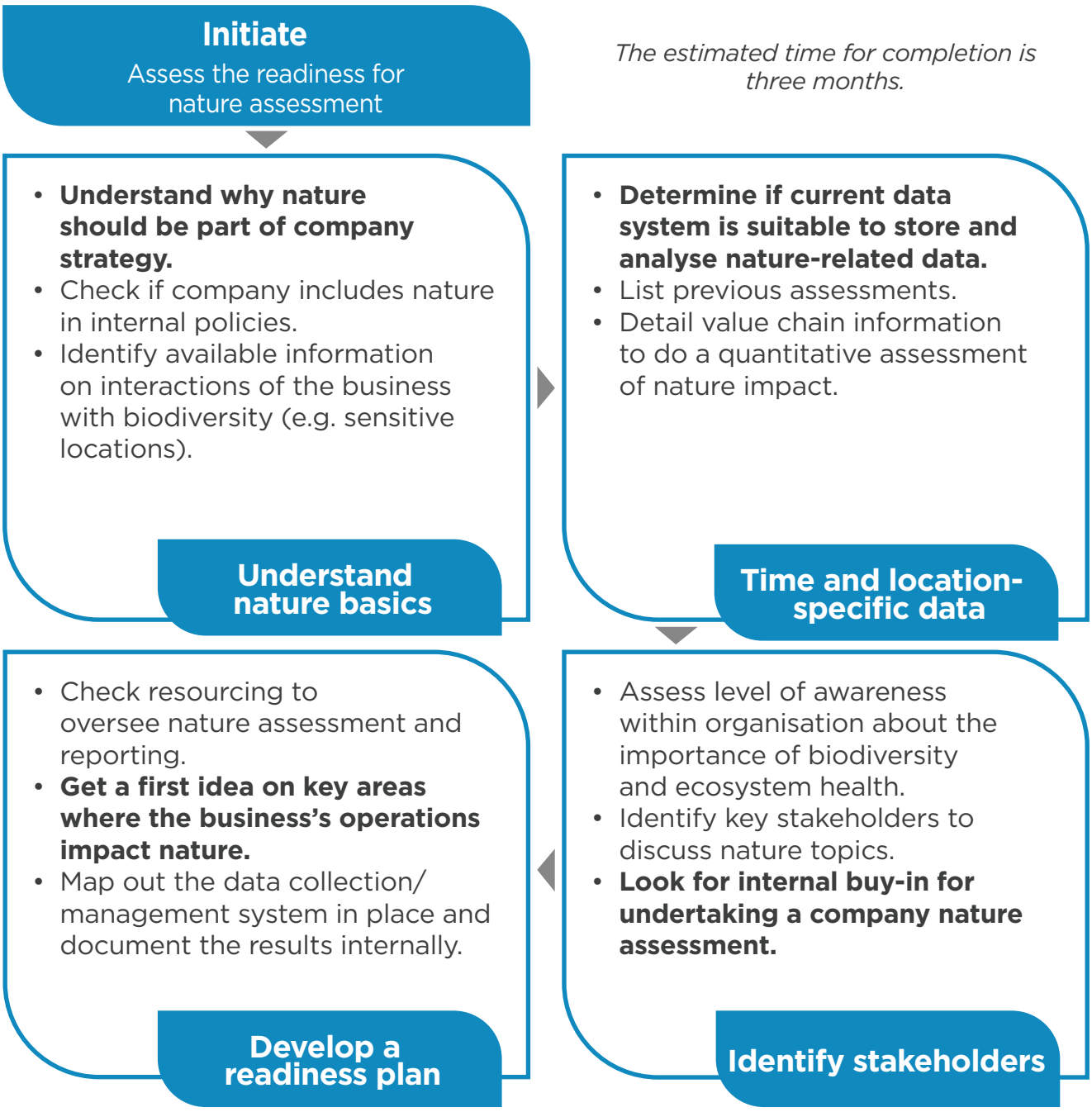
This guidance aligns across, and builds upon, existing frameworks. It is in five phases, from an initiation phase to assess readiness, through to a lead phase to deliver action to reduce impacts on nature (Figure 7).

Compared with existing frameworks, this approach provides a more simplified and practical method for the telecommunications sector to follow. For a detailed comparison, this guidance is mapped against the TNFD LEAP approach in Annex 1. Each phase is described in the following sub-sections with an estimated completion time.

3.1 Initiate – assess the readiness for nature assessment

The 'Initiate' phase sets the scene for a mobile operator to undertake a thorough nature assessment and includes nature in a broader company-wide strategy. Key actions for the 'Initiate' phase are summarised in Figure 8.

Figure 8 | Key actions for companies at the 'Initiate' phase



3.1.1 Checklist to understand business nature basics

For a mobile operator to begin its nature journey, the first step is to understand why nature should be an integral part of its strategy. To start, the operator is advised to assess its readiness by evaluating internal awareness, securing leadership commitment and allocating necessary resources. The best way to do this is to address the questions in the checklist below and be able to tick most of the boxes.

Understanding of nature basics

- ☐ Does your company have a formal policy or guidelines that address the importance of nature within its operations?
- ☐ Has your company made any internal commitments to environmental management?
- ☐ Have you identified available internal information on the current interactions of the business with biodiversity (e.g. critical habitats or sensitive locations)?

Key drivers for nature assessments

- ☐ Does the company have to report on nature impacts because of current or impending regulation or regular voluntary disclosures?
- ☐ Has the company already reported some nature impacts such as climate or e-waste?
- ☐ Are there other drivers for understanding nature impacts such as reputational, financial or ethical reasons, or investor requests?

Data to capture relevant timing and location-specific aspects

- ☐ Does your organisation already collect any data on any nature-related metrics (e.g. water withdrawal, land use, etc) for your operations?
- ☐ Do you have a system in place to record, store and analyse nature-related data, such as an environmental management information system?
- ☐ Do you have value chain information that would enable you to make some quantitative assessments of nature impact (e.g. emissions to air or water, water withdrawal, land use, location of own sites with spatial footprint, waste generation, etc)?

Stakeholder engagement

- ☐ Is there a good level of awareness within your organisation about the importance of nature?
- ☐ Have you identified your key stakeholders related to nature assessments?
- ☐ Have you initiated discussions with stakeholders (internal/external) about the importance of nature in your company-wide strategy?
- ☐ Is there leadership buy-in for undertaking a company-wide nature assessment?

Readiness plan development

- ☐ Have you developed an initial readiness plan to start integrating nature assessments into your broader business strategy?
- ☐ Are resources available to implement a nature readiness plan?

3.1.2 Key drivers for nature assessments

Understanding why a company should carry out a nature assessment is important to determining which phase to work towards. For example, impending mandatory disclosures may require a more rigorous assessment than voluntary initiatives, as well as faster progress through the phases. Stakeholder pressure may necessitate a focus on a particular impact, e.g. sensitive ecosystems.

3.1.3 Understand timing and location-specific aspects

A tonne of carbon dioxide emitted has the same impact anywhere in the world. However, the use of a tonne of fresh water could have very different impacts on nature depending on its location and when it is extracted. Nature assessments must account for the unique ecological characteristics of different regions and timescales. This complexity requires a more context-specific approach, considering local species, habitats, water catchment pressures and seasonal variations. Table 2 shows examples of mobile sector-specific impacts and dependencies.

Table 2 | Mobile sector-specific examples of localised impacts and dependencies

Nature impact: Water availability for cooling data centres	Nature impact: Network construction impact local habitats	Nature dependency: Rain attenuation of satellite signals
Typical cooling systems can operate both directly and indirectly. Indirect systems are most effective during winter and transitional seasons, but capacity decreases as ambient temperature rises. Energy requirements to maintain other refrigeration systems hinders energy efficiency improvements. (Ge et al, 2024)[15]	Linear infrastructure crossing various habitats and local ecosystems affects the local fauna or flora (de Jonge et al, 2022)[16]. While onshore infrastructure construction can affect habitats and create noise/light pollution, subsea cables could be laid during sea turtle spawning season, disrupting reproductive capacities of local species.	Rain-induced attenuation in satellite communication will likely become more unpredictable as rain patterns and intensity change diurnally and monthly. Mobile operators may have challenges in determining selective time periods for better link availability. (Shrestha and Choi, 2018)[17]

To capture the relevant timing and location-specific aspects of a nature assessment, the mobile operator is advised to:

- Check if data is already being collected on nature-related metrics
- Determine if the current data system is suitable to store and analyse nature-related data
- Can it manage geographical coverage?
- Can it capture timings/seasonality?
- List previous assessments done with this data
- Detail value chain information that would enable a quantitative assessment of nature impact

[15] Ge, L., Han, Z., Yang, Z., Zhang, Y., Qiu, B. and Li, X. (2024). Feasibility investigation on a novel data centre cooling system based on cross-seasonal soil cool storage in severe cold area. Journal of Energy Storage, 98, 113233

[16] de Jonge, Melinda MJ, et al. 'The impacts of linear infrastructure on terrestrial vertebrate populations: A trait based approach.' Global Change Biology 28.24 (2022): 7217-7233.

[17] Shrestha, S. and Choi, D. Y. (2018). Diurnal and monthly variations of rain rate and rain attenuation on Ka-band satellite communication in South Korea. Progress in Electromagnetics Research B, 80, 151-171.

3.1.4 Identify key stakeholders and engaging them

As a business, identifying and engaging with key stakeholders is crucial for a successful nature assessment. Typically, there are four groups of stakeholders to consider during the 'Initiate' phase'. Figure 9 presents possible engagement methods that may be used.

Figure 9 | Example of key stakeholders and engagement methods

To identify key stakeholders, a mobile operator is advised to:

- Assess the level of awareness within the organisation about the importance of biodiversity and ecosystem health.
- Identify key stakeholders to discuss nature topics in its operations.
- Look for internal buy-in for undertaking a company-wide nature assessment.

3.1.5 Develop a nature readiness plan

To embark on the nature assessment journey, a mobile operator is advised to create a structured readiness plan, based on the pre-assessment checklist, that details the following:

- The sustainability person or team responsible for overseeing the nature assessment and reporting process
- Why the company should undertake a nature assessment and which stakeholders it would be produced for
- Key areas where the business's operations have an impact on nature and which areas of the value chain should be investigated further
- What nature-related data is already being collected, through which systems, and how it is being reported
- Which stakeholders within the company should be involved in the nature assessment process and whether they have been engaged already
- The governance for nature assessments – for example, reporting to an existing or newly created sustainability advisory committee

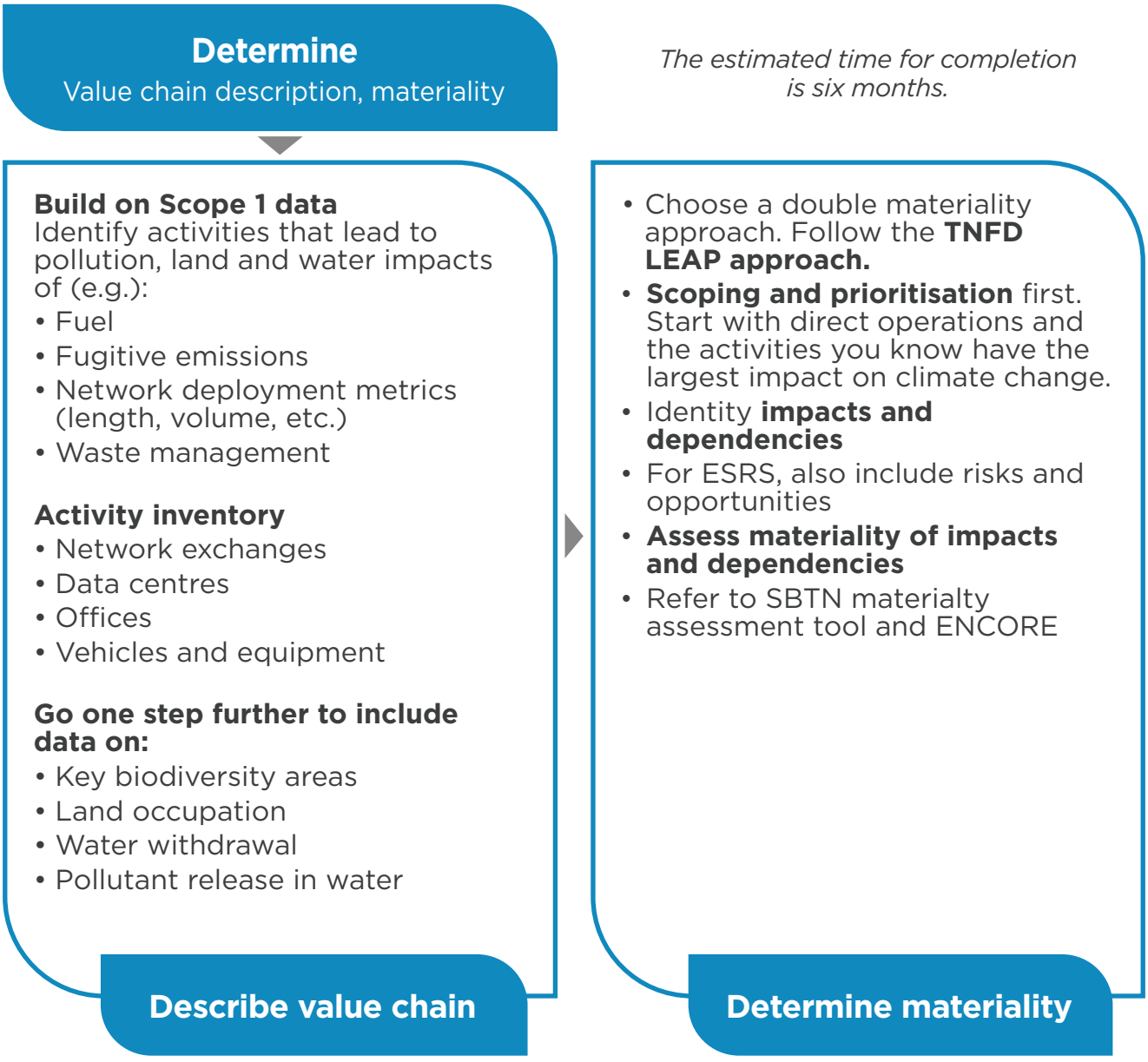
This readiness plan can then be communicated to the senior leadership team to secure support and resources to progress to the next phase.

3.2 Determine – materiality assessment

The 'Determine' phase is a critical decision phase to determine whether nature impacts and dependencies are sufficiently material.

Key actions for the 'Determine' phase are summarised in Figure 10.

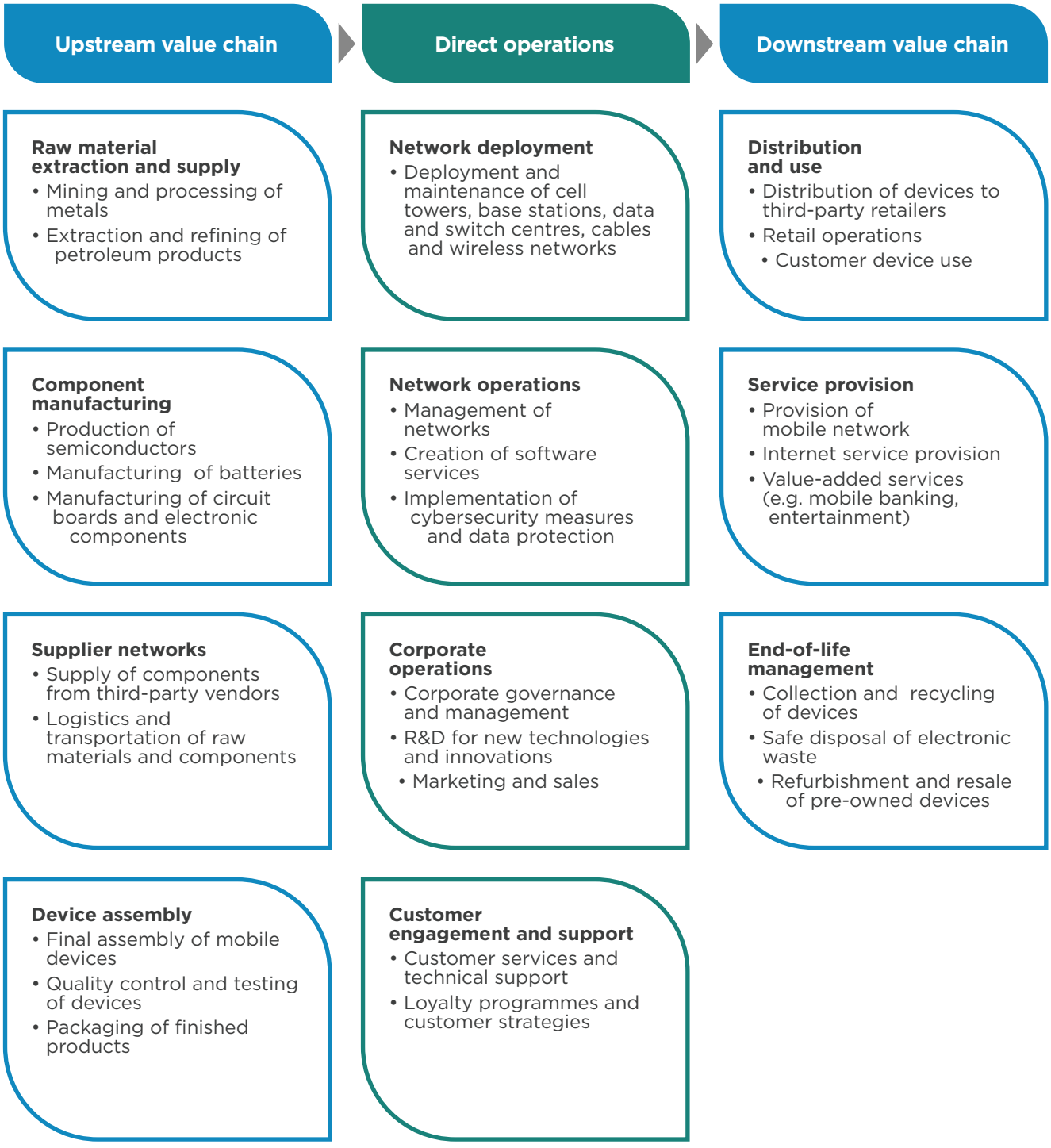
Figure 10 | Key actions for companies at the Determine phase



3.2.1 Describe the value chain

The first step to effectively assessing a mobile operator's impact on nature is to describe the full range of value chain activities, starting with direct operations (Figure 11). As there is usually a good understanding of direct operations from corporate carbon accounting, operators can refer to the same internal activity categorisation and then expand to include pollution, land and water (quantity and quality) impacts.

Figure 11 | General overview of mobile operators' value chain



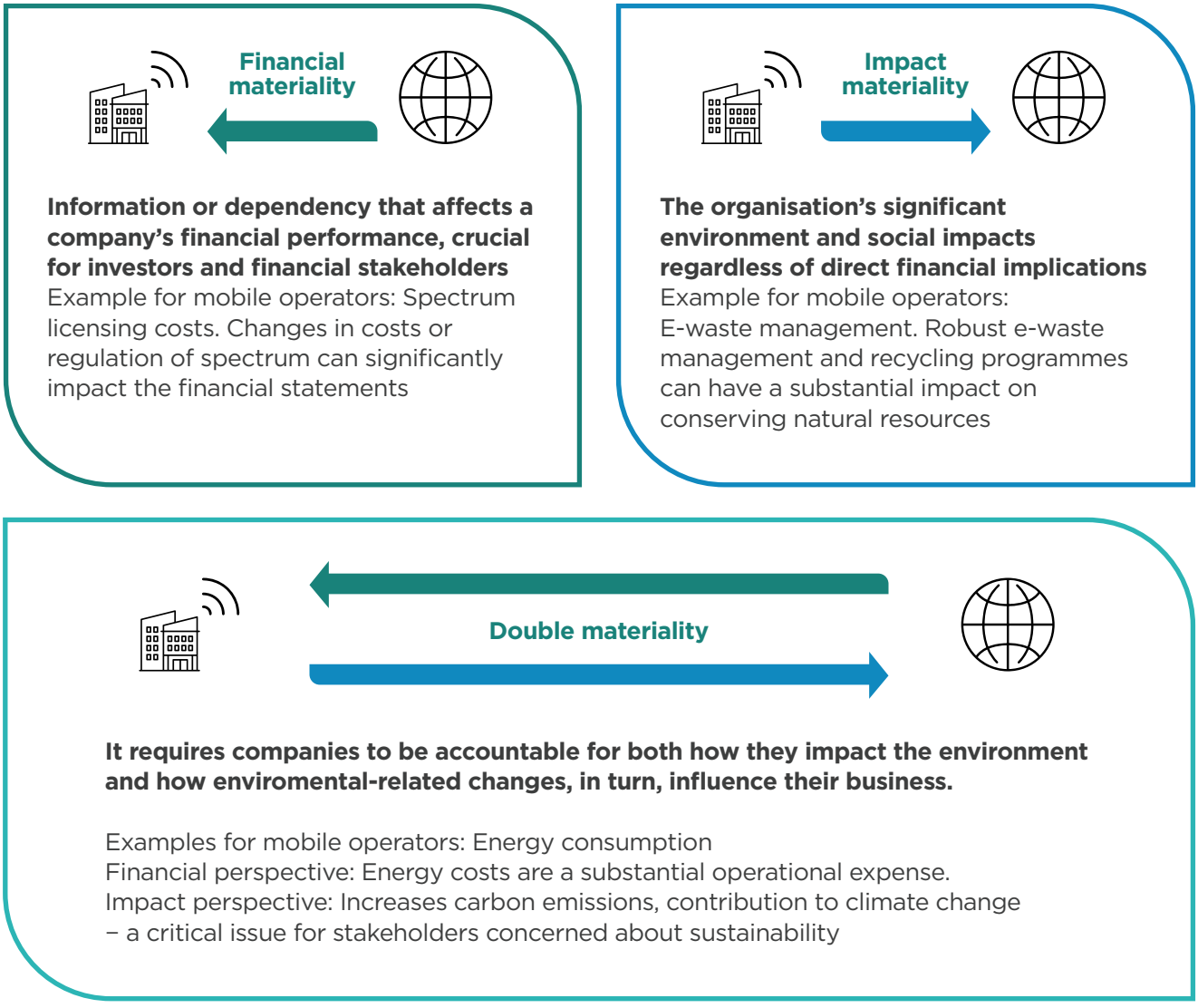
3.2.2 Approaches to materiality

Materiality is at the core of every disclosure initiative and the approach to defining nature-related materiality depends on the disclosure framework/standard. Figure 12 shows the different approaches to materiality that exist and which are covered by the main disclosure frameworks such as CSRD, TNFD, TCFD and CDP.

The CSRD mandates the assessment of both financial materiality (information relevant to investors and primary users of financial reports) and impact materiality (the operator's impact on the environment and people).

The TNFD allows organisations to choose their materiality approach based on jurisdictional requirements and their own preferences and recommends using the ISSB's financial materiality as a baseline and incorporating impact materiality as needed. For the mobile sector, TNFD is the recommended framework for voluntary disclosures, especially when a mobile operator does not have to report under CSRD.

Figure 12 | Reporting standards and types of materiality in the mobile sector



The TNFD and CSRD approach materiality in different ways. In the TNFD's LEAP approach, the initial scoping and prioritisation are followed by an assessment of dependency and impact materiality. This assessment occurs at a later stage, after measuring dependencies and impacts. The materiality of risks and opportunities is evaluated in the last stage of the 'Assess' phase of the LEAP approach, while the decision on what information to disclose is made during the 'Prepare' phase of the LEAP approach.

The CSRD mandates that companies complement initial prioritisation (covered in this section) with a final materiality assessment of dependencies, impacts, risks and opportunities, which are advised to be completed after identifying and measuring these nature-related issues.

3.2.3 Determine materiality for company operations

To help assess materiality, several online materiality tools are available (Box 1). The ENCORE tool provides insights on impacts and presents lists of dependencies on ecosystem services by sector and sub-industry, which makes it complementary to the SBTN materiality tool (UNEP, 2024a)[18]. Annex 3 provides an example of the application of materiality assessment for the case of telecommunication towers and data centres.

The SBTN's materiality assessment tool requires companies to conduct an initial impact screening and provide a rationale for the potential materiality of key drivers of biodiversity loss. This aligns with the TNFD and CSRD frameworks (see Box 2 for a sector-specific example).

It is recommended to use the ENCORE tool first, followed by the SBTN Materiality tool for a comprehensive initial materiality screening, and then to compare results.

BOX 1 – TOOLS FOR MATERIALITY ASSESSMENT

1. Tools for initial materiality screening

ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure)
ENCORE is a comprehensive database linking environmental changes with economic consequences. It provides visualisations to help understand dependencies on natural capital across various sectors. The tool is user-friendly and integrates well with other frameworks such as the TNFD's LEAP approach. To bring additional value, users might find it effective to use site-specific data and assign a biodiversity expert to conduct the assessment.

SBTN Initial Guidance – Materiality tool
The SBTN guidance provides a framework for businesses to conduct materiality impact assessments related to nature. It integrates well with existing data sources such as ENCORE and offers a structured approach to assessing natural impacts. The guidance itself is generic, but organisations might need additional company-specific information to achieve detailed assessments.

2. Going further with a more granular assessment

WWF Risk Filter suite
The suite is made up of two tools: the Biodiversity Risk Filter and the Water Risk Filter. It is an online platform developed by the Worldwide Fund for Nature (WWF) to help companies and financial institutions assess and manage environmental risks. The tool is designed to identify and address risks related to water and biodiversity in their operations and supply chains, helping users make informed decisions to enhance sustainability and reduce environmental impact.

Mobile operators should start by assessing potentially high-impact activities, nature-related impacts and dependency categories (refer to Box 1 and Table 3), followed by evaluating their entire operational scope. Specific metrics are not required for this initial materiality assessment; they will be detailed in later sections of this guidance.

[18] UNEP. 2024a. ENCORE - Exploring Natural Capital Opportunities, Risks and Exposure. Available at www.encorenature.org/en

Table 3 | Priority nature impacts and dependencies for direct operations of telecommunication operators

Priority activity categories	Priority nature impacts
Network expansion	• Land use and/or land use change • Sea use and/or sea use change
Network exchanges and data centres	• Land use and/or land use change • Water use • Climate change
Maintenance of existing infrastructure	• Land use and/or land use change • Climate change • Species disturbances

Priority activity categories	Priority nature dependencies
Network infrastructure	• Water provisioning for cooling • Erosion control in sensitive areas for stability (e.g. hillside tower locations) • Flood regulation against extreme weather
Network exchanges and data centres	• Access to renewable energy • Water provisioning for cooling systems
Maintenance of existing infrastructure	• Erosion control in sensitive areas for stability (e.g. hillside tower locations) • Flood regulation against extreme weather

While both ENCORE and the SBTN are widely recognised international tools, some activities may have data gaps which could lead to materiality in one tool but not another. In this case, judgement may be required to better understand company activities and operations, drawing upon sector experts such as telecommunication specialists who can provide insights which add valuable context.

The TNFD recommends that companies use spatial data to assess their interface with sensitive ecosystems such as Key Biodiversity Areas (KBAs) or protected areas. This guidance recommends that mobile operators use a map to overlay their asset data on top of nature datasets (e.g. KBAs, Ramsar wetlands or Natura 2000 sites) to identify and prioritise assets in sensitive locations. Regardless of the materiality tool findings, any activities occurring in these sensitive locations should be advanced to the next assessment phase.

3.2.4 Expand materiality assessment to the value chain

Value chain activities often have greater impact, dependencies and materiality than direct operations, even if they are less visible (see Table 4). For a comprehensive materiality assessment across the value chain, mobile operators are advised to use the same tools applied to direct operations, starting with ENCORE and then the SBTN Materiality tool.

Table 4 | Priority nature impacts and dependencies for the telecommunications operator value chain

Priority activity category	Priority nature impacts	Priority nature dependencies
Mining (e.g. rare earth metals, etc.)	• Land use and/or land use change • Sea use and/or sea use change • Water use • Water and/or soil pollution • Climate change • Invasive species and disturbances	• Water provisioning for mining processes • Erosion control to prevent land degradation in mining regions • Air quality regulation (to manage industrial emissions)
Manufacturing of equipment (e.g. network equipment, mobile devices)	• Land use and/or land use change • Water use • Water and/or soil pollution • Climate change • Invasive species and disturbances	• Water provisioning for production processes • Flood regulation for protection of manufacturing facilities
Infrastructure construction (e.g. mobile masts, fibre optic cabling)	• Land use and/or land use change • Sea use and/or sea use change • Water use • Climate change • Invasive species and disturbances	• Erosion control (preventing degradation in coastal or hilly areas) • Flood regulation (protection against extreme weather events)
Waste management (e.g. from infrastructure decommissioning, e-waste)	• Water use • Water and/or soil pollution • Climate change • Invasive species and disturbances	• Water and soil purification capacity (preventing contamination from hazardous materials) • Air quality regulation (to manage emissions from improper disposal)

Although the SBTN tool may not fully address value chain nuances, it can be adapted by assessing materiality from the perspective of suppliers, requiring a deeper understanding of value chain activities. Box 2 has an illustrative example output from the SBTN tool.

BOX 2 – MATERIALITY ASSESSMENT OUTPUT EXAMPLE USING THE SBTN MATERIALITY TOOL

Activities by the mobile sector can contribute to the six main drivers of change in biodiversity: land use/use change, sea use/use change, water use, water and soil pollution, climate change, and invasive species and disturbances.

Using the SBTN materiality tool and internal resources, the below is an illustrative example for direct operations of a telecommunications operator. Please note that the illustration is indicative, will depend on operations and location, and is not prescribed by any framework.

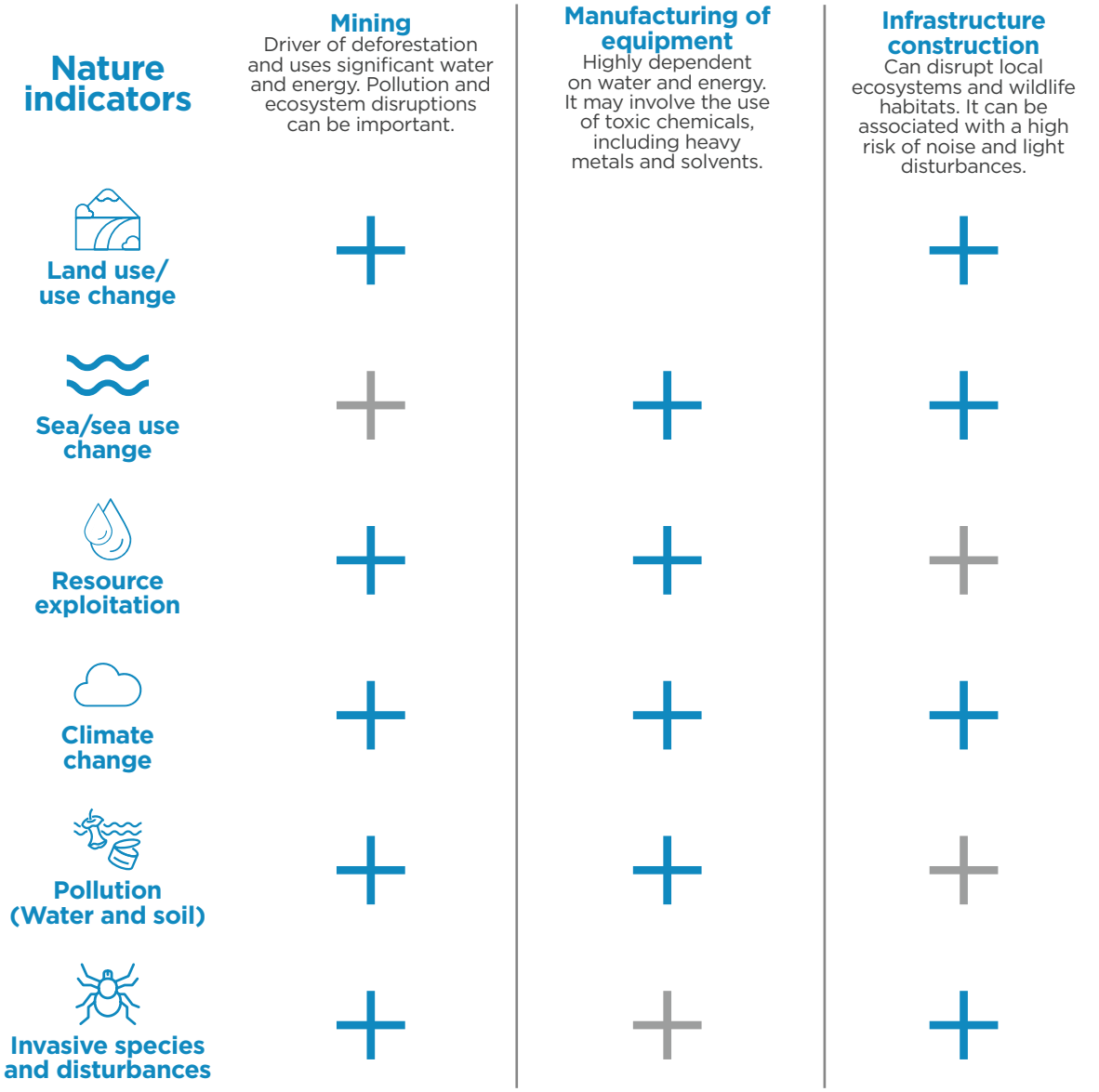
Direct operations – activities to prioritise

Nature indicators	Data centres These consume significant amounts of water and energy for server cooling and to maintain optimal temp. and humidity conditions	Infrastructure expansion Linear terrestrial network, base stations, large data centres and undersea cables	Infrastructure maintenance Upkeep of access roads in bushland, forests or other natural areas can contribute to incursion of invasive species
Land use/ use change	+	+	+
Sea/sea use change	+		
Resource exploitation		+	
Climate change		+	
Pollution (Water and soil)	+	+	+
Invasive species and disturbances	+		+

+ = Pressure to be assessed + = Pressure to be considered for materiality

Source: SBTN Materiality tool, Quantis resources

Upstream supply chain – activities to prioritise



Key activities in the upstream value chain of the telecommunications sector that have nature impacts are displayed above. Three key activities are mining extraction, manufacturing of commercial equipment and infrastructure construction. Please note that this illustration is also indicative and will depend on the specific supply chain of the company.

Source: SBTN Materiality tool, Quantis resources

The WWF Risk Filter is another useful option but requires more data input, making it suitable for companies with greater data access.

Mobile operators should also assess potential overlaps between their suppliers' activities and sensitive ecosystems, similar to the process for direct operations. This guidance recommends using Tier 1 supplier information on manufacturing at this stage (for example, life cycle assessments of products).

An annual reassessment of value chain materiality is recommended or, alternatively, when a major change in the organisation occurs (e.g. new products, business acquisition, geographical expansion etc).

Case Study: BT Group

Programme:
Integrating Nature into Business Decision-Making: A Case Study

Overview
BT Group collaborated with Little Blue Research to develop a roadmap for integrating nature and biodiversity into business decision-making and disclosures. The goal was to understand the impacts and dependencies on nature throughout BT Group's operations and supply chain.

Problem statement
BT Group wanted to explore how nature-related risks and opportunities could be considered in its business processes. The company was looking to gain a better understanding of how to prioritise more than 8,000 assets that included telephone exchanges, data centers and Openreach training centres, and to then screen these assets for nature-related impacts.

Solution
Little Blue Research provided technical support to develop a future strategy on biodiversity and nature-related disclosures.

The team conducted spatial data analyses for some of BT Group's assets and suppliers to identify potential biodiversity impacts.

BT Group's assets were prioritised based on their nature interface and their potential to impact nature. They were

also screened to find opportunities for local protection, enhancement and restoration of nature.

A roadmap was crafted, outlining short-term and long-term actions for integrating nature into business decision-making. Additionally, Little Blue Research supported and peer-reviewed Openreach's internal nature working group.

Impact

BT Group has begun implementing the recommended actions from the roadmap to integrate nature into business processes, such as tracking which assets have protected species on-site. Openreach also presented its approach to identifying nature-related impacts to members of the UK Business & Biodiversity Forum.

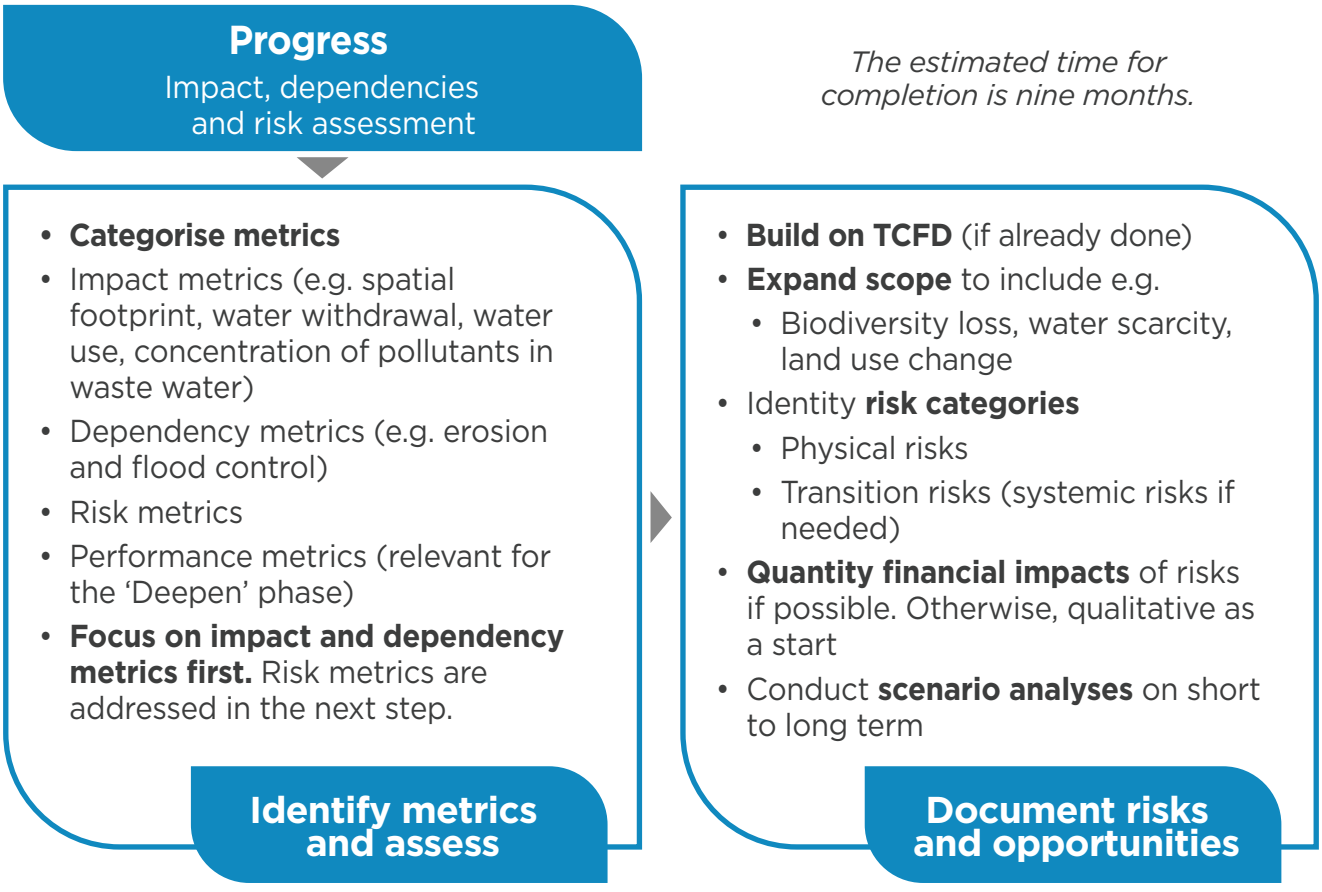
Conclusion

The collaboration between BT Group and Little Blue Research has provided an example for assessing nature-related impacts. This will enable BT Group to prioritise which business activities and processes should have nature-related considerations. While there is still much more to do, this work has provided a better understanding and a useful starting point for future efforts.

3.3 Progress – impacts, dependencies and risk assessment

The 'Progress' phase is the core of this phased approach because it integrates the main qualitative and quantitative estimates of an operator's impact and dependencies on nature. Key actions for the 'Progress' phase are summarised in Figure 13.

Figure 13 | Key actions for companies at the Progress phase



3.3.1 Identify metrics to assess impacts and dependencies

Disclosing metrics helps organisations communicate their sustainability performance to stakeholders, including investors, regulators and the public. Common disclosure metrics from nature assessments include:

1. **Impact metrics:** Quantitative measures of an operator's environmental footprint, such as greenhouse gas emissions, water usage and land use (see Table 5 for recommended metrics).

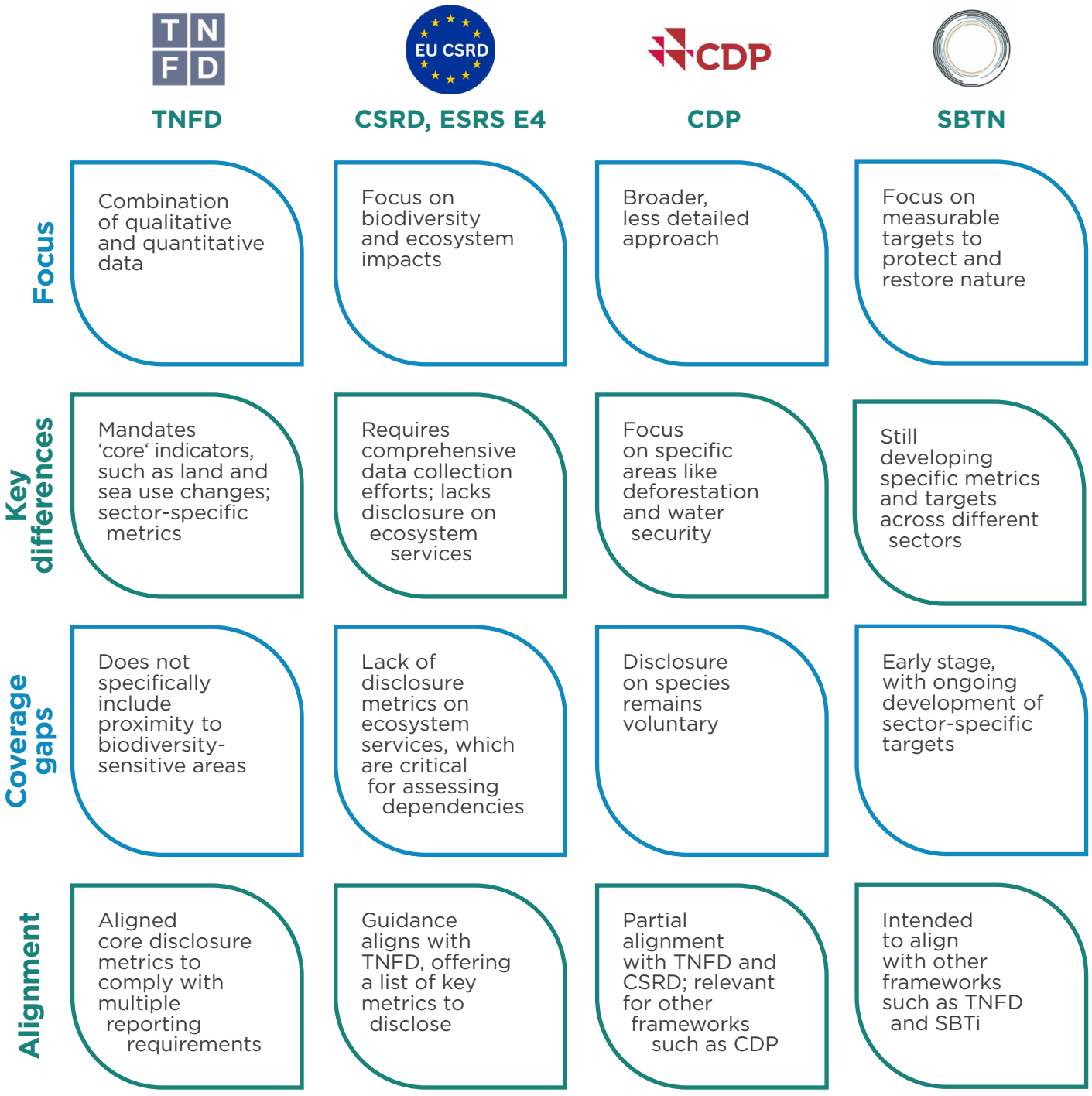
2. **Dependency metrics:** Measures that indicate how much an operator relies on natural resources, such as the volume of water required for operations or the dependence on specific ecosystem services (see Table 5 for recommended metrics).

3. **Performance metrics (targets):** Indicators that track progress towards sustainability goals, such as reductions in emissions or improvements in resource efficiency (relevant for the 'Lead' phase). Those are directly linked to the impact and dependency metrics (see Table 6 for sample targets).

4. **Risk metrics:** Indicators that assess the potential financial and operational risks associated with environmental dependencies and impacts, including the likelihood and magnitude of these risks (see Figure 15 for examples). Risk metrics that are related to the financial and operational key performance indicators of each organisation go beyond the advice in this guidance.

The main differences between disclosure metrics in the different nature assessment frameworks lie in their scope and depth (Figure 14).

Figure 14 | Overview of the main nature frameworks with regards to metrics



This guidance proposes six potential nature impact and dependency metrics for mobile operators (see Table 5). These metrics can be used for (partial) alignment with the TNFD and CSRD, as well as for other global reporting frameworks such as the CDP and GSMA ESG Metrics for Mobile[19].

It is recommended they are the priority focus. Other metrics in Annex 2 may also be required, depending on the framework and the region(s) of the operator. Please note that some of these metrics may not be relevant, with guidance given on the expected relevance depending on the activities, location and land use of the operator.

Table 5 | Recommended nature impact and dependency metrics for mobile operators

Category	Metric	Indicator description	Raw data sources	Expected relevance
Waste management (impact)	Total weight of waste by type and disposal method	Assesses waste generation and disposal practices	Waste management records crossed with LCA data	All operators
Biodiversity (impact)	Area and number of sites in or near protected areas or key biodiversity areas	Identifies interaction of organisation activities with Key Biodiversity Areas	Environmental impact assessments, GIS data	Dependent on location of sites
Land use (impact)	Total spatial footprint	Total spatial footprint of areas controlled/ managed by the organisation, where the organisation has control (km^2)	Land occupation and cadastral information e.g. boundaries, spatial data	Dependent on land use of operator
Water use (impact)	Water withdrawal from areas of water scarcity	Total water withdrawal (m^3) annually and overlap with areas of water scarcity by water source (e.g. surface water, groundwater, seawater, produced water, third-party water).	Water bills, metering data, LCA data	Dependent on activities (e.g. data centres) and their location
Water provisioning (dependency)	Water supplied by the ecosystem*	Volume of blue water supplied by the ecosystem (m^3)	Ecosystem services tool (e.g. InVEST Water Yield model, WWF Risk Filter), GIS data	Dependent on activities
Erosion control (dependency)	Capacity of the soil to prevent sediment flow**	Ability of a local ecosystem to retain sediments (0-100)	Scientific literature, SoilGrids, Ecosystem services tool (e.g. InVEST SDR Model, WWF Risk Filter)	Dependent on location of sites

* A proxy like water availability maps can be used if the company does not have access to regional local data and/or the capacity to model the dependency.
** A proxy like landslide risk can be used if the company does not have access to regional local data and/or the capacity to model the dependency.
19 GSMA. 2024b. ESG Metrics for Mobile .Available at www.gsma.com/solutions-and-impact/connectivity-for-good/external-affairs/esg-metrics-for-mobile/

Impact driver metrics[20] could be assessed in combination with the local environmental conditions, or 'state of nature', to better prioritise actions and targets. For instance, using a given volume of water in a water-scarce region has a more significant ecological impact than areas with high water availability, and thus should be prioritised.

For guidance on setting priorities based on the state of nature, we recommend referring to the SBTN Technical Guidance. Climate change (GHG emissions) is also a priority, but is excluded from the scope of this guidance as it is covered elsewhere.

Among the dependency metrics, water provisioning (i.e. ability of an ecosystem to supply water in sufficient quantity and quality) is expected to be the most critical for mobile companies with data centre operations. Erosion control may also be relevant depending on specific activities (e.g. network deployment and maintenance).

Global maps of dependencies (ecosystem services) are often dispersed or incomplete[21]. If mobile operators do not have the capacity to compile data from regional or local sources and/or using modelling tools, they can use risk proxies to estimate dependencies. For example, erosion control can be modelled using maps of landslide risks and flood control using flood hazard maps (from the WWF Risk Filter, for instance).

[20] The quality of the environment in relation to the functions that it fulfils
[21] See www.nature.com/articles/s41559-022-01934-5 and www.nature.com/articles/s43247-024-01797-7#Sec1 for examples

3.3.2 Nature-related risks and opportunities

Nature-related risk assessment builds on corporate risk management and climate-related risks. The mobile industry is already using TCFD-aligned processes like climate scenario analysis, stakeholder engagement and sustainability goals integration. Key elements include risk assessments, mitigation strategies, regular environmental metrics reporting and managing risks related to energy use, emissions and resource efficiency.

Adapted to nature, Figure 15 shows the interactions between impacts, dependencies and risks. It shows what constitutes a risk and the elements (i.e. magnitude, likelihood and vulnerability to an impact and dependency) that may be considered during the assessment and prioritisation of risks (WWF, 2019)[22]. These elements of a risk (impact/transition or dependency/physical) are to be used for each risk category (Box 3). The categorisation of the different risk types shown in Box 3 are recommended and are aligned with both the TNFD and the CSRD.

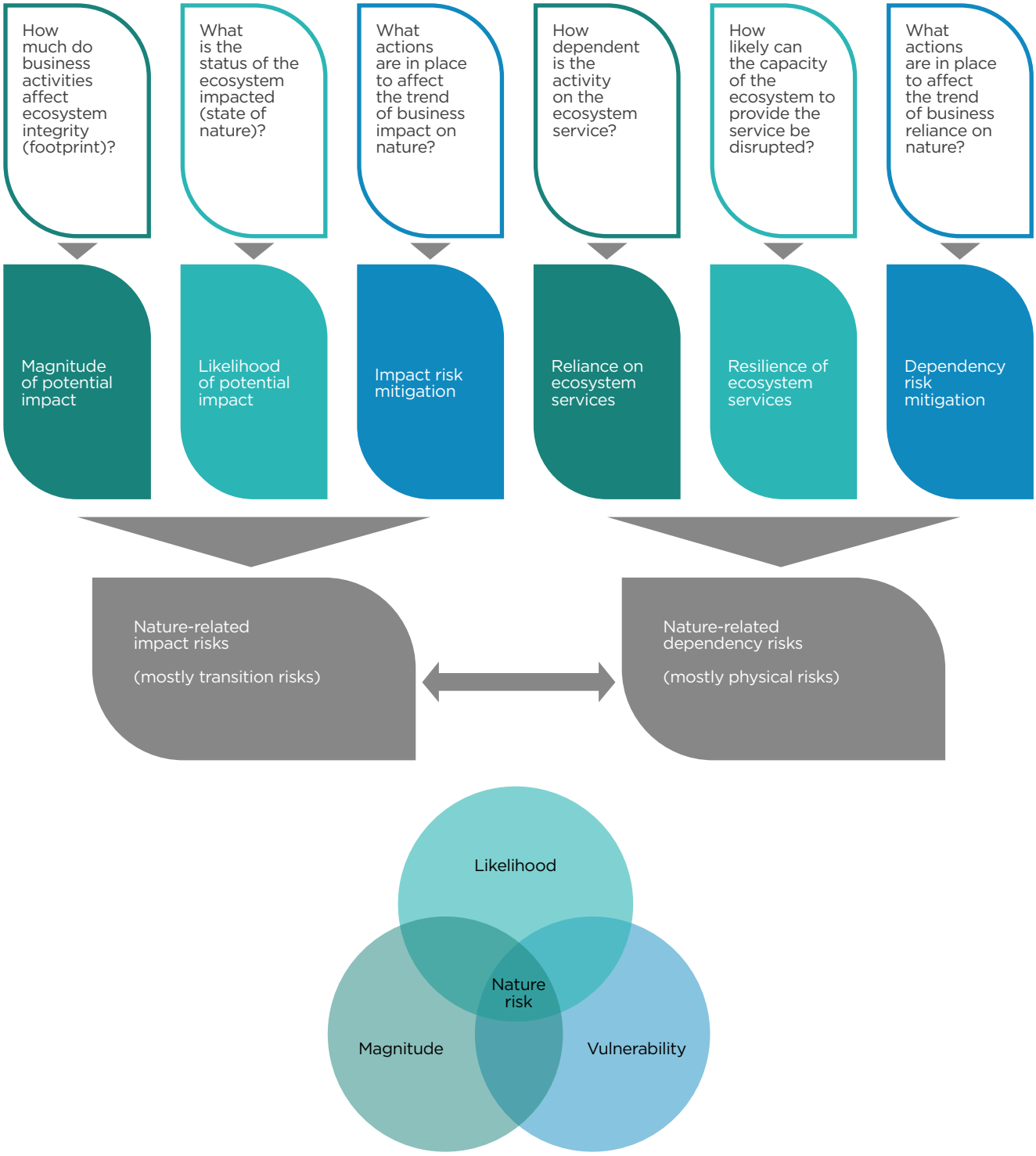
To incorporate nature-related risks, it is recommended for the industry to expand risk taxonomies to include biodiversity loss, water scarcity and land use. Typical risks include physical risks (e.g. flooding, erosion), transition risks (e.g. regulatory changes) and systemic risks. For example, transition risks linked to market changes may be considered due to growing consumer preference for sustainable products influencing demand for services and devices.

Engaging stakeholders through regular dialogue ensures responsiveness to external insights on risk. As with climate assessments, nature risk assessments may include initial qualitative estimates of financial impact and scenario analyses. This is recommended under both the TNFD and the CSRD (EBBP, 2024)[23].

[22] WWF. 2019. The Nature of Risk; A framework for understanding nature-related risk to business. Available at www.worldwildlife.org/publications/the-nature-of-risk-a-framework-for-understanding-nature-related-risk-to-business

[23] EBBP (European Business and Biodiversity Platform). 2024. Biodiversity Disclosures Initiatives. Available at green-business.ec.europa.eu/news/publication-thematic-report-biodiversity-disclosure-initiatives-2024-05-08_en

Figure 15 | Conceptual approach to identifying risks arising from nature impact and dependencies



Over short-, medium- and long-term time horizons, enhancing scenario analyses to include nature and integrating these insights into strategic planning will provide a more comprehensive understanding of risks and opportunities.

Regular training and engagement with stakeholders can help ensure that the entire organisation understands and incorporates nature-related considerations into decision-making processes.

3.3.3 Considerations when assessing the value chain

A simple assessment shows that nature impacts can be significant across the value chain (see Box 2 for an example). Metrics applicable to direct operations should also be applied to the value chain. While data on direct operations is usually available, possibly using the same input data as for climate assessments, collecting accurate data from suppliers can be challenging.

It is recommended that the relevant department, such as procurement or sustainability, develops consistent data collection systems, particularly with tier 1 suppliers, to access deeper supply chain information. Data collection for the value chain can involve supplier surveys, questionnaires and Lifecycle Assessment (LCA) data.

In the value chain, risks and opportunities often overlap with direct operations and particularly with transition risks. Environmental regulations can impose stringent requirements on both direct processes and upstream suppliers, leading to potential fines and reputational damage. Supply chain disruptions due to natural disasters can affect raw material availability and manufacturing continuity.

Classifying risks and opportunities into those impacting direct operations and value chain activities helps with implementing targeted strategies and assigning accountability to the appropriate teams (e.g. sustainability, procurement, HSE, etc) (UNEP, 2024b)[24].

24 UNEP. 2024b. Accountability for Nature: Comparison of Nature-related Assessment and Disclosure Frameworks and Standards. United Nations Environment Programme. Available at www.unepfi.org/publications/accountability-for-nature-comparison-of-nature-related-assessment-and-disclosure-frameworks-and-standards/

BOX 3 – EXAMPLES OF NATURE-RELATED RISKS AND OPPORTUNITIES RELEVANT TO A MOBILE OPERATOR, FOLLOWING THE TNFD CLASSIFICATION

Physical risks

Acute - Extreme weather events leading to service disruption
Mobile operators are at risk from acute physical events such as hurricanes, floods and storms. For instance, a severe storm can damage cell towers and disrupt service, leading to significant repair costs and service downtime.

Chronic - Long-term water scarcity leading to increased cooling needs and costs
Water scarcity affects cooling systems in data centres. In regions experiencing long-term droughts, mobile operators may face increased operational costs and potential service interruptions due to insufficient water supply for cooling critical infrastructure.

Transition risks

Policy - Stricter environmental regulations
Governments may impose stricter regulations on electronic waste disposal, requiring mobile operators to adopt more rigorous recycling and waste management practices (e.g. the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive).

Market - Shift in consumer preferences
Consumers are increasingly preferring sustainable products and services. Not aligning with these preferences may result in market share loss to competitors who offer eco-friendly options, such as devices with lower footprints or services powered by renewable energy.

Reputation - Negative public perception due to environmental impact
A mobile operator known for high levels of e-waste and resource-intensive operations may suffer reputational damage. This can lead to decreased customer loyalty and challenges in attracting new customers, impacting overall market position and profitability.

Technology - Emergence of sustainable technologies
The introduction of new technologies that reduce environmental impact, such as energy-efficient network equipment or biodegradable materials for devices, can pose risks to operators using older, less sustainable technologies.

Liability - Legal action for environmental damage
If the installation of a cell tower leads to the destruction of a protected habitat, the operator may face lawsuits and fines, resulting in financial losses and operational disruptions.

Systemic risks

Ecosystem stability - disruption of local ecosystems due to infrastructure expansion
The expansion of mobile network infrastructure into new areas can disrupt local ecosystems, leading to long-term ecological imbalances, ultimately affecting the stability of operations and the health of the communities served by the mobile operator.

Material opportunities

Physical opportunities
Implementing water and energy-saving technologies that reduce operational costs and enhance sustainability. Investing in infrastructure that is more

resilient to extreme weather, thereby reducing the risk of service disruptions.

Growth in revenues due to developing products and services that help monitor and protect nature (fire prevention, smart agriculture, etc).

Transition opportunities:
Developing new products and services that help customers reduce their environmental impact, such as smart home technologies and energy-efficient devices.

Green financing:
Accessing sustainable financing options and incentives that support investments in environmental sustainability.

3.4 Accelerate – target setting and disclosures

The 'Accelerate' phase includes target setting and the transition to voluntary/mandatory disclosures, marking a significant step forward in a company's nature assessment journey. Key actions for the 'Accelerate' phase are summarised in Figure 16.

Figure 16 | Key actions for companies at the Accelerate phase

3.4.1 Navigate frameworks and determine reporting scope

Starting voluntary or mandatory nature disclosures requires integrating nature into an operator's reporting systems, including sustainability reports, financial reports and regulatory disclosures such as the CSRD (Table 1). Disclosures should be comprehensive, transparent and aligned with frameworks such as the TNFD.

Under the CSRD, operators are expected to report on environmental impacts, risks and strategies, including greenhouse gas emissions, water usage, biodiversity impacts and progress toward targets. The TNFD also requires disclosure of dependencies on natural capital such as water for data centres, and associated risks, such as water scarcity.

Disclosures under the European Sustainability Reporting Standards (ESRS) E4 only require metrics disclosure for direct operations at present. Other disclosures, such as the process to identify material impacts and dependencies under the TNFD, must include value chain considerations. It is recommended that mobile operators report on actions to build resilience to nature-related changes and align their business model with the global biodiversity framework vision. This includes addressing biodiversity and ecosystem risks across the value chain.

3.4.2 Set targets

Both the TNFD and the CSRD require setting clear, measurable targets to manage impacts and dependencies on nature. These frameworks guide organisations in identifying and mitigating nature-related risks while contributing positively to global environmental goals.

It is advised that each target includes information on:

- the impact driver/risk management objective that the target addresses
- the metric to quantify the target and progress
- a baseline
- the targeted value of the metric (e.g. falling under an ecological threshold)
- the timeframe and alignment with global goals such as the GBF, the Paris Agreement or the planetary boundaries.

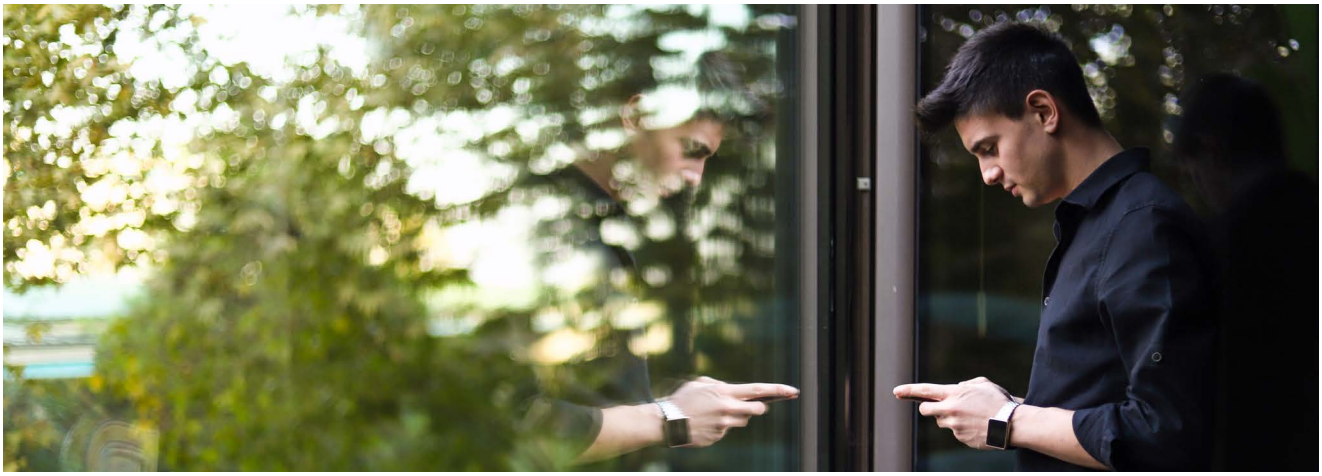
Ecological thresholds and allocations of impacts to activities or materials by regions should be considered when setting targets. To set ambitious targets and thresholds for material indicators, the following approach is suggested by order of preference:

1. As suggested by the TNFD and the CSRD, is there an approach to determine a safe limit for pressure on the processes which maintain ecological stability and resilience (based on the scientific literature, e.g. Rockström et al (2009)[25])?
2. Does a science-based goal already exist to inform the target (e.g. local guidelines, EU directives etc.)?
3. Does a societal goal exist but some gaps in the science are acknowledged?

As general advice, this guidance suggests referring to online databases of planetary boundaries' tipping points[26], ecosystem health indicators (e.g. ecosystem integrity index or health index) and the guidance on biomes from the TNFD. The SBTN uses ecological thresholds to guide companies to set land and water targets.

This guidance recommends the SBTN's Step 3 guidance[27] to help set key targets on land and water, while Table 6 provides sample outcome targets for each of the main impact categories identified in the Progress phase.

These targets show possible target scopes and should be reconsidered after a mobile operator has undertaken the Initiate and Progress phases.



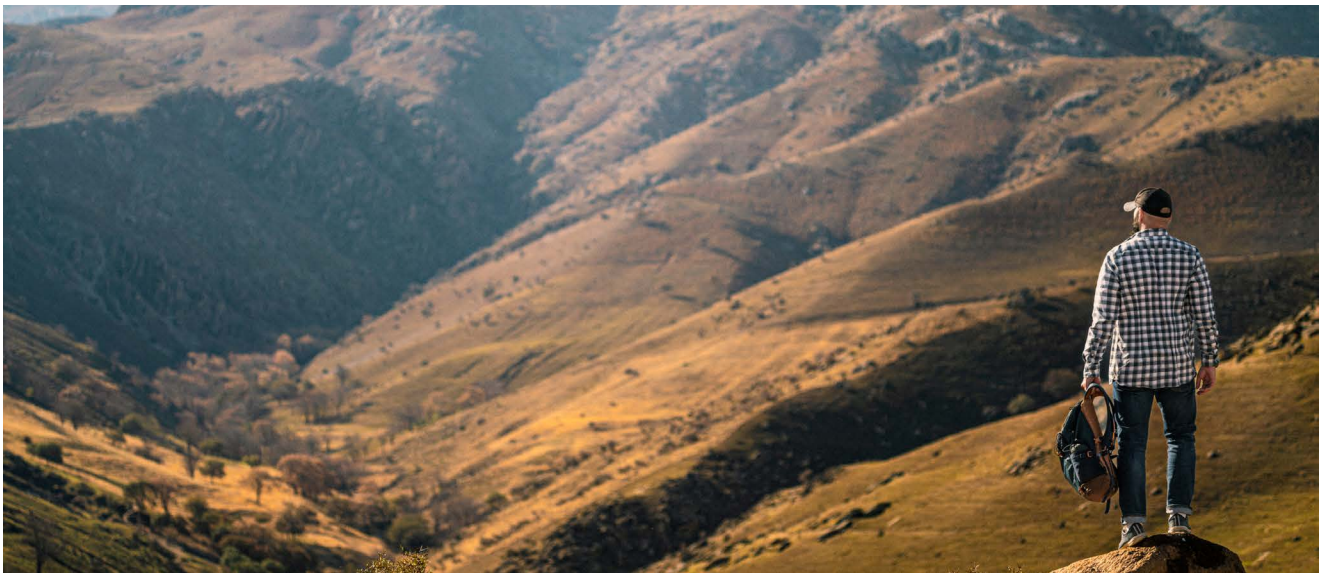
[25] Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. Schellnhuber, B. Nykvist, C. A. De Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen and J. Foley. 2009. Planetary boundaries: exploring the safe operating space for humanity. Ecology and Society 14(2): 32.

[26] https://global-tipping-points.org/resources-gtp/

[27] https://sciencebasedtargetsnetwork.org/companies/take-action/set-targets/

Table 6 | 2025 and 2030 sample targets for mobile companies

Category	2026 recommended sample target	2030 recommended sample target	Connected legislation
Waste management	Achieve a xx% reduction in e-waste generated from devices	Achieve zero e-waste to landfill	The target aligns with the Basel Convention and the Waste Electrical and Electronic Equipment Directive
Biodiversity	Map xx% of mobile network infrastructure (e.g. cell towers, data centres) near or in biodiversity-sensitive areas.	No net biodiversity loss from mobile infrastructure by implementing biodiversity action plans for sites near or in biodiversity-sensitive areas.	The targets align with the Post-2020 Global Biodiversity Framework
Land use	xx% of all new mobile towers and data centres are built on previously developed land or through tower-sharing agreements to minimise land footprint.	Reduce the company's overall spatial footprint by xx%	The targets align with the Post-2020 Global Biodiversity Framework
Water use	Reduce water withdrawal by xx% across all company data centres and network operations in water-scarce basins	Achieve a xx% reduction in water usage in all data centres located in water-scarce basins	The target aligns with the CEO Water Mandate



3.4.3 Value chain reporting requirements across frameworks

Operators may report using frameworks that differ slightly on how they address various components of the value chain. Table 7 below summarises the main differences in how the SBTN, TNFD and CSRD approach value chains. These vary from upstream to downstream, as well as when companies are required to report.

Table 7 | Approach to the value chain from the SBTN, TNFD and CSRD

Framework	Approach	Upstream activities	Downstream activities
SBTN	Baseline assessment, supplier collaboration	Focus on high-impact areas, accurate data collection	Added in June 2024 update for complete coverage
TNFD	Supply chain mapping, sector-specific guidance	Assess impacts on biodiversity and ecosystems (e.g. raw material extraction)	Consider nature-related risks (e.g. product use, disposal)
CSRD	Mandatory reporting on environmental impacts and dependencies	Required for direct operations, upstream disclosures mandatory by 2027	Downstream disclosures mandatory by 2027

3.4.4 Prepare public disclosures

Mobile operators may not fully align with all disclosure recommendations immediately, but are advised to begin initial disclosures and acknowledge gaps transparently. These disclosures should include methodologies, materiality assessments and progress on interim targets, and can also cover governance and social considerations that are not addressed by this guidance. The readiness plan from the 'Initiate' phase can be updated to address these gaps with clear timeframes and resource allocation.

Case Study: TDC NET

Programme:
Connecting Danish Nature

Overview
TDC NET, the leading provider of digital infrastructure in Denmark, has been connecting the country for more than 140 years. With a commitment to futureproof digital infrastructure through its fibre network and 5G mobile network, TDC NET is now taking significant steps to integrate nature and biodiversity into its business decision-making processes.

Problem statement
Denmark is significantly behind the '30by30' target set by COP15 in Montreal, which aims to preserve 30% of land and ocean by 2030. Currently, only 1.6% of land and 1.9% of sea areas in Denmark are protected. Biodiversity loss poses a substantial threat to the global economy and immediate action is required to mitigate this crisis.

Solution
- TDC NET has adopted the ambition from COP15, setting a target to preserve 30% of its its land by 2030. The company impacts nature above ground, below ground and below water through its extensive digital infrastructure. To address this, TDC NET has mapped its national area footprint against existing nature areas with high biodiversity and species scores. This mapping helps

identify where the company can expand nature preservation efforts. A roadmap has been developed to onboard nature projects throughout Denmark by 2030.

- In 2024, TDC NET onboarded the first 10% of its nature preservation target, focusing on 30 hectares of land in North-East Zealand, a Nature 2000 area with protected nature types. Collaborating with the municipality's nature team, TDC NET developed a plan for nature care and identified concrete recovery projects, including a shared grazing project with the Danish Nature Agency and a heather restoration project to improve conditions for red-listed butterflies.

Impact

The partnership approach to nature restoration has already shown promising results. By collaborating with local partners and volunteers, TDC NET is creating the best possible conditions for nature. The company's efforts contribute to expanding and connecting Danish nature, promoting biodiversity and enhancing the resilience of ecosystems.

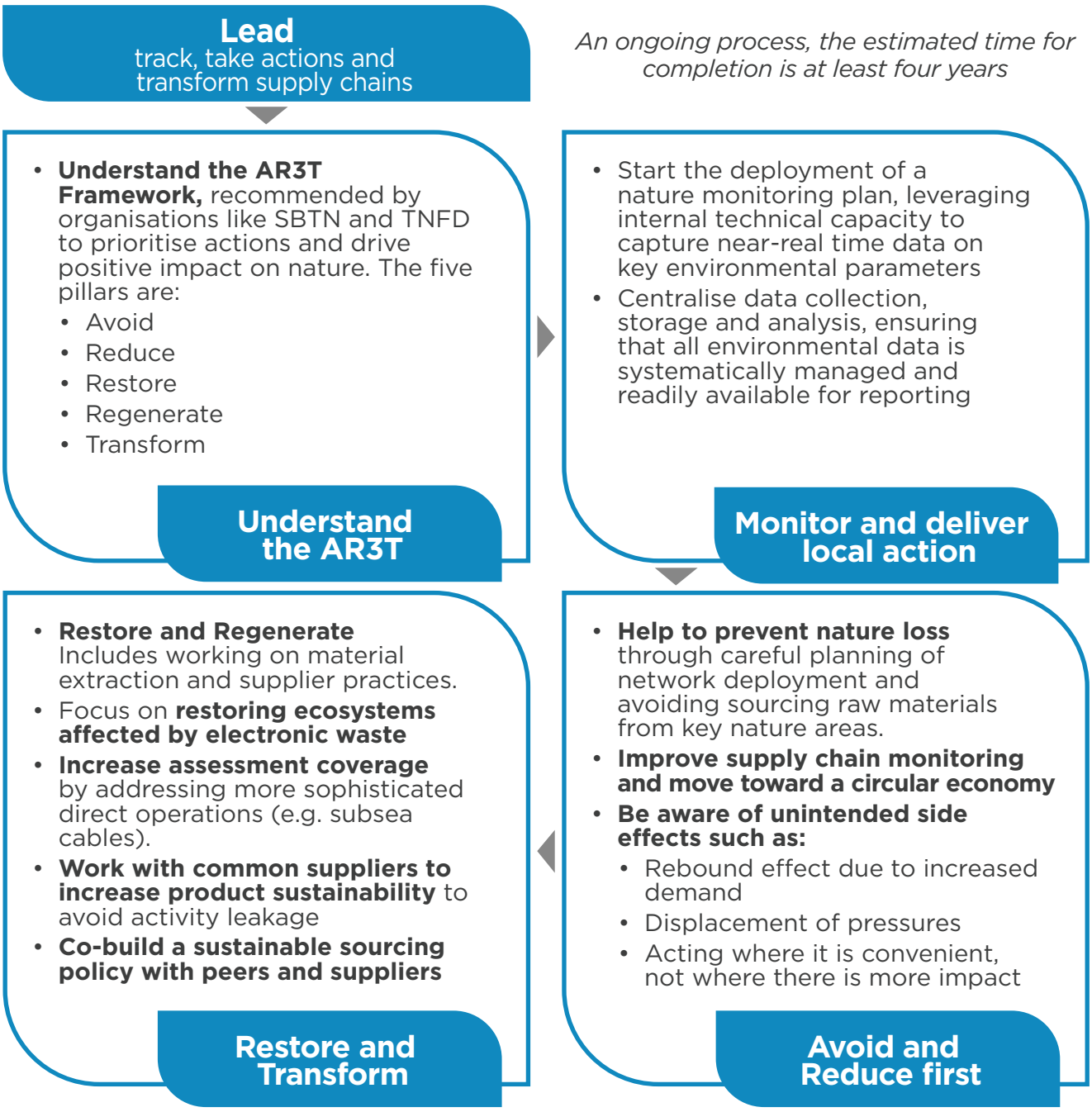
Conclusion

TDC NET's commitment to integrating nature and biodiversity into its overall strategy and processes demonstrates a proactive approach to addressing environmental challenges. By setting ambitious targets and collaborating with various stakeholders, TDC NET is contributing to the preservation of natural capital and promoting sustainable growth. The company's efforts align with the broader goal of achieving the '30by30' target, ensuring a positive impact on both the environment and society.

3.5 Lead – track, take action and transform supply chains

The 'Lead' phase emphasises proactive stewardship of nature. Here, mobile operators not only manage their own environmental footprint but also influence and improve the sustainability performance of their suppliers, fostering systemic change. Key actions for the 'Lead' phase are summarised in Figure 17.

Figure 17 | Key actions for companies at the Lead phase



3.5.1 Understand the AR3T framework

The AR3T Framework, recommended by the SBTN and TNFD, guides actions to create positive impacts on nature (TNFD, 2023)[28]. The CSRD advises applying the mitigation hierarchy (avoidance, minimisation, restoration, compensation) and aligning targets with AR3T. This framework supports a phased approach, starting with 'avoidance' and progressively moving to the full 'transformation' of the industry to align business practices with nature protection objectives (Table 8).

Table 8 | AR3T framework for the mobile industry

AR3T framework element	Description	Action example
Avoid	Prevent impact from happening in the first place, eliminating the impact entirely	• Careful planning of network deployment to help prevent nature loss • Avoid sourcing raw materials from key nature areas
Reduce	Minimise impacts, but without necessarily eliminating them ('As low as reasonably practicable')	• Improve supply chain traceability to monitor nature impacts across ICT and other industries • Infrastructure sharing to reduce spatial footprint • Circular business models to reduce e-waste and the need to mine minerals
Restore	Bring a degraded natural system (like a watershed or peatland) back to a near-original natural condition or state	• Promote green space restoration in urban areas and invest in local restoration projects close to upstream activities. • Invest in high-quality biodiversity credits to support biodiversity-positive projects [Note: these should not be used as a compensation mechanism for an operator's negative impact]
Regenerate	Increase the functionality of an ecosystem, with focus on specific stocks (like soil) or services (like pollination)	• Create pollinator-friendly habitats in green buffer zones around infrastructure in urban spaces
Transform	Ensure systemic change across the industry within and beyond own supply chain	• Map and align mobile operator supply chains with the circular economy principles through traceability and improved practices

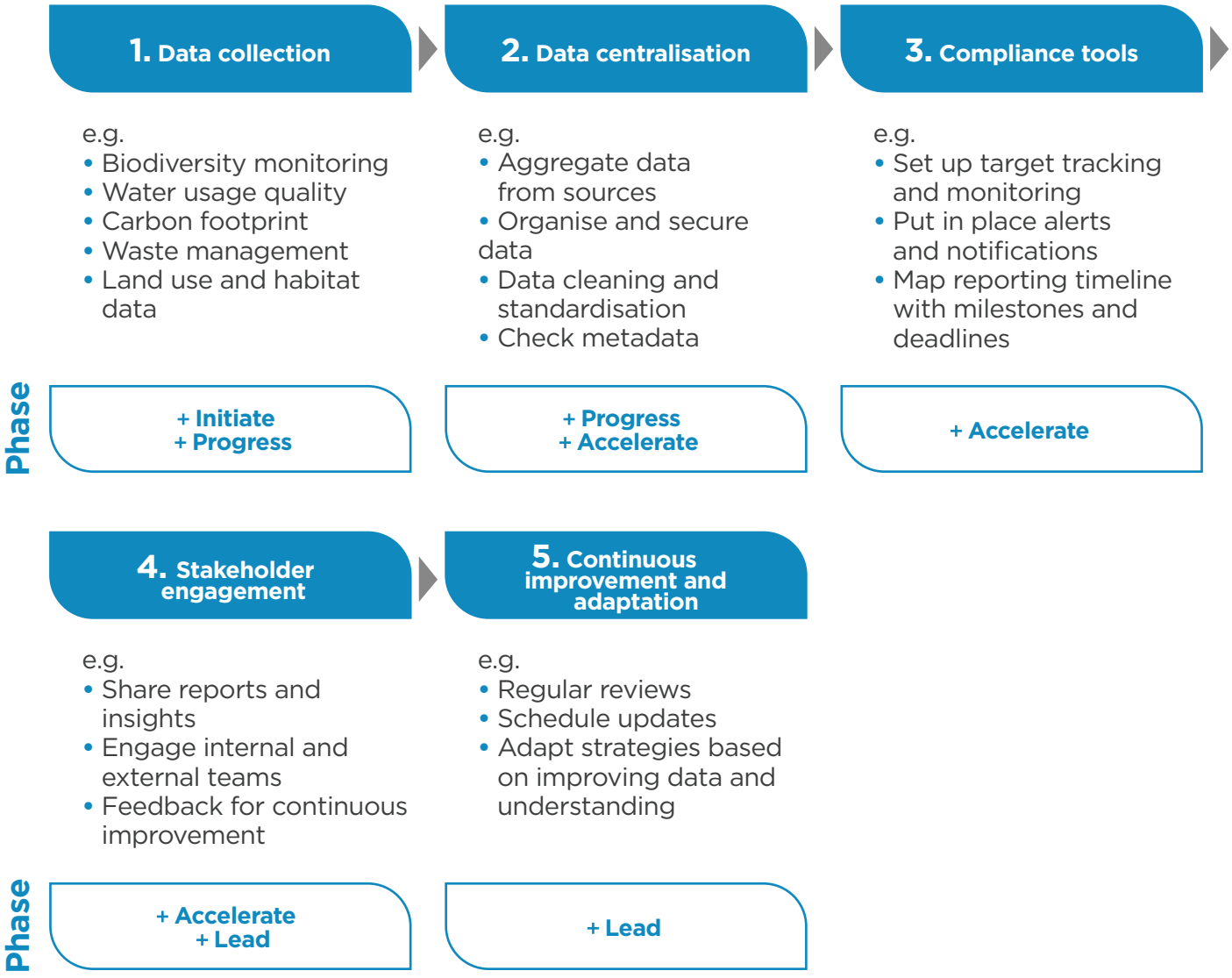
28 TNFD (Task Force for Nature-related Disclosure). 2023. Recommendations of the TNFD. Available at tnfd.global/recommendations-of-the-tnfd/

3.5.2 Monitor and deliver local action

Mobile operators can deploy a monitoring plan using internal capabilities to capture near-real-time data on key environmental parameters like energy use, water, emissions and land use changes.

This data can be centralised in an Environmental Management System (EMS) to streamline data management and align with reporting obligations and continuous improvement mechanisms (Figure 18).

Figure 18 | Using nature-related data in an EMS for compliance, reporting and continuous improvement



See Biodiversity Credit Alliance for more information on what constitutes a high-quality biodiversity credit

3.5.3 Avoid and Reduce as priorities

Figure 19 illustrates how operators can move towards impact avoidance and reduction. Circular business models have broad nature benefits, reducing carbon emissions, raw material extraction and e-waste. Collaboration with waste management firms can support the development of innovative recycling technologies that reduce waste disposal costs and enhance material recovery. Smart connected mobile technologies can also be deployed to directly support monitoring of nature impacts to help target conservation and restoration efforts.

Figure 19 | Actions to avoid and reduce impacts on nature for the mobile industry

Moving towards circular business models

+ Prioritise extending the lifetime of products and components through recycling and recovery. This can be done through direct reuse of an obsolete product or component or remanufacturing to re-establish full functionality. **ex: Re initative (Orange)**
+ Establish a strong value proposition to encourage customers to bring back their used and old devices. This can include offerings on information security, financial incentives, added convenience, contribution to a good cause and compliance with local legislation, as well as building trust with customers. **ex: Telia return logistics of devices**
+ Adequate planning before deploying network and/or the sharing of infrastructure between mobile operators. This reduces pressure on land occupation, greenhouse gas emissions **ex: Infrastructure sharing (Cellnex)**

Avoid **Reduce**

Improving the monitoring of nature

+ Provide the technology and mobile network to enhance traditional observation methods to monitor biodiversity, including micro-cameras, photo-traps and acoustic recorders (bio-acoustics and eco-acoustics) **ex: Wildlife crime technology project (Cisco)**
+ Use technology and know-how to improve evaluation, analysis of biodiversity and protection of key nature areas, including real-time reporting of possibie illegal activities, species identification through modeling ex: **RFC x Italy Wetlands Protection (Huawel)**

Reduce

3.5.4 Advance to Restore, Regenerate and Transform

Going beyond avoidance and reduction focusses on restoring and regenerating degraded ecosystems. There are many options that will depend on local conditions. Examples include pollinator-friendly buffer zones around network infrastructure in urban areas, green roofs on office buildings and investing in biodiversity credits to enhance nature elsewhere.

To establish leadership, mobile operators can advance through to the Transform element of the AR3T framework, focusing on broader assessment coverage and deeper supplier engagement. This entails either expanding assessments to include complex and harder-to-evaluate operations, such as subsea cables (see Box 4) situated in understudied ecosystems or politically sensitive areas, or by comprehensively evaluating all indirect impacts across the entire value chain, covering all supplier tiers and downstream activities.

BOX 4 – INCREASE ASSESSMENT COVERAGE OF COMPLEX SYSTEMS: EXAMPLE OF SUBSEA CABLES

Telecommunication cables and high-voltage power cables are the two broad categories of subsea cables. Around 600 telecommunications cables are active or planned, for a total length of 1.4 million km in operation (Aquacomms, 2024)[29]. Typically, cables are laid in low-hazard regions and buried in near-shore areas where human activities could affect the cable. It is common for biodiversity, especially opportunistic species, to survive when a cable is installed before ecological succession takes place. However, there are short-term and long-term impacts that needs to be considered:

Short-term impact: e.g. seabed disturbances; loss of habitat; increase in turbidity.

Long-term impact: e.g. increases in heat as a direct function of the current passing through a cable and the depth at which it is buried; invasive species can spread along cable routes through different ecosystems that were previously separated.

While physical disturbances and impacts caused by cable laying and repairs depend on the frequency and extent of these activities, other impact types are related to the cable composition and operation, as well as species present in the area affected by potential behavioural changes and their sensitivity (Taormina et al. 2018)[30].

Mobile operators can both be a source of and offer solutions to subsea cable impacts by funding deep-sea research or investing in R&D to monitor wildlife. For example, Distributed Acoustic Sensing (DAS) has emerged as a game-changer in remote acoustic sensing and could fill monitoring gaps. It brings a combination of good spatial coverage, relatively low capex and potential for real-time monitoring (Rørstadbotnen et al. 2023)[31].

29 Aquacomms. 2024. Submarine Cable 101. Available at www2.telegeography.com/submarine-cable-faqs-frequently-asked-questions
30 Taormina, B., Bald, J., Want, A., Thouzeau, G., Lejart, M., Desroy, N. and Carlier, A. (2018). A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions. Renewable and Sustainable Energy Reviews, 96, 380-391.
31 Rørstadbotnen, R. A., Eidsvik, J., Bouffaut, L., Landrø, M., Potter, J., Taweesintananon, K. ... and Oye, V. (2023). Simultaneous tracking of multiple whales using two fibre-optic cables in the Arctic. Frontiers in Marine Science, 10, 1130898.

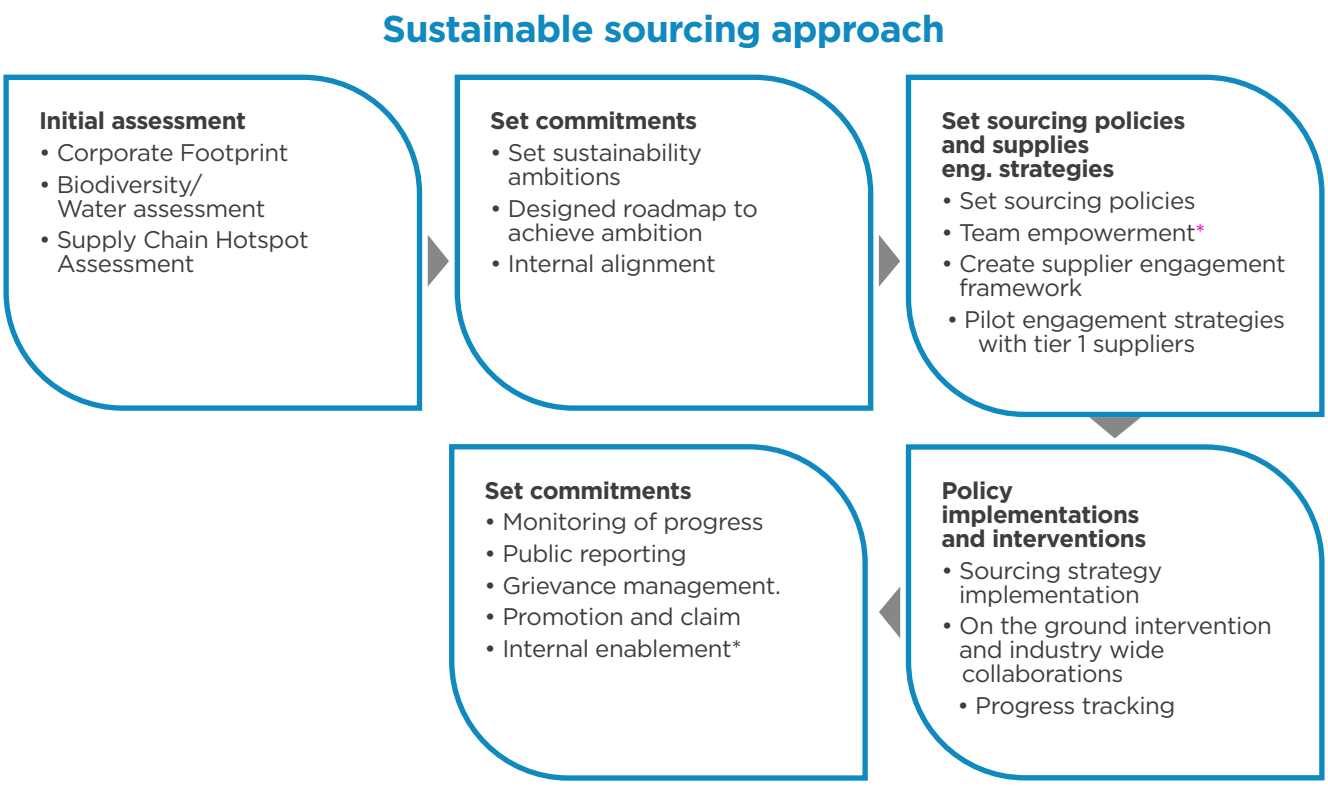
Mobile operators could identify and address hidden environmental impacts (i.e. leakages) by expanding the scope of assessment. Leakage can occur when value chain interventions lead to unintended environmental impacts outside the value chain (Bastos Lima et al, 2019).

Both activity leakage (e.g. compensation for activity/financial loss by expanding non-sustainable activities) or market leakage (e.g. increase in sustainable resource demand and prices lead to increase in resource use) are potential issues for mobile operators and should be considered at this stage.

3.5.5 Develop a sustainable sourcing approach

The AR3T framework is particularly relevant for upstream value chains in the Restore, Regenerate and Transform elements. For upstream, this involves improving raw material extraction and supplier practices. Partnering with suppliers to implement these solutions can help ensure verifiable restoration commitments and long-term positive impacts near extraction sites. Figure 20 provides an outline of a sustainable sourcing approach.

Figure 20 | Sustainable sourcing approach in phases



Collective action within the sector can be highly effective in advocating for and supporting improved environmental standards among business partners. Co-building a sustainable sourcing policy with peers and suppliers is recommended because this collective effort can help achieve zero land conversion, reduce energy consumption and water losses and foster practices that reduce or avoid negative nature impact.

Case Study: América Móvil

Programme
Conservation of Marine Species in the Sea of Cortés.

Overview
The seas are vital for environmental balance. For 15 years, the WWF Telmex Telcel Foundation Alliance has restored and conserved 17 million hectares of marine and coastal ecosystems in the Gulf of California and the Mexican Pacific. América Móvil, in collaboration with various stakeholders, has focused on research, preservation and recovery of more than 10 key marine species, including cetaceans, sharks and marine turtles, which are essential for ecosystem health.

Problem statement:
The degradation of marine and coastal ecosystems and the decline of key marine species due to human activities.

Solution:
América Móvil has implemented a multifaceted approach to marine conservation and the management of Marine Protected Areas, including:

- Scientific information for decision-making: Monitoring initiatives for key species in various regions, including whale sharks in La Paz Bay, white sharks near Guadalupe Island and the Coronado Islands, and marine turtles across different locations.
- Technology for conservation: Use of cutting-edge technology, such as satellite and acoustic tracking for marine turtles, AI-driven photo-identification of turtles and innovative tracking methods for vessels engaged in whale shark tourism.

- Installation of mooring buoys around Espíritu Santo Archipelago to manage marine tourism and protect the reef.
- Capacity building and workshops: Conducted workshops for CONANP (National Commission of Natural Protected Areas) and SEMAR (Marine Ministry) staff on marine turtle monitoring and ghost gear impact, as well as sessions to update the management programme of Espíritu Santo Archipelago.
- Whale Disentanglement Network (RABEN): Strengthened the whale disentanglement network, successfully rescuing 31 whales in the last three years.
- Community involvement and training: Supported 10 turtle camps in the Mexican Pacific, engaging 124 individuals in conserving 50 km of beach and protecting 8,211 nests.

Impact:
These actions have reduced high-speed incidents in the sighting area from more than 300 in 2020 to just seven in the 2022-2023 season. América Móvil established the whale shark scientific committee in 2023 with CONANP for their protection and preservation. More than 120 tons of trash have been removed from beaches, mangroves and the sea floor in six protected areas in Baja California Sur. Sixty-thousand tourists in Balandra and Espíritu Santo Archipelago were received, generating much-needed revenue, and two hectares of mangrove forests were restored. Additionally, América Móvil impacted more than 2,200 coastal community members and reached more than 32,000 people with conservation information and enlightenment efforts.

Conclusion:
The information and experience gained over the years enabled América Móvil to work with the federal government on designing and updating seven public policy instruments. These efforts secure coastal communities' livelihoods and enhance their climate change resilience. América Móvil's commitment to integrating scientific information with decision-making, policy development and ecosystem conservation highlights the lasting impact of their work.

4 Integrating nature into business strategy

Integrating nature into the business strategy of mobile sector players involves recognising the connections between business activities and the natural environment. This section presents key pillars to consider to support integration.

4.1 Internal business case

A robust internal business case aligns environmental sustainability with financial and operational goals, ensuring that nature initiatives are integrated into the company's strategic priorities and decision-making processes. Mobile operators can draw upon the information presented in this guidance to create the business case to senior leadership to take action and support nature assessments.

4.2 Focus on high-impact areas

Operators can leverage its existing data collection and analysis capabilities to focus on high-impact areas. Operators should also remain agile and responsive to emerging insights and best practices, using available data and allowing for iterations.

The challenges of value chain data access and accurate quantification can be addressed in separate research, though operators do not need full understanding before starting the groundwork set out in this guidance.

4.3 Continuous improvement and customisation

Leveraging industry averages and proxy data can be effective starting points for initial assessments. Methods can be refined and enhanced as more specific data becomes available (for example, from suppliers or for specific products).

Continuous improvement by incorporating feedback and adapting to specific processes and geographical regions will be necessary to ensure relevance and effectiveness as the nature assessment landscape evolves and nature data improves.

4.4 Supply chain traceability

Mobile operators can improve supply chain traceability by looking at other sectors, such as the food and beverage industry, that have established blockchain technologies to track the journey of products from farm to table (e.g. IBM Food Trust, 2024)[32]. This system provides consumers with detailed information about the origin and production methods. Emerging technologies such as blockchain and AI can be employed to enhance supply chain transparency, ensuring that all materials and processes meet sustainability standards.

4.5 Industry engagement

Encouraging engagement across the value chain is crucial. The mobile industry is mature in several areas such as risk management, financial impact analysis and environmental assessments. However, there is room for improvement in engaging the entire value chain, particularly upstream suppliers and downstream partners, to ensure that sustainability efforts are not isolated but collaborative.

[32] IBM. (2024). IBM Food Trust. Available at www.ibm.com/products/supply-chain-intelligence-suite/food-trust

4.6 Conclusion

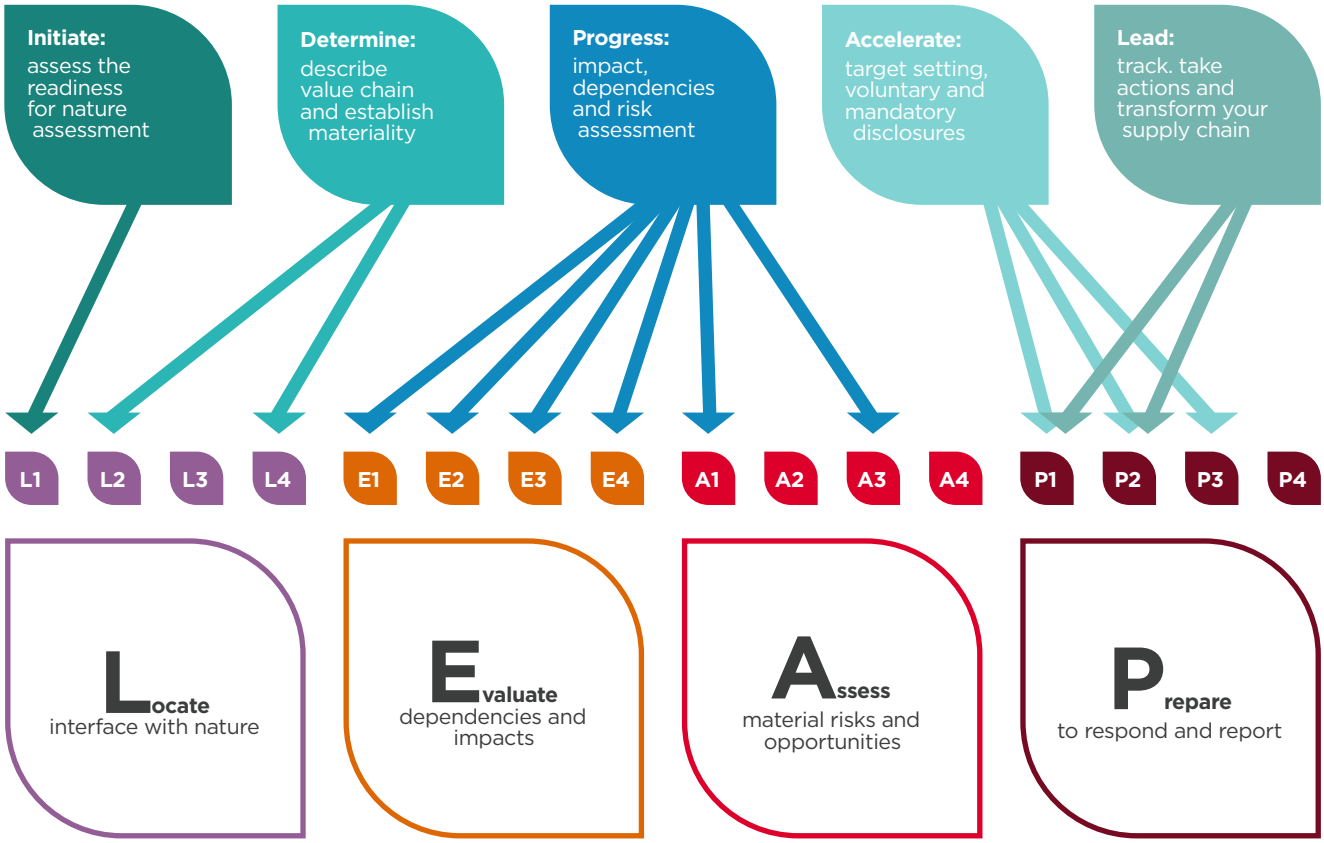
Integrating nature into the business strategies of the sector is a critical step towards building resilient and sustainable operations. By embedding nature into core business processes, focusing on high-impact areas and continuously improving methodologies, companies can not only mitigate risks, but also unlock new opportunities for innovation and growth.

The mobile industry, with its technological strengths, can lead by example, ensuring nature-focused strategies are practical, iterative and aligned with global sustainability goals. Collaborative efforts across the value chain will be key to making a lasting, positive environmental impact.

Annex 1 – Mapping the five phases approach against the TNFD LEAP approach

This guidance aligns with the following sections from the TNFD LEAP approach.

Full compliance with the TNFD LEAP approach should be confirmed on case-by-case basis.



TNFD Taskforce on Nature-related Financial Disclosures

Focus on most **MATERIAL** activities across the full value chain

Focus on **DEPENDENCIES, IMPACTS, RISKS AND OPPORTUNITIES (DIRO)**

Annex 2 – Mobile sector-specific nature disclosure metrics

The table covers the main impact and dependency metrics and is aligned with the TNFD, CSRD and SBTN. It remains non-exhaustive. Each company should adapt this list and the relevant data sources based on contextual company information. Priority metrics for the sector are classified as high. Other metrics are important and should be addressed in priority if company-specific assessments show materiality.

Impact category	Metric	Indicator description (unit)	Direct operations covered	Raw data sources	Priority for mobile companies
Biodiversity	Area (km^2) and number of sites owned, leased or managed in or near protected areas or key biodiversity areas*	Identifies interaction of organisation activities with Key Biodiversity Areas	Offices, stores, equipment (cell towers, landlines, etc), factories (if any in direct operations; upstream to be included if possible)	Environmental impact assessments, GIS data	High
Biodiversity	Level of ecosystem condition by type of ecosystem and business activity	Several indicators can be used: • Ecosystem Integrity Index (0-100) • Biodiversity Intactness Index (0-100) • Species extinction risk (number of species at risk of extinction)	Offices, stores, equipment (cell towers, landlines, etc), factories (if any in direct operations; upstream to be included if possible)	Environmental impact assessments, GIS data	Medium
Air emissions	Total annual emissions of greenhouse gases	Measures GHG emissions in tons of CO_2 equivalent (tCO_2e)	Energy use in operations (offices, switch centres, data centres, shops...)	Emission inventories, LCA data	High (excluded from the scope of this guidance)
Land/sea/ freshwater use change	Total spatial footprint	Total surface area controlled/ managed by the organisation, where the organisation has control (km^2)	Offices, stores, equipment (cell towers, landlines, etc), factories (if any in direct operations; upstream to be included if possible)	Cadastral information, spatial data	High
Land/sea/ freshwater use change	Extent of land/ freshwater/ ocean use change	Surface of natural land (e.g. forests or all natural lands) that has been converted since 2020 for direct operation (km^2) by: • Type of ecosystem • Type of business activity	Offices, stores, equipment (cell towers, landlines, etc), factories (if any in direct operations; upstream to be included if possible)	Cadastral information, spatial data	Medium
Soil pollution	Percentage of total emissions of pollutants to soil	Nitrogen load to soil from direct and upstream operations (kg N eq)	Direct release (if any), waste disposal destination (e.g. e-waste landfills)	LCA data	Low

* A commonly recommended buffer for such assessment ranges from 1 to 10 kilometres. Companies can try to use different buffers and agree on a conservative buffer average.

Impact category	Metric	Indicator description (unit)	Direct operations covered	Raw data sources	Priority for mobile companies
Waste management	Total weight of waste by type and disposal method	Assesses waste generation and disposal practices	Direct release (if any), waste disposal destination (e.g. e-waste landfills)	Waste management records, LCA data	High
Water pollution	Total pollution water discharge by quality and destination	kg nitrogen/ phosphorus eq: total volume of nutrients discharged OR concentration (%) in discharged water and volume of discharged water	Offices, stores, factories (if any in direct operations, upstream should be included), operations (e.g. cooling systems)	Environmental monitoring data, LCA data	Medium
Water use	Water withdrawal from areas of water scarcity	Total water withdrawal (m^3) annually and overlap with areas of water scarcity, by water source (e.g. surface water; groundwater; seawater; produced water; third-party water)	Offices, stores, factories (if any in direct operations, upstream should be included), operations (e.g. cooling systems)	Water bills, metering data, LCA data	High
Water use	Water consumption	Total m^3 of water consumed annually	Offices, stores, factories (if any in direct operations, upstream should be included), operations (e.g. cooling systems)	Water bills, metering data	Medium
Water use	Water recycling	Total m^3 water recycled and reused	Offices, stores, factories (if any in direct operations, upstream should be included), operations (e.g. cooling systems)	Water bills, metering data	Medium

Dependency (ecosystem service)	Metric	Description	Direct operations covered	Raw data sources	Priority for mobile companies
Water provisioning	Water supplied by the ecosystem*	Volume of blue water supplied by the ecosystem (m^3)	Factories (if any in direct operations, upstream should be included), operations (e.g. infrastructure), offices	Ecosystem services tool (e.g. InVEST Water Yield model, WWF Risk Filter), GIS data	High
Erosion control	Capacity to the soil to prevent sediment flow**	Ability of a local ecosystem to retain sediments (0-100)	Factories (if any in direct operations, upstream should be included), operations (e.g. infrastructure), offices	Scientific literature, SoilGrids, ecosystem services tool (e.g. InVEST SDR Model, WWF Risk Filter)	High
Flood control	Land area exposed to flood events***	Production (raw materials and sites) exposed to altered flood risk levels (m^2)	Factories (if any in direct operations, upstream should be included), operations (e.g. infrastructure), offices	Scientific literature, ecosystem services tool (e.g. InVEST Runoff model, WWF Risk Filter)	Medium

* A proxy like a water availability map can be used if the company does not have access to regional/local data and/or the capacity to model the dependency.
** A proxy like landslide risk can be used if the company does not have access to regional/local data and/or the capacity to model the dependency.
*** A proxy like flood hazard can be used if the company does not have access to regional/local data and/or the capacity to model the dependency.

Annex 3 – Assessing materiality for telecommunication towers and data centres

TELECOMMUNICATION TOWERS AND USE OF THE SBTN MATERIALITY TOOL

Telecom towers are essential to mobile network operations, supporting communication services by hosting antennas and other equipment for signal transmission. However, their construction and operation pose various environmental and biodiversity challenges due to their energy consumption, land use and material waste. The SBTN materiality tool provides a structured approach to assessing the environmental impacts and dependencies of business operations. Using this tool, the following steps show the thinking process a company could have when defining the materiality of telecom towers for nature impact/dependencies and for risks:

Identify material pressures:

Energy consumption:
Towers often rely on electricity, with many in remote areas depending on diesel generators which are significant sources of pollution. This makes energy consumption a primary environmental pressure, especially for towers located off-grid.

Land use and habitat disruption:
The construction and placement of telecom towers can lead to land use (and changes), potentially disrupting local ecosystems and wildlife.

Waste generation: The installation, maintenance and eventual decommissioning of telecom towers generate solid waste, including obsolete electronics, batteries and structural materials. Proper management of these materials is essential to prevent soil and water contamination.

Assess the scale and scope of impacts:

Scale:
It is essential to measure the total energy consumption of telecom towers, especially in regions where reliance on non-renewable energy sources is high. For example, a telecom operator with thousands of towers could be using millions of literes of diesel annually.

Scope:
The scope includes both direct and indirect environmental impacts. For example, the installation of towers in wildlife-rich areas can disturb habitats, while the use of diesel generators contributes to local air pollution.

Evaluate the irreversibility and likelihood of impacts:

Irreversibility:
Land use changes caused by the construction of telecom towers can lead to the permanent loss of natural habitats. Additionally, the pollution from diesel generators, if unregulated, can cause long-term degradation of air and soil quality, affecting local flora and fauna.

Likelihood:
Determine the probability of these

impacts occurring based on current operational practices and environmental management strategies.

Prioritise action based on materiality:

High priority:
Energy consumption and possible reliance on diesel generators are contributing to greenhouse gas emissions and air pollution. Transitioning to renewable energy sources and improving energy efficiency should be the focus.

Moderate priority:
Land use and habitat disruption are moderately prioritised, particularly in regions with vulnerable ecosystems. Implementing careful site selection processes and minimising land disturbance during construction is critical.

Low priority:
E-waste management, which, while important, may be more straightforward to address with existing recycling programmes.

DATA CENTRES FOR MOBILE OPERATORS AND USE OF THE SBTN MATERIALITY TOOL

Data centres are part of the network infrastructure development stage, playing a crucial role in supporting mobile network operations, cloud services and other digital offerings. They are energy-intensive facilities that house servers and networking equipment for processing and storing data. They represent a significant part of the industry's direct operations with substantial environmental and biodiversity impacts:

Energy use
Data centres require continuous power supply, often relying on electricity from non-renewable sources, leading to high carbon emissions.

Water use
Cooling systems in data centres consume large volumes of water, impacting local water resources.

Waste generation
Disposal of outdated servers and equipment generates e-waste, which needs proper management to avoid environmental contamination.

Identify material pressures

Energy consumption
Data centres consume substantial amounts of electricity, often sourced from non-renewable energy, leading to significant greenhouse gas emissions.

Water usage
Cooling systems in data centres require large volumes of water, impacting local water resources and ecosystems.

Waste generation
Disposal of obsolete servers and electronic equipment generates e-waste, which can contain hazardous materials.

Assess the scale and scope of impacts

Scale
Measure the total energy consumption and carbon footprint of the data centres. For example, a large data centre might consume hundreds of megawatts of electricity annually.

Scope
Evaluate the direct and indirect impacts on local environments, including water bodies and wildlife habitats affected by water extraction and potential pollution from e-waste.

Evaluate the irreversibility and likelihood of impacts

Irreversibility
Assess the potential for long-term damage to ecosystems from water depletion or contamination.

Likelihood
Determine the probability of these impacts occurring based on current operational practices and environmental management strategies.

Prioritise action based on materiality

High priority
Energy consumption and carbon emissions due to their significant contribution to climate change and regulatory scrutiny.

Moderate priority
Water usage, especially in water-scarce regions where competition for resources is high.

Low priority
E-waste management, which, while important, may be more straightforward to address with existing recycling programmes.

Acronyms and glossary

COP – United Nations Climate Change Conference
CSRD – Corporate Sustainability Reporting Directive
DAS – Distributed Acoustic Sensing
EMF – Electromagnetic Fields
ENCORE – Exploring Natural Capital Opportunities, Risks and Exposure
ESRS – European Sustainability Reporting Standards
ESG – Environmental, Social and Governance
GBF – Global Biodiversity Framework
GBIF – Global Biodiversity Information Facility
GRI – Global Reporting Initiative
IBAT – Integrated Biodiversity Assessment Tool
ICT – Information and Communications Technology
IFRS – International Financial Reporting Standard
ISSB – International Sustainability Standards Board
LCA – Lifecycle Assessment
KBA – Key Biodiversity Area
SBTi – Science-Based Targets Initiative
SBTN – Science-Based Targets for Nature
SDGs – UN Sustainable Development Goals
SEC – Securities and Exchange Commission
State of nature – the quality of the environment in relation to the functions that it fulfils
TCFD – Task Force on Climate-Related Financial Disclosures
TNFD – Task Force for Nature-related Financial Disclosures
WBCSD – World Business Council for Sustainable Development
WEEE – Waste Electrical and Electronic Equipment

GSMA Head Office
1 Angel Lane,
London,
EC4R 3AB,
United Kingdom
Tel: +44 (0) 20 7356 0600
Fax: +44 (0) 20 7356 0601