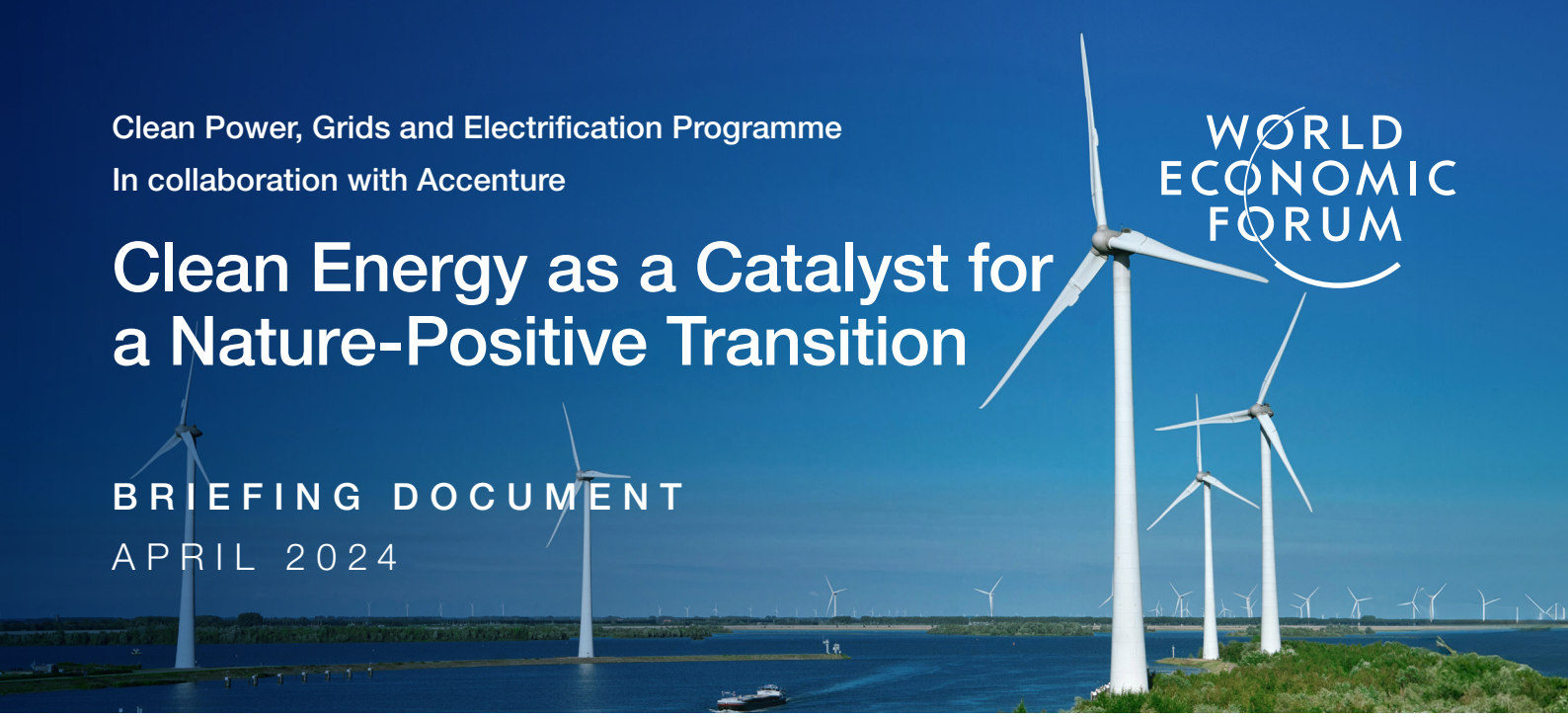
Clean Power, Grids and Electrification Programme

In collaboration with Accenture

Clean Energy as a Catalyst for a Nature-Positive Transition



BRIEFING DOCUMENT

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Renewables scale-up is critical to meet global climate targets, but requires large land and water areas

Clean energy deployment has the potential to achieve 90% of the energy-related CO_2 emission reduction needed to meet the Paris Agreement's 1.5℃ ambition requiring a tripling of capacity by 2030 and a ninefold increase by 2050. Unless properly managed, land and sea use change associated with the clean energy transition could increase biodiversity conservation pressures by disturbing habitats, fragmenting ecosystems and affecting protected species in designated areas. Biodiversity could also be threatened by mining activities required to extract rare earth minerals and metals forming crucial components of clean power technologies. Despite the potential implications of mining activities and other supply chain-related issues, this briefing paper focuses on the direct impact of clean power technologies (i.e. renewables, electricity grids, etc.) on biodiversity during their design, construction and operation phases.

There is an opportunity for the clean energy transition to deliver a positive impact on nature and benefit from it

Business leaders and governments are increasingly considering nature-positive as key in delivering the clean energy transition. Nature-positive refers to a measurable, global ambition of halting and reversing biodiversity loss. This aligns with the 2030 mission of the Global Biodiversity Framework, which includes targets such as restoring 30% of degraded ecosystems and conserving 30% of land, water and seas. The recently launched Nature Positive Initiative is working to drive global alignment around the use of the nature-positive term and efforts to deliver on it.

Clean energy can contribute to nature-positive outcomes by ensuring that the infrastructure deployment has a net-positive impact (NPI) on biodiversity, leaving ecosystems in better condition than before the introduction of clean energy assets. Given that biodiversity impacts vary across locations and cannot be exactly comparable, clean power infrastructure development must adhere to the principles of mitigation hierarchy to avoid irreplaceable biodiversity loss ahead of additional conservation actions.

In the clean energy sector, there are already examples of pilot initiatives aimed at achieving NPI outcomes such as offshore wind farms becoming home for corals and solar farms improving habitats on the land around the panels.

Nature-positive approaches can also deliver business value by improving community acceptance, reducing risk of opposition, and addressing material risk to operations and supply chains. Such approaches can help comply with current and future environmental legislation and are also increasingly becoming a requirement for investors. Beyond business value, nature-positive approaches also deliver broader system value by enhancing the resiliency of the planet and societies – for instance by enriching biodiversity, storing carbon, purifying water and reducing pandemic risk.

Six enablers to secure a clean energy transition that contributes to nature-positive

The following enablers can facilitate a responsible clean power infrastructure build-out, with a net-positive impact on biodiversity:

1. **Government action and policy:** Policy mandates and regulatory requirements remain among the strongest drivers for nature-positive action. Global and national commitments – including the Paris Agreement and countries' Nationally Determined Contributions (NDCs), the Global Biodiversity Framework and the National Biodiversity Strategies and Action Plans (NBSAPs) as well as the Biodiversity Beyond National Jurisdiction treaty – are important and require policy reforms, sector-level targets and guidelines to be applied and fast-tracked.

Policy reforms can also help guide business decisions. For example, England's new Biodiversity Net Gain mandate enforced since 2024, establishes a regulatory requirement for all new developments to achieve a minimum 10% biodiversity net gain. In addition, practices that enhance nature and biodiversity can be embedded in renewable energy tenders while incentives can mobilize action, such as preferential procurement practices, and facilitate access to low-interest loans. Nature sensitivity mapping and strategic environmental assessments (SEAs), such as those used to identify Renewable Energy Development Zones (REDZ) in South Africa, can help select suitable areas for the development of renewables also considering sensitive ecosystems, protected areas and key biodiversity.

2. **Measurement frameworks:** The impact of infrastructure deployment and its supply chains on biodiversity is currently not widely or uniformly assessed, measured and monitored. While factors such as location specificities, complex system dynamics and lack of historical baselines make biodiversity challenging to measure and monitor, investment in data collection and the development of metrics and tools can help address this.

   Globally there are emerging reporting and measurement frameworks to address biodiversity impact. In 2024, the Global Reporting Initiative (GRI) launched its updated biodiversity standard while in 2023 the Science-Based Targets Network released the first corporate science-based targets for nature. The International Sustainability Standards Board (ISSB) is adding biodiversity and just transition aspects to its climate-related disclosure standards and the Taskforce for Nature Related Financial Disclosure (TNFD) provides guidance for organizations to report and act on evolving nature-related dependencies, impacts, risks and opportunities. Some companies have developed frameworks to establish site-specific, quantifiable baselines for biodiversity impact and to assess no net loss and net gain of biodiversity.

   Despite these initiatives, a common language and site-specific measurement system for the clean power industry is missing. Such standards should guide not just the assessment, but also the measurement and monitoring of clean power projects' impact on biodiversity at an asset level. This would help businesses benchmark progress, support an objective definition and assessment of non-price criteria in renewable energy tenders as well as requirements in the permitting process, inform investments and improve reporting.

3. **Visionary leadership setting and delivering ambitious goals:** Although 80% of CEOs feel that they have a strong understanding of their business impact on biodiversity, only 35% are initiating nature protection and/or restoration. Additionally, only 5% of the 400 world's most influential companies have conducted an assessment of their operation's impact on nature and biodiversity. Business leadership includes setting goals, allocating the required resources (staff, financing, etc.) and demonstrating progress.

   Some renewable energy companies have set no net-loss or net-positive biodiversity ambitions and have defined measurable, time-bound targets. As an example, as part of its ESG vision, Tata Power aims to have no net loss to biodiversity by 2030. Enel is committed to achieving no net loss of biodiversity for new infrastructures by 2030, and undertakes business solutions aimed at creating shared value with the local areas and communities (e.g. agrivoltaics). Lightsource bp has set the ambition for its solar farms to achieve biodiversity net gain within five years of operation. This is supported by an implementation plan and measurement framework to track progress. In 2021, Ørsted made a pledge to deliver net-positive biodiversity impact from all new renewable energy projects commissioned by 2030 at the latest. Similarly, in 2022, Iberdrola approved its Biodiversity Plan and commitment to become net positive on biodiversity for its new developments from 2025 and for all its existing assets by 2030.

   In addition to company-level targets, a sectoral approach can help address the impacts and dependencies that different parts of the economy have on nature and biodiversity. To help accelerate the transition to a nature-positive future, new guidance sets out the priority actions to be taken by all businesses across 12 global industries.

4. **Partnerships for collective action:** Addressing the nexus of energy, climate and biodiversity is new territory for many leaders. Cross-functional collaborations and partnerships to test and scale up efforts, learn from experience and develop best practices are critical to accelerate the development of new solutions, approaches and tools. For example, the United Nations Convention on the Conservation of Migratory Species of Wild Animals established the Energy Task Force to reconcile renewable energy development with biodiversity conservation. The task force, coordinated by BirdLife International, fosters collaboration between governments, investors, the private sector and non-governmental organizations to develop guidance and tools for nature-sensitive siting, deployment and retrofitting of renewable energy technologies as well as to share best practices and recommendations.

   A partnership approach can also allow businesses to benefit from the expertise of conservation groups, academia and local organizations as well as contribute to innovative research. For example, AES designed the Grafton Solar project in Massachusetts with farming and partnership in mind, from the height of the panels to their spacing, enabling cattle grazing as well as squash and lettuce cultivation since 2022. Additionally, serving as a US Department of Energy Solar Energy Technology Office trial site, researchers from the University of Massachusetts Amherst and American Farmland Trust partnered to assess productivity, soil health and micro-climatic conditions. The research contributed to a National Renewables Energy Laboratory study confirming the positive synergies between solar energy projects and agriculture.

5. **Innovative financing:** Innovative financing is key in implementing and scaling up nature conservation and restoration initiatives within clean energy deployment. In 2023, Ørsted became the world's first energy company to issue blue bonds. This provides an instrument for investors to allocate capital towards biodiversity action in renewable energy while demonstrating to the wider financial community that there are opportunities as well as demand to invest in such initiatives. Another example is Iberdrola's Carbon2Nature, which manages carbon credits as a funding mechanism for nature-positive solutions when deploying new renewables projects.

Other solutions include debt-for-nature swaps, biodiversity credits and certificates, green bonds, payments for ecosystem services (PES) as well as other incentives, such as tax incentives, subsidies, or market-based mechanisms to encourage biodiversity conservation and restoration. All solutions require transparency, accountability and ideally government oversight to ensure additionality and the avoidance of leakage and perverse outcomes.

6. **Data, technology and innovation:** Data is critical to understanding the local environment, monitoring the projects' local and global impact and making informed decisions. HUB Ocean is leveraging its Ocean Data Platform to publicly share ocean environmental data from offshore wind farms and to harmonize the shared industrial data with a broad range of other data sources. This helps create valuable insights for industry, academia and governments.

   Other examples include solutions such as the Integrated Biodiversity Assessment Tool (IBAT), developed to provide access to global biodiversity information and safeguard nature from infrastructure development. IBAT also incorporates the Species Threat Abatement and Restoration (STAR) Metric to help identify actions that have the potential to address threads, bring benefits for threatened species and support the establishment of science-based targets for biodiversity. Similarly, BirdLife International has developed the Avian Sensitivity Tool for Energy Planning (AVISTEP), which provides a detailed spatial assessment of avian sensitivity in relation to different types of energy infrastructure – wind (both onshore and offshore), photovoltaic solar and overhead power lines (transition and distribution). An overview of numerous nature-related data tools available today is provided by the TNFD Tools Catalogue.

   Additionally, technology such as satellite remote sensing and artificial intelligence (AI) is supporting biodiversity research, monitoring and conservation. For example, Vattenfall collaborated with Spoor and the British Trust for Ornithology to implement AI technology that records the 3D flight behaviour of seabirds in the immediate vicinity of their offshore wind farm on the coast of Aberdeen. The information and data will be used to advance the understanding of collision risks and improve the planning of new offshore wind farms.

Conclusions

There is both an urgency and an opportunity to generate broader system value by embedding responsible approaches in the lifecycle of clean power projects, on land as well as oceans. This requires collaborative efforts across businesses, government, academia, philanthropies, multilateral organizations and civil society groups to embrace the six enablers discussed above and accelerate a clean energy transition that is not only secure, sustainable and just, but also nature-positive.

Authors

Prerana Pakhrin Misrahi, Lead, Clean Power, Grids and Electrification, World Economic Forum

Christelle Marais, Management Consulting Manager, Accenture

Irene Varoli, Project Fellow, Clean Power, Grids and Electrification, World Economic Forum

Advisers

Alfredo Giron, Head of Ocean, World Economic Forum

Kristen Panerali, Head Clean Power, Grids and Electrification, World Economic Forum

Contributors

The World Economic Forum acknowledges and thanks the following experts, without whose guidance this briefing paper would not have been possible. However, the paper does not necessarily reflect the views of these companies and/or individuals. Expert advice is purely consultative and does not imply any association with the takeaways or conclusions presented within this document.

Johannes Berrum, Head of Growth & Energy Industry Lead, HUB Ocean

Josefin Blanck, Director of Environmental Strategic Projects, Vattenfall

Sebastian Dunnett, Senior Programme Officer, United Nations Environment Programme - World Conservation Monitoring Centre (UNEP-WCMC)

Sebastian Felix, Management Consulting Analyst, Accenture

Amy Finlayson, Lead Public Affairs Advisor, Ørsted Services

Manoj Gupta, Chief Executive Officer, TP Renewable Microgrid, The Tata Power Company

Shweta Jadhav, Project Fellow, Clean Power, Grids and Electrification, World Economic Forum

Shivin Kohli, Lead, Financing for Nature, World Economic Forum

Noelle Kumpel, Senior Policy Advisor, BirdLife International

Penny Laurenson, Global Head of Sustainability & Director of Environmental Affairs, EMEA/APAC, Lightsource bp

Xinqing Lu, Community Lead, Champions for Nature, World Economic Forum

Marta Martinez Sanchez, Head of Climate Change and Alliances, Iberdrola

Madelka McCalla, Chief Corporate Affairs and Impact Officer, AES Corporation

Claudio Mosti, Global Manager in Environmental Sustainability, Enel

Hanh Nguyen, Ocean Industries Lead, World Economic Forum

Emilio Tejedor, Head of Environmental Sustainability and Quality, Iberdrola

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Shalu Agrawal, Senior Programme Lead, Council on Energy, Environment and Water (CEEW)

Rachel Asante-Owusu, Project Officer, International Union for Conservation of Nature (IUCN)

Stacey Baggaley, Principal Specialist: Nature and Business, United Nations Environment Programme - World Conservation Monitoring Centre (UNEP-WCMC)

Jamie Batho, Growth Manager, The Landbanking Group

Kelly Carlin, Clean Power Lead, The Climate Change High-Level Champions

María Adelaida Correa Ruiz, Corporate Sustainability Director, Interconexion Electrica SA ESP (ISA)

Ingo Erkens, CTI at Smart Infrastructure Electrification & Automation, Siemens AG

Diana Ferrari, Energy Manager, World Business Council for Sustainable Development (WBCSD)

Ramon Fiesta, Director, Latin America, Global Wind Energy Council

Pedro Matos Gouveia, CEO Office, Corporate Affairs, EDP Group

Marcela Ruas, Latin America Coordinator, Global Wind Energy Council

Simon Turner, Chief Technology Officer, UK&I, Avanade

Akansha Tyagi, Programme Associate, Council on Energy, Environment and Water (CEEW)