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Optimising for net zero and nature positive outcomes

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Responsible Investing

Net zero and nature positive investing may seem aligned in their goals, yet our analysis reveals that certain net zero investment strategies could inadvertently embed nature risks. Our findings are a first step for investors moving from climate transition plans to integrated planning.

Main findings from assessing different investment tilt strategies focused on greenhouse gas (GHG) emissions exposure relative to broader nature impact exposure are:

- Nature exposure cannot be reasonably mitigated through an approach that seeks to exclude or underweight specific sectors
- Nature and GHG emissions exposures are aligned in the majority of circumstances, but an emissions-only strategy will have more limited benefits for nature
- Nature creates overlapping dependencies across economic sectors that – if nature were to become more priced-in to markets – would undermine traditional diversification strategies

While the market continues to calibrate on the definitions and indicators for nature positivity, investors can take steps to integrate nature into investments by:

- Prioritizing the themes where corporate economic activity has the greatest impact. Leverage the climate transition playbook to identify material sectors and companies for engagement.
- Using the themes of natural resource usage, land use change and waste/pollution generation to screen for risks and monitor improvements. Apply a science-based approach to assess the ambition and execution of improvements against nature positive goals.
- Taking a whole portfolio approach to identify sources of nature impact and allocations to nature solutions. Consider both event and systemic-based risks.

NATURE POSITIVE INVESTING

The focus on sustainable investment, according to the Taskforce on Nature-related Financial Disclosures (TNFD), is evolving from a focus on climate transition plans to integrated planning that considers nature and social objectives managed holistically with climate integrated into nature.

The investment strategy nonetheless faces a tension for investors to manage: how to further the energy transition in line with net zero goals despite many of its catalysts having an impact to nature.

Overall, we believe the opportunity costs of inaction on the energy transition poses greater risks than the marginal increases to nature impact over the short term so long as investors are mindful of the need to monitor, and where possible mitigate, the long-term impact to nature.

There are opportunities to offset specific impacts at a local level and facilitate a more equitable distribution of the benefits from natural capital usage across a value chain.

At COP16 in Colombia, the TNFD announced over 500 voluntary commitments across 54 jurisdictions to TNFD reporting. These commitments represent a cumulative $24 trillion in capital. This is a 34% increase in less than one year since TNFD's first round of early adopters. COP16 is also mobilizing more regulatory action with concepts ranging from mandatory nature disclosures to a global profit-sharing mechanism that redistributes profits by tracing product genetic codes back to their original source in nature.

Despite these catalysts in the private and public sector, these approaches thus far are not yielding sufficient results; commentary around COP16 has highlighted that only 22% of the most critical ecosystems are within a global protected area network and the decline in biodiversity is faster in protected areas than outside them.

Traditional risk management frameworks often overlook the connections between ecosystems and economic activities. By understanding these links, investors can better anticipate and manage risks from biodiversity loss, climate change and other environmental challenges. The research presented in this paper underscores the importance of understanding these interconnections and incorporating them into investment decisions.

THE PUSH FOR NATURE POSITIVE INVESTING

The energy transition is projected to require $275 trillion in cumulative spending through 2050 (7.5% of global GDP) to align global value chains to a net zero economy.[1] Investors recognize the risks and opportunities posed by the amount of capital in transition, and 325 investors representing over $57 trillion in assets under management have a net zero investment commitment with key milestones approaching over the next five years.[2]

Similar to net zero goals in relation to the energy transition, nature-related goals focus on nature positivity, which generally aims to enhance the resilience of the planet's natural resources by improving the abundance, diversity, integrity and resilience of species, ecosystems and natural processes.[3] The milestones for nature positivity generally seek to halt any further loss of nature by 2030 and achieve a full recovery by 2050.

> *Investors are mindful of the need to monitor, and where possible mitigate, the long-term impact to nature.*

The scope of nature risk is estimated to influence $58 trillion in economic value (over half of global GDP[4]), but an estimated $2.7 trillion in annual investment could unlock an additional $10.1 trillion of business opportunities.[5] In this regard, nature positive may be both a larger systemic risk and require less direct forms of investment to unlock economic opportunities relative to a net zero focus.

However, the commitments so far for nature positive investing relative to climate are fewer in number and lesser in ambition. While there are 200 investors and $28 trillion in assets under

management committed to engaging on nature, there is not yet a material collection of investors committed to nature positive target setting in their investments.[6]

While the scoping and quantification of nature positivity is being calibrated, we nonetheless find there is significant momentum in addressing nature impacts alongside climate impacts. This is particularly the case given recent regulatory drivers. For instance, the introduction of the Taskforce on Nature-Related Financial Disclosures and regulations such as the Corporate Sustainability Reporting Directive, Corporate Sustainability Due Diligence Directive and the EU Deforestation regulation are accelerating this focus.

Many firms also see the potential for nature to move more quickly than climate in their businesses and in the industry given the existence now of internal governance, systems and processes that have been established to deliver net zero investment policies.

Many firms also see the potential for nature to move more quickly than climate in their businesses and in the industry given.

Currently, the global economy has an ecological footprint that is equivalent to 1.7 times the sustainable supply of natural capital. While economies generally become more efficient with use of natural capital as the economy develops, the increased wealth also triggers increases in population and consumption that currently add to the total demand of natural capital usage.

In this analysis, part of a series on nature positive investing, we explore where net zero and nature positive investment strategies complement each other and where a focus specifically on GHG emissions may not capture a broader set of nature impacts, leading to unintended consequences. The main findings from assessing different investment tilt strategies focused on GHG emissions exposure relative to broader nature impact exposure are:

1. Nature exposure cannot be reasonably mitigated through an approach that seeks to exclude or underweight specific sectors
2. Nature and GHG emissions exposures are aligned in the majority of circumstances, but an emissions-only strategy will have more limited benefits for nature
3. Nature creates overlapping dependencies across economic sectors that – if nature were to become more priced into markets – would undermine traditional diversification strategies within corporate investments

There is no singular investment strategy that will solve both climate and nature goals simultaneously and equally. Nonetheless, there are steps that investors can take to promote biodiversity and ecosystem health alongside climate and financial investment objectives.

- Prioritize the themes where corporate economic activity has the greatest impact. Capitalize on the momentum and consensus building of TNFD reporting, and leverage the climate transition playbook to identify material sectors and companies for engagement where a focused target list can generate significant impact.
- Use the themes of natural resource usage, land use change and waste/pollution generation to screen for risks and monitor improvements. Use standards such as Science Based Target Network's avoid, reduce, restore and regenerate framework to assess the ambition and execution of improvements against nature positive goals.
- Take a whole portfolio approach to identify sources of nature impact and allocations to nature solutions. Consider both event and systemic-based risks. Fixed income assets, including use-of-proceeds investments, offer an easy first step to develop a strategy that can capture the localized focus of a particular risk or solution as while simultaneously being an asset class that can put capital to work at scale quickly.

CASE STUDY

What nature positive investing can do

Protect

- Intact ecosystems
- Existing vegetation
- Existing forests
- Water quality
- Legal reserves, conservation set-asides and riparian areas

Improve

- Water quality
- Agricultural/silvicultural regeneration practices
- Conservation easements
- Nutrient and chemical management
- Forest carbon

Restore

- Wetlands/peat
- Degraded pasture
- Riparian buffers
- Native species

Fixed income funds reforestation

Nuveen is the lead investor in a $225 million dollar-denominated Amazon reforestation bond issued by the World Bank and scheduled to mature in 2033.

Proceeds will help reforest up to 3,300 hectares of degraded and deforested farmland with native tree species — roughly the size of 7,400 U.S. football fields or 5,200 Premier League football pitches. Brazil-based company Mombak will acquire or partner with landowners in Pará (which is traversed by the lower Amazon River) and will manage planting and maintenance of the regenerated forest. The project is expected to remove 2 million tons of carbon dioxide (CO_2) over the next 50 years – equal to the greenhouse gas emitted by over 260,000 homes in a year – while enhancing biodiversity and stimulating economic development in local communities.[7]

As an outcome bond, a portion of the coupon repayment to bondholders depends on the amount of CO_2 removed from the atmosphere by the reforested land until the bond matures. This activity is monetized through the sale of carbon reduction credits to Microsoft, a very high quality offtaker. This transaction marks the first bond to link investors' financial returns to the amount of carbon removal. Carbon removal credits are viewed to be more desirable and less controversial than carbon avoidance credits.

Nuveen worked with Mombak to ensure impact reporting would include not just carbon sequestered, but also key performance indicators that focus on forest health, biodiversity and community impact.

Climate and nature-based solutions

Timberland and farmland owners have the potential to realize climate and nature benefits embedded in their natural capital assets by taking a more holistic approach to management – one that seeks not only to generate strong financial returns, but also to make a positive contribution to global challenges. Land-based investments can generate quantifiable carbon and nature benefits by approaches that protect, improve and restore natural capital.

Across these approaches, ESG metrics can be used to track performance and risk over time. In some cases, climate and nature benefits can be monetized through environmental markets to enhance returns. For example, timberland and farmland owners can generate carbon credits by managing land in ways that reduce GHG emissions or increase removals of CO_2 from the atmosphere. In the U.S., restoring streams, wetlands and endangered species habitats can generate credits within a tradeable certificate system. To quantify the benefits of these land management activities, each market-based framework has established crediting standards and mechanisms for monitoring, reporting and independent verification.

NATURE POSITIVE AND NET ZERO: THE SAME, BUT DIFFERENT

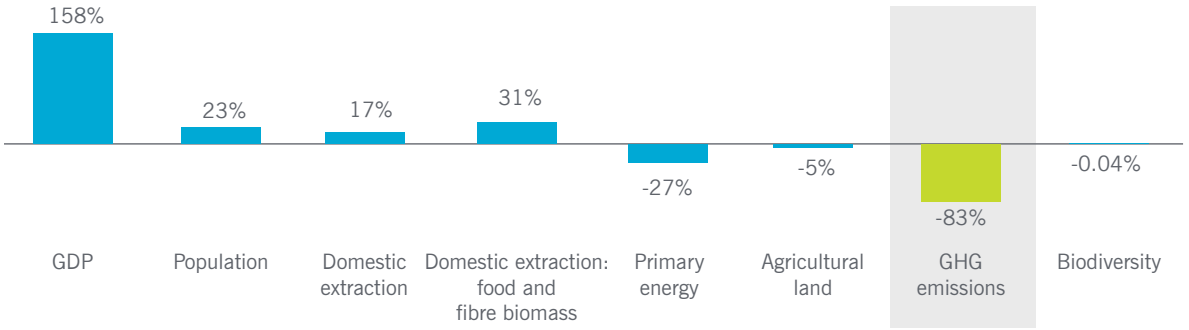
The theories for net zero and nature positive investing generally align. The energy transition generally seeks increased efficiency in emissions intensity, technology and policy developments that encourage zero-emissions energy sources, and climate solutions and offsets to address the remaining unabated emissions. Nature risk is similar in its focus on resource intensity, changing demand preferences and nature-based solutions that could create nature positive investment opportunities to offset the impacts from other portfolio investments.

Net zero pathways, such as the International Energy Agency (IEA) net zero emission scenario, suggest 80% reduction in fossil fuel demand by 2050[8]; similarly, the sustainability transition pathway developed by the United Nations Environment Programme (UNEP) projects a more than 80% reduction in GHG emissions by 2060 as part of changes to total energy demand and the mix of primary energy sources.

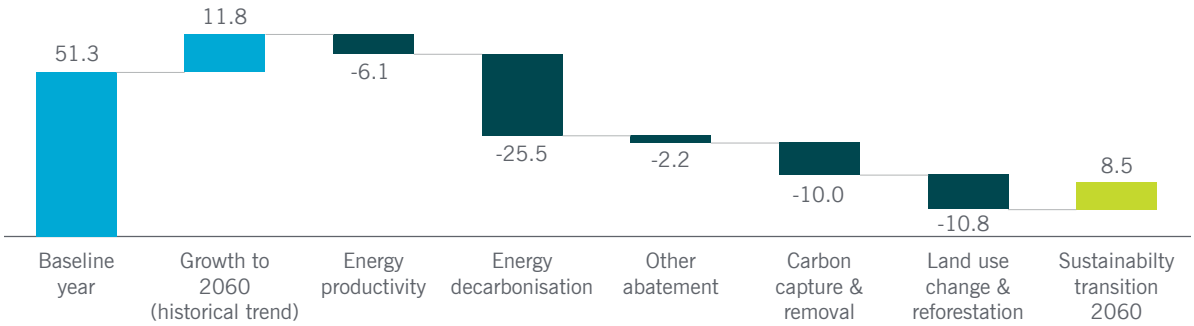
Net zero and nature positive goals are also symbiotic. The intent of achieving a net zero economy is to eliminate the pressures to nature caused by GHG emissions and the impacts ranging from sea level rise and flooding to habitat modification and fire – 16 specific impact drivers in total.[9] Similarly, resilient ecosystems such as peatlands, wetlands, soil, forests and oceans play a crucial role in absorbing and storing carbon.[10]

However, the strategies to achieve the energy transition – such as building large wind or solar projects – do have a cost in terms of nature impacts, for example land use change and ecosystem disturbance. The question for investors is how to balance the costs – including opportunity costs – when considering GHG emissions reductions as a stand-alone investment objective and as part of a broader nature positive investment objective.

Figure 1:
Sustainability transition: change in key sources of impacts to nature by 2060 relative to 2020 baseline year



Contributing sources of GHG emissions reduction by 2060 relative to 2020 baseline year Resulting in 83% GHG emissions reduction (Gt CO2e)



Data source: United Nations Environment Program. Global Resources Outlook 2024.[12]

'PRIORITIZING' ENGAGEMENT

Few industries or business models do not have an impact on nature. However, similar to climate risk where there is a concentration of negative impacts from the largest carbon-intensive companies, a relatively small number of companies account for a significant portion of the estimated biodiversity impact across the different themes.

Nuveen's nature risk initiative developed a methodology to quantify the estimated nature impact of the enterprise corporate holdings.. The Nuveen approach was able to capture one quarter of the direct impacts from just 50 companies. Other studies have similarly estimated that one-third of biodiversity impact across all scopes - both direct operations and upstream or downstream activity - is concentrated within the top 50 high-impact companies and nearly half (49%) is concentrated within the top 100 companies.[12] While absolute impact is biased by company size, the total impact is outsized relative to the total revenue.

Similar to climate risk, the largest negative impacts are Scope 3 value chain impacts. In the case of nature, the food products industry has the largest impact primarily through Scope 3 impacts stemming from land use change whereas the oil and gas industry has the second largest absolute impact (third largest by intensity).[12]

Figure 2: Proportional contributions of nature impact and revenue for highest-impact companies

	Revenue proportion (% of total)	Impact proportion (% of total)
Top 250	50%	67%
Top 100	31%	50%
Top 50	19%	38%

Data source: Finance for Biodiversity Foundation. Assessment of the biodiversity impacts and dependencies of globally listed companies. Percentages are based on the MSCI ACWI universe. October 2024.

Notwithstanding the seeming concentration of nature risk, the sources of the impacts – in particular Scope 3 – occur at a smaller scale but with a high frequency. In the food products industry, for example, much of the impact associated with land use and deforestation is undertaken by smallholder farmers operating as independent contractors. The raw product will often change hands multiple times before reaching the aggregator that is the company's direct supplier. We have seen progress made, however, in traceability through supply chain engagement as well as companies adopting risk-based approaches such as flying drones over the physical location of the aggregation point to monitor for evidence of deforestation over time. Given over half of

Figure 3: Distribution of nature impact across nature themes and sources of impact

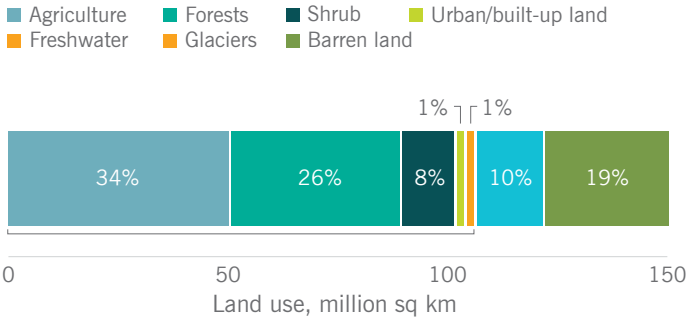
		Distribution of industry nature impact by theme				Distrubition of industry nature impact by scope		
Industry nature impact rank	Industry	Climate change	Waste/ pollution generation	Land use change	Natural resource use	Scope 1	Scope 2	Scope 3
1	Food products	7%	12%	68%	13%	17%	7%	76%
2	Oil, gas and consumable fuels	54%	23%	12%	11%	28%	25%	47%
3	Chemicals	11%	46%	14%	29%	4%	63%	33%
4	Consumer staples distribution and retail	23%	18%	53%	5%	3%	22%	75%
5	Metals and mining	35%	48%	9%	8%	29%	56%	15%

Data source: Finance for Biodiversity Foundation. Assessment of the biodiversity impacts and dependencies of globally listed companies. Percentages are based on the MSCI ACWI universe. October 2024

habitable land (which excludes glaciers and barren land) is used for agriculture, enforcement of nature positivity through corporate supply chain engagement will support but not solve the impact if there is not more direct investment in the sustainable farming practices themselves.

Traceability of impacts – and opportunities for investors to have influence – is where climate and nature can diverge. In the climate context, energy producing companies are the known original sources of climate impacts. The majority of energy – producing companies rely on financial markets – either via equity or debt – to finance their activities. The Scope 3 challenge for climate is apportioning responsibility for GHG emissions across a value chain, where one company's Scope 3 emissions is representative of another companies Scope 1 and 2.

Figure 4: Global habitable land by current method of use



Data source: GS Sustain and UN Food & Agriculture Organization (FAO)

For nature, the original sources of impacts are harder to trace and less likely to be a corporation that is directly connected to institutional investors. Therefore, investors must rely more heavily on influencing downstream investments to take responsibility for upstream nature impacts as enhance efforts to find opportunities to influence nature impacts at their source, whether through direct investment in sustainable operations or through policy activity that can monitor and regulate non-corporate economic activity.

METHODOLOGY

To balance the change in energy mix with other sources of nature impacts, here are illustrative strategies of how the two different investment objectives align – and differ – in terms of investment allocations.

We analysed different components of a typical globally diversified fixed income portfolio, as represented by the Bloomberg Global Aggregate Index, with a focus on the corporate securities within the index to compare the similarities and differences between climate and nature investment strategies through the lens of portfolio tilts.

To understand and compare investment exposures across climate and nature, our analysis generally relies on the Exploring Natural Capital Opportunities, Risks and Exposure (Encore) taxonomy for defining nature-related dependencies and impacts in terms of specific production processes that commonly occur within different corporate activities as categorized by company GICS classifications. Encore assigns a materiality rating to each form of nature impact and has a standardised taxonomy of production processes that can identify common sources of nature impact across GICS sectors.

Encore sets how the economy – sectors, sub-sectors and production processes – depends on impact on nature. It defines nature impact drivers in accordance with the Natural Capital Protocol as a measurable quantity of a natural resource that is used as an input to production or a measurable non-product output of business activity.[11] The materiality of a particular impact accounts for: how frequently might the impact occur; how quickly might the impact start to affect natural capital; and how severe might the impact be.[13]

ANALYSIS

Overall, the analysis suggests that:

Nature risk mitigation is more challenging than climate transition risk mitigation given the broad spectrum of economic activities with high impacts to nature and limited data granularity to isolate the different sources of nature risk.

In addition, tensions between climate mitigation and nature mitigation in portfolio-tilting strategies may limit the contribution of emissions-focused investment strategies to nature positive investment strategies.

Sectors that require significant commodity inputs in the supply chain and/or generate waste post-consumption can cause significant nature impacts despite a low carbon footprint.

While the comparison focuses on nature impacts, it should also be recognised that nature dependencies, such as value chains that are reliant on natural capital inputs, face similar broad and overlapping exposures across sectors that would limit opportunities to avoid risk by avoiding exposure.

Nature risk as a physical risk will be harder to monitor at the portfolio level relative to physical risks associated with climate change. This is due to nature risk requiring more on-the-ground monitoring to build bottom-up nature risk predictions, whereas climate can generally be tracked at a global level and modelled top-down to predict probabilities of localised impacts.

The physical risk analysis associated with climate risk is challenging in terms of predicting the specific event (e.g. hurricane, flood, drought, etc.), but the probability of these events can be identified in advance from modelling of globally collected data. Climate risk assessments can also focus on global economic activity to predict future GHG emissions since the global climate is agnostic to the original source of emissions.

Figure 5: Nuveen nature risk categories

Nature risk category	Percent of exposure for corporate securities within index
Land use change	17%
Natural resource use	32%
Waste/pollution generation	43%
Total nature exposure across themes	49%

Data source: Nuveen

Figure 6: Changes in sector-level portfolio weights from exposure tilts

Sector	Global Aggregate portfolio weight %[20]	Climate risk transition tilt portfolio %	Nature risk mitigation tilt portfolio %
Communication services	3.45	4.39	3.42
Consumer discretionary	5.99	6.58	5.66
Consumer staples	4.00	2.31	3.49
Energy	2.00	0.95	1.21
Financials*	53.69	62.28	57.69
Government	0.02	0.03	0.02
Health care	5.25	5.13	4.77
Industrials	6.36	3.49	5.03
Information technology	4.66	4.86	4.65
Materials	1.54	1.11	1.27
Other	0.35	0.44	0.39
Real estate	2.76	3.51	2.94
Transportation	2.13	1.02	1.64
Utilities	7.80	3.90	7.81

Data source: Nuveen. *As described in the text above, securities classified within the financials sector can include issuances for specific financial transactions from operating companies that are classified in other sectors. As such, both the absolute weighting as the tilts assigned to the financials are not specific only financial operating companies.

For nature risk, local ecosystems each have different baseline compositions and different threshold points of resiliency. In addition, changes to an ecosystem, such as measurements of soil quality, cannot be detected through scaled processes. Therefore, idiosyncratic threats to nature are more likely to go undetected until the risk has materialized.

In the context of corporate debt, a focus on sector-based exposures may not capture the nature risks in supply chains and/or the systemic risk in a sector-diversified portfolio. This is due to the reliance on specific sources of natural capital stock for a diversity of commodity inputs and ecosystem services, as well as the limited ability for corporates to adapt supply chains proactively ahead of the ecosystem loss.

CORPORATE EXPOSURES AND TILTS: CLIMATE VS. NATURE

Nuveen generally categorizes the Encore impacts into three primary themes: land use change, natural resource use and waste/pollution generation.[14] Our analysis suggests approximately half of the corporate securities in the Global Aggregate Index have a very high level of nature risk based on the Encore rating scale (which ranges from very low to very high).[15,16]

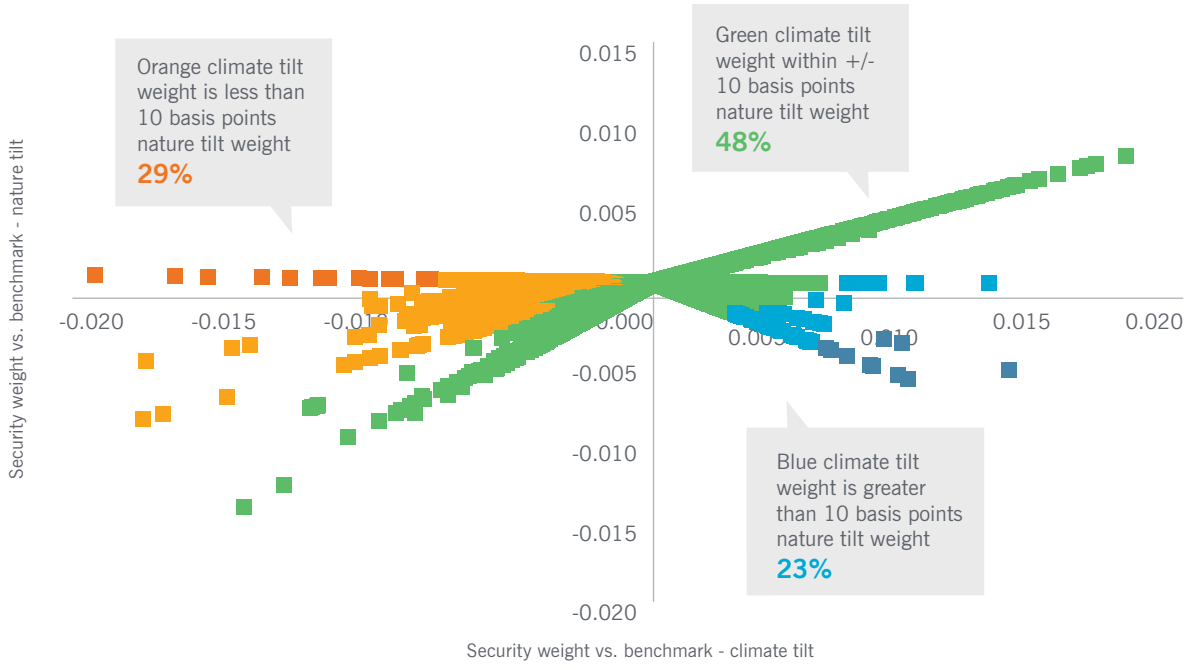
Given total exposure levels (Figure 5), avoidance of exposure to nature risk is not a practical strategy for development of a nature positive portfolio. However, it is possible that a portfolio already tilted toward climate transition is sufficiently reducing the total exposure to nature risk.

Compare two different portfolio tilts of the corporate sleeve of the Bloomberg Global Aggregate Index using a similar methodology – underweighting companies with high/very high impact to GHG emissions (climate) and overweighting companies with low/no impact to GHG emissions (nature).[17,18]

While there are some similarities in terms of sector-level weights based on the tilting strategy, the broader scope of nature risks tends to flatten, and in some cases reverse, the tilting suggested by the GHG emissions portfolio (Figure 6). The scatterplot (Figure 7) shows significant alignment

at the company level between GHG emissions impacts and nature impacts (quadrants I and III); nonetheless, the chart also shows a non-trivial portion of companies (quadrants II and IV) that have conflicting tilts between GHG emissions impact and nature impact. Overall, the broader scope of nature risks reduces security-level differentiation in terms of nature impacts such that there are a greater number of underweight securities, but the tilt for each security is not as significant relative to the climate risk tilt.

Figure 7: Comparative over- and under-weight security tilts for climate risk transition and nature risk mitigation portfolio strategies



For example, no companies within the communication services sector are assessed as having high impact for GHG emissions, and overall it has a 27% increased weight (from 3.45% to 4.39%) for the climate risk transition tilted portfolio. However, nearly half of communication services companies require physical assets that have high impacts on land and/or water use. The resulting over- and under-weights at the company level within the sector reduce the sector-level tilt to a 1% underweight (from 3.45% to 3.42%) for a nature risk mitigation tilted portfolio.

For instance, while communication services companies may have lower average carbon emissions intensity/revenue, they demonstrate significant nature impacts across business processes associated with telecommunication and wireless services, as well as cable and satellite installations on land and marine fibre-optic installation (see Figure 8).

Examples of the business processes associated with high impact activity tracked by Encore include:

- **Terrestrial ecosystem use:** Wireless telecommunication services, through the masts and base stations that they use, can lead to habitat modification (loss of vegetation, soil and other land cover). Use of pylons can lead to the loss of vegetation and trees along the overhead lines. Trees and vegetation are removed for electrical safety reasons.
- **Freshwater (marine) ecosystem use:** The burial and recovery of cables results in the disturbance of the seabed affecting habitats and species, including mussel beds, seagrass beds and maerl beds. These effects can be long term.
- **Water pollutants:** Cable burial, recovery and repair has the potential to release contaminated sediment into the water column.
- **Disturbances (land):** Noise pollution from electrical components can also negatively impact species in localised areas around cables, transmitters and power points.
- **Disturbances (marine):** Underwater noise pollution occurs during the installation and maintenance of underwater cables from the use of vessels and machinery. Underwater noise can have adverse effects on marine species, including marine mammals and fish. The cables also produce heat and electromagnetic fields, which may affect marine life.

The accumulation of these various forms of nature impact are illustrative of why the communication services sector can see an overweight tilt when focused on GHG emissions exposure but an underweight tilt when expanded to all forms of nature impact.

There is no one sector that is devoid of any impact to nature. A focus on nature positive investing in the context of corporate securities will require more in-depth consideration of the resource efficiency of a particular company, its value chain dependencies on at-risk sources of natural capital (including risks that may be posed by sectors that would not normally be considered competitors) and how corporate engagement and collaboration across a value chain can help unlock synergies in resource use through circular economies.

For example, one approach to mitigating the effects of macroeconomic forces on a portfolio is to diversify investments based on exposure to business cycles. Here, we look at three industries

Figure 8: Encore impact classifications for the primary production processes within the communication services sector

Encore impact	Telecommunication and wireless services	Cable and satellite installation on land	Fibre-optic cable installation (marine)
Terrestrial ecosystem use	High	Low	-
Freshwater ecosystem use	-	Low	High
Marine ecosystem use	-	-	High
Water pollutants	Low	-	High
Soil pollutants	Low	-	-
Solid waste	Medium	-	-
Disturbances	-	High	High

Data source: Encore

Figure 9: Sample of relative amount of correlation between industry pairs based on equity price movements vs revenues generated from nature exposure

Industry pair	Equity price correlation percentile	Nature exposure correlation percentile
Defensive-Sensitive	26%	93%
Defensive-Cyclical	18%	90%
Sensitive-Cyclical	10%	87%

Data source: Equity price correlations derived from S&P 500 companies as of 30 Jun 2024 and assessed based on monthly price movements between 01 Jan 2021 and 30 Dec 2023. In cases where there was 0 industry representation within the index, a value of 0 was assigned to complete the correlation matrix. Nature exposure correlations derived from company total revenues for most recently completed fiscal year as of 30 Dec 2023. In cases where Encore has multiple production processes within a sub-industry, the company revenue was equally divided among the number of Encore production processes. In cases where a sub-industry was not represented in the index or in cases where Encore did not assign a production process with nature impact to the industry, then a value of 0 was assigned to complete the correlation matrix. Stock price and revenue data sourced from FactSet.

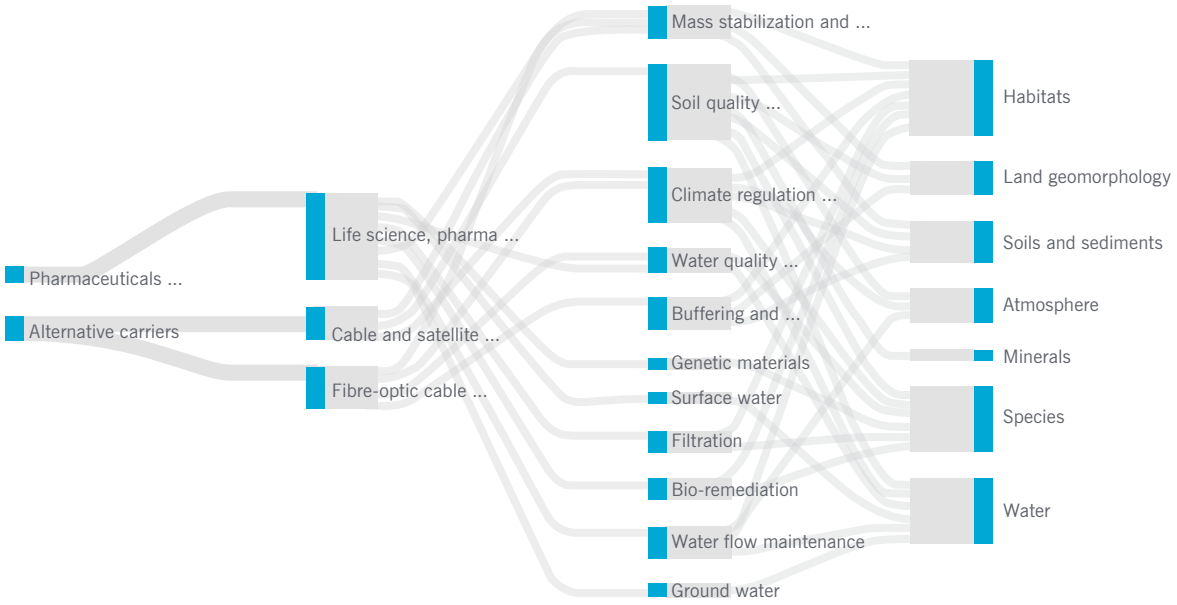
within each of the defensive, sensitive and cyclical supersectors. The health care supplies industry (health care sector) is generally part of the defensive supersector that is less dependent on economic cycles; the cable & satellite industry (communication services sector) is part of the sensitive supersector that tracks market movements; and the automobile manufacturers industry (consumer discretionary sector) is part of the cyclical supersector that is highly sensitive to business cycle peaks and troughs.

Figure 9 looks at the correlations between each of these industries based on equity price movements as representative of traditional diversification strategies and based on revenue exposures categorized to the Encore business processes as representative of nature risk exposure.[11] The correlations were ranked against all of the other industry pairs to test the consistency (or lack thereof) between the two diversification approaches – the 1st percentile would be the least correlated industry pairs and the 100th percentile the highest.

For example, cable companies and pharmaceutical companies generally would not be classified as sensitive to the same macroeconomic forces. Communication services is classified as part of the sensitive supersector and tracks market movements, whereas Health care is classified as part of the defensive supersector and generally considered less dependent on economic cycles.[19]

Nonetheless, these sectors overlap on seven sources of nature impact where at least one of the industries has a high impact. Not only are companies in both sectors contributing to nature loss through impacts such as disturbances, but also the impact caused by fibre-optic cable installation may disrupt species that are key ingredients in pharmaceutical manufacturing.

Figure 10: Encore impacts flow diagram for selected production processes



Data source: Encore

CONCLUSION

Energy transition and nature risk investment strategies have more commonalities than differences. In the case of corporate-focused analysis, understanding company value chains and physical locations of operations will increase in importance.

However, the market focus on net zero portfolio alignment is likely to leave blind spots in the systemic risk associated with planetary resilience given the expansive, and in many cases currently under-considered, impacts that economic activity has on nature.

The Encore impact classifications note that it is not just severity, such as severe weather events, that can degrade ecosystem resiliency, but also the frequency of the events and the threshold point past which the ecosystem will no longer be able to regenerate.

Nature positive investment strategies ultimately will require a holistic approach that allocates investments to the most resource-efficient economic activities, looks for investment opportunities such as nature-based solutions to maintain a resilient supply of natural capital, and engages corporations and policymakers to recognise the overlapping dependencies on key sources of natural capital and disincentivize overuse of common goods.

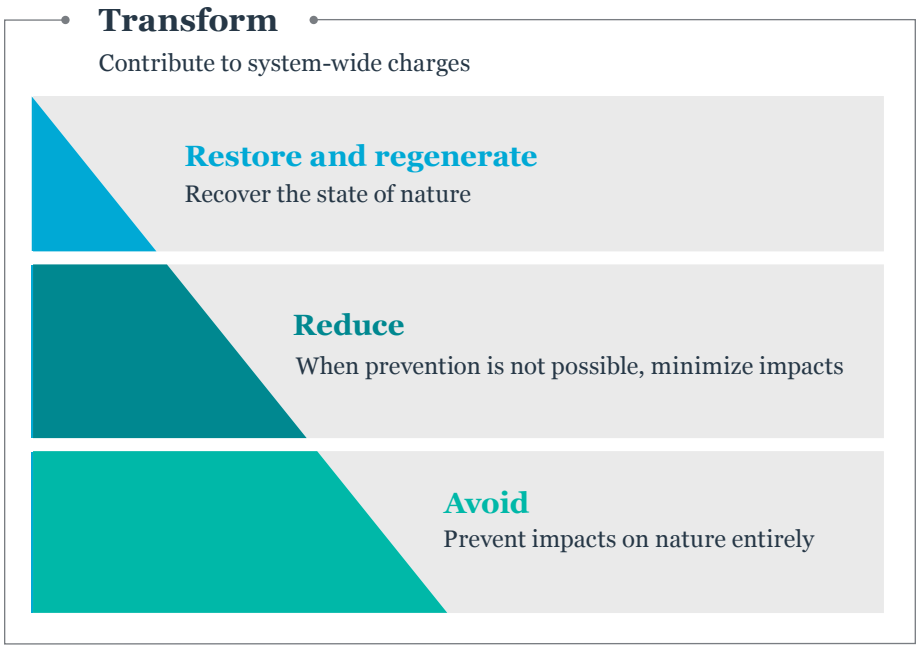
A helpful starting point is to integrate nature considerations focused on water use, land use and waste generation into the investment process. Additionally, the use of Science Based Targets Network's nature positive investment framework enables the classification of activities across a spectrum from avoidance or do no significant harm activities through to restorative and transformational practices.

Discover more about the investment implications of nature and prepare for the future with our tools and resources. Visit ***www.nuveen.com/naturepositive***

APPENDIX

Nature-positive investing framework

Nature-positive investing opportunities rely on investments to maintain the supply of natural resources as well as investments to reduce the demand of natural resource inputs in generating economic outputs



Example activities

Transform – replace unsustainable products and practices and expanding sustainable product line, introducing environmental incentive structures (e.g. providing financial material or in-kind support for landscape restoration)

Restore and regenerate – improving soil health, implementing regenerative agriculture to regenerate degraded

Reduce – reducing water use (existing or future) through efficient use, reducing agricultural land footprint in direct operations and supply change

Avoid – eliminating use of hazardous chemicals, avoiding illegal logging

Data source: SBTN Initial Guidance for Business (2020), Action Framework (AR3T)

For more information, please visit nuveen.com.

Endnotes

1 McKinsey Sustainability. Six characteristics define the net zero transition.

2 Net Zero Asset Managers Initiative Signatories.

3 Nature Positive Initiative. What is Nature Positive.

4 Half of the World's GDP Moderately or Highly Dependent on Nature, WEF, January 19, 2020.

5 World Economic Forum. Financing the Nature Positive Transition.

6 Nature Action 100 Investor Signatories.

7 World Bank; Nuveen. Map source: Google.

8 International Energy Agency. Net Zero by 2050: A Roadmap for the Global Energy Sector.

9 Encore. GHG Emissions Drivers of environmental change.

10 European Union. Nature's role in climate change.

11 Natural Capital Coalition, 2016. "Natural Capital Protocol". (Online) Available at: www.naturalcapitalcoalition.org/protocol.

12 Finance for Biodiversity Foundation. Assessment of the biodiversity impacts and dependencies of globally listed companies. October 2024.

13 See Encore Data & Methodology: Materiality. Available at: https://encorenature.org/en/data-and-methodology/materiality.

14 Encore primary impacts classification with Nuveen categorization overlay: i) biological interferences/alterations (land use change); ii) disturbances (land use change); iii) freshwater ecosystem use (water use); iv) GHG emissions (waste production); v) marine ecosystem use (water use); vi) non-GHG air pollutants (waste production); vii) other resource use (land use change); viii) soil pollutants (waste production); ix) solid waste (waste production); x) terrestrial ecosystem use (land use change); xi) water pollutants (water use); and xii) water use (water use).

15 Encore rating classification: Very high, high, medium, low, very low, not disclosed.

16 The Global Aggregate Index is comprised of a mix of securities across various fixed income asset classes including corporate debt, sovereign debt, municipal debt, preferred securities, asset backed securities, and other structured securities. There are more than 30,000 unique securities across more than 2,300 issuers when securities are aggregated to an ultimate parent level.

17 Following a basic methodology of portfolio tilting illustrated by MSCI, very high/high impact companies are tiled to 0.75X weight of the benchmark; medium impact companies are unchanged; very low/low or no impact companies are overweighted 2.0X weight of the benchmark. The raw values are then reweighted such that the portfolio is redistributed to equal 100% allocation.

18 The weighting assigned to each sector for the Bloomberg GA Weight is its proportional representation of the total weight of all corporate securities in the index. For the climate risk transition tilt portfolio, only the GHG emissions impact criteria is considered. For the nature risk mitigation tilt portfolio, all three themes are taken into account and over- and underweighting is aggregated across the twelve different Encore impacts to nature. See footnote 7 for list of Encore impact categories.

19 See Morningstar global equity classification methodology for sector classifications with the cyclical, sensitive, and defensive categories.

20 Percent is relative to all of the securities tagged as corporate securities within the index.

A word on risk

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