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Leveraging Environmental Opportunities for a Resilient Future

How Can Investors Spot the Leaders and Laggards?

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Executive Summary

Environmental solutions are expected to play a critical role in building a more resilient future by reducing the likelihood of crossing irreversible environmental tipping points. While the focus of governments on mitigating the impact of environmental breakdown has created opportunities for investors, they may face two immediate challenges: identifying the full opportunity set and, differentiating business activities likely to experience significant growth tailwinds with potential for mass adoption.

In this paper, we identify a set of eight environmental opportunity themes (**clean energy, energy efficiency, other mitigation, adaptation, sustainable water, pollution prevention and control, recycling, biodiversity and ecosytems**) for investors to consider. Then, we discuss two analytical dimensions, **the scale of potential adoption** and **the nature of potential disruption**, which can help investors understand the strength of growth tailwinds supporting a given environmental opportunity. These two analytical dimensions may help investors in differentiating potential leader companies, which are exposed to significant growth tailwinds due to environmental sustainability considerations, from laggard companies which may be exposed to relatively weaker growth tailwinds.

Confluence of factors **driving greater interest in environmental solutions**

Investors and governments are seeking to increase sustainability across the global economy and change how conventional methods of extraction and consumption have underpinned economic growth since industrialization.[1] Environmental solutions are expected to play a critical role in achieving this transition towards a more sustainable global economy and in building a more resilient future by reducing our likelihood of crossing irreversible environmental "tipping points," such as significant climate change, groundwater depletion or biodiversity loss. Environmental solutions include products, services or processes that minimize environmental damage by improving energy and material efficiency, developing more renewable energy capacity, reducing reliance on natural resources, and preventing pollution.

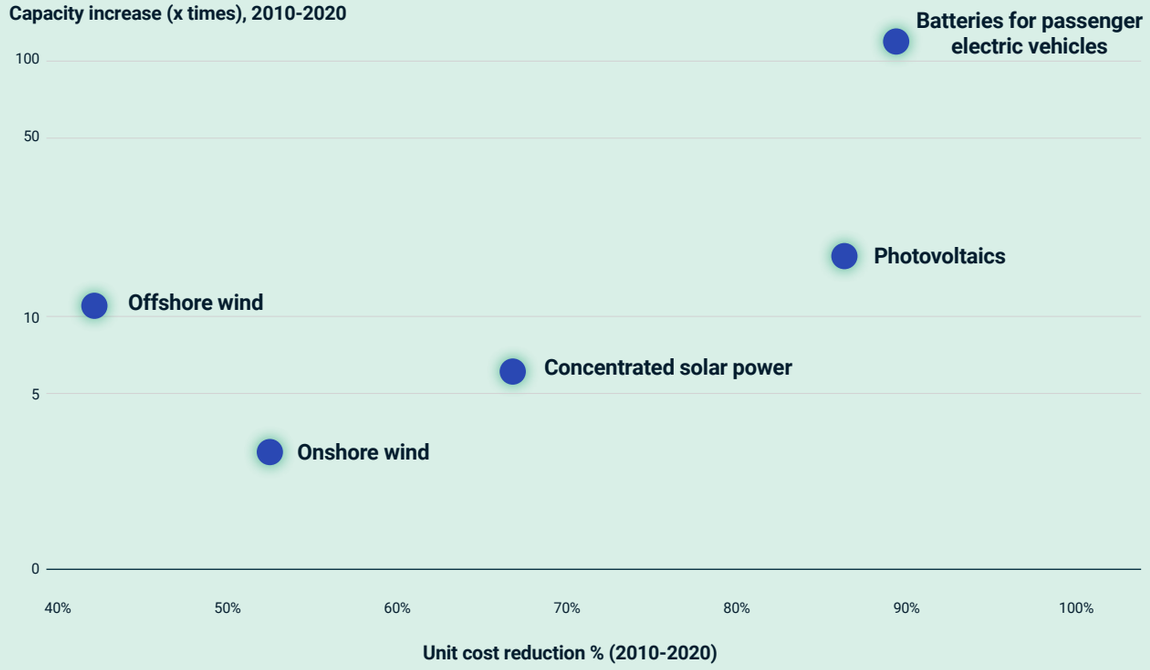
A targeted focus by governments on mitigating the worst possible impact of environmental breakdown has unlocked a series of policy measures to support the uptake of these solutions. Environment-friendly industrial policies and financing options, such as the European Union's (EU) LIFE program,[2] the Inflation Reduction Act,[3] the European Green Deal[4] and the Net-Zero Industry Act,[5] may enhance the commercial viability of projects involving environmental solutions. This could further drive down their cost (Exhibit 1) and thereby may accelerate investment flows and broaden their adoption.

We have already seen a wave of new opportunities and a surge of technological innovation resulting from this transition with environmental solutions, as a broader category, projected to attract USD 5-10 trillion in investments per year by 2025.[6] As capital flows toward environmental solutions, key questions for investors are:

- How can I identify companies that provide environmental solutions?
- Within this broad opportunity set, how can I pick a subset of themes associated with significant growth tailwinds[7] due to their potential for mass disruption and adoption driven by environmental sustainability considerations?

Exhibit 1:
Cost and adoption trend for select environmental opportunities

Source: Inferred from the figure SPM.3 on page 16 of "Mitigation of Climate Change: Summary for Policymakers" report by the IPCC's 6th Assessment Report Working Group 3. For power generation technologies (concentrated solar power, offshore wind, onshore wind, and photovoltaics), cost reduction is based on 2020 USD per MWh whereas capacity increase refers to increase in Gigawatts (GW) capacity. For batteries for passenger electric vehicles, cost reduction is based on 2020 USD per kWh whereas capacity increase refers to increase in number (in millions) of electric vehicles. https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf



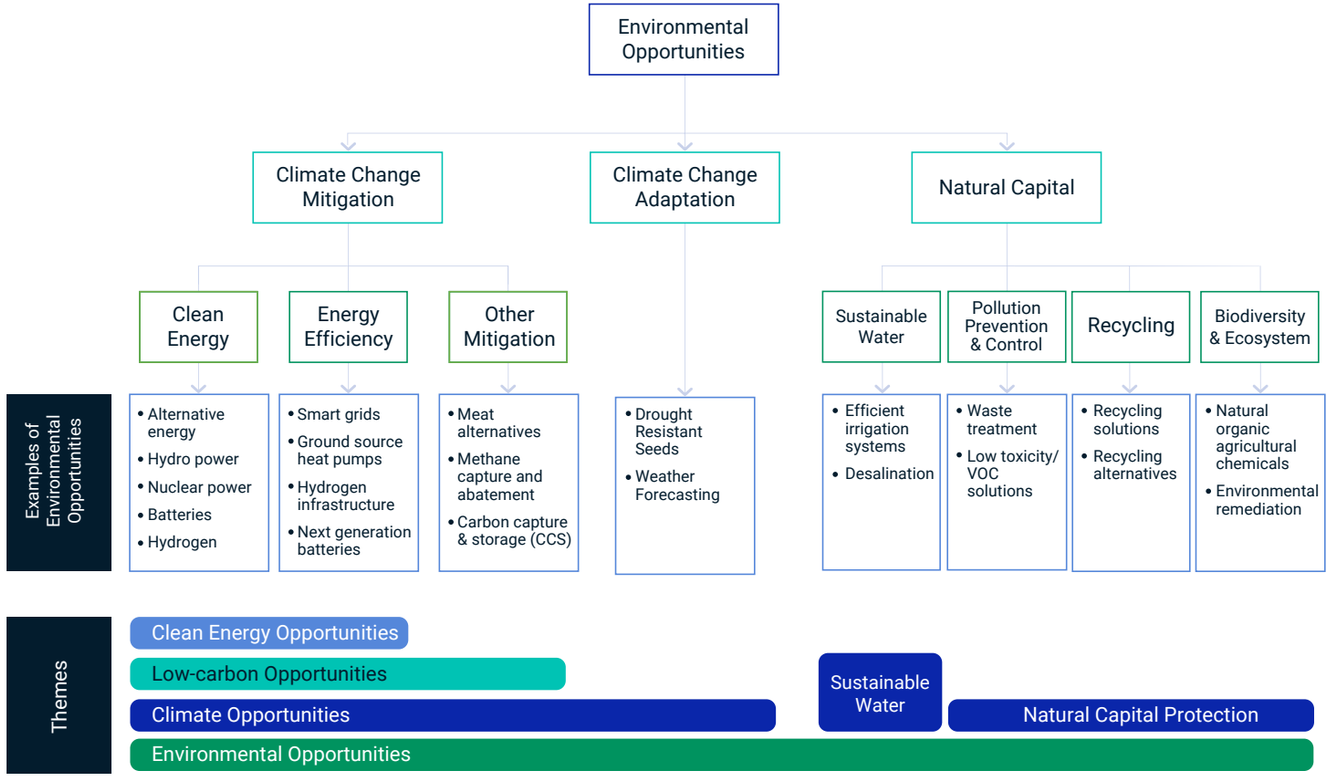
1 Global investors shift focus to sustainability amid push for a green recovery (worldbank.org); Four steps towards a more sustainable global economy | United Nations; COP26: Together for our planet | United Nations
2 LIFE - European Commission (europa.eu)
3 "Inflation Reduction Act of 2022." Public Law No: 117-169, Aug. 16, 2022.
4 The European Green Deal - European Commission (europa.eu)
5 "Net Zero Industry Act." European Commission, March 16, 2023.
6 Green tech investment could reach $5 trillion by 2025 | GPI (globalpi.org) ; Green business opportunities and net zero | McKinsey
7 In this paper, we discuss growth tailwinds or growth opportunity driven by environmental sustainability considerations only. Investors may wish to consider other risks and opportunities.

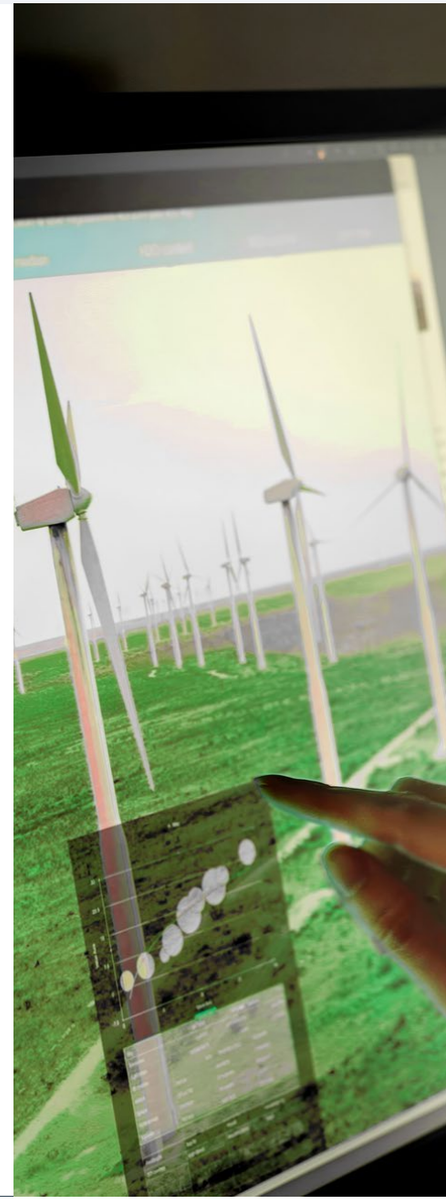
Identifying environmental opportunity themes

To identify themes with opportunities for positive environmental contributions, we looked at MSCI ESG Research's Environmental Impact themes[8] and publicly available taxonomies and frameworks developed by the EU and the United Nations Environment Program (UNEP).[9] After understanding the commonalities and differences among these, we have proposed environmental opportunities themes (Exhibit 2) to help investors broadly identify business activities with potential for positive environmental contributions through mitigating greenhouse gas emissions, adapting to new climactic patterns or helping reduce adverse impacts on natural capital. It also allows investors to focus on specific environmental opportunity trends by carving out a subset of themes such as clean energy and sustainable water.

8 MSCI Sustainable Impact Metrics Factsheet
9 EU taxonomy for sustainable activities (europa.eu), Definitions and Concepts: Background Note (unep.org)

Exhibit 2:
Environmental opportunity themes
Source: MSCI, Based on the EU Taxonomy {TEG final report on the EU taxonomy (europa.eu}, UNEP, and MSCI ESG Research's Environmental Impact Categories





Selecting environmental opportunity themes positioned **for significant growth tailwinds**

While the above themes (Exhibit 2) offer a starting point for investors aiming to capitalize on subset of themes likely to experience significant growth tailwinds driven by environmental sustainability considerations, simply relying on an extensive list may have several pitfalls for them as not all environmental solutions may offer similar growth opportunities. For example,

- Some technologies have already grown close to their market saturation. For instance, LED lightbulbs may have experienced high growth in the past but could be near their market saturation phase by now as their deployment become widespread.[10]
- Some environmental solutions may not be positioned to grow significantly if they are not aligned with broader trends. For example, fossil fuel-based cogeneration is not aligned with the global goal of a zero-carbon world and thus, in a scenario of transition to a zero-carbon world, it may not be positioned to grow at the same rate as that of solutions aligned with a zero-carbon world.
- Finally, it is crucial for investors to distinguish between solution users and solution providers as they are exposed to different sets of growth opportunities, though both are generally considered by taxonomies as environmentally sustainable economic activities.

To identify a subset of themes likely to experience significant growth tailwinds and have high potential for mass disruption and adoption, we discuss two main analytical dimensions investors can adopt: one is defining the **scale of potential adoption** the environmental solution could have in the real economy; the other is determining the **nature of potential disruption** the solution will bring to different sectors in the value chain. We go into detail on both questions below.

10 Must-Know Led Light Statistics [Recent Analysis] • Gitnux; Nearly half of U.S. households use LED bulbs for all or most of their indoor lighting - U.S. Energy Information Administration (EIA)

Scale of **potential adoption**

The first dimension — **the scale of potential adoption** — has two main components. The first is how well a technology solves the problem it was built to address. For example, solar PV, and wind turbines, which don't produce greenhouse gas emissions through their operations, solve the problem of decarbonizing electricity production extremely well (Exhibit 3). For these power sources, this is true both in an absolute sense and from an opportunity cost perspective, where alternatives are high emitting options like combined cycle gas turbines (CCGT), oil-fired generators and coal-fired plants. Also, considering enabling technologies like high voltage transmission lines, utility scale battery storage, and upgrades to the electricity grid to deploy renewable energy can ensure investors capture opportunities across the renewable power value chain. Similarly, new agricultural technologies that are more natural resource efficient and reduce pesticide use,[11] for example, may have the potential for widespread adoption as well.

The second component of the scale of potential adoption is the remaining runway for the technology's room to grow. What is the size of the total remaining addressable market? Some markets are already saturated: The use of LED lightbulbs grew exponentially over the past two decades and the bulbs are now ubiquitous. They solve their problem well — LED lightbulbs are much more energy efficient than previously conventional alternatives — but large part of the market has already been addressed with remaining addressable market shrinking every year.[12]

Exhibit 3:
Relative mitigation potential and cost of selected climate solutions

Note: Low/Medium/High categorization for both axis is inferred from the figure SPM.7 on page 42 of the report "Mitigation of Climate Change: Summary for Policymakers" by the IPCC's 6th Assessment Report Working Group 3. "Mitigation potential" of a solution is based on its potential contribution to net greenhouse gas emissions reduction, as defined in the IPCC report, in terms of gigatons of carbon dioxide equivalent per year by 2030 at all possible lifetime cost levels. Net lifetime cost categorization of a measure is based on the total cost profile, as provided in the IPCC report, associated with its full decarbonization potential, which may include a distribution of implementation costs.

Net lifetime cost	Mitigation potential of different measures		
	Low	**Medium**	**High**
High	• Bioelectricity, Hydropower, Geothermal energy, Biofuels. • Carbon capture and storage. • Methane reduction in coal mining. • Methane and N2O reduction in agriculture. • New energy efficient buildings, Improvement of existing buildings. • Industrial energy and material efficiency • Feedstock decarbonization and cementitious material substitution in industries.	• Carbon sequestration in agriculture • Ecosystem restoration, afforestation and reforestation • Fuel switching in industries	• Reduced conversion of forests and other ecosystems
Medium	• Nuclear energy. • Reduce methane emissions in oil & gas sector and solid waste management.	• Wind energy	• Solar energy
Low	• Shift to public transportation and bikes. • Efficient lighting, appliances, and equipment. • Fuel-efficient vehicles. • Shipping and aviation energy efficiency.	-	-

On its own, fast growth does not mean a small future market: technologies such as solar PV, wind turbines, and electric batteries have seen widespread adoption globally in the last decades (Exhibit 1) but growing energy demand and the large amount of emissions-intensive electricity generation still in use[13] suggest these widely used technologies still have significant room for growth.

11 UNDP-Cultiv@te-Finalists-Brochure-Jul2020-compressed.pdf ; 5 Tools and Technologies That Drive Sustainable Agriculture – U.S. Farmers & Ranchers in Action (usfarmersandranchers.org)
12 Must-Know Led Light Statistics [Recent Analysis] • Gitnux; Nearly half of U.S. households use LED bulbs for all or most of their indoor lighting - U.S. Energy Information Administration (EIA)
13 Unabated fossil fuel-based electricity – Analysis - IEA

Nature of **potential disruption**

After the scale of potential impact, the second analytical dimension is the nature of potential disruption that environmental solutions will bring to different sectors in the value chain. For instance, a typical product value chain may contain both providers and users of an environmental solution, however these two entities in the value chain could be exposed to different levels of growth opportunities.

To explain this, we refer to MSCI's Low Carbon Transition Categories which are defined based on the nature of transition different companies are likely to experience in a low carbon transition scenario (Exhibit 4). Here, solution users are generally the businesses which currently have carbon intensive operations or products (e.g., steel, cement, utilities and automobiles), and thus may be undergoing operational or product transition, as applicable, driven by climate considerations. Such businesses may face headwinds in the form of carbon pricing risk in the low-carbon scenarios. In contrast, solution providers such as wind turbine manufacturers may face greater growth tailwinds due to increased demand for their products and services in a low carbon transition scenario (Exhibit 5).

In earlier research,[14] we analyzed the earnings growth of companies with different low-carbon-transition risk profiles. We found that, over the study period,[15] Solutions LCT category, which includes low-carbon solutions providers, had higher earnings growth compared to Asset Stranding, Product Transition and Operational Transition LCT categories. Classifying companies into provider and/or users of an environmental solution thus may help investors in identifying companies likely to experience significant growth tailwinds.

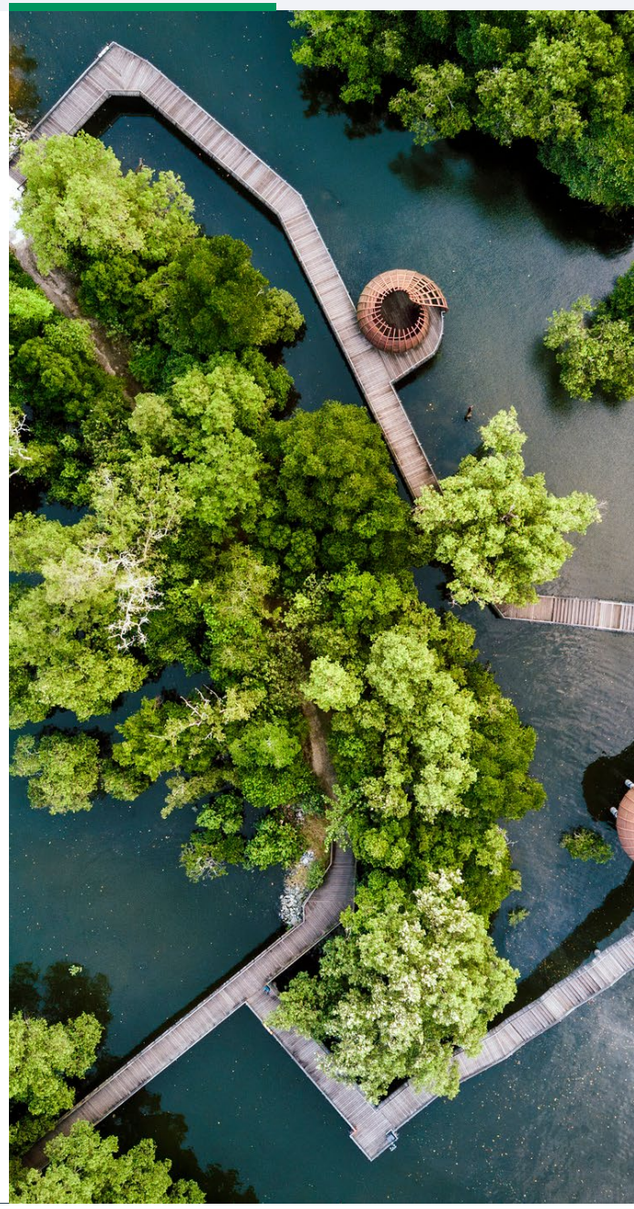


Exhibit 4:
MSCI's Low Carbon Transition Categories

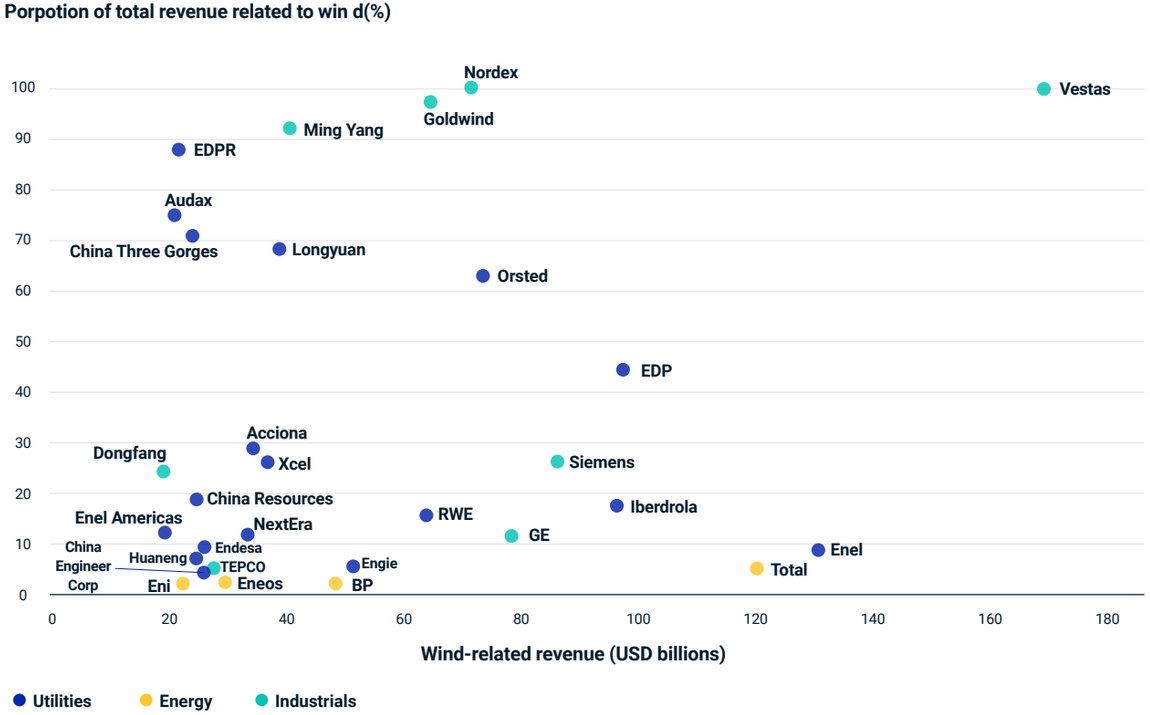
Source: MSCI ESG Research

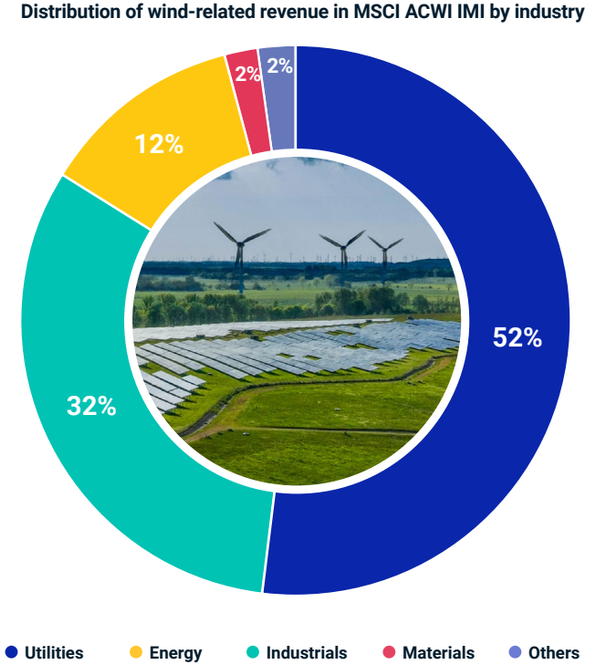
LCT Category	Description
Asset Stranding	Potential to experience stranding of physical or natural assets due to regulatory, market and technological forces arising from low- carbon transition.
Product Transition	Reduced demand for carbon-intensive products and services; winners and losers are defined by the ability to shift product portfolio to low-carbon products.
Operational Transition	Increased operational and capital cost due to carbon taxes and investment in carbon emissions mitigation measures, leading to lower profitability of companies.
Neutral	Limited exposure to low-carbon transition risk; companies could face physical risk or indirect exposure to transition risk via lending, investment operations.
Solutions	Potential to benefit through the growth of low-carbon products and services..

14 Foundations of Climate Investing: How Equity Markets Have Priced Transition Risk (msci.com)
15 From Oct. 31, 2013, to Jan. 31, 2021

Exhibit 5:
Some wind turbine manufacturers generate more wind-related revenue than utilities

Top 25 firms by wind-related revenue in the MSCI ACWI Investable Market Index (IMI), as of March 6,2024. Source: MSCI ESG Research





An assessment of different environmental solutions using the two analyses above can help investors compare the strength of potential growth tailwinds due to the transition towards a more sustainable global economy. For example, renewable energy technologies such as PV cells have high potential for future adoption and can bring massive transformation to the power generation sector in terms of avoided carbon emissions. Favorable assessment on both dimensions makes PV cells a technology with potentially higher growth tailwinds. On the other hand, in this context natural gas-based co-generation may face headwinds as it is would not be aligned with a net-zero emissions scenario, and has only incremental advantage over existing options in terms of its climate impact.

Conclusion

The set of environmental opportunity themes proposed in this report may help investors in identifying business activities with a potential for positive environmental contribution. Further, two analytical dimensions discussed, the scale of potential adoption and the nature of potential disruption, can help them understand the strength of growth tailwinds supporting a given environmental opportunity. This approach may support investors in differentiating potential leader companies, which are exposed to significant growth tailwinds, from laggard companies in a given set of companies with exposure to environmental opportunities.

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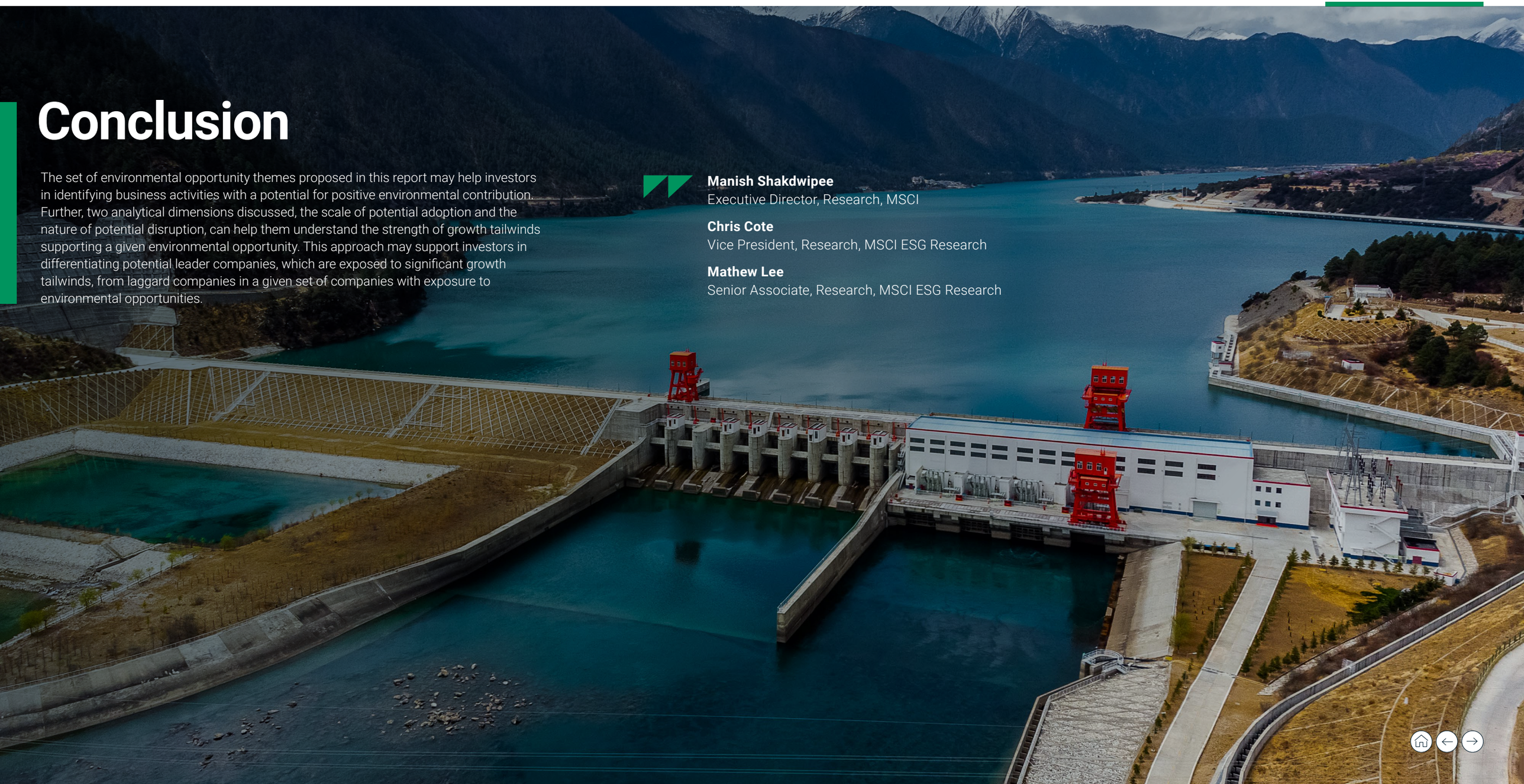

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