



White paper

The Little Boy, The Big Impact

How El Niño can shape physical climate risks for companies and investors

Introduction

El Niño is often viewed as a meteorological phenomenon. For investors, however, it is increasingly relevant as a source of physical climate risk that can disrupt corporate operations, supply chains, infrastructure and global trade.

Under normal conditions, strong trade winds push warm surface waters across the equatorial Pacific toward Indonesia, while colder waters rise along the west coast of South America. Every two to seven years these winds weaken, allowing warm water to spread eastward and altering weather patterns around the world. An El Niño event is officially declared when sea surface temperatures in the central Pacific rise at least 0.5°C above their long-term average for a sustained period.¹

Most El Niño events have limited economic significance. However, so-called "Super El Niño" events typically characterized by temperature anomalies exceeding 2°C have historically been associated with widespread disruptions across agriculture, transportation networks, energy systems and industrial production. The 1997-98 Super El Niño triggered severe flooding across parts of South America and extensive droughts in Southeast Asia. The 2015-16 event contributed to crop failures across multiple regions, disrupted commodity markets and intensified inflationary pressures in several emerging economies.

More recently, the 2023-24 El Niño contributed to reduced water levels at the Panama Canal, creating significant bottlenecks for global shipping and supply chains.

From an investment perspective, El Niño matters because it demonstrates how physical climate risks can rapidly translate into financial risks. Extreme rainfall, droughts, heat stress and water shortages can affect company revenues, disrupt production, damage infrastructure and increase operating costs. In a globalized economy, these impacts are often transmitted through supply chains, meaning Nordic companies can face material exposure even when their headquarters are thousands of kilometers away from the affected regions. This is particularly relevant for Nordic investors, as many Nordic companies operate facilities, source inputs and maintain supply chains in regions historically affected by El Niño-related weather disruptions.

For many investors, attention is increasingly shifting beyond emissions and transition risk toward the real-world impacts of droughts, floods, heat stress and supply-chain disruptions. El Niño provides a useful real-world example of how changes in the climate system can affect corporate operations, supply chains and investment-relevant physical risks over relatively short time horizons.

¹ [NOAA Climate Prediction Center: Oceanic Niño Index (ONI) v5 data].

Oceanic Niño Index - monthly - 1990 - present

Seasonal [3-month] sea surface temperatures vs the 1981-2010 average - degrees Celsius

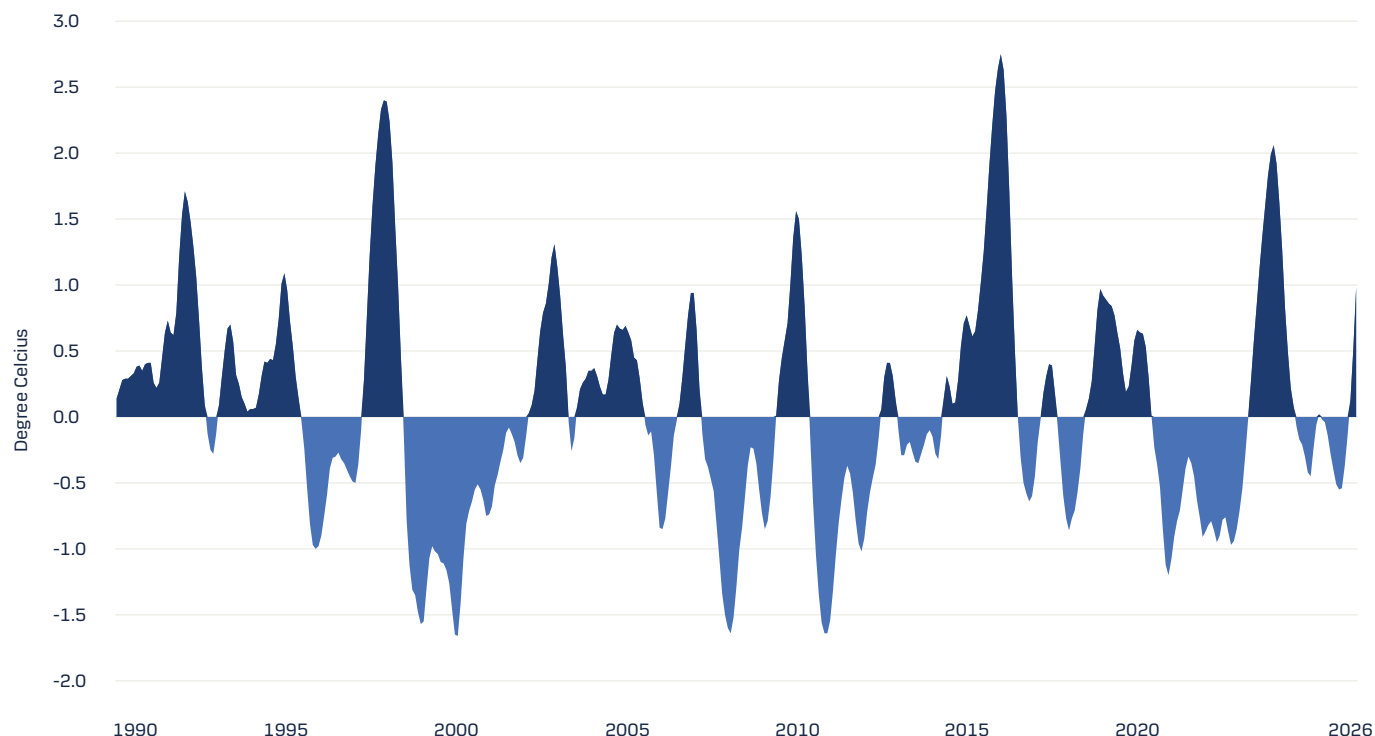


Figure 1: Oceanic Niño Index - 1990 - present. Source: NOAA CPC Oceanic Niño Index (ONI v5) 3-month ERSSTv5 SST anomalies in Niño 3.4 vs the 1981-2010 baseline

Why investors are paying attention to El Niño

The recent surge in investor interest stems from growing indications that a significant El Niño event could emerge during the 2026-27 cycle.

Meteorologists have now moved beyond the period of greatest forecast uncertainty, with several leading forecasting systems signaling conditions consistent with El Niño development. While forecasting skill naturally declines at longer time horizons, current model outputs increasingly point toward a meaningful warming event in the tropical Pacific.

What has particularly attracted attention is the projected intensity of the event. Current forecasts from the ECMWF SEAS5 model indicate a potential peak around 2.95°C above average, placing the event firmly within Super El Niño territory². Even more striking, NOAA's CFSv2 forecasting system currently projects a peak anomaly of approximately 4.14°C.³

If realised, such a reading would be unprecedented in the modern observational record. For comparison, the strongest El Niño event ever recorded occurred during the 2015-16 cycle, which peaked at approximately 2.75°C. A 4.14°C anomaly would therefore exceed the previous historical record drastically.

Naturally, forecasts at these magnitudes should be treated with caution. Climate models often diverge significantly when projecting extreme outcomes, and current forecasts display

substantial dispersion across forecasting systems. Nevertheless, even if realised warming falls well below the most extreme projections, the probability of a major El Niño event appears materially higher than normal.

For investors, the significance lies not in the precise temperature outcome but in the implications for physical risk exposure. Historically, stronger El Niño events have been associated with more pronounced disruptions to weather patterns, including droughts in parts of Southeast Asia and Australia, flooding across portions of Latin America, heat stress in several emerging markets and disruptions to agricultural production and transportation infrastructure.

As a result, investors are increasingly assessing not only which regions may be affected, but also which companies have assets, suppliers or revenue exposure linked to those regions. In that sense, El Niño has evolved from a meteorological curiosity into a potentially material source of investment risk, particularly for globally diversified companies whose operations extend far beyond their home markets.

² ECMWF SEAS5 ensemble forecast (As of 08-07-2026)

³ NOAA Climate Prediction Center: Oceanic Niño Index (ONI) v5 data is (As of 08-07-2026)

From climate event to financial risk

The financial relevance of El Niño comes from its ability to alter weather patterns across multiple regions at the same time. Depending on geography, El Niño can be associated with drought, flooding, heat stress, wildfire risk, changes in agricultural yields and shifts in cyclone activity. These hazards can affect companies directly, but often the most important impacts are indirect.

For companies, physical climate risk can materialize through several channels. Production sites may be affected by floods, water shortages or heat stress. Suppliers may face crop losses, lower output or higher operating costs. Transport routes may be disrupted by low water levels, port delays or weather-related infrastructure constraints. Commodity markets may experience tighter supply, affecting input prices for food, agriculture, energy or industrial companies. Insurance losses may also shift geographically, as some perils become less active while others intensify.

For investors, the important question is therefore not whether El Niño is “good” or “bad” for markets. The more relevant question is where the potential exposure sits in company assets, in supply chains, in key transport corridors, in commodity inputs or in end-market demand.

This makes El Niño a useful case study for a broader investment challenge: physical climate risk is becoming increasingly measurable, but it remains highly location-specific and company-specific.

The main transmission channels

El Niño can affect companies through four broad transmission channels.

Operational disruption

The first channel is direct operational disruption. This includes droughts, floods, heat stress, wildfires or storms affecting company-owned facilities such as factories, warehouses, mines, farms, data centres, ports or distribution hubs.

The impact depends heavily on the type of facility and the resilience of local infrastructure. For example, a production site in a water-stressed region may face operational constraints if local water availability declines. A facility in a flood-prone coastal region may face business interruption or higher adaptation costs. A site exposed to prolonged heat may face higher cooling needs, lower labour productivity or stress on local power systems.

This is the most visible form of physical climate risk, but it is not necessarily the only or most important one.

Supply-chain disruption

The second channel is supply-chain disruption. Many companies depend on suppliers, raw materials or components located far from their own headquarters. El Niño-related drought, flooding or heat can affect agricultural production, mining, commodity processing, manufacturing or logistics in exposed regions.

This means that a Nordic company may be affected by El Niño even if none of its own facilities are directly hit by extreme weather. The risk may instead sit with a supplier, an input commodity or a critical transport node.

This is one of the most important insights for investors: physical climate risk does not stop at the company gate. It can travel through the value chain.

Cost and margin pressure

The third channel is cost pressure. Weather-related disruptions can affect input prices, freight costs, insurance premiums, energy costs, cooling demand and water availability. Companies with limited ability to pass on higher costs may face margin pressure, while companies with stronger pricing power or more diversified sourcing may be better positioned.

This is especially relevant for sectors dependent on agricultural commodities, food ingredients, energy, water-intensive production or long-distance logistics.

The financial impact is therefore not only about physical damage. It can also come through higher operating costs, tighter supply and reduced flexibility.

Demand and revenue effects

The fourth channel is demand. El Niño can change demand patterns in certain sectors. Higher temperatures may increase demand for cooling equipment. Weather-related disease patterns may affect demand for vaccines, diagnostics or healthcare products. Travel and tourism flows can be affected by heat, storms, drought or wildfire risk. Insurance demand may also change if customers become more aware of weather-related losses.

These demand effects can be positive, negative or mixed depending on region, timing and business model. That is why the analysis should not be reduced to a simple sector view. The same climate event can create challenges for one company and opportunities for another.



Why geography matters

El Niño does not affect all regions in the same way. Its impacts are highly uneven, and the financial consequences depend on the location of assets, suppliers and transport routes.

Some regions may experience wetter-than-normal conditions, while others face drought, heat or wildfire risk. In parts of South America, El Niño has historically been associated with flooding along the Pacific coast, while parts of the Amazon, Northern Brazil and the Andes may face drought and elevated fire risk. In Southeast Asia and Australia, El Niño has often been linked to drier conditions and heat stress. In parts of the United States, the effects can differ significantly between the southern and northern regions. The Atlantic hurricane season may also be affected, with El Niño often associated with suppressed Atlantic hurricane activity.

This regional variation is important for investors because it means exposure cannot be assessed only at sector level. A food company, utility, insurer or industrial company may be affected very differently depending on where its facilities, suppliers and customers are located.

The same also applies to Nordic companies. The Nordic headquarters location tells only part of the story. The more relevant question is often where the company's physical assets, production networks, suppliers and logistics routes are located.

How El Niño affects different business models

El Niño does not affect companies equally. The impact depends on how a business generates revenue, where it operates, which resources it depends on and how resilient its supply chain is.

Some companies are primarily exposed through physical assets and operations. Others are exposed through agricultural commodities, transportation networks, insurance losses or changing demand patterns. Understanding these transmission mechanisms is often more important than assessing whether an entire sector is likely to benefit or suffer from an El Niño event.

The following examples illustrate how El Niño-related physical risks can become financially relevant across different parts of the economy.



The impact depends on how a business generates revenue, where it operates, which resources it depends on and how resilient its supply chain is.

Logistics and global trade

Shipping and logistics can be exposed when El Niño affects key transport corridors. The Panama Canal is a clear example. During the 2023-24 El Niño period, low water levels contributed to restrictions on canal transit, affecting shipping routes, transit times and logistics planning.

For companies, this type of risk may appear through higher freight costs, rerouting, delays or inventory challenges. It can affect shipping companies directly, but also retailers, manufacturers and other companies dependent on global supply chains.

The broader investment lesson is that physical climate risk can affect companies through infrastructure bottlenecks far away from their own operations.

Food, agriculture and consumer staples

Food and agriculture-related companies can be affected through both volume and price effects. Drought, heat or flooding can reduce yields in some regions, while wetter conditions may improve harvests elsewhere.

This creates a complex picture. Agricultural producers in one region may benefit from improved rainfall, while food manufacturers in another region may face higher input costs for coffee, cocoa, sugar, palm oil, fishmeal or other commodities. The financial impact depends on sourcing, hedging, inventory levels, pricing power and the ability to reformulate or diversify supply.

For investors, the key is not simply whether a sector is exposed, but how dependent a company is on climate-sensitive inputs and whether it has flexibility in procurement.



Energy, utilities and water-dependent industries

Water availability is another major transmission channel. Hydropower utilities, metals production, pulp and paper, mining, agriculture and other water-intensive activities can be affected by drought or changes in reservoir levels.

Lower water availability may reduce hydropower generation, increase reliance on alternative power sources, raise production costs or create operational constraints. In some cases, lower hydropower output can also affect electricity prices and industrial competitiveness.

This is particularly relevant for investors because water risk is both a climate issue and a nature issue. It links physical climate risk with resource dependency, ecosystem resilience and local infrastructure capacity.

Insurance and financial risk transfer

Insurance and reinsurance are affected through changes in the location and type of weather-related losses. El Niño may reduce some risks, such as Atlantic hurricane activity, but that does not necessarily mean global insured losses decline. Risks can rotate toward floods, bushfires, storms or other regional hazards.

This means the insurance impact is often mixed. A quieter hurricane season in one region can be partly offset by increased losses elsewhere. For investors, the relevant question is how well insurers and reinsurers understand peril rotation, pricing adequacy and geographic concentration.

This is a good example of why physical climate risk cannot be assessed through simple averages. The distribution of losses matters.

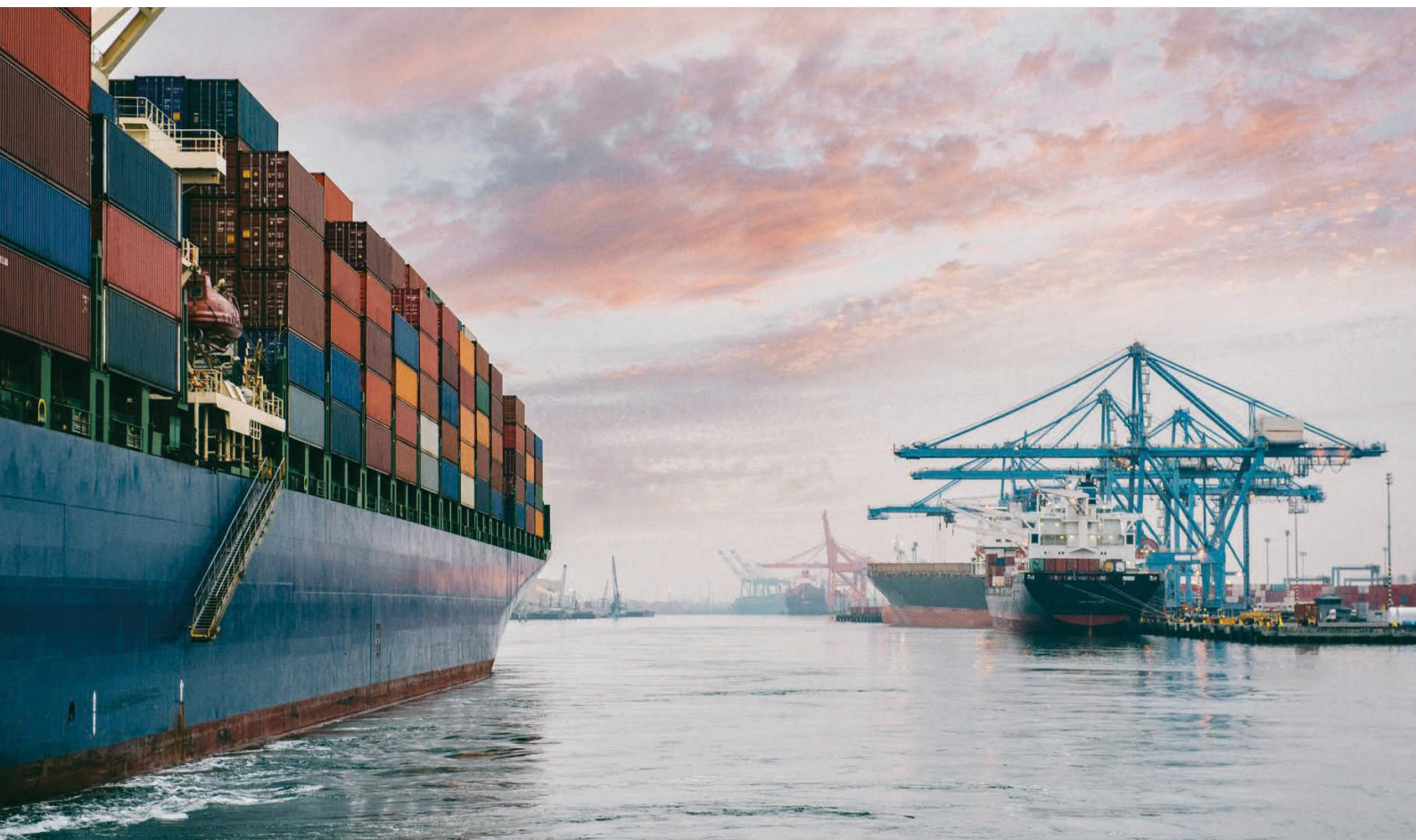
Health, cooling and adaptation-related demand

Some sectors may see changes in demand linked to heat, disease patterns and adaptation needs. Higher temperatures may increase demand for cooling and HVAC systems. Changes in rainfall and temperature can also affect vector-borne disease patterns, which may influence demand for vaccines, diagnostics or healthcare services in some regions.

These effects are highly context-specific. They depend on geography, public health preparedness, infrastructure, affordability and the timing of weather impacts. The point is not to identify “beneficiaries”, but to show that physical climate risk can affect both the risk side and the demand side of company analysis.

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What the Nordic 100 exposure tells us

The relevance of El Niño for Nordic investors is not primarily linked to weather conditions in the Nordic region itself. Rather, it stems from the global footprint of Nordic companies. While many companies are headquartered in Northern Europe, their operations, suppliers, customers and logistics networks span regions that have historically experienced significant El Niño-related disruptions.

Our analysis of the 100 largest Nordic listed companies suggests that El Niño exposure is neither evenly distributed nor driven by a single hazard. Instead, exposure is concentrated in specific industries, geographies and transmission channels. Four findings stand out.

Exposure is global rather than Nordic

The first finding is that the physical exposure of Nordic companies is overwhelmingly international. Across the Nordic 100 universe, facilities are located far beyond the region, with significant concentrations in North America, Latin America, Southeast Asia, China and Australia.



Our analysis of the 100 largest Nordic listed companies suggests that El Niño exposure is neither evenly distributed nor driven by a single hazard.

This means that investors cannot assess physical climate risks solely through a company's headquarters location. A Nordic-listed company may appear geographically distant from El Niño-affected regions while at the same time having substantial operational exposure through manufacturing sites, processing facilities, logistics hubs or key suppliers located in areas historically affected by droughts, floods, heat stress and wildfires.

The analysis highlights an increasingly important reality for investors: physical climate risk is often imported through global operations and supply chains rather than experienced directly in home markets.

Supply chains and logistics matter as much as physical assets

A second key finding is that exposure frequently originates outside a company's own facilities.

While direct exposure to droughts, floods, heat and wildfires remains important, the analysis indicates that indirect exposure through logistics networks, transport corridors and commodity supply chains is often equally significant. In several industries, disruptions to shipping routes or critical infrastructure create larger aggregate exposures than direct weather impacts on company-owned facilities.

The Panama Canal is one example. The restrictions introduced during the 2023-24 El Niño demonstrated how water stress in one location can affect global freight flows, shipping costs and supply chains far beyond the immediate region. Similar dynamics can emerge through commodity markets, where climatic impacts on agricultural production, fisheries or mining output can affect companies with no direct physical presence in the affected area.

This suggests that investors should think beyond facility-level risks when assessing physical climate exposure. Understanding dependencies on suppliers, transport routes and critical infrastructure can be just as important as understanding where a company's assets are located.

Heat emerges as the dominant hazard

A third finding is that heat represents the single largest hazard category across the Nordic 100 analysis.

While El Niño is often associated with flooding, droughts and extreme weather events, the facility-level assessment suggests that elevated temperatures account for a substantial share of identified exposures. Heat-related impacts are more widespread than any other individual hazard category and appear across multiple industries and geographies.

This matters because heat affects companies in ways that are often less visible than floods or storms. Higher temperatures can increase cooling costs, reduce labour productivity, strain local power systems, increase water demand and place pressure on critical infrastructure. Unlike isolated weather events, heat can affect large geographic areas simultaneously and persist over extended periods.

For investors, this suggests that temperature-related operational resilience may become increasingly important when assessing company preparedness for physical climate risks.



Nature-dependent industries appear particularly sensitive

The fourth finding is that the largest identified exposures are concentrated in industries that depend directly on biological systems, water availability or climate-sensitive resources.

Sectors linked to aquaculture, food production, agricultural inputs, fisheries, metals and mining appear particularly exposed because climatic disruptions can influence the underlying ecosystems and natural resources upon which their business models depend.

Importantly, many of these exposures arise through indirect ecological pathways rather than direct asset damage. Changes in fish stocks, agricultural yields, water availability or ecosystem conditions can create operational and financial impacts long before physical infrastructure itself is affected.

This highlights the close relationship between climate risk and nature risk. In many cases, the financial consequences of El Niño are ultimately transmitted through natural systems, whether through water availability, agricultural productivity, fisheries, ecosystem health or biological supply chains.

The broader implication

Taken together, the Nordic 100 analysis suggests that El Niño should not be viewed simply as a weather event. Rather, it illustrates how physical climate risks can propagate through global business models in complex ways.

The largest exposures do not necessarily occur where a company is headquartered. They do not always originate at the company's own facilities. And they are not limited to direct physical damage from extreme weather events.

Instead, exposure increasingly reflects a combination of geography, supply-chain dependencies, infrastructure constraints and reliance on nature-dependent systems. Understanding these interconnections may become an increasingly important part of investment analysis as investors seek to assess resilience in a world of growing physical climate risk.

What investors should monitor

The conclusion is not that investors should make short-term sector bets based on El Niño. The more important conclusion is that El Niño illustrates why physical climate risk is becoming increasingly relevant for company analysis.

For investors, the key is to monitor where weather-related disruptions may become financially material.

Important indicators include:

- **Facility exposure** in regions affected by drought, flood, heat, wildfire or storm patterns
- **Supply-chain dependencies** linked to agriculture, food ingredients, minerals, components or water-intensive production
- **Transport routes and chokepoints**, including the Panama Canal and other critical logistics corridors
- **Water availability** for hydropower, mining, metals, pulp and paper, agriculture and cooling
- **Input-cost pressure** from commodities such as coffee, cocoa, sugar, palm oil, fishmeal, energy or freight
- **Insurance and reinsurance loss patterns**, especially where risks rotate between regions and perils
- **Company preparedness**, including contingency planning, sourcing flexibility, insurance coverage and business continuity plans
- **Cost pass-through ability**, particularly for companies exposed to higher input or logistics costs
- **Disclosure quality**, including whether companies provide sufficient information on asset location, supply-chain resilience and physical climate risk management

This is where physical climate risk becomes relevant for responsible investment. It is not about predicting the precise impact of one weather event. It is about understanding whether companies are prepared for a world in which climate-related disruptions may become more frequent, more severe or more financially visible.

El Niño is a reminder that climate risk is not only about long-term emissions pathways or future policy changes. Physical climate risks are already affecting infrastructure, supply chains, ecosystems and business models today. For Nordic investors, the relevance lies in the global footprint of Nordic companies and the potential for weather-related disruptions to travel through facilities, suppliers, transport routes and markets.

The broader lesson is that investors increasingly need to understand geography, not just sectors; supply chains, not just direct operations; and resilience, not just exposure. El Niño is one example of that challenge but the investment relevance of physical climate risk extends far beyond a single climate event.



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