

Mastering the flow of water risks

How to build water-conscious investment strategies?



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In a world grappling with escalating water issues, prioritizing water as a strategic business imperative has never been more critical.

In the past few years, accumulating evidence has highlighted the challenge of water availability for our societies. Record extremes in rainfall, along with the increasing frequency, duration and intensity of meteorological droughts, are becoming more common worldwide. According to the UN¹, roughly half of the world's population currently experiences severe water scarcity for at least part of the year.

In this context, we believe that companies must accurately assess the growing operational and strategic challenges posed by water scarcity and the deterioration of water quality. They need to understand how these issues could impact their business activities and navigate this changing landscape accordingly. However, harnessing the power of water is not just a necessity; it also represents a transformative opportunity to propel businesses towards a sustainable and prosperous future.

The repercussions can be significant for investors and their portfolios as well. Evaluating investee companies' exposure and management

¹ - The United Nations World Water Development Report (2024), <https://www.unwater.org/publications/un-world-water-development-report-2024>

of water risks is becoming crucial in assessing sustainability risks, mitigating negative impacts on ecosystems, and identifying potential investment opportunities.

Contrary to other global environmental challenges such as climate change, water is a local issue requiring asset-level localized data to be properly understood and managed. This of course creates significant challenges related to data availability

and quality, and highlights the necessity for investors of creating sophisticated geographic models and the urgency of improving corporate disclosure on this complex matter.

By recognizing water as a strategic business priority and investment theme, companies and investors can position themselves at the vanguard of sustainable development, working towards long-term resilience of business activities and investment portfolios.

1. Water: A strategic business priority and a key investment risk.

Water is a vital resource for businesses across many sectors. In 2022, 69% of listed companies reporting via the Carbon Disclosure Project (CDP) stated that they were exposed to water risks that could generate substantive changes in their business².

Still, only one-third were actually assessing water-related risk exposure. Thirty-nine percent currently didn't, but planned to within the next two years³.

Transitioning to more water-resilient business models is absolutely crucial in the context of the unprecedented water crisis that our world is facing.

The United Nations predict a 40% global shortfall in water supply by 2030 if current consumption and production patterns do not change⁴.

At the beginning of 2024, the European Commission's Joint Research Centre⁵ reported on the impacts of persisting droughts in the Mediterranean region. Water use restrictions have been announced or are already implemented in Spain, Portugal, France and Morocco. The International Energy Agency (IEA) reports that about two-thirds of the world's population experience severe water scarcity for at least one month each year⁶.

2 - Source: CDP

3 - Source: CDP Europe Report, March 2024, https://cdn.cdp.net/cdp-production/cms/reports/documents/000/007/624/original/CDP_Europe_Report_2024_.pdf?1713465804

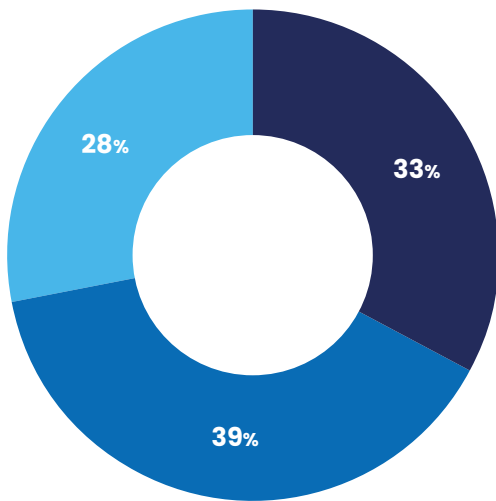
4 - Source: World Economic Forum, <https://www.weforum.org/agenda/2023/03/global-freshwater-demand-will-exceed-supply-40-by-2030-experts-warn/>

5 - Source: European Commission, https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/prolonged-drought-and-record-temperatures-have-critical-impact-mediterranean-2024-02-20_en

6 - Source: International Energy Agency March 2023 - Clean energy can help to ease the water crisis, <https://www.iea.org/commentaries/clean-energy-can-help-to-ease-the-water-crisis>



Figure 1:
Companies assessing water-related risk exposure (% of companies)



■ Yes	33%
■ No, but we plan to within the next two years	39%
■ No and we do not plan to in the next two years	28%

Source: CDP (2024)

The operational and financial impacts of water-related risks have started materialising. Global companies in key industries are already losing billions as a result of the global water crisis. CDP research from 2022 showed how \$15.5 billion had been stranded or were at risk because of depleted and contaminated water supplies⁷.

Therefore, **companies must consider and manage water as the long-term strategic and operational risk it can represent.** Companies' strategic planning

and capital allocation must integrate resilience to changing water availability patterns as a top priority. Anticipating these changes will unlock opportunities for companies: according to CDP, those that integrate water into long-term business and financial planning realise four times more opportunities⁸.

7 - Source: CDP - <https://www.cdp.net/en/research/global-reports/high-and-dry-how-water-issues-are-stranding-assets>

8 - Source: CDP March 2023, https://cdn.cdp.net/cdp-production/cms/reports/documents/000/006/925/original/CDP_Water_Global_Report_2022_Web.pdf?1679328280

Electric utilities: getting into hot water?

Some sectors are more acutely concerned than others by water availability issues. Utilities is probably one of the most at risk, as power producers depend heavily on water resources for electricity generation. Several forms of power generation activities are particularly threatened by structural and seasonal water scarcity:

- **Hydroelectric power:** hydro has a critical position in the global energy mix, as it accounts for 15% of global electricity generation in 2021⁹ and is currently one of the only ways to store energy at scale. Hydroelectric plants are particularly vulnerable to changing precipitation patterns and reduced water availability. While droughts can limit power generation capacity by reducing water levels, excessive rainfall and runoff can lead to flooding, causing damage to infrastructure. In 2023, weather, and particularly droughts, below average rainfall and early snowmelt, impacted power generation, which reduced global hydropower generation by more than 2% compared to 2022¹⁰.
- **Thermal fossil-based power plants** need available freshwater at all times for cooling purposes. They accounted for about 40% of total freshwater withdrawals for energy production in 2021¹¹. As a consequence, limited water availability and increasing seasonal variations represent very critical operational risks for electricity generation capacity. Put simply, without sufficient access to freshwater, thermal turbines cannot operate (safely).
- **Nuclear power plants** also require very large amounts of water for cooling purposes. Cooling

systems in nuclear power plants play a critical role in maintaining safe operating temperatures. The water used for cooling is typically drawn from nearby water bodies, such as rivers, lakes, or more rarely oceans, and then returned to the source at a higher temperature. This dependence on water represents a serious risk, as illustrated by the record output cuts in 2022 at French operator EDF due in part to severe droughts that reduced the amount of surface water available for cooling. **In France, the cooling of nuclear reactors accounts for about one third of total water consumption**, behind agriculture (45%), but ahead of drinking water (21%) and industrial use (4%)¹². Given the significant operational concerns that changing patterns in water availability can create, it is crucial that water availability and quality be considered in the planning, construction, and operation of nuclear power plants to ensure their long-term sustainability.

Critically, the share of energy supply infrastructure in high water stress areas is set to increase over the coming years, as illustrated in the figure on the next page. **Around one-third of thermal power stations and oil refining capacities are located in high water stress areas.** The IEA forecasts an increase up to 45% for the former and 55% for the latter by 2040. The situation is even worse for some activities upstream the electricity value chain, such as copper mining, with already more than half of activities located in extremely high water stress, posing significant operational and strategic risk on the electrification “king” metal¹³.

9 - International Energy Agency - IEA, World Energy Outlook 2022

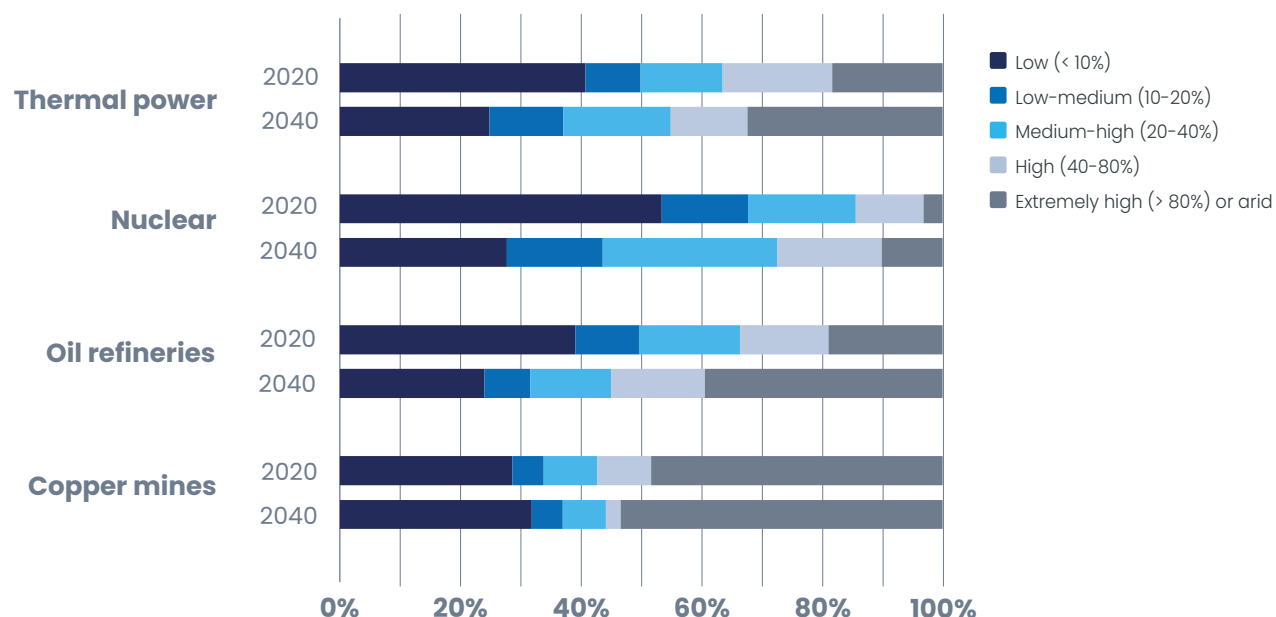
10 - Source: IEA, Electricity 2024

11 - Source: IEA, World Energy Outlook 2022

12 - Source: French Ministry of Environmental Transition (2022), L'eau en France : ressource et utilisation - Synthèse des connaissances en 2021

13 - Source: IEA, analysis based on WRI Aqueduct 3.0, 2019, and S&P Global, 2021

Figure 2:
Share of capacity by water stress level



Source: IEA, analysis based on WRI Aqueduct 3.0, 2019, and S&P Global, 2021

2. Water risk assessment: complex but crucial for companies and investors.

Water risks have become a material issue for companies and investors; it is thus critical for both to properly assess them.

- Investors need to understand companies' exposure to water risks and how such risks can potentially impact the value of their investments.
- Companies must assess water risks and develop appropriate strategies to address them, including oversight at the highest governance level.

Such strategies should include in-depth risk assessment, comprehensive water footprinting (assessment of water impacts and dependencies) and contextual target-setting and reporting.

Assessing water-related risks remains very complex, due to the lack of relevant data and the fact that many companies have so far failed to adopt an adequate approach to water management and disclosure. Adequate disclosure includes localized information on the sources of water intake, water consumption, contextual assessment of water-related risks, potential risks arising for competition for water access. Without this level of information, it can prove very difficult to integrate water-related risks to investment decisions, beyond proven cases of mismanagement and controversies.

Disclosures: work in progress

While there was an 85% growth in corporate water disclosure through CDP over five years to 2022¹⁴, with an additional 23% increase in 2023¹⁵, the level of disclosure could still be improved. Even among companies disclosing via CDP, **very few of them have adopted a contextual approach to water management, with identification and adequate disclosure regarding water “hotspots”. Many companies limit their approach to general principles and group-level objectives.**

To tackle this, **various regulatory initiatives are supporting larger and more homogeneous disclosure.** While the EU’s Corporate Sustainability Reporting Directive (CSRD) requires large, listed companies to report on a range of ESG data including water use and biodiversity loss, the Sustainable Finance Disclosure Regulation (SFDR) introduces mandatory reporting for financial market participants. We still note that there is significant room for improvement.

On a practical side, some internationally recognised initiatives provide reporting frameworks, guidelines and recommendations helping investors assess companies’ water risks exposure and water stewardship strategy. Examples include the CDP Water Security Questionnaire, the Taskforce for Nature-Related Financial Disclosure (TNFD), the guidelines for freshwater of Science-Based Targets Network, which were released in May 2023, and the framework of the Climate Disclosure Standards Board (CDSB).

Both the TNFD’s and CDSB’s guidance for water-related disclosure provide significant steps in the right direction, by requiring contextualised and localised water reporting that include asset-level data on hotspots. This will be crucial for companies and investors to develop adequate water-risk assessment and management approaches. Importantly, investors have a key role to play in engaging with companies to push for more transparency and improved data.



When the well is dry, we know the worth of water.

– Benjamin Franklin



14 – Source: CDP Global Water Report 2022; <https://www.cdp.net/en/research/global-reports/global-water-report-2022>

15 – Source: CDP Global Water Report 2023; https://cdn.cdp.net/cdp-production/cms/reports/documents/000/007/620/original/CDP_Water_Global_Report_2023_.pdf?2171103014

3. Building a sophisticated water assessment framework.

Comprehensive and accurate data is crucial to investors looking to make informed decisions by assessing risks and identifying investment opportunities. Against the backdrop of the lack of relevant data on water, a solution is for investors to develop their own water framework or to work with asset managers that have developed such methodologies.

At Candriam, we have developed our own internal proprietary water framework. It is based on the CDSB framework, relies on data from our in-house Biodiversity Assessment Model, and uses the WWF Water Risk Filter Suite to identify and evaluate water risks around the world.

This model is based on the combined evaluation of each company's specific exposure to water risks, and whether the company has put in place a relevant strategy and management to address water risks.

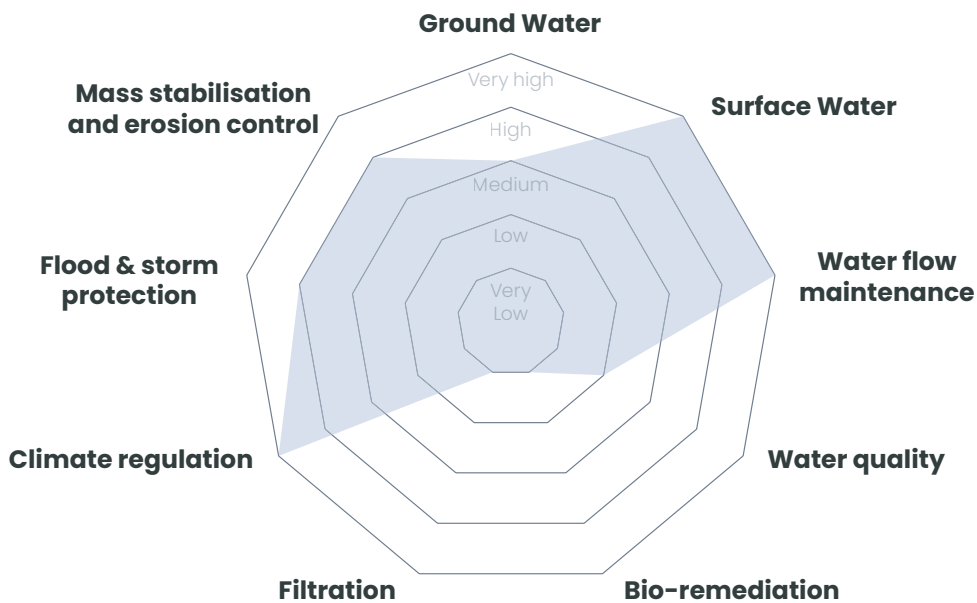


Evaluating water risk exposure

Water being a local issue, the exposure to water risk will depend on both the activities performed by the company and the location where they are performed.

We assess water risk exposure as part of our proprietary biodiversity model. This model starts by identifying the relevant dependencies and impacts associated with the company's activities. For water, 5 dependencies are the main areas of focus: Water Quality, Water Flow Maintenance, Surface Water, Ground Water and Filtration. This assessment is based on the database ENCORE.

Figure 3:
Analysing a Utilities company's water dependencies

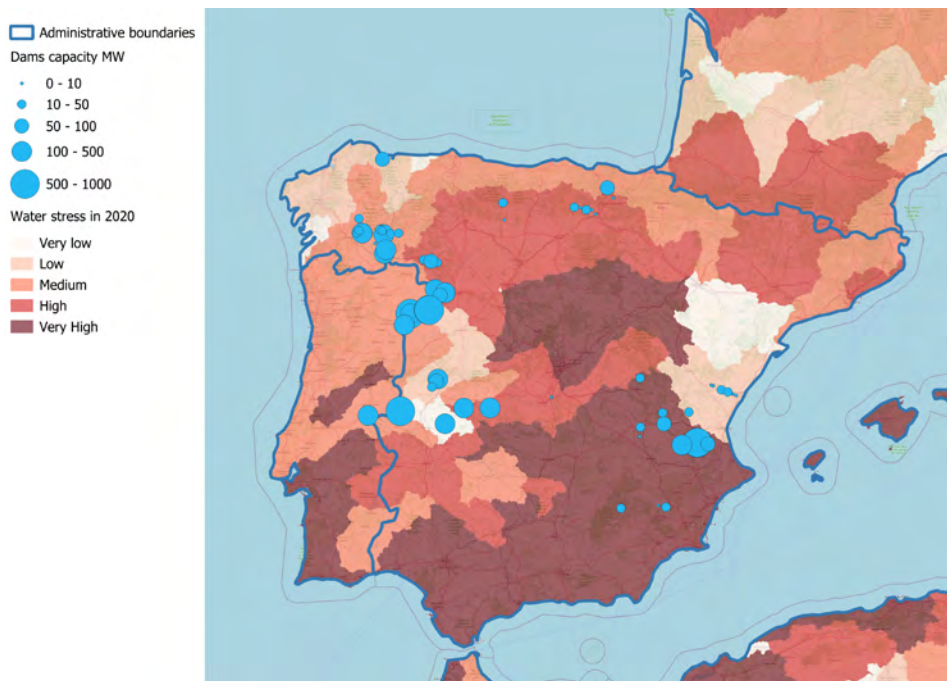


Source: Candriam

We then add a geographic filter to this initial assessment, as water-related risks are local by nature. Using an asset-level analysis, we identify which of the company's operating sites are located in high water risks areas, using the WWF Water Risk tool.

Figure 4:

Analysis of the level of water stress of a company's operating sites



Source: Candriam, WWF Water Risk tool

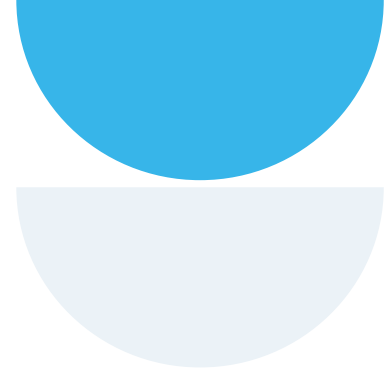
This assessment is run asset by asset, and allows to identify which sites are at risk, and what type of risks these operating assets are facing, not only today, but also with forward-looking 2030 and 2040 projections of the evolution of water-related risks.

This asset-level assessment is then aggregated at company level, depending on both the strategic importance of each asset and the level of risks, to result in a **company-wide exposure score** ranging from "Limited" to "Very High" water risk exposure.

Evaluating water strategy and management

Our evaluation of water management is structured around four aspects, in line with CDSB and TNFD guidance:

1. Governance & disclosure
2. Water strategy & Targets
3. Risk Assessment & management
4. Performance



The assessment is then structured around a set of criteria that are each weighted by importance.

Governance & Disclosure	
Oversight	Has the company put in place a relevant governance structure, including clear ownership by top management?
Information	Has the company set in place clear communication and reporting channels from top management to operations?
Incentives	Are top managers and operational managers incentivize on water management?
Disclosure	Does the company provide adequate level of disclosure, including local and contextualized information?
Water Strategy & Targets	
Dependencies & Impact	Has the company identified relevant water dependencies and impacts?
Strategy	Has the company put in place and communicated on a relevant water strategy?
Targets	Has the company set relevant contextualized water targets, at least for its high water risks operations?
Resources	Has the company allocated sufficient management resources?
Rationale	Does the company provide sufficient information on the perimeter, methodological choices and potential limits of its water strategy?
Risk Assessment & Management	
Risk Assessment	Has water been identified as risk and included in relevant risk management systems?
Quantification	Has the company assessed and quantified water related risks, including through relevant forward looking scenarios?
Management	Has the company put in place a relevant water management system including all relevant management levels?
Performance	
Progress	Is the company making the necessary progress to reach its targets?
Explanation	Does the company provide information to explain its performance?
Controversies	Has the company faced water-related controversies?

Source: Suez, Candriam

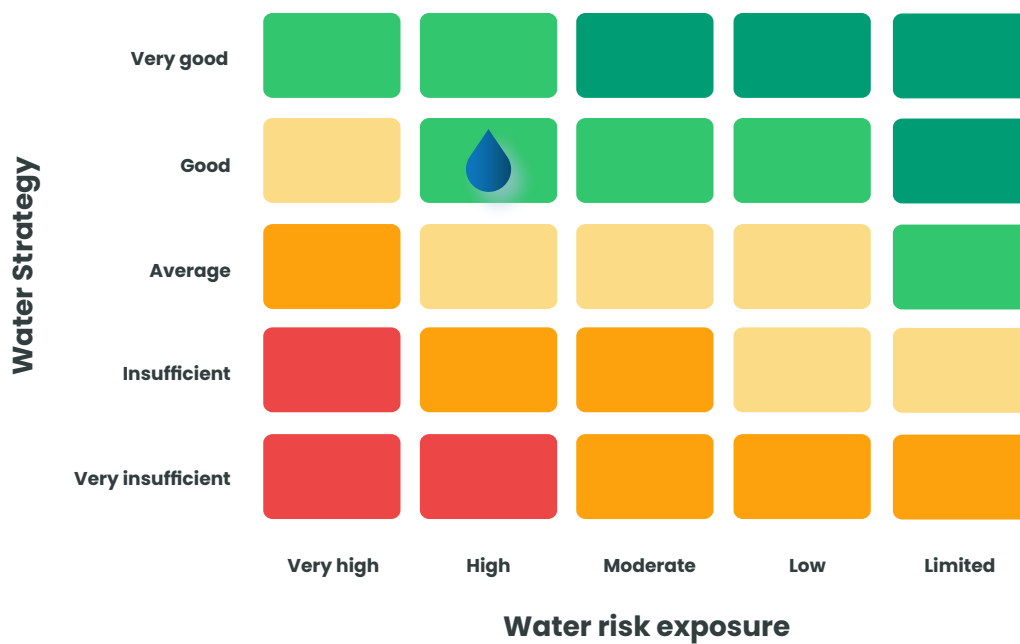
Companies are assessed and scored based on this assessment framework, which results in a 0 to 100 rating that translates into an **evaluation of their water strategy** going from “*Very Insufficient*” to “*Very Good*”.

The Water Risk Matrix

Combining these 2 dimensions (Exposure & Management), we can position each company into our **water risk matrix**.

Figure 5:

The Water Risk Matrix, a proprietary tool summarizing the evaluation of a company's water risk exposure and water strategy



Source: Candriam

This matrix is both used to assess water related physical and transition risks, and to guide our engagement efforts.

Conclusion: Towards water-risk conscious strategies.

Water scarcity, variations in water availability and other water-related risks not only impact companies' operations. Their effects extend to financial results, and can thus affect the value of investors' portfolios. Investors seeking to avoid such repercussions need to integrate water risks into the overall ESG analytical framework in order to build water-resilient portfolios.

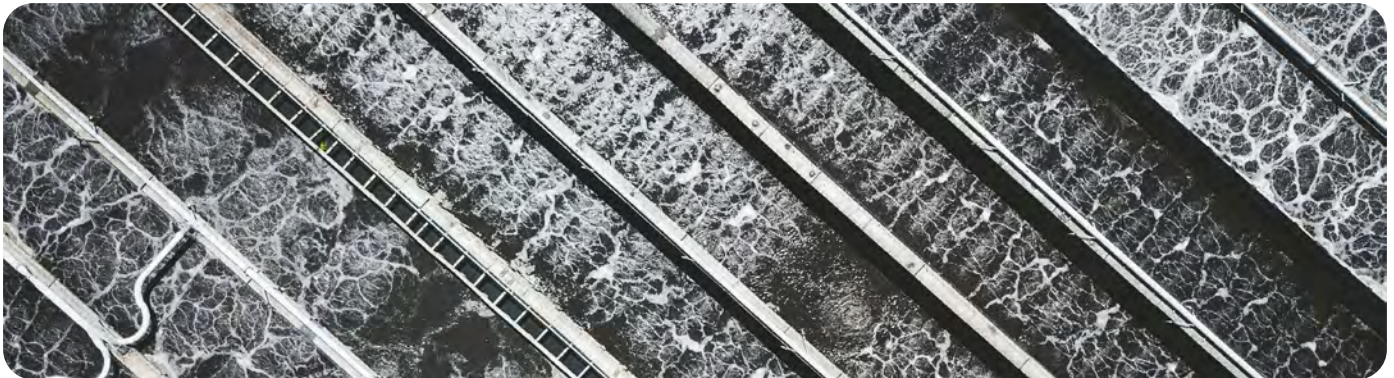
However, identifying and integrating water-related physical and transition risk is a highly complex exercise that requires sophisticated models based on contextualised asset-level assessments, and an enormous volume of data that so far remain quite poorly reported by companies.

Investors won't be able to integrate water in investment decisions without a significant improvement in terms of water disclosure from companies. This is where both regulation and engagement are absolutely

crucial levers that water-conscious investors should largely promote.

And without waiting for "perfect" data, water assessments have to evolve beyond simple comparison of aggregated water intensity numbers that tell very little about risks, in order to embrace a more contextualized, in-depth and forward-looking approach. It is the case both at corporate level and for investors.

The journey towards water-conscious business models and investment strategies is not a long, quiet river, and time is running out. But it is from complexity that emerge business and investment opportunities. Let's not wait until our wells are dry before building our water resilience. Because then, we will discover the true worth and cost of water. Infinite.



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