Rotoplas

Climate scenario analysis report: physical and transition risks and opportunities associated with climate change

April 2024

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Executive summary

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Assessment of climate-related risks and opportunities for Rotoplas

To understand the climate risks and opportunities it could be exposed to in the future, **Rotoplas** contacted South Pole to conduct an assessment of climate change-related risks and opportunities through a scenario analysis.

Creation of the baseline and record of climate risks 01

South Pole conducted a business mapping exercise and comprehensive assessment to identify a long list of physical and transition risks and opportunities relevant to **Rotoplas**' operations and value chain.

Prioritization of climate risks and opportunities 02

Based on the long list, a prioritization exercise of the 8 most relevant climate risks and opportunities for the company was carried out, considering the judgment of South Pole, as climate experts, and of key members of the **Rotoplas** team, as specialists in operations and the value chain.

'High level' risk assessment 03

The risks and opportunities were evaluated through three time horizons (2025, 2030 and 2050) and two climate scenarios: a high physical impact scenario (+4°C) and a rapid transition scenario (+1.5°C).

Report 04

South Pole drafted the key findings in a report, which includes:

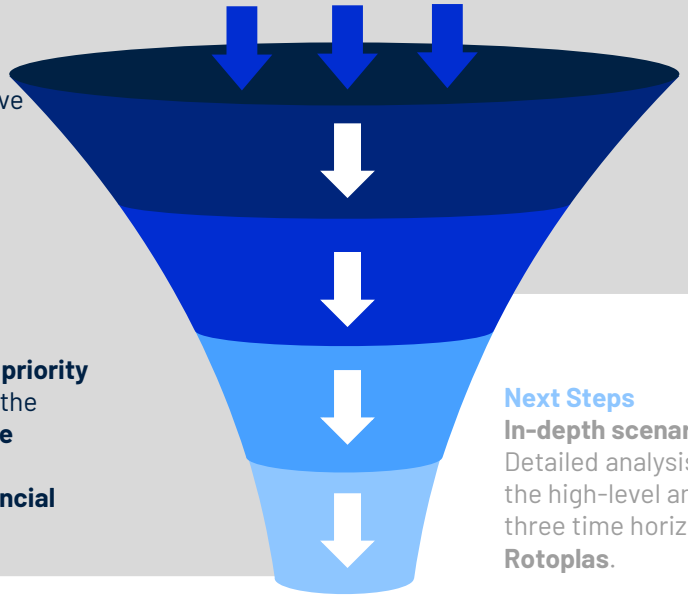
- Detailed description
- Methodology and detailed results of physical risk assessment
- Methodology and detailed results of transition risk assessment and opportunities.

Climate risk assessment

The South Pole methodology includes a three-step process covering the identification of risks and opportunities for assessment based on climate scenarios

1) Baseline, risks and opportunities mapping
Mapping of the business and comprehensive selection to identify a **long list of physical and transition risks and opportunities** relevant to **Rotoplas**' operations and value chain.

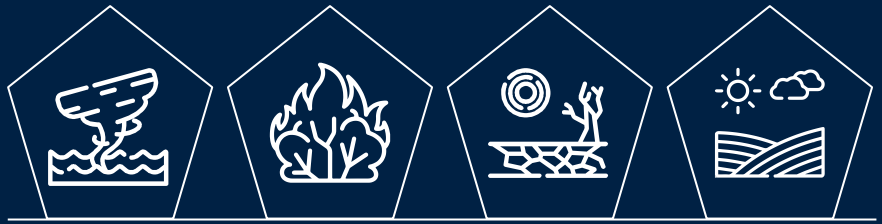
2) High-level climate scenario analysis
Qualitative climate scenario analysis of 8 priority themes exploring the degree of change in the risk/opportunity under **two climate change scenarios and three time horizons,** and **quantification of potential high-level financial impacts**



Prioritization
Prioritization and pre-selection of **8 physical and transitional risks and opportunities,** based on a high-level assessment of **Rotoplas**' perceived exposure and vulnerability

Next Steps
In-depth scenario analysis and business impact assessment
Detailed analysis of the prioritized issues based on the results of the high-level analysis across three climate change scenarios and three time horizons, and assessment of potential impacts for **Rotoplas**.

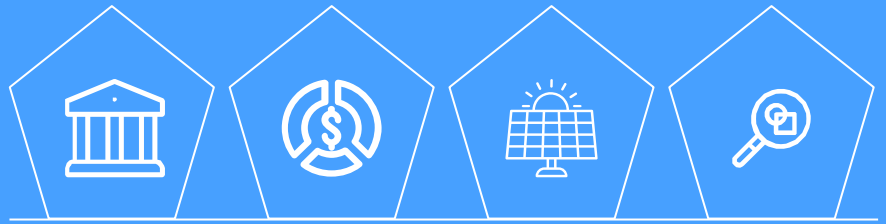
Physical climate risks



Storms and hurricanes | Forest fires | Droughts | Rising temperatures

Physical risks are those associated with extreme weather events (acute physical risks), such as forest fires and rain-related floods, and with long-term climate change (chronic physical risks), such as sea level rise

Transition climate risks

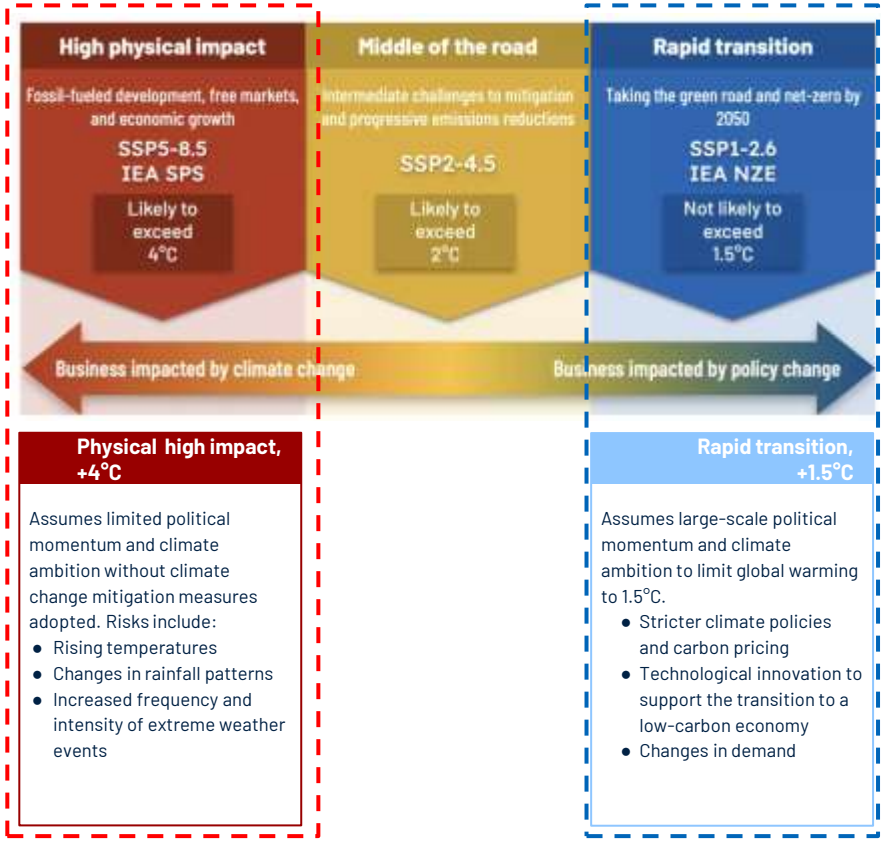


Policy and legal | Markets | Technology | Reputation

Transition risks are those associated with the transition to a low-carbon economy that limits global warming to 1.5°C above pre-industrial levels by the end of the century. There are five categories of transition risks: political, legal, market, technological, and reputational risks

Approach to climate scenarios

South Pole focuses on two opposing climate scenarios for the high-level scenario analysis: a 2050 net-zero emissions and 'rapid transition' scenario (aligned with +1.5°C); and a worst-case, physical 'high impact' scenario (+4°C).



Burgess, M. G., Pielke Jr, R., & Ritchie, J. (2022).

Transition risks and opportunities focus on a rapid transition scenario (1.5°C warming)

Physical risks of climate change are assessed through a physical high impact scenario

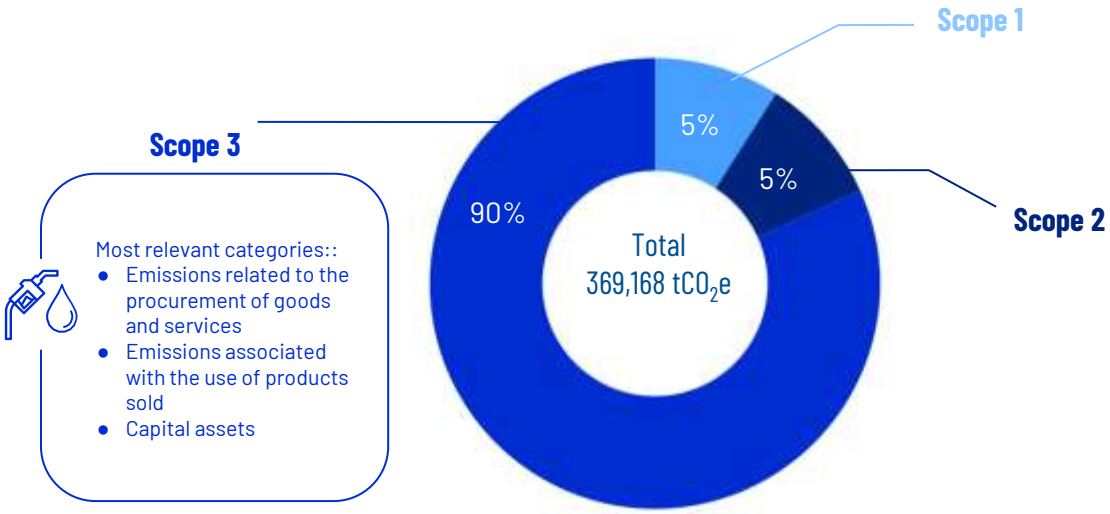
Scope of physical risk assessment

The physical risk assessment covered the 29 key sites identified by **Rotoplas** stakeholders**,** including plants, distribution centers, and stores, in seven countries across the continent.

Sites	
Pacific-Plant	San Martín-Plant
Guadalajara- plant	Loma Hermosa-Plant
León Rotopinsa and León Rotomolding-Plant	California Anderson-Store
Lerma-Plant	California Hanford-Store
Mexico City - Anahuac-Plant	California Anderson-Store
State of Mexico - Ixtapaluca-Plant (under construction)	Florida Pompano Beach-Store
Monterrey Composites and Monterrey Rotomolding-Plant	Indiana Gary-Store
Gulf-Plant	Oklahoma-Store
Tuxtla Gutiérrez-Plant	South Carolina Duncan-Store
Southeast-Plant	Texas Austin-Store
Guatemala-Plant	Texas Buda-Store
Nicaragua-Plant	Texas Fort Worth-Store
Peru-Plant	Texas Buda-Store
Honduras-CEDIS (distribution center)	Texas San Antonio-Store
Pilar and Pilarica-Plant	

Scope of transition risks and opportunities assessment

The transition risk assessment covers risks and opportunities across **Rotoplas**' entire Greenhouse Gas (GHG) footprint, focusing on raw material use and water policies



Source: **Rotoplas** 2022 GHG Emissions Inventory Findings Report

Rotoplas Emissions Reduction Targets (2022)

- Absolute Scope 1 and 2 emissions reduction of **42% by 2030**
- Absolute Scope 3 emissions reduction of **25% by 2030**
- Absolute Scope 1, 2 and 3 emissions reduction of **90% by 2050**

Definition of the change in physical and transition risk and opportunities scores for 2030 and 2050

Categorization from very low to very high risk / opportunity based on the change over the medium and long term*

Opportunity	**Very Low**	**Low**	**Moderate**	**High**	**Very high**
Risk	**Very Low**	**Low**	**Moderate**	**High**	**Very high**
Expected change	The frequency or intensity of climate risk will not change or decrease in the future.	The frequency or intensity of climate risk will not change significantly in the future.	The frequency or intensity of climate risk will increase in the future.	The frequency or intensity of climate risk will increase in the future.	The frequency or intensity of climate risk will will increase drastically in the future.
Possible impact	It does not pose a risk to the company's physical assets.	It could pose minimal risk to the company's operations, value chain, or supply chain, if the vulnerability of its assets is extremely high.	It could pose a risk to the company's operations, value chain, or supply chain, depending on its vulnerability.	It could pose a risk to the company's operations, value chain, or supply chain.	It could pose a very high risk to the company's operations, value chain, or supply chain.

*Short-term risk scores are based on current observations and not on a change from historical periods.

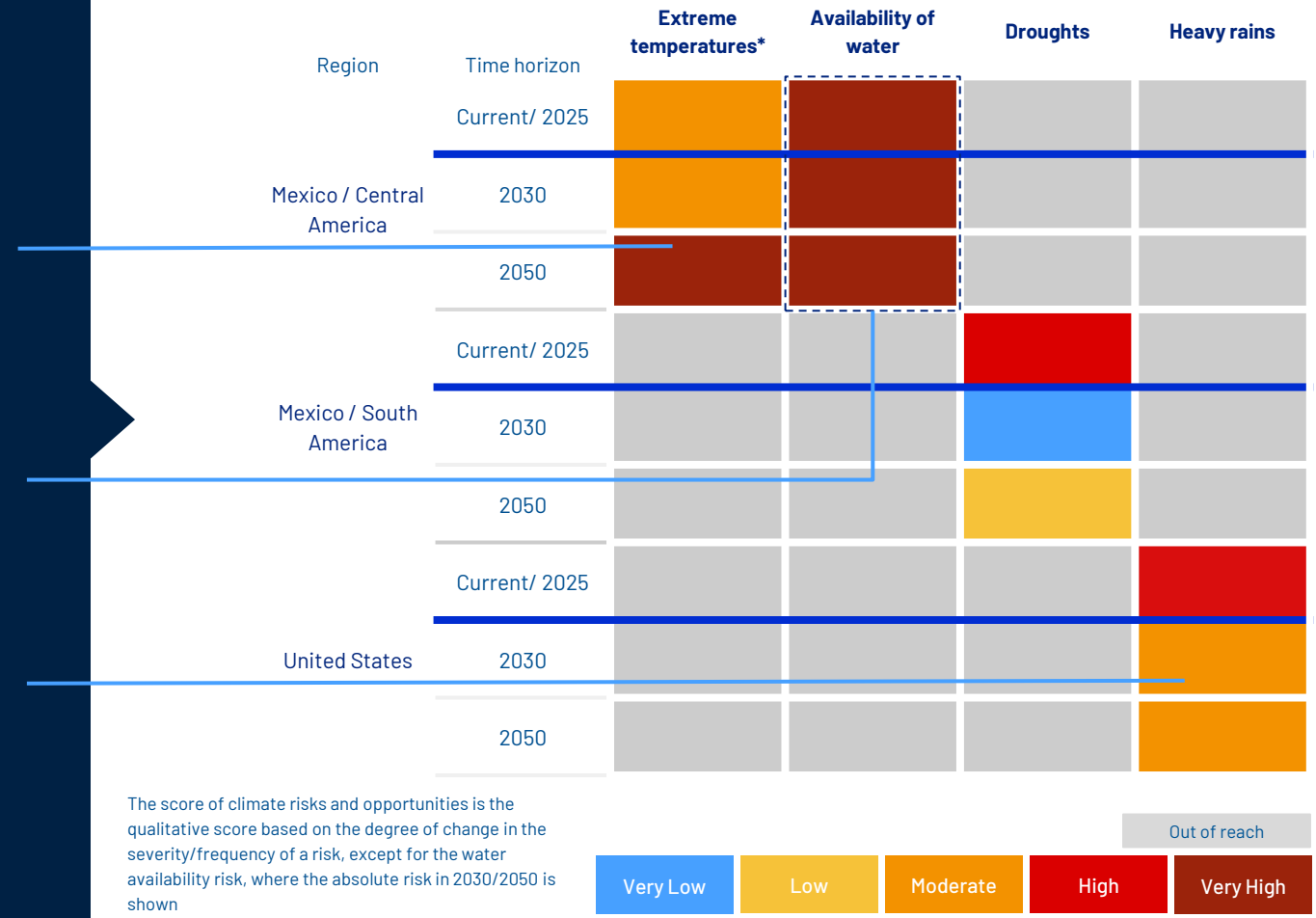
Summary of physical risk assessment

Annual maximum temperatures, and specifically **the number of days per year exceeding 30°C,** are projected to increase, especially in Guatemala, Honduras, and central Mexico.

Water availability is projected to remain at a very high risk level across all time horizons. Projected water shortages at six of the plants in Mexico could cause operational interruptions.

Heavy rainfall represents a current high risk for **Rotoplas** stores in the United States, with projections indicating a moderate increase in the medium to long term.

*Since there are two climate indicators for this risk, the highest score was taken into account for the overall score

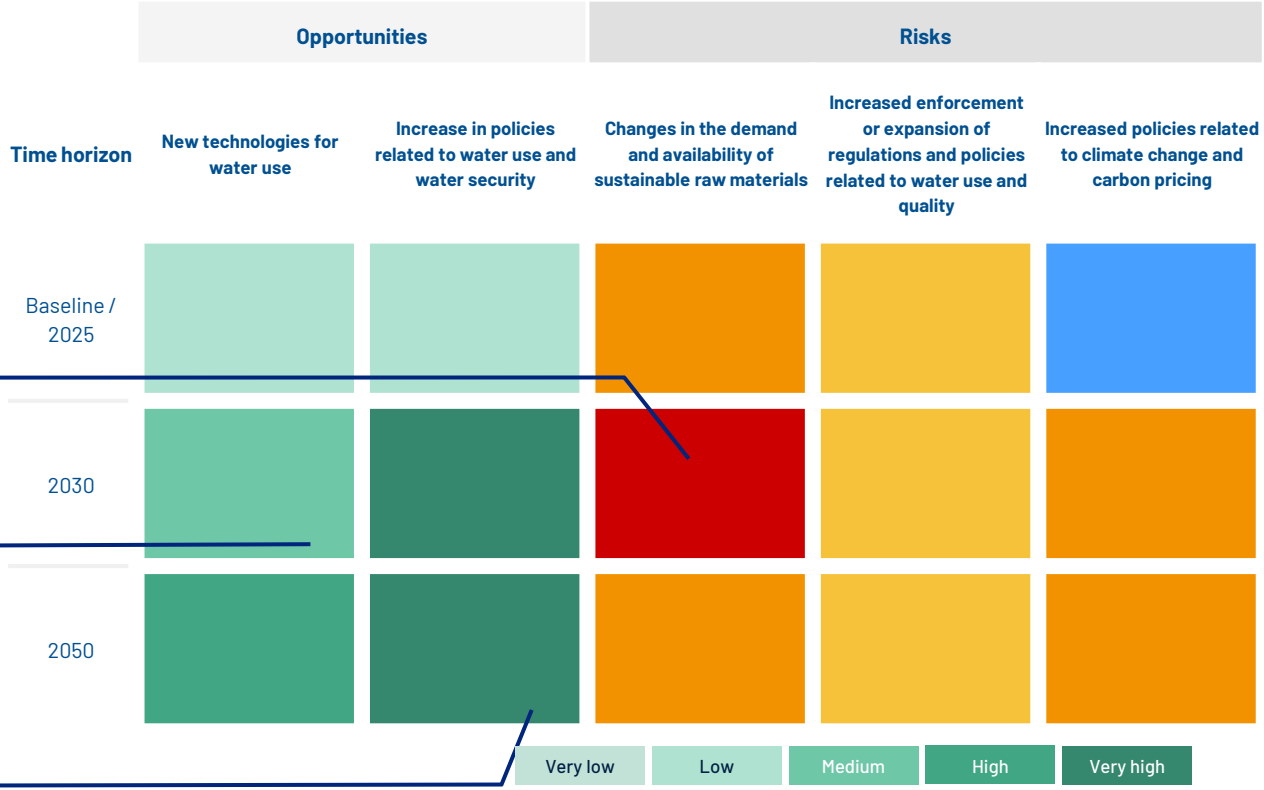


Summary of transition risks and opportunities assessment

In the short term, Mexico plans to **increase its plastic recycling rate** to 70% on all post-consumer plastic. By 2030, there could be an imbalance in demand for sustainable plastic.

Investment in water efficiency technologies is expected to **increase** by up to US$55 billion by 2030. An increase of up to 50% in water use efficiency improvement is expected, which can facilitate the implementation of new technologies and reduce capital costs.

Increased investment in water storage solutions is expected in the medium and long term, as well as a reduction in capital costs for water investments in developing economies.



These changes are also expected in a high impact scenario (+4°C), as the rise in drought and water scarcity events increases the need for better water resource management.

The score of climate risks and opportunities is the qualitative score based on the combination of the degree of change in the severity/frequency of a risk and the potential impacts to the sector

Risk	Very Low	Low	Moderate	High	Very High
Opportunity	Very Low	Low	Moderate	High	Very High

Results of the 'high-level' scenario analysis

From a list of 57 physical and transition risks and opportunities, South Pole assessed 8 risks and opportunities under two possible climate scenarios for **Rotoplas**

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Physical climate risk assessment

Extreme temperatures / Heat waves

Extreme temperatures / Heat waves

Both indicators studied present a moderate current risk, with additional moderate and very high increases projected for the number of days per year exceeding 30°C in 2030 and 2050, respectively. As for annual maximum temperatures, the increase with regard to the baseline is low and moderate towards 2030 and 2050, respectively.

Main findings

- More frequent extreme high temperatures can cause the interruption of plant operations and produce heat stroke in workers.
- Among the plants analyzed, those in Lerma, State of Mexico (under construction) and Mexico City show the highest increases in annual maximum temperatures with regard to the baseline, with an increase of at least 2.5°C by 2050.
- In terms of the number of days per year above 30°C, the plants located in Guatemala, Honduras, Lerma, State of Mexico, Mexico City, Guadalajara, and Leon show the largest increases with regard to the baseline.

Climate indicator	Current / Short term (2025)	Risk score due to climate change (4°C increase scenario)	
		Medium-term change (2030)	Long-term change (2050)
Intensity Maximum annual temperature [°C]	**34.9°C**	**+1.1°C** (+0.4°C to +1.4°C)	**+2.3°C** (+1.3°C to +2.7°C)
Frequency Number of days per year above 30°C	**67 days**	+0 days to +82 days	+0 days to +147 days

Climate risk score	Very low	Low	Moderate	High	Very high

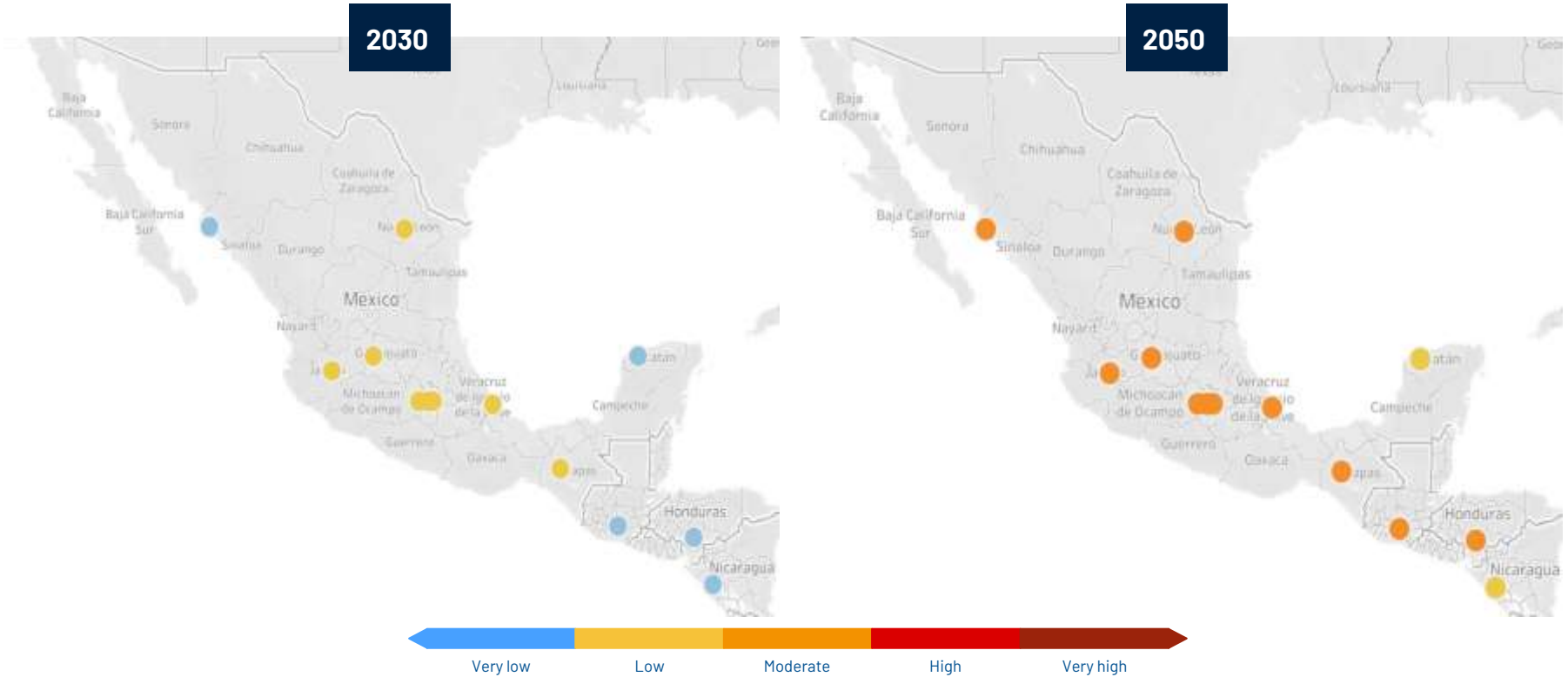
Key regions assigned to each risk level

Region	Baseline	Medium-term change (2030)	Long-term change (2050)
Maximum annual temperature			
Central America			
Mexico			
Number of days per year above 30°C			
Central America			
Mexico			

The first two rows show the intensity score and the last two rows show the frequency score. The average of the projections for both regions was taken into account for the climate indicator score

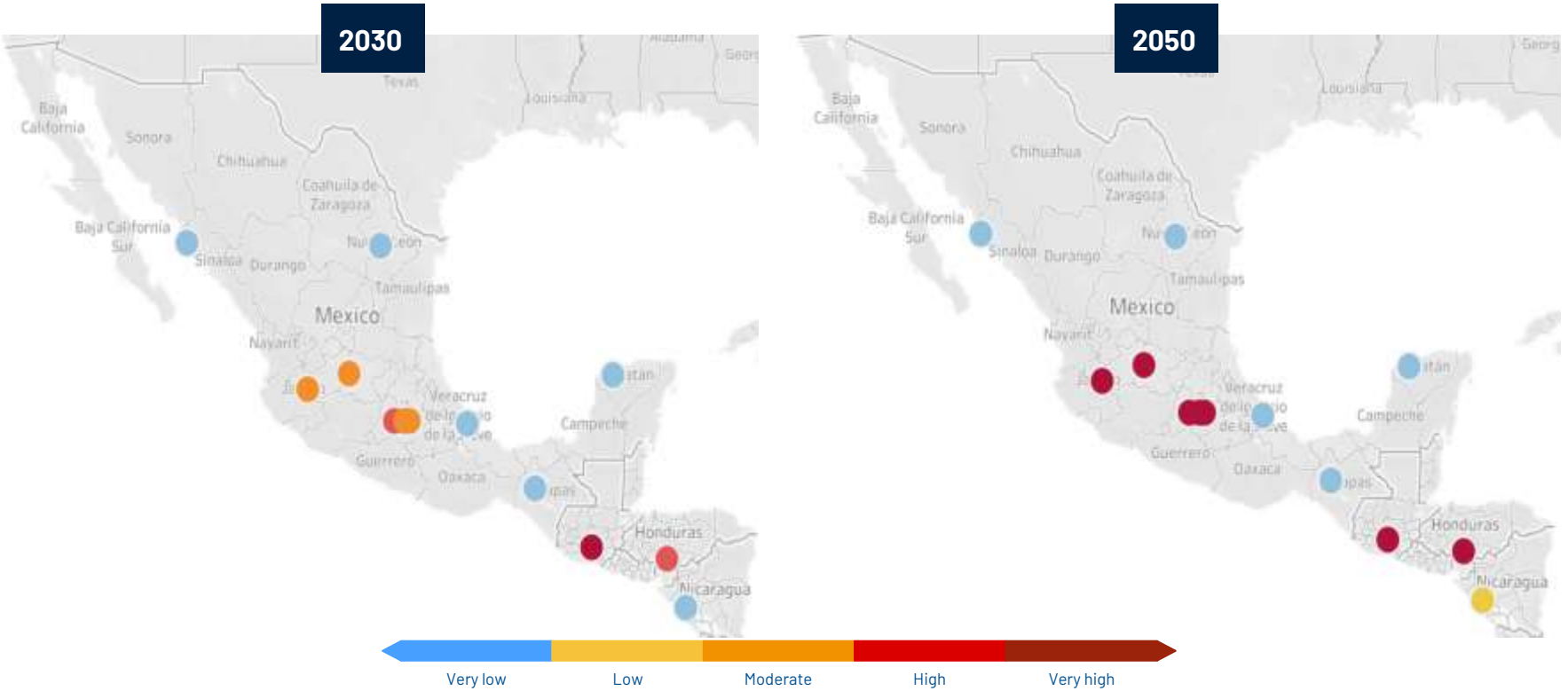
Maximum temperatures

Projected changes (vs. 2025) in the maximum temperature indicator at key sites for **Rotoplas** in the medium and long term in a high emissions scenario (+4°C).



Days exceeding 30°C

Projected changes (vs. 2025) in the number of days exceeding 30°C indicator at key sites for Rotoplas in the medium and long term in a high emissions scenario (+4°C).



Availability of water

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Availability of water

Projections indicate very high risk for Mexican operations in both future time horizons. This extreme water stress, especially in the Pacific, Ixtapaluca, and Anahuac plants, causes the average risk score to be very high.

Main findings

- A very high average water risk is projected for operations in Mexico, while in Central America, the projected water stress also increases, albeit more moderately. Within this region, operations in Guatemala are exposed to greater water stress, reaching a moderate risk level by 2050.
- Operations at the Nicaragua plant are the least exposed of all the sites analyzed.
- Water stress, which is already very high at the baseline level, is projected to increase in all cases, and particularly in the Guadalajara plant, where it increases from 88% in the short term to 269% by 2050. The generalized increase in water stress is probably due to the continuous increase in the amount of water extracted.
- The level of risk assigned varies significantly by region as it depends on the specific watershed and local regulations. Values greater than 100% indicate that water demand exceeds supply.
- The extreme water stress projected for Mexico's central, Bajio and Pacific plants could increase the risk of experiencing water outages and operational interruptions due to water pipeline shortages.

Climate indicator	Current / Short term (2025)	Risk score due to climate change (4°C increase scenario)	
		Medium term (2030)	Long term (2050)
Water stress Describes the amount of water extracted (municipal, industrial, agricultural) as a percentage of blue water available annually	312%	354.6%	356%

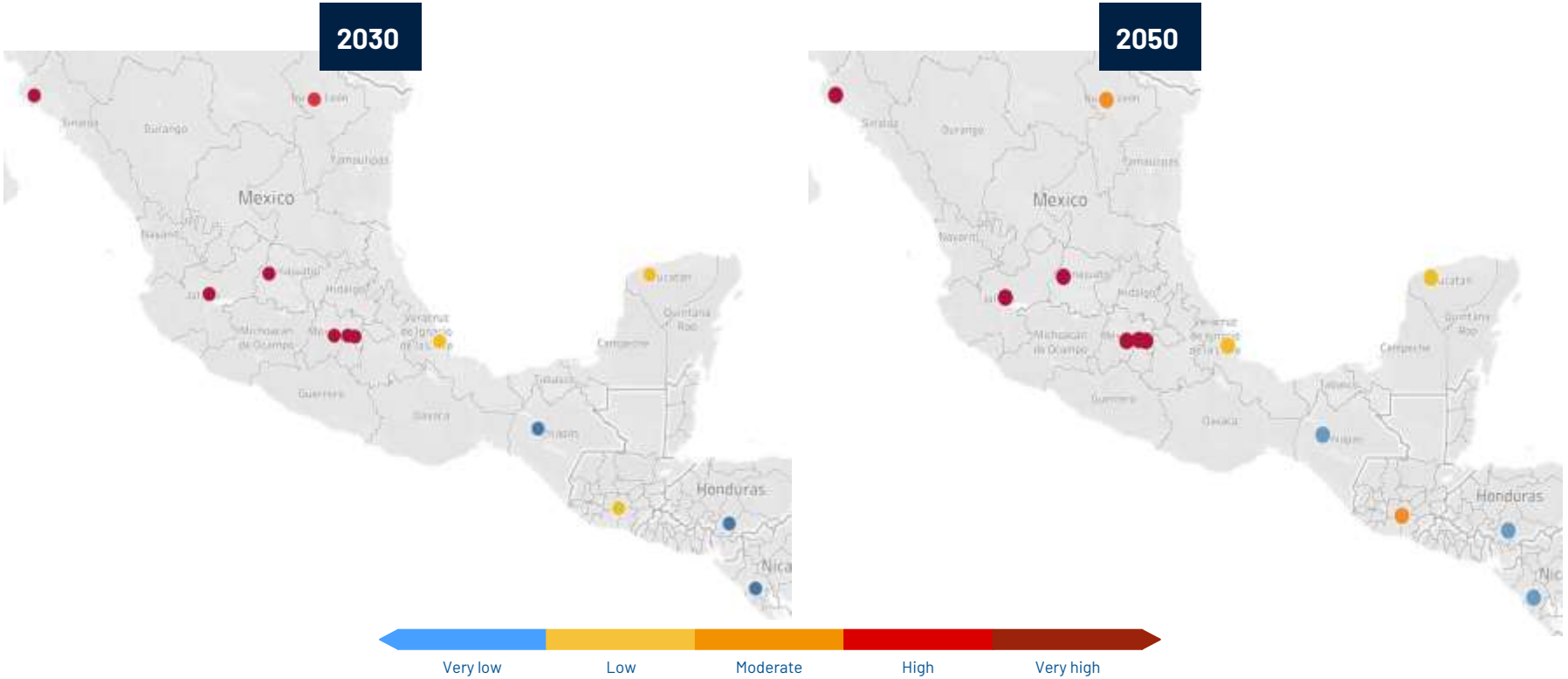
Key regions assigned to each risk level
(water stress)

Region	Baseline	Medium term (2030)	Long term (2050)
Central America	Very low	Very low	Low
Mexico	Very high	Very high	Very high

Climate risk score	Very low	Low	Moderate	High	Very high

Water stress

Comparison in the risk levels of the water stress indicator at key sites for **Rotoplas** in the medium and long term in a high emissions scenario (+4°C).



Droughts

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Droughts

With a current high risk, projections indicate that the intensity of acute drought could decrease in the Peru plant, and increase in the Argentina and Mexico plants, especially towards 2050. In the short term, the plant with the highest risk level is Pacific (Mexico), and the one with the highest projected future increase is Southeast (Mexico).

Main findings

- An average reduction in the number of consecutive dry days (CDD) per year is projected in Peru, where CDD are projected to decrease by 4% in 2030 and by 9.7% in 2050 compared to the baseline. Due to the particular location of Peru's plant on the coast, the projections that indicate decreases in the CDD with regard to the baseline show an opposite behavior to most of the country.
- The projections obtained for Argentina's plants indicate minimal changes in 2030 and slight increases of about 1.5% in 2050 for the three locations analyzed.
- In Mexico, projections indicate an increase in all plants (except Gulf in the medium term), especially in the central, *Bajoo* and southern parts of the country. On average, the CDD increases by 5% in the country by 2050, which could cause moderate impacts on **Rotoplas'** operations.

Climate indicator	Current / Short term (2025)	Risk score due to climate change (4°C increase scenario)	
		Medium-term change (2030)	Long-term change (2050)
Intensity - CDD Maximum number of consecutive days per year where rainfall is less than one millimeter per day	42 days	+1.6% (-4.1% to +6%)	+3.3% (-9.7% to +9.7%)

Key Countries assigned to each risk level
(CDD)

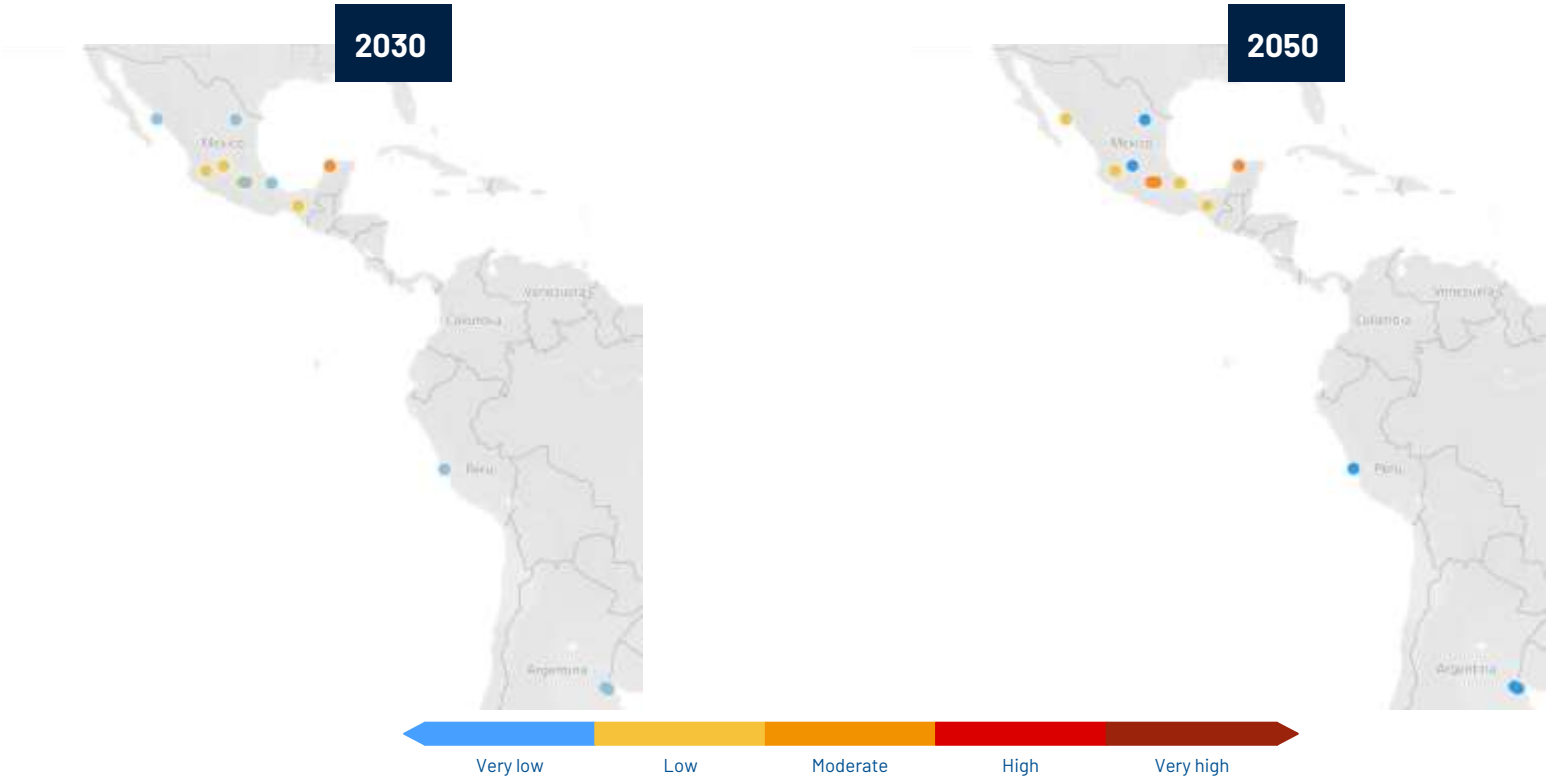
Region	Baseline	Medium-term change (2030)	Long-term change (2050)
Argentina	Low	Very low*	Very low*
Peru	High	Very low*	Very low*
Mexico	High	Low	Moderate

Climate risk score	Very low	Low	Moderate	High	Very high

*The 'Very low' score does not mean that the risk is very low for 2030 and 2050, but rather that the change in the duration and severity of dry periods compared to 2025 is very low.

CDD (consecutive dry days)

Projected changes (vs. 2025) in the CDD indicator at key sites for **Rotoplas** in the medium and long term in a high emissions scenario (+4°C).



Heavy rainfall

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Heavy rainfall

With a high current risk, projections indicate a moderate increase for the medium and long term, with the sites located in San Antonio (Texas) and Handford and Anderson (California) having the highest increases by 2050. The site in Fort Worth, Texas, has the lowest projected increases among all sites analyzed for both time horizons.

Main findings

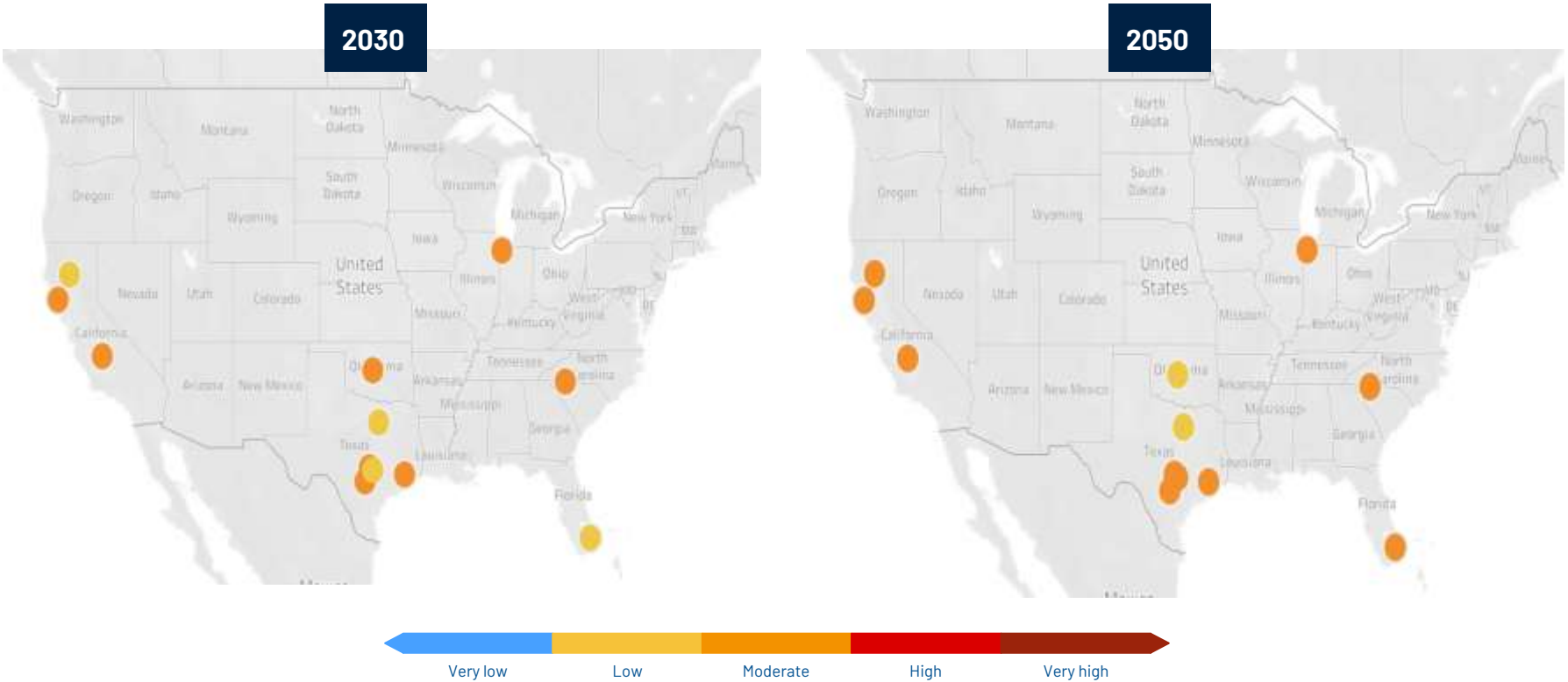
- For all US sites, an increase from baseline in heavy rainfall events measured over a period of five consecutive days within a year is projected; this indicator was used because it can capture longer storm systems, such as extratropical cyclones.
- An increase in the frequency of heavy rainfall events can lead to flooding, which could translate into damage to roads near stores, decreased water quality due to sediment runoff, disruptions within the supply chain, and temporary store closures, resulting in decreased profits for **Rotoplas**.
- Sites located in Anderson (California), Buda (Texas) and Pompano Beach (Florida) are projected to have a low to moderate increase in the indicator from 2030 to 2050. On the other hand, the Oklahoma site is the only one with a projected moderate to low decline from 2030 to 2050.
- Likewise, these impacts are already becoming apparent in Mexico at the Gulf, Pacific, and Los Mochis plants.

Climate indicator	Current / Short term (2025)	Risk score due to climate change (4°C increase scenario)	
		Medium-term change (2030)	Long-term change (2050)
rx5day Largest heavy rainfall events measured over a period of five consecutive days within a year [mm]	102mm	+5.6% (+ 3.3% to +10.3%)	+6.8 % (+3.2% to +10.5%)

Climate risk score	Very low	Low	Moderate	High	Very high

rx5day (maximum rainfall on 5 consecutive days)

Projected changes (vs. 2025) in the rx5day indicator at key sites for **Rotoplas** in the medium and long term in a high emissions scenario (+4°C).



Assessment of transition risks and opportunities

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Transition risks and opportunities

South Pole used customized methodologies to perform a robust analysis of each relevant transition risk and opportunity in a 1.5°C-aligned scenario.

Approaches to analyze each of the transition risk and opportunity issues included the following:

Policy

South Pole uses its own experience of future climate change policy and shifts, including carbon pricing and emissions trading schemes, to assess risk exposure.

Legal

South Pole reviews current data on climate litigation and regulatory trends and issues to qualitatively assess current and future risks.

Market

South Pole assesses market trends on low-emission, energy- and resource-efficient, country-specific water solutions and associated supply chain developments.

Technology

South Pole evaluates new and evolving technologies, including those related to products and equipment in the water solutions sector. We will focus on low-emission and efficient technologies.

Reputation

South Pole evaluates media trends on corporate environmental performance with a focus on water solutions to estimate the strength of climate-related reputational exposure.

Technology opportunity: New technologies for water use

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New technologies for water use

Main findings

Technological innovations for water use focus on the efficiency and automation of processes in the management of water services. Machine Learning, Artificial Intelligence, and complementary technologies such as water pumps or renewable energy are the main technologies for this sector.

Key results of the scenario analysis

- **2025 [Low]:** Digital technologies can increase process efficiency by identifying patterns in water management with up to 88% accuracy.
- **2030 [Moderate]:** An investment of up to $55 billion is expected by 2030. Predictions made by Machine Learning and Artificial Intelligence can increase water efficiency by up to 50%. Pumps with brushless motors and renewable energy supply can make pumping management more efficient.
- **2050 [Very high]:** Rainwater harvesting and the use of technology for monitoring and automation could help meet water demand in the long term.

Potential impact*

- The development of new business opportunities, with the use of machine learning and the incorporation of geospatial analysis, would prevent supply disruption by having reserves for irrigation and purification services.
- Improved operational efficiency, reduced leakage and use of low-carbon energy.
- Improvement in water quality.
- Preference in the young market in cities with high water stress across Latin America.

*Potential impact can be interpreted as the possible impacts on the business if the opportunity is capitalized upon.

Market risk: Changes in the demand and availability of sustainable raw materials

Changes in the demand and availability of sustainable raw materials

Main findings

A large amount of waste plastic is generated in Latin America, and although the region has a lower recycling rate than the global average, Mexico expects an increase in recycling and in the demand for recycled plastic, as there is evidence to declare that this market will grow in the medium term.

Key results of the scenario analysis

- **2025 [Moderate]:** Mexico plans to increase its plastic recycling rate to recycle 70% of all post-consumer plastic.
- **2030 [High]:** Although uncertain, an imbalance in demand for sustainable plastics could impact **Rotoplas**. In Mexico, annual growth of 7% is expected by 2030 in terms of recycling and 8% in demand for recycled plastics by the same year. In Canada, demand for recycled plastic is expected to increase by 3% annually, so there is likely to be competition for recycled plastic from Mexico.
- **2050 [Moderate]:** Plastic consumption and use in Latin America is expected to grow 2.4 times vs. 2019 by 2060. And, although uncertain, it is expected that in a 1.5°C scenario, recycling rates, secondary plastic production, and new technologies will meet this demand, in the face of a possible ban on primary plastic.

Potential impact (no mitigation scenario*)

- Increases in the internal or external requirement for the use of sustainable raw materials can impact the costs of obtaining them.
- Without the development of new secondary plastic points and suppliers, in the medium term, **Rotoplas** will have difficulty meeting its own goal of using sustainable materials.
- In the medium term, an imbalance in demand for secondary plastics is likely to limit **Rotoplas**' ability to reduce the carbon footprint of its products.
- A reputational impact could affect **Rotoplas**' image. Climate change and environmentally conscious consumers would prefer products with better sustainable performance if **Rotoplas** fails to adapt to a market with demand for sustainable products.

*'No mitigation' refers to the lack of response measures to a risk. In this case, it can be interpreted as the lack of measures to prevent or mitigate this risk.

Policy risk: Increased enforcement or expansion of regulations and policies related to water use and quality

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Increased enforcement or expansion of regulations and policies related to water use and quality

Main findings

The greatest risk in increasing the demand or expansion of water policies is the gap between announced public policies and the implementation of concrete actions. Although there is currently a regulatory framework with regard to water resource management, there is little certainty in the application or execution of public policies related to water use in the medium and long term.

Key results of the scenario analysis

- **2025 [Low]:** Current policies are segmented between different levels of government and although mitigation measures against the effects of climate change have been implemented in some countries as part of public policies, 87% of the largest cities in Latin America still do not have measures in place, which translates into a gap between policy-setting and their implementation.
- **2030 [Low]:** Regions in advanced economies are in the process of implementing more robust and stringent water disclosure requirements and resource efficiency standards, and it is expected that, in the medium term, these will be adopted in developing economies, especially those with water-related Nationally Determined Contributions (NDCs).
- **2050 [Low]:** The creation of public policies related to the efficient management of water resources is expected to increase, especially in terms of collaboration between different territories and stakeholders and the need for resource management standards, which may hinder the implementation of water solutions. However, there is no mention of measures that could have a negative impact on the sector.

Potential impact (no mitigation scenario*)

- Increased operating costs due to stricter water-related disclosure;
- Reduction in revenue due to a loss of market share if **Rotoplas**' product offering does not meet climate or environmental label standards and falls behind its competitors;
- Interaction between key players in the sector (e.g. government, private, NGOs) can complicate operational processes and cause clashes between key players, increasing the operating costs of the service division;

These changes are also expected in a high impact scenario (+4°C), as the rise in drought and water scarcity events increases the need for better water resource management.

*'No mitigation' refers to the lack of response measures to a risk. In this case, it can be interpreted as the lack of measures to prevent or mitigate this risk.

Policy risk: Increased policies related to climate change and carbon pricing

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Increased policies related to climate change and carbon pricing

Main findings

The greatest climate policy risk in Mexico is the increased requirement or expansion of carbon pricing policies within a 1.5°C scenario; however, no significant increases are expected in the country. Although there is currently a regulatory framework for climate change mitigation and adaptation, there is little indication of the timeframe or scope for the implementation and execution of these existing public policies within the current administration, which creates uncertainty in all time horizons.

Key results of the scenario analysis

- **2025 [Very Low]:** A step back in climate ambition and action is seen both in the new NDC published in 2022, which presents results with higher emissions than the 2016 NDC, and in the dismantling of past climate policies, and further promotion of fossil fuels. While there are climate policies in place and a robust framework for a national emissions trading system, they have been paused and political uncertainty makes it impossible to assume when they will be resumed.
- **2030 [Moderate]:** In a scenario aligned to 1.5°C, carbon pricing could be implemented in all regions of Mexico at USD$15 per ton of CO_2 in 2030.
- **2050 [Moderate]:** In a 1.5°C scenario, carbon prices in Mexico are expected to increase to USD$55 per ton of CO_2 by 2050.

Likewise, if Mexico aligns with the 1.5°C scenario, it is expected to resume the implementation of past climate policies, the creation of new, more demanding policies, and the setting of more ambitious targets for 2030 and 2050.

Potential impact (no mitigation scenario*)

- Increased operating costs due to a carbon price implementation for **Rotoplas'** Scope 1 and 2 emissions;
- Increased costs within the value chain as suppliers pass through costs related to carbon pricing to **Rotoplas**;
- Increase in operating costs due to greater implementation of measures to achieve more demanding climate targets, derived from an increase in Mexico's climate ambition.

*'No mitigation' refers to the lack of response measures to a risk. In this case, it can be interpreted as the lack of measures to prevent or mitigate this risk.

Policy opportunity: Increase in policies related to water use and water security

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Increase in policies related to water use and water security

Main findings

Globally, the issue of efficient water resource management is critical within the agendas aligned to the achievement of the SDGs and a 1.5°C scenario. A greater focus is expected on improving water infrastructure, access to drinking water, and greater participation from private players that can provide water solutions.

Key results of the scenario analysis

- **2025 [Moderate]:** Latin America currently has policies in place regarding the use of and access to water resources. However, there is a gap between policies and implementation, which requires further investment.
- **2030 [Very high]:** The implementation and creation of climate policies focused on the water sector—specifically on service price—is expected; this can translate into subsidies to protect customers from abrupt increases and reduce the costs of creating water infrastructure.
- **2050 [Very high]:** Increased investment in water storage solutions is expected in the medium and long term, as well as a reduction in capital costs for water investments in developing economies.

Potential impact*

- Reduction in capital and operating costs for water access and purification services;
- Access to a greater number of consumers as access to water expands and new water infrastructure is created;
- Access to more funding channels for the implementation of water management and water infrastructure projects.

These changes are also expected in a high impact scenario (+4°C), as the rise in drought and water scarcity events increases the need for better water resource management.

*Potential impact can be interpreted as the possible impacts on the business if the opportunity is capitalized upon.


Magnitude of potential business impact
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Magnitude of potential business impact

The magnitude of the potential financial impacts of each of the risks and opportunities relevant to **Rotoplas** is quantified using the following methodologies and assumptions

Risk/opportunity	Methodologies and assumptions used	2030	2050
Extreme temperatures / Heat waves	**Methodology:** There is no history of shutdowns due to heat waves/high temperatures. However, in the future, continued increases in extreme temperatures and longer and more frequent heat waves could reduce worker productivity, which could drop by as much as 50%, according to the UN. **Main assumptions**: • Potential reductions in productivity in plants where maximum temperature exceeds 40°C as projected for 2030 and 2050 in a high impact scenario (+4°C). • In 2030, the four plants potentially affected are Pacific, Monterrey, Gulf, and Tuxtla Gutierrez, and in 2050, all of the above plus the Southeast plant. • In the absence of a more accurate temperature indicator, such as wet bulb temperature, atmospheric temperature is used as a proxy, and is assumed to be equal to the temperature within the plants. • The minimum cost range does not consider any impact on productivity due to high temperatures, while the maximum range assumes a 50% interruption in productivity on the day with the highest temperatures in the year in each of the plants where temperatures exceed 40°C. • In plants where there is a lack of specific data on the cost of the loss due to operational stoppage, the average cost of the four Mexican plants (Anahuac, Leon, Monterrey, and Lerma) for which data is available is used; this average is $1,469,746 Mexican pesos. • Projected changes under the SSP 5-8.5 scenario for a scenario aligned to +4°C are used.	**0 - $5,392,635 MXN**	**0 - $6,862,381 MXN**

Magnitude of potential business impact

The magnitude of the potential financial impacts of each of the risks and opportunities relevant to **Rotoplas** is quantified using the following methodologies and assumptions

Risk/opportunity	Methodologies and assumptions used	2030	2050
Availability of water	**Methodology:** There is a history of operational pauses due to the lack of water at the Monterrey plant, as well as the price of water pipes at three plants in Mexico (Anahuac, Tuxtla, and Monterrey). For the calculation of future impacts, an increase in the duration of the pause in operations only at the Monterrey plant was taken into account for a lower cost range, in accordance with the increase in water stress projected for the region, and for the higher cost range, an increase in average pipeline purchase expenses at the three plants was added, which increases linearly according to the average water stress projected for the country in a high impact scenario (+4°C). **Main assumptions**: ● Cost per operating pause of 50% in Monterrey in 2022: $983,398 MXN. ● An increase of, for example, 20% in water stress causes an equal percentage increase in expenses incurred due to lack of water. ● For the average annual cost in water pipes, the data for 2022 and 2023 were averaged. The prices obtained were: $404,800 MXN for Anahuac, $611,400 MXN for Tuxtla, and $254,000 MXN for Monterrey. ● There are no additional pipeline purchases at other plants in Mexico or Central America. ● Projected changes under the SSP 5-8.5 scenario for a scenario aligned to +4°C are used.	**$1,424,598 - $2,653,122 MXN**	**$1,459,077 - $2,649,563 MXN**

Magnitude of potential business impact

The magnitude of the potential financial impacts of each of the risks and opportunities relevant to **Rotoplas** is quantified using the following methodologies and assumptions

Risk/opportunity	Methodologies and assumptions used	2030	2050
Heavy rainfall	**Methodology:** There is a history of store closures in California due to heavy rains, as well as store repair costs and inventory damage in Yukon, Oklahoma, due to flooding, storms, and high winds. For the calculation of future impacts, the costs previously incurred at the Yukon plant are considered for the lower range, and a linear relationship is applied according to the projected increase in the rx5day index in Yukon (5.5% and 3.8% in 2030 and 2050, respectively) in a high impact scenario (+4°C). In the upper range, possible damage to structures and inventory on the same scale as those recorded in Yukon is taken into account, only for stores that have a projected baseline rainfall amount (in mm) equal to or greater than the levels recorded in Yukon. **Main assumptions**: • Damage previously incurred by flooding is presumed to be similar in scale to the potential damage caused by heavy rains. • In the lower impact range, no other stores outside of Yukon are affected by heavy rains. • Only stores that have a baseline projected rainfall over five consecutive days (rx5day indicator) equal to or greater than those recorded in Yukon are presumed to be vulnerable to damage from heavy rainfall. These stores are Ukiah and Anderson in California, as well as Fort Worth, Houston, and San Antonio in Texas. • Average cost of store repairs for flood-related damage (costs incurred in Yukon are presumed to be applicable for each of the vulnerable stores): USD$3,000 or $50,120 MXN. • Average cost of product/store inventory damage caused by storm and/or high winds (assumes similar inventory and that costs incurred in Yukon are applicable for each of the vulnerable stores): USD$15,000 or $250,602 MXN. • Projected changes under the SSP 5-8.5 scenario for a scenario aligned to +4°C are used.	**18,987 - $114,088 USD** **317,212-1,906,045 MXN**	**19,543- 120,550 USD** **326,500-2,014,004 MXN**

Magnitude of potential business impact

The magnitude of the potential financial impacts of each of the risks and opportunities relevant to **Rotoplas** is quantified using the following methodologies and assumptions

Risk/opportunity	Methodologies and assumptions used	2030	2050
New technologies for water use: Use of Machine Learning and Artificial Intelligence	**Methodology:** An impact was quantified on the potential savings derived from the reduction in the cost of waste in the water used/processed by **Rotoplas**, and in the waste in its treatment processes. Water management efficiency percentages and water market prices were used to calculate potential costs or savings for **Rotoplas** over two time horizons (2030 and 2050) with a Shared Socioeconomic Pathways (SSP) climate scenario, and according to the PCR global hydrology and water resources model. **Main assumptions**: ● The measurement unit used was the m^3. ● Percentage of waste in water management in Latin America: 45% ● Percentage of waste in water treatment: 10% ● Percentage of waste prevented with the use of technologies: 5% - 20% ● Percentage of efficiency in water management: 15% -30% ● Average cost of water MXN/m^3: $80 - $275 MXN (taking into account the cost of water pipes of between $1,600 MXN and $5,500) ● Scenario: SSP1(<2°C) ● Hydrological model: PCR-GLOBWB - makes a calculation on industrial and domestic water demand, considering population, socioeconomic, and technological development changes in the future; however, ● Increase in water demand 2030: PCR/SSP1(33%) ● Increase in water demand 2050: PCR/SSP1(78%) ● Total water extracted for **Rotoplas** (2022*): 97,227 m^3 ● Total water treated by **Rotoplas** (2023): 7,403 m^3	**Leakage avoided** 5% **~ 0.23 - 0.79 million MXN** **Management (buffering)** 15% **~ 1.54 - 5.3 million MXN** **Waste avoided in water treatment** 15% **~ 11 - 40 thousand MXN**	**Leakage avoided** 5% **~ 0.3 - 1.06 million MXN** **Management (buffering)** 15% **~ 2.07 - 7.1 million MXN** **Waste avoided in water treatment** 15% **~ 15 - 54 thousand MXN**

*The 2022 data was used as it is complete and published by **Rotoplas** in its integrated report 2022.

Magnitude of potential business impact

The magnitude of the potential financial impacts of each of the risks and opportunities relevant to **Rotoplas** is quantified using the following methodologies and assumptions

Risk/opportunity	Methodologies and assumptions used	2030	2050
Changes in the demand and availability of sustainable raw materials	**Methodology:** The financial impact of this risk was quantified, considering projections of the percentages of production and use of recycled versus virgin plastic within a high mitigation scenario for 2030 and 2050, as well as data on the current use of recycled plastics within **Rotoplas** processes and the cost in 2023 of virgin and recycled resins. **Main assumptions**: ● A 3% annual growth rate in total resin usage is used according to talks with **Rotoplas**. ● **Rotoplas'** targets for recycled resins usage are taken into account (30% by 2030 and 45% by 2050) ● Secondary (recycled) plastic production is used as a proxy for increases in recycled plastic use/demand. ● The Clean Technology Scenario (CTS) of the IEA report *The Future of Petrochemicals*, which is aligned to a scenario below 2°C (the IEA SDS), is used. ● The displacement rate in the CTS scenario, which represents the percentage of virgin plastic that will be replaced with secondary plastic, was taken as the rate of increase in the use of secondary versus primary plastics (48% by 2030 and 67% by 2050). ● The prices of virgin and recycled resins in 2023 are taken as a constant, since the prices of petrochemicals and raw materials tend to be volatile and have high uncertainty (23.55 MXN per kg of virgin resin and 17.7 MXN per kg of recycled resin). ● The average price of virgin polyethylene and virgin polypropylene in 2023 is used as the price for virgin resins. ● The analysis of the dynamics of price changes in recycled resins for 2030 and 2050 is beyond the scope,	If **Rotoplas** were to align itself to a higher percentage of recycled resin use, its sustainable raw material procurement costs would be reduced by **~68 million MXN**	If **Rotoplas** were to align itself to a higher percentage of recycled resin use, its sustainable raw material procurement costs would be reduced by **~149 million MXN**

Magnitude of potential business impact

The magnitude of the potential financial impacts of each of the risks and opportunities relevant to **Rotoplas** is quantified using the following methodologies and assumptions

Risk/opportunity	Methodologies and assumptions used	2030	2050
Increase in policies related to water use and water security	**Methodology:** The financial impact of this risk was quantified using projections of the increase in domestic water use within a 1.5°C aligned scenario for 2030 and 2050, data on people impacted by **Rotoplas** in access to water and sanitation, and products sold within the Improvement area to calculate how the projected increase in access to water for 2030 and 2050 would impact the number of **Rotoplas** products sold and the number of people impacted in access to water and sanitation. **Main assumptions**: ● It will only focus on changes in water use within the domestic sector. ● Assumptions under the SSP1 scenarios for a scenario aligned to 1.5°C are used. ● The PCR-GLOBWB model is used because it considers population, gross domestic product (GDP), electricity production, energy consumption, and per capita water use for its water use projections. It also takes into account policies that optimize the use of water resources, especially in urban areas, but does not elaborate on specific policies. ● The increase in domestic water use by 2030 and 2050 (33% by 2030 and 78% by 2050) is taken as a proxy for the increase in access to sanitation. ● **Rotoplas'** data for people impacted by access to water and sanitation in 2023 is used as a baseline.	**~399 million MXN** in revenues from sales derived from access to a greater number of consumers as access to water expands and new water infrastructure is created A cumulative impact of **~2.8 million people in access to water and sanitation** is expected	**~533 million MXN** in revenues from sales derived from access to a greater number of consumers as access to water expands and new water infrastructure is created A cumulative impact of **~10.7 million people in access to water and sanitation** is expected

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