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ITP Destination Water Risk Index

August 2018



The Prince's
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Business in the Community is registered in England and Wales (297716) and Scotland (SC046226). Company limited by guarantee No 1619253.

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About this document

This report presents the key results from ITP's "Destination Water Risk Index", which was created through the collaboration of ITP, Ecolab and Greenview. The Index provides unique insights on water risk for hotels operating in the 68 largest markets in the world, with an unprecedented level of detail for the hotel industry. This report was published on 30 August 2018 in Stockholm at the SIWI World Water Week.

The International Tourism Partnership ([ITP](#)) is a membership organisation that unifies the hotel industry to act collectively on key issues aligned with the United Nations' Sustainable Development Goals. Senior leaders from member organisations share ideas, build relationships and work collaboratively to take active and responsible leadership on key industry-wide issues in a non-competitive manner. After extensive consultations with member companies, ITP set four ambitious [Goals](#) to 2030 to leverage the sector as a force for good: water, climate change, human rights and youth employment. ITP is increasingly being recognised as the voice for sustainability in the hotel industry.

[Ecolab](#) is the global leader in water, hygiene and energy technology and services. Around the world businesses in food service, food processing, hospitality, healthcare, industrial, and oil and gas markets choose Ecolab products and services to keep their environment clean and safe, operate efficiently and achieve sustainability goals.

[Greenview](#) is a boutique sustainability firm that provides hospitality organisations with consulting and advisory services, the leading online sustainability data platform, and industry research studies. Greenview has a niche focus and expertise in the hotel industry and works with many of the hotel industry's leading chains, research institutions, destinations, and cruise lines to catalyse sustainability as the industry's thought leader.

Executive Summary

Why create a Destination Water Risk Index?

Collective human demands on the planet's resources are rapidly mounting in the wake of worldwide populace and economic activity. Demand for fresh water is likely to exceed supply by 40 percent by 2030, and a third of the world's population will be living in areas of severe water stress by this time (source: [UN Environment](#)). Local water availability worldwide is increasingly threatened by the effects of climate change including extreme droughts and floods.

Island nations and popular travel destinations can be those most prone to water shortage, particularly where the tourism season overlaps with the driest months, and where water use per guest in hotels greatly exceeds that of the local population. Significant tourism growth is forecast to continue in future years (one billion more people will be in the global middle class by 2030 adding to the number of travellers), contributing significantly to the global economy (10.2% of global GDP in 2017, source: WTTC) but also building pressure on water use.

“Over tourism” is currently discussed as one of the major threats for the sector, not only for local ecosystems (pollution and resource overuse) and infrastructure (e.g. challenges in energy consumption and waste management) but also degrading the tourist experience.

The hotel industry has an opportunity to show that it can grow sustainably, responsibly and intelligently. By planning smart and inclusive growth, safeguarding freshwater resources in the communities where they operate, and contributing to their long-term availability, hotel companies can use tourism growth to bring positive change for their guests, staff and local stakeholders.

Even hotels predominantly located in water plentiful regions can address risk within their supply chains when sourcing products from companies operating in high risk locations.

Members of the International Tourism Partnership (ITP) aim to place sustainable businesses at the heart of healthy communities. In 2017, ITP set a [Goal for the hotel industry to “Embed water stewardship programmes, reduce the number of people affected by water scarcity, improve water-use efficiency and identify ways to address water scarcity”](#).

Following recent water crises in Sao Paulo and Cape Town, and in consultation with its member companies, ITP commissioned this research to better understand water scarcity in key destinations around the world, so the sector could work proactively to address this issue. This Destination Water Risk Index (DRWI) has four key objectives:

- **To help hotel companies (ITP members and others) prioritise action on water scarcity where water risk is the highest**, and implement water stewardship strategies in their hotel developments and operations in destinations. This index will help developers, corporate responsibility (CR) teams and property managers evaluate risks and take action with a first-of-its-kind dataset.
- **To encourage the hotel industry to come together and take collective action** in destinations with the highest water risk, to address current and future local water scarcity in their properties and within the communities in which they operate.

- **To call the attention of the wider tourism industry and its stakeholders** (e.g. national and local governments) to water scarcity in these destinations and the need to take proactive and collective action to avoid many more Cape Town situations.
- **To highlight existing solutions and best practices** implemented by ITP member companies to prevent water risks by adopting a water stewardship approach to water management right from the hotel development phase, and throughout their operations and supply chain.

The ITP Destination Water Risk Index (DWRI) is the result of collaboration between ITP (project lead), Ecolab (sponsor and data provider) and Greenview (data analysis) to overlay existing water risk and hotel industry databases to produce cutting-edge intelligence. The Index seeks to help hotel developers, companies, properties and their stakeholders to better understand the financial implications of local water risk in the largest hotel markets in the world. It is designed to provide evidence and rationale to prioritise water conservation in capital allocation, development and renovation decisions, and operational focus in these top risk locations, now and in the future. Companies are expected to invest in solutions going beyond site-based efficiency and to set context-based targets to ensure sustainable freshwater availability. The Index will provide hotel companies with information to build the business case for making investments that support this strategy.

Key findings

This Index identifies twelve locations across six countries with the highest overall risk when factoring water stress (WRI Aqueduct), future water cost increase risk (Ecolab Water Risk Monetizer), water usage intensity per occupied room, hotel supply (of rooms), and hotel pipeline growth (see map in detailed analysis):

- **Indonesia:** Bali, Jakarta, Surabaya
- **India:** Mumbai, Delhi
- **Thailand:** Bangkok
- **China:** Beijing, Qingdao, Hangzhou, Xian
- **United Arab Emirates:** Dubai
- **Philippines:** Manila

Bali and Mumbai are the two destinations with the highest overall assessment risk (“extremely high”). The report highlights the need to prioritise the above 12 locations when designing water stewardship strategies among global portfolios because they already face chronic high-water stress, and significant operating cost increases are likely to affect hotels and tourism operators there. If no action is taken, this could lead to increased risks due to the high number of properties already operating and under construction around them.

The Index also reveals key trends in how hotels are already affected by water stress in several markets, and what future risks look like in these destinations:

- **All locations with the highest overall assessment score are in Asia.** Five out of the top 12 locations with the overall highest risk – Jakarta, Surabaya, Bali, Delhi, and Mumbai – are in **Indonesia and India**. This is a clear indication that any hotel company operating in these countries faces acute water risks and related costs, and will do so increasingly in the future.
- 7 destinations were determined to have “extremely high” or “high” current and future water stress: Bali, Jakarta, Mumbai, Dubai, Istanbul, Zhengzhou, Abu Dhabi.

- 10 destinations were identified to have an “**extremely high**” water risk premium (i.e. cost increase caused by water risk) for both 1-year and 5-year outlooks: Surabaya, Bali, Jakarta, Mumbai, Bangkok, Delhi, Bandung, Cape Town, Pattaya, Cairo.
- 10 destinations are foreseen to have a “**high**” or “**extremely high**” hotel pipeline growth in the coming years, exposing hotels operating there to increased water risks in the future: Mumbai, Surabaya, Dubai, Manila, Los Angeles, Melbourne, Warsaw, Delhi, Hong Kong, Sydney.

DWRI results lead to a set of specific recommendations for different decision makers and teams within hotel companies. You can find these recommendations in the following sections of this report:

- [Hotel CR teams](#),
- [Hotel Development teams](#),
- [Hotel General Managers and Engineering teams](#).

This report presents the summary findings of the top hotel markets identified with highest risk overall and in specific categories. Hotel companies submitting data to the [Cornell Hotel Sustainability Benchmarking Index](#) can receive a complete analysis of their portfolios in further detail. More information is provided for where more specific details can be found, including [Ecolab's Water Risk Monetizer](#) for water cost risks.

“As a responsible industry demonstrating its leadership on the Sustainable Development Goals, water is a critical issue for the hotel sector to address. It is imperative we do all we can to protect this vital resource for generations to come. We must examine our supply chains and embed water stewardship at all levels to ensure water-use efficiency, sustainable withdrawals and a consistent supply of freshwater thereby helping to reduce the number of people affected by water scarcity around the world.”

***Wolfgang M. Neumann – Chair of ITP Board & Non-Executive Director,
Radisson Hotel Group***

Detailed Analysis

Methodology

The Destination Water Risk Index (DWRI) was created by combining factors from the World Resources Institute (WRI) Aqueduct Water Risk Atlas, Ecolab's Water Risk Monetizer, the Cornell Hotel Sustainability Benchmarking Index, Green Lodging Trends Report, and compiled hotel supply and pipeline research. This work is an industry-first analysis of these datasets together, factoring them to create sector-specific insights:

- a. Baseline water stress, seasonal variability and future water stress (2030), using data from the World Resource Institute (WRI)'s Aqueduct tool.
- b. Incoming risk likelihood and risk premium, i.e. the likelihood that a hotel will be impacted by increased operating costs as a result of future water risk, and the estimated scale of this cost increase. This was estimated using Ecolab's [Water Risk Monetizer](#).
- c. Current median water usage per occupied room of hotels based in the area, using data from [Cornell Hotel Sustainability Benchmarking](#).
- d. Current hotel supply and estimated growth from the planning and development pipeline (absolute and relative to current portfolio). Data was taken from published data form STR Global.
- e. Overall water risk based on the combination of the above factors.

Ecolab, Greenview and ITP worked in collaboration to identify 68 destinations based on the size of their hotel markets, and for which relevant data was available. The overall analysis was generated by combining the above factors in a weighted, composite score. Scores are given using 5 risk tiers, from 1 (lowest risk) to 5 (highest risk). Additionally, the Green Lodging Trends Report¹ was used to provide insights on current water management practices. The full list of destinations with their overall risk assessment score is available as an [annex](#) of this document, as well as a list of definitions of the key metrics used.

Overall risk findings

Overall, 12 locations shown in Figure 1 were found to have at least a “high” score (tier 4 & 5) in the overall Destination Water Risk Index. Tier 4 is defined as “high” and tier 5 is defined as “extremely high.” These scores were determined from WRI and WRM indicators, water usage intensity per occupied room, hotel supply, and hotel pipeline growth.

¹ <https://greenview.sg/green-lodging-trends/>

Figure 1 – Overall risk findings



These 12 locations should be regarded as a priority when designing water stewardship strategies among global portfolios, since the combination of these factors reveal that:

- They already face chronic high water stress, which will worsen in the future.
- Significant operating cost increases are likely to affect hotels in these destinations, through regulatory, reputational risk, and changes in national or local water tariffs.

Although Cape Town received overall “high / extremely high” scores in both the current, future and Water Risk Monetizer indicators, the location’s overall intensity per occupied room (OCRM), hotel supply, and hotel pipeline growth were generally ranked as “low” resulting in an overall assessment tier score of 3. While this score seems low compared to other locations, it does not imply that addressing water scarcity in Cape Town or South Africa should be disregarded. Rather it’s an indicator that the hotel industry is expected to have a bigger impact in other destinations with similar water stress, due to the size of their current and future market.

Highest current and future water stress

The seven locations listed in Table 1 were determined to have “extremely high” or “high” current and future water stress. They are destinations which are already affected by water stress and will experience the highest water risk in the coming years (making hotel properties operating there particularly affected). This increased future water stress is determined from changes in water demand (withdrawals), changes in water supply, changes in water stress, and changes in intra-annual (seasonal) variability in these destinations. Bali was found to have “extremely high” current and future water stress scores.

Table 1 – Destinations with highest current and future water stress

Location	Country	Baseline Water Stress Tier	Future Water Stress Tier
Bali	Indonesia	Extremely high	Extremely high
Jakarta	Indonesia	Extremely high	High
Mumbai	India	Extremely high	High
Dubai	United Arab Emirates	Extremely high	High
Istanbul	Turkey	Extremely high	High
Zhengzhou	China	Extremely high	High
Abu Dhabi	United Arab Emirates	Extremely high	High

Additionally, 35 locations were identified to have “extremely high” or “high” current water stress; however, these locations had a “medium” or “low” future water stress level.

Differences in baseline and future water stress are mainly caused by climate change and economic development, which has the potential to impact water availability due to competition for the resource.

In total, 42 locations were found to have “extremely high” or “high” current baseline water stress levels. Abu Dhabi, Zhengzhou, Istanbul, and Bandung were found to have “high” and “extremely high” current and future water stress, whilst being among the highest markets in hotel supply and pipeline growth.



Hyatt Pune – Heating and cooling over 200 guest rooms while saving freshwater resources

The 5-star Hyatt hotel in Pune, India, faced complicated issues when its water supply was abruptly cut off due to a municipal water shortage. The expansive Hyatt property includes 209 guest rooms, restaurants and banquet rooms. To maintain heating and cooling comfort for its guests and employees in the face of this cut-off, the hotel used treated Sewage Treatment Plant (STP) water in its cooling towers. Hyatt and Ecolab worked together to implement Ecolab’s state of the art 3D TRASAR™ automation technology for its HVAC systems to deliver the following results:

- Treated blow down water with oxidizing and non-oxidizing biocide reduced issues with wastewater discharge
- Consistent approach temperature helped to eliminate the need for quarterly condenser cleanings
- More efficient reuse improved HVAC performance.

The project resulted in **1.8 million gallons of freshwater saved and 4.8 million gallons of STP water reused**. Using STP water in the three HVAC units did create two issues: rising approach temperatures of the STP water necessitated more frequent condenser cleanings and more cleanings produced more effluent discharge from blowdowns.



Highest water risk premium

Water risk premiums are based on algorithms from Ecolab's WRM that place a monetary value on the full cost of water for each location. This includes factors such as local environmental, human-health and domestic supply impacts of water depletion, and the future costs of incoming water treatment. Local water availability, local water quality and local population density are all variables that impact the size of the premium. The water risk premiums referenced below are based on incoming water risk premiums.

Table 2 – destinations with highest current and future water stress

Location	Country	Water Risk Premium Tier (Year 1)	Risk Premium Relative to current Price (multiplier factor - Year 1)	Water Risk Premium Tier (Year 5)	Risk Premium Relative to current Price (multiplier factor- Year 5)
Surabaya	Indonesia	Extremely high	64.2	Extremely high	60.8
Bali	Indonesia	Extremely high	15.9	Extremely high	15.6
Jakarta	Indonesia	Extremely high	12.9	Extremely high	12.4
Mumbai	India	Extremely high	23.1	Extremely high	18.8
Bangkok	Thailand	Extremely high	12.5	Extremely high	12.9
Delhi	India	Extremely high	44.2	Extremely high	40.6
Bandung	Indonesia	Extremely high	14.2	Extremely high	13.7
Cape Town	South Africa	Extremely high	14.4	Extremely high	13.4
Pattaya	Thailand	Extremely high	11.2	Extremely high	11.5
Cairo	Egypt	Extremely high	20.3	Extremely high	14.3

The ten locations listed in Table 2 were identified to have an “extremely high” water risk premium for both 1-year and 5-year outlooks. These locations have risk premiums of 11 to 64 times more than the current water bill, which is a representation of the full value of water for that site (taking risk associated with the quality and quantity of water into account). This means that hotels in these locations could incur operating costs of 11 to 64 times more than the current cost of water.

Surabaya, Indonesia had the highest water risk premium for both 1-year and 5-year outlooks, which could result in water-related costs increasing by more than 64 times for hotels, based on average cost/risk analysis globally.

The analysis also shows how hotels may face high risk of cost increases from water utilities even though the water stress risk is not as high, due to the extreme undervaluation of the provision of municipal water. Examples of this are Surabaya, Bangkok, Delhi, Cape Town, Pattaya and Cairo, which are locations within the “medium” tier for future water stress, however have an “extremely high” cost increase risk. Hotel companies can mitigate this risk by sharing information with local water agencies and users (e.g. other hotel properties) to improve public water management, ensuring that their corporate water strategy is in line with local catchment stewardship plans (e.g. sharing data on current and future water use linked with hotel development, water strategy and results, engaging with public water agencies to share information on water quality and scarcity, seasonal use, etc.).

Bali, Jakarta, Mumbai, Surabaya, Bangkok, and Delhi were identified to be the highest water risk locations with “extremely high” cost increase risk.

Highest intensity per occupied room

The Destination Water Risk Index reviewed the median water usage per occupied hotel room for properties in the identified locations, using the 2018 Cornell Hotel Sustainability Benchmarking Index (CHSB) , which contains data for more than 10,000 hotels, segmented by geography and hotel classifications. Based on global data, tiers were demarcated accordingly and each destination placed within a respective tier. The “high” and “extremely high” tiers indicate the destinations in which properties consume the most water from their operations and will need to significantly improve their water management in the coming years to limit their risk.

The map below illustrates those locations with high water intensity levels per occupied room, which often correlates to an overall “high” water risk (overall tier assessment of 4 or 5). Results can be used to highlight the opportunity for hotels in these locations to avoid likely cost increases by improving water management. To do so, hotels can consult ITP’s manual [Environmental Management for Hotels](#) which provides detailed guidance on how to use less water, how to keep it free from contamination during use and how to ensure responsible treatment of wastewater at property level.

NB: The results below are based on information shared by a portion of hotels in each destination and do not reflect the individual performance of all properties located in the area.

Figure 2 – Destinations with highest water intensity per occupied room



Extremely high hotel pipeline growth

While water usage intensity is an important managerial indicator, and water stress or cost risk are valuable for operational decision-making, the future demand for water from a destination's hotel supply will become more important over time. The DWRI invites the hotel industry to take into consideration the risk to a project from the future environmental stress resulting from aggregated hotel development.

Analysis for the Index incorporated both the hotel pipeline (in terms of number of rooms) as well as its comparison to the existing number of rooms in the destination, mostly using published data from STR Global. For this analysis, we're evaluating the estimated future growth of the market ("Pipeline growth tier") and the percentage that the pipeline growth represents in comparison to the current supply ("Pipeline growth % tier").

The destinations listed in Figure 3 are foreseen to have a "high" or "extremely high" hotel pipeline growth. Among them:

- Mumbai, Surabaya, Dubai, and Manila are recorded as locations with the highest incoming water cost premium and pipeline growth percent, which stresses the importance of taking local water resources into account when planning and designing future properties and retrofits.
- Los Angeles, Dubai, Mumbai, Surabaya and Melbourne were found to have an "extremely high" baseline water stress level, and an "extremely high" hotel pipeline growth percent tier.
- Delhi and Sydney were found to have an "extremely high" baseline water stress level, in addition to "high" hotel pipeline growth.

Figure 3 – Destinations with highest hotel pipeline growth compared to current supply (future portfolio estimate/current portfolio)



How to use DWRI insights in your company

CR teams: focusing your water stewardship policy on the highest risk destinations

The Destination Water Risk Index provides a unique analysis on water risk in key markets, by factoring multiple datasets. The results can therefore be used to initiate a water stewardship strategy or complement an existing water risk assessment, using sector-specific information. Three main observations stand out from the overall analysis of the index results:

- **Asia is the region with the highest risk levels.** Destinations with either “high” or “extremely high” baseline water stress levels, and “high” or “extremely high” intensity per occupied room, are in Asia. Asian destinations are often highlighted as priority locations to address water risk in tourism, but our Index results provide further insight into the role of the hotel industry. The fact that the highest water intensity per occupied room figures are also found in Asian hotels, is a clear call to action to companies operating in the region to improve their water management.
- **The largest hotel supply markets have a “high” risk of future operating cost increase because of water risk.** However, there was no significant correlation between top hotel supply markets and baseline water stress. This result suggests that the hotel sector cannot be held solely responsible for causing water stress in these markets, but that many properties operating there are likely to be affected by future water related cost increases. This could cause a significant overall cost impact on brands operating multiple properties in these destinations.
- **Most locations with a “high” or “extremely high” baseline water stress level, and/or water intensity per occupied room, are likely to be impacted by cost increases.** This result highlights the importance of addressing water scarcity to minimise future financial impact in the following markets: Jakarta, Hong Kong, Mumbai, Monterrey, Cape Town, Dubai, New York City, Istanbul, Qingdao, Sydney, Bandung, Hangzhou and Tokyo.

Development teams: integrating water risk when choosing and planning new developments

When determining locations for hotel development, the Destination Water Risk Index can be used to consider the potential impacts from future water stress, and water cost for identified markets. Hotel companies can use the Index results to identify and plan for future hotel growth in water stressed and future water stressed areas to better manage water demand.

Two main observations stand out from the overall analysis of the index results:

- **Locations with “high” or “extremely high” hotel pipeline growth levels have a high risk of being impacted by future cost increases.** Additional properties built in these markets will face increased local water stress in the future. Their operational costs will likely increase due to future water shortages, inter-annual variability, seasonal variability, national or local regulatory and reputational risk, and changes in national or local water tariffs. These locations include: Dubai, Hong Kong, Los Angeles, Manila, Melbourne, Mumbai, Delhi, Sydney and Surabaya.
- **Most locations with a medium or low pipeline growth may have a “high” or “extremely high” baseline water stress level,** which presses development teams

to make water stress a key factor in their planning and development process in the following markets: Abu Dhabi, Bali, Barcelona, Beijing, Cape Town, Istanbul, New York City, Monterrey, Singapore, and Tokyo.

General Managers and engineering teams: upgrading water management practices and infrastructure in water stressed destinations

The Destination Water Risk Index includes data from the Green Lodging Trends Report², which assesses and benchmarks sustainable best practices across properties worldwide. Trend results allow a more practical understanding of current water management practices in the high water risk destinations that we have identified in this report, and help identifying how current gaps between risks and practices can be closed:

- **Regular water use monitoring** is essential, in particular in locations with a “high” or “extremely high” baseline water stress, and/or a “high” risk of cost increases in the future. This applies worldwide, however trends indicate that this practice can still be improved in Asian hotels as a priority.
- **Rainwater and grey water reuse** can significantly help hotels to be resilient to future operational cost increases linked to water risk. These systems can be applied worldwide but are particularly recommended in destinations with high water risk premiums in 1 and 5 years.
- **Advanced water management best practices** (including rainwater capture, grey water reuse, native or drought tolerant landscaping, leak detecting for water piping or toilet tanks, automatic sprinkler systems, and water sub-metering practices) are recommended in all destinations to avoid being impacted by future water related costs.

Property managers and staff can use the resources created by ITP and Greenview to improve their water management: [ITP Water Stewardship for Hotels Report](#), [ITP Hotel Water Measurement Initiative](#) (HWMI), [ITP's Environmental Management Manual for Hotels](#), and [The Green Lodging Trends Report 2017](#) (full list of best practices and trends on their implementation).

“As a responsible industry trying to address water scarcity, we recognise the need for long-term planning and collaboration that encompasses a holistic end-to-end approach in addressing the urgent and complex issue.

The Destination Water Risk Index is a key tool developed with support from ITP members that will help the hotel industry to proactively identify and prioritise focus areas and take action both individually and collectively. We invite organisations to come join us in this journey so we can go further, together.”

Madhu Rajesh – Director of the International Tourism Partnership

2 <https://greenview.sg/green-lodging-trends/>



IHG – Tackling water scarcity at destination level in Chengdu, China



In 2015, IHG completed a comprehensive water risk assessment to identify the key water risk locations for its hotels, mapping results with ITP's Destination Water Risk Index. The assessment focused on hotels with a high water stewardship business case, high water scarcity and pollution rating, and key IHG markets. This global assessment led to a first destination level pilot project in Chengdu, China in 2017, in order to embed learnings at a local level.

Several concrete actions were taken by IHG properties to address water risk in Chengdu:

- **InterContinental® Century City and Holiday Inn® Chengdu Century City-West Tower:** All water data was analysed for the whole property to find hotspots for water usage. All rooms have been installed with low flow shower heads before April 2018. Water meters have been installed and 2 pipe leakages were identified and resolved, decreasing average leakage by about 50 tons per day.
- **Crowne Plaza® Chengdu City Centre:** replaced its water pipes to reduce leaks and installed regional metering, recording the regional water situation. Swimming pool treatment chemicals are now controlled by machine, thus improving water quality. Shower heads are being gradually all replaced in guest rooms.
- **Holiday Inn Express® Chengdu Huanhuaxi:** trained its housekeeping staff to reduce water use during cleaning resulting in 1 tonne of water saved per day. Cleaning chemicals have been replaced with eco-friendly versions, and the hotel is now closely monitoring water use to understand where further action needs to be taken.
- In addition, the hotels have partnered with non-governmental organisation CURA (Chengdu Urban Rivers Association), to develop community plans to manage consumption, water scarcity and pollution in the local area.

This risk assessment is just one part of IHG's broader actions in water stewardship, and its commitment to managing its business responsibly. In March 2018, IHG launched its 2018-2020 targets to continue being a force for positive change around the world. As part of this, IHG has promised to deliver six water stewardship projects in markets around the world to the end of 2020. Starting in London and Delhi, these projects will empower its hotels to become water stewards not only for their property, but also for their wider communities.



Hilton's commitment to water stewardship at global and destination level

Hilton has long focused on reducing water consumption at its hotels, and the company achieved a 20% reduction in water use intensity across its global portfolio between 2008 and 2017. However, the company's goal is to further water stewardship well beyond the walls of its hotels and to become one of the world's leading water stewards. To accomplish this, Hilton is taking bold and innovative steps to address water stewardship across its business.

In 2017, Hilton signed the United Nations CEO Water Mandate and announced, in collaboration with its environmental partner World Wildlife Fund (WWF), Hilton's 2025 Water Commitments to promote water stewardship across their value chain.

In May 2018, Hilton took its water stewardship work even further with the release of its new Travel with Purpose commitments to double the company's social impact and cut its environmental footprint in half by 2030. As part of these 2030 Travel with Purpose targets, Hilton has set the ambitious goal of cutting operational water use intensity by 50% by 2030, while also activating 20 context-based water stewardship projects in local communities and watersheds facing the highest water risk.

In order to understand the company's global water risk and develop a road map for context-based water projects, Hilton and WWF mapped the company's 5,300+ managed and franchised hotels against the WWF Water Risk Filter, allowing a deep understanding of hotel water risks at the river basin level. The risk data was further analysed against the hotel's consumption and cost information as well as internal knowledge about current activities at the hotel. Based on Hilton and WWF's joint analysis, the first three water stewardship pilot locations were selected to take place in Southern California in the U.S., the Yangtze Basin in China and Cape Town, South Africa.

To date, the company has completed an in-depth risk analysis for each of the pilot locations, incorporating feedback from local stakeholders and water risk impact information specific to the pilot location. This information has been used to develop detailed recommendations of steps that the local hotels can take to mitigate water risk both at their properties and in their communities to promote the resilience of the watershed.

Many of these recommendations have already been implemented:

- Sub-metering to provide a more comprehensive understanding of the use of water in the hotels.
- Training of Team Members to ensure they appreciate the individual actions they can take to reduce water-related impacts.
- Actively participating in local action groups, such as the [California Water Action Collaborative \(CWAC\)](#) and context-based water target pilot to further encourage collective action.
- Identify and source innovative new technologies that can reduce water consumption on property within reasonable payback periods.





Whitbread – Recycling greywater in Qatar and United Arab Emirates properties



Premier Inn has extensive experience of using water reuse technologies in the UK, so it was a natural step for Premier Inn hotels in the Middle East to determine their newest hotel should set the standard by utilising greywater recycling technology.

The Premier Inn at the Abu Dhabi International Airport (ADIA) has enlisted the help of specialist water management solutions [Waterscan](#) to install the region's first ever water recycling system, which will save an average of 735,000 litres of water each month - almost a quarter of the hotel's monthly water use. As well as lowering water demand in the area - Abu Dhabi averages 120mm of rainfall each year, and is likely to suffer from 'extreme water stress' within the next 15 years - the system runs on low energy components to deliver increased energy efficiency and lower running costs. Its success led to the installation of a similar system in the Premier Inn Doha Education City and Premier Inn Dubai Al Jadaf.

Waterscan's system works by harvesting used water from showering and bathing across the hotel's 300 rooms, and treating it through an ultra-filtration membrane before feeding it back into the hotel for use in flushing toilets and for irrigation. The process has seen 100% of toilets in the hotel using recycled water, with wholesale water consumption reduced by an equivalent of 60 litres per guest and of 110,000 baths annually, without any interruption in supply or effect on customer experience. The water recycling system also uses a fixed barrier that nullifies the threats of waterborne viruses and pathogens. Remote diagnostic reporting is also incorporated into the system allowing for around the clock maintenance.

With the success achieved at Premier Inn ADIA, the company will roll the technology out across all their own new builds in the Middle East.



Soneva – Solar Powered Desalination



Drinking water on Maldivian islands can be an unreliable resource. Extended dry seasons can lead to wells drying up and Maalhos residents – a neighbouring island of Soneva Fushi – have required emergency supplies of drinking water to be transported from the capital, Malé, for the past three years.

Two of Soneva Fushi's Hosts, Federica Siena and Anshul Bakhda, identified a solution based on Soneva's own pioneering drinking water system. Working closely with the local community, they identified that an unused desalination machine on the island could be the solution to the island's water scarcity issues. This formed the basis for the creation of a bottling plant that could service the drinking water needs of the whole island.

From the island's solar-powered desalination water plant, Soneva Water will filter water with carbon resin and reverse osmosis, mineralise, UV sterilise, and bottle water in reusable, eco-friendly bottles. These bottles will then be delivered to households, guest houses, cafes, schools, and businesses in 500ML reusable glass bottles or 5 gallon (19 litre) reusable polycarbonate bottles. Once the water is consumed, the empty bottles will be collected and replaced with a fresh bottle of water. This is the first service of its kind outside of the capital city, Malé.

The innovative model makes water production more environmentally sustainable as it aims to prevent thousands of water bottles from being produced, transported to the island, and then incinerated or thrown into landfills or the sea.



NH Hotel Group – The NH Lord Charles, Cape Town



The NH Lord Charles (188 rooms) has been implementing drastic measures to adapt to the extreme water scarcity affecting Cape Town, South Africa. Going beyond local water legislation and recommendations, the property implemented several actions in its back of house, with a strong focus on employee and guest engagement.

Investment was undertaken in the hotel's infrastructure in order to continue saving and reusing water: the hotel's fountain was drained and decorated instead with plants; a rain-water tank was installed, and its collection used to irrigate the gardens and fill the two swimming pools, which also have two tanks to capture their backwash. Furthermore, all water from the washing machines is captured and recycled for cleaning purposes.

The property also created a Resources Saving Team made up of members from all departments, which had the task of educating and supporting staff to ensure no water or energy was wasted during daily operations at the hotel.



All guests were informed at check-in about the critical drought situation in the Western Cape and asked for cooperation in the control of water usage. Posters and signage were placed in the lobby, conference areas and public toilets and messages were shown on the TV in every single room.

Apart from the existing water saving devices placed in taps and shower heads to reduce the flow of water, guests' behaviour change was also encouraged through other indirect incentives: plugs were removed from bathtubs to dissuade them from taking baths, and 2-minute sand-timers were installed in all rooms to encourage guests to take short showers.

Through these new measures and others that were already in place, the hotel saved an equivalent amount of water that would fill more than 2 Olympic swimming pools.

The NH The Lord Charles in Cape Town is the first hotel in South Africa to receive a [Green Key award](#) in 2018.



Radisson Hotel Group properties tackling the Cape Town water crisis

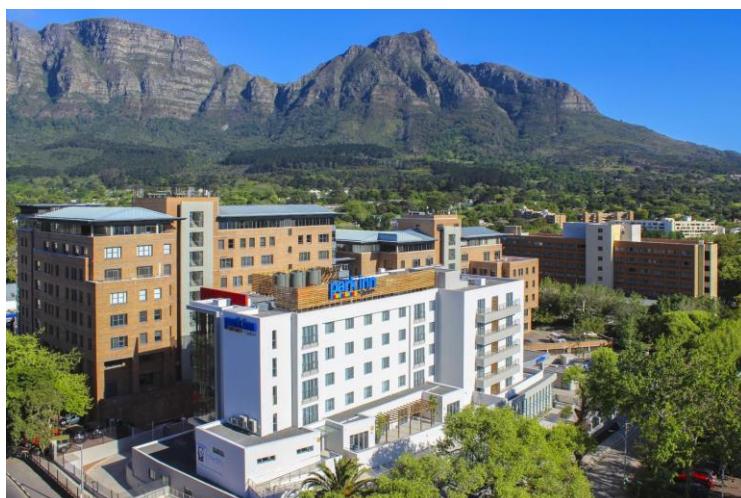
Water restrictions have been applied in Cape Town, South Africa since February 2018 to push back "Day Zero" on water resources as far as possible. Each of the Radisson Hotel Group's (RHG) six hotels in the region has been actively embarking on operational changes and continuously implementing new initiatives to save as much water as possible since the water crisis started. They are also taking every opportunity to educate and encourage their guests to save water too.

Local and international guests in the city are made aware of Cape Town's extreme water crisis, and strictly adhere to the regulations that have been put in place to save water.

The six RHG hotels in the region have taken several practical steps to cut down on water usage. They have removed the large flush option from the dual-flush systems (as well as the automatic flush from their urinals), removed all the bath plugs and have installed aerators to reduce water flow from all taps. And to make these measures more effective, the hotels provide hand sanitisers in public areas and bathrooms.

Initiatives taken by the RHG hotels in Cape Town include:

- Collection of rainwater from the roof and of laundry rinsing water used to top up the pool (following treatment), gardening, and floor cleaning at the Park Inn by Radisson Cape Town Foreshore.
- Selling bottled water at cost price to guests, recycling used water (providing guests with buckets to catch their shower water), and the installation of a tank to catch the bathroom basin water that is then reused in the garden at the Park Inn by Radisson Cape Town Newlands and Radisson Blu Le Vendome Hotel.
- Using only microwaves or ovens to defrost food items, removing wash basins and controlling the usage of chillers to reduce condenser water consumption. The pool was closed for a few months and reopened over the holiday period using non-potable water. The hotel turned off the pool heater and installed a water blanket to avoid evaporation. Radisson Blu Hotel & Residences, Cape Town
- The newly built Radisson RED Cape Town has incorporated design elements that assist in water saving, such as eco-flush on all toilets, showers that heat up in under six seconds instead of baths, and a climate control system that uses ocean water for heating and cooling processes.



Annexes

Annex 1 – list of all destinations reviewed – highest (5) to lowest (1) overall risk assessment score

Destination	Country	Overall Risk Assessment Tier (High-5 to low-1)
Bali	Indonesia	5
Mumbai	India	5
Bangkok	Thailand	4
Beijing	China	4
Dubai	United Arab Emirates	4
Hangzhou	China	4
Jakarta	Indonesia	4
Manila	Philippines	4
Delhi	India	4
Qingdao	China	4
Surabaya	Indonesia	4
Xian	China	4
Abu Dhabi	United Arab Emirates	3
Bandung	Indonesia	3
Cape Town	South Africa	3
Chengdu	China	3
Denver	United States	3
Hong Kong	Hong Kong	3
Istanbul	Turkey	3
Kuala Lumpur	Malaysia	3
Los Angeles	United States	3
Melbourne	Australia	3
New York City	United States	3
Orlando	United States	3
Pattaya	Thailand	3
Phoenix	United States	3
Seoul	South Korea	3
Shanghai	China	3
Shenzhen	China	3
Singapore	Singapore	3
Suzhou	China	3
Tianjin	China	3
Tokyo	Japan	3
Zhengzhou	China	3

Atlanta	United States	2
Barcelona	Spain	2
Boston	United States	2
Cairo	Egypt	2
Chicago	United States	2
Dallas	United States	2
Guangzhou	China	2
Houston	United States	2
Las Vegas	United States	2
London	United Kingdom	2
Mexico City	Mexico	2
Miami	United States	2
Milan	Italy	2
Monterrey	Mexico	2
Moscow	Russia	2
Nanjing	China	2
Paris	France	2
Philadelphia	United States	2
San Antonio	United States	2
San Diego	United States	2
San Francisco	United States	2
Seattle	United States	2
Sydney	Australia	2
Tampa	United States	2
Washington, D.C.	United States	2
Berlin	Germany	1
Birmingham	United Kingdom	1
Guadalajara	Mexico	1
Madrid	Spain	1
Minneapolis	United States	1
Munich	Germany	1
Toronto	Canada	1
Vienna	Austria	1
Warsaw	Poland	1

Annex 2 – Key definitions

- **Current Water Stress Risk** – Baseline water stress measures the ratio of total annual water withdrawal to average annual available blue water. Baseline water stress thus measures chronic stress rather than drought stress.
- **Seasonal Variability** – Seasonal variability estimates the within-year variation of water supply. The mean total blue water for each of the calendar months is computed, and divided the standard deviation of the 12 monthly values by the overall mean monthly total blue water.

- **Future Water Stress** – Future water stress measures the change in water demand (withdrawal), change in water supply, change in water stress, and change in intra-annual (seasonal) variability for future periods.
- **Incoming Risk Likelihood Score** – The incoming risk likelihood score is the likelihood that a business will realise increased operating costs as a result of incoming water risk based on baseline water stress, future water stress, inter-annual variability, seasonal variability, national or local regulatory and reputational risk, and historical changes in national or local water tariffs.
- **Water Risk Premium** – The water risk premium is a monetary estimate of the increased price of water, which may be realised by a hotel as an increase in its operating costs.
- **Water Usage Intensity Per Occupied Room** – Water usage intensity per occupied room is the total water usage of the property divided by the total number of occupied rooms within the same calendar year.
- **Hotel Supply** – Hotel supply is the total number of hotel rooms in the identified geographies.
- **Hotel Pipeline Growth** – Hotel pipeline growth measures the number of hotel rooms that are planned or under construction within each respective identified geography. Growth is considered as ongoing and doesn't have a specified time frame for this analysis.
- **Hotel Pipeline Growth Percentage** – Hotel pipeline growth percentage is the number of hotel rooms that are planned or under construction per identified geographies divided by the total current number of hotel rooms.

• Abbreviations

ADIA	Abu Dhabi International Airport
CHSB	Cornell Hotel Sustainability Benchmarking Index
CR	Corporate Responsibility
DWRI	Destination Water Risk Index
HVAC	Heating, ventilation and air conditioning
HWMI	Hotel Water Measurement Initiative
ITP	International Tourism Partnership
RHG	Radisson Hotel Group
UV	Ultra Violet
WRI	Water Resources Institute
WRM	Ecolab's Water Risk Monetizer



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We exist to build healthy communities with successful businesses at their heart.



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