

CORPORATE WATER ACCOUNTING

**An Analysis of Methods and Tools for
Measuring Water Use and Its Impacts**



The CEO Water Mandate

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Preface

The United Nations Environment Programme's Division of Technology, Industry, and Economics (UNEP DTIE) commissioned this report from the Pacific Institute in its capacity as part of the CEO Water Mandate Secretariat. The report is one component of the broader UNEP Water Footprint, Neutrality, and Efficiency (WaFNE) Umbrella Project.

The CEO Water Mandate is a UN Global Compact initiative designed to help the private sector better understand and address its impacts on and management of water resources. Recognizing the urgency of the emerging global water crisis, the UN Secretary-General, in partnership with a number of international business leaders, launched the Mandate in July 2007. Endorsing CEOs acknowledge that in order to operate in a more sustainable manner, and contribute to the vision of the UN Global Compact and the realization of the Millennium Development Goals, they have a responsibility to make water resources management a priority, and to work with governments, UN agencies, non-governmental organizations, and other stakeholders to address this global water challenge.

The Pacific Institute is dedicated to protecting our natural world, encouraging sustainable development, and improving global security. Founded in 1987 and based in Oakland, California, the Institute provides independent research and policy analysis on issues at the intersection of development, environment, and security and aims to find real-world solutions to problems like water shortages, habitat destruction, global warming, and environmental injustice. The Pacific Institute conducts research, publishes reports, recommends solutions, and works with decision-makers, advocacy groups, and the public to change policy.

The Institute for Environmental Research and Education undertakes and disseminates comprehensive, fact-based research for use in the development of responsible environmental policy, programs, and decisions. The American Center for Life Cycle Assessment, the professional society for LCA in the United States, is its flagship program.

UNEP established the WaFNE Project in order to enhance water efficiency and water quality management through the refine-

ment and pilot testing of several existing water accounting methods and supporting management tools. This project will encourage convergence of practice and compatibility among these methods. This \$4 million project—established in March 2009—will be implemented over the course of three years with supporting partners including the UN Global Compact/CEO Water Mandate, Stockholm International Water Institute, Water Footprint Network, Society of Environmental Toxicology and Chemistry, World Business Council for Sustainable Development, World Economic Forum, International Water Association, National Cleaner Production Centre Network, UNESCO, and the UN-Water Secretariat. In addition to the stocktaking exercise, this WaFNE Project will:

- Map and refine methodologies and related management tools for the water footprint and water neutrality concepts;
- Build capacity and raise awareness among the public and private sectors in order to apply water accounting and neutrality concepts on a greater scale and with greater consistency;
- Demonstrate the applicability of harmonized concepts in enhancing water efficiency and improving water quality in water-intensive industries and water-stressed regions.

Some of the key outputs from this project will include: methodologies and tools for water accounting, dialogue platforms at the global and local level, a capacity platform with online knowledge management and guidance materials for water accounting methods, country-level pilot testing of methods, and awareness raising activities. The pilot testing will look at the implementing of corporate water accounting methods—in possibly six countries spanning multiple continents and at least four industry sectors.

As an initial step to the WaFNE Project, UNEP has commissioned a stocktaking exercise of existing methodologies and supporting tools for corporate water accounting. The findings of this stocktaking exercise are the subject of this report.

Executive Summary

Problem Statement

Water as a natural resource is facing many challenges at the local, regional, and global levels. Human water use is increasingly having negative impacts on human health, economic growth, the environment, and geopolitical stability. In recent years, concerns over growing water scarcity, lack of access to water to meet basic human needs, degraded ecosystem function, and the implications of climate change on the hydrologic cycle have brought water to the forefront as a strategic concern for companies around the world.

Companies' ability to measure and account for their water use and wastewater discharges throughout the value chain is a critical component in their risk assessment and mitigation efforts, as well as their broader ambitions to become responsible water stewards. Corporate water accounting also allows consumers, civil society groups, and the investment community to compare different companies' social and environmental impacts in order to inform their actions and decision making. In sum, the ability to effectively account for corporate water use and impacts is essential in helping companies drive improvement and become aligned with external stakeholders' expectations, as well as their efforts to advance sustainable water management.

However, collecting and disseminating meaningful water-related information is a complicated and difficult undertaking. And while corporate water accounting methods and tools have been under development for the past decade, there is still near universal agreement that current methods—though a good start—are inadequate and need to be refined.

Project Objectives and Methodology

This stocktaking exercise—a joint effort of the United Nations Environment Programme (UNEP) and the CEO Water Mandate—aims to assess existing and emerging water accounting methods and tools being used in the private sector, with the goals of:

- Elucidating commonalities and differences among emerging methods and practice;
- Identifying gaps and challenges;
- Suggesting where accounting methods

might benefit from harmonization and increased field testing.

Our analysis focuses primarily on four main methods/tools:

- **The Water Footprint Network's "water footprint"**: A method for measuring the volume of water used by any group of consumers (including a business or its products) that is intended to help those consumers better understand their relationship with watersheds, make informed management decisions, and spread awareness of water challenges.
- **Life Cycle Assessment**: A systems analysis tool designed specifically to measure the environmental sustainability of products (including water use/discharge and many other resource uses/emissions) through all components of the value chain.
- **WBCSD Global Water Tool**: A free online platform that couples corporate water use, discharge, and facility information input with watershed- and country-level data as a means of assessing water-related risk.
- **GEMI Water Sustainability Planner/ Tool**: Two free online tools meant to help companies better understand their water-related needs and circumstances. The Water Sustainability Tool assesses a company's relationship to water, identifies associated risks, and describes the business case for action. The Water Sustainability Planner helps elucidate a facility's dependence on water and the status of the local watershed.

In an appendix to this report, we provide a brief overview of several water accounting methods that are regionally/nationally specific, industry-sector specific, or proprietary and therefore not included in our analysis. In addition, the International Organization for Standardization (ISO) is currently developing a standard for water accounting that is highly relevant to this research, though is not included here because the standard is in its early stages.

Water accounting—as well as companies' need for and use of it—has evolved significantly over time. In exploring these needs and their evolution in recent years, we summarize when and for what reasons companies are

seeking to use existing methods and tools, along with the questions they are asking with regard to their corporate water use/discharge and the resulting impacts and business risks. Because current water accounting methods and tools all have different histories, intended objectives, and outputs, we explicate these origins and core functions in order to shed light on the circumstances for which various methods and tools may (or may not) be appropriate and effective.

Corporate water accounting today can be seen as serving four general, inter-related applications:

- Operational efficiency, product eco-design, sustainable manufacturing
- Water risk assessment/identification
- Managing water-related social and environmental impacts and water stewardship response
- Communicating water risk/performance with stakeholders

These areas of interest to companies represent the broad types of methods and tools available and are motivated by a number of factors, including pursuit of reduced costs, strategic planning, brand management/corporate reputation, and corporate ethics/philanthropy. However, at their root, they are all driven by the desire to identify and reduce water-related business risk (and seize opportunities), whether through building competitive advantage, ensuring long-term operational viability, or maintaining and/or improving social license to operate. Because understanding and mitigating the inter-related issues of water risk and impact is a core driver for emerging water accounting methods and tools, they are explored extensively in this analysis.

Findings

Our analysis has resulted in a number of key findings, including those pertaining to: 1) the areas in which corporate water accounting in general is lacking, 2) the similarities across all four general applications covered in the study, and 3) the characteristics, strengths, and weaknesses of specific methodologies and tools. Conclusions about the four application areas and water accounting in general are listed below, while conclusions regarding the main methods/tools assessed are summarized in Table ES-1. We conclude with a list of rec-

ommendations for improving corporate water accounting in the future.

OVERARCHING CONCLUSIONS

- **Terminology confusion:** The term “water footprinting” is frequently used by different interests to mean very different things. Most notably, for many, it is used as an umbrella term for all water accounting methods connoting a volumetric measurement of water use that reflects water-related impacts. This usage of the term is similar to the way that many understand carbon footprinting. However, water footprinting—as defined by the Water Footprint Network (WFN)—is in fact fundamentally different from carbon footprinting in a number of key ways, especially with regard to the assessment of impacts, which the WFN excludes. Because of this varied understanding, any claims or conclusions made about “water footprinting” should be scrutinized carefully.
- **Shift toward external factors:** The extent to which a company has water-related business risks is largely dependent on the socio-political, environmental, and geo-hydrologic contexts in which the company and its suppliers operate. As such, corporate water accounting has transitioned from a primarily inward focus on production processes to an outward focus that entails the social, political, environmental conditions of the watersheds in which companies operate.
- **Lack of harmonization:** Being a nascent field, the approaches used by businesses to measure and report water-related risks and impacts vary significantly among companies and industry sectors. In addition, methods for characterizing watershed conditions are still largely underdeveloped. As such, it is often difficult for companies to compare their water risks and impacts, and benchmark their progress against that of other companies. Furthermore, it makes it difficult for external stakeholders to accurately assess companies’ risk and impacts.
- **Supply chain issues underemphasized:** Companies are increasingly recognizing that a significant portion of their water-related risks and impacts can occur in their supply chain rather than their direct operations. Yet this component of corporate water accounting remains relatively underdeveloped. This is due partly to the challenge of collecting and managing data from often hundreds of different suppliers,

as well as the fact that many companies (e.g., those that source supplies in global commodity markets) are not able to track water issues relating to their supplies.

- **Inadequate data:** A lack of sufficient data is in many cases the greatest factor limiting the ability of corporate water accounting to provide meaningful information on water-related impacts and risks. This is most often due to inadequate databases, lack of access to existing data, or insufficient granularity of data.
- **The water-energy-carbon nexus:** Companies are increasingly acknowledging that water-related impacts and risks are inextricably linked to their energy use and carbon emissions. Sustainability accounting methods are only beginning to develop efficient ways to align such assessments and highlight linkages.

FINDINGS REGARDING THE FOUR APPLICATION AREAS

Operational efficiency, product eco-design, sustainable manufacturing

Companies simply seeking to improve the efficiency of their operations with respect to water use and discharge may require relatively little knowledge of watershed conditions in which they operate. Although the need for operational efficiencies may be greater in certain locations due to water stress, the process through which these improvements are achieved is typically not dependent on the local context. Thus, companies can often track operational efficiencies using internal production data alone. That said, efforts to make “eco-friendly” products are predicated on assessing external factors, which will require watershed-level, local context data.

Water risk assessment/identification

Water-related business risks are associated not only with the impacts of corporate water use/discharge on the surrounding environment, but also changing external social, environmental, and political conditions in places where the company operates. As such, risk can be effectively assessed using a number of different approaches, including the four main methods/tools evaluated in this study. Conducting a simple “first-tier” risk screen that identifies at-risk operations or value chain stages that are likely to have water issues is quick and relatively inexpensive, and can be done without extensive detailed internal or

external data. However, conducting a comprehensive assessment that considers the specific local social, environmental, and political conditions that create risk in a particular locale requires detailed data on both internal water use/discharge and local watershed conditions. Such data collection requirements can be resource intensive and are often hindered by a paucity of primary data.

Managing water-related social and environmental impacts and water stewardship response

Accurately assessing the social and environmental impacts of a company’s water use/discharge is an important component in any comprehensive corporate water accounting exercise. Yet methods for assessing such water-related impacts are currently underdeveloped. This is partly due to the data limitations mentioned above, but also due to a lack of agreement among practitioners on the appropriate range of social and environmental impacts that must be addressed, as well as consensus on the methods by which such impacts are characterized. A detailed assessment of impacts could consider a number of different environmental and social factors, including physical abundance of water, human access to water, affordability of water services, human health issues, and ecosystem function/biodiversity, among others. However, at present there is no consensus in the field of corporate water accounting as to the appropriate scope of such impact assessments.

Communicating water risk/performance with stakeholders

Companies are increasingly using their water accounting outputs to support their disclosure to key stakeholders and the general public as a strategy for improving transparency and accountability. Traditionally, quantitative water data disclosed has focused on indicators such as total water use, discharge, and/or recycling. This information alone is now widely considered inadequate as it does not address the local contexts in which the water is used. As corporate water accounting has evolved from an inward to outward focus over the years, a corollary shift in demand for supporting information has taken place. New initiatives, such as the Carbon Disclosure Project, underline that such disclosure of risk-related and location-specific information is now an expectation of companies.

ES-1 Summary of Findings on Corporate Water Accounting Methods and Tools

Application:	Water Footprint	Life Cycle Assessment	WBCSD Global Water Tool	GEMI Water Sustainability Tools
General Strengths	<ul style="list-style-type: none"> • Good tool for “big picture” strategic planning purposes • Easily understood by non-technical audiences • Best for water use assessments, as opposed to water quality 	<ul style="list-style-type: none"> • Uniquely well-suited for cross-media environmental assessments • Mature science-based methods for assessing water-quality impacts 	<ul style="list-style-type: none"> • Good first-tier risk screen • Inexpensive, fast, and does not require company expertise • Simple inventory for companies to compile their water data 	<ul style="list-style-type: none"> • Useful for companies just beginning to think about water stewardship • Inexpensive, fast, does not require expertise
General Weaknesses	<ul style="list-style-type: none"> • Generic, aggregated blue-green-grey WF¹ figures are misleading • Grey WF deemed ineffective by many companies 	<ul style="list-style-type: none"> • No universally accepted method of assessing water use impacts • Results can be difficult to communicate to non-technical audiences 	<ul style="list-style-type: none"> • Does not address water quality/discharge-related risks • Does not address impacts • Assessments provide only rough estimates of risk 	<ul style="list-style-type: none"> • Rudimentary assessment of relative risks • No quantified results
Assessing Water-Related Business Risks	<ul style="list-style-type: none"> • Identifies “hotspots” linking corporate consumptive water use and source water data • Green/blue WF distinction helps shed light on nature of risk 	<ul style="list-style-type: none"> • Uses science-based impact assessment as the starting point for understanding business risk • Operational “hotspots” used for product design improvement, technical improvements 	<ul style="list-style-type: none"> • Emphasizes place-based water metrics that contextualize company water use and that serve as the basis for understanding risk • Identifies “hotspots” by mapping facilities against external water and sanitation data 	<ul style="list-style-type: none"> • The Planner assesses external factors that affect specific facilities • The Tool helps companies identify business-wide water-related risks
Understanding and Responding to Water Use and Quality Impacts	<ul style="list-style-type: none"> • WF calculation does not attempt to quantify water-related impacts • Green/blue WF distinction illustrates general extent and type of impact • Gray WF underdeveloped/ underutilized – focuses on primary pollutant and calculates theoretical volume of dilution water needed to reach regulatory standards 	<ul style="list-style-type: none"> • Situates water impacts within a broader understanding of sustainability impacts • Characterizes water use data based on relative water stress to quantify impacts • Measures individual contaminant loads • Does not typically quantify impact to specific local receiving bodies 	<ul style="list-style-type: none"> • Does not characterize corporate water use or otherwise attempt to assess impacts • Does not assess water quality issues 	<ul style="list-style-type: none"> • Provides a compilation of information that can help better understand and identify impacts, but does not quantify them • Provides questions that help companies understand their effects on quality of water bodies
Conveying Water Information to Stakeholders	<ul style="list-style-type: none"> • Can be an effective public-awareness building tool • Conducive to business engagement with water resource managers 	<ul style="list-style-type: none"> • In many instances, particularly in North America, is used for internal purposes only • Awareness levels in both business and the public vary greatly • Used to inform ecolabel programs 	<ul style="list-style-type: none"> • Results of “hotspotting” are more frequently being included in CSR reports • Automatically calculates water-related GRI indicators to be used for CSR reports 	<ul style="list-style-type: none"> • Is not intended for use as a communication tool, nor is it commonly used as one

Recommendations

In our analysis, we identified six key areas in which water accounting practices can be improved through emerging practice. These improvements can manifest themselves through the field testing that UNEP is planning within its multi-year WaFNE Project, or the efforts of other corporate water stewardship initiatives.

- **Common definitions:** Reaching broad consensus on an acceptable definition of the term and concept of “water footprinting” is essential moving forward in order to clarify communication of important information among companies and allow non-technical audiences, including consumers and investors, to more easily understand and engage with this field.
- **Assessment of local water resource context:** Corporate water accounting must better measure and more consistently characterize the local external contexts in which companies operate. In particular, a better understanding of the social dimensions (e.g. accessibility, affordability) of water resources is needed. Companies, practitioners, and other stakeholders stand to benefit from reaching agreement on appropriate and effective “local context” metrics and better ways of working together to collect and manage the relevant watershed-based information.
- **Harmonized reporting criteria:** In order to support companies’ and stakeholders’ ability to assess corporate water risks, impacts, and performance and guide future corporate water stewardship practices, a more consistent approach to measuring and communicating water-related information must be developed. Such information should be relevant across industry sectors and regions and must be valuable for companies themselves, while addressing external stakeholder needs.
- **Improved data collection:** Since many corporate water accounting efforts are limited by insufficient corporate water use and external watershed data, emerging best practice should focus on building the capacity of operations managers to develop and manage more robust information systems.
- **Assessment of supply chain:** More robust and systematic ways to address suppliers’ water issues must be developed. Building out this relatively underdeveloped aspect of corporate water footprinting can be accomplished by focusing on standardized and improved data collection systems in complex supply chains—and innovative ways to communicate and incentivize this focus to suppliers.
- **Addressing water quality:** Priority should be given to developing more effective ways of accounting for wastewater discharge/ water quality, assessing related impacts on ecosystems and communities, and “characterizing” ambient water quality in the watersheds in which companies operate.
- **Cooperation among companies:** There is an opportunity for companies to pool resources in their efforts to better measure and contextualize their relationship with water resources and contribute to sustainable water management. Companies can expedite the advancement of water accounting practices by sharing policies and programs, watershed and supplier data, innovative technologies, and effective reporting criteria.