



# TOTAL WATER MANAGEMENT

TRENDS AND ADVANCES

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APEC ENVIRONMENTAL SERVICES WORKSHOP

HANOI, 11 MAY 2017



# **WATER:GLOBAL CONTEXT**

# Macro trends shaping the future



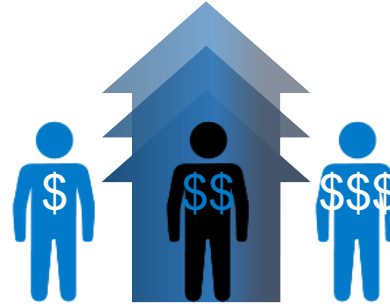
## POPULATION GROWTH

**50% MORE PEOPLE** by 2050,  
with most growth in  
emerging markets



## AGING POPULATION

in EMEA, Japan,  
and China will  
**shift CONSUMER BEHAVIOR;**  
**Drive HEALTHCARE**



## GROWING MIDDLE CLASS

More **DISPOSABLE INCOME,**  
**DIET SHIFTS** to protein and  
away from home dining

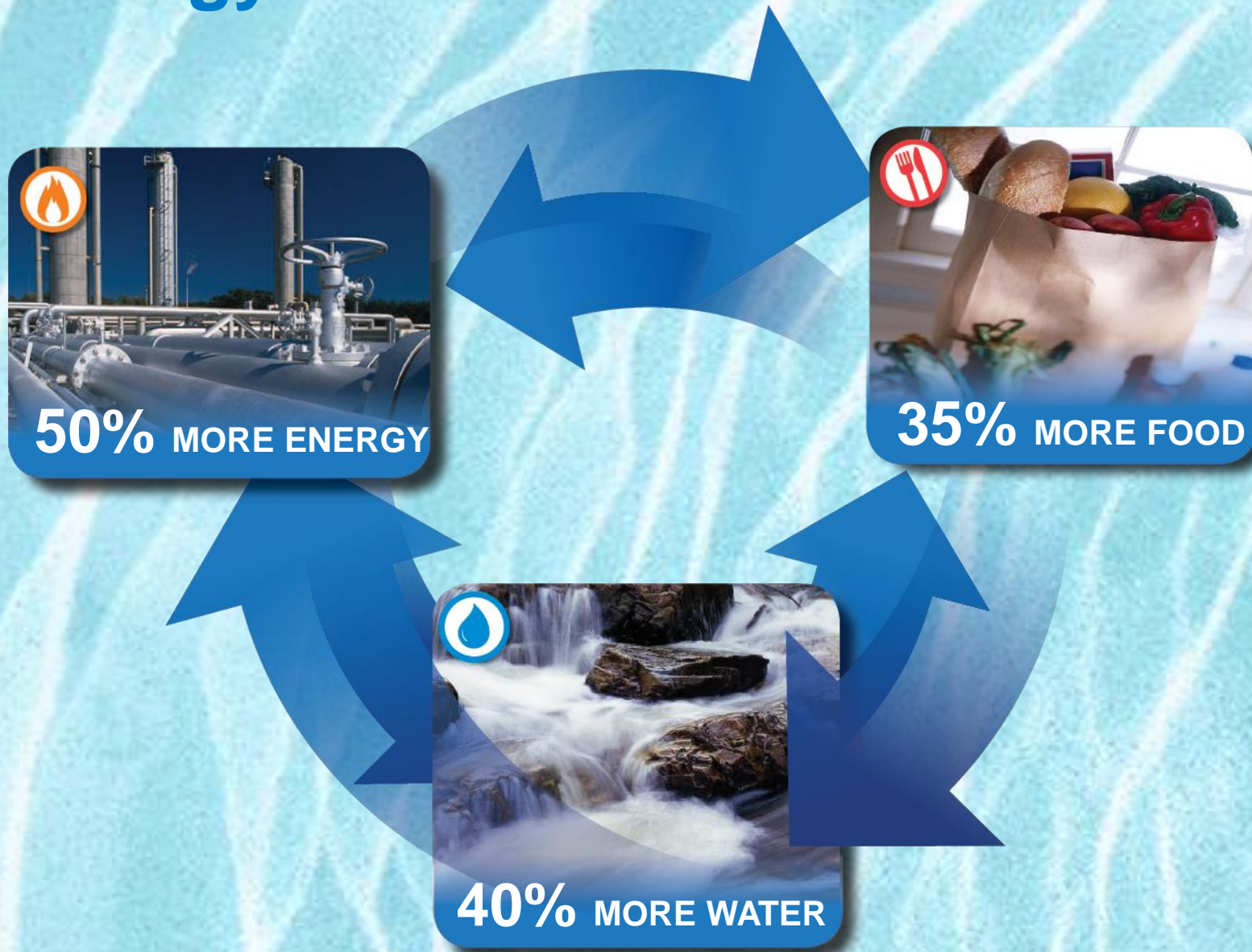


## RISE OF THE MILLENNIAL CONSUMER

Socially-conscious, **less BRAND-LOYAL,**  
more tech savvy

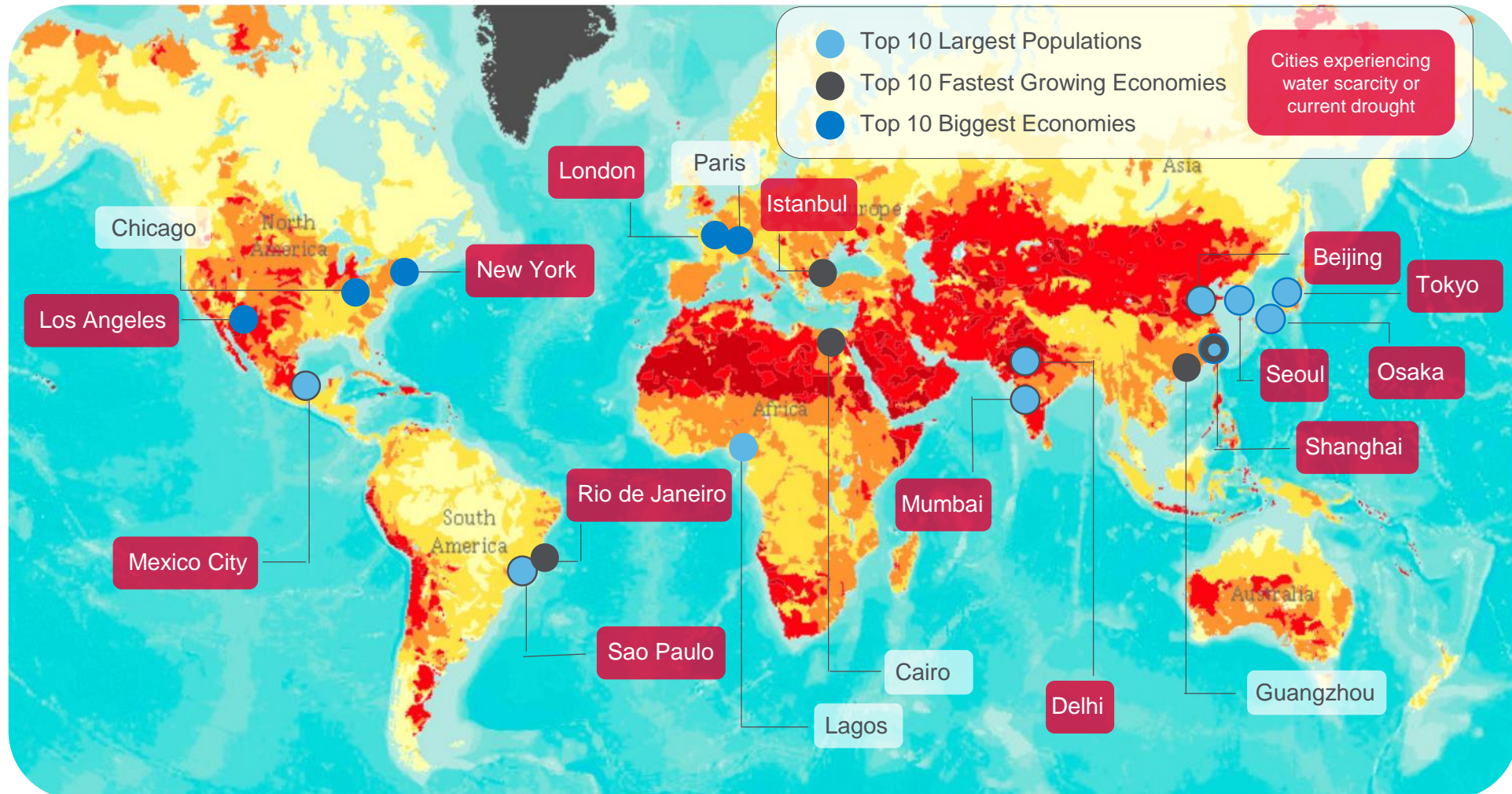


# Water-Energy-Food Nexus





# Water Scarcity's Global Impact : World's Biggest Economies at Risk



Source: UN.org., World Water Development Report 4. World Water Assessment Programme (WWAP), March 2012.

# World's Water Inventory

**97.5%**

= SALT  
WATER

**VS.**

**2.5%**

= FRESH  
WATER

glaciers, ice caps

groundwater

lakes, rivers,  
ice/snow

**1.72%**

**.75%**

**.03%**



# Water crisis making International headlines

**The Washington Post**

**Southwest braces as Lake Mead  
water levels drop**

**FINANCIAL TIMES**

**Nestlé warns water scarcity  
'more urgent' than climate change**

**FINANCIAL TIMES**

**Water shortage shuts Coca-Cola  
plant in India**

**THIRSTY FOR  
INVESTMENTS IN WATER**

**NATIONAL  
GEOGRAPHIC**  
**If You Think the Water Crisis  
Can't Get Worse,  
Wait Until the Aquifers  
Are Drained**

**HOUSTON★CHRONICLE**

**Water woes force big brewers to tighten the tap**

**Sao Paulo Told to Cut Water  
or Risk Running Out in 100 Days**

**THE WALL STREET JOURNAL**

**California Drought Squeezes Wells  
State Considers Regulating Groundwater  
Use for First Time**

**BangaloreMirror**

**MAJOR WATER SCARCITY  
THREAT LOOMS OVER INDIA**



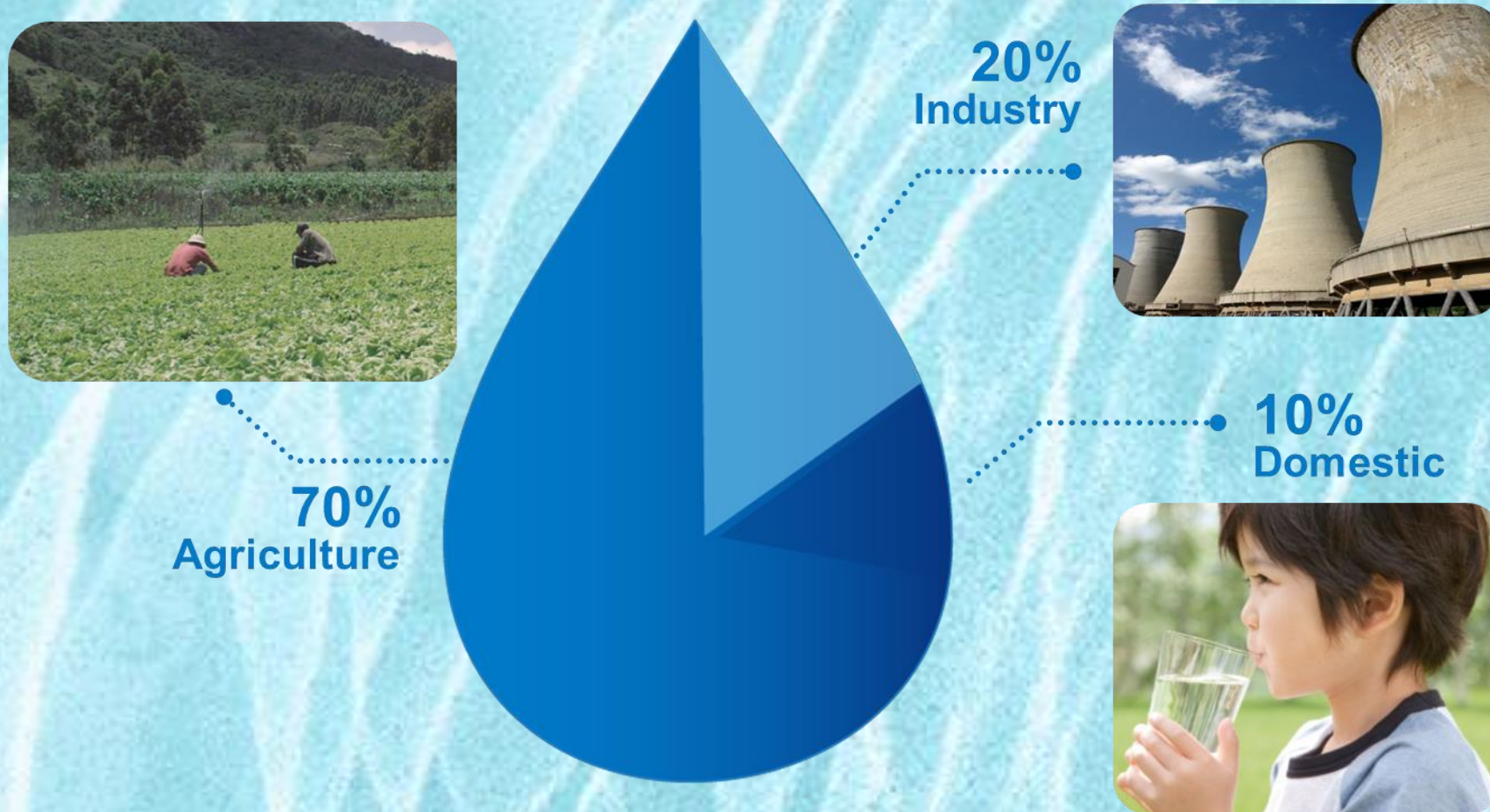
# A Top Global Risk

The global water crisis rose to a top-three risk for **impact** and **likelihood** in 2014 according to the World Economic Forum Global Risk Report

No.	Global Risk
1	Fiscal crises in key economies
2	Structurally high unemployment/underemployment
3	Water crises
4	Severe income disparity
5	Failure of climate change mitigation and adaptation
6	Greater incidence of extreme weather events (e.g. floods, storms, fires)
7	Global governance failure
8	Food crises
9	Failure of a major financial mechanism/institution
10	Profound political and social instability



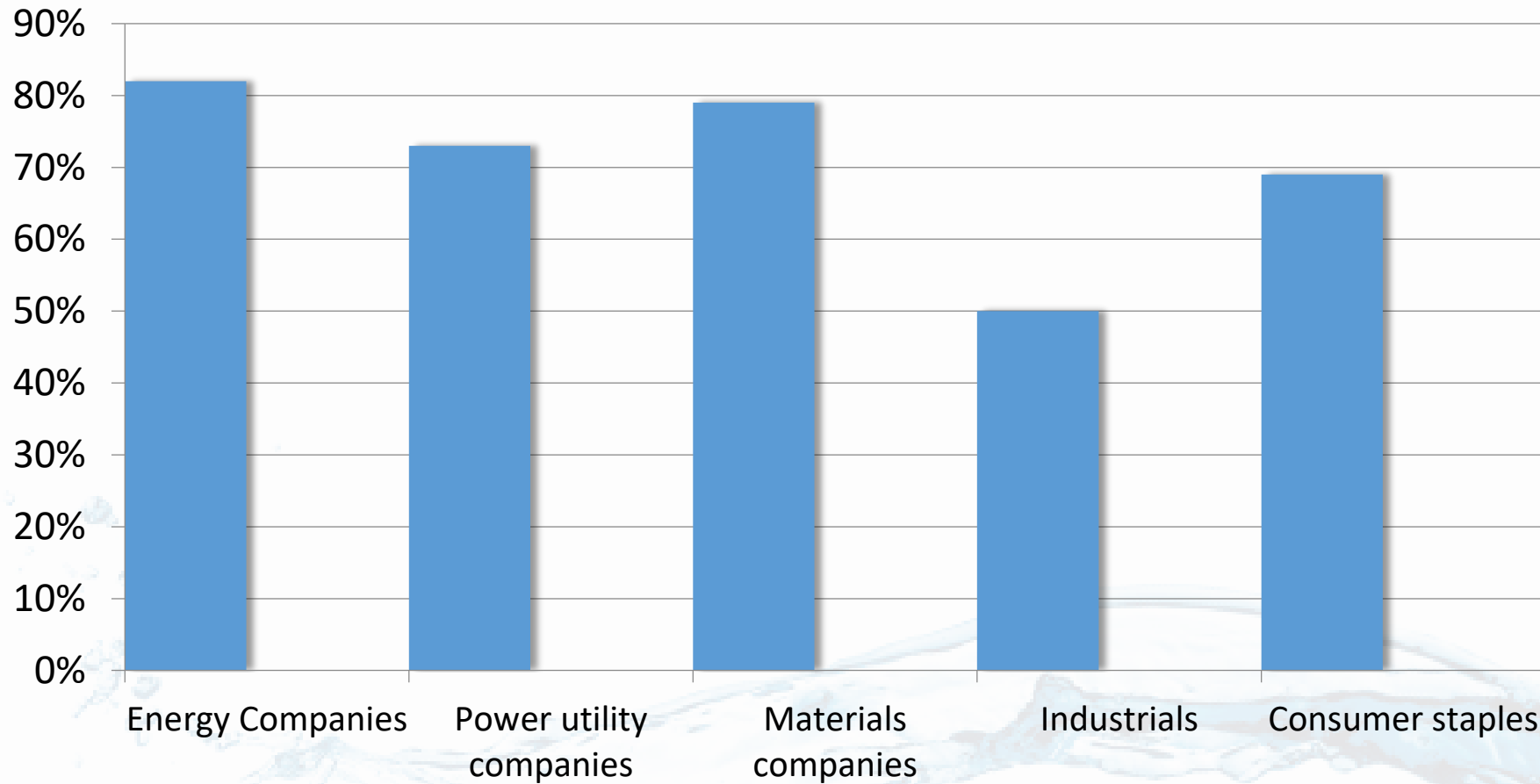
# Industry is second-largest consumer



Source: World Water Assessment Programme

# Water risks rising across sectors

Global companies identify water as a substantive risk to business operations



*Source: CDP Water Report, 2013 (survey of 180 Global 500 companies)*



# Significant business impact



In 2015, the global water crisis was cited as the number-one **business risk** for impact



**70% of companies surveyed** identify water as a substantive business risk

## Global Water Crisis impact upon **US-based Fortune 500 companies:**

**94%** face potential physical challenges  
**69%** face reputational risks

**80%** affects their decisions on where to locate facilities  
**60%** affects business growth and profitability within five years

SOURCES: World Economic Forum  
2013 CDP Water Report

*Bridging Concern with Action: Are US Companies Prepared for Looming Water Challenges?*, Pacific Institute and VOX  
Global 2014 survey of US-based Fortune 500 companies

# Global players setting aggressive goals



By 2020, safely return to communities and nature an amount of water equal to what is used in finished beverages and their production



Cut total water intake by 30% by 2020, compared to 2010 baseline



2015 goal to improve freshwater efficiency by 5%



Intends to cut water use per pound of product by 20% by 2020, compared to a 2008 baseline



Goal to reduce water consumption per guest night by 25% by 2020, 30% in water-stressed areas



Aims to reduce direct water withdrawal per ton of product by 40% by 2015, compared to 2005 baseline



Further reduce water consumption 20 percent per occupied room by 2020 from a 2007 baseline



Committed to “zero-discharge” operations as a critical part of a long-term target to build a resource-saving and no-emission management enterprise



15% improvement in water use by 2015 as compared to 2011



20% reduction in fresh water use by 2015, compared with 2006



2020 target to reduce water intensity by 15% from 2011 levels



Water-use-per-vehicle reduction goal of 30% from 2009 to 2015



# Global Industry Market Drivers

THE IMPORTANCE OF PROPER WATER MANAGEMENT



Proper  
**WATER MANAGEMENT** impacts key  
industry drivers and trends:

**COST REDUCTION**

**PERFORMANCE**

**DISCHARGE COMPLIANCE**

**GLOBAL STANDARDIZATION**

**BRAND ENHANCEMENT**

# SOLVING COMPLEX WATER CHALLENGES

**APCO** **NALCO** Water  
worldwide An Ecolab Company

**ECOLAB**



# A new way to factor water risks into business decisions



## WATER RISK MONETIZER

### **Assess**

water scarcity  
risks at site and/or  
enterprise level

### **Understand**

the full value of  
water to your  
business

### **Calculate**

potential revenue  
at risk

### **Quantify**

water risks in  
financial terms  
that make  
business sense

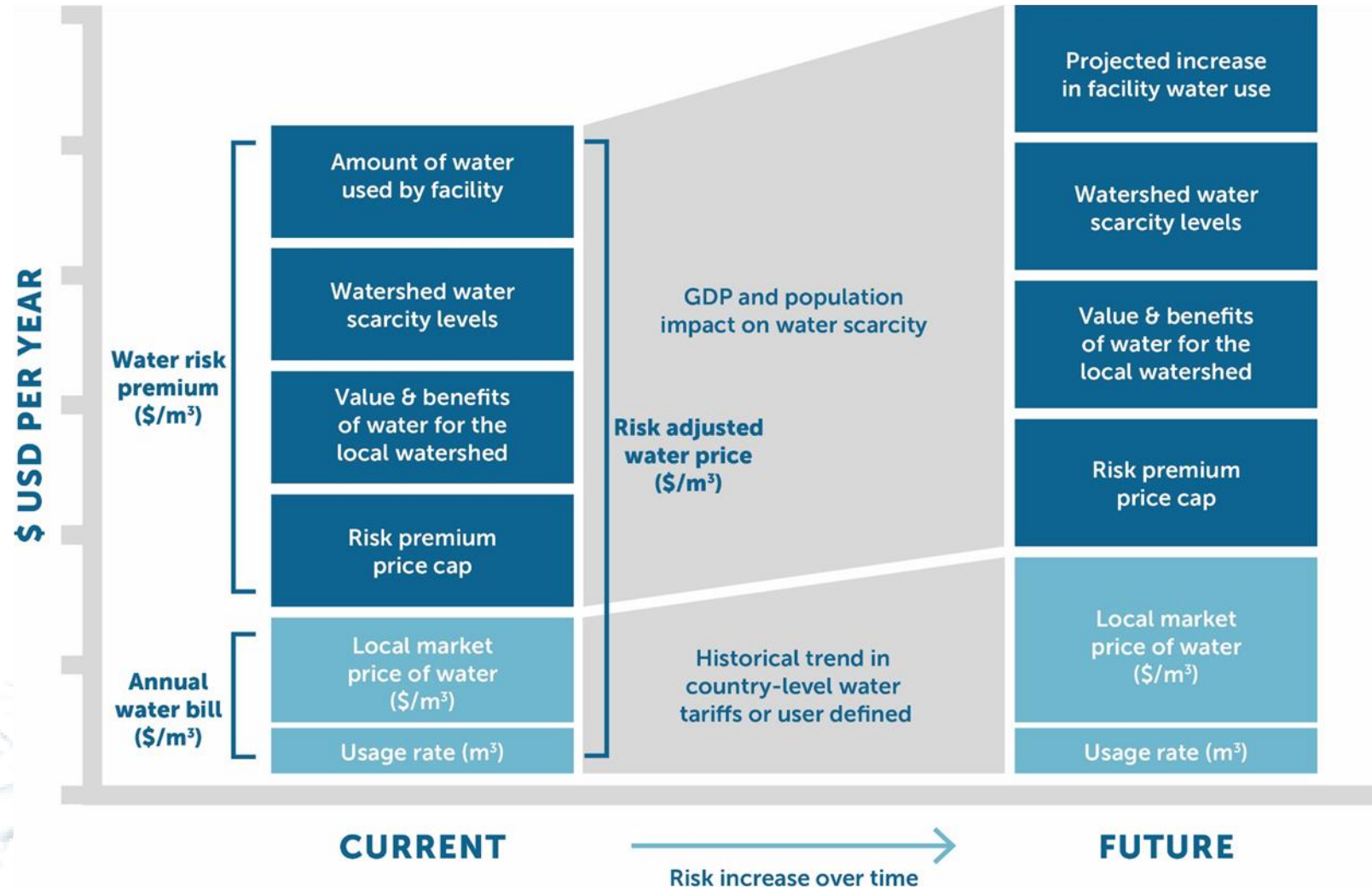
**First-of-its-kind**

**Publicly available**

**No cost**

# Water Risk Monetizer

## CALCULATING THE FULL VALUE OF WATER





**INCORPORATE** a risk-adjusted cost of water and potential revenue loss into analysis

**MAKE THE CASE** for proactive water management strategies

**IDENTIFY** operations/locations at greatest risk

**MONETIZE** rate of return for water management improvement projects

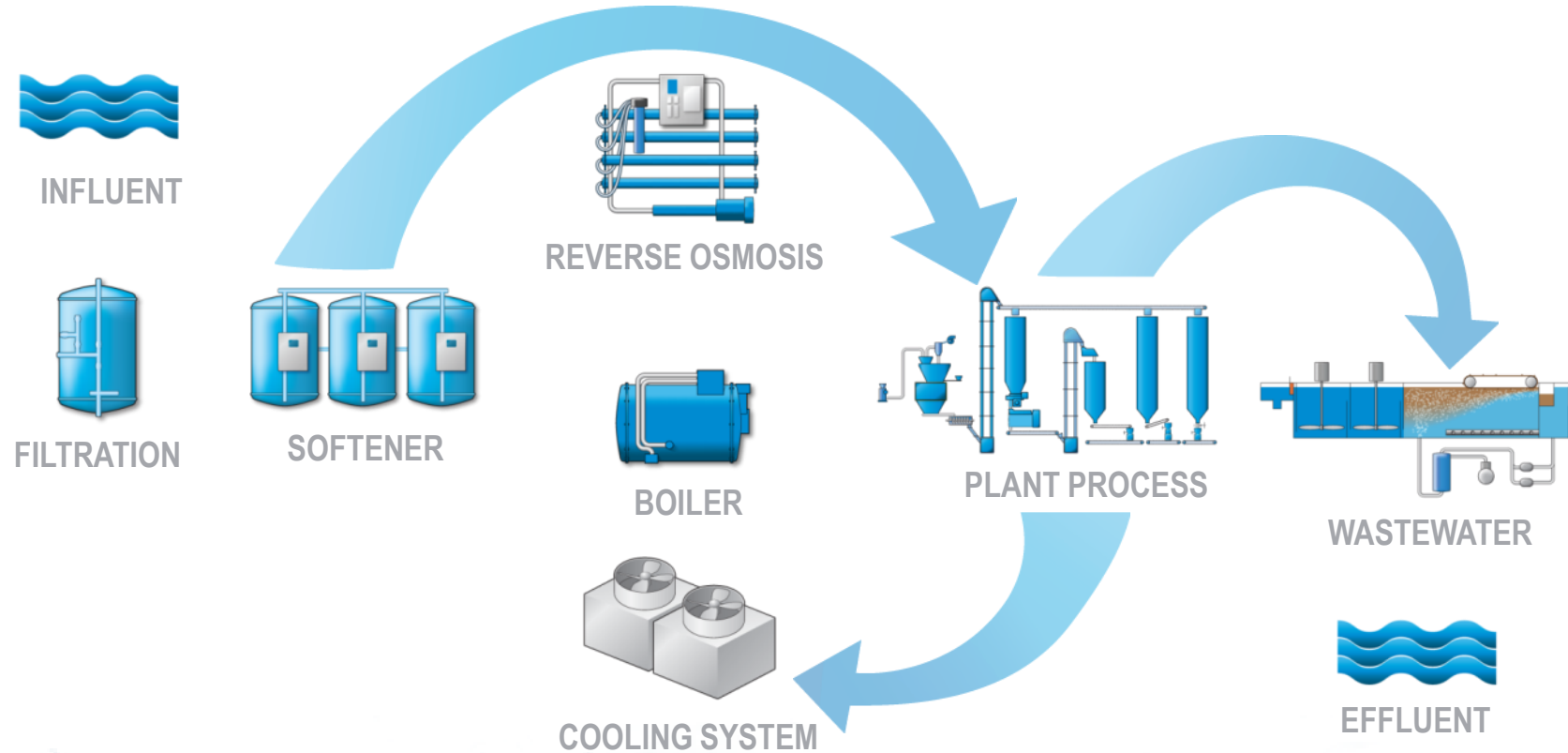
**SELECT** where and how to increase production or meet demand in new regions



[www.WaterRiskMonetizer.com](http://www.WaterRiskMonetizer.com)

# Total Plant Assessment

FROM INFLUENT TO EFFLUENT ACROSS OPERATIONS



**REDUCE | REUSE | RECYCLE**

➤ **Impact Virtually 100% of the Water in a Plant**



# We help facilities do more with less

- **Use less** water, reuse and recycle
- **Increase** operational efficiency
- **Reduce** total cost of operation
- **Protect** and extend asset life
- **Meet** environmental and other regulations
- **Protect** health and safety



**HEATING AND  
COOLING**



**INDUSTRIAL  
PROCESSING**



**WASTEWATER  
TREATMENT**

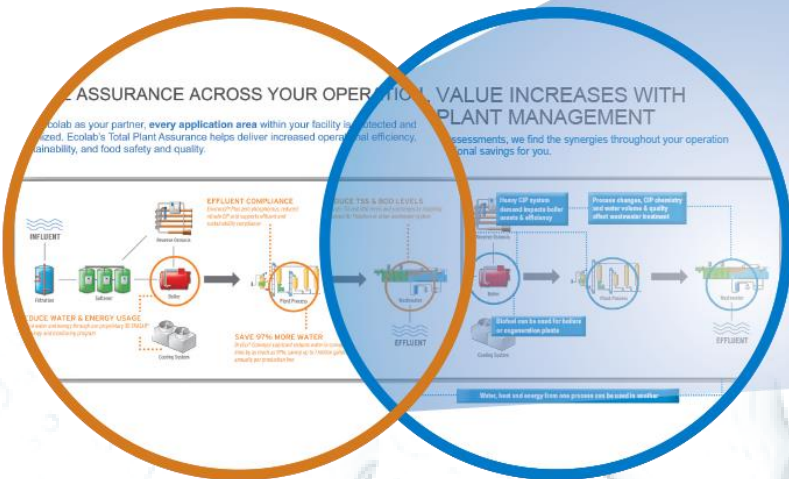


**CLEANING AND  
SANITIZING**

**Ecolab is First in the World to Receive  
Alliance for Water Stewardship Standard Certification**

# Water reduction strategies can uncover huge savings opportunities

**25** Average Number of Opportunities Identified per TPA



Average\*  
**SAVINGS**



69,573,026 gals



660,537 lbs.



52,644 DTH

**TOTAL \$/TPA**  
**\$975,279**

\*TPAs conducted at nearly 200 F&B manufacturing and processing facilities in over 20 countries has provided Ecolab with robust information on industry averages



# Approach

## SINGLE APPLICATION



**REDUCE**  
REDUCE WATER  
CONSUMPTION  
**UP TO 25%**

## BETWEEN APPLICATIONS



**REUSE**  
REDUCE WATER  
CONSUMPTION  
**UP TO 50%**

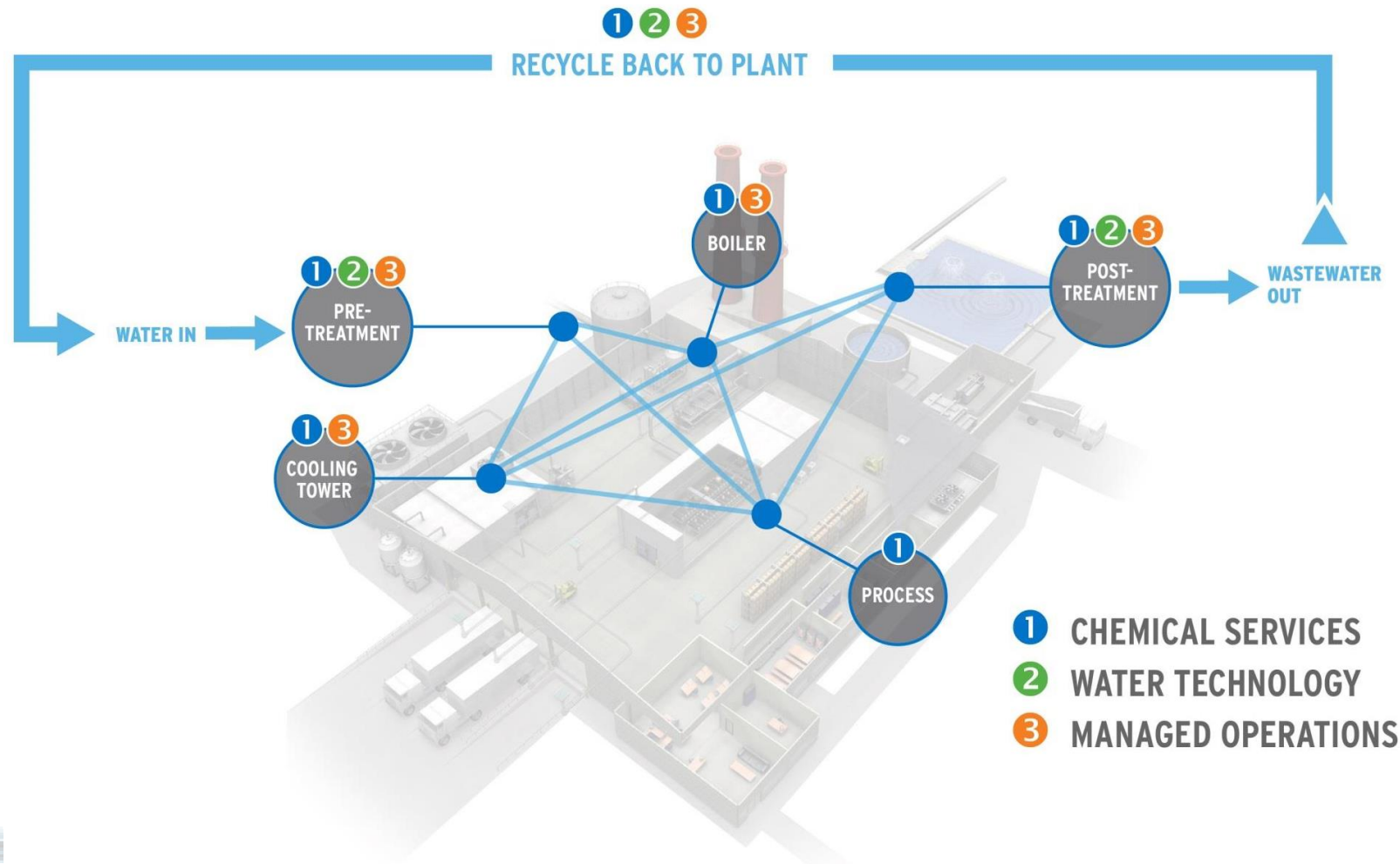
## POST-TREATMENT RECYCLE



**RECYCLE**  
REDUCE WATER  
CONSUMPTION  
**UP TO 100%**

$$R1+R2+R3=ZLD$$

# End to end water solutions





# IMPACT - 250 TPAs – 25 ECONOMIES

**7,100**  
OPPORTUNITIES  
IDENTIFIED  
= **\$235M**

↓ Reduce  
Energy

**10.5M**  
DTH  
**150M**  
KW



↓ Reduce  
Chemical

**\$9.7M**



↓ Reduce  
Water

**15B**  
Gallons



↓ Reduce  
Waste

**132M**  
lbs BOD



↑ Improve  
Productivity\*

**\$25M+**  
**19,119**  
hours



\*Asset protection, production increases, cost avoidances, revenue increases, etc.

CUSTOMER IMPACT  
COUNTER

## APPLICATION

Cooling Water

## TECHNOLOGY

3D TRASAR™ Technology for  
Cooling Water OUR 3D TRASAR™ TECHNOLOGY FOR  
COOLING WATER SAVED**18,533,089,292****18.5 billion**

gallons

of

water

this year

equivalent to the yearly drinking water  
needs of more than**64.1 MILLION PEOPLE**



Case Study

AUTOMOTIVE PLANT –  
GREATER CHINA

# The Nalco Water Integrated Membrane Solution saves water and improves membrane life for Reverse Osmosis system in wastewater recycle application of an automotive plant in China

## CUSTOMER IMPACT



## ECONOMIC RESULTS

Improved the water quality and reduced fresh water intake by 38,400 m<sup>3</sup> per year



Saving US\$ 37,911 per year

Extended membrane life and reduced maintenance time and cost.



Saving US\$ 4,777 from membrane cleaning per year

*eROI is our exponential value: the combined outcomes of improved performance, operational efficiency and sustainable impact delivered through our services and programs.*



Case Study  
POWER PLANT –INDONESIA

# Nalco Water Chemical Management Services saves more than US\$ 250,000 in Total Cost of Operations for a Major Coal-Fired Power Plant in Indonesia

## ENVIRONMENTAL INDICATORS



## ECONOMIC RESULTS

Reduced cleaning frequency by 75% from 4 times per year to once per year



Reducing the total SWRO consumable part cost by 77%, US\$ 150,310

Reduced membrane replacement frequency by extending operation lifespan from 3 years to 10 years



Reduced chemical consumption by 33,840 kgs

Reducing chemical cost by 2.3%, US\$ 3,800 per year

Reduced wastewater discharge volume by 120m3 due to lower cleaning frequency

Saving wastewater treatment cost by US\$ 25,000 per year

*eROI is our exponential value: the combined outcomes of improved performance, operational efficiency and sustainable impact delivered through our services and programs.*



# PRODUCTION & MANUFACTURING

UNILEVER – NORTH AMERICA



- Installation of more than 50 **3D TRASAR® Technology** units worldwide will help Unilever factories monitor water use across cooling water, boilers, membranes and dissolved air flotation (DAF) unit operations
- Projected savings of more than 150,000 cubic meters of water year-over-year

“At our Henderson, Nevada, plant that produces Breyer’s ice cream, we have seen a 39 percent decrease in water use in three of our cooling towers. As a result, **our facility won a Water Hero Award by the Water Conservation Coalition.** We have made significant reductions to the total volume of water extracted for use since 1995 and **partners like Ecolab help us deliver even more water savings.**”

*- Neal Saiz, Safety, Health & Environment Director, North America*



“The world’s water company addressing the  
world’s water challenges”

through

# **TOTAL WATER MANAGEMENT**

Thank you





The background of the slide features a pattern of light blue, wavy, vertical lines on a darker blue background. A horizontal white band runs across the center of the slide, containing the text.

**BACKUP SLIDES**



Ecolab is the global leader in water, hygiene and energy technologies and services; providing and protecting what is vital: clean water, safe food, abundant energy and healthy environments.

- Founded in 1923
- Headquartered in St. Paul, Minnesota
- Fortune 500 company
- 47,000 employees
- Serving customers in more than 1 million locations in 171 countries
- \$14 billion in annual sales

**NALCO** Water  
An Ecolab Company

Nalco Water is the global division of Ecolab dedicated to help institutional, industrial and water process customers meet business objectives that are impacted by water and other vital resource constraints.

Ecolab By the Numbers

\$14 BILLION ANNUAL SALES

**47,000**  
ASSOCIATES

1.3 MILLION  
CUSTOMERS

IN 171 COUNTRIES

> \$30 Billion  
Market Cap

6,900 Patents



"World's Most Innovative  
Companies"



"Best Companies to Sell  
For"

# Increased Attention on Water Needed to Produce Everyday Products

**2k** Gallons of Water =



**450** Gallons of Water =



**55** Gallons of Water =



**700** Gallons of Water =



**167** =  
Gallons of Water



**39,090** =  
Gallons of Water





ECOLAB

## SITE MANAGEMENT

City Power Site  
REACHED: 14:00

87%

Goal: 85% (+2.55%)

Fabrikam Site  
WARNING: 14:00

76%

Goal: 85% -70%

Contoso Site  
WARNING: 11:30

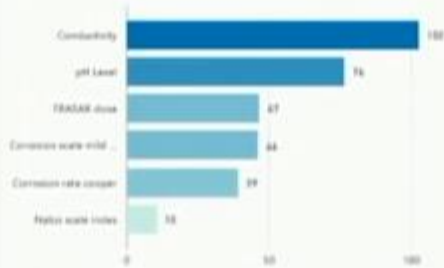
75%

Goal: 85% -70%

Northwind Site  
NO ISSUES DETECTED

18%

Goal: 85% (+76.82%)

System Monitoring Last 24 hours  
CORE CHEMICAL METRICSWater Consumption  
OVERALL USAGE VS TARGETWater Saving vs. Target  
HYD

84%

## PERFORMANCE

Total Performance  
LAST HOURDaily Water Consumers  
BY CUSTOMER SEGMENTCustomer Sentiment by Country  
QUARTERLY SURVEY FEEDBACK

## RETAIL

Revenue  
LAST 4 MONTHS

\$46,772

Goal: \$76,169 (+64.1%)

Margin  
LAST 4 MONTHS

8.4%

Goal: 8% (+5%)

Revenue by Region  
\$K OVER LAST 4 MONTHSTop Customers  
SAVINGS OVER LAST 4 MONTHS

## OPERATIONS

Device Distribution and Status  
FOR U.S. ACCOUNTSLegionella Results by SBU/SINC  
LATEST TESTNumber of Sites  
LAST 4 MONTHS

340

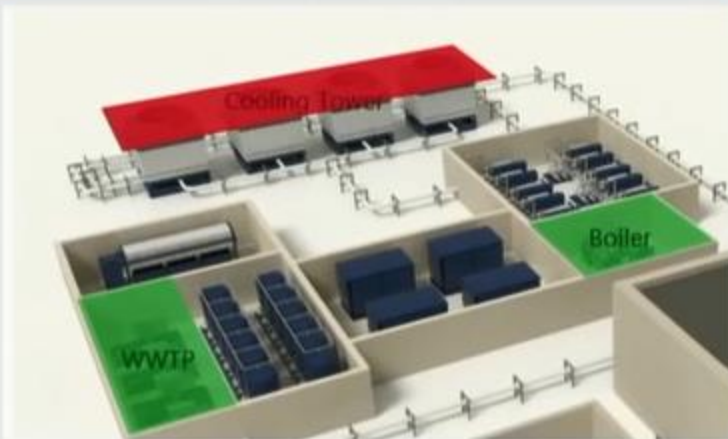
Efficiency  
OVERALL IMPROVEMENT

83%

## RESULTS - Added value

## Real-time eROI Analysis Combined

Savings Delivered, Annual	Program Cost	eROI
\$223.54	\$315.85	70.77%



18.18K

CvP Water Savings (gal)

3.54K

CvP Energy Savings (GJ)

8240

CvP Waste Savings (gal)

\$61.71

CvP Water Savings Value (\$)

\$141.78

CvP Energy Savings Value (\$)

\$20.05

CvP Waste Savings Value (\$)

Thursday, July 7, 2016

Friday, July 8, 2016

Saturday, July 9, 2016

Sunday, July 10, 2016

Cumulative

Point in Time



## Your eROI Value Snapshot



### CLIENT SITE

City Power  
New Orleans, LA

### TREATMENT PROGRAM

All Programs

Delivered Annual Program Cost **\$403.89K**

### RESULTS – Added Value

Delivered eROI

**130.53%**

Delivered Program Savings

**\$527.20K**



Saved **water**



**\$112.62K**

6.31M gal



Saved **energy**



**\$233.01K**

533.33M GJ



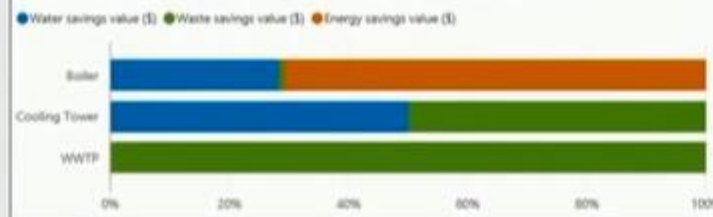
Reduced **waste**



**\$181.57K**

245.21K gal

Water savings value (\$), Waste savings value (\$) and Energy savings value (\$) by Asset Type



Water Savings (gal), Waste savings (gal) and Energy savings (GJ) by Asset Type

