SUSTAINABLE DEVELOPMENT GOALS

Prepared for the Embassy of
the Republic of Slovenia

Genesis Systems®

Introduction

Water at the Edge™

Mission

Solve global water scarcity with sustainable green technologies while providing un-matched products and value to humanity

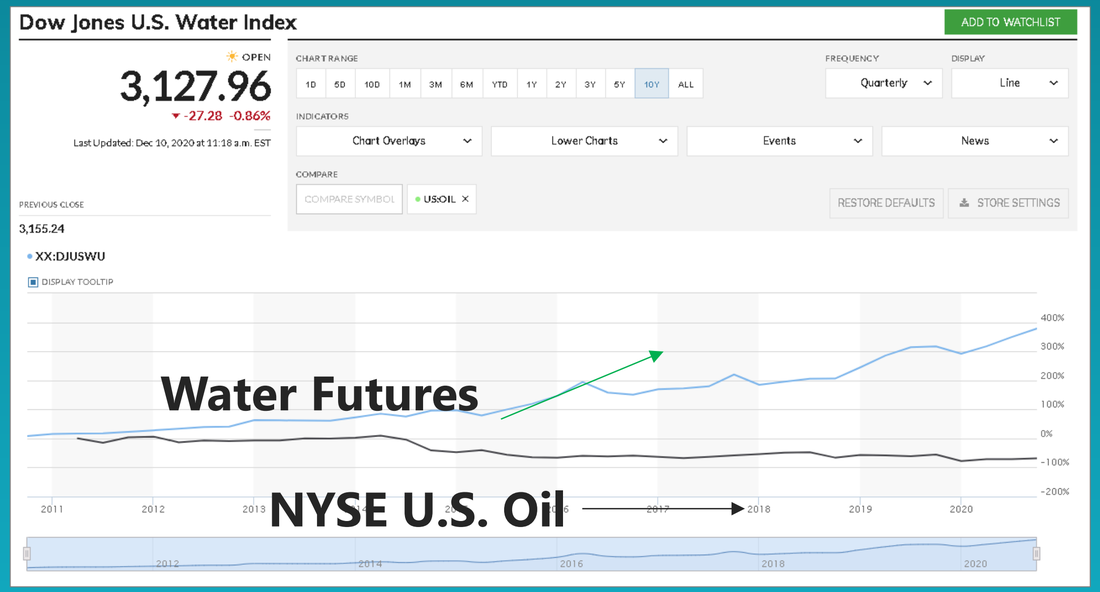
Like hundreds of US & international communities, Cape Town's Theewaterskloof Reservoir is dry (AP photo)

Overview

- Mission
- At-a-glance
- Team
- The Big Idea
- *NextGen* Water
- Competition
- Value of Water Markets
- Customer Segments (case studies)
  - Real Property
  - Commercial
  - Defense
  - Agriculture
- Initial Market Approach

Water as an asset class… will eventually become **the single most important physical commodity** dwarfing oil, copper, agricultural commodities, and precious metals.

– Willem Buiter, Chief Economist
Citigroup



US Water Futures launches on the Dow Jones, December 2020

At-a-glance

Momentum

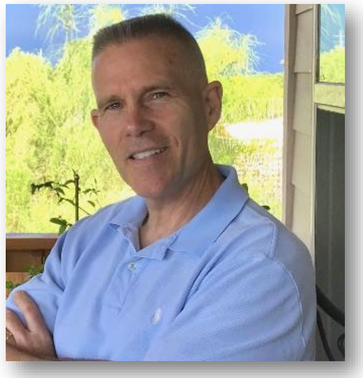
Busines	Product/Tech	Market
Partner w/US' Largest Infrastructure Builder	4 prototypes	awards: DoD SBIR, xTech 2020/2021, KC's Most Investable Pepperdine U Most Fundable USAF Challenge 2021
global team	10 patents; pending; trade secrets	706 addressable markets
zero debt	>90,000 hrs engineering	21 nations pulling

Partners/Allies

Executive Team

CEO & Co-Founder

Shannon Stuckenberg



CGO & President

Steve Kwast, Lt Gen (Ret)

COO & Co-Founder

Dr. David Stuckenberg

CTO

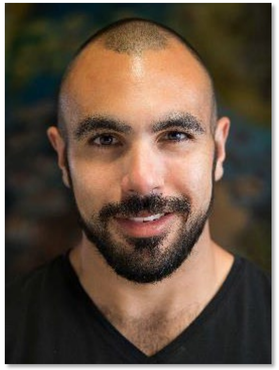
Erick Went

Directors and Advisors

Mr. Frank X. "Frazier" Henke

Mrs. Joni Kwast

David A. Deptula, Lt Gen (Ret)



Jordan Noone

Mr. Chad Hennings

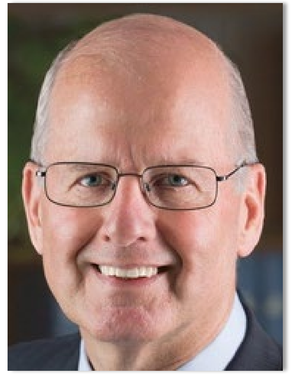
Dr. Nigel Cameron

Governor Matt Blunt

Mr. John “Phil” Sumrall

Ambassador R. James Woolsey

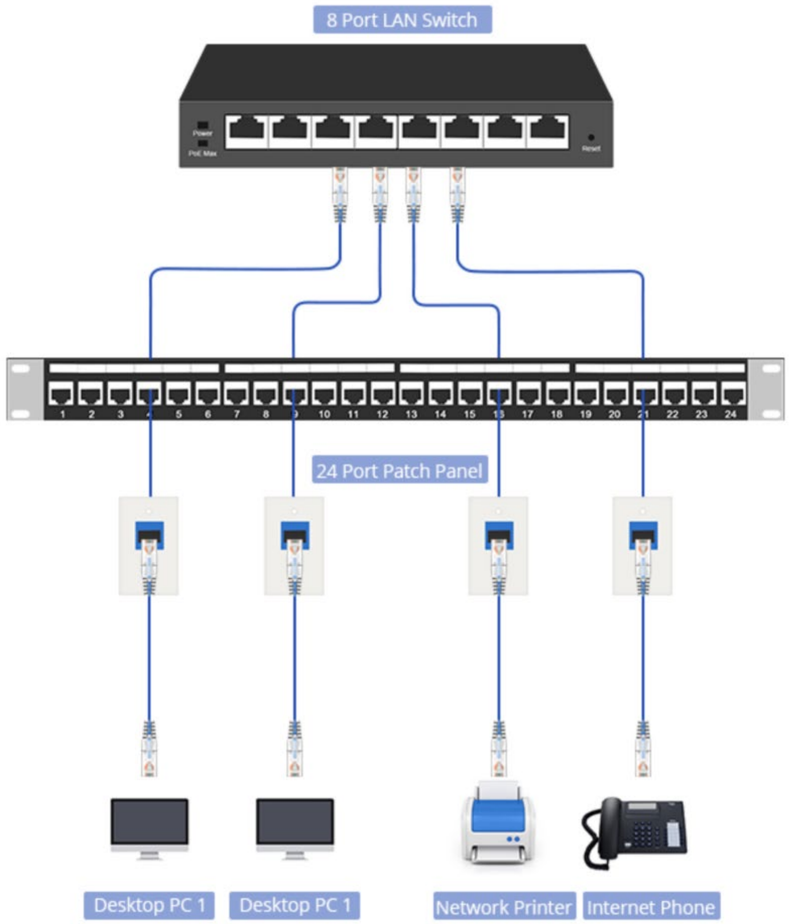
Mr. Martin Ford



Norbert Ryan, Jr., Vice Admiral (Ret)

The Big Idea

Remember when **internet went wireless?**



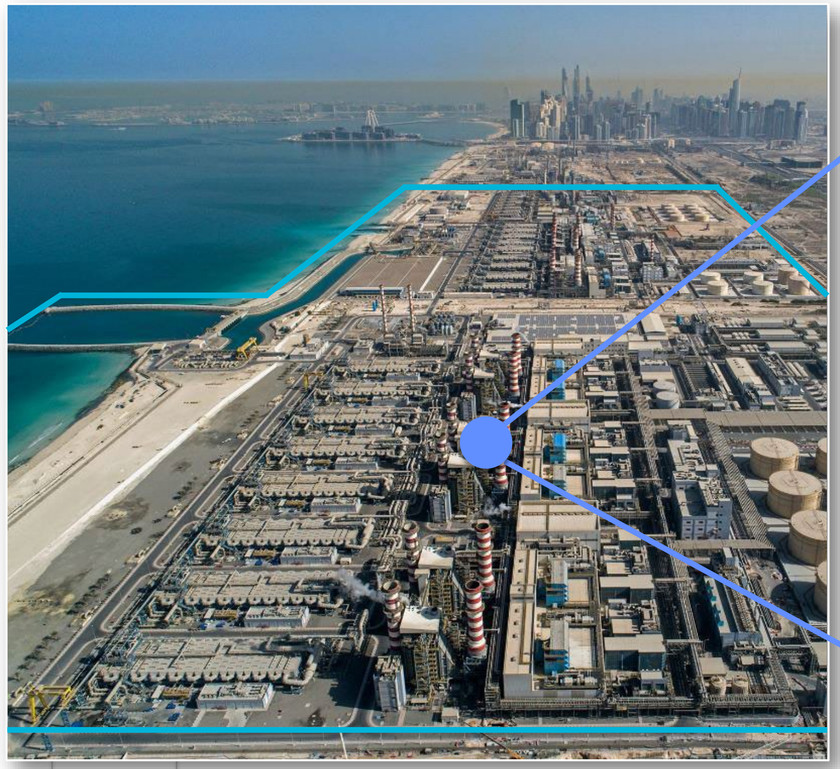
The Big Idea

Genesis will bring “water at the edge”™

Legacy Water Infrastructure

Transforming water from complex, centralized, capital heavy, and exhaustible models is a global imperative

Desalinization Plant Cap Ex: **$114M – $3.6B***



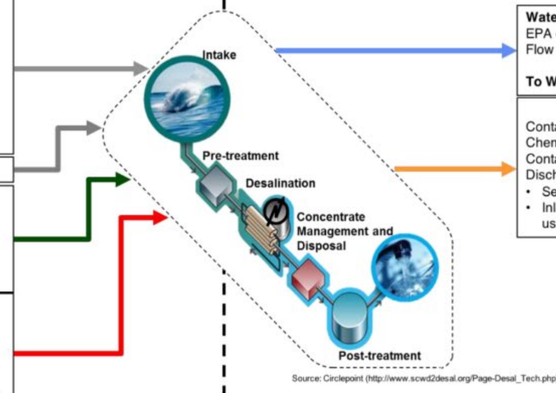
Whole System Economic and Operational Characteristics							
Fixed cost ($)	Construction	Siting	Permitting	Land Use	Equipment	Construction time	
Variable cost ($)	Labor	Chemicals	Maintenance	Parts	Disposal		
Energy cost ($)	Electricity	Natural gas	Steam				
Operational characteristics	Water quality	Flow rates (m^3/day)	Temperature (°C)	Pressure (kPa)	Energy (kWh)	Chemicals	Brine (m^3/day)
	System lifetime	Modulation capability	Operation when under loaded	Capacity Factor	Availability (hours/year)	Operability with other components	Water recovery (%)

Water In
Salinity/TDS (ppm)
TOC (ppm)
TSS (ppm)
pH
Marine life
Required flow rate (m^3/day)
Temperature (°C)
Pressure (kPa)
Distance to plant (km)

Non-potable water for dilution

Chemicals Used/Added
- Pretreatment chemicals (ppm)
- Disinfection (ppm)
- Re-mineralization (ppm)
- Adjustment for taste
- Cleaning chemicals (ppm)

Energy Intensity
(Energy/Volume of water produced ($kWh_{T,equiv}/m^3$))
- Electricity (kWh_e/m^3)
- Equivalent electrical energy for:
  - Direct heat ($kWh_{e,equiv}/m^3$)
  - External waste heat ($kWh_{e,equiv}/m^3$)
- Temperature of the direct or external waste heat (°C)



Water Out
EPA drinking water requirements
Flow rate (m^3/day)

To Water Storage

To Discharge
Contaminant concentration (ppm)
Chemicals (ppm)
Contaminant type
Discharge location
- Seawater: surface, subsurface ocean discharge.
- Inland brackish water: rivers, evaporation ponds, land use, injection, Zero Liquid Discharge

Whole System Environmental Considerations	
Emission intensity (tCO_2/m^3)	• CO_2 emissions (tCO_2/m^3 of freshwater produced)
Other	• Marine life • Concentrate disposal • Consumables disposal and chemical use/disposal • Electric grid impact • Water system integration • Co-location with power generators

*Source: Pacific Institute: https://pacinst.org/wp-content/uploads/2012/11/financing_final_report3.pdf

NextGen Water

A fresh approach to water technologies…

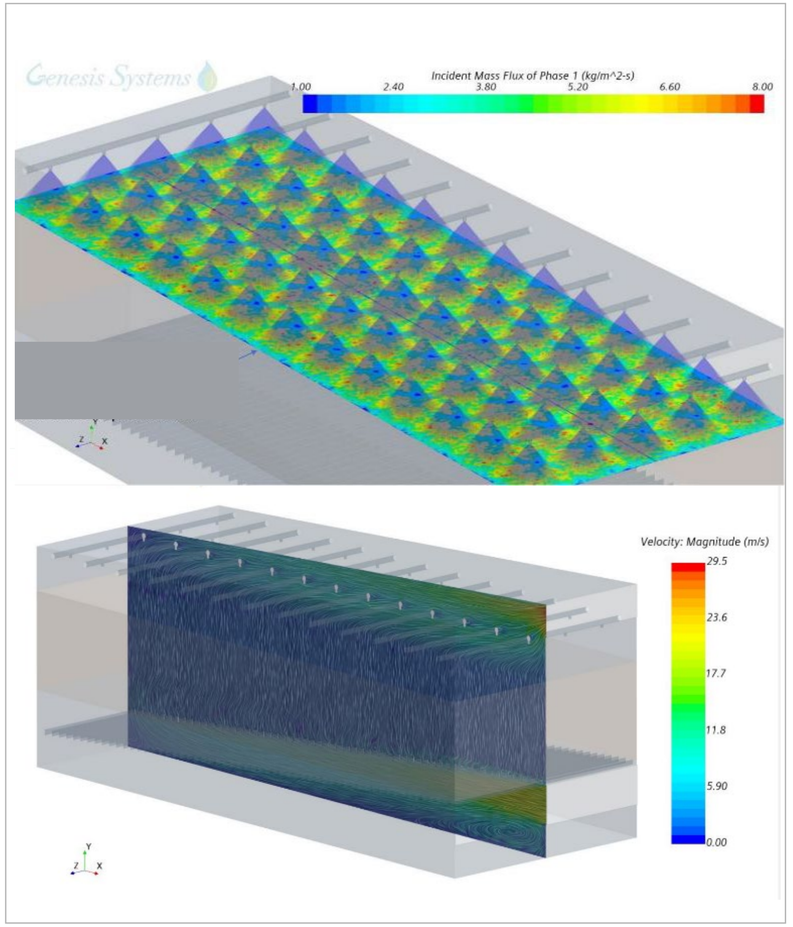
civil

nano materials

aerospace

process

fluid dynamics



by merging key science & engineering fields **our breakthroughs are propelling water industry transformation**

Our Feedstock

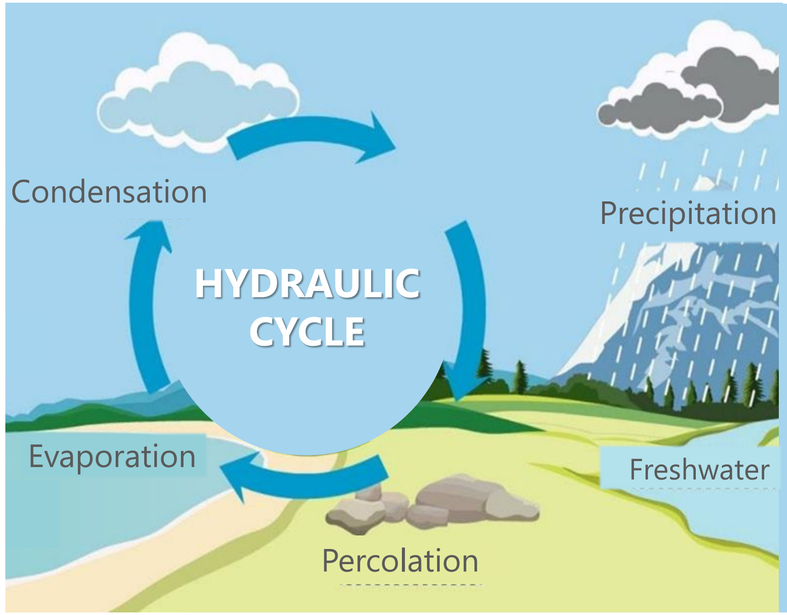
37.5 Million Billion Gallons

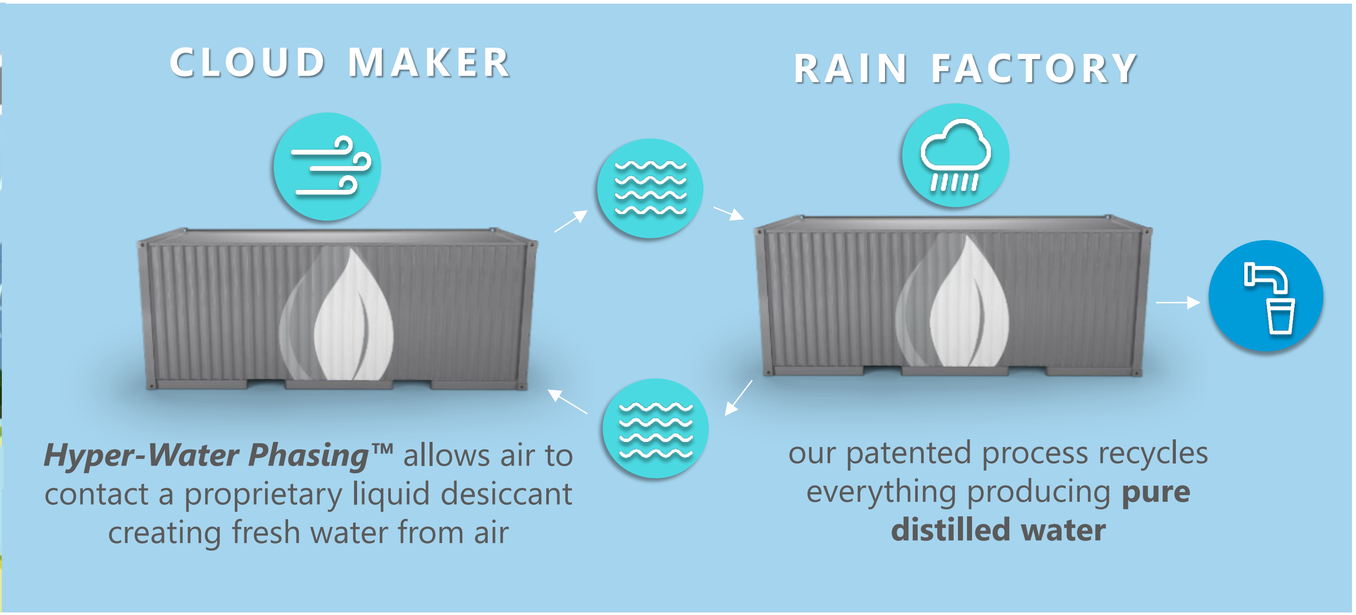
...water available in the atmosphere everyday

NOAA

NextGen Water

The ***Hydraulic Cycle*** is clean and sustainable



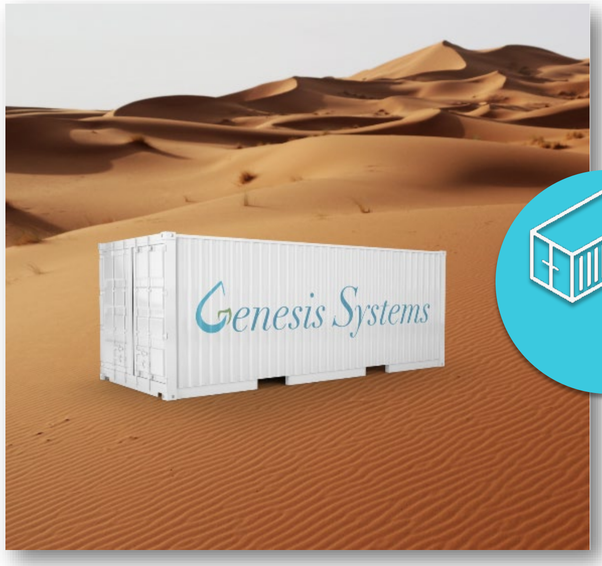


using nature's perfection (biomimicry), we create sustainable and scalable water almost everywhere

NextGen Water

Genesis provides ***water at the edge***™ - elegant, sustainable, economical, and green water solutions

1,000 to **100,000** gallons/day

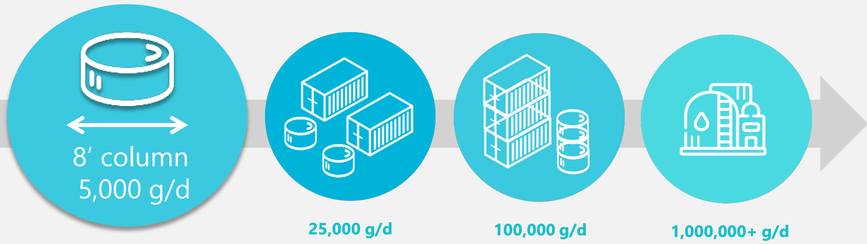


- Infrastructure: Portable
- Energy Source: Agnostic
- Consumables: None
- Water: Point of Need

100,000 to **1,000,000** gallons/day

- Infrastructure: Fixed
- Energy Source: Agnostic
- Consumables: None
- Water: Point of need

Genesis was created to **scale up**



Competition

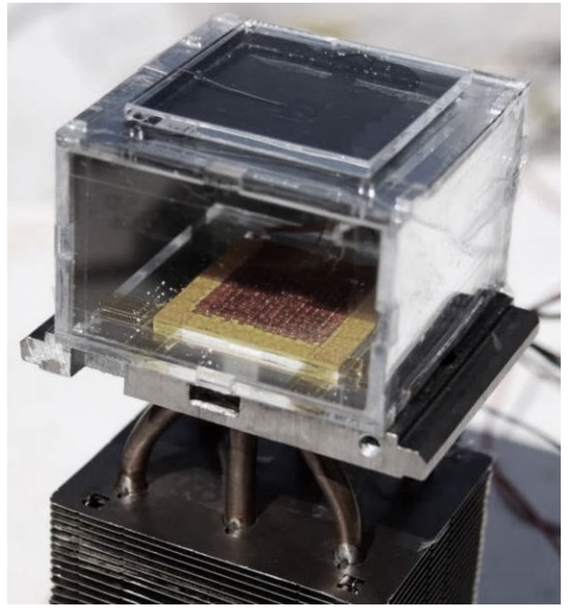
Genesis scales up better than any tech, at a lower cost…

Rain Catcher

Air Conditioning

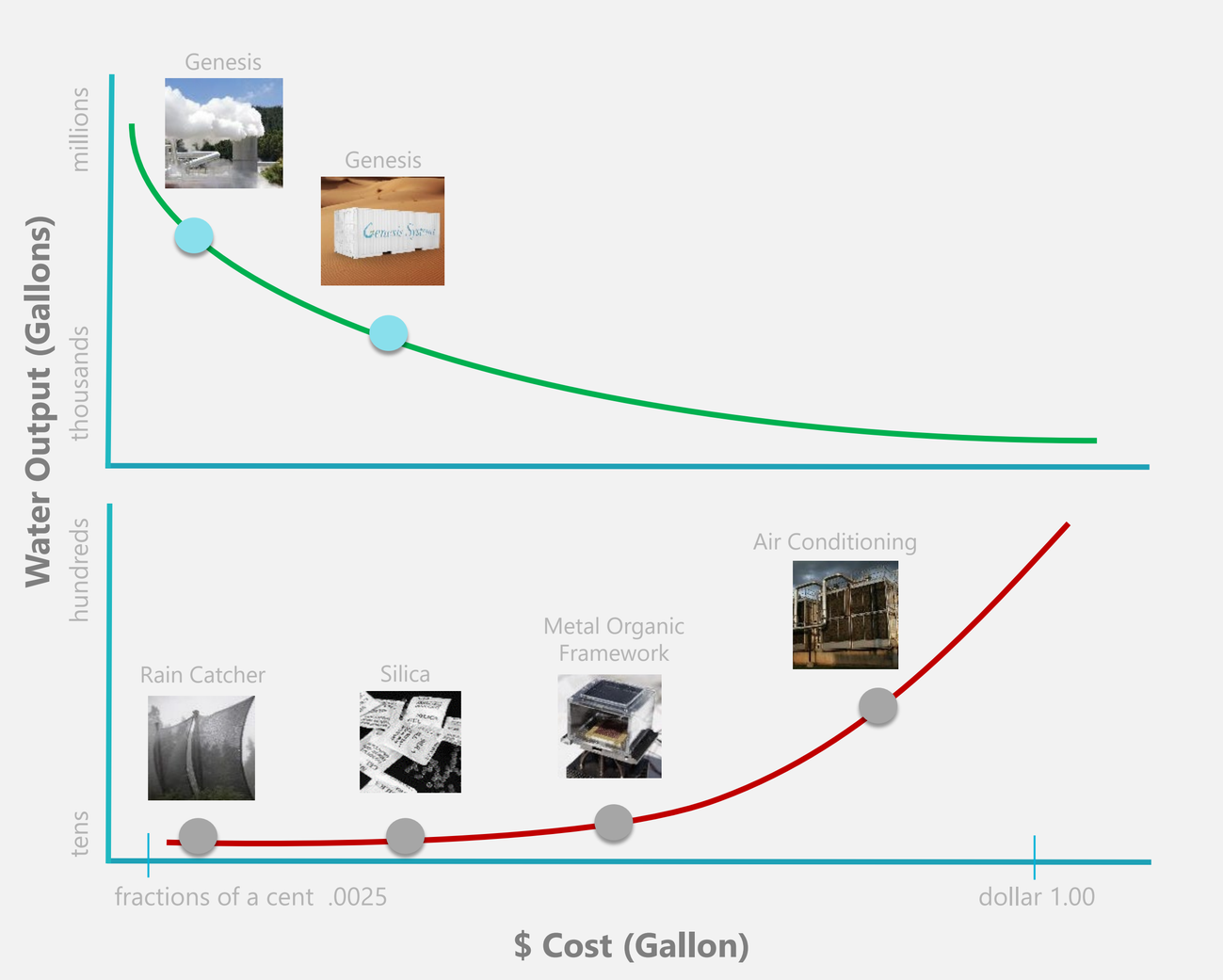
Crystal Desiccant

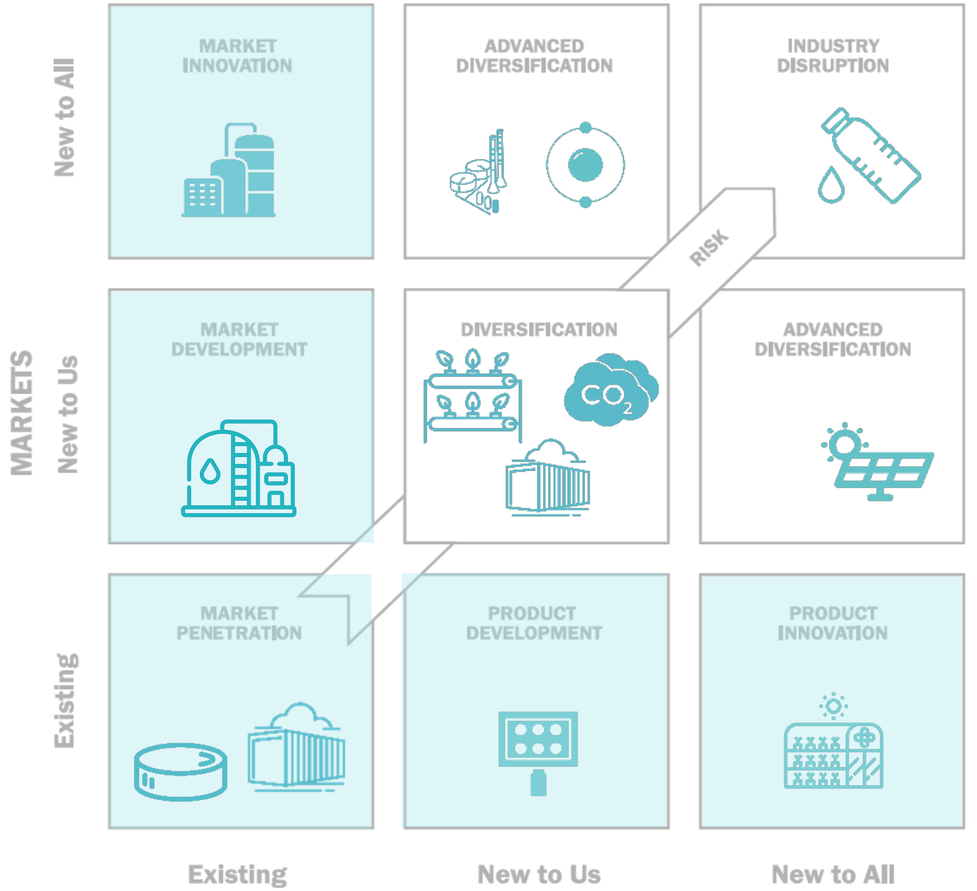
Metal Organic Framework



Competition

Genesis shatters volume limits & reverses cost curves





Un-matched technical supremacy puts Genesis in a field of its own as a global water technology leader

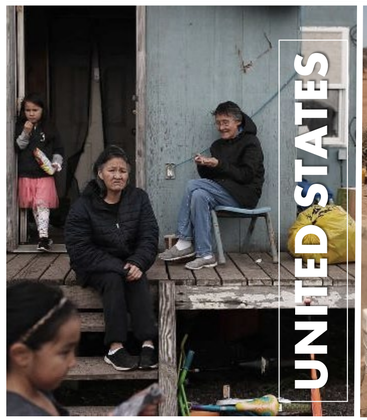
Advantage
Slight Advantage
Disadvantage

	WATER (GALLONS)	SCALABLE	CONSUMABLES	HUMIDITY (LOWER = BEST)	COMPLEXITY	PORTABILITY	OPERATIONS AREA	COST IN THOUSANDS $	HARDENED/RESILIENT	GREEN/SUSTAINABLE	
LIQUID SYSTEM											
Genesis Systems	**>1000-no upper limit**	**Yes**	**No**	**18% and above**	**Low**	**Yes**	**Any**	**500***	**Yes**	**Yes**	• **Water cost competitive with desalinization** • **90% capital cost savings** • **Largest global operations area** • **No requirement for water source/*may be protected from EMS threats**
AIR CONDITIONERS & DEHUMIDIFIERS											
Zero Mass (Source)	1.5	No	No	10% and above	Low	No	Local	2.5M	No	Yes	• Household Units (Solar Panel + Dehumidifier)
WaterGen	300	No	Yes	25% and above	High	Yes	Local	3.7M	No	No	• Claims most efficient water with *air conditioning* technology
Any Vendor	1,000<	No	Yes	80% and above	High	Yes	Local	3.0-5.0M	No	No	• Almost all vendors globally use air conditioning to chill a volume of air to the dew point. • Thermodynamically chilling air is inefficient • Slight improvement over circa 1904 technology
METAL ORGANIC FRAMEWORKS (ZEOLITES, ALUMINUM, ETC.)											
Any Laboratory	Theoretical	No	No	28% and above	High	No	Any	3.15M	N/A	No	• Documented 300'000+ MOF structures in the Cambridge Structural Database • May absorb up to 90% of weight in water • 20 tons of MOF needed to generate 5,000 GPD • No equipment currently available to generate this volume with a MOF
RAIN NETS											
Any Vendor	Limited	No	No	90% or more	High	No	High-elevations	450	Yes	Yes	• 300 rain nets of 40 sq meters each (129,000 sq/feet) needed to generate 5,000 GPD
SILICA DESICCANTS											
Silica gel is an amorphous form of silica (SiO_2 xH_2O)	Theoretical	No	Yes	10% or more	High	Yes	Any	1.25M	No	No	• 62 tons of silica needed to generate 5,000 GPD • No equipment currently available to generate this volume with silica desiccants

Cost baseline is 5,000 GPD. Dollars USD. Compiled from multiple sources 2020.

SUSTAINABLE DEVELOPMENT GOALS

…a platform for civilization, Genesis supports 11 of 17 UN Sustainable Development Goals



Value of Water

Depleting water

2.1 billion without access to safe water

Lack of access

50% of people living in stressed areas by 2025

Inadequate Alternatives

Desalination – restricted to coastal areas

2020 Top Global Economy Risks – World Economic Forum

2016	2017	2018	2019	2020
Climate Action Failure	Weapons of Mass Destruction	Weapons of Mass Destruction	Weapons of Mass Destruction	Climate Action Failure
Weapons of Mass Destruction	Extreme Weather	Extreme Weather	Climate Action Failure	Weapons of Mass Destruction
Water Crisis	**Water Crisis**	Natural Disasters	Extreme Weather	Biodiversity Loss
Involuntary Migration	Natural Disasters	Climate Action Failure	**Water Crisis**	Extreme Weather
Energy Price Shock	Climate Action Failure	**Water Crisis**	Natural Disasters	**Water Crisis**

Economic **Environmental** **Geopolitical** **Societal**

Value of Water

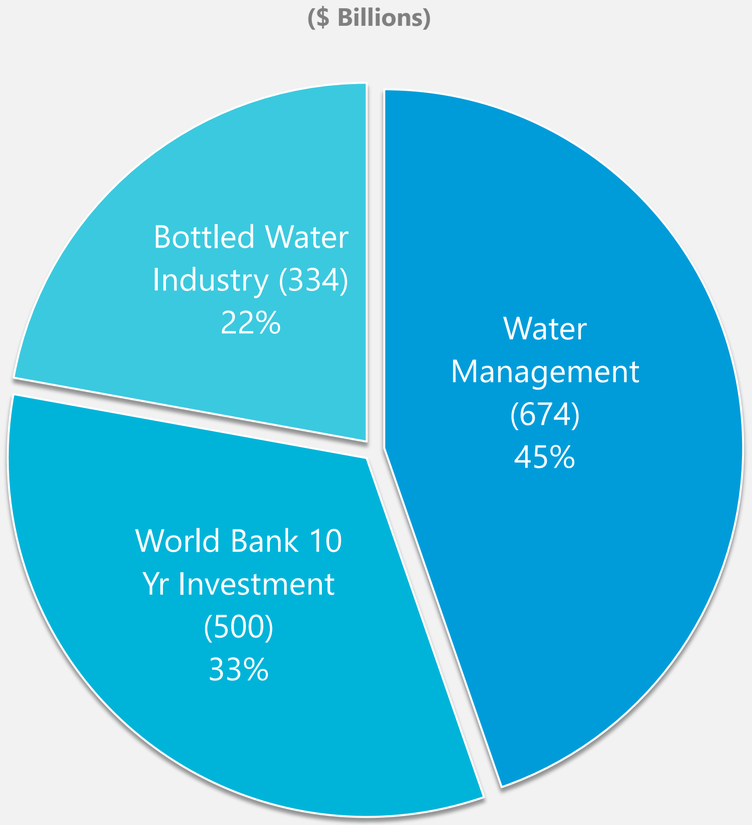
When the well runs dry, you will know the worth of water.

- Benjamin Franklin

#1

Customer Feedback

High Need
&
High Demand



Bulk/bottled water, water management*, and WBG** grants represent **only three sectors totaling more than $1.5T; total addressable sectors 706.**

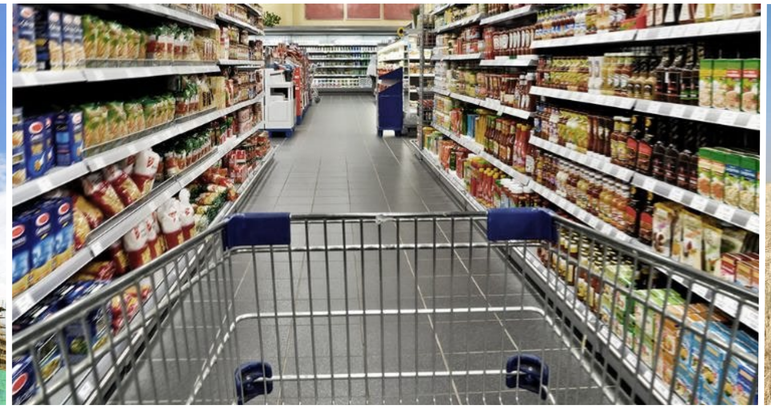
***Services 60 %, Equipment 26 %, Chemicals 2 %, Others 12 %. Estimate $41B water generation market. Source: Helmut Kaiser Consultancy 2016-2026**

******Public drinking water supply has grown at an average annual rate of 9% and high investment in this field is expected. The World Bank has granted an investment of over $450BN for the next 10 years. Source: Artemis, Allison Kopf, May 19, 2019

Value of Water

…everything is produced with water (Gallons to Produce)

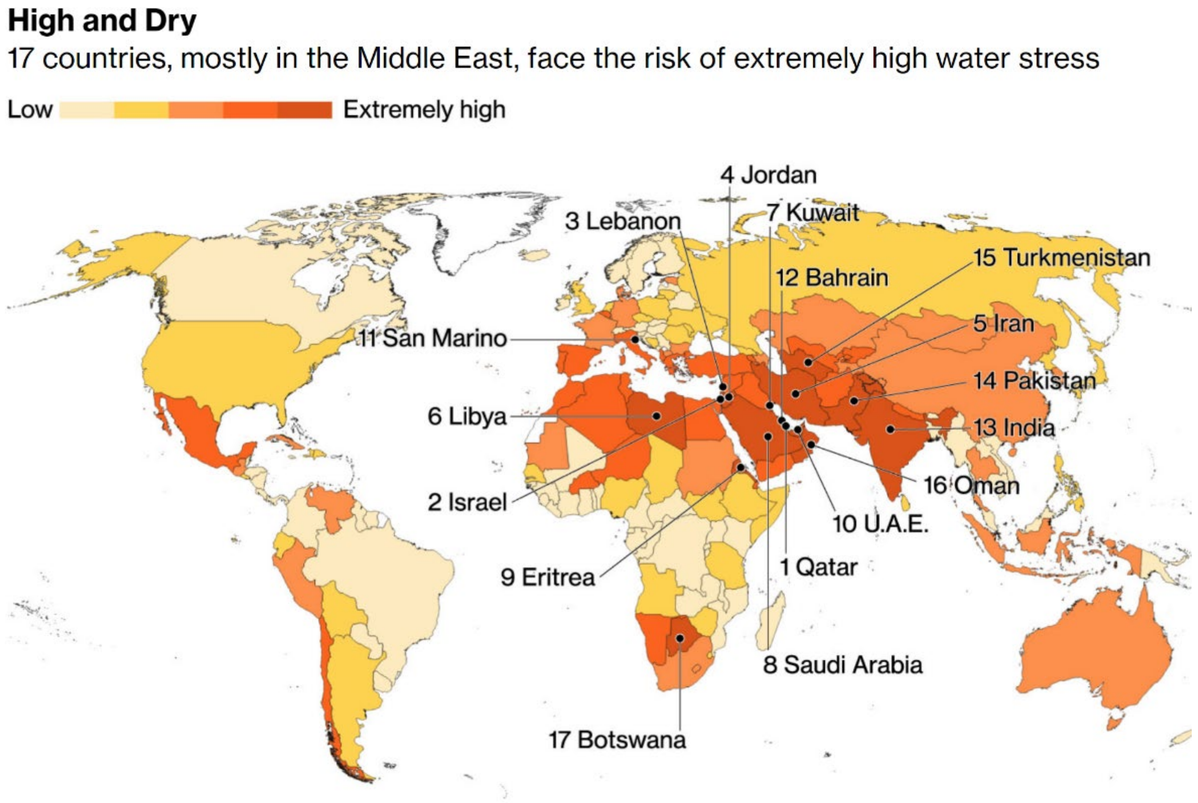
650	3,190	17,832	460	180/Day

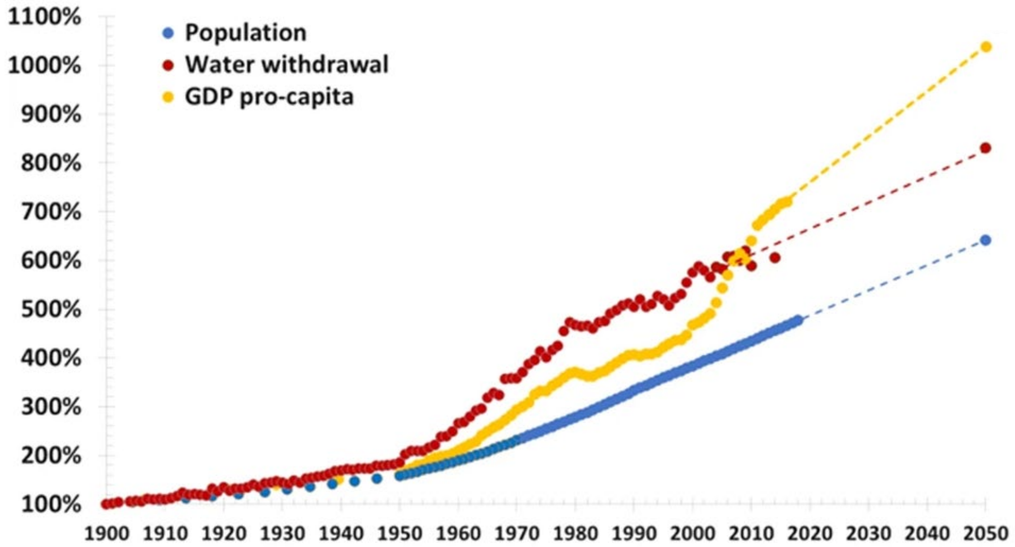
supply constraints are impacting sovereign GDPs in the billions and the crisis is deepening

Value of Water

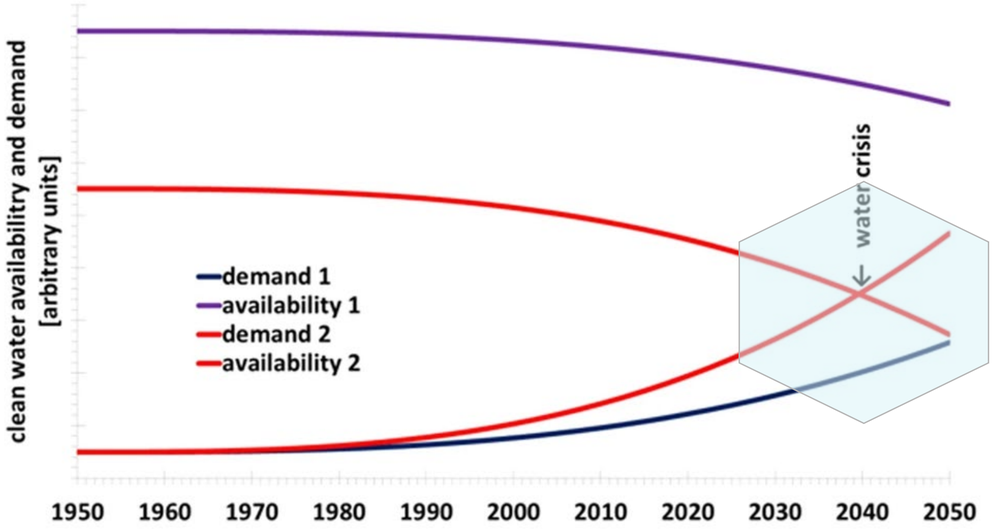
1.8 Billion People in Water Scarcity



Note: Data on water withdrawal, available water and groundwater are used to calculate baseline water stress.
Source: World Resources Institute's Aqueduct Water Risk Atlas



Source: Springer Nature Limited:: https://www.nature.com/articles/s41545-019-0039-9/figures/1

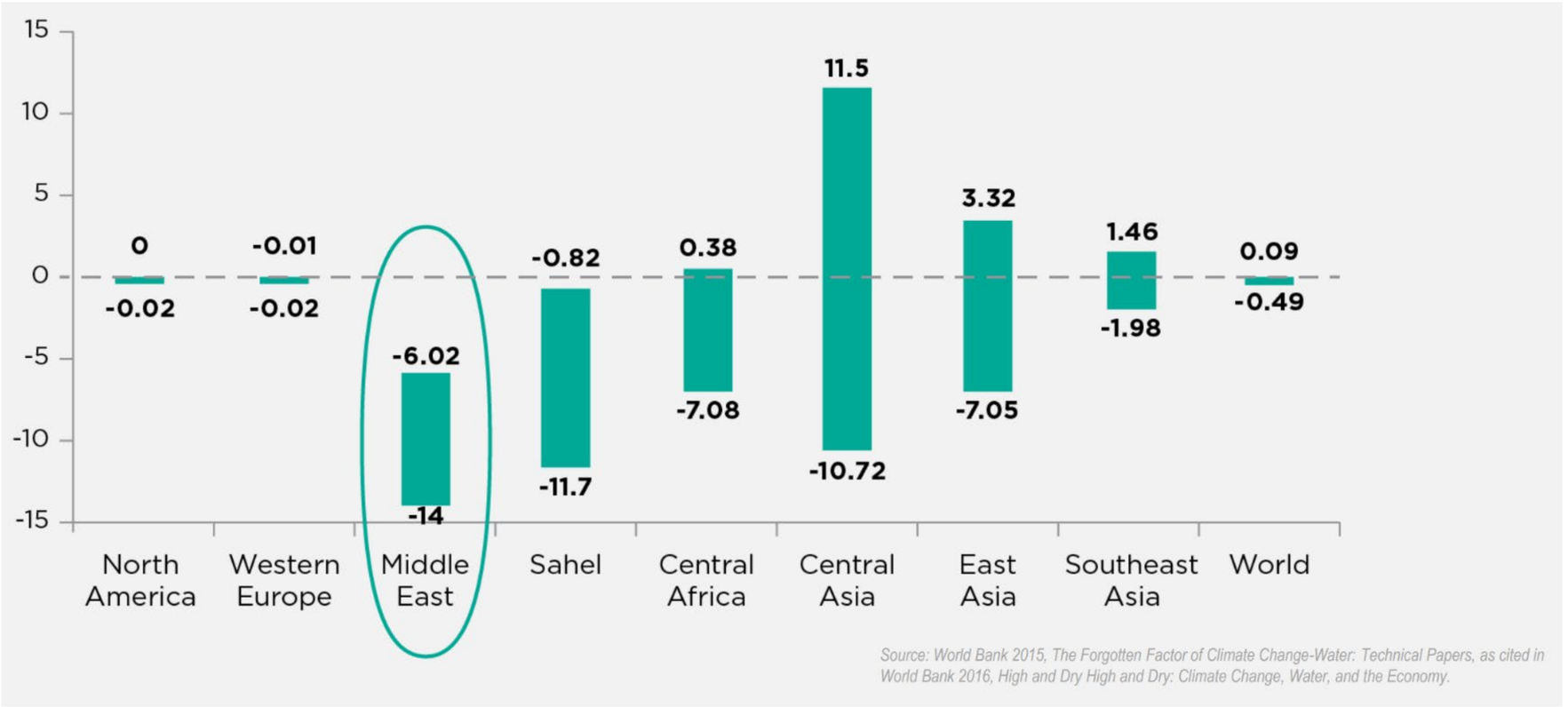


Source: Springer Nature Limited:: https://www.nature.com/articles/s41545-019-0039-9/figures/1

Value of Water

GDP risks by region due to impact of water scarcity

Range of variation in GDP (%)

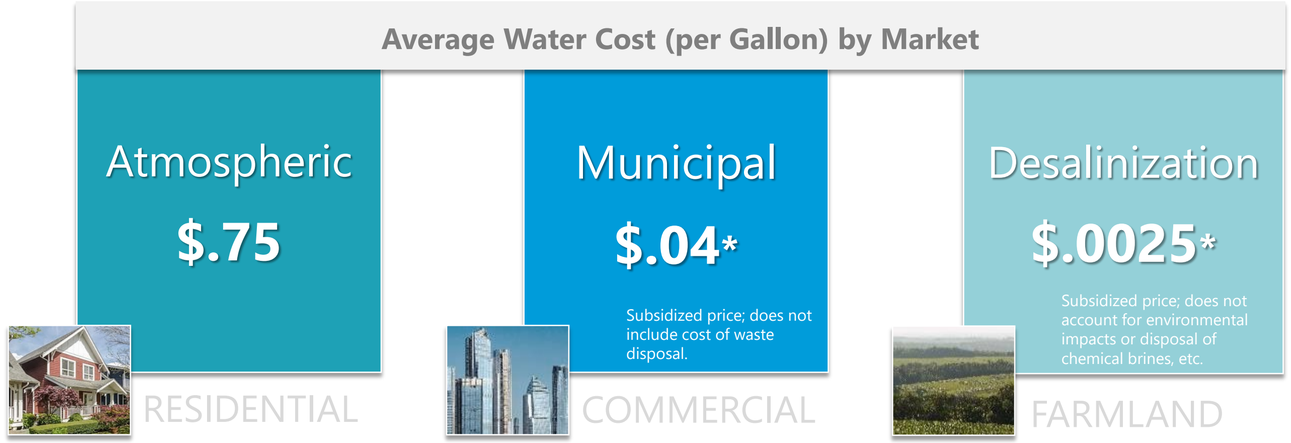


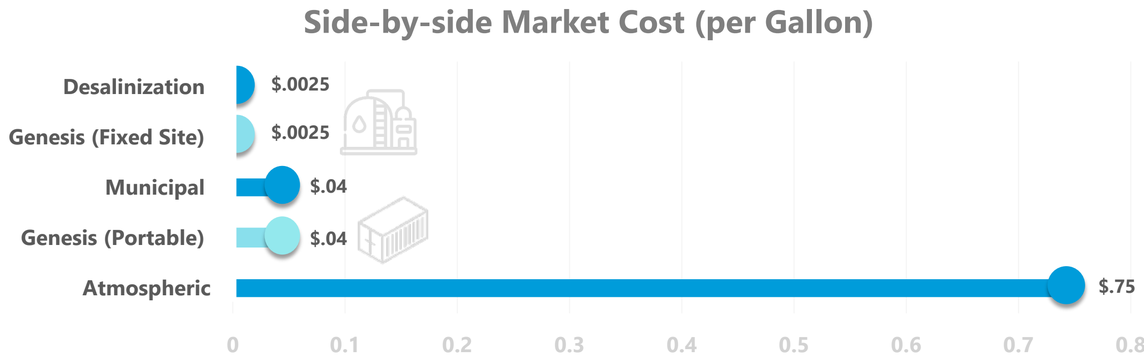
Source: World Bank 2015, The Forgotten Factor of Climate Change-Water: Technical Papers, as cited in World Bank 2016, High and Dry High and Dry: Climate Change, Water, and the Economy.

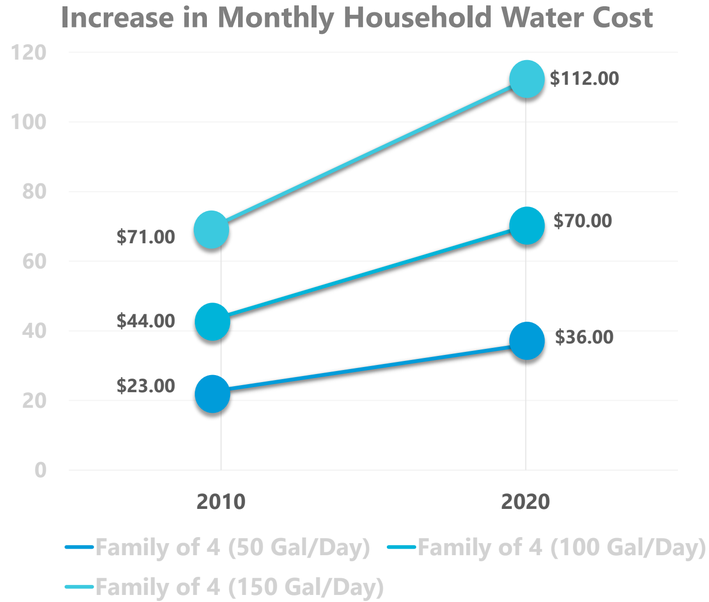
Fitch (a global credit rating company) **to use water supply to determine credit ratings for states**

Value of Genesis

…Genesis is competitive in all water markets with 10-20X lower Cap Ex







- 48% price increase since 2010
- Based on municipal water 30 US cities

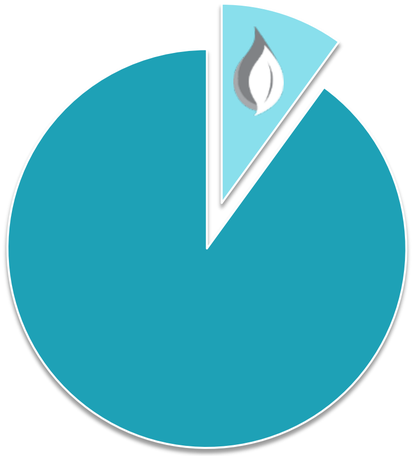
Sources: https://www.circleofblue.org/waterpricing/
https://www.forbes.com/sites/quora/2017/09/07/why-desalination-isnt-the-answer-to-the-worlds-water-problems/?sh=4336e6d04737
https://pacinst.org/wp-content/uploads/2012/11/financing_final_report3.pdf

Value of Genesis

...if Genesis captures 10 percent of the Atmospheric (AWG) Market

Market

Atmospheric (AWG)



AWG market value by 2027

$10.0B

2025 Annual Revenue

$1.0B*

Genesis

Enterprise Value

>$3.0B**

Sources: https://www.circleofblue.org/waterpricing/
https://www.forbes.com/sites/quora/2017/09/07/why-desalination-isnt-the-answer-to-the-worlds-water-problems/?sh=4336e6d04737
https://pacinst.org/wp-content/uploads/2012/11/financing_final_report3.pdf

*EBITA/**Based on a revenue multiple of 3x

Customer Segments

Representative TOP RANKED water demands (by U.S. Industry):

Industrial

Goals:

1. Zero Water Withdrawals in Manufacturing
2. Freshwater Only Used for Human Consumption

Commercial

Goals:

1. 25% Reduction in Water Used
2. Replenishment of 100% Water Extractions
3. 25% Co2 Reduction by 2030

Agricultural

Goals:

1. Water: Restore 159 billion gallons
2. Reduce supply chain emissions 30% - 2030

- **Reliable Water**
- **Sustainable Water**
- **Lower Emissions**

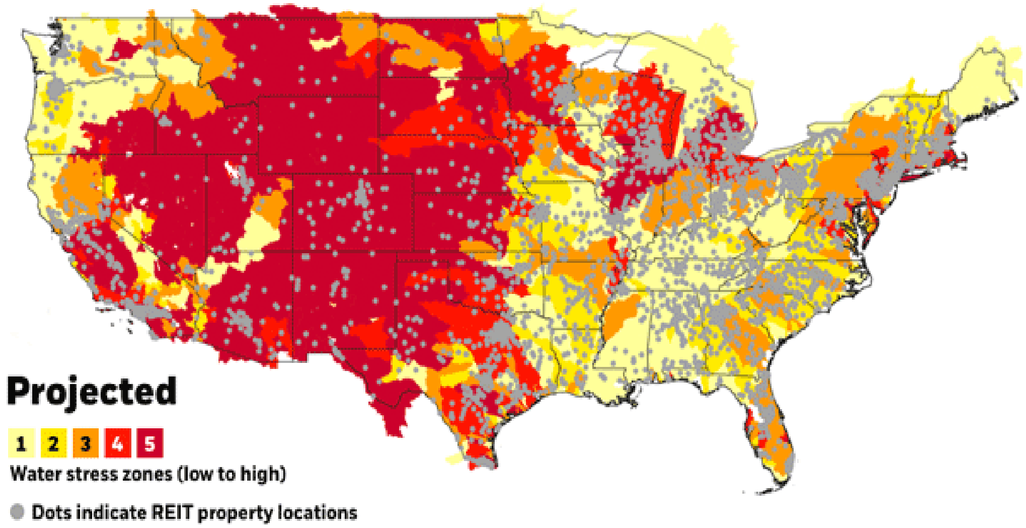
Case Study:

Real Estate Investment Trusts (REITs)

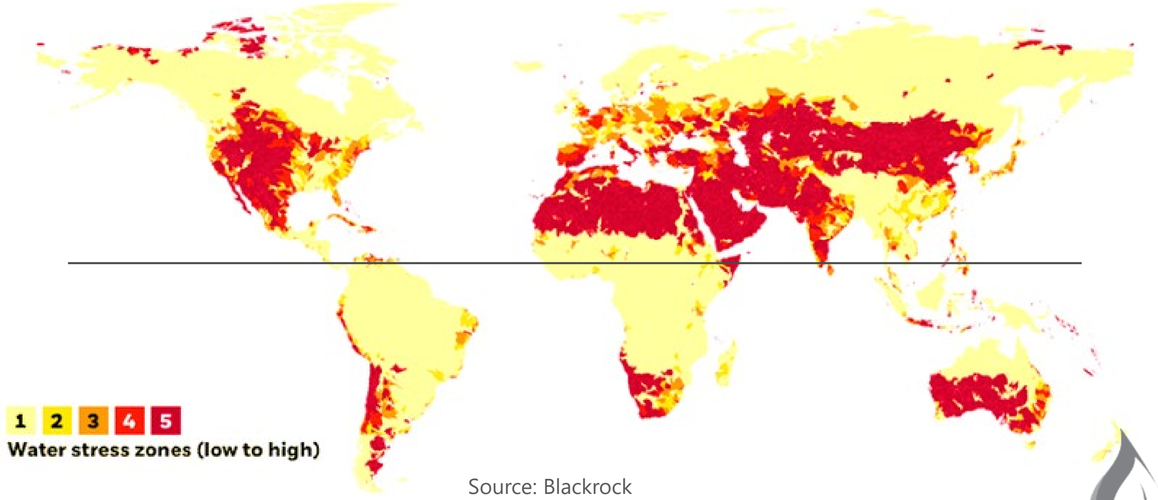
(malls, offices, warehouses, hotels, apartments)

84,000	number of REIT's studied
66%	U.S. properties high-stress by 2030
60%	global REIT's high-stress by 2030
$425 Billion	reported value of company risks*

Source: Blackrock



Source: Blackrock



Source: Blackrock

*As disclosed by 520 companies according to CDP; this figure is underestimated as respondents failed to provide financial values for 50% of risks faced

Case Study:

Water Footprint: 79 Billion Gallons/Year

"Coca-Cola pledged to become 'a truly water-sustainable business on a global scale' in 2007. Eleven years later, by the standards of the 2008 assessment, **the company still has nearly 99 percent of its water footprint to go.**"

– The Verge

Case Study:

Cost effective sustainable solutions for companies like Coke

2030 Goals	Water Challenges	Genesis Solutions
Water **25%** ↓	• **Water use: 5.8B cases Coke (7.9B Gallons H20) (2019)** (Sugar Cane) + (Water) **406 Gallons = 1 Gallon of Coke** • **Water Sourcing (plant closings)** • **Customer protests (negative public relations)**	• Sustainable • Reliable • Available anywhere • Eliminate “legal” issues • Positive public relations

Green Houses Gas
25% ↓
	• **Green house gas production**
	  • Agriculture, manufacturing, and cold drink equipment
	  • Accounts for 60-75% of emissions
		• Carbon capture technology
		• Reduces carbon footprint
		• Provides carbonation
		• Positive public relations

Case Study:

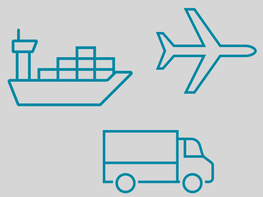
30 Percent of DOD Budget: Water & Fuel Costs

"Demand for drinking water is a constant across all Department of Defense missions, and the **risk, cost, and complexity that go into meeting that demand can quickly become force limiting factors.**"

- Seth Cohen, Ph.D, DARPA AWE Program Manager

Case Study:

30 Percent of DOD Budget: Water & Fuel Costs

Goal: Find Supply	Water Challenges	Genesis Solutions
Expedition Water 	• **Due to contested operations, future logistics not permitted** • **68 Casualties [WIA/KIA] resulted from water transport (2007)** • **Water generation capability at point-of-need required**	• Sustainable water source • Water security • Water at point-of-need • Save lives/ensure health • Lower cost
Base Water 	• **102 U.S. Military Bases running out of water** • **400 active and/or closed bases contaminated water** • 149 U.S. bases designated “Superfund” sites • **$7,000,000 annual water bill Al Udeid Air Base, Qatar** • **Public relations catastrophe (i.e. Fairchild AFB)**	• Sustainable water source • Reliable water • Water at point-of-need • Ensure health • Lower cost • Positive public relations

Case Study:

Water Cost: Al Udeid Air Base (population 8,000)

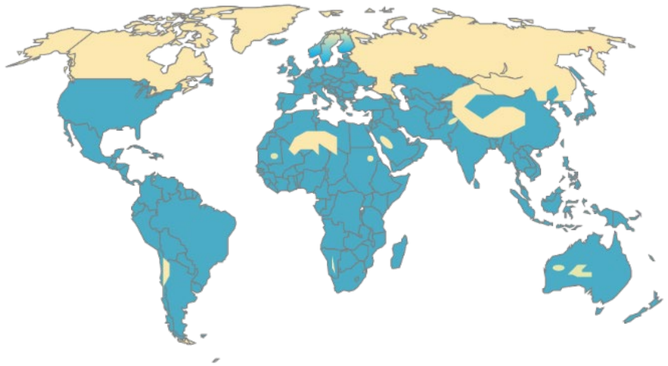
Al Udeid Air Base	Genesis Fixed (100K per Day)
Water Price Per Gallon	
$5.00	$.009
Amortized Cost (25 Yr)	
Indeterminable	$340,000
Capitol Expense (CAP EX)	
Indeterminable	$8.5M
Annual Operations and Maintenance (O&M)	
Indeterminable	$25,000
Annual Water Cost	
$7,000,000.00	$365,000

Annual Savings to Government		Percent Cost Savings
$0.00	$6,635,000.00	96%

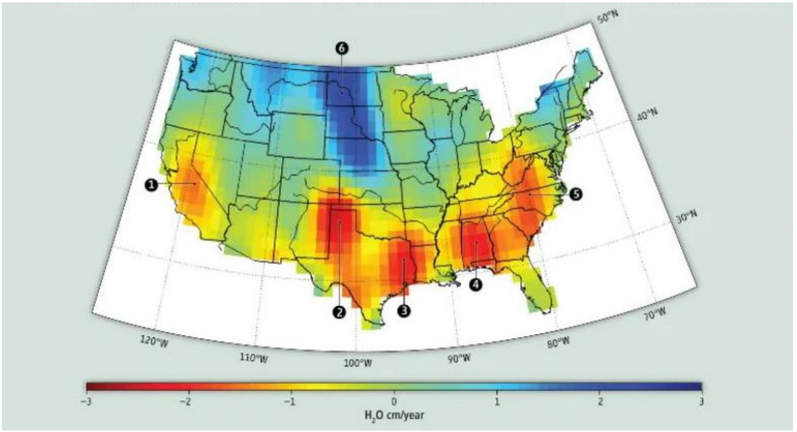
Case Study:

Cargill™ U.S. Commercial Ag losing water sources; 40 percent still wasted

Genesis' water generation regions



Blue indicates operational area based on average humidity and temperature



NASA/GRACE: U.S. Water Hotspots : Drought and agriculture have depleted water reserves across the southern United States in the last decade, as measured by the GRACE satellite mission. Meanwhile, water storage has increased in the flood-prone Upper Missouri River basin. The **six regions are 'hotspots'** where water losses are pronounced

Case Study:

Cargill™ U.S. Commercial Ag losing water sources; 40 percent still wasted

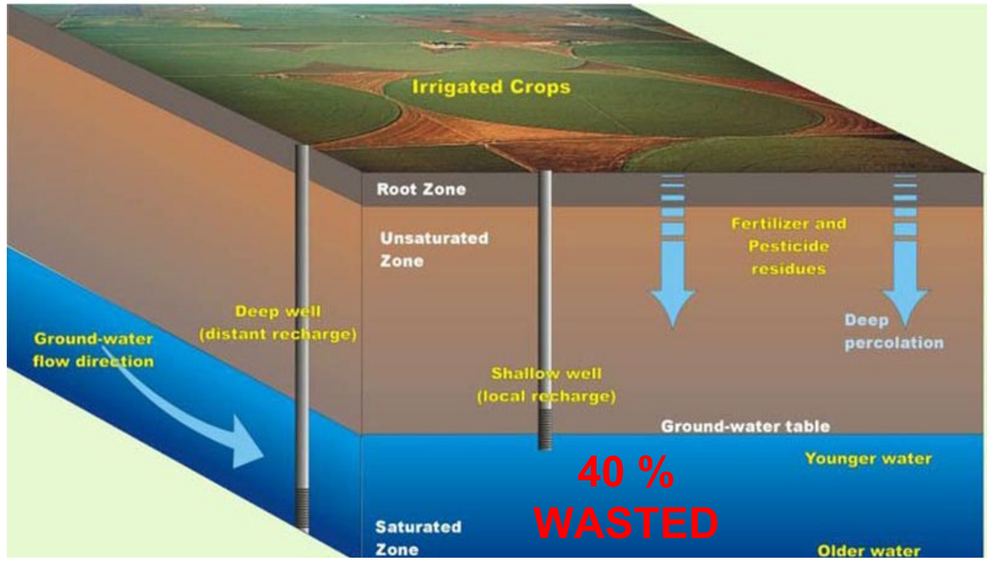
Goals	Water Challenges	Genesis Solutions
Water	• **Crops being impacted, driving productivity changes** (Crops) + (Irrigation) = **40% of Water Wasted** • **Restore 159B gallons water** • **Water sourcing** • Irrigation wells drying up	• Sustainable water source • Eliminate shocks of drought • Available anywhere • Eliminate “legal” issues • Positive public relations
Green House Gas **30%**	• **Green house gas production** • **Reduce supply chain emissions 30% - 2030** • Essential for operations	• Carbon capture technology • Reduces carbon footprint • Provides fertilizer • Positive public relations

Agra Case Study: Deep Dive

Water Usage: 50 acres

BASELINE:

- 168 gal per minute (GPM)
- 1,008 gal per hour (GPH)
- 24,200 gal day
- 170,000 gal week
- 5,080,000 gal month
- Wasted: 2,032,128 gal per month†

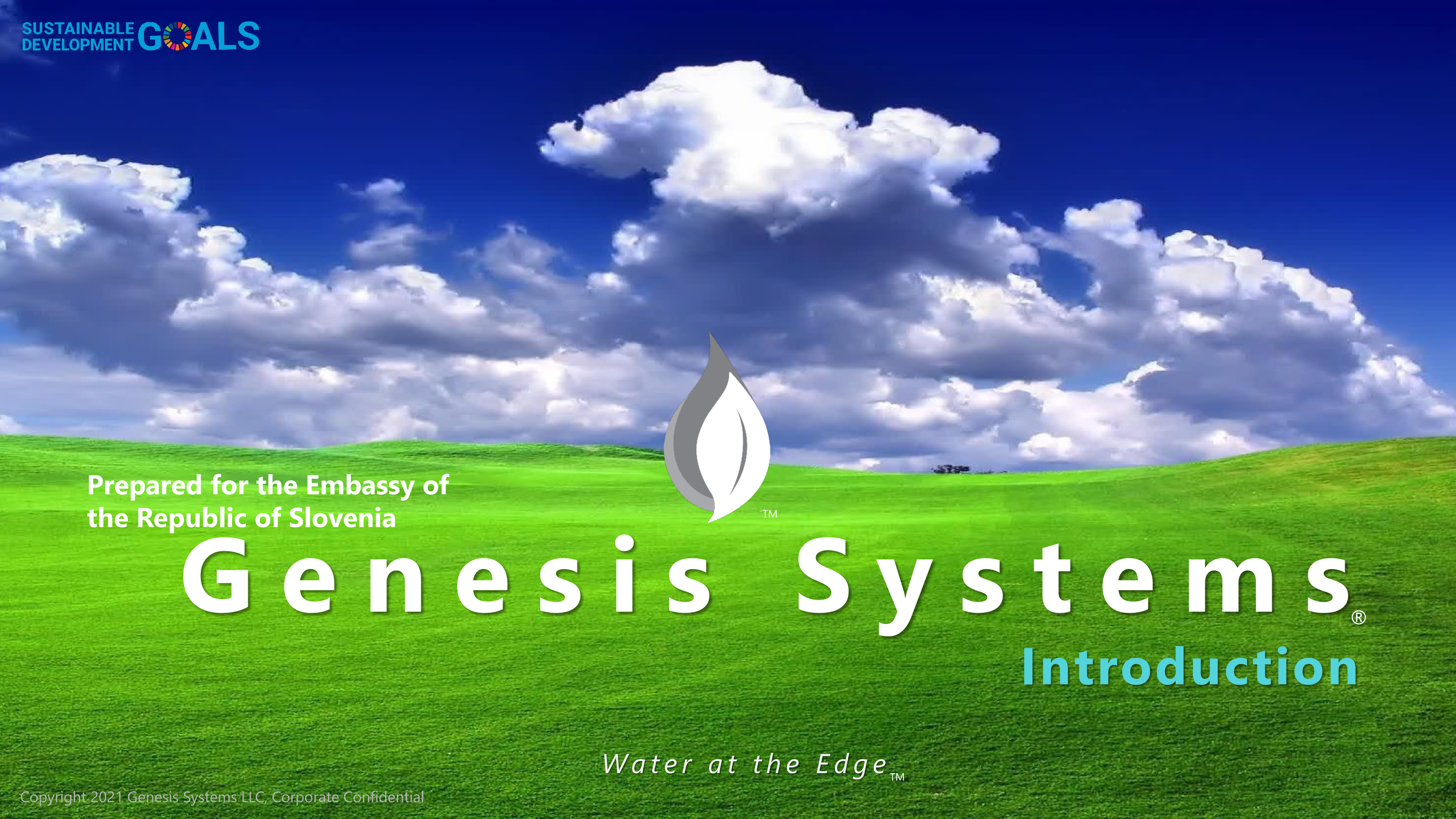


Over 24,000,000 gal wasted annually…

†Assumes 60 percent irrigation efficiency and 1 inch water per week

Agra Case Study: Deep Dive

U.S. Annual WASTED Irrigation Water: Equivalent to 144 New York cities…


SUSTAINABLE DEVELOPMENT GOALS
Prepared for the Embassy of the Republic of Slovenia
Genesis Systems®
Introduction
Water at the Edge™
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