XPRIZE WATER SCARCITY

مبـــادرة محمد بن زايد للـــماء
THE MOHAMED BIN ZAYED WATER INITIATIVE

للماء

WE'RE PROUD TO BE A QUALIFIED TEAM

CHILCORP

WATER CELLS AND WATER CUBES

>90% OPEX reduction
vs. RO @ same CAPEX

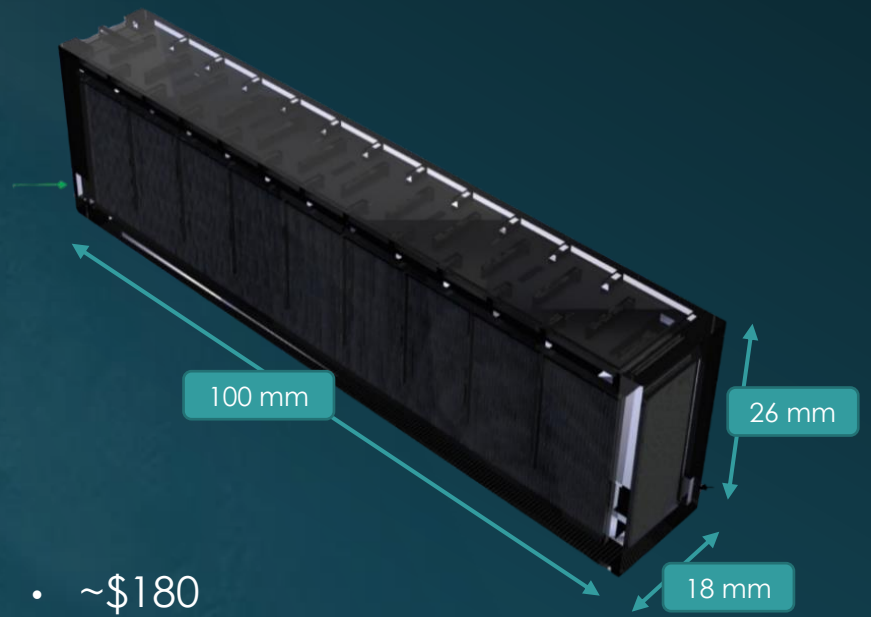
Need $400K this quarter
To stay in XPRIZE ($8M top prize)

Kaustubh Chilwarwar
Founder & Inventor

Electricity Free Desalination:
A Patented Hydrophilic Breakthrough

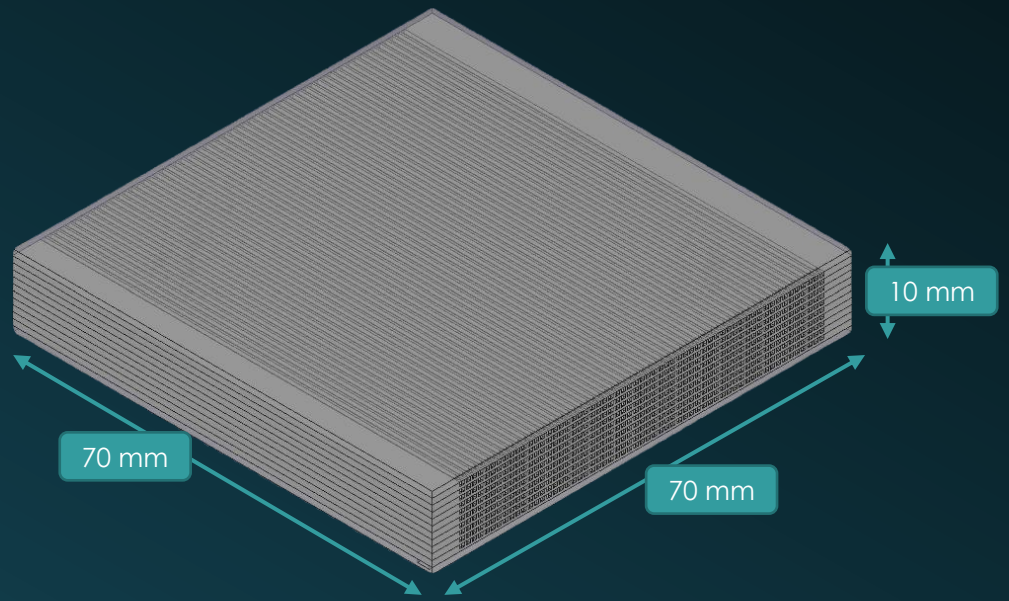
Water CELLS/CUBES - Bottomline

Water Cells *(Patent Granted)*



- ~$180
- ~10 Litres/Hour *@ ~1m Head*
- 23k Water Cells for 1000 GPM

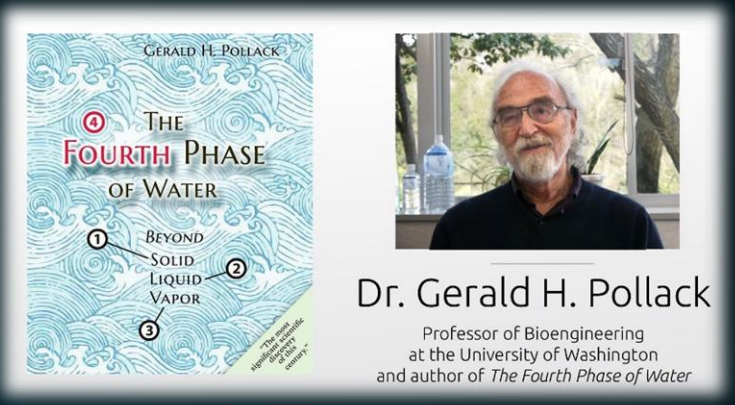
- ~$250
- ~17 Litres/Hour *@ 5cm – 40cm Head*
- ~13k Water Cubes for 1000 GPM



Water Cubes *(Patent Published)*

"At scale, our systems **reduce** desalination operating costs by **over 90% compared to RO** while maintaining **similar CAPEX.**"

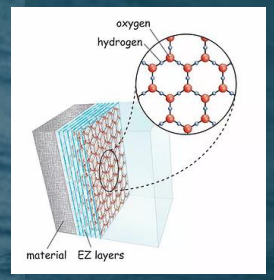
Exclusion Zones – As Observed



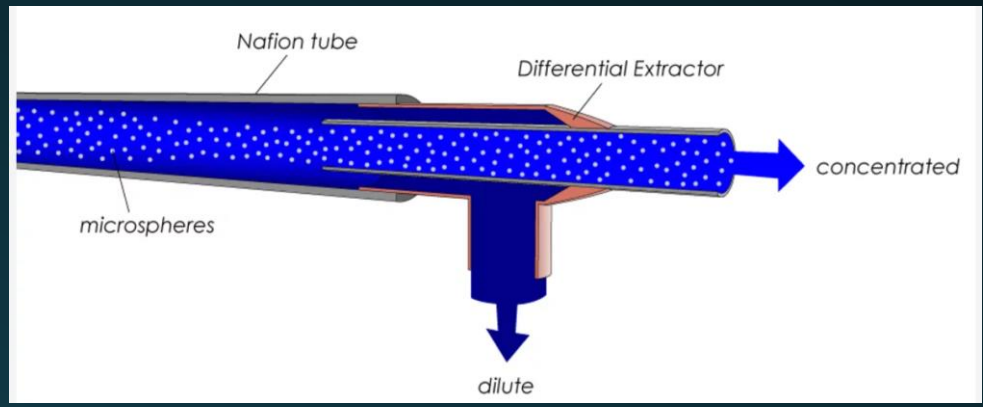
Engineered Ultra-Hydrophilic Surface

When a hydrophilic surface encounters water, an exclusion zone of 100% pure water is formed.

- My tech uses capillary action to pull water from this region.

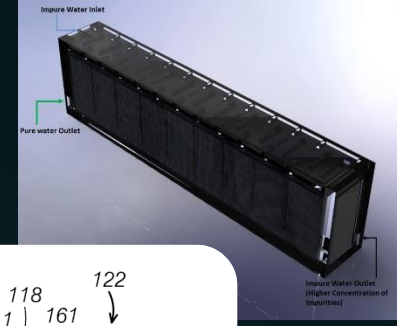


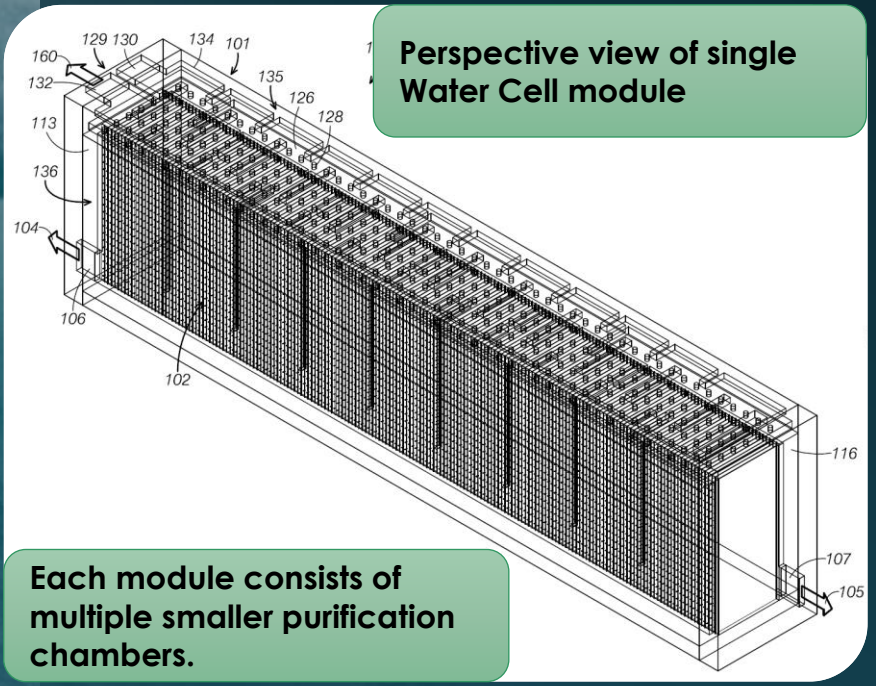
Hydrophilic surfaces have highly polarizing groups at the surface that attract the polar H-O-H molecules very strongly, and thus everything else is expelled from the vicinity.



- Pollack's Filterless Filter Demonstration.
  - Separation ratio - 200:1 in a single pass.
  - Demonstration with soil and microbes
  - No demonstration with Oceanic Water

Water Cells (*Patent Granted*)

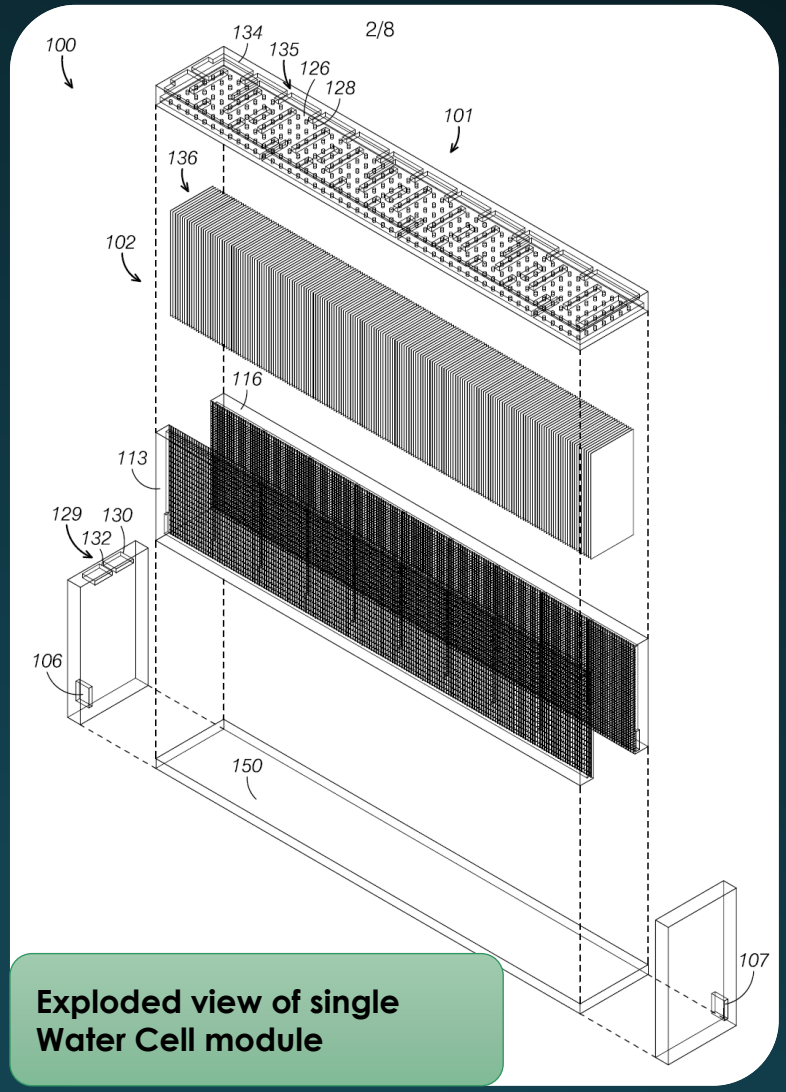




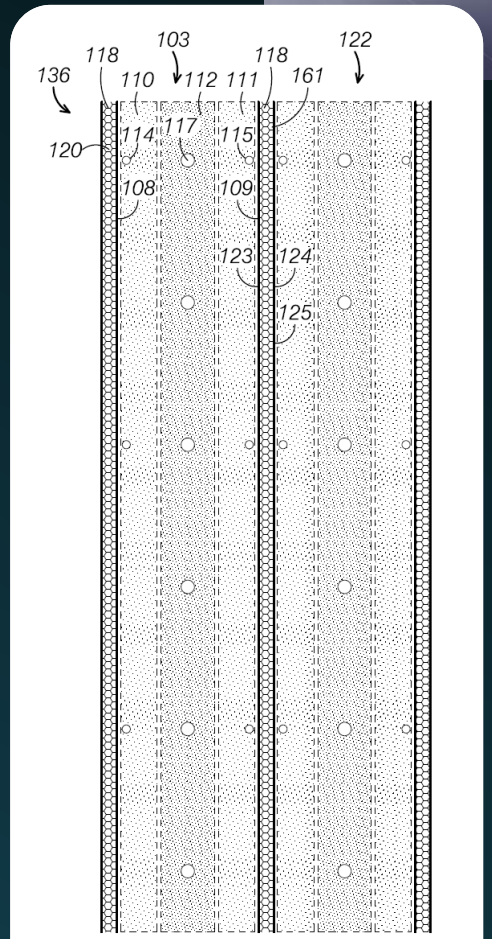
Perspective view of single Water Cell module

Each module consists of multiple smaller purification chambers.

- Low complexity for parts microfabrication
- High complexity for assembly

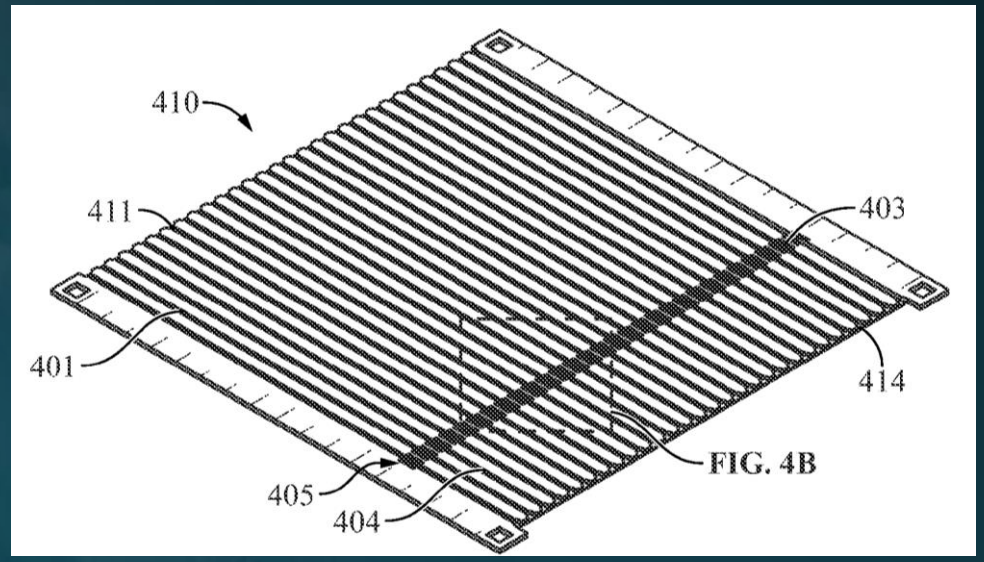


Exploded view of single Water Cell module

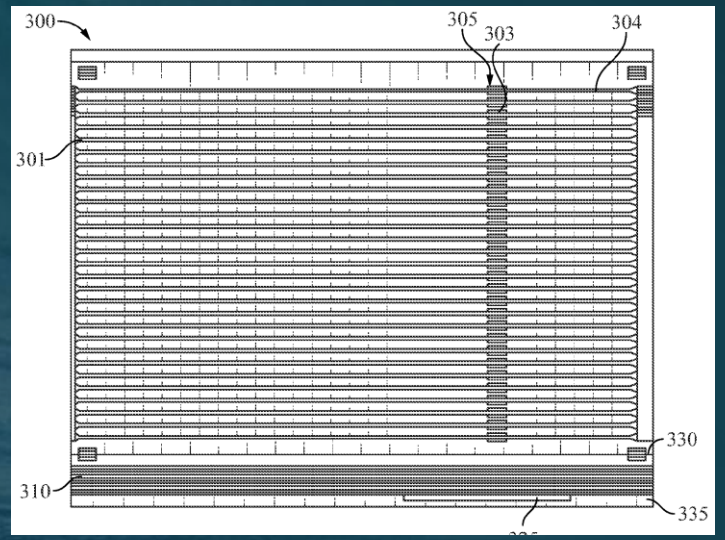


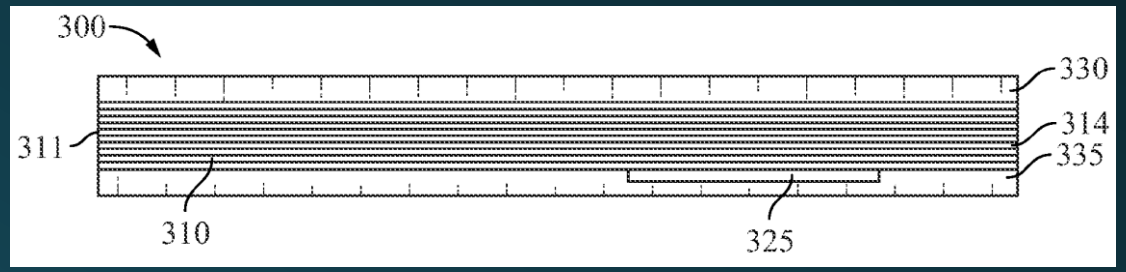
Right side elevation view of two adjacent purification chambers

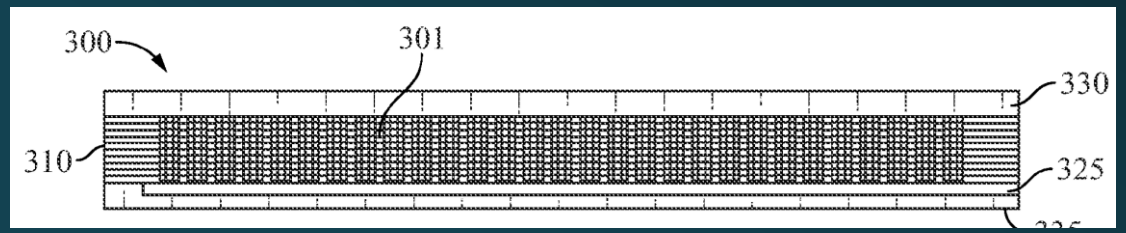
Water Cubes (*Patent Published*) – Lead Tech



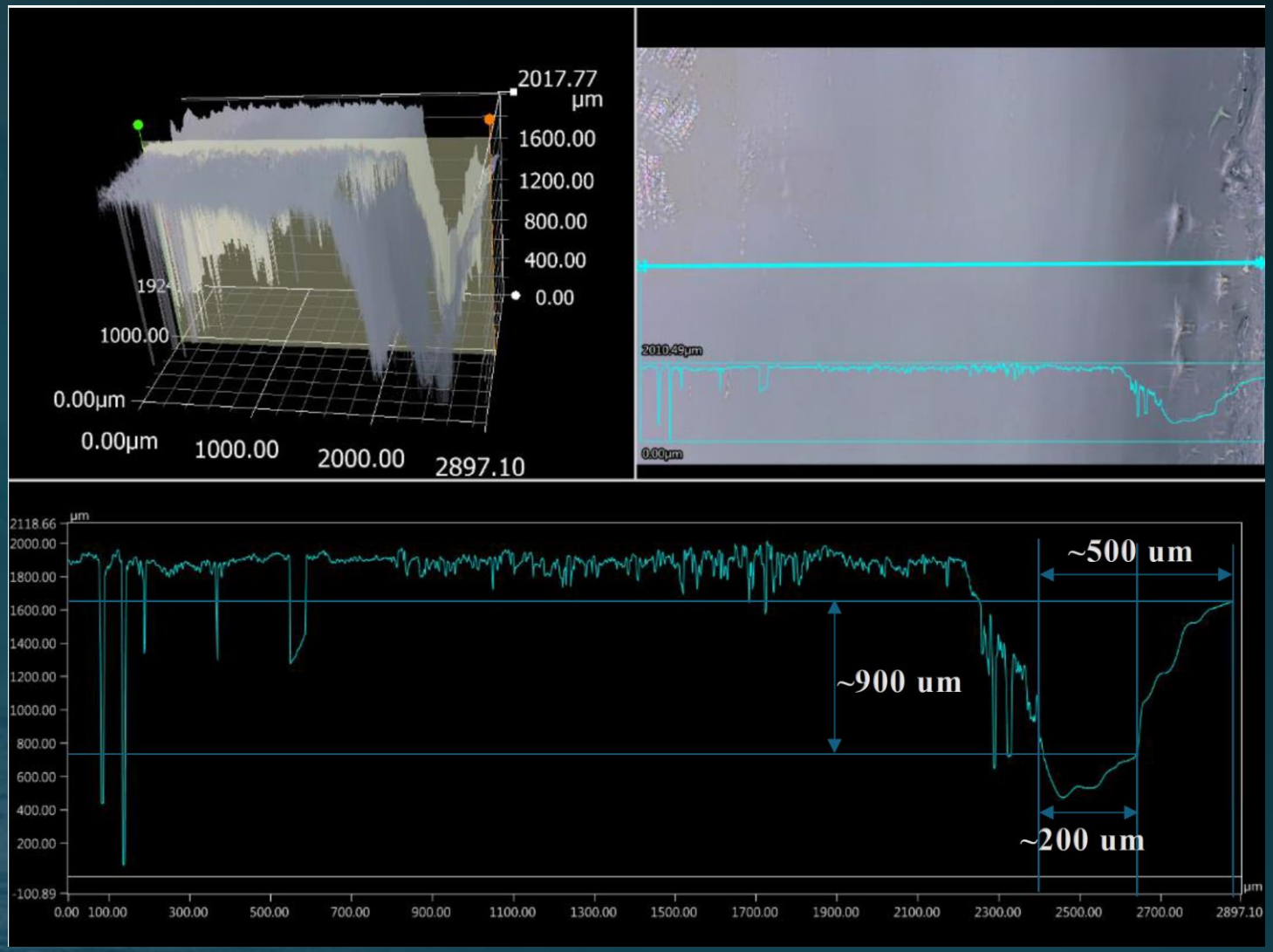
- Stacked wafers structure
- XPRIZE Entry
- More complex patterning geometry
  - Increases microfabrication complexity
  - Decreases complexity for assembly







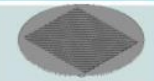
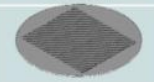
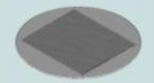
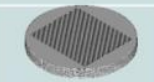
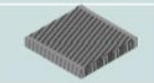
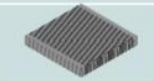
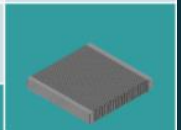
Exclusion Zones with Oceanic Water



EZ Observations in Oceanic Water (Sunny Isles Beach):

- >200 microns wide stable EZ observed
- Non-standard surface engineered at home
- Library of 28 surfaces (patent pending)
- 1 Tested
- 3 Ready to be Tested

Water Cubes - Scalability

Process Step	University Lab Cost (Per Wafer)	Contract Manufacturing (Per Wafer)	Mass Manufacturing Cost (Per Wafer)	
Wafer Cleaning (Standard Clean)	$150 - $300	$600 - $900	$0.20 - $0.30	
DRIE Etching – Trench (~600 µm)	$3,750 - $5,000		$1.45 - $4.72	
DRIE Etching – Through Via (~400 µm)	$3,750 - $5000	$600 - $900	$2.97 – $4.16	
Piranha Clean (Post-DRIE Residue Removal)	$150 - $350	$120 - $200	$0.31 - $0.35	
Oxygen Plasma Cleaning	$100 - $200		$0.15 - $0.28	
Direct Wafer Bonding (10 wafer stack)	$3,500 - $4,500		$1.95 - $2.83	
Wafer Stack Dicing	$100 - $300	$20 - $35	$1.50 - $3.40	
Post-Dicing Cleaning	$150 - $300		$0.07 – $0.14	
Mica Deposition (Solvothermal Process)	$400 - $1,600	$150 - $300	$1.87 - $3.75	
Total Per Wafer	**$12k - $18.5k**	**$1490 - $2335**	**$10.47 - $19.93**	
Total Per Water Cube	**$120k - $180k**	**$14900 - $23350**	**$104.70 - $199.3**	
Inspection + Frame Assembly + Final Packaging	$300 - $500	$300 - $500	$50 - $100	
Total Cost Per Packaged Water Cube	**$121k - $181k**	**$15k - $24k**	**$250.00 - $300.00**	

RO vs Water Cells vs Water Cubes
@1000 GPM Scale

Metric	Reverse Osmosis	Water Cells	Water Cubes
Cost of Core System	$ **5.24**25 Million (SeaWater Pro RO system baseline)	$ **4.12**12 Million (Scaled manufacturing cost basis)	$ **3.27**764 Million (Scaled manufacturing cost basis)
Pressure Head	**4-8** MPa	~**9.8** kPa	~**0.5** kPa to **3.9** kPa
Annual Power Consumption	~**6963** MWh (Carlsbad Plant Basis)	~**7.04**1017334 MWh (1.3 m assumed system height)	~**1.08**3233436 MWh (20 cm assumed system height)
Annual CO2 footprint	>**396** Metric Tons (Carlsbad Plant Basis)	~**2.6**11 Metric Tons	~**0.37**3 Metric Tons
System Footprint	~15000 sq. ft.	~84 sq. ft.	~500 sq. ft.
Maintenance	Heavy	Very Light (Pending Validation)	Light (Pending Validation)

- **>99% Reduction** in Power Consumption, CO2 footprint, and required Pressure head
- **>95% reduction** in Area footprint

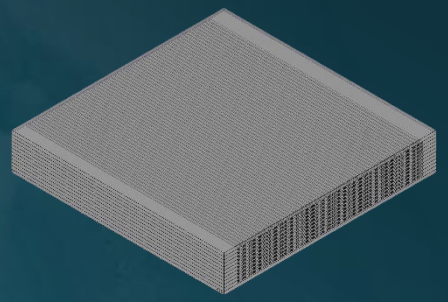
Current Stage, Roadmap, and Ask

- Patterned wafer – process milestone
- Precise and Repeatable: 3 total built
- ~50k in trial and error R&D Effort

Phase	Objective	Amount Needed	Timeline	Objectives
Phase I	Prototyping and Testing for XPRIZE Water Scarcity	**$300k - $400k**	~4-5 months *(Hard Deadline: Mar, 20 2026)*	• Surface Testing and Observations – 4 total • Proto design Optimization • 10-12 Prototype fabrication • Prototype functional and durability testing • Submission to XPRIZE
Phase II	Full product development with Reliability Testing	$1.5 Million – $3 Million	~17 months	• Product Design Optimization • Reiterative Testing • Product Design Finalization • Reliability Testing • Commercial Readiness

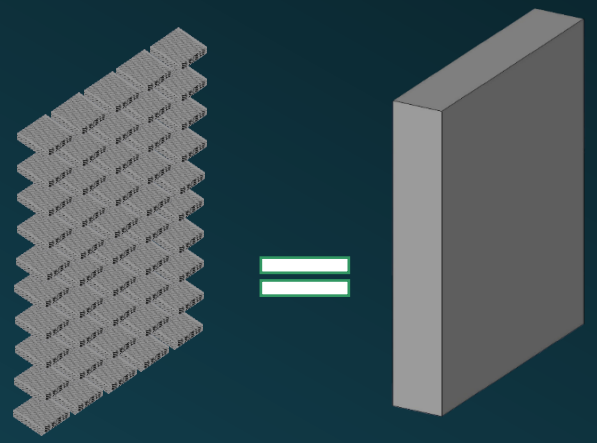
- We **must secure $400k this quarter** to stay qualified for **XPRIZE Water Scarcity** (Top Prize $8 M).
- **People**: Experts in water tech, microfabrication, and commercialization
- **Partnerships**: Microfabrication, Microscopy, and Water Testing Labs

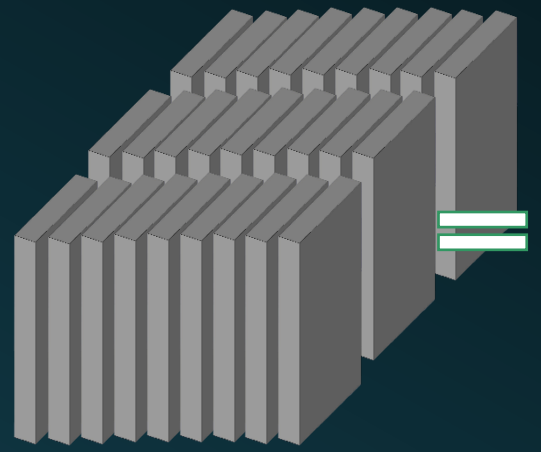
Vision



One Water Cube

~7 cm x 7 cm x 1 cm



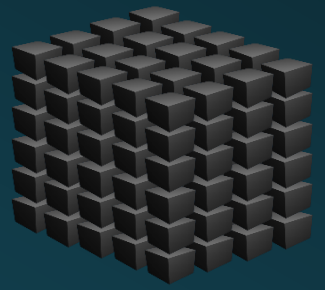


One Water Cell

~10 cm x 2.6 cm x 1.8 cm

One Cell-Box

Multiple water cells working in tandem
~Size of car battery



Water purification plant

Multiple batteries stacked together in server like fashion
Very high scalability

Current Team

Kaustubh Chilwarwar
Founder and Inventor

Robert (Bob) Tekolste
Technical Advisor(Microfabrication and System Integration)

Stefan Grigorov
Strategic Advisor and Investor Relations Lead

Arvind Kumar
Business Representative - India

Thank You!

Kaustubh Chilwarwar

Founder & Inventor

k@chilcorp-water.com

https://www.chilcorp-water.com/

Austin, Texas – USA

XPRIZE Water Scarcity Qualified Team