

SETO CSP Program Summit 2019

High-efficiency, Zero-Liquid Discharge, Multiple-Effect Adsorption Distillation

GREENBLU

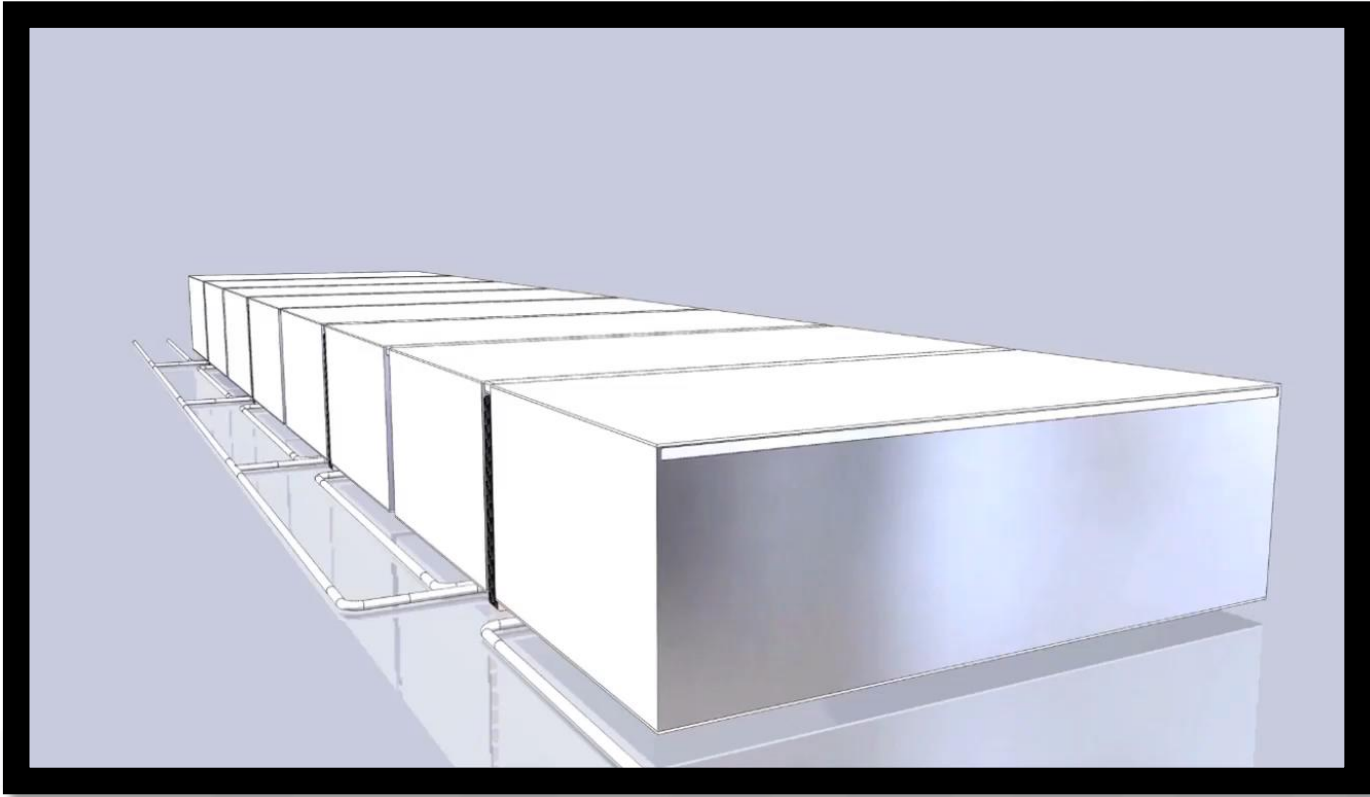
NO COMPROMISE DESALINATION

Challenge: Mitigate Global Water Crisis

- Constrained by existing technology:
 - Accessibility
 - GHG emissions
 - Grid dependence
 - Environmental damage

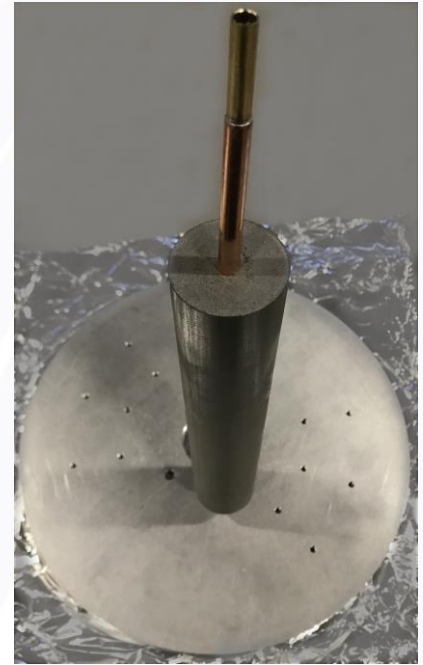


VADER™: Vapor Adsorption Distillation + Energy Recycling



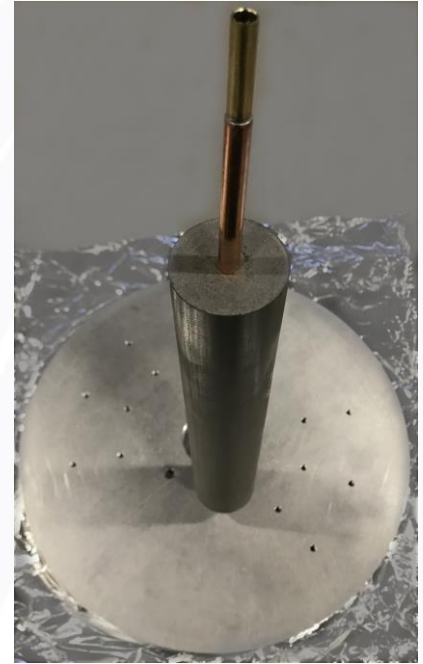
Patented: Adsorbent and VADER™ cycle

- Composite adsorbent
 - Metal-like thermal conductivity
 - Enables energy recycling
 - Inexpensive: <\$1/kg
- VADER™ cycle
 - Bypass top brine temp scaling limit
 - Increase efficiency
 - Adsorbent, not water, is hottest component



VADER™: Vapor Adsorption Distillation + Energy Recycling

- 3x thermal efficiency than current MSF/MED distillation tech
- Uses 35x less electricity than RO
- Thermal drive: solar, waste heat, etc
- Competitive with RO, 20x less expensive than MVR for ZLD



SETO Activities: Advancing Readiness Levels

Key Technical Activities

- Optimize and test adsorbent
- 10% scale prototype
- Design for crystallizer stage
- Design for manufacturing prototype

Key Commercialization Activities

- Cost target demonstration
- Manufacturability
- Stakeholder buy-in



Impacts

- Distiller:
 - first ever multiple-effect adsorption distillation engine
 - Feed-water agnostic
 - Grid independent – disaster relief, military
- Crystallizer - ZLD
 - Brine disposal – RO/inland
 - Industrial
- Mineral recovery
 - MgCl
 - NaCl₂
 - Other high value/critical elements



Team: GreenBlu's management



**HOWARD
YUH**
CEO

PhD, Nuclear Engineering
MIT '05



**ETHAN
SCHATMAN**
CTO

PhD, Astrophysics
Princeton '08



**KEVIN
TRITZ**
COO

PhD, Engineering Physics
U. Wisc. Madison '02



**DAN
DRESSEL**
Head of Business Dev

BA, Business Administration
Cal Polytechnic '98