Cleantech Forum
San Francisco

Fledglings & Seedlings

Searching for Diversity of Thought

High-Performance, Earth-Friendly Ingredients for Cleaning Products

Christoph Krumm, Co-Founder, CEO

SIRONIX
RENEWABLES

Problem:

Only 3%

of U.S. cleaning products are eco-friendly.

SIRONIX
RENEWABLES

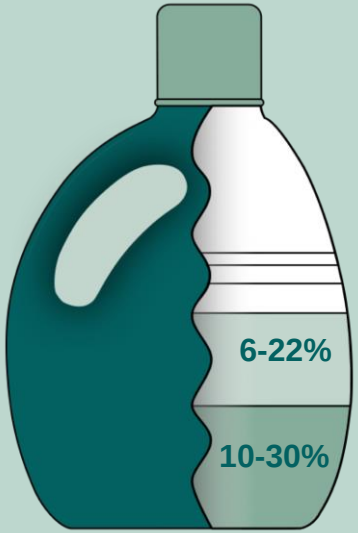
Main ingredients in:

Cloudy = Inactive

Tide

Seventh Generation

SIRONIX RENEWABLES



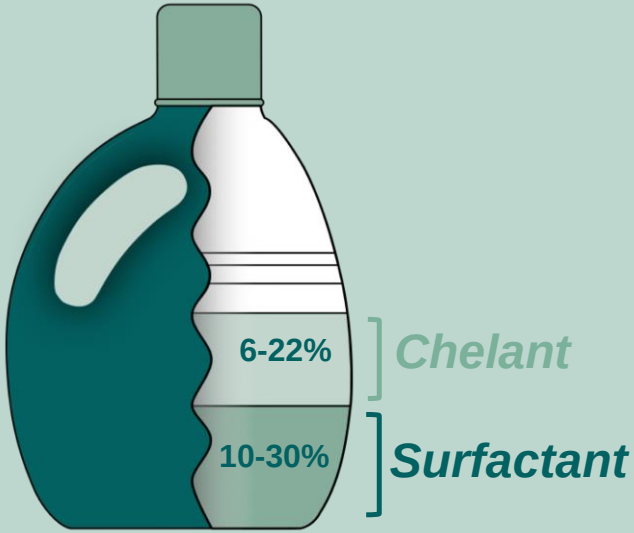
Additive

Active Cleaner

$13 billion

cleaning products market

SIRONIX RENEWABLES



$13 billion

cleaning products market

SIRONIX RENEWABLES

Main ingredients in:

Tide

Seventh Generation

Eosix®

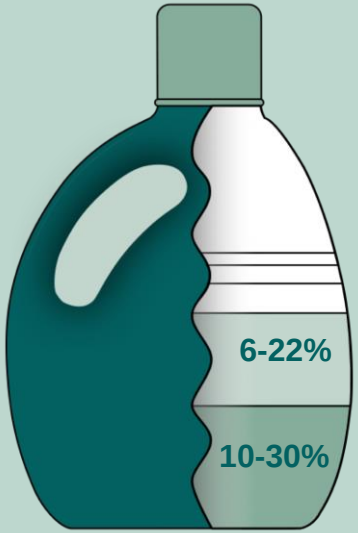
Surfactants

SIRONIX
RENEWABLES

Water

SIRONIX
RENEWABLES

Solution: a new molecule that simplifies cleaning products



Chelant

Surfactant

SIRONIX RENEWABLES

Eosix®

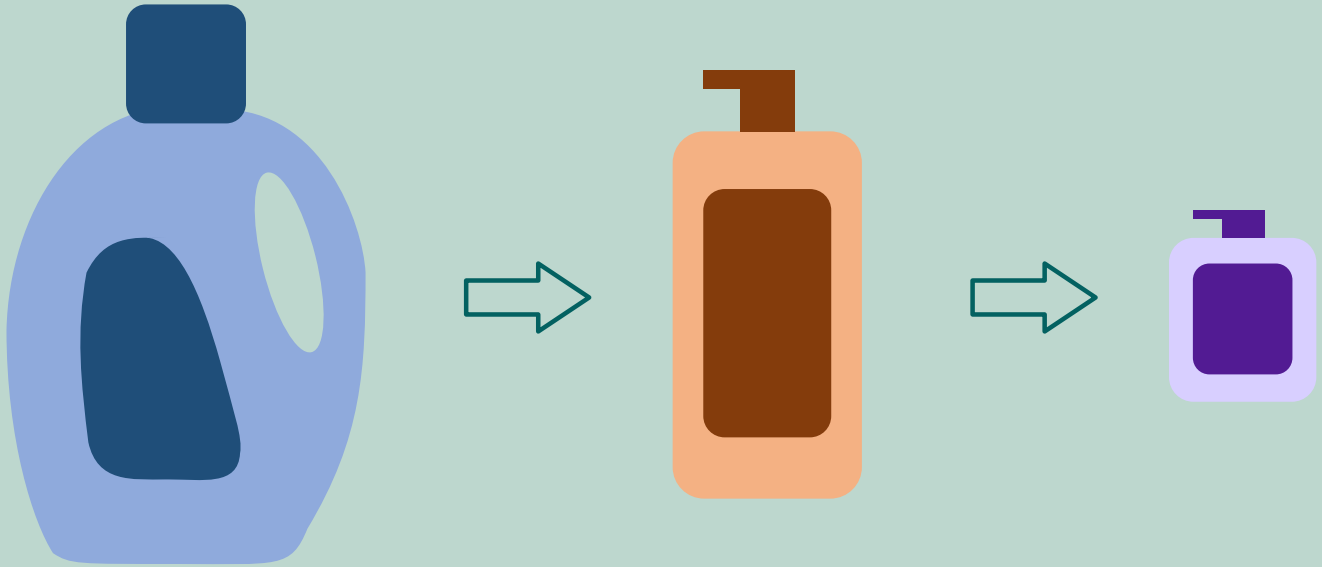
Surfactant

$13 billion

cleaning products market

SIRONIX RENEWABLES

Solution: a new molecule that enables more concentrated products



SIRONIX
RENEWABLES

Christoph Krumm, Ph.D.
Co-Founder, CEO

- Manage business development
- American Institute of Chemical Engineers **Top 35 Under 35**
- Developed & patented technology during PhD at University of Minnesota

Shawn Eady, Ph.D.
R&D Lead Chemist

- Manager of new molecule inventions & separations
- Over 10 years of chemistry and chemical engineering laboratory experience

Connor Beach
R&D Lead Engineer

- Manager process development
- Four years of chemical engineering laboratory experience

Paul J. Dauenhauer, Ph.D.
Co-Founder

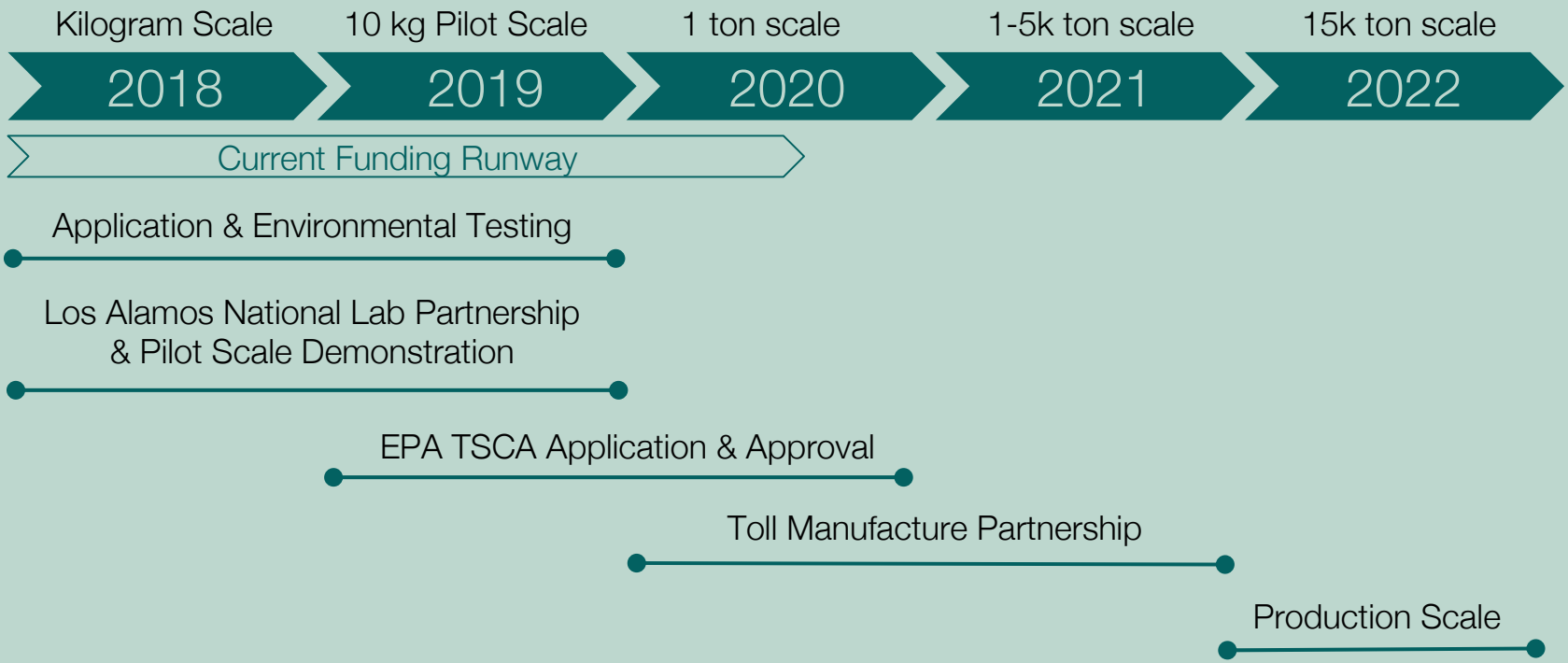
- Manage UMN joint-development research
- Professor of Chemical Engineering at UMN
- Over 20 years of chemical reaction engineering experience

SIRONIX
RENEWABLES

All R&D to be done with non-dilutive grant funding.

June 2016	2016-2017	2018 →	2018 →
4 composition & process patents filed internationally	*$1.4M in SBIR funding* *Developed proof of concept*	*$1.3M partnership* *Process Development*	*Process intensification & pilot development partnership*

SIRONIX RENEWABLES

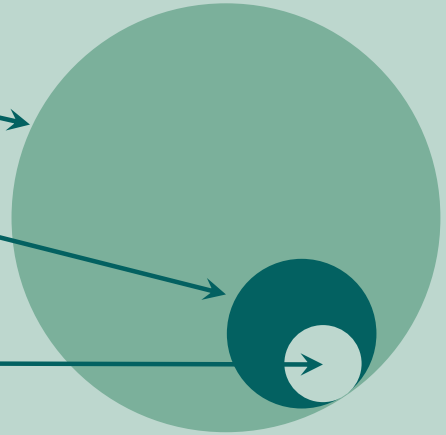


SIRONIX
RENEWABLES

Total addressable market
$12.8 billion surfactants in cleaning products

Serviceable addressable market
$475 million surfactants in laundry detergents

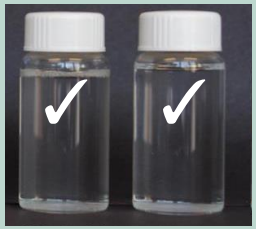
Target market
$79 million surfactants in eco-friendly laundry detergents



SIRONIX
RENEWABLES

Future development for $38 billion surfactants industry:

SIRONIX RENEWABLES



Eosix®
Surfactant

- ***Paints, Inks & Coatings***
- ***Cleaning Products***
- ***Personal Care & Cosmetics***
- ***Agriculture & Agrochemicals***

What we need:

Your connections to build a business advisory group

Resources to help with future fundraising

Manufacturing & regulatory guidance

SIRONIX RENEWABLES

Use, Don’t Waste, Carbon Dioxide

Contact:
Todd Brix, CEO
toddbrix@ocochem.com
www.ocochem.com

2 Big Problems

Carbon Dioxide

We emit too much of it

Intermi1 ent Electricity

We can’t store it

Nature's Solu- on

Photosynthesis

+ CO_2

H_2O

RuBisCO

O_2

Carbohydrates

$(C_nH_{2n}O_n)$

. . . but its inefficient and very slow

OCO's Solu*on . . . *Inspired by Nature*

Formisynthesis

+ **CO_2**

H_2O

O_2

Formic Acid

(CH_2O_2)

50x more efficient and 50,000x faster than photosynthesis

What is Formic Acid?

Overview

- Made in nature by ants and plants
- Kills bacteria (*e.g. E.coli, salmonella*)
- Non-toxic
- Environmentally benign
- Generally Regarded as Safe - FDA
- Clear, dense, non-flammable liquid

Global Avg. Market Price: $1,000/ton

$1B Market, 6% CAGR

- Animal Feed
- Clothing
- Consumer Products/Pharma
- Energy/TransportaL on

Formic Future: Energy Storage Liquid

A liquid for storing vast amounts of intermittent electricity for stationary grid or vehicle use for years at a time

- Energy Dense: 40x higher than Li-ion
- Cost Effective: 100x lower than Li-ion
- Energy Efficient: >85% energy recovery
- Liquid: cheap/easy to store and transport

Make It Here

Store It Here

Use It Here

. . . Formic Scales, Batteries Don't

Our Machine

OCOform Module

- Commodity components
- Proprietary cataly7c cathode
- Ambient opera7on
- Produces 1,000 kg per day per module
- Leveraging 60+ year experience of the chlor-alkali industry

Representa7ve module size and configura7on
Source: Global Chlor-Alkali Ion Exchange Membrane Market 2018 – Asahi Kasei

Our Innovation

Use Intermittent Renewable Electricity (when and where cheapest)

Carbon Negative (not just neutral)

Modular Production

Cheap, long-lasting, highly selective catalyst

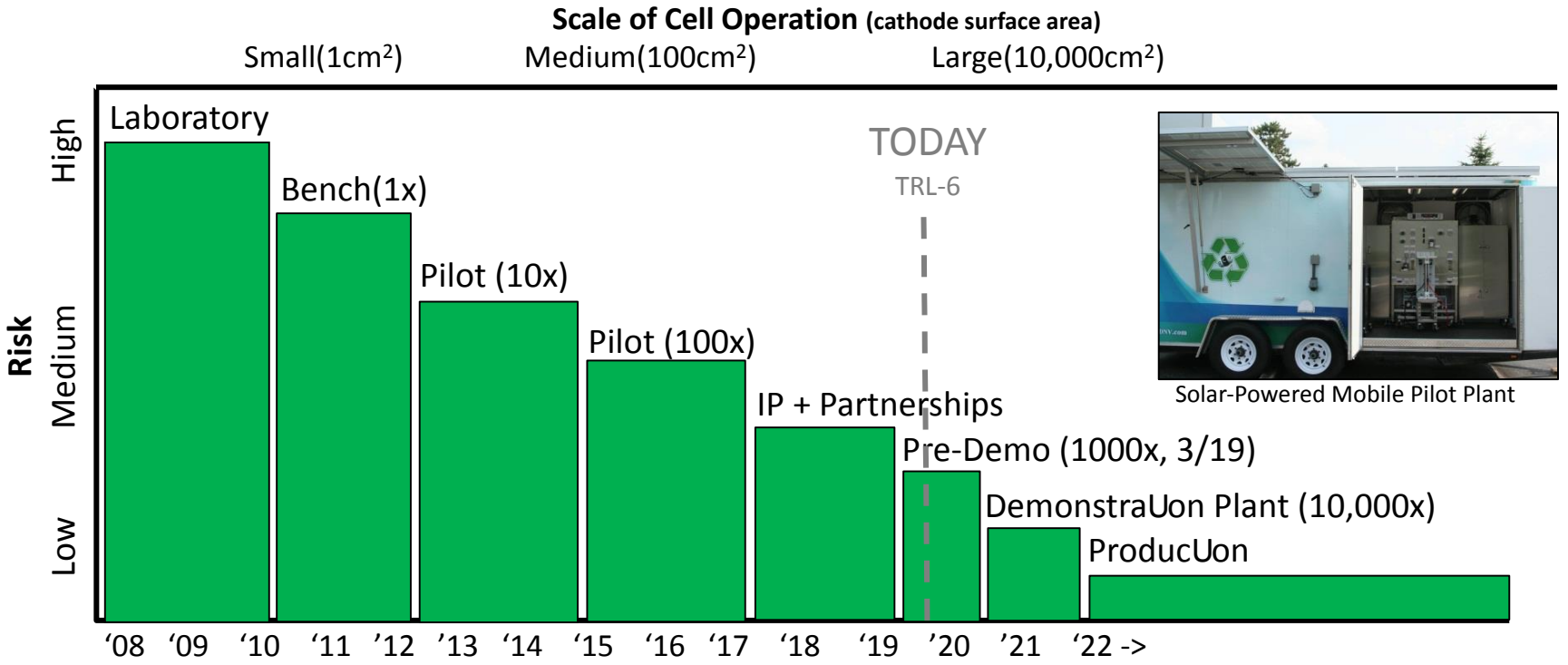
17 Global Patents

The Competition

	OCO	Alt-Green	Fossil
Highly Selec2ve Catalyst	✓		
Cheap Catalyst	✓		
Long-las2ng Catalyst	✓		
Ambient Condi2ons	✓		
High Faradaic Efficiency	✓		
Intermi@ent Power OK	✓		
Cost per Ton	**$430**	**$2000**	**$620**

OCO's produc2on cost is: **78% lower** than "green" alterna2ves
30% lower than exis2ng fossil-based methods

We've De-Risked the Technology



Commercial Traction

CO_2 Suppliers & FA Customers

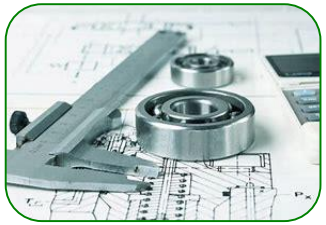
RD&D Partners

DNV GL

DOE-PNNL

Montana St. University

University of South Florida



Electro Catalysis and Fuel Cell Component & Engineering Partners

U.S. DOE Grants

EERE: $1.8M (9/18)

NETL: $1.0M (11/18)

Private Seed and Bridge Capital

Bend Venture Fund, LLC

Multiple Angel Investors

OCO Leadership

Terry Brix

Founder, President, CTO

Serial entrepreneur. 18 start-ups

Green chemistry commercializa@on

7 exits, 1 IPO

MS/BS ChemE/MBA - 250+ patents

Todd Brix

CEO, COO

Process/catalyst design engineer. 10 plants

IA/IoT soNware+hardware products

Started/Led 3 $1B+ IoT businesses

BS ChemE/MBA - 12 patents

Battelle · Pacific Northwest National Laboratory · 3M · W · Montana State University · Microsoft · intel · Chevron · Harvard Business School · W

OCO makes CO_2 profitable

Thank You

Contact:
Todd Brix, CEO
toddbrix@ocochem.com
+1 (425) 445-8358
www.ocochem.com

Leap allows every connected device to help balance the grid, and get paid for it.

Access wholesale markets through a single API and help build the flexible, renewable grid of the future.

STATION A

automating clean energy development

600 California Street, #14-003, San Francisco, CA 94108 | info@stationa.com | https://stationa.com

Station A is built by a highly talented and interdisciplinary team

KEVIN BERKEMEYER

Chief Executive Officer

- clean energy project developer, power trader, started First Solar China and South East Asia, worked at ARPA-E , Tesla, and served as NRG's V.P. of Innovation
- *M.B.A. - M.I.T.*

JEREMY LUCAS

Head of Engineering

- software engineer with 10 years of work experience and expertise in large-scale distributed data systems
- *part of the initial technical team at URX that grew company from 5 to 40 employees*

MANOS SARATSIS

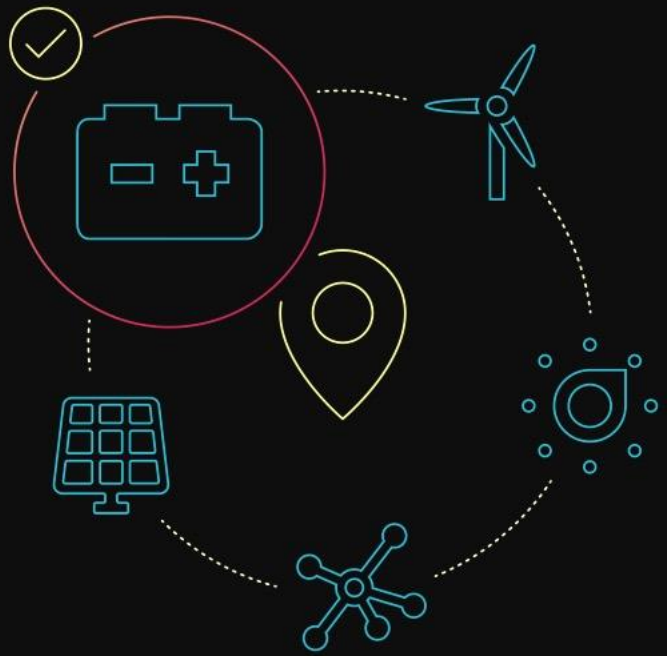
Head of Product

- building scientist and software engineer with expertise and extensive published work in building energy modeling, urban energy modeling, and geospatial analytics
- *M.S. in Building Technology - M.I.T.*

SAM STEYER

Head of Analytics

- mathematician, data scientist and software engineer with prior experience in energy and data systems
- *M.A. in Computational Math - Stanford*



Station A offers a full clean energy evaluation for every building

Finding the clean energy solution that works best for a specific building isn't always easy. Station A provides a complete and unbiased view into all the available technological and financial options.

3 solutions in 2018 → **6** solutions today

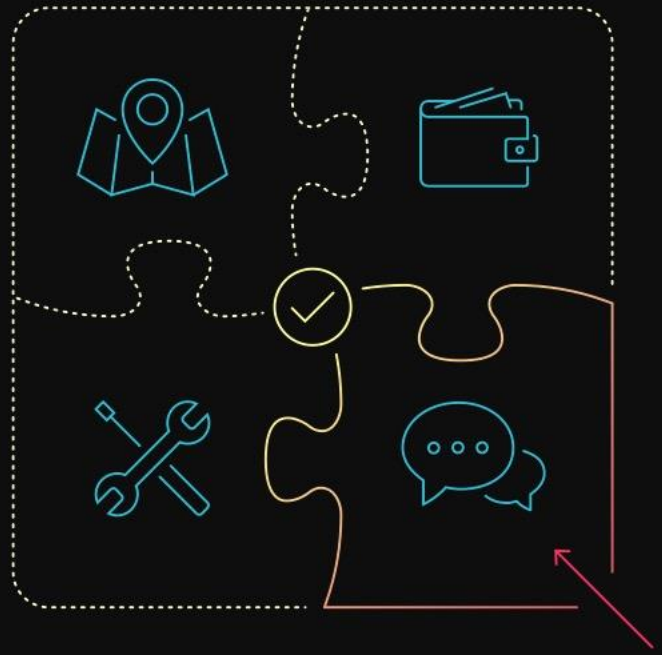
6 developers in 2018 → **10** developers today

Station A enables smarter decision-making with complete data

The clean energy puzzle pieces are scattered. Station A connects geospatial, financial, and technical performance data to enable the most educated decisions for any building.

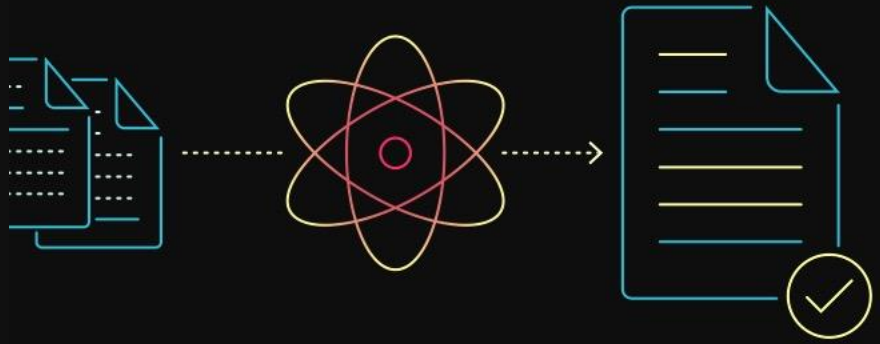
0.9m buildings in 2018 → **22m** buildings today

7m parcels in 2018 → **130m** parcels today



2018 2019

23x increase in building coverage + **18x** increase in parcel coverage



Station A applies machine learning to accelerate development

The process of clean energy development is manual, iterative, and slow. Station A automates the repetitive parts of this work to improve efficiency, bring simplicity, and save time.

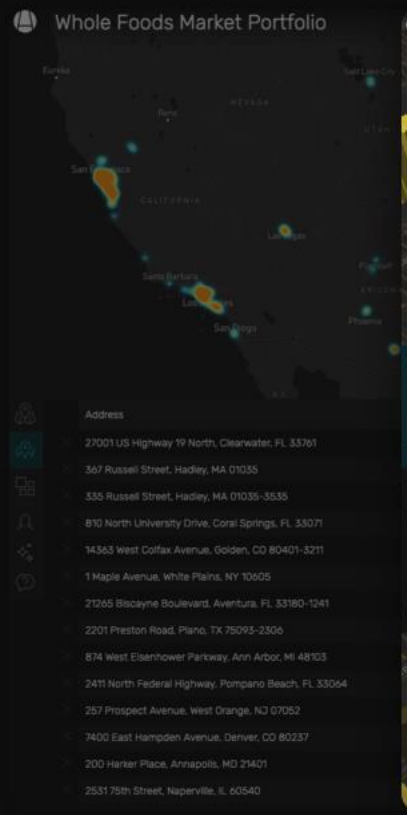
- **20m** synthetic building features
- **5,500 years** of historical interval data

Developers use Station A to find potential projects

Developers join Station A to assess potential markets, find new customers, size products, and analyze their existing customers for new products. Station A allows developers to organize their project development process in one place.

Energy users use Station A to explore their options

Energy users join Station A to analyze the impact of clean energy on their electricity bill and environmental footprint. Station A empowers them to explore different clean energy solutions, utility tariffs, and energy efficiency improvements.



Station A has secured the country's largest developers as paying customers

Station A is backed by an all-star and diverse group of investors

Powerhouse Ventures	Oakland-based early stage venture investor
Southern Company	One of the largest energy providers in the country
Howard Wenger	Former President of SunPower
Ed Woiteshek	Former CEO of CarProof, sold to IHS for $650 M
Jules Kortenhorst	Current CEO of the Rocky Mountain Institute
Frank O'Sullivan	Director of Research at the MIT Energy Initiative
Tom Steyer & Kat Taylor	Founders, climate activists, and impact investors

1. Automation: tech-enabled clean energy development
2. Ubiquity: the standard for evaluating clean energy feasibility
3. Marketplace: enabling new business models

OSMO SYSTEMS

Sustainable Seafood through Technology Driven Aquaculture

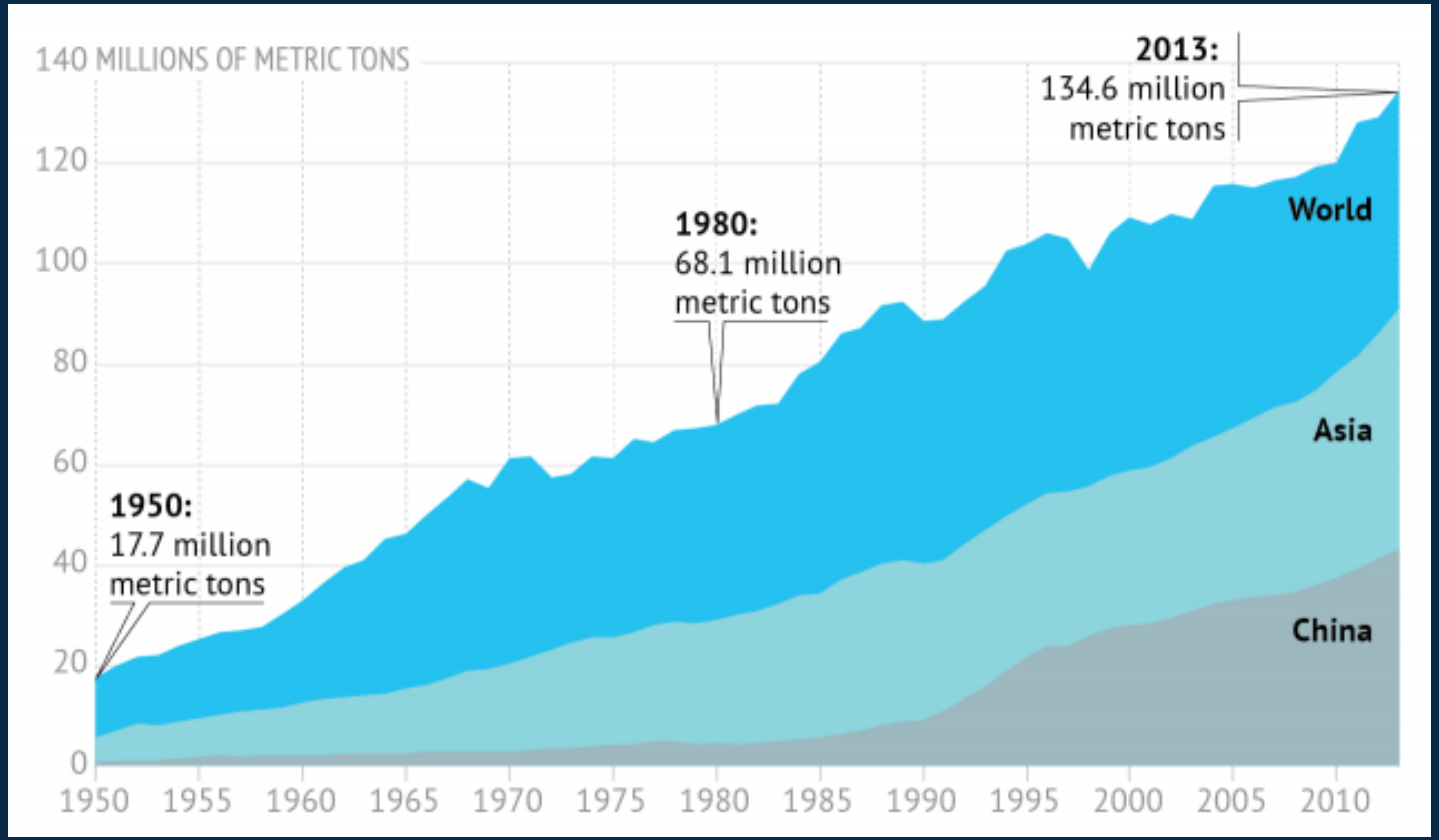
Cutting Edge Hardware

World Class Software

Building Aquaculture's Data Platform from the Ground Up

www.osmobot.com

OCEAN FISHING IS UNSUSTAINABLE



5:1

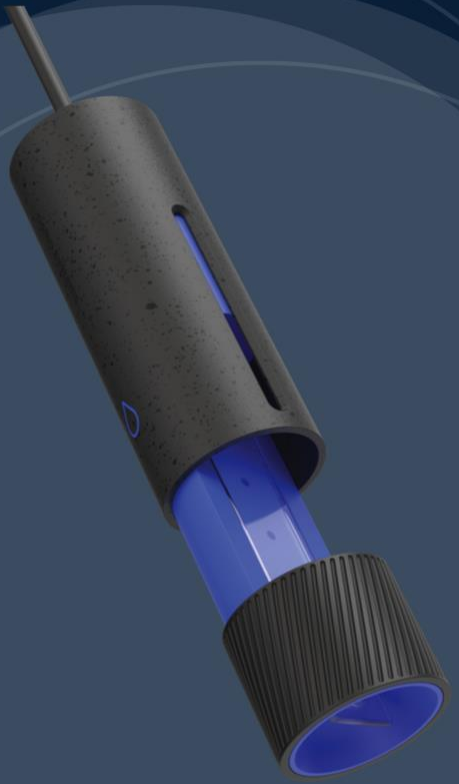
2048

A SENSOR DESIGNED FOR THE POND

One Sensor, All Key Parameters
Dissolved oxygen, pH, NH3 (ammonia), and temperature

Cartridges, Not Probes
Osmobot tells you when to replace the optical cartridge and clean the sensor

Farmer Friendly Pricing
90% less expensive than equivalent monitoring systems today



OSMO SYSTEMS

Sustainable Seafood through Technology Driven Aquaculture

Cutting Edge Hardware

World Class Software

Building Aquaculture's Data Platform from the Ground Up

www.osmobot.com

Aquacycl

BioElectrochemical Treatment Technology (BETT™) is wastewater treatment made BETTer

DR. ORIANNA BRETSCHGER, PHD
Founder
CEO

Wastewater treatment is a global problem

80% of wastewater discharged without treatment

Existing wastewater treatment processes have cost-prohibitive energy requirements

Photo credit: http://www.sixdegreesnews.org/archives/16816/untreated-wastewater-from-cities-expose-885-million-people-to-severe-health-risks-globally

AQUACYCL

Industrial wastewater costs millions to treat

High-strength wastewater -> **100,000+ mg-COD/ L**

Each confection facility may pay **$1MM/ yr** for **hauling/ disposal**

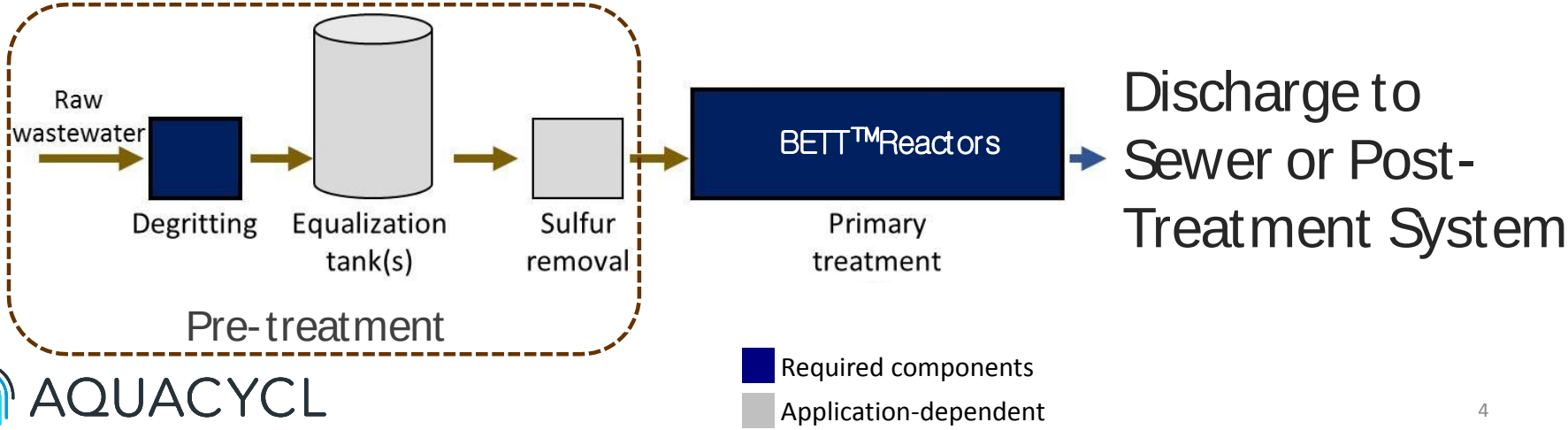
Conventional anaerobic digestion -> **no methane** -> no ROI

Aquacycl BETT™ Systems:
Rented Equipment -> Energy Neutral Operations -> <u>Immediate Savings</u>

AQUACYCL

Aquacycl's BETTer Solution

BioElectrochemical Treatment Technology (BETT™)



AQUACYCL

AQUACYCL COMMERCIALIZING ROBUST TECHNOLOGY

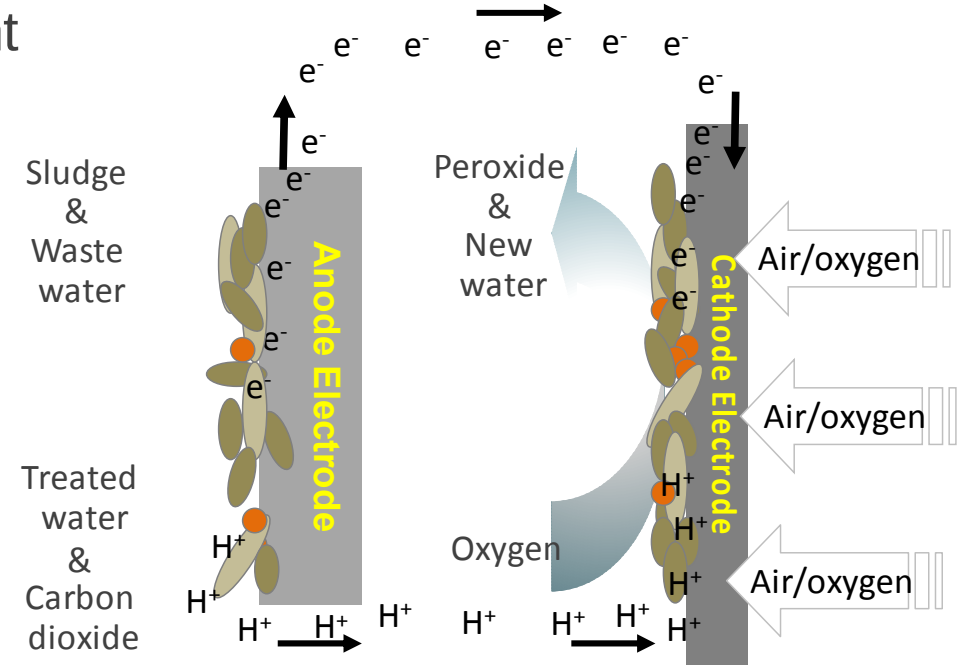
More electricity = faster treatment

Cathode scalability

Sludge Elimination

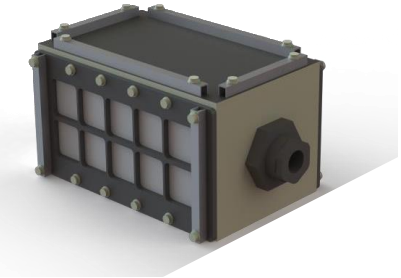
Defensibility

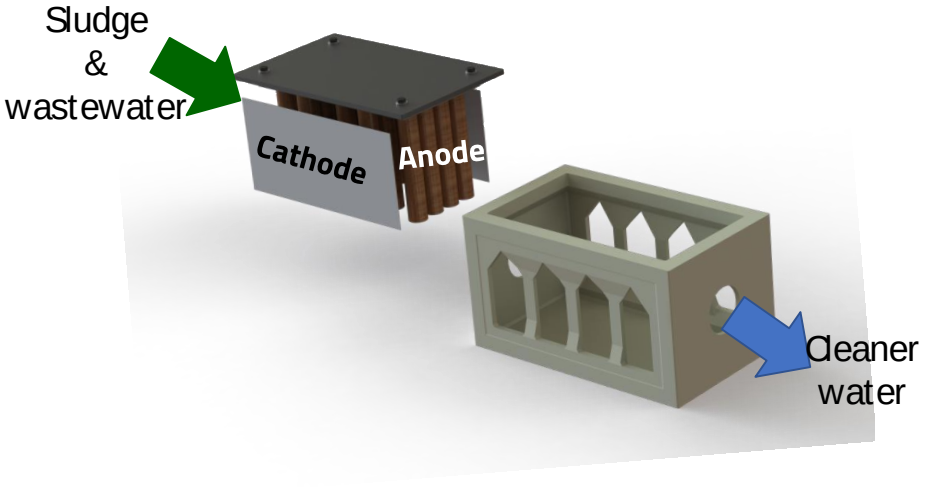
1 patent awarded
8 patents pending
14 years know-how



AQUACYCL

EASILY SCALABLE PRODUCT



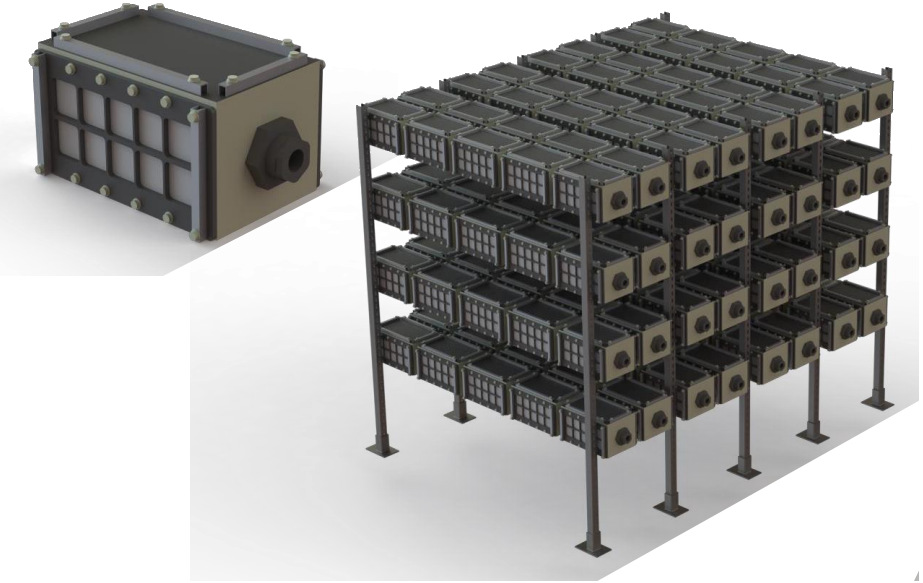


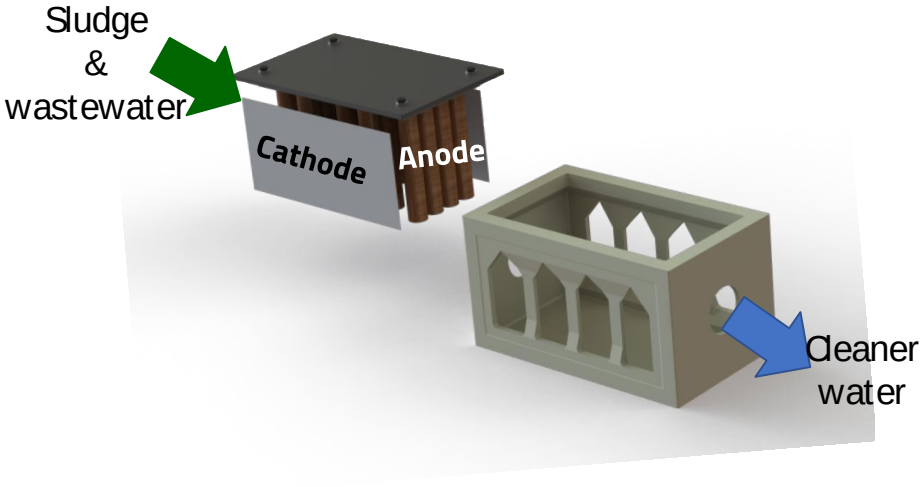
Modular systems w/ lease option = **low CAPEX**

Remote monitoring = **low OPEX**

AQUACYCL

EASILY SCALABLE PRODUCT





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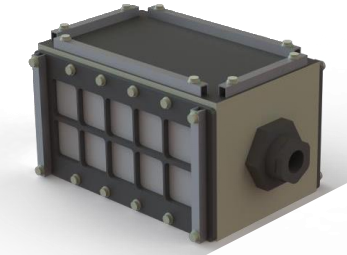
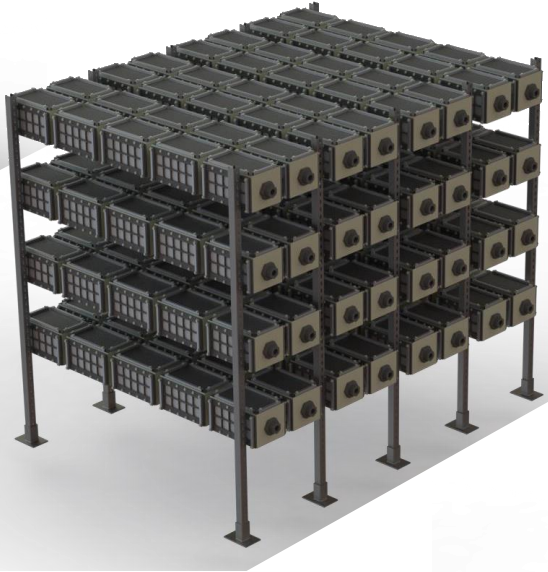
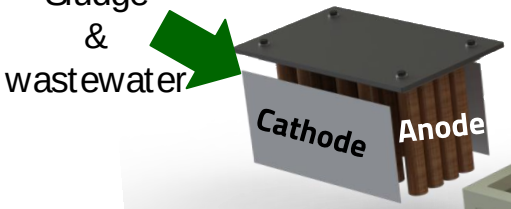
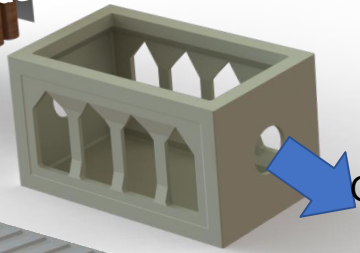
AQUACYCL

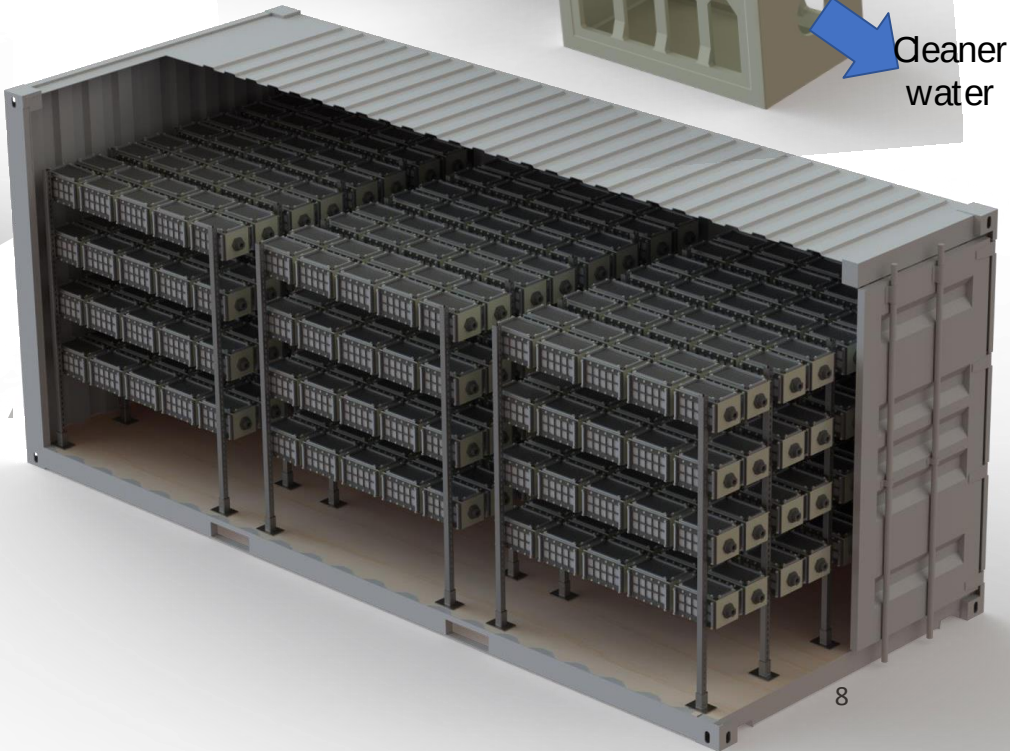
EASILY SCALABLE PRODUCT











Modular systems w/ lease option = **low CAPEX**

Remote monitoring = **low OPEX**

AQUACYCL

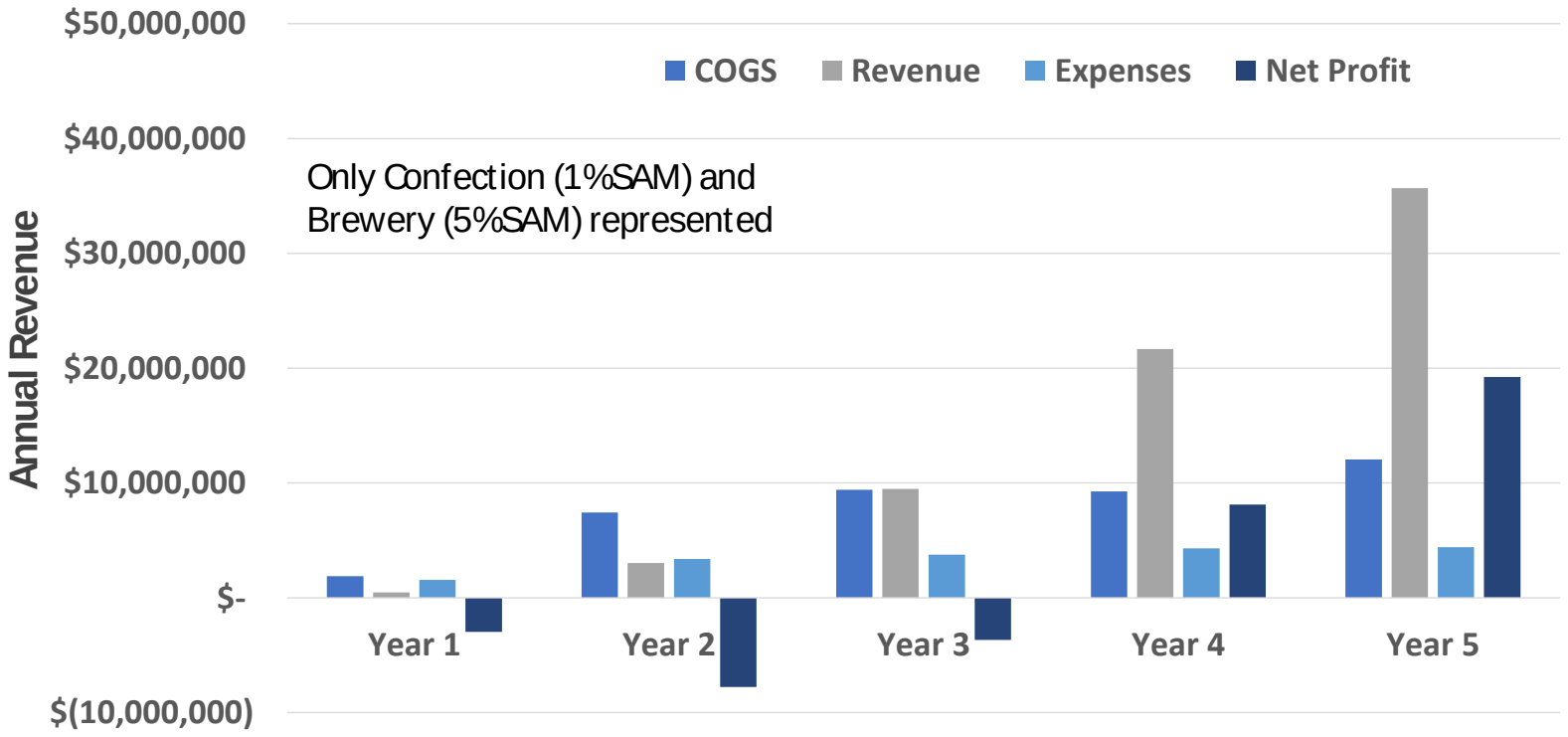
AQUACYCL SYSTEMS RUN 95% MORE EFFICIENT (OPEX)

	Aquacycl BETT™	Aerobic Standard	Anaerobic Standard
Treatment time	**4 hours**	8 hours	15 days
Energy recovery	**Yes (no methane)**	No	Yes (methane)
Total* sludge management	**Annually**	Daily	Monthly
Nutrient dosing	**No**	Yes	Critical
OPEX	**$0.1k**	$3k	$2K

*primary sludge transformation to energy, and secondary sludge reduction

AQUACYCL

INITIAL TARGETS IN FOOD & BEVERAGE



AQUACYCL

EXPERIENCED LEADERSHIP TEAM

Orianna Bretschger, PhD
CEO/ Founder

Sofia Babanova, PhD
VP R&D/ co-Founder

Ryoji Naito
VP Manufacturing/ co-Founder

INDUSTRY & BUSINESS ADVISORS

Anil Jha (BoD) – Former VP R&D Siemens Water & CEO/ Founder AquaNovation
Michael Jones (BoD) – President Profinance & The Maritime Alliance
Wayne Byrne – CEO OXYMEM
Gary Eaton – Water Pigeon/ SD REIN/ Former SDCWA
John Wammes – CEO Water Works Inc.

Project and Corporate Financing Needs for 2019-2029

$900K convertible note round: Scale

- 4x commercial pilots operating w/ customers
- Tooling/ Scale Manufacturing
- Production and system automation

Investment Secured to-date

$1,000,000

Roddenberry FOUNDATION

$1,535,000

New Convertible Note ($900,000):
12 months, 8% interest, 20% discount,
$6.5MM-$7.5MM progressive cap

$25MM non-dilutive financing: Grow

- Execute recurring revenue rental/ service contracts ($10MM pipeline now)
- Grow strategic partnerships/ indirect sales

Revenue secured to-date

$145,000

$80,000

U.S.ARMY

$38,000

agresearch
Farming, Food and Health. First™

$50,000

ICP INNOVATIVE CONSERVATION PROGRAM

AOS Advanced Oxidation System

$190,000 + 5yr O&M

AQUACYCL

AQUACYCL

SB 2018 VANCOUVER JUNE 4 - 7

'People's Choice'
Award Winner

BlueTech FORUM

'Best New Technology Innovation'
Award Winner

weftec
the water quality event™

'Best Pitch', Award Winner

BioElectrochemical Treatment Technology (BETT™) is Wastewater treatment made BETTer

www.aquacycl.com
info@aquacycl.com

Cleantech Forum
San Francisco

Next: 10:45 AM - 11:15 AM
NETWORKING BREAK