PLUG AND PLAY

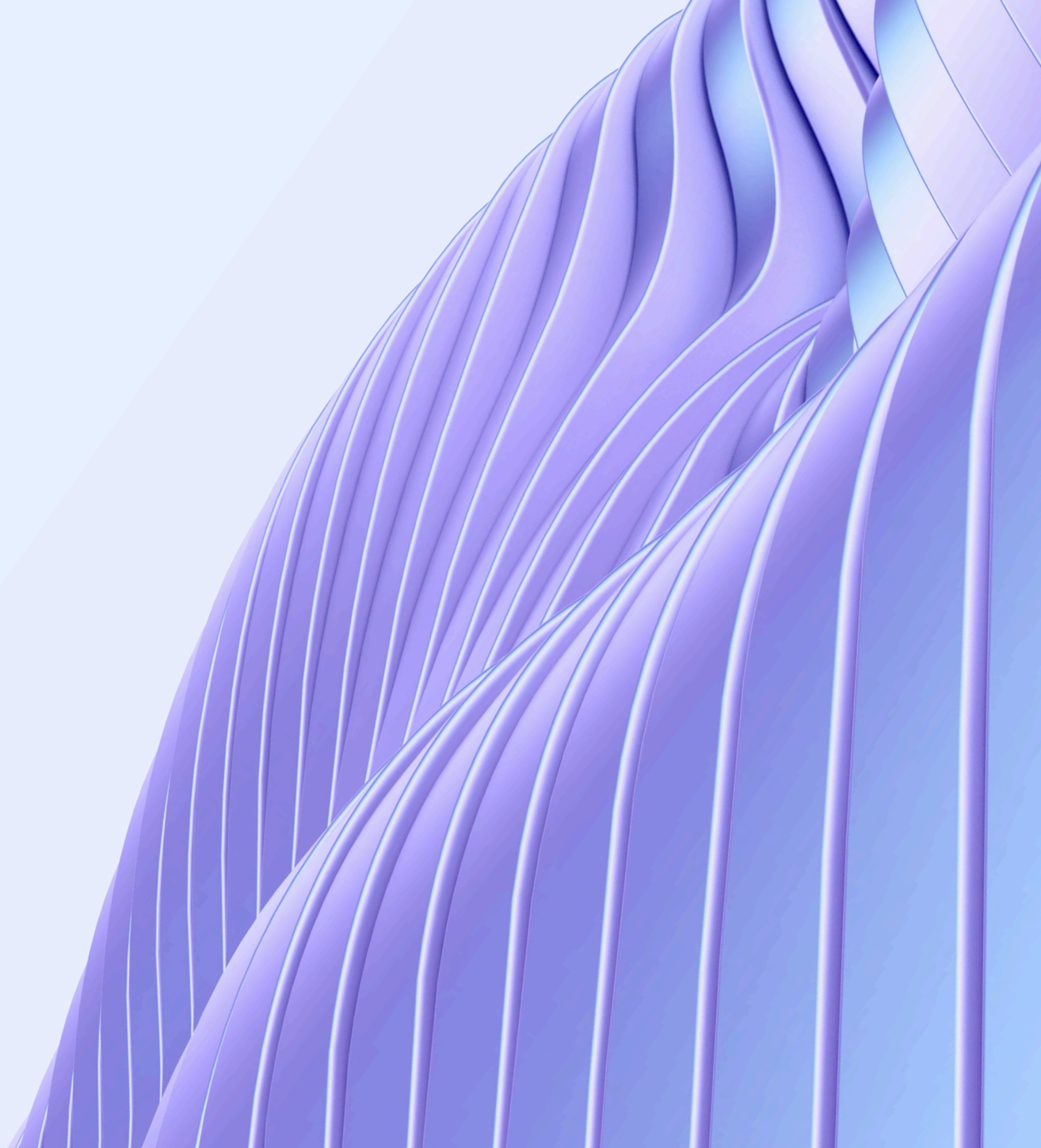
# SILICON VALLEY SUMMIT

JUNE 10-12 2025

PLUG AND PLAY

# ENERGY EXPO

SV SUMMIT



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# OPENING REMARKS

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OPENING REMARKS

## Reza Khaj

Director

*Plug and Play Energy*

#PNPTCSiliconValley

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# START NETWORKING ON BELLA!

**Sign in here:**
https://next.brella.io/join/SVJuneSummit25

**Password: SVJuneSummit25**

- Explore 3 meeting areas on the 1st and 2nd floors (highlighted on the map).
- Access features via the web version or app.
- Network with all attendees.
- View startup profiles.
- Stay updated on the weekly schedule, maps, and announcements.

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5,000+ FOLLOWERS!

# FOLLOW US ON LINKEDIN!

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ENERGY

bitly

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# TODAY'S AGENDA

| | |
|---|---|
| 11:00 AM | OPENING REMARKS |
| 11:05 AM | KEYNOTE SPEAKER |
| 11:15 AM | STARTUP PITCHES |
| 11:40 AM | CASE STUDY & SUCCESS STORY |
| 12:00 PM | STARTUP PITCHES |
| 12:25 PM | CLOSING REMARKS |
| 12:30 PM | GROUP PHOTOS |

# PLUG AND PLAY ENERGY

| Year Launched | Partners | Energy Startups | Startups Accelerated | Energy Portfolio |
|---|---|---|---|---|
| 2017 | 20+ | 8000+ | 250+ | 40+ |

Alberta
Seattle
Headquarters
Silicon Valley
San Jose
Los Angeles
Arizona
Cedar Park
Topeka
Frisco
Warsaw
Toronto
Detroit
Hoboken
Cleveland
NW Arkansas
McKinney
Orlando
NeoCity
Bryan-College Station
Sugar Land
São Paulo
Hamburg
Gothenburg
Amsterdam
Stuttgart
Antwerp
Munich
Vienna
United Kingdom
Vilnius
Paris
Turin
Basel
Milan
Tirana
Madrid
Istanbul
Valencia
Catania
Barcelona
Modena
Ben Guerir
Cairo
Saudi Arabia
Uzbekistan
Abu Dhabi
Beijing
Seoul
Osaka
Tokyo
Kyoto
Wuhan
Shanghai
Taoyuan
GIFT City
Shenzhen
Bangkok
Kuala Lumpur
Phnom Penh
Singapore
Jakarta




**Silicon Valley**
- Energy & Climate



**Brazil**
- Energy & Climate



**Tokyo**
- City vertical focus

ACARIO TOKYO GAS GROUP
OMV
TOKYO GAS
jera
MITSUI & CO.
CHIYODA CORPORATION
FURUKAWA ELECTRIC GROUP
OSAKA GAS
worley
VOLVO PENTA
PG&E
DUKE ENERGY
CPFL ENERGIA
a2a
ENERJISA Energy of Turkey
eneva
EWE

# Energy Focus Areas

## Green and Renewable Energy Generation



SwiftSolar

FERVO ENERGY

ORPC

OKLO

SolarMente

DANDELION

Helical Fusion

Natel

# Energy Focus Areas

## Green and Renewable Energy Generation



SwiftSolar
FERVO ENERGY
ORPC
OKLO
SolarMente
DANDELION
Helical Fusion
Natel

## Electrification and Smart Grids



EXOWATT
WeaveGrid
enline
LAD
ENERGYDOME Our WORLD can't wait.
SAPIENT
Plexigrid
HyWatts

# Energy Focus Areas

## Green and Renewable Energy Generation



SwiftSolar
FERVO ENERGY
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## Electrification and Smart Grids



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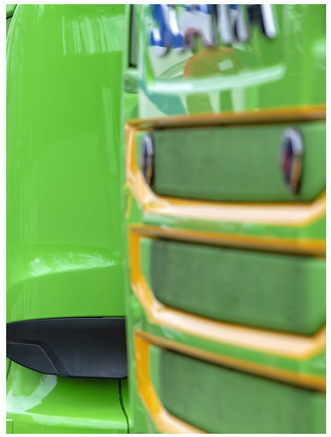
## Sustainable Fuels



Electrochaea
sunfire
GENERAL GALACTIC
UTILITY
twelve
Enapter
POWER to HYDROGEN
ammobia

# Energy Focus Areas

## Green and Renewable Energy Generation



SwiftSolar
FERVO ENERGY
ORPC
OKLO
SolarMente
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Helical Fusion
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## Electrification and Smart Grids



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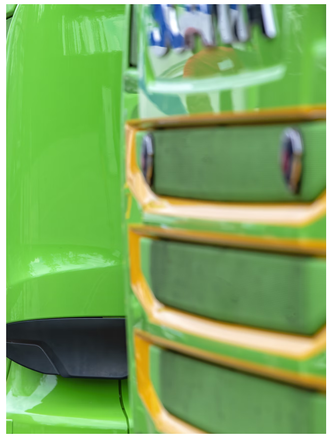
## Sustainable Fuels



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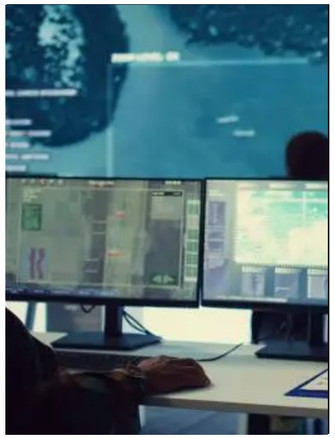
## Digital Transformation and AI



Terra AI
exodigo
GHGSAT
datch
novity
avathon.
HData
ARCHETYPE AI

# Energy Focus Areas

## Green and Renewable Energy Generation



SwiftSolar
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## Electrification and Smart Grids



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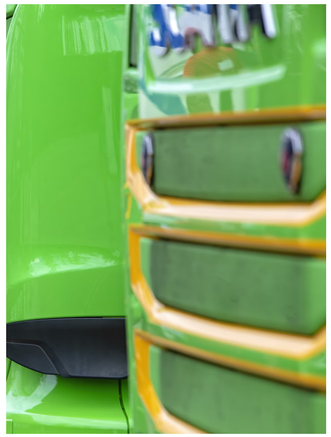

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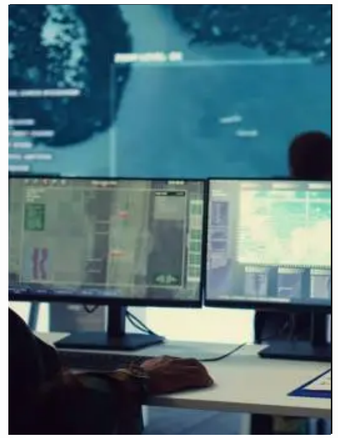

Terra AI
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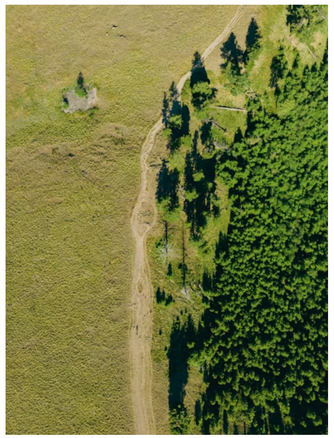
ARCHETYPE AI

## Carbon Circularity



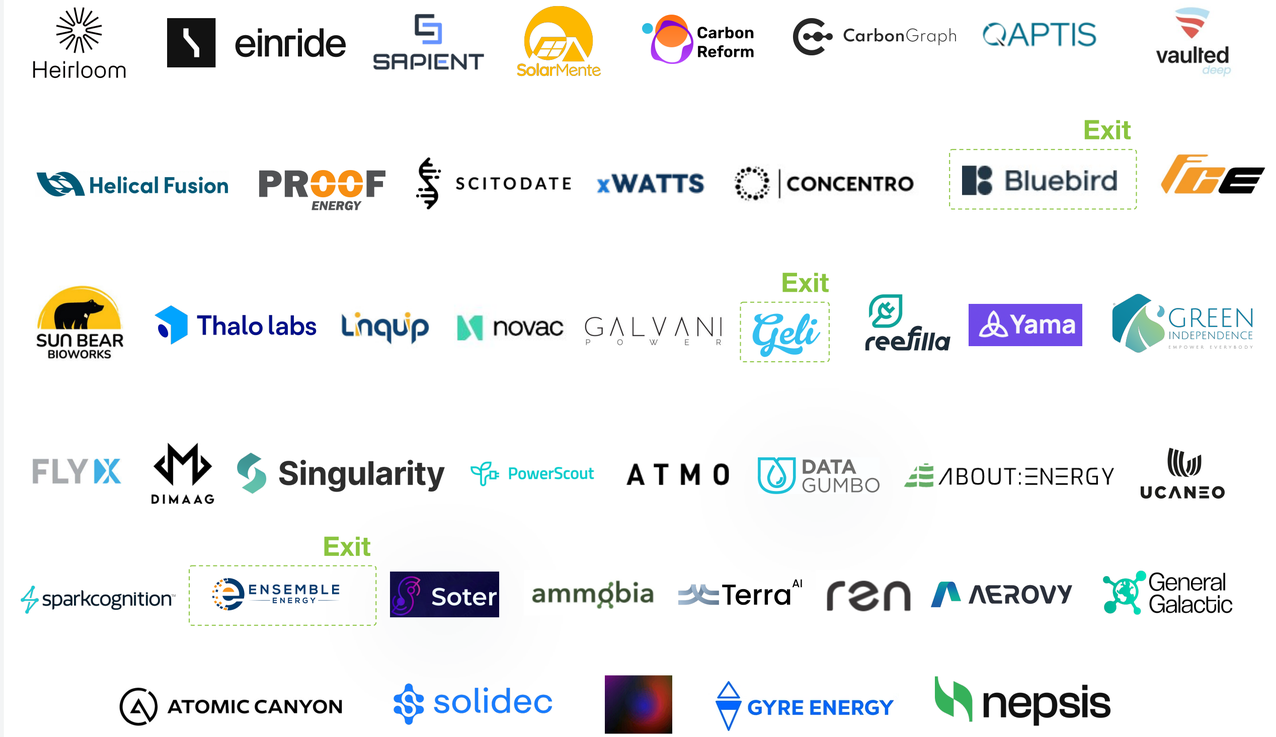
vaulted deep
Heirloom
UCANEO
CHARM INDUSTRIAL
HOLOCENE
Yama
mitico
Sylvera

# Our Energy and Climate Tech Portfolio

**50+**
Portfolio companies

**$100k**
PNP average ticket

**$1.2B+**
Total money raised



# Our Energy and Climate Tech Portfolio

Heirloom · einride · SAPIENT · Carbon Reform
vaulted deep · Helical Fusion · PROOF ENERGY · ice
sparkcognition · SUN BEAR BIOWORKS · SCITODATE · xWATTS
CONCENTRO · Thalo labs · Linquip · SolarMente
Exit: Geli
GALVANI POWER · CarbonGraph · QAPTIS
Exit: Bluebird
FLYX · DIMAAG · Singularity
PowerScout · ATMO · UCANEO · reefilla
Exit: ENSEMBLE ENERGY
ammobia · Soter · novac
Terra AI · DATA GUMBO · ABOUT:ENERGY · GREEN INDEPENDENCE
AEROVY · General Galactic · Yama · ren

## New portfolio highlights 2025

ATOMIC CANYON
2024, CA, US

**Round**: Seed, $7M
ENERGY IMPACT PARTNERS · Commonweal · Tower RESEARCH CAPITAL




PG&E Launches First Commercial Deployment of On-Site Generative AI Solution for the Nuclear Energy Sector at Diablo Canyon



# Our Energy and Climate Tech Portfolio

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einride
SAPIENT
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SUN BEAR BIOWORKS
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ABOUT:ENERGY
GREEN INDEPENDENCE
AEROVY
General Galactic
Yama
ren

## New portfolio highlights 2025

ATOMIC CANYON

2024, CA, US

**Round**: Seed, $7M

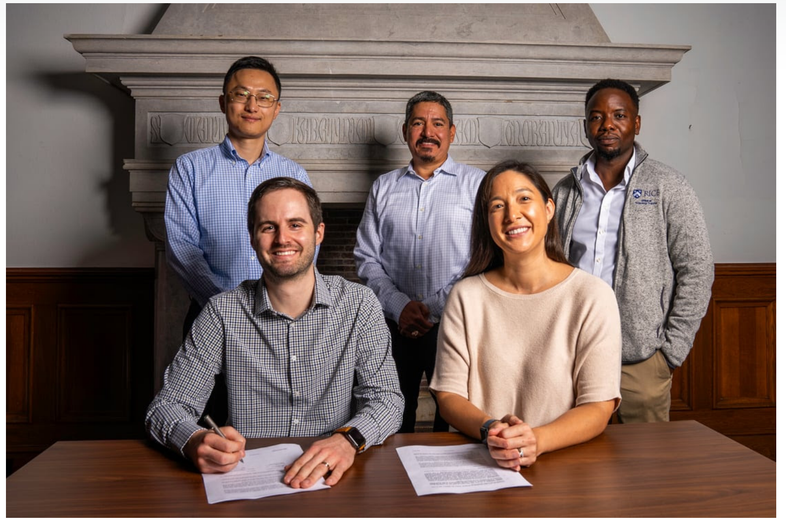
ENERGY IMPACT PARTNERS
Commonweal
Tower RESEARCH CAPITAL

solidec

2024, Houston, TX, US

**Round**: Pre-seed, $2.5M

NEW CLIMATE VENTURES
Collab Fund
Ecosphere Ventures

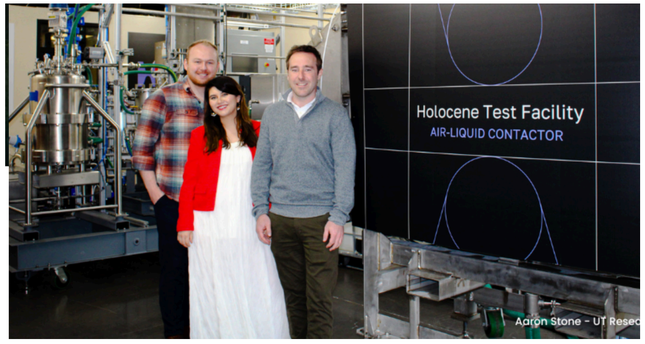


# Latest Portfolio Highlights

HOLOCENE

Heirloom (2020, Knoxville, US) specializing in direct air capture (DAC) technology using a low-temperature chemical process to remove carbon dioxide ($CO_2$) from the atmosphere.
Occidental Petroleum (Oxy) acquired.

**Plug and Play Energy Batch 15**




**Knoxville-based Holocene gets acquired by oil and gas giant: Oxy**

vaulted deep

Vaulted (2023, Houston, US) is a carbon removal startup that permanently stores carbon-rich organic waste deep underground. Vaulted Deep's technology repurposes established oil and gas techniques, specifically slurry injection, to sequester carbon-rich waste.

**Portfolio**, **Stage** Series A, **Funding** $40.3M




**News** April 23, 2025

Vaulted Deep Wins $8M in XPRIZE Carbon Removal Competition




**News** November 14, 2024

Vaulted Deep's Series A raise of $32.3 million, led by Prelude Ventures

# Hydrogen Immersion Week, February 2025

Meeting strategic partners and understanding the market (growth) for renewable and low-carbon hydrogen in Europe

- 18 meetings & site visits




- **Electrolysers** (production):
- **Turquoise hydrogen** (production):
- **Storage**:
- **Usage**:
- **Electrochemical separation:**
- **Investors/Market Opinions**:

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# KEYNOTE SPEAKER

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KEYNOTE SPEAKER

# Larry Bekkedahl

Senior Vice President
*Portland General Electric*

#PNPTCSiliconValley

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# About Portland General Electric

## Quick facts

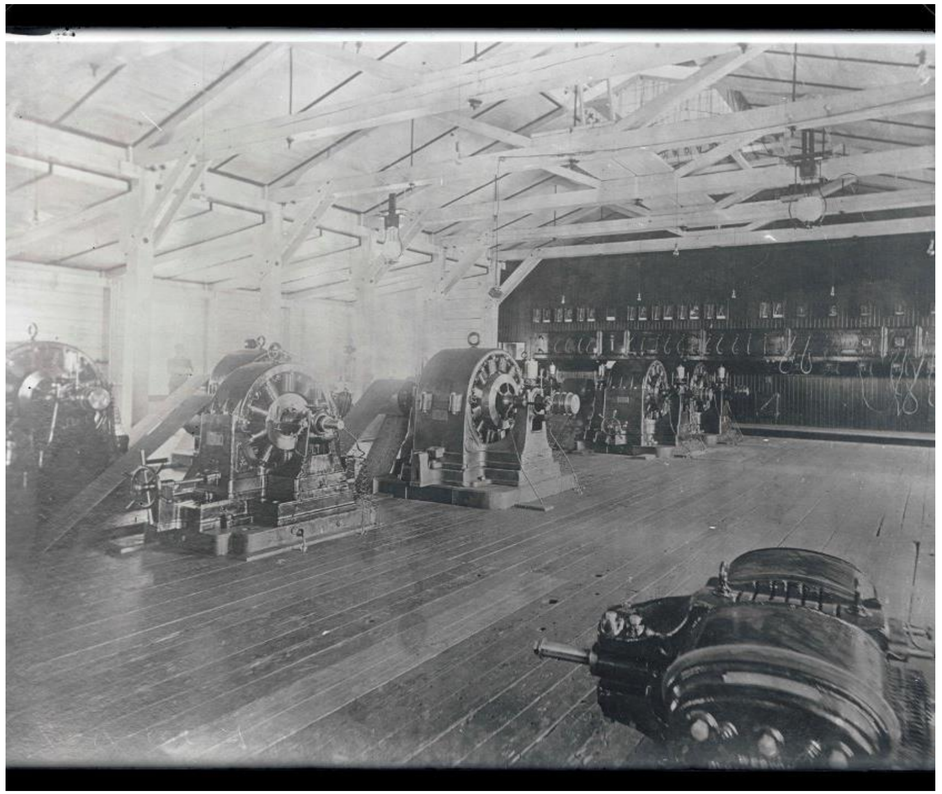
- PGE serves over 950,000 customers in 51 incorporated cities across Oregon.
- We have approximately 2,960 employees.
- Continued position as #1 ranked renewable power program in the U.S. for 15 years according to the National Renewable Energy Laboratory (2024).[1]
- PGE was PGE was ranked the No. 1 utility in the 2024 Forrester U.S. Customer Experience Index.
- In 2024, PGE employees, retirees and the PGE Foundation donated $5.5 million and volunteered nearly 23,000 hours to more than 480 nonprofit organizations.

## Leading the way to a clean energy future for Oregon

- Our goals align with the state's 100% clean energy by 2040 framework. The targets to reduce baseline greenhouse gas emissions from power served to Oregon retail customers are:
    - 80% reduction in greenhouse gas emissions by 2030
    - 90% reduction in greenhouse gas emissions by 2035
    - 100% reduction in greenhouse gas emissions by 2040



# Building on over 100 years of innovation and reliable operations



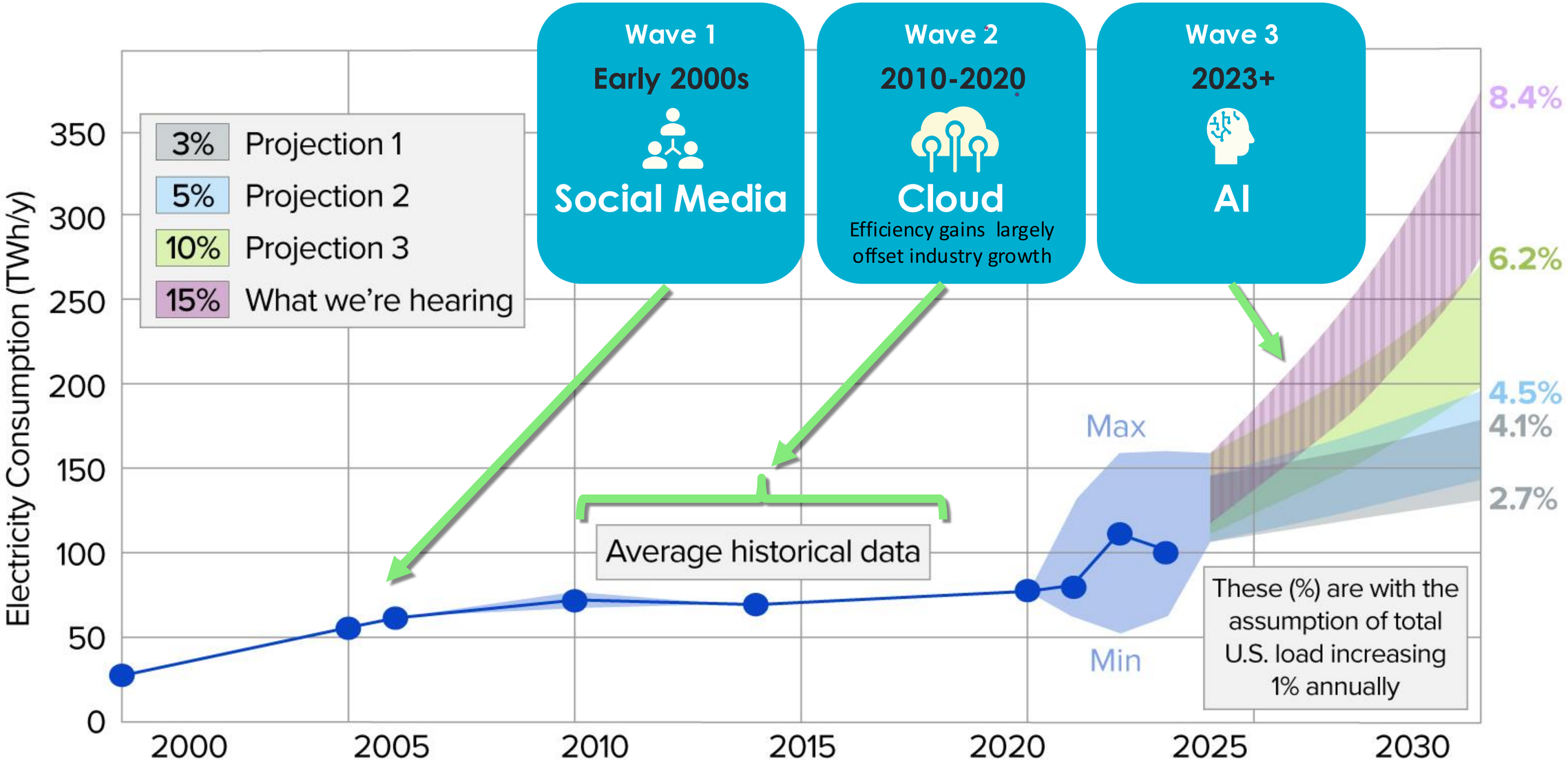
Bold Ambition, Achieved



Transmit Electricity over a long distance, Power a City

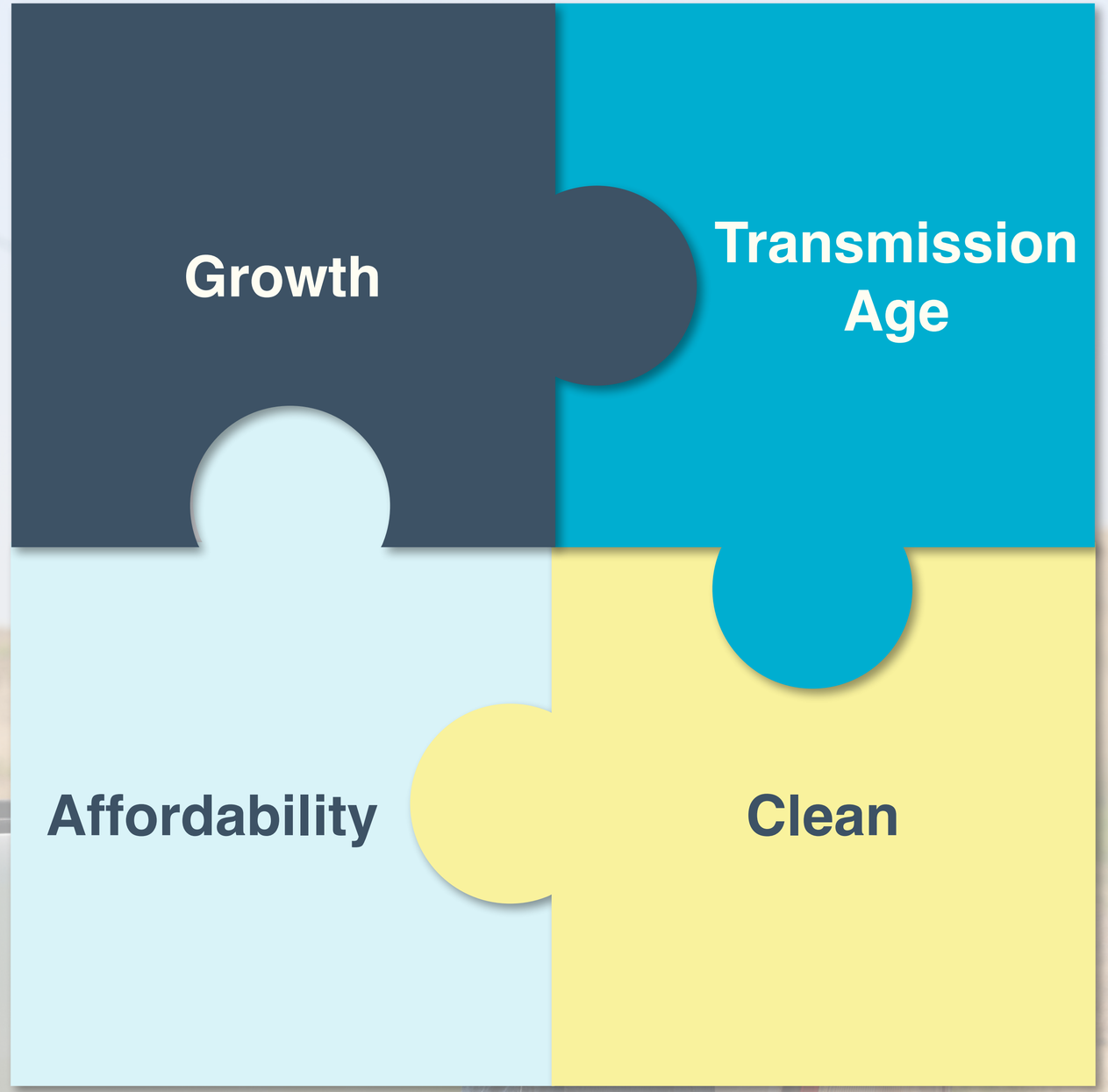
Internal

# AI is Driving a Third Wave of Data Center Growth



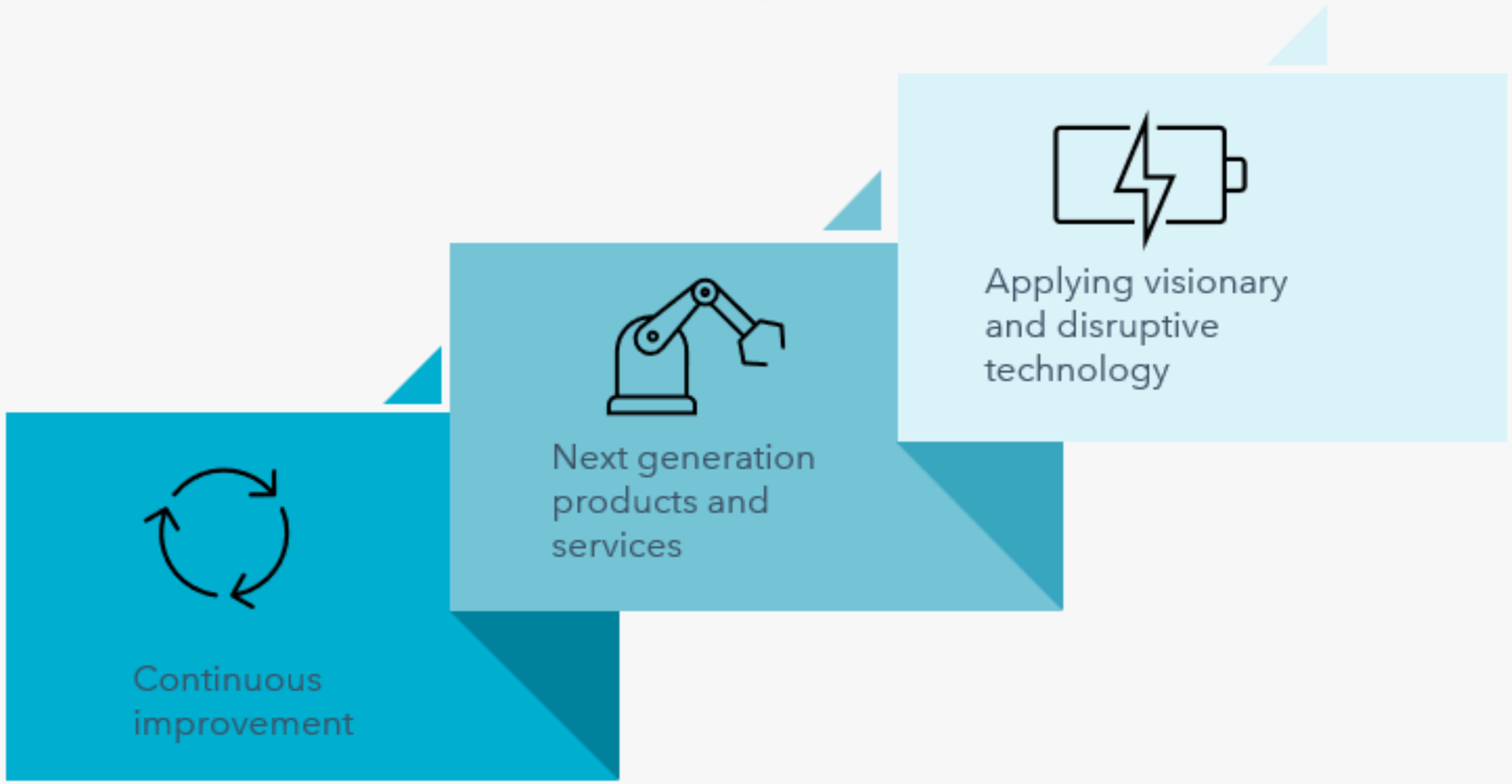

Internal

# Solving the puzzle




Internal

# What Innovation Means to PGE




PGE has positioned itself with partners and investments to adopt and scale new technologies, products and business models as they prove cost-effective

## PERFORM

Continuous improvement of operations, cost efficiencies, reliability, safety, environmental compliance.

## GROW

Creation of next generation products, services in TE, customer energy management, regional expansion and clean empowerment.

## TRANSFORM

Apply visionary, disruptive technology from partner labs and startups to achieve 100% decarbonization, virtual power plant (VPP) platform, and value for customers.

**Technology - Markets - Process - Culture**

# Innovation focus areas



## Grid performance

Building an intelligent, resilient and flexible grid.

**Key runways:** DER integration and operation, grid management systems, and enterprise DERMS



## Decarbonization at scale

Decarbonizing our regional energy supply and assessing emerging, front-of-meter technologies.

**Key runways:** Energy supply resource investments, regional expansion



## Transportation electrification and load flexibility

Scaling PGE's Virtual Power Plant and creating customer value.

**Key runways:** VPP, customer centric product and program design



## Business enhancements

Optimizing workflows to deliver on corporate goals.

**Key runways:** AI maturity, wildfire risk mitigation, grid hardening

# Strategic innovation process

**STEP 00**
**In the Hangar**

Ideation and discovery.

Pitch idea at "Spark Tank"
**[DECISION POINT]**

**STEP 01**
**Taxi to Runway**

Scope problem statement & solution.

Scoring Session with focused SMEs to document risks/benefit.
**[DECISION POINT]**

**STEP 02**
**Runway**

Develop Test Plan & document learning objectives.

Complete Cyber/Risk, Procurement, Legal Review.

**STEP 03**
**In-Flight**

Test prototype in the field.

**Demonstration Period**

**STEP 04**
**Landing**

Capture "Day in the life" learnings.

Draft value proposition to inform final recommendation.
**[DECISION POINT]**

**STEP 05**
**Final Decision**

Hand off to business (ex. executive review, OSPMM technology white paper, etc.).
**[DECISION POINT]**

Learnings documented in library and shared with PGE's innovation ecosystem.



1. Can you see what you need to achieve?

2. How much time did you spend on it last week?

3. How excited are you about it?

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# STARTUP PITCHES

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# STARTUP PITCH

THIOZEN

## THIOZEN

Pragmatic Energy Innovation through Low-Cost Hydrogen from Hydrogen Sulfide.

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# THIOZEN

Oil and gas waste to low-cost hydrogen

# Customer hydrogen is **dirty** or **expensive**

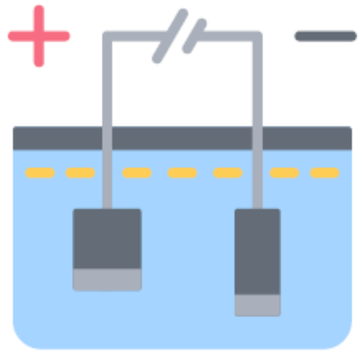
## Hydrocarbon Reforming ($CH_4$)



**2%**

**Global $CO_2$ Emissions[1]**

## Electrolysis ($H_2O$)



**2-3x**

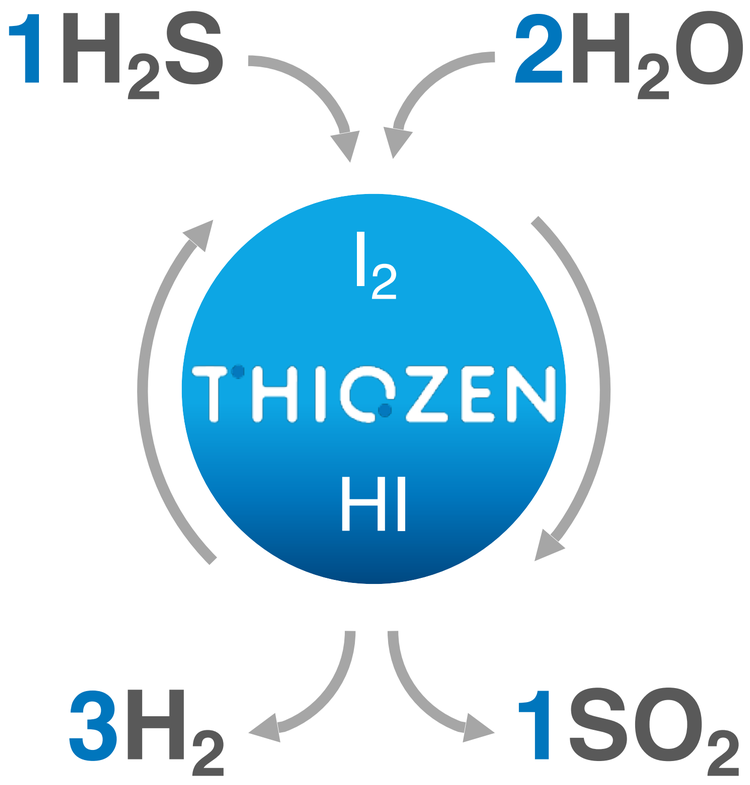
**Current Production Costs[2]**

1. IEA, The Future of Hydrogen, 2019
2. International Journal of Hydrogen, Ulleberg et. al, 2020

# New **low-cost** method for **zero-emission** hydrogen

## Thiozen's Novel Chemical Cycle

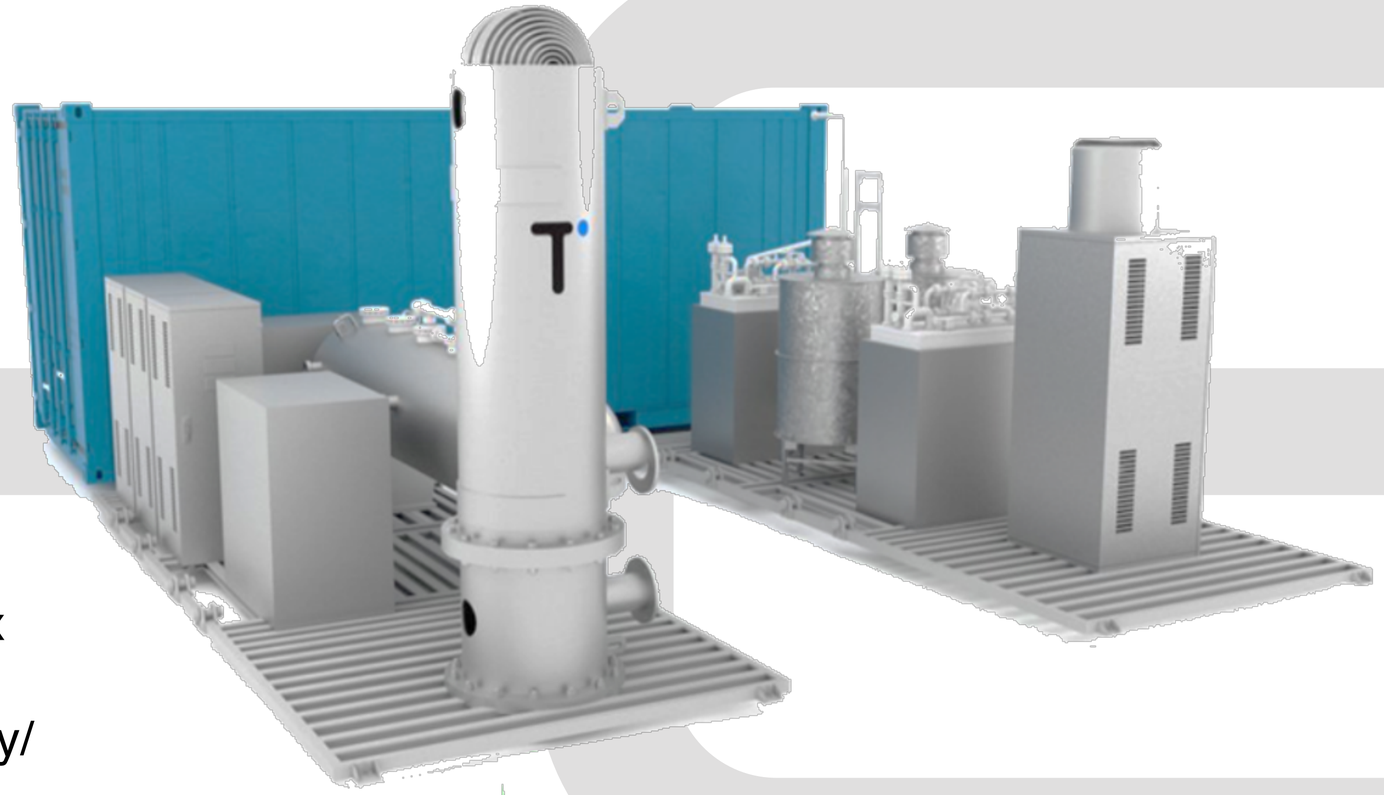
- Low Emission $H_2$
- Low Cost $H_2$
- Patent Protected



# ZEN creates value from waste

## Sour Gas

- $H_2S$ containing gas
- % Varies by site



Able to produce >5x the amount of hydrogen per energy/ natural gas cost

## Sweet Gas

- Gas without $H_2S$
- Natural Gas, $H_2$

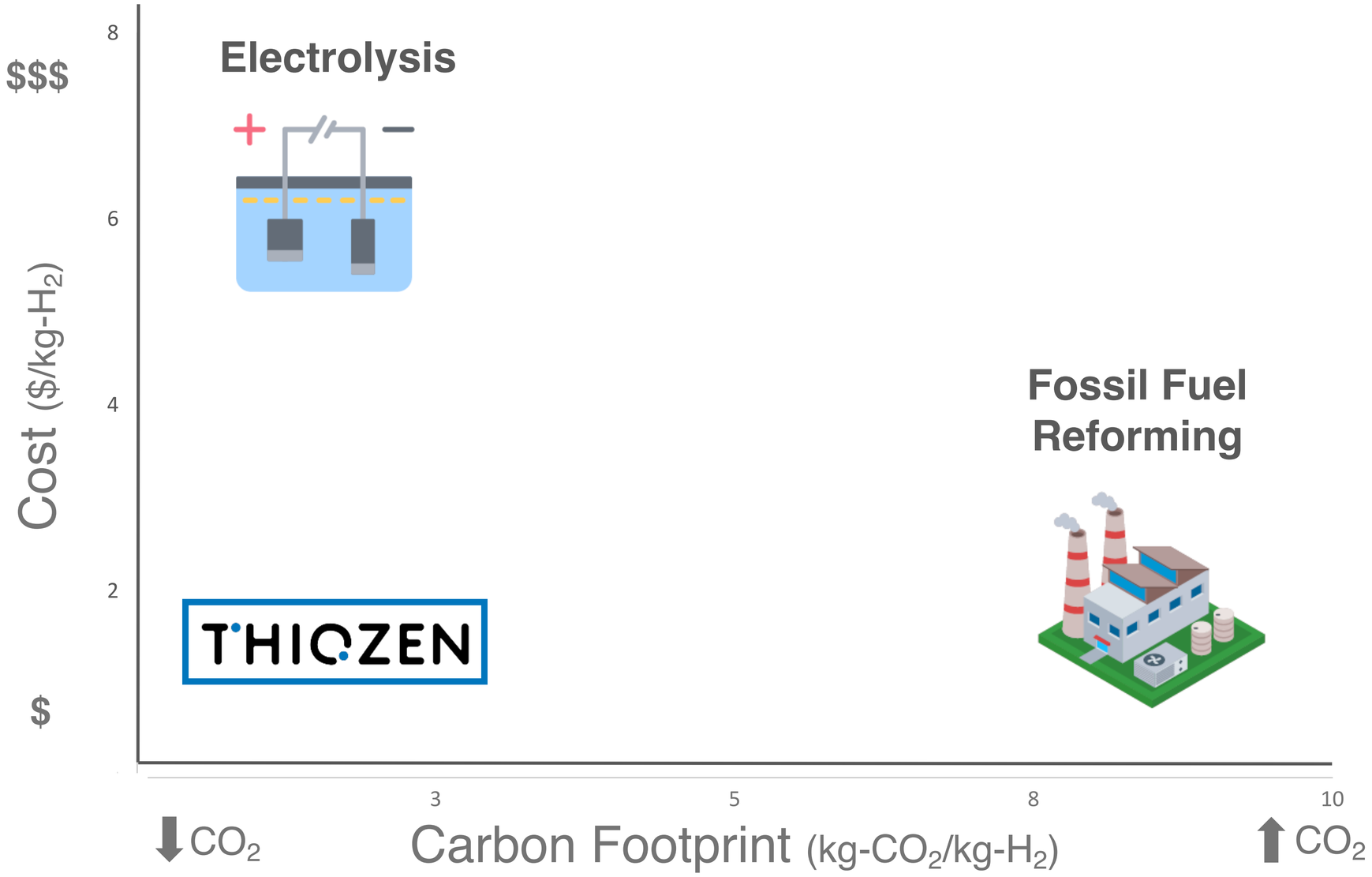
## Hydrogen

- Traditional $H_2$ use
- Emerging $H_2$ use

## Sulfur Products

- $SO_2$ to Fertilizer
- $SO_2$ to Sulfuric Acid

# Clear **advantage** on fundamentals




| Metrics | Carbon Optimized | Cost Optimized |
|---|---|---|
| **Cost** *($/kgH2)* | **$1.50** | **$1.08** |
| **Carbon** *($kgCO_2/kgH_2$)* | **0.05** | **1.4** |

**No Green Premium**
**95% less emissions**

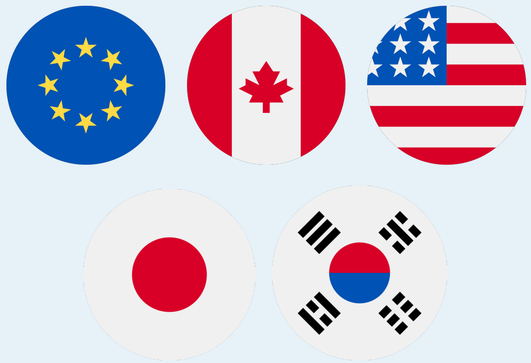


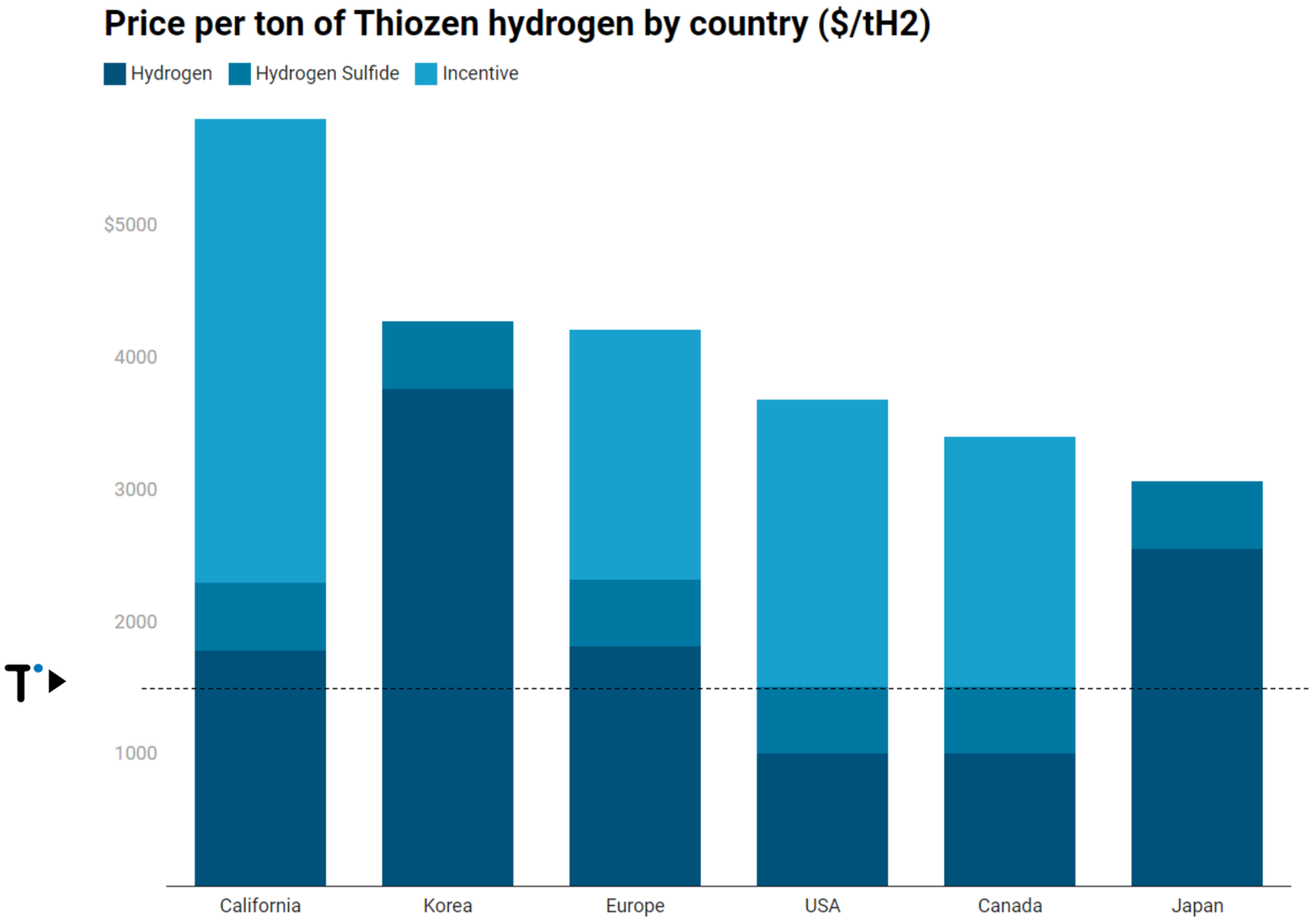
THIOZEN

# **High return investment** for customers globally

## 1-2 year payback period for customers

- 50-75% margins[1]
- >30% IRRs[1]





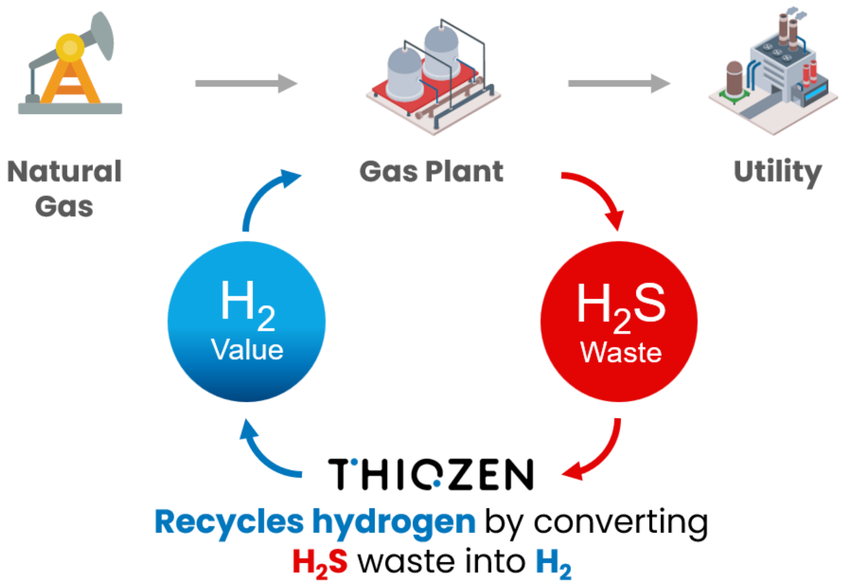

1. Economic estimate based on a 23 tpd H2 commercial implementation using Aspen Pro, assuming no Thiozen value capture, subject to change

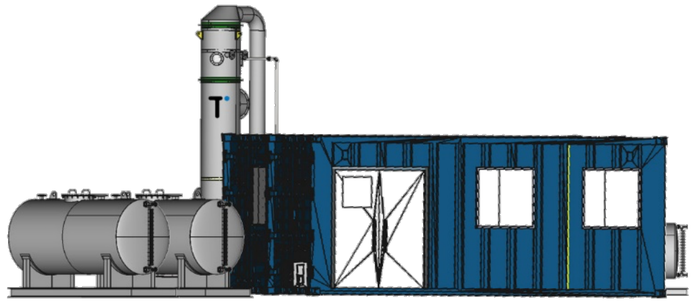
THIOZEN

# In-field pilot proves $H_2S$ reforming is real



# **First Of A Kind** in Alberta, Canada









EMISSIONS REDUCTION ALBERTA

CSV midstream solutions

ALLARDYCE BOWER ABC CONSULTING INC.



THIOZEN

# Pipeline Energy **transition** & **expansion** projects

**Energy Expansion** **Energy Transition**



Refinery Capacity Expansion



Exploration of high $H_2S$ Fields



Sour gas plant integration



$CO_2$ Utilization enabled by $H_2$

Market Size of Existing Relationships: **$2B**



THIOZEN

# Team stands **poised for success**



**Ryan Gillis**
**CEO, Co-Founder**

MIT Chemical Engineering Ph.D.

*Inventor of Thiozen Technology*
*Energy Entrepreneurship, MIT*
*B.S. Chemistry,*
*Brigham Young University*



**William H. Green**
**Board, Co-Founder**

Director, MIT Energy Initiative

*World Leader in Fuel Chemistry*
*Principal Investigator, Exxon R&D*
*Ph.D. Chemistry, Berkeley*
*B.A. Chemistry, Swarthmore*



**Ajay Bawa**
**COO, Co-Founder**

MIT MBA
Harvard MPA

*Vice President, LA Gauge Mfg.*
*Quality Manager, LA Gauge Mfg.*
*Founder, Seed Consulting Group*
*B.S. Industrial Engineering, Berkeley*

## Board Members



**Fabien Duclocher**
Director of Technology
ENI Next



**Maureen Boyce**
Managing Partner
Good Growth Capital



**Miles Allen**
Business Development
Clean Energy Advisors

# What we are looking for…



## Industrial Partners

Particular Interest in East Asia (especially Japan and South Korea)

- Joint Development Projects
- Technology Partnerships



## Investment Now

SAFE Round

- $45M Cap
- 20% Discount

Space for an additional $1-2M USD



## Investment Soon

Series A Funding

- Winter/Spring 2026

**Ryan Gillis, CEO**
**ryan@thiozen.com**

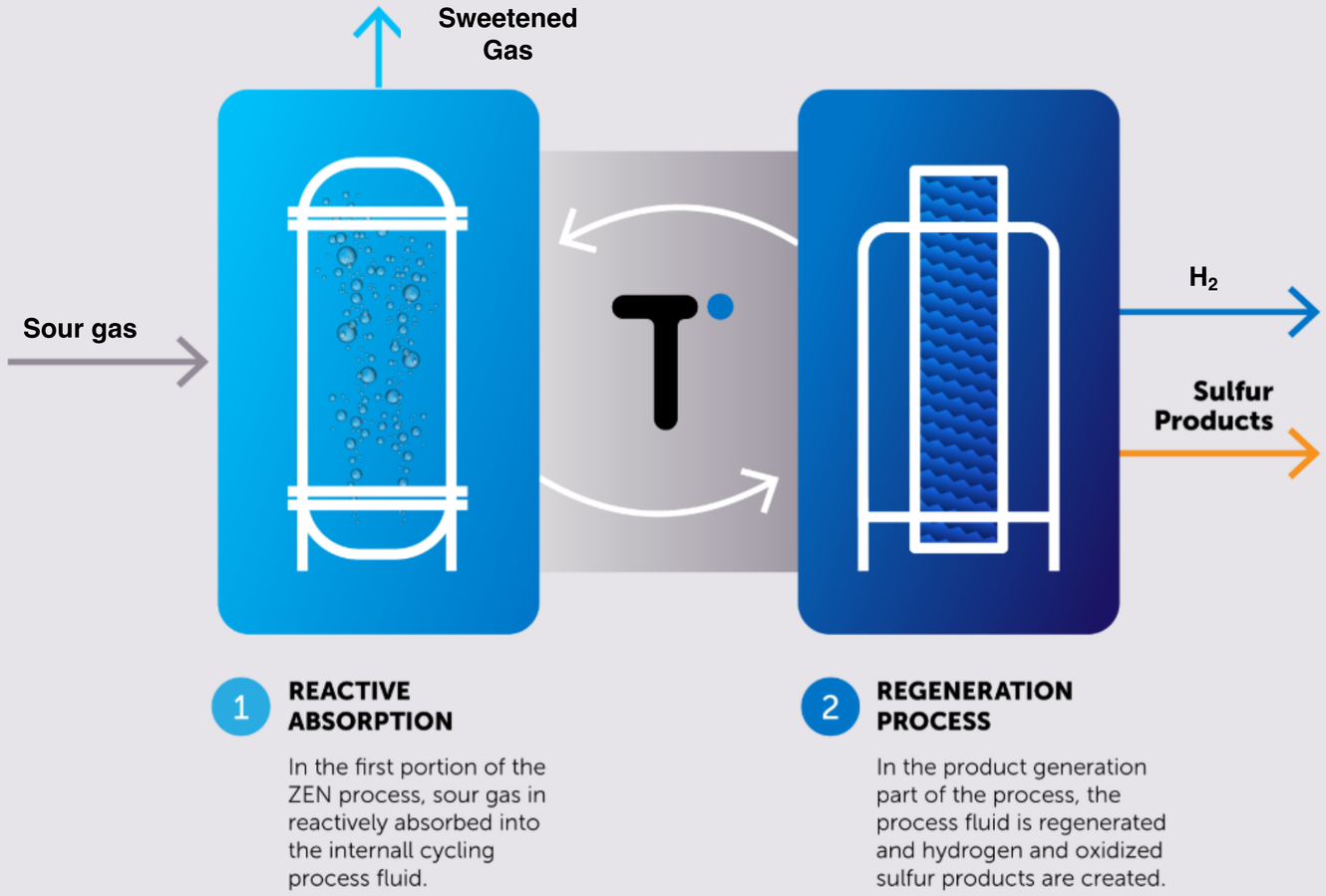
# THIOZEN

Oil and gas waste to low-cost hydrogen

**Ryan Gillis**
**CEO**
ryan@thiozen.com

**Ajay Bawa**
**COO**
ajay@thiozen.com

# How ZEN™ works




## Chemical Process

### Overall

$$H_2S + 2H_2O \rightarrow 3H_2 + SO_2$$

### Step-by-Step

1. $H_2S + 3I_2 + 2H_2O \rightarrow 6HI + SO_2$
2. $6HI \rightarrow 3H_2 + 3I_2$

### Conditions

Temperature: 300°C – 350°C

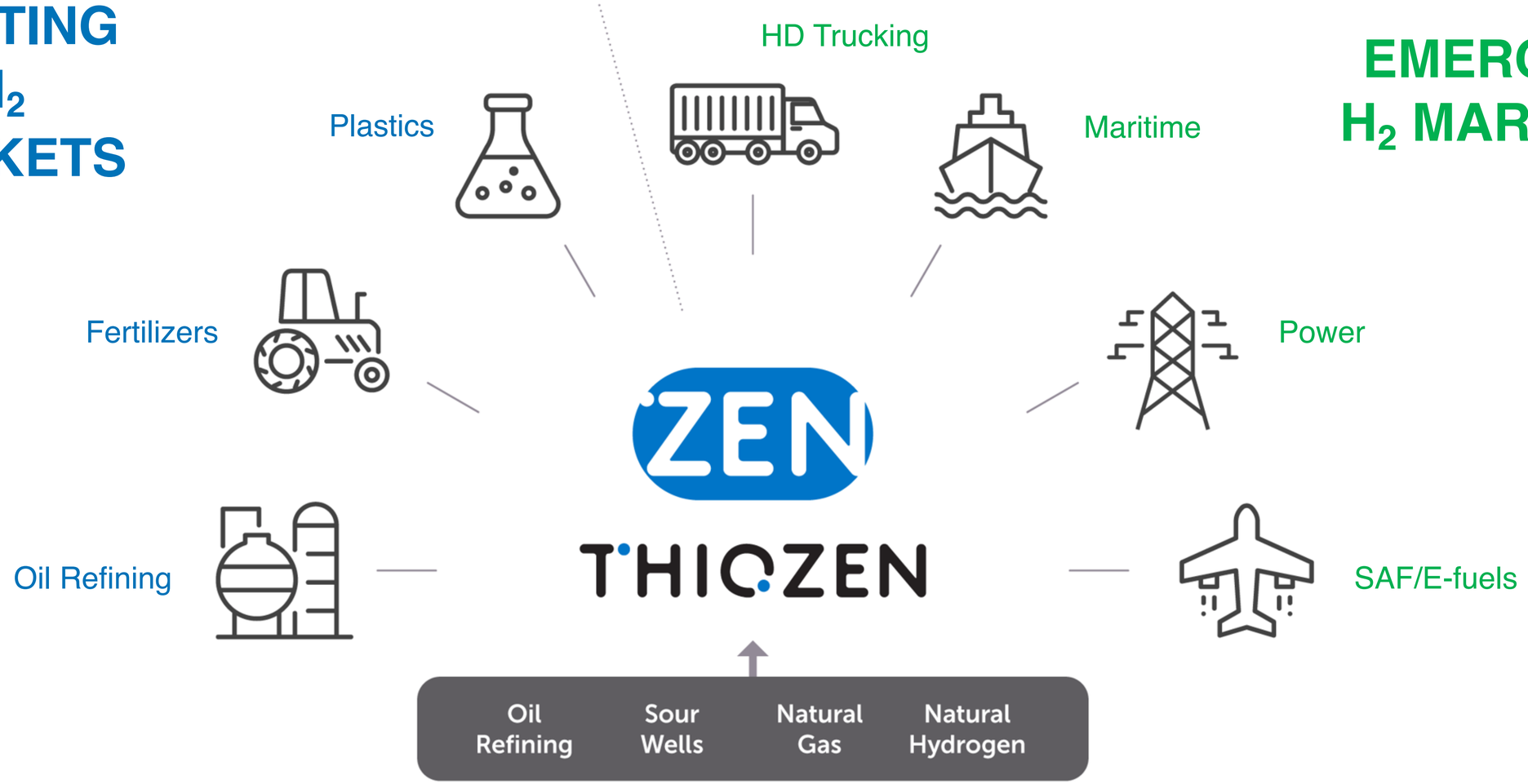
Pressure: Tunable

1. Several additional units for pressurizing the process streams, purifying the outlet flows, and recovering energy are omitted for simplicity in this representation

# **$51B** global market

**EXISTING $H_2$ MARKETS**

**EMERGING $H_2$ MARKETS**






THIOZEN

PLUG AND PLAY

SV SUMMIT

# STARTUP PITCH

H Genium

## HGENIUM

HGenium is commercializing a thermochemical water splitting process, developed at Caltech, which simultaneously splits water and captures CO2 in a single integrated process, driven primarily by heat instead of electricity.

#PNPTCSiliconValley

Join us at **pnptc.com**

# Genium

## Clean Feedstocks for Clean Hydrocarbons

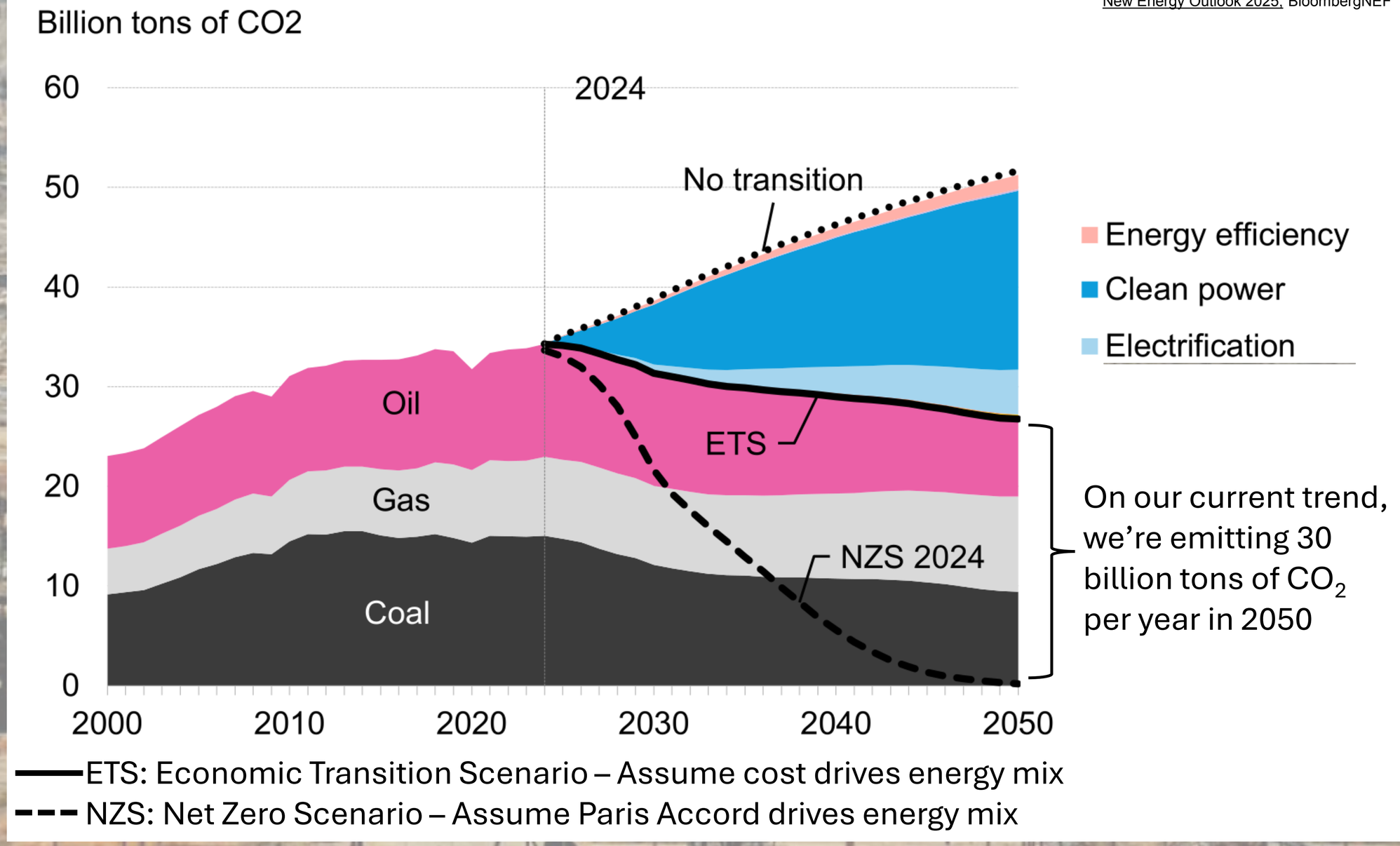
May 2025

Genium



# CIVILIZATION'S $CO_2$ PROBLEM

New Energy Outlook 2025, BloombergNEF



FEEDSTOCK CHALLENGE

# Carbon neutral e-fuels need affordable clean feedstocks supply

FINANCIAL TIMES

Energy Source Energy sector + Add to myFT

Brookfield to invest up to $1.1bn in e-fuels start-up Infinium

INFINIUM™

FINANCIAL TIMES

Saudi Aramco + Add to myFT

Saudi Aramco steps up e-fuel investment to prolong combustion engine era

aramco

c&en CHEMICAL & ENGINEERING NEWS LATEST TOPICS MAGAZINE FEATURES COLLECTIONS PODCASTS CHEMPICS JOBS

START-UPS

Dimensional Energy cuts ribbon on $CO_2$ utilization plant

First of four planned low-carbon fuel facilities is up an running in Tucson

™ Dimensional Energy

THE WALL STREET JOURNAL.

Latest World Business U.S. Politics Economy Tech Markets & Finance Opinion Arts Lifestyle Real Estate

BUSINESS

The Clean Jet-Fuel Technology Winning Over Wall Street

Startup doing 'industrial photosynthesis' raises $645 million in one of the sector's biggest investments ever

twelve

$CO_2$ + $H_2$

?

TODAY'S COST PROBLEM

# Cost effective solutions needed

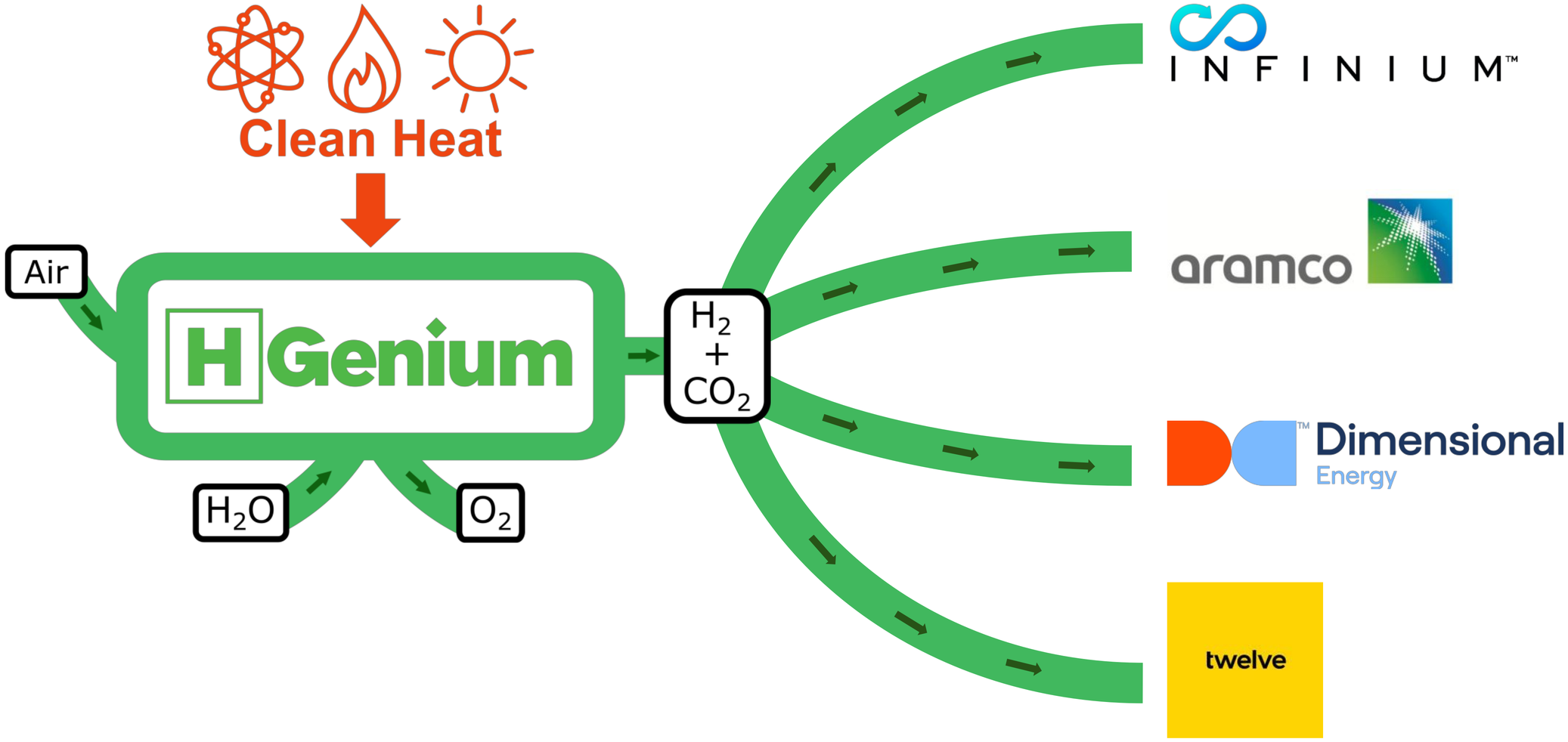



?

**Direct air capture & electrolysis as independent processes are cost prohibitive and NOT suitable replacements**

THE SOLUTION

# HGenium's green $H_2$ production and $CO_2$ capture using HEAT



MISSION AND LEADERSHIP TEAM

# Become global leader in carbon negative green hydrogen



**Chris Murphy**
CEO

President & CEO, Materia
(exit to ExxonMobil Chemical)
DuPont, SABIC

BS, University of Wisconsin,
Madison, Chemical Engineering



**Professor Mark Davis, Ph.D.**
Co-founder & Chairman

Professor of Chemical
Engineering, Caltech

Ph.D., University of Kentucky,
Chemical Engineering



**Casper Brady, Ph.D.**
Co-founder &
Senior Scientist

Ph.D., University of Delaware,
Chemical Engineering



**Nate Thomas, Ph.D.**
Vice President
Strategy & Analytics

Ph.D., Caltech,
Materials Science



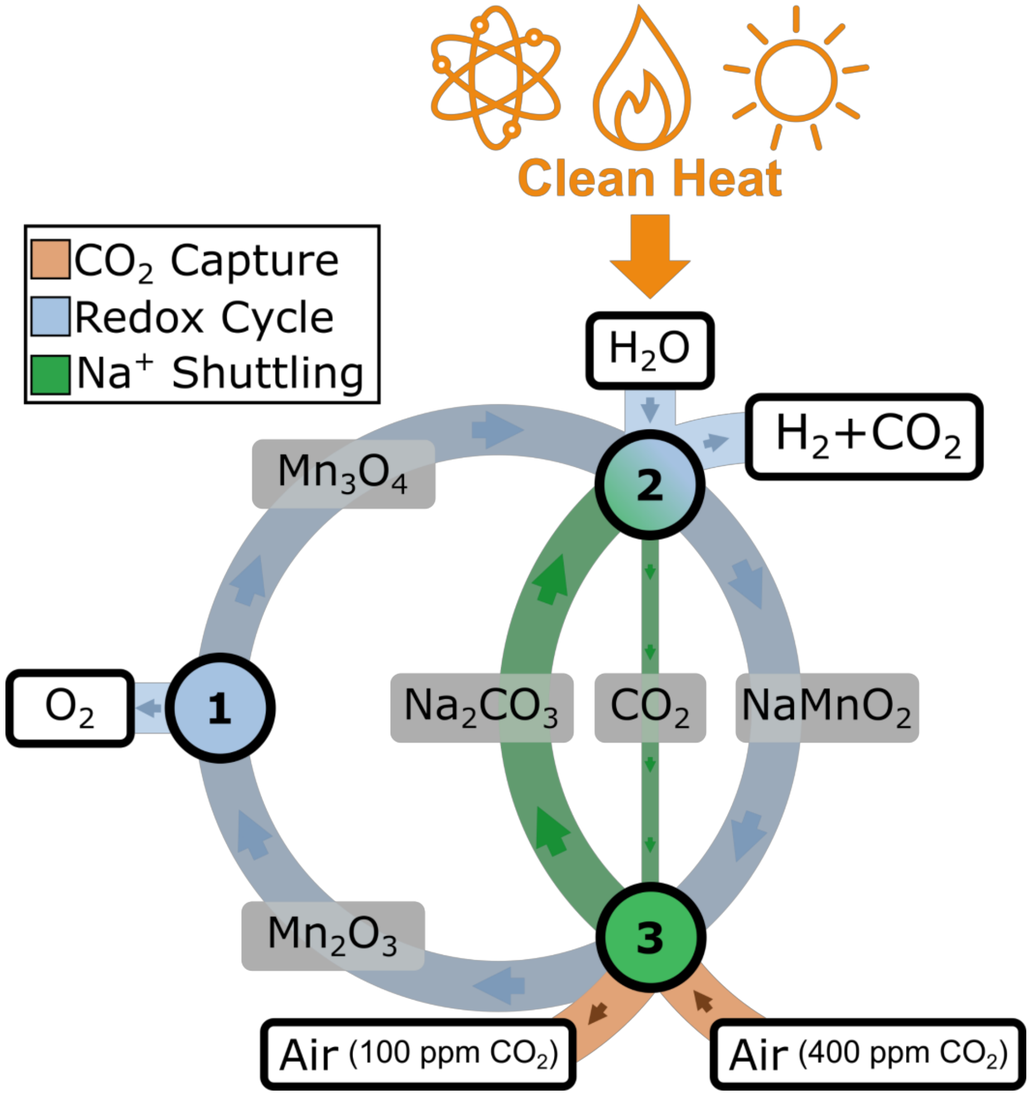
**James Lattner, Ph.D.**
Scale-Up Advisor

Former Chief Engineer, Exxon Mobil
Chemical (30+ years with Exxon)

Ph.D., University of Houston,
Chemical Engineering

THERMOCHEMICAL WATER SPLITTING

# A revolutionary way to split water




**Use heat instead of electricity for stable, long-duration hydrogen supply**

## Net splitting of water

Produce $H_2$ and $O_2$ without depleting other materials

## Bolt-on direct air capture

Simultaneously pull $CO_2$ from the air, if desired

COMPETITIVE DIFFERENTIATION

# Benefits versus incumbent electrolysis processes

| | Genium | PEM | Alkaline | Gray $H_2$ |
|---|---|---|---|---|
| Carbon Negative | ✓ | X | X | XX |
| No Pt Group Metals | ✓ | X | ✓ | ✓ |
| Flexible Water Supply | ✓ | X | X | ✓ |
| Power Resiliency | ✓ | ✓ | X | ✓ |
| Cost | $$ | $$$ | $$ | $ |

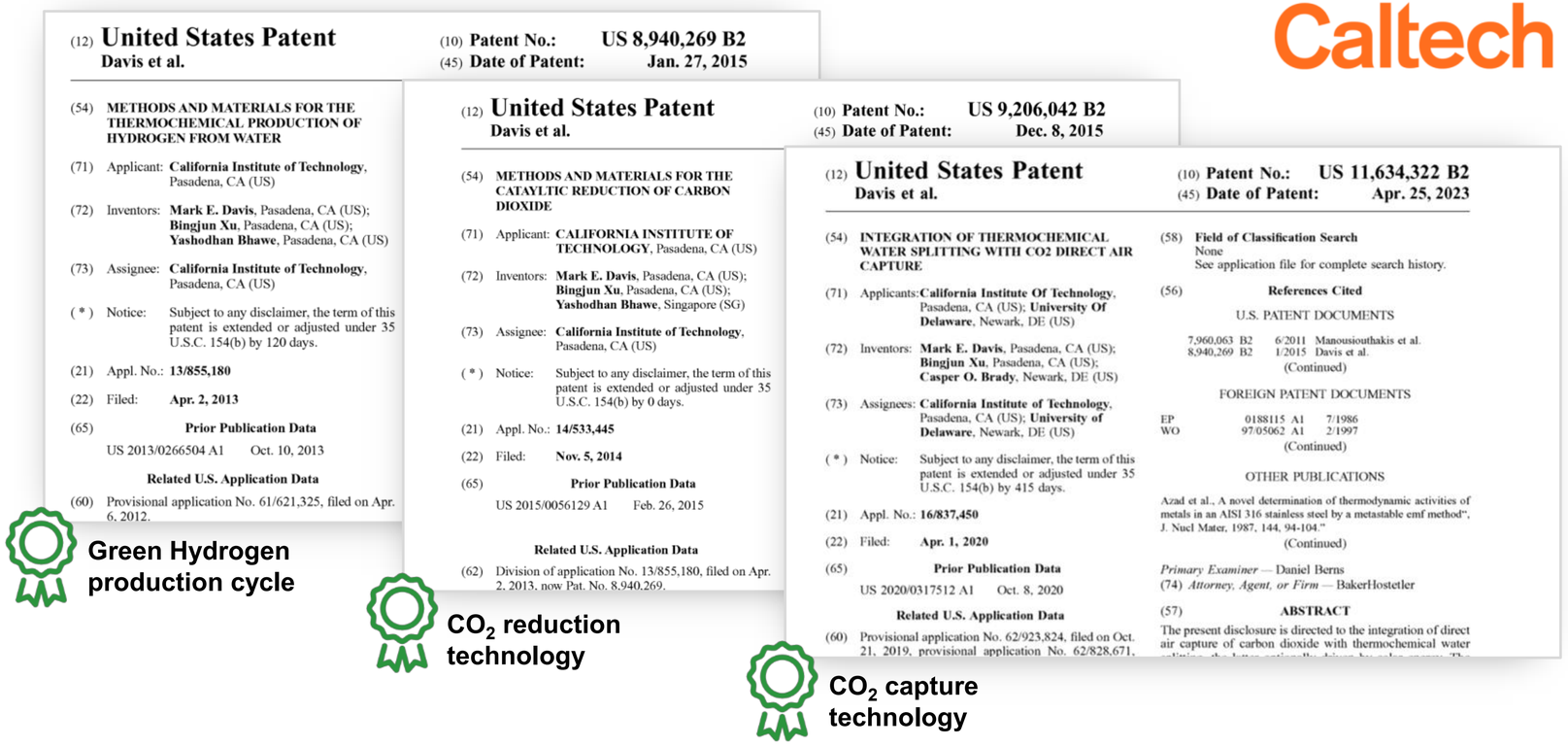
## MAINTAINING COMPETITIVE ADVANTAGE

# We hold an exclusive license from Caltech for all relevant process patents with significant additional IP potential

### HGenium:

- Foundational technology developed explicitly to thermochemically split water at less than 1000°C
- Broad patent coverage, including technology for integrated direct air capture (DAC)

Caltech



(12) **United States Patent**
**Davis et al.**

(10) **Patent No.: US 8,940,269 B2**
(45) **Date of Patent: Jan. 27, 2015**

(54) **METHODS AND MATERIALS FOR THE THERMOCHEMICAL PRODUCTION OF HYDROGEN FROM WATER**

(71) Applicant: **California Institute of Technology**, Pasadena, CA (US)

(72) Inventors: **Mark E. Davis**, Pasadena, CA (US); **Bingjun Xu**, Pasadena, CA (US); **Yashodhan Bhawe**, Pasadena, CA (US)

(73) Assignee: **California Institute of Technology**, Pasadena, CA (US)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 120 days.

(21) Appl. No.: **13/855,180**

(22) Filed: **Apr. 2, 2013**

(65) **Prior Publication Data**

US 2013/0266504 A1 Oct. 10, 2013

**Related U.S. Application Data**

(60) Provisional application No. 61/621,325, filed on Apr. 6, 2012.

**Green Hydrogen production cycle**

(12) **United States Patent**
**Davis et al.**

(10) **Patent No.: US 9,206,042 B2**
(45) **Date of Patent: Dec. 8, 2015**

(54) **METHODS AND MATERIALS FOR THE CATAYLTIC REDUCTION OF CARBON DIOXIDE**

(71) Applicant: **CALIFORNIA INSTITUTE OF TECHNOLOGY**, Pasadena, CA (US)

(72) Inventors: **Mark E. Davis**, Pasadena, CA (US); **Bingjun Xu**, Pasadena, CA (US); **Yashodhan Bhawe**, Singapore (SG)

(73) Assignee: **California Institute of Technology**, Pasadena, CA (US)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/533,445**

(22) Filed: **Nov. 5, 2014**

(65) **Prior Publication Data**

US 2015/0056129 A1 Feb. 26, 2015

**Related U.S. Application Data**

(62) Division of application No. 13/855,180, filed on Apr. 2, 2013, now Pat. No. 8,940,269.

$CO_2$ **reduction technology**

(12) **United States Patent**
**Davis et al.**

(10) **Patent No.: US 11,634,322 B2**
(45) **Date of Patent: Apr. 25, 2023**

(54) **INTEGRATION OF THERMOCHEMICAL WATER SPLITTING WITH CO2 DIRECT AIR CAPTURE**

(71) Applicants: **California Institute Of Technology**, Pasadena, CA (US); **University Of Delaware**, Newark, DE (US)

(72) Inventors: **Mark E. Davis**, Pasadena, CA (US); **Bingjun Xu**, Pasadena, CA (US); **Casper O. Brady**, Newark, DE (US)

(73) Assignees: **California Institute of Technology**, Pasadena, CA (US); **University of Delaware**, Newark, DE (US)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 415 days.

(21) Appl. No.: **16/837,450**

(22) Filed: **Apr. 1, 2020**

(65) **Prior Publication Data**

US 2020/0317512 A1 Oct. 8, 2020

**Related U.S. Application Data**

(60) Provisional application No. 62/923,824, filed on Oct. 21, 2019, provisional application No. 62/828,671,

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,960,063 B2 6/2011 Manousiouthakis et al.
8,940,269 B2 1/2015 Davis et al.
(Continued)

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EP 0188115 A1 7/1986
WO 97/05062 A1 2/1997
(Continued)

OTHER PUBLICATIONS

Azad et al., A novel determination of thermodynamic activities of metals in an AISI 316 stainless steel by a metastable emf method", J. Nucl Mater, 1987, 144, 94-104."
(Continued)

*Primary Examiner* — Daniel Berns
(74) *Attorney, Agent, or Firm* — BakerHostetler

(57) **ABSTRACT**

The present disclosure is directed to the integration of direct air capture of carbon dioxide with thermochemical water

$CO_2$ **capture technology**

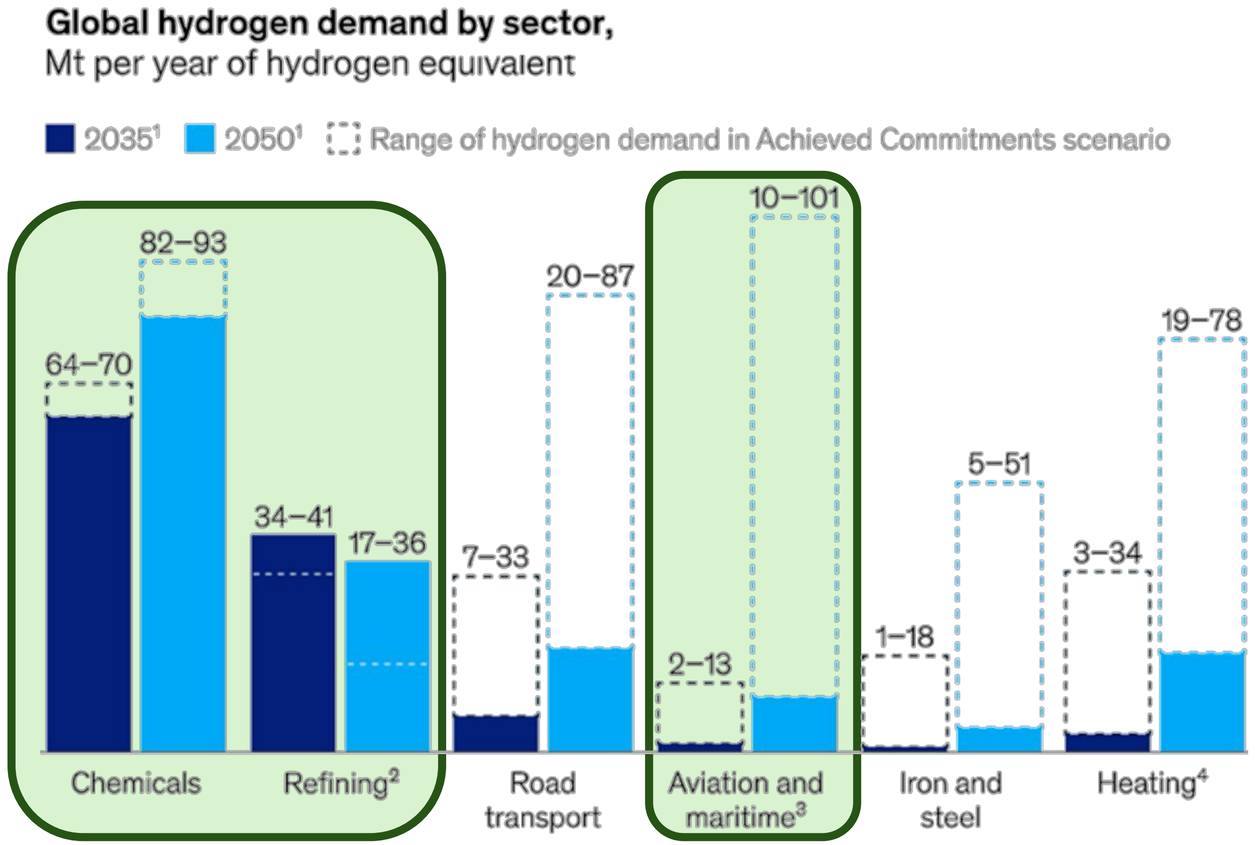
MARKETS

# Clean hydrogen AND e-fuels feedstocks

**Immediate ~$200B market for industrial hydrogen**

**Long term opportunity in e-Fuels**

**Revenue from licensing, $H_2$ supply and/or carbon credits**




Global Energy Perspective 2023: Hydrogen outlook. McKinsey & Company

Chevron YARA ExxonMobil aramco سابك sabic Woodside Energy

COMMERCIAL ROADMAP

# Scaling the chemical process

**Batch Scale Testing (TRL 1-4)** | **Continuous Scale Piloting (TRL 5-6)** | **Industrial Scale Piloting (TRL 7-8)** | **Commercial Demo Plant (TRL 9)**



Batch scale proof-of-concept, leveraging years of university-based research

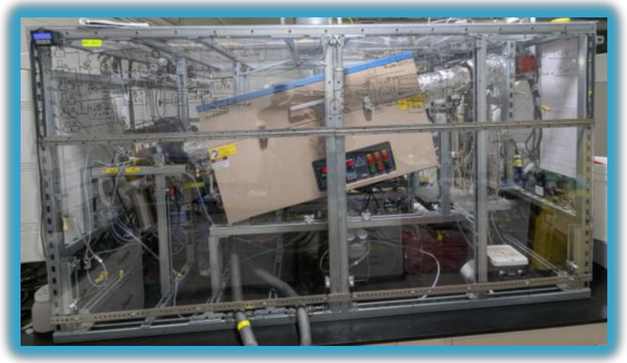
COMMERCIAL ROADMAP

# Scaling the chemical process

**Batch Scale Testing (TRL 1-4)** → **Continuous Scale Piloting (TRL 5-6)** → **Industrial Scale Piloting (TRL 7-8)** → **Commercial Demo Plant (TRL 9)**







We've built and are operating multiple continuous flow reactors to advance our water splitting process and to increase hydrogen yield

COMMERCIAL ROADMAP

# Scaling the chemical process

**Batch Scale Testing (TRL 1-4)** → **Continuous Scale Piloting (TRL 5-6)** → **Industrial Scale Piloting (TRL 7-8)** → **Commercial Demo Plant (TRL 9)**

We're working on FEED designs with Southwest Research Institute for our industrial pilot plant – location to be determined



BUSINESS MODEL

# Multiple monetization pathways exist

## 1
## License Only

ASSET ULTRA-LIGHT

Segment exclusivities at the right price

Faster to revenues

Reduced influence on technology development

## 2
## License & Service

ASSET LIGHT, STRATEGIC PARTNERSHIPS

License + service-and-improvement contract

Increased margins & ongoing technical engagement

Greater need for technical and sales talent

**Likely offers best balance of speed-to-profits and investor ROI**

## 3
## Build & Operate

ASSET HEAVY

Produce and sell Green Hydrogen and Green Syngas

Maximize long term return to investors

High costs and slower returns to shareholders

FUNDING PLAN

# Prepare for Industrial Pilot in 2026

## Raising minimum $2M

- [x] Chemical verification is complete
- [ ] Build and scale remaining continuous-scale operations for water-splitting process
- [ ] Expand upon our existing units prior to complete integrated pilot

Additional equipment: $0.5
Contractor work: $0.2
People and OPEX: $1.3

**Nate Thomas, VP Strategy & Analytics**
nate@hgenium.com
www.hgenium.com

PLUG AND PLAY

SV SUMMIT

# STARTUP PITCH

MEMBRAVO
Membranes for Industrial Efficiency

## MEMBRAVO

Membravo reduces cost and waste across a variety of industries with the world's most durable polymer membranes.

#PNPTCSiliconValley

Join us at **pnptc.com**

# MEMBRAVO

Membranes for Industrial Efficiency

Joe Sawa, CEO
Joe@membravo.com

# Chemical Separations

## Energy Intensive

**15% of global energy used for separations**



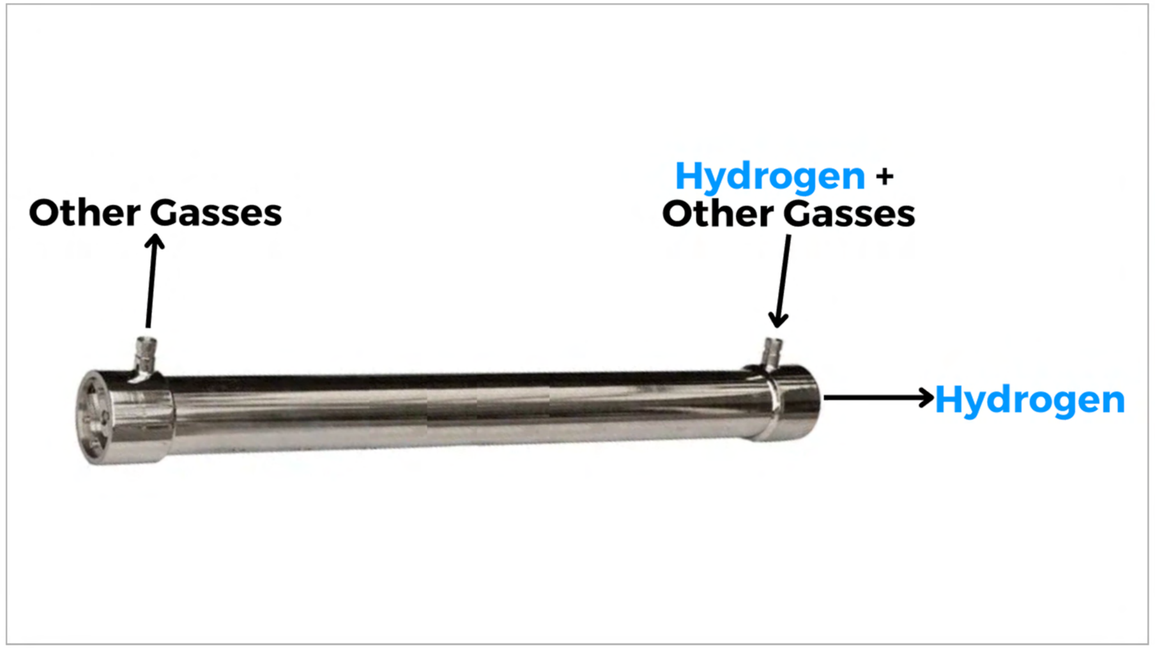
## Product Waste

**$100+ billion due to inneffective separation**



MEMBRAVO

# Membravo’s membranes recover waste and reduce energy consumption




**Robust**

**Retrofittable**

**Profitable**

# Experts in industry and membrane technology



**Joe Sawa**
CEO and Founder
Joe@Membravo.com

Shell Hydrogen

BerkeleyHaas

ILLINOIS



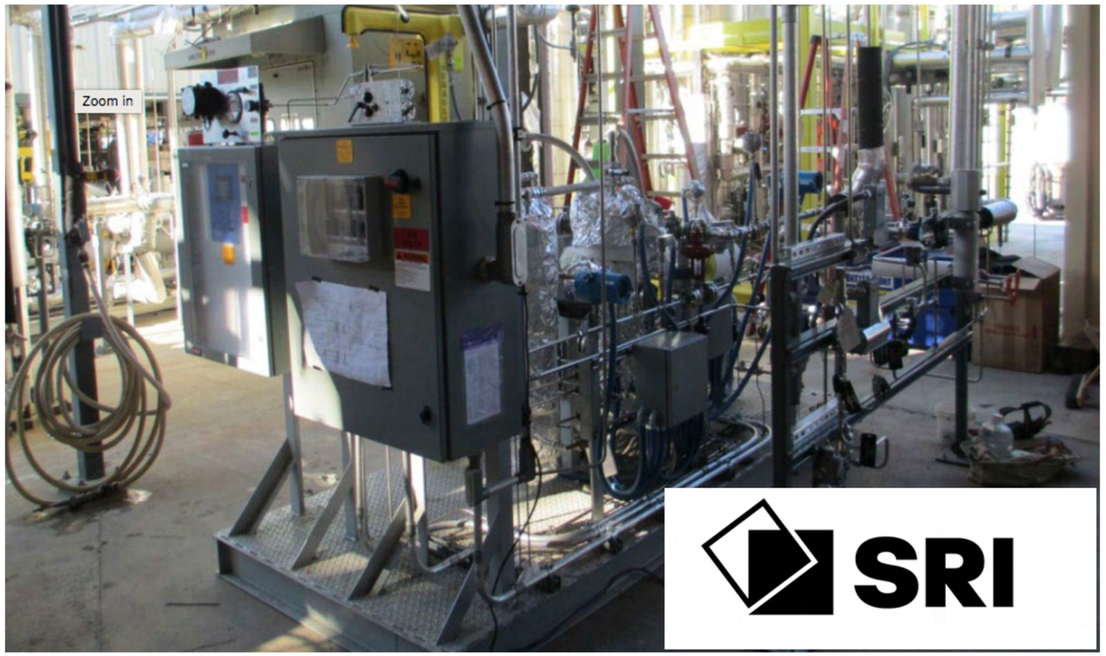
**Milad Yavari, PhD**
CTO and Founder

SRI

UB

# Membrane R&D is complete

- **$10M from DOE**
- **Manufacturing**
- **Field-proven**
- **Patented + trade secrets**



# Wide range of hydrogen applications

$200B



## Existing applications

- Steam methane reforming (gray hydrogen)
- Refinery off-gas recovery
- Ammonia and methanol production
- Hydrogen from gasification
- Syngas ratio adjustment
- DRI Steel




## Emerging applications

- Blue hydrogen
- Sustainable aviation fuel production
- Natural geological hydrogen (gold/white hydrogen)
- Methane pyrolysis (turqoise hydrogen)
- Ammonia cracking
- Pipeline de-blending
- Renewable diesel production

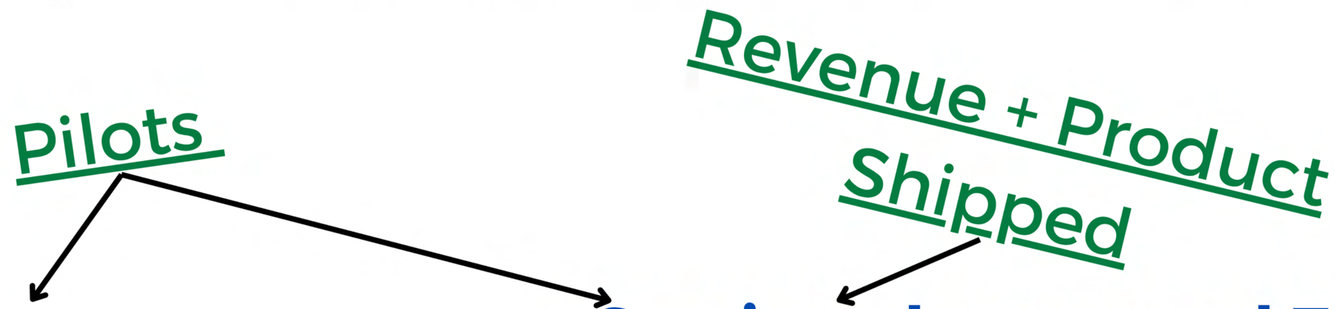
# Technology platform for harsh applications

- **Hydrogen**
- **Critical Minerals**
- **Pharma**
- **Food and beverage**
- **Semiconductors and Electronics**
- **Water (e.g. PFAS)**
- **Biofuels**

**...and more**

aramco · Chevron · VEOLIA · Purity ReSource · MARATHON · SYZYGY PLASMONICS · EASTMAN Eastman Chemical Company · Aether Fuels · NALCO An Ecolab Company · AMOGY · AsahiKASEI · PHILLIPS 66 · ExxonMobil · NOV · MEMBRAVO

# Technology platform for harsh applications




- **Hydrogen**
- **Critical Minerals**
- **Pharma**
- **Food and beverage**

- **Semiconductors and Electronics**
- **Water (e.g. PFAS)**
- **Biofuels**

**...and more**

aramco · Chevron · VEOLIA · Purity ReSource · MARATHON · SYZYGY PLASMONICS · EASTMAN Eastman Chemical Company · Aether Fuels · NALCO An Ecolab Company · AMOGY · AsahiKASEI · PHILLIPS 66 · ExxonMobil · NOV · MEMBRAVO

# Short Path to Scale-Up

~$500k non-dilutive funding

Activate

U.S. DEPARTMENT OF ENERGY

**Now: Small-Scale Pilots**



**2025: Product Scale-Up**




**2026: Pilot Test**




**2026-2027: Mfg Scale-Up**




MEMBRAVO

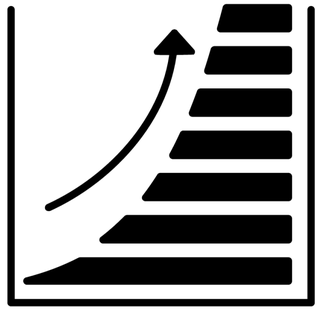
# Highlights



**Strong Unit Economics**



**Resilient in any policy scenario**



**Short path to profitability and scale-up**

MEMBRAVO

# Now Raising Pre-Seed and Planning Pilots

**Please reach out!**

**Joe@membravo.com**

MEMBRAVO

Membranes for Industrial Efficiency

PLUG AND PLAY

SV SUMMIT

# STARTUP PITCH




## EDO

Edo provides an energy and demand management solution that transforms commercial buildings into virtual power plants.

#PNPTCSiliconValley

Join us at **pnptc.com**

# Transforming Buildings into Virtual Power Plants

June 12, 2025

Courtney Blodgett, Co-Founder



# Surging Load Growth


UTILITY DIVE Deep Dive Opinion Library Events Press Releases

Generation T&D Grid Reliability Electrification Load Management Renewables

DIVE BRIEF

**Five-year US load growth forecast surges 456%, to 128 GW: Grid Strategies**

U.S. electricity demand is forecast to increase 15.8% by 2029, according to a new report from Grid Strategies. Six regions of the country are driving the growth.

**Forecast**

Demand side solutions can offset this by up to 30%*

Decade of relative flat load

2000 2005 2010 2015 2020 2025 2030

*Tennessee Valley Authority report, "Energy Efficiency and Demand Response", 2024

# Edo Solution: Virtual Power Plants (VPP)

## Commercial Building VPP

- ✓ Energy Management
  - ✓ ~15% energy savings
- ✓ Demand Optimization
  - ✓ ~20% peak load shift
- ✓ Load aggregation
  - ✓ Orchestrate multiple buildings & DERs



# Edo Gateway

- ✓ Connects to existing Building Management System
- ✓ Enables remote control for reliable load shifting

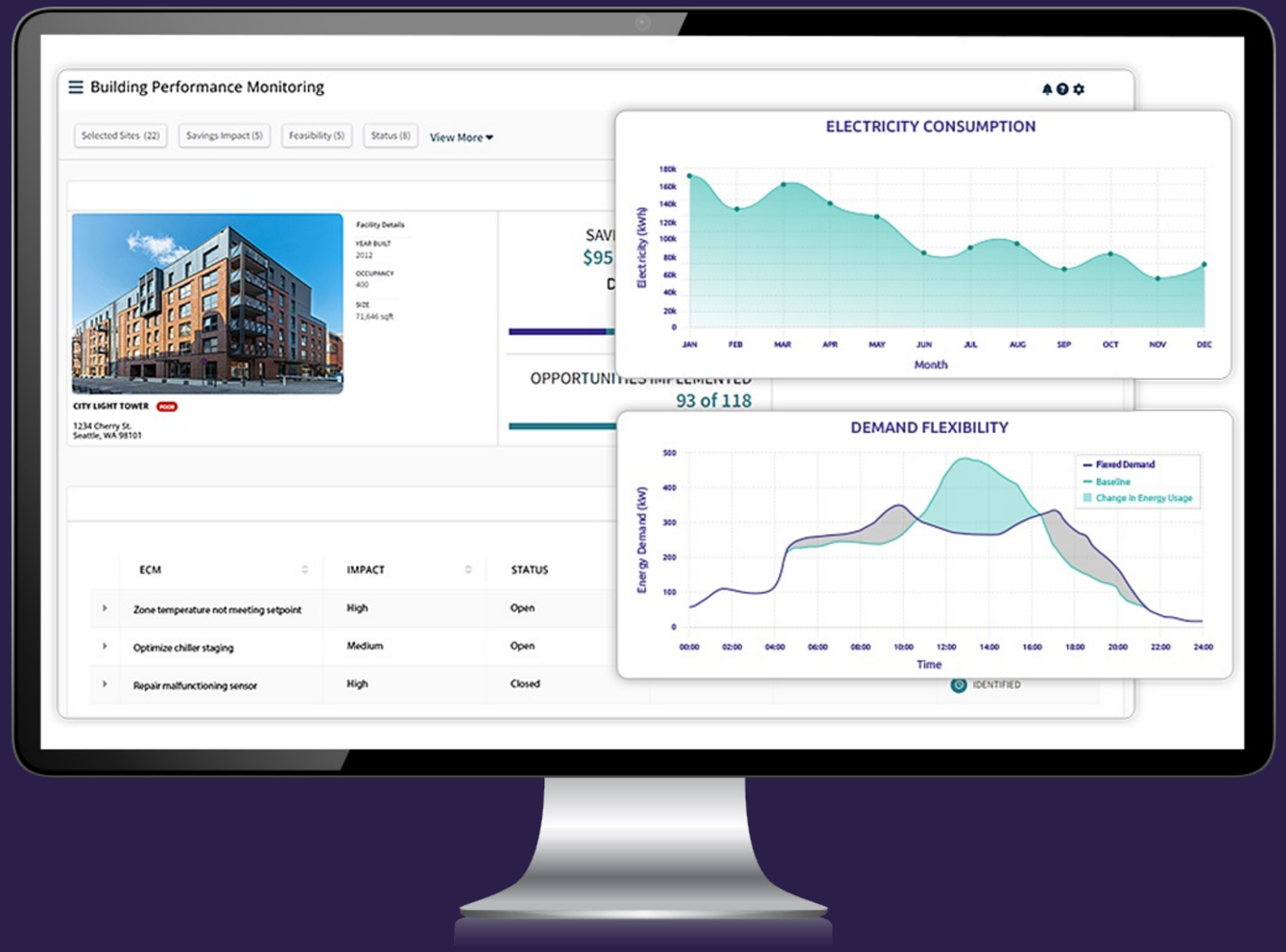







# Edo Platform

- ✓ Flexible Load Forecast
- ✓ Automated Load Shifting
- ✓ Performance Monitoring



# Edo Services

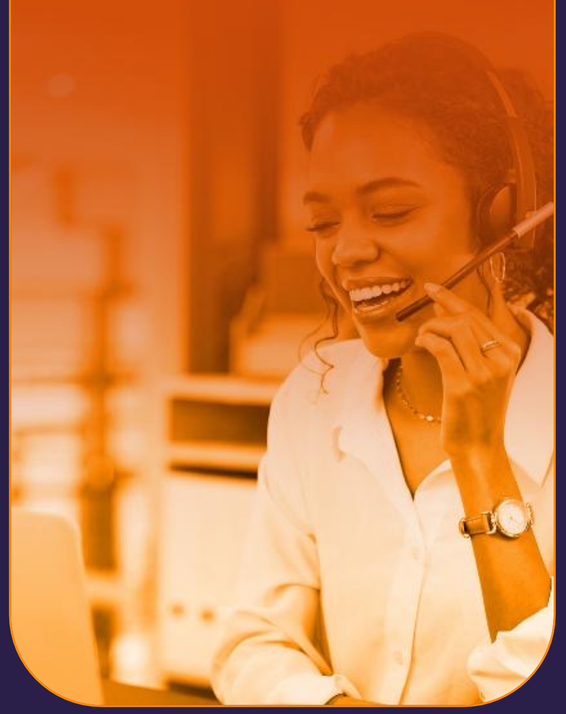
## Utility Program Administration



## Customer Recruitment



## Customer Technical Support



# Our Reach

**45**
EMPLOYEES

**6,000+**
BUILDINGS

**9,300+**
UTILITY METERS

**200+ MILLION**
SQUARE FEET



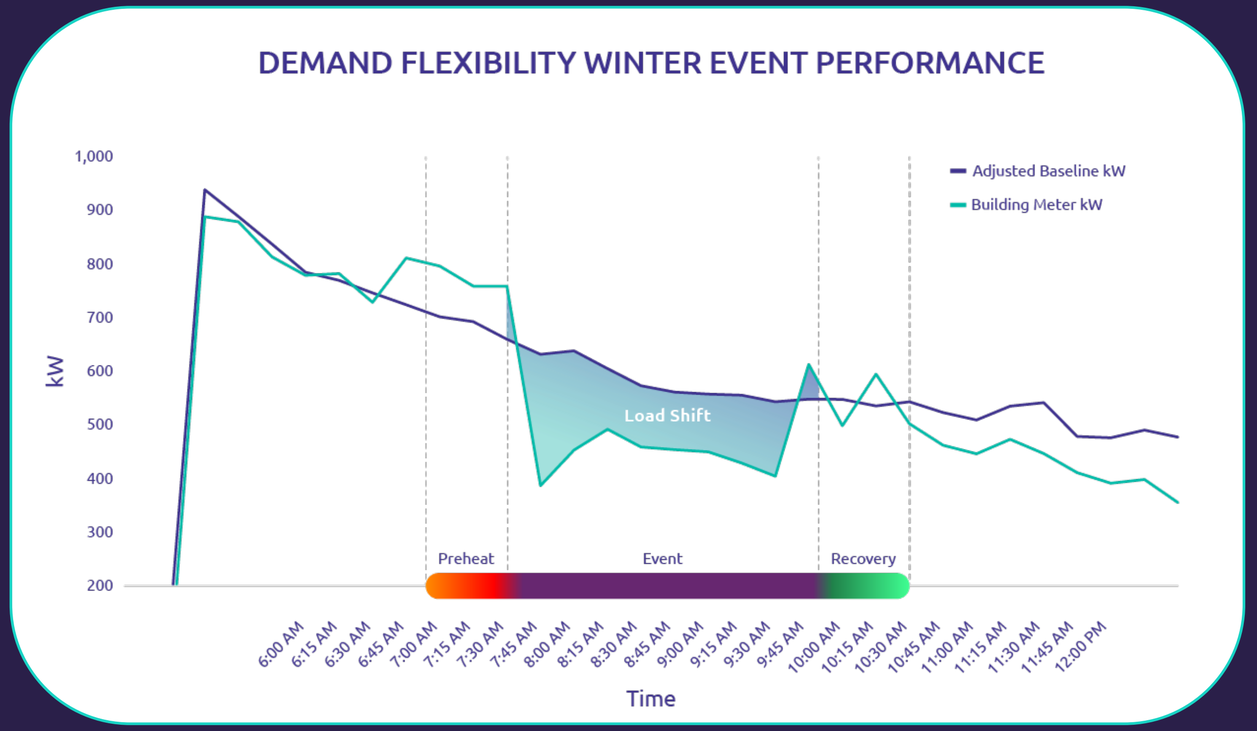
Mortenson · McKinstry · Orange & Rockland · PSE Puget Sound Energy · Avista · U.S. Department of Energy

edo

Case Study

# School Demand Flexibility with Puget Sound Energy

- Enrolled a Washington elementary school in PSE's demand response program
- Dynamic control of 94 pieces of HVAC equipment during events
- Reduced peak energy use by 21% during events



# THANK YOU

**Courtney Blodgett**

Co-Founder

Courtneyb@edoenergy.com

PLUG AND PLAY

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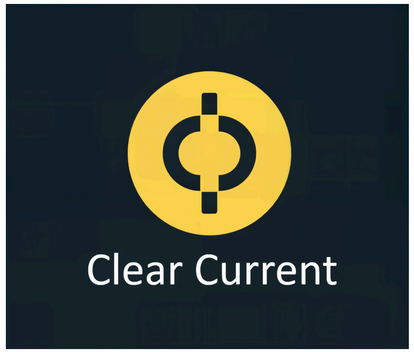
# STARTUP PITCH




## CLEAR CURRENT

Clear Current AI has built the nerve center for all enterprise energy operations by leveraging AI, bringing transparency to the energy spending and needs of any enterprise customer, allowing them to better predict, audit, and procure energy.



# Clear Current

Energy Transparency for the AI Age

Clear Current is building the energy nerve center to help enterprises control their $26B+ overspend for energy annually

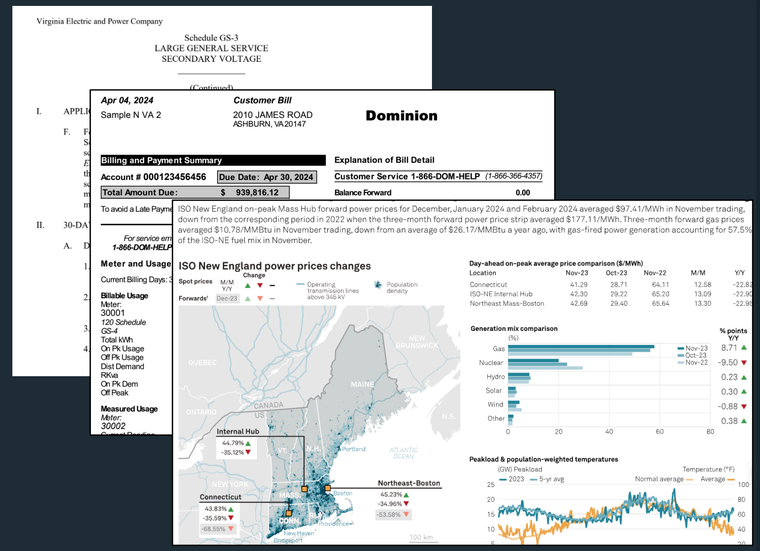


PROBLEM

# Information Overload for Energy Teams

## Frustrating, time-consuming, error-prone manual process to:

- Audit 1000s of lines on energy bills each month
- Contact energy provider to recover overpayments
- Pay monthly bills on time and accurately
- Procure electricity as cost-effectively as possible
- Forecast energy consumption in future
- Allocate PPA, RECs, and charges correctly to each site or customer
- To name just a few of the admin tasks…



WHY NOW?

# Business struggles to keep up with large, extremely volatile, & inaccurate power bills

## *AI Explosion is Driving this Trend*

Businesses spend $260+ billion on energy annually

Source: EIA

Commercial power rates are doubling over the next 10 years



**PJM capacity prices hit record highs, sending build signal to generators**

Consumers across the PJM Interconnection footprint will pay $14.7 billion for capacity in the 2025/26 delivery year, up from $2.2 billion in the last auction.

Published July 31, 2024

Source: Yahoo Finance

17% of all invoices contain an error

Source: Engie

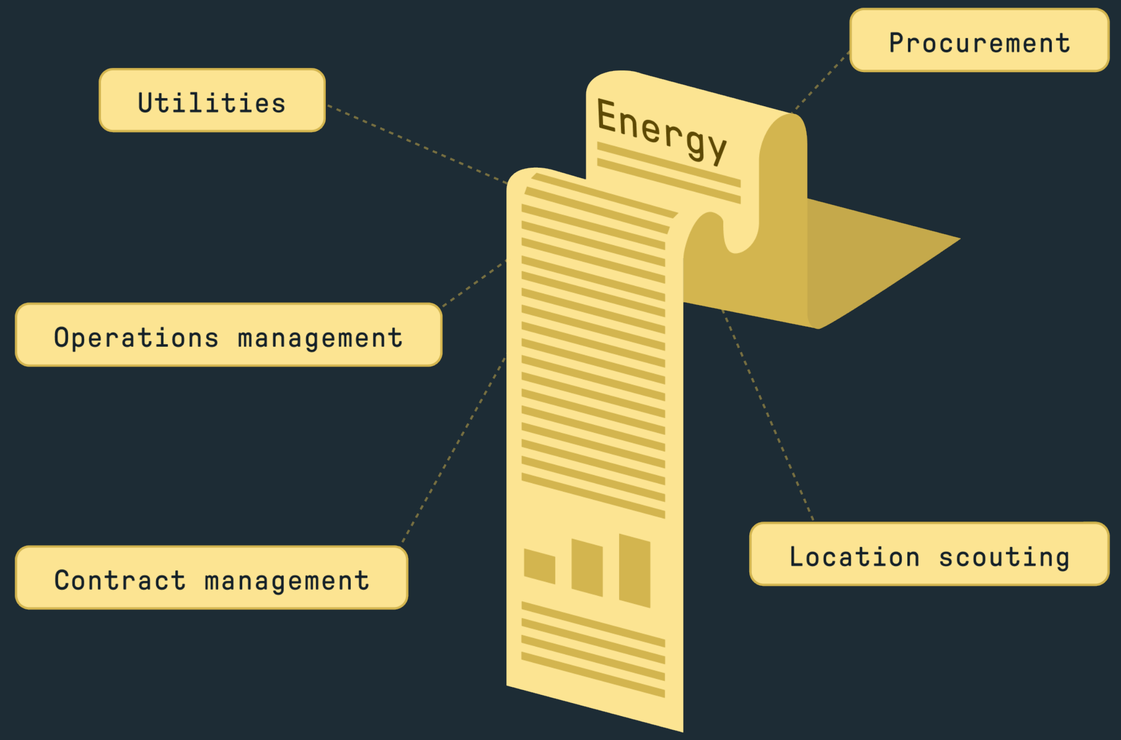
SOLUTION: CLEAR CURRENT

# Fundamental Shift: Enabling Energy Transparency

First AI-Enabled Energy ERP:

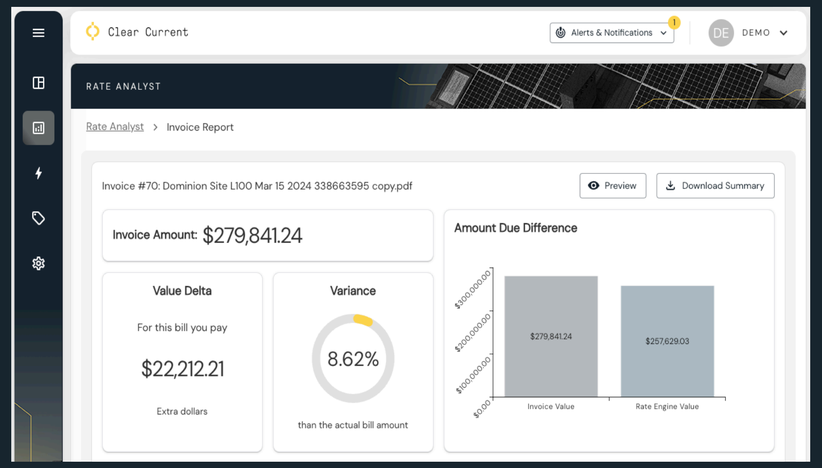
Finds insights in thousands of documents to:

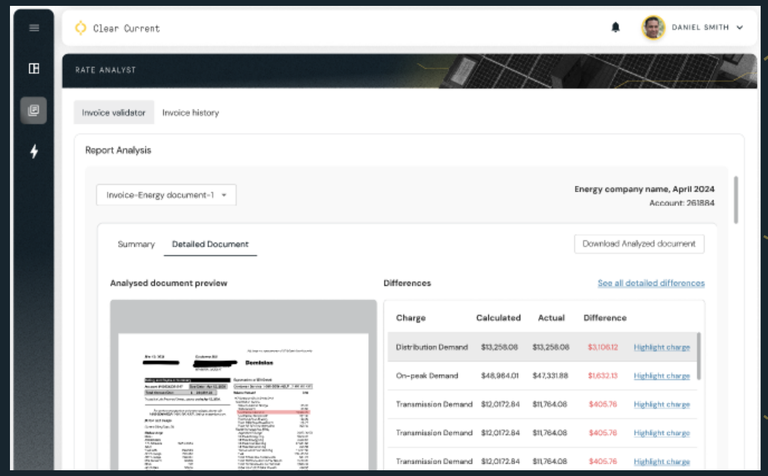
- Reduce electricity cost & carbon emissions
- Automate energy procurement & management
- Enable cost-effective carbon reduction

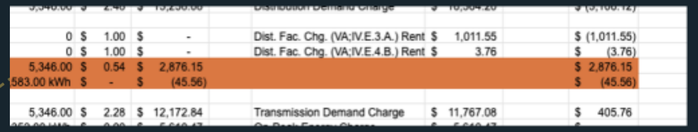


## CLEAR CURRENT SOLUTION: RATE ANALYST

# Rate Analyst audits energy bills, reducing costs








Reads documents, finds changes/insights

Audits & finds errors

Links calculations

You overpaid by $22,212

# Traction

- Raised $4.275M seed round
- Customers
  - Large data center ($1.2M) - found $200k savings for data center
  - AB InBev ($55k pilot) – found $60k savings on one site
- Demonstrated success with other languages already

# Thank you!

EMAIL: JREUTER@CLEARCURRENT.AI



PLUG AND PLAY

SV SUMMIT

# CASE STUDY & SUCCESS STORY

#PNPTCSiliconValley

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PLUG AND PLAY

SV SUMMIT

# ACARIO INNOVATION & NOVITY



## Nigel Carr

Director
*Acario Innovation*



## Markus Larsson

CEO
*Novity*

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# How bad can it be?

**$1.4 trillion**

in lost production, every year.



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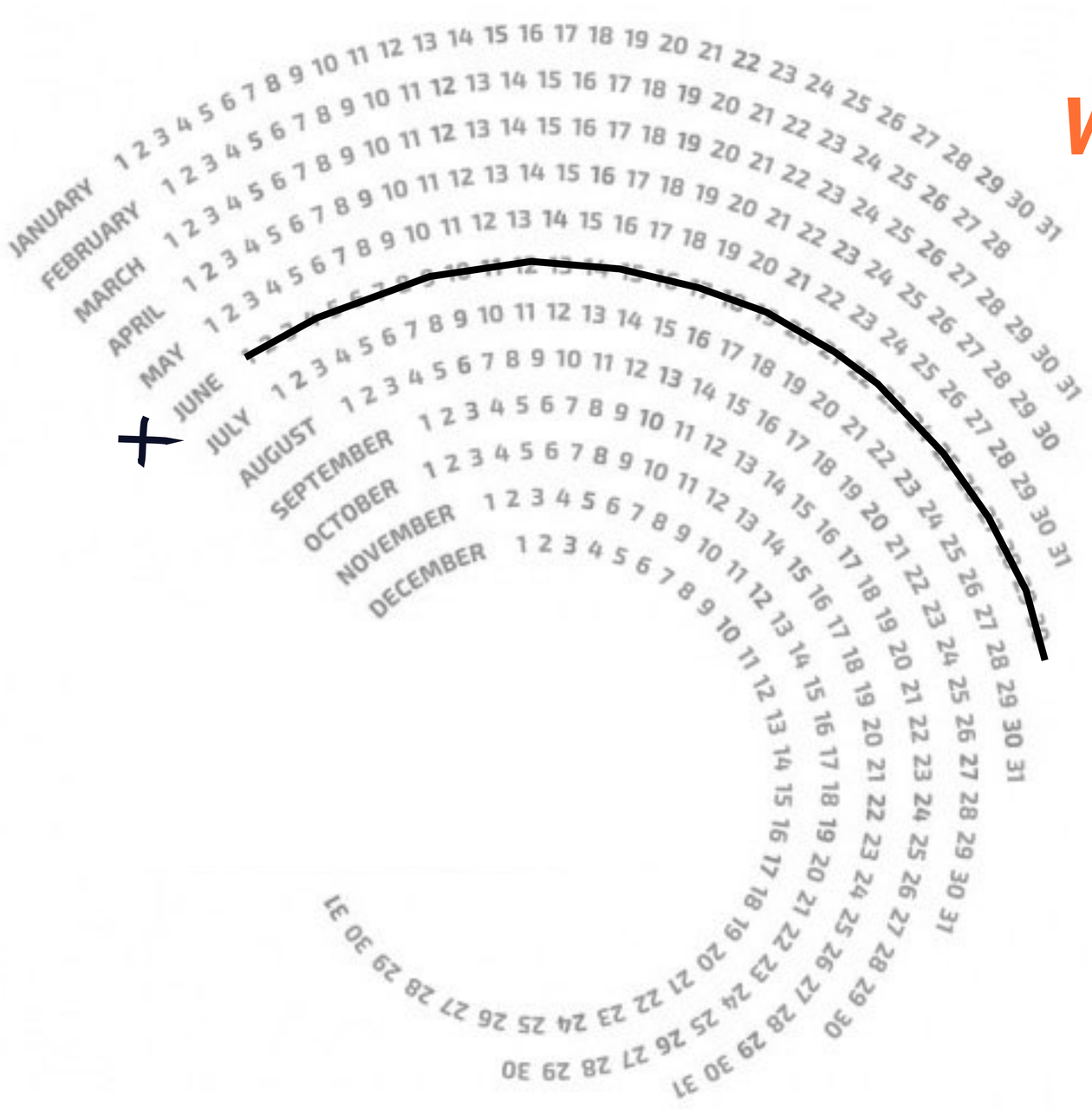


# *Why* is it so expensive?

**8%**

of lost production,
every year.

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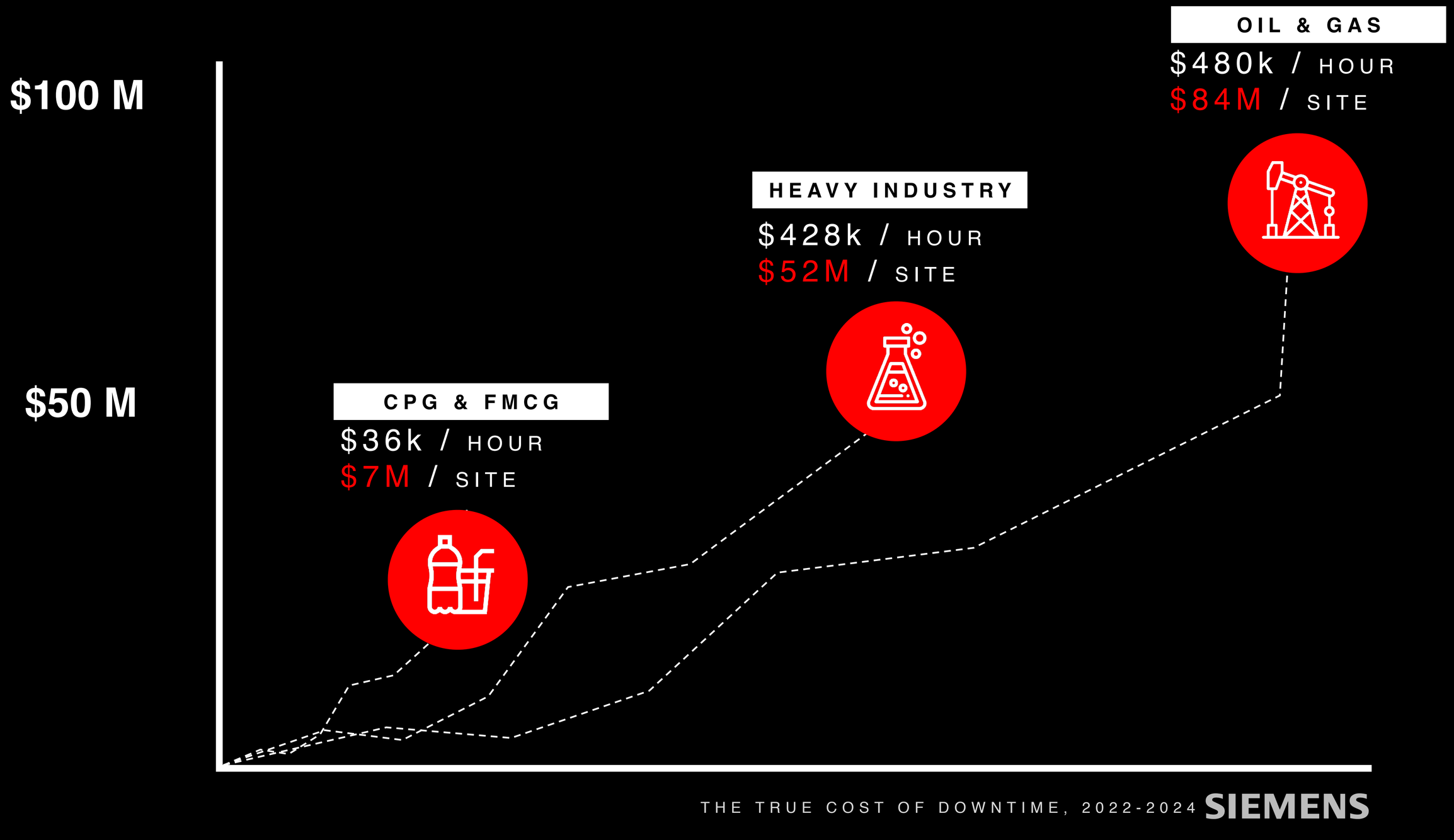
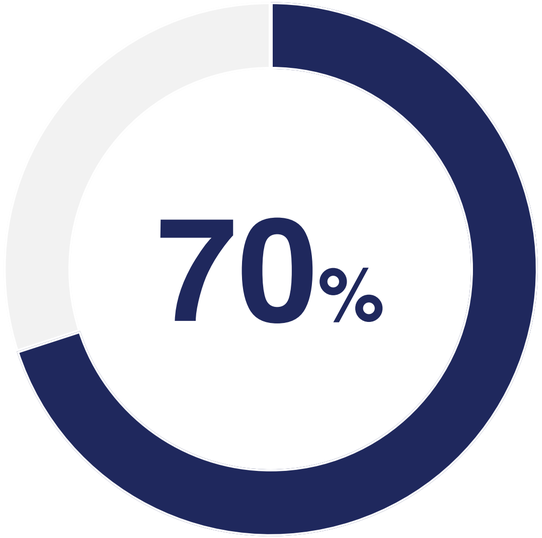



THE TRUE COST OF DOWNTIME, 2022-2024 SIEMENS

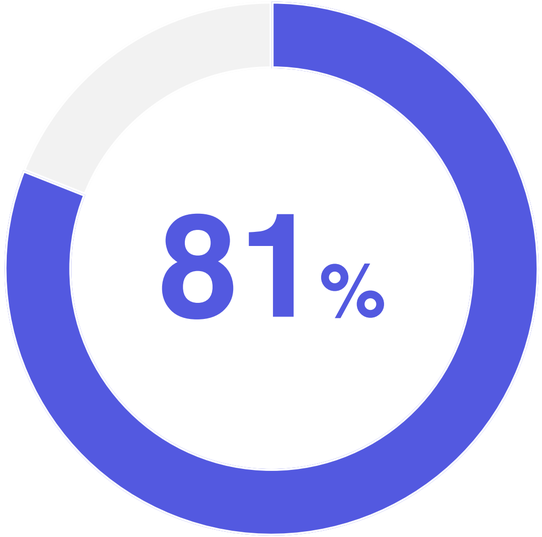
# The motivation to solve this problem could not be higher

CONSEQUENCES OF UNPLANNED DOWNTIME, 2017

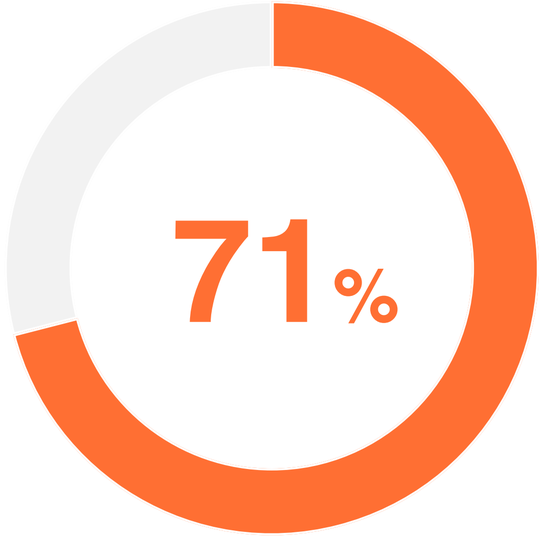
GE VERNOVA




**list zero unplanned downtime as a board-level top priority**




**believe that digital tools can eliminate unplanned downtime entirely**




**believe they cannot solve this problem on their own.**

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# Training accurate ML-based predictive models requires very rare, very expensive datasets

**98%**

of industrial manufacturers face **major data issues**

- **Industrial data suffers from quality, relevance, or availability problems**
- **Production Run-To-Failure datasets with good sensors are rare**
- **They are also incredibly expensive and time consuming to generate organically**

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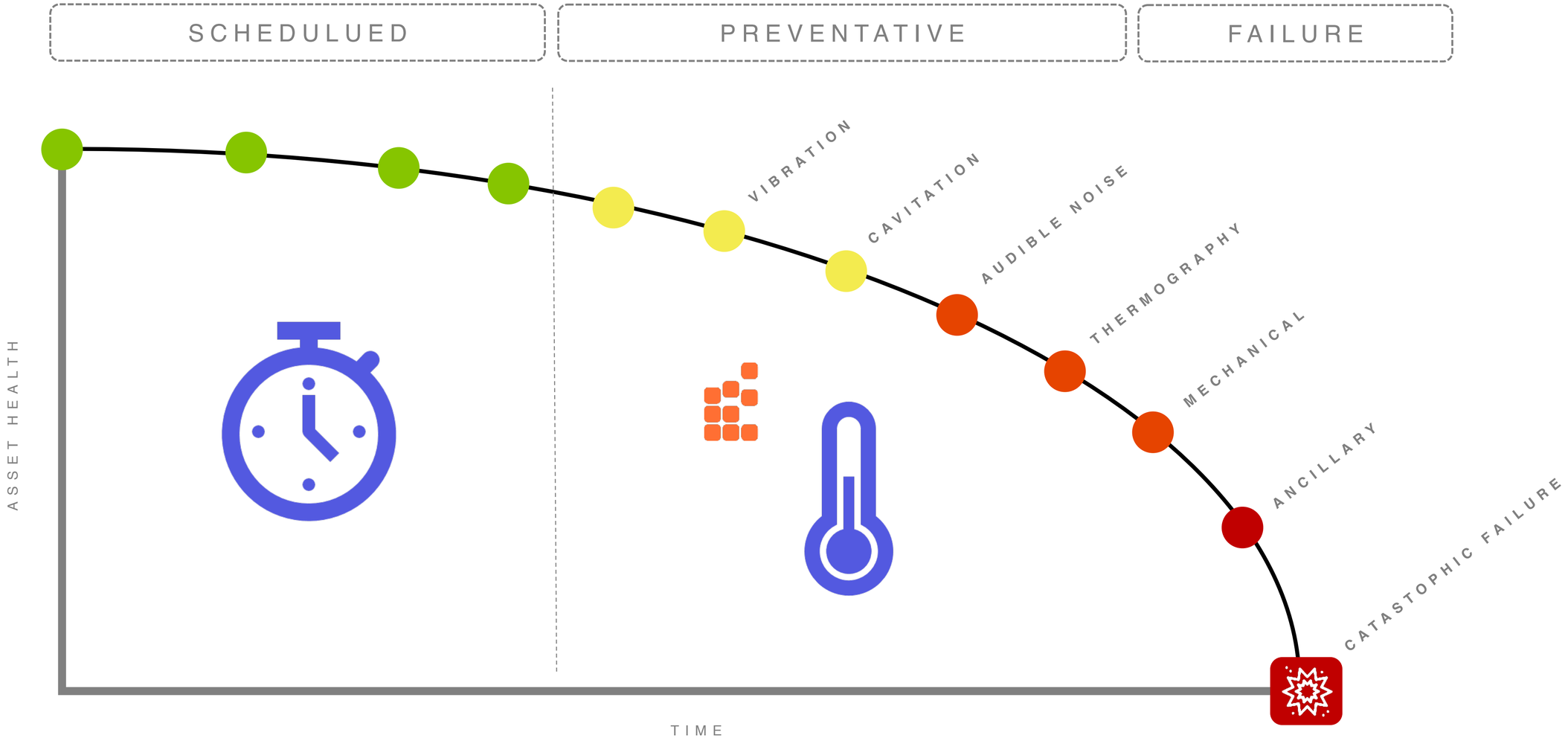
# You are stuck with two bad options:

**1** Fix earlier than necessary

**2** Watch failures unfold by observing conditions

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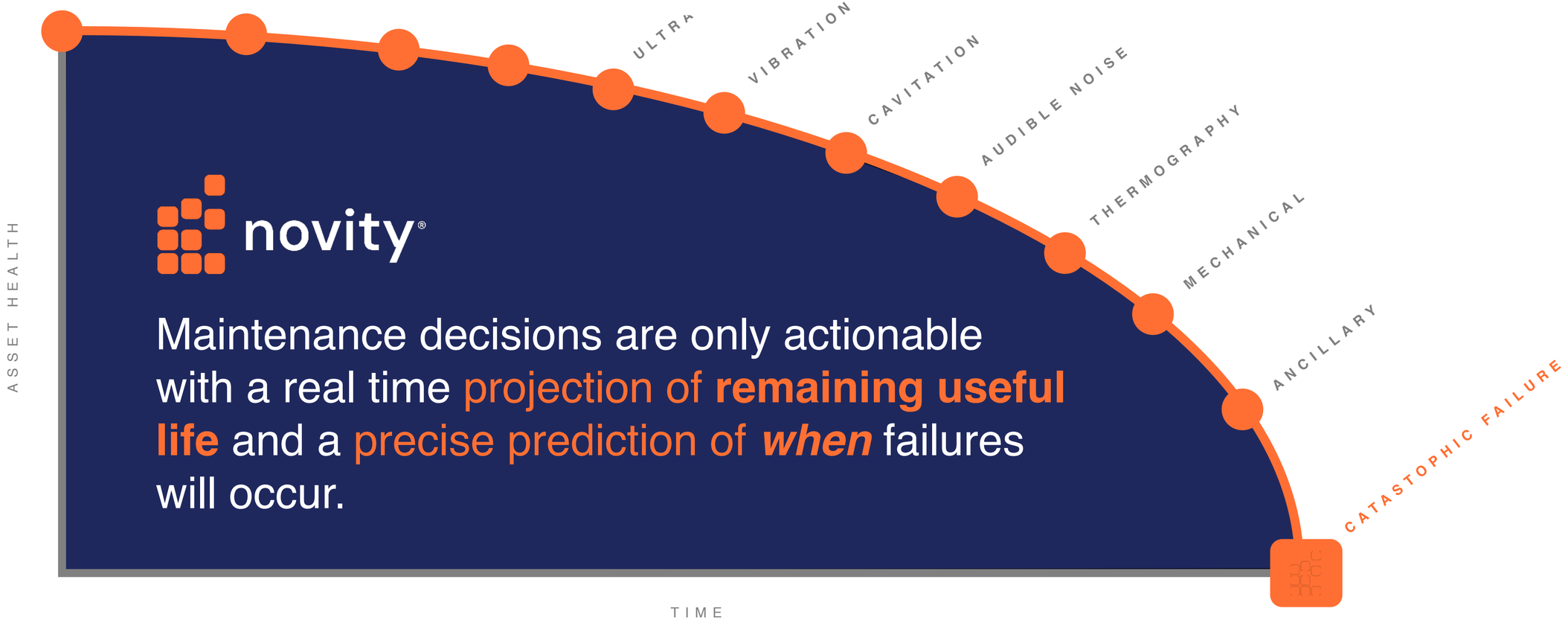
# Fortunately, there is something better…

## 3 Truly Predictive Maintenance

SCHEDULUED | PREVENTATIVE | FAILURE




novity®

Maintenance decisions are only actionable with a real time projection of **remaining useful life** and a precise prediction of ***when*** failures will occur.

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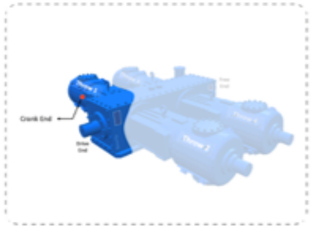
- EA Toner Plant
  - Facility Equipment
  - Production Equipment
    - AC Premix 1
    - Aggregation Reactor 1
    - Coalescence Reactor 1
    - Coalescence Reactor 2
    - Dryer 1
    - Dryer 2
    - Filter Press
    - Larox Press 1
    - Subsystem 1
    - Wet Sieve 1
    - Wet Sieve 2
    - Compressor 1
      - Compressor 1-Throw 1
        - Compressor 1-Throw…
        - Compressor 1-Thr…
      - Compressor 1-Throw 2
      - Compressor 1-Throw 3
      - Compressor 1-Throw 4
    - Water Pump 1

## Compressor 1-Throw 1-Crank

Moderate

### General Information



| | |
|---|---|
| Risk profile | Mission critical |
| OT system tag | C1-T1-CE |
| Hazardous area certification | N/S |

SHOW DETAILS

### Events

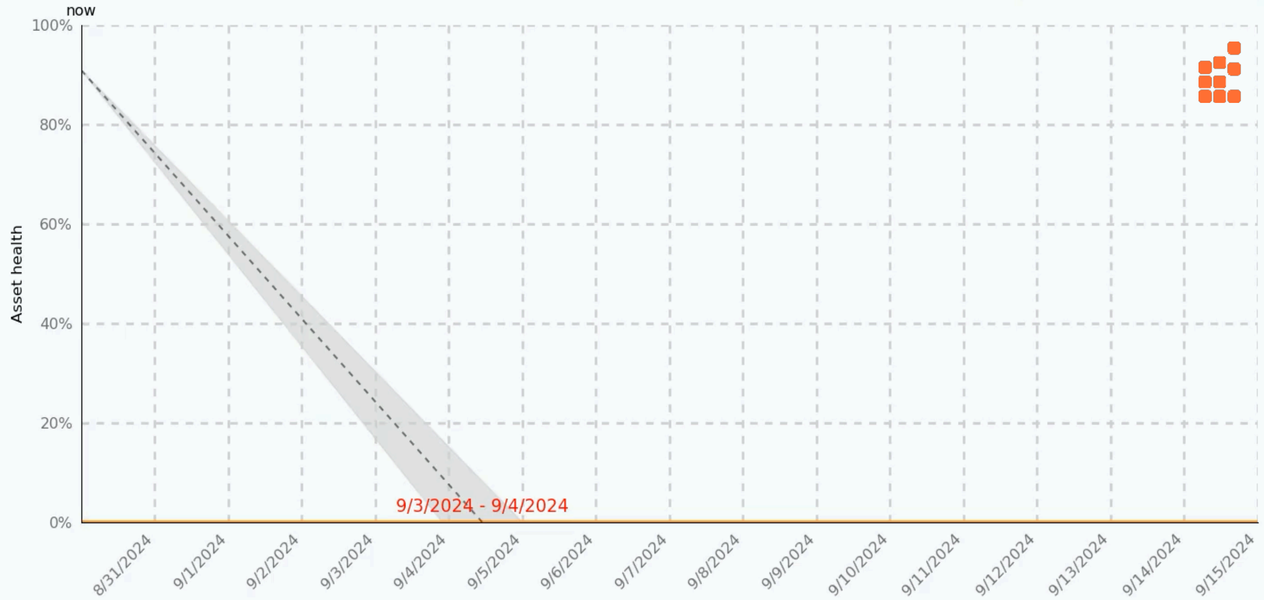
Alert: 1 Warning: 7 Closed Alert: 1 Closed Warning: 0

Filters: Acknowledgement: All | AND | Status: All

| Time | Asset name | Description | |
|---|---|---|---|
| Opened: 5/6/2025, 5:24 AM Duration: 34d 14h 56m | Pump WP1 | Asset health has decreased to 59%. There is a risk of failure due to Wear in 1 to 3 days. | ACKNOWLEDGE |
| Opened: 5/6/2025, 4:57 AM Duration: 34d 15h 22m | Latex Transfer Valve TACPM1 | Asset health has decreased to 58%. There is a risk of failure due to Sluggish operation in 3 to 7 days. | ACKNOWLEDGE |
| Opened: 5/6/2025, 4:57 AM Duration: 34d 15h 22m | Latex Transfer Valve TACPM1 | Anomaly detected in Ball valve: Valve open time value out of normal range: 2.86sec (normal range 0.1 to 1.0). | ACKNOWLEDGE |
| Opened: 5/5/2025, 2:14 PM Closed: 5/6/2025, 1:54 PM Duration: 23h 40m | Pump WP1 | Asset health has decreased to 59%. There is a risk of failure due to Wear in 14 to 28 days. | ACKNOWLEDGE |
| Opened: 4/30/2025, 5:53 AM Duration: 40d 14h 27m | Compressor 1-Throw 1-Head End | Asset health has decreased to 59%. There is a risk of failure due to Leak in 8 to 12 days. | ACKNOWLEDGE |
| Opened: 4/28/2025, 8:35 AM Duration: 42d 11h 44m | Heat Exchanger HXRPM1 | Asset health has decreased to 59%. There is a risk of failure due to Fouling in 135 to 171 days. | ACKNOWLEDGE |
| Opened: 4/10/2025, 2:34 PM Duration: 60d 5h 46m | HOB 1 Pump Mechanical Seal | Asset health has decreased to 59%. There is a risk of failure due to Wear in 29 to 33 days. | ACKNOWLEDGE |
| Opened: 4/10/2025, 2:34 PM Duration: 60d 5h 46m | Mechanical Seal WP1 | Asset health has decreased to 59%. There is a risk of failure due to Friction in 29 to 38 days. | ACKNOWLEDGE |

### Remaining useful life

Valve Leak 5-6 days




# Dynamically updated RUL (Remaining Useful Life) enables optimal maintenance planning and performance

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novity®

**Our models show accurate, real-time RUL and predict failures months before competing approaches.**

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# Cloud software + AI that integrates with operator or partner clouds




## 1 Predictive Asset Health Platform (Saas)

- Available directly to industrial operators
- AI-powered, ML enabled
- Full-service

## 2 AI as a Service (AIaas)

- TruPrognostics powers OEM monitoring services
- **Immediate global outreach via APIs**

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# 10x

Faster Results Generation

# 90%+

Accurate RUL / Failure Predictions

# 100%

Agnostic to historical data

**The first hybrid of physics-based predictive maintenance and AI, built from the ground up for machine-specific remaining useful life.**

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H O W

# How are we able to achieve this?

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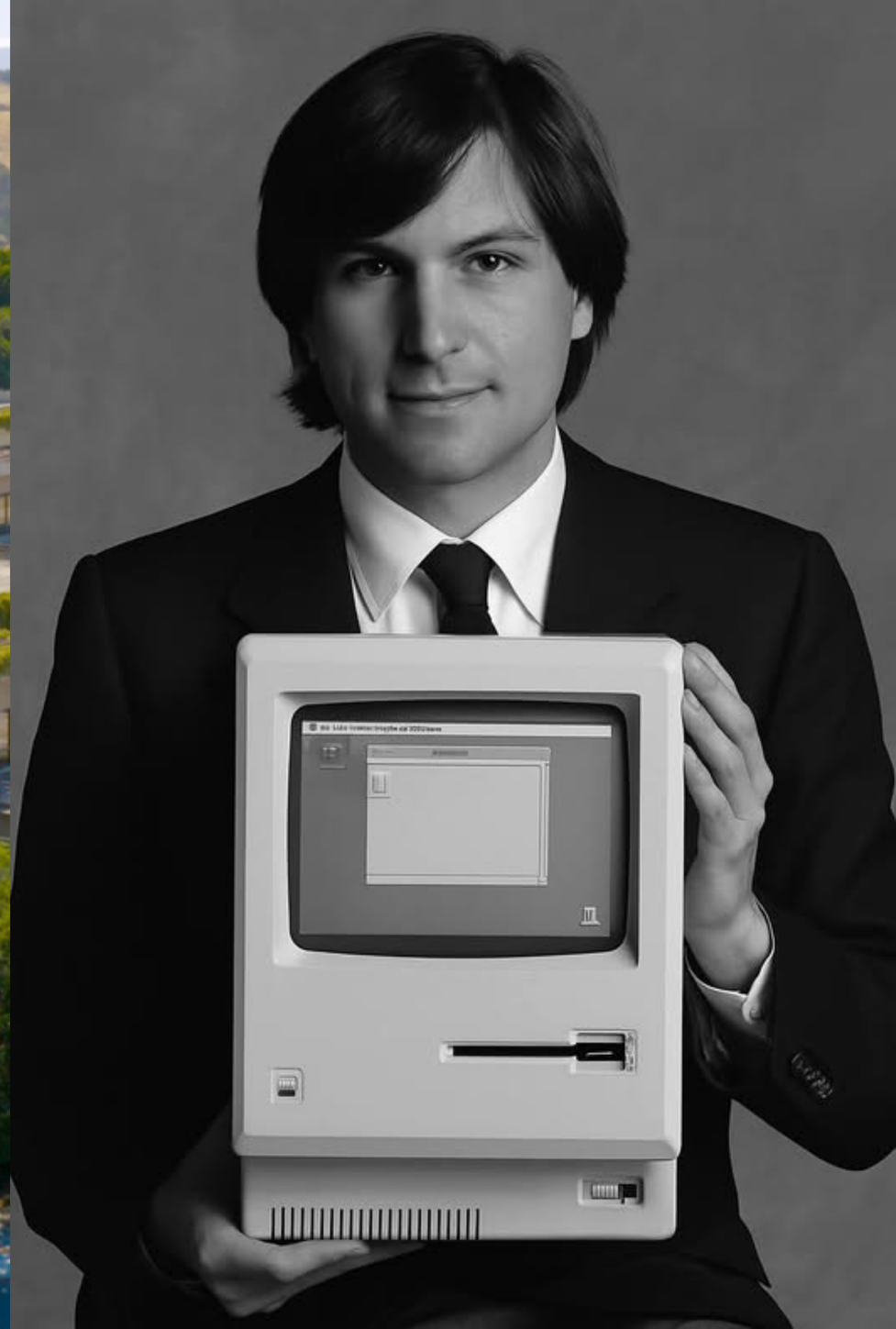
XEROX®
PARC



## Customers & Pilots

## Investors

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# IMPACT

## What if you could truly know the future health of your machines?

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TOKYO GAS

ACARIO

TOKYO GAS GROUP

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We would be one of the largest gas utilities locally

| Company | Customers | Volumes (Mcf) | Revenue ($) |
|---|---|---|---|
| TOKYO GAS | 8,789,000 | 399,161,678 | $ 17,014,000,000 |
| SoCalGas | 5,909,191 | 313,858,830 | $ 6,320,072,967 |
| Pacific Gas and Electric Company | 4,212,250 | 229,647,937 | $ 4,703,562,661 |
| ATMOS energy | 3,357,601 | 272,584,745 | $ 3,625,083,772 |
| CenterPoint Energy | 2,267,729 | 106,687,150 | $ 1,602,684,231 |
| SOUTHWEST GAS | 2,205,461 | 132,091,959 | $ 2,365,003,697 |
| Nicor Gas | 2,056,652 | 223,715,480 | $ 2,138,735,544 |
| PSEG | 1,842,016 | 177,386,258 | $ 1,943,861,420 |
| Consumers Energy | 1,816,656 | 198,500,251 | $ 2,310,264,256 |
| Xcel Energy | 1,474,408 | 143,384,227 | $ 1,590,721,865 |
| DTE Energy | 1,228,208 | 126,437,744 | $ 1,369,142,408 |

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And also, one of the largest electric utilities locally

| Company | Customers | Volumes (MWh) | Revenue ($) |
|---|---|---|---|
| Pacific Gas and Electric Company | 5,188,308 | 79,455,318 $ | 13,188,085,000 |
| Southern California Edison | 4,963,983 | 75,828,585 $ | 11,939,729,900 |
| FPL | 4,708,793 | 104,431,096 $ | 10,526,025,000 |
| **TOKYO GAS** | **4,152,000** | **25,479,000 $** | **6,327,000,000** |
| conEdison | 2,478,248 | 19,756,921 $ | 5,035,755,000 |
| Georgia Power | 2,410,402 | 83,740,365 $ | 8,255,813,000 |
| Dominion Energy | 2,381,321 | 75,562,974 $ | 6,677,362,600 |
| Ameren | 2,400,000 | 71,907,000 $ | 5,794,000,000 |
| DTE Energy | 2,142,829 | 41,923,096 $ | 4,705,304,000 |
| Duke Energy | 7,400,000 | 52,700,616 $ | 4,852,431,300 |
| Consumers Energy | 1,791,366 | 33,253,922 $ | 4,104,009,700 |

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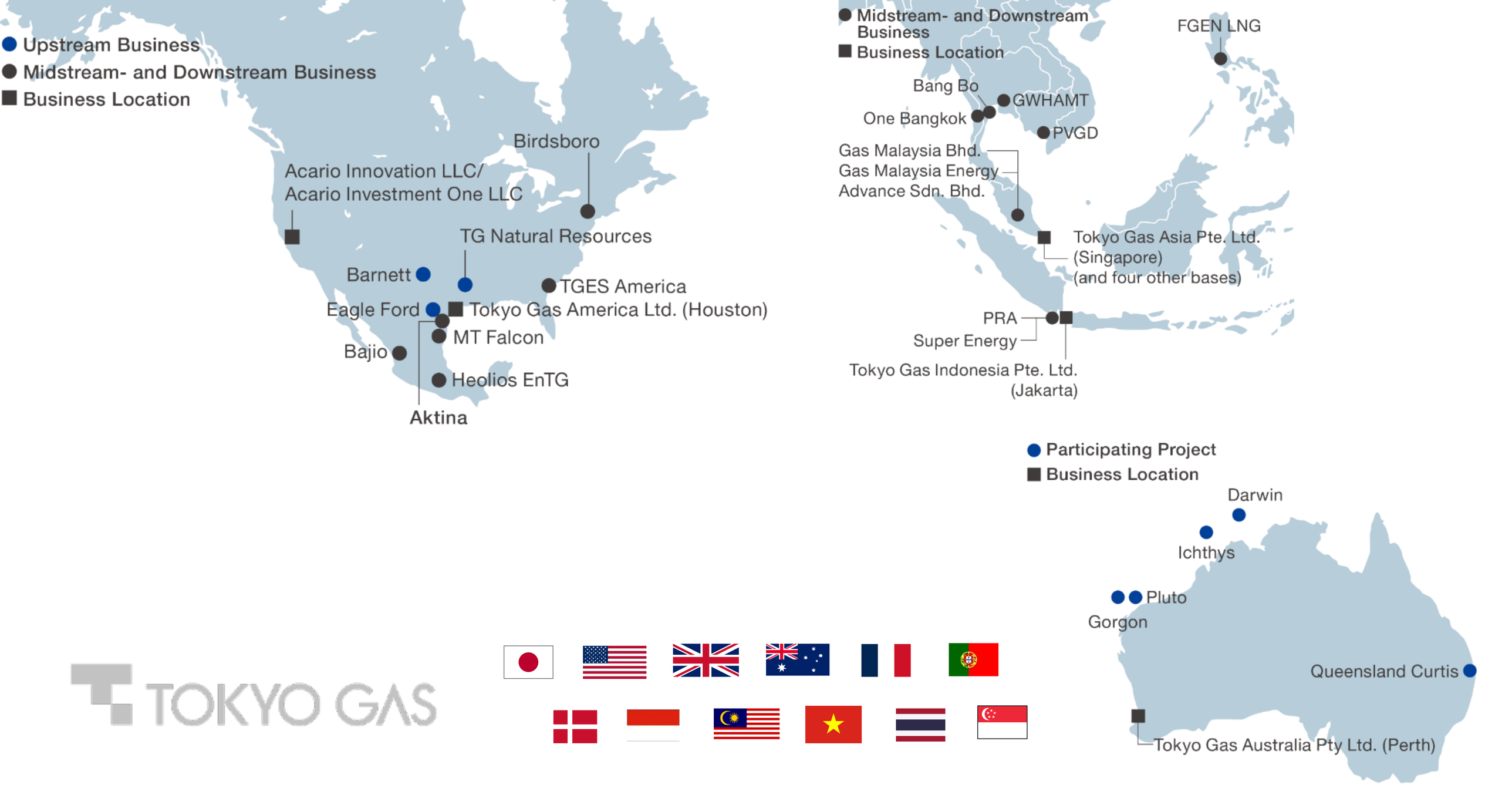


TOKYO GAS

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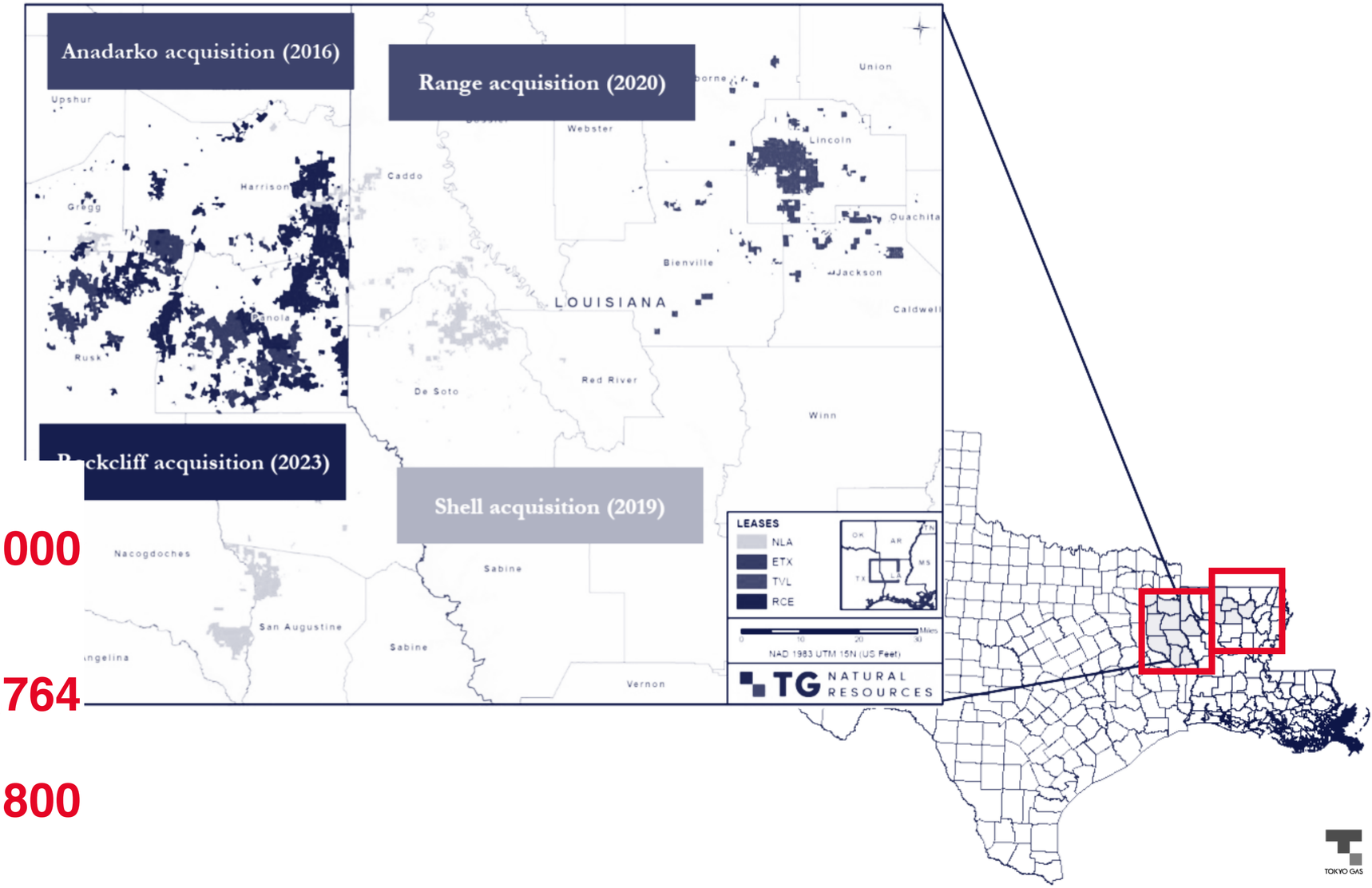
# TG NATURAL RESOURCES




## Resource

| | |
|---|---|
| **Acres** | **410,000** |
| **Wells** | **4,764** |
| **Pipeline (miles)** | **800** |

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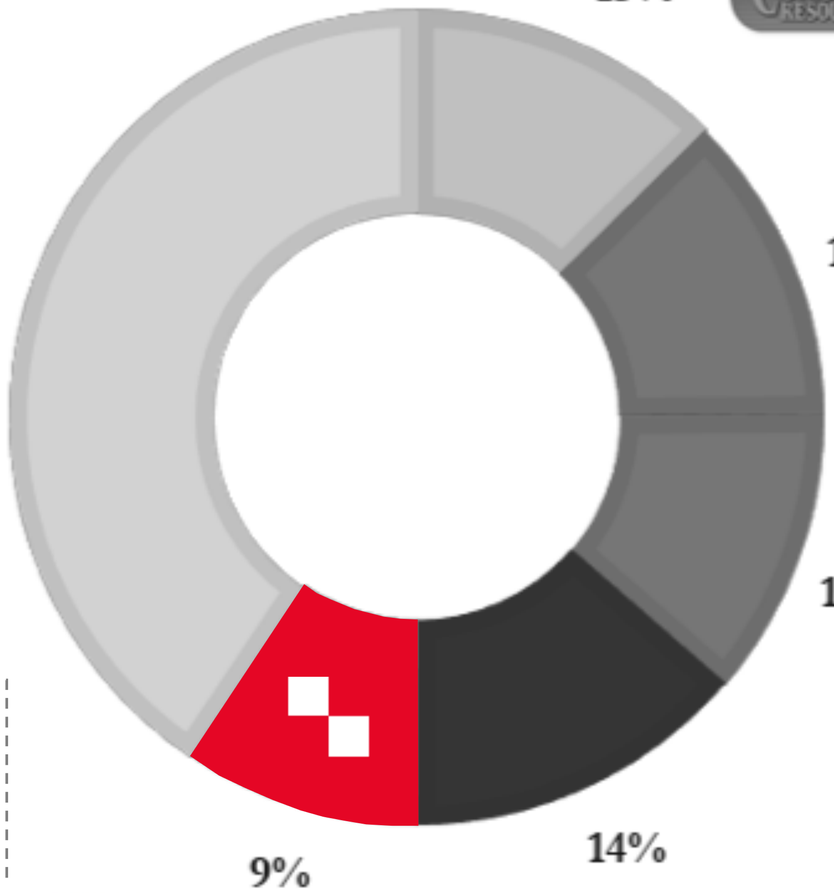
# TG NATURAL RESOURCES

In 2023, we were responsible for **almost 10% of the production** of the entire Haynesville.

LARGEST PRODUCERS BY SHARE, 2023

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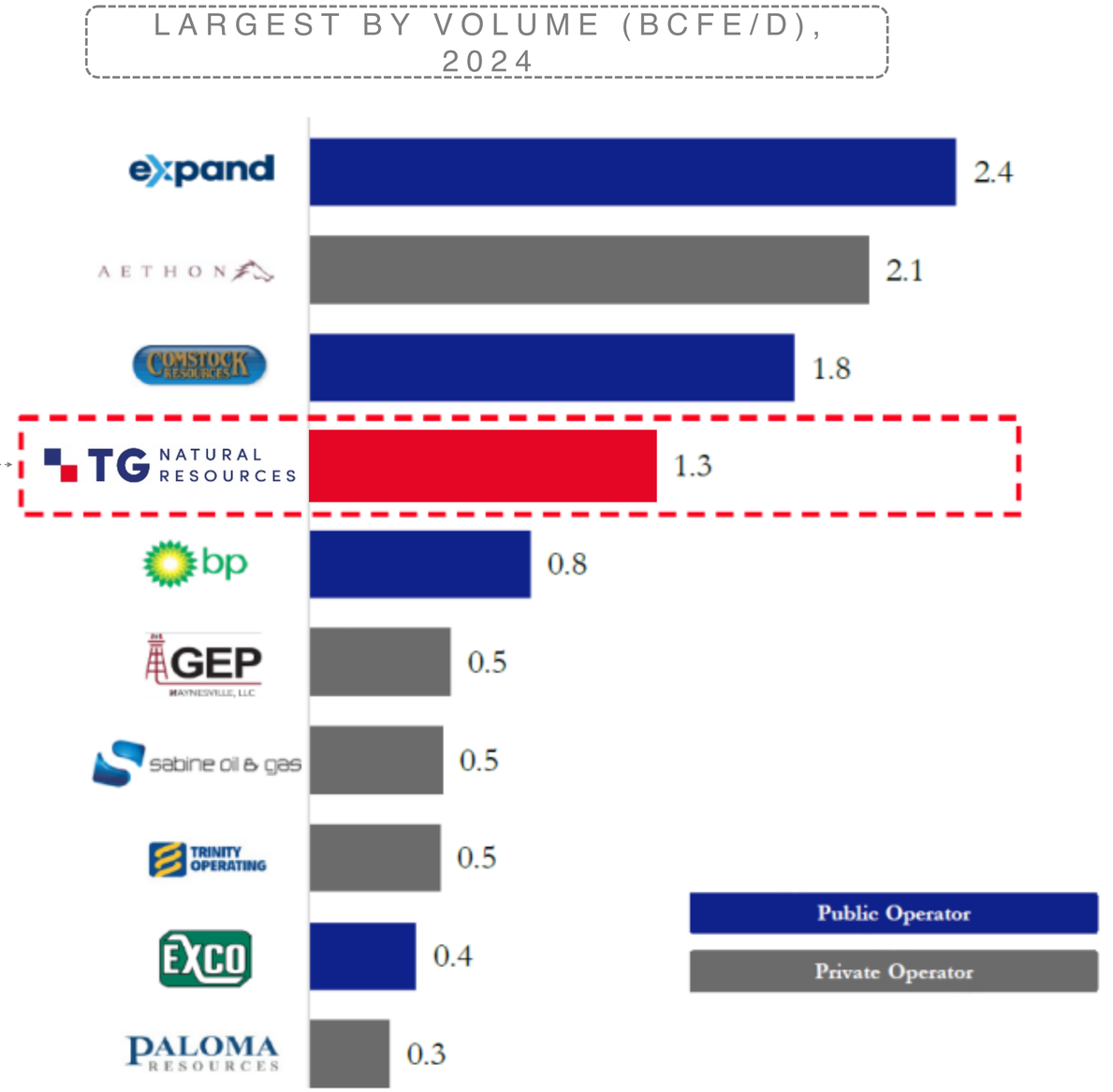
# TG NATURAL RESOURCES

As of last year,

**we are now the 4th largest producer.**

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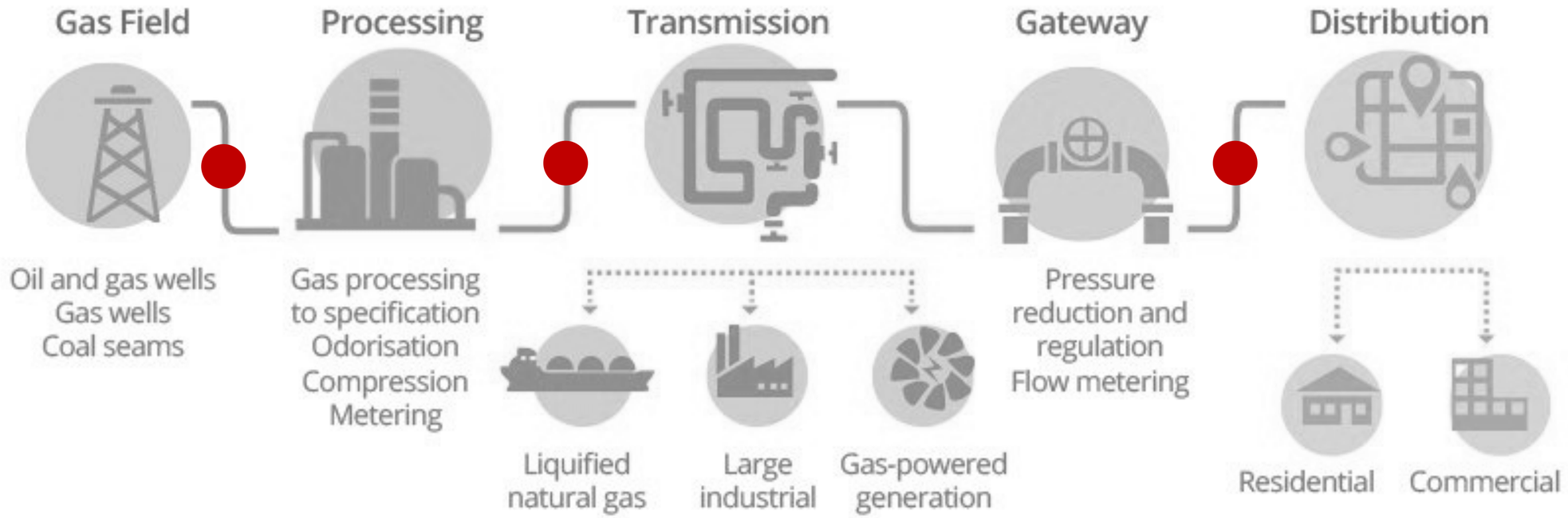
# In order to be transported, gas must be compressed:

NATURAL GAS SUPPLY CHAIN




PRODUCTION

TRANSMISSION

DISTRIBUTION

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TG NATURAL RESOURCES



Image: Enerflex



Image: Enerflex

# What would *minimal* downtime cost?

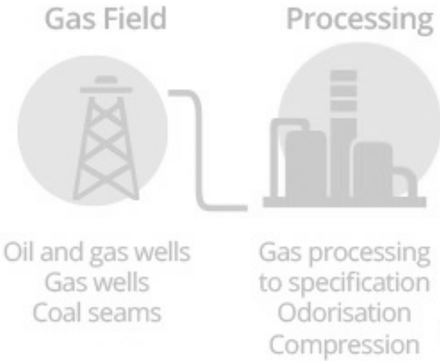
TG NATURAL RESOURCES

**25x**
**compressors**

**2.1%**
**downtime**

# $10,343,650

every year for a single site

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# What the *impact* of Novity?

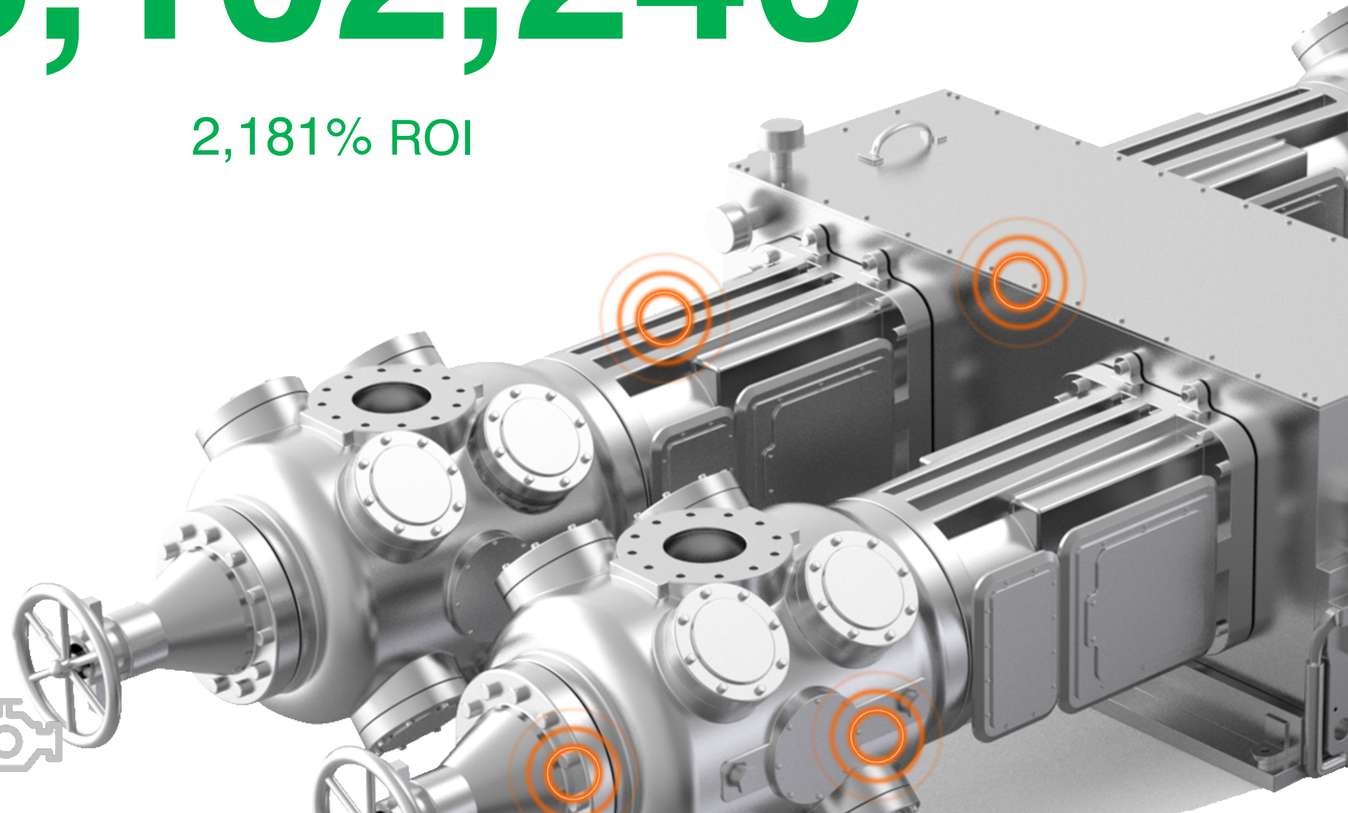
184 hours

**128 hours**

**$3,102,240**

2,181% ROI

**25x**
**compressors**



# IMPACT

## What if you could truly know the future health of your machines?

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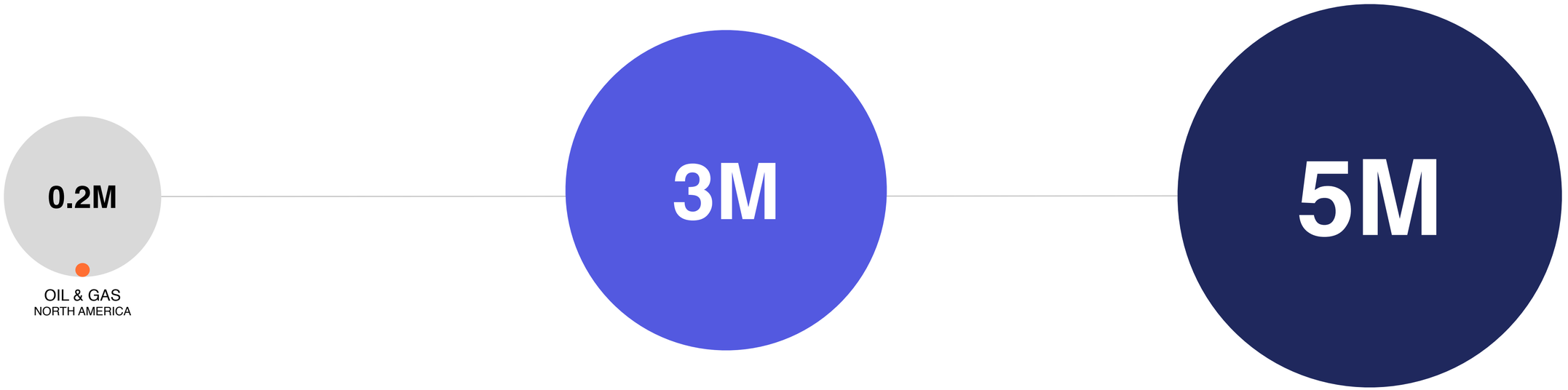
# Industrial needs go far beyond compressors

COMPRESSORS

PUMPS

MOTORS




Reciprocating compressors in operation in the US today

Large pumps used in industrial manufacturing worldwide

Large motors in industrial use today worldwide

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# Want to see the future of your machines?



join the movement

novity

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# THANK YOU!

markus.larsson@novity.us

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PLUG AND PLAY

SV SUMMIT

# STARTUP PITCH




## QUINO ENERGY

Quino Energy manufactures low-cost, non-flammable, and immediately mega-scalable organic flow batteries from abundant raw materials for commercial and grid applications.

#PNPTCSiliconValley

Join us at **pnptc.com**

Eugene Beh, Co-Founder and CEO
eugene@quinoenergy.com

# Organic Flow Batteries for Renewable and Conventional Power Plants

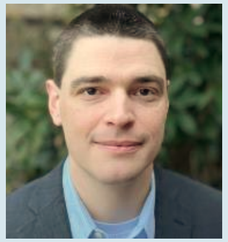
## Leadership Team



**Eugene Beh**
**Co-Founder, CEO**
Multilingual, Inventive,
Adaptive PhD Chemist



**Meisam Bahari**
**Co-Founder, CTO**
Harvard Post-Doc
PhD Electrochemist



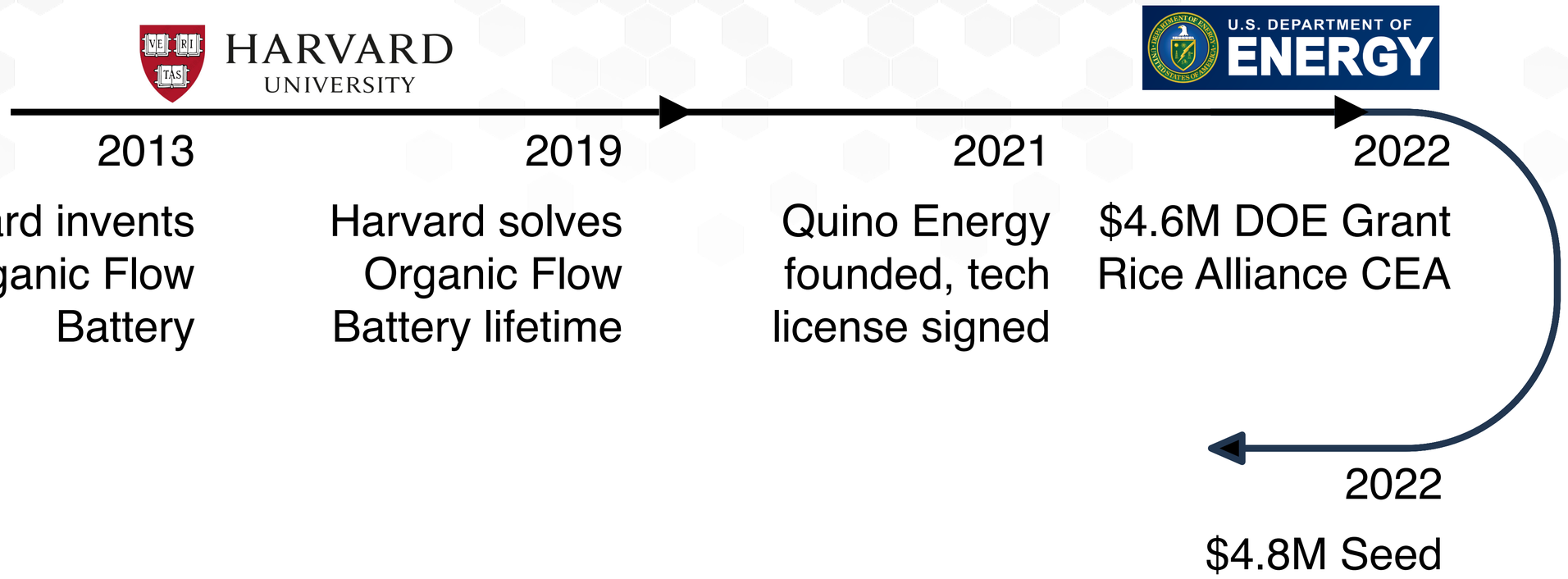
**Nathan Ball**
**EVP BD & Sales**
Startup Executive
and Mentor since 2011

# Before We Begin

- ✓ Awarded non-dilutive $15M at 0% cost share, to start Q3
- ✓ Term Sheet received for a $16M Series A round.
- ✓ Fully subscribed but open to additional close in mid-Q3.

Get in touch: eugene@quinoenergy.com

# Company History and Series A Objectives



# Company History and Series A Objectives

2013
Harvard invents Organic Flow Battery

2019
Harvard solves Organic Flow Battery lifetime

2021
Quino Energy founded, tech license signed

2022
$4.6M DOE Grant Rice Alliance CEA

2022
$4.8M Seed

2023
Chemical Pilot line: MRL 7



2024
100 kWh lab pilot system: TRL 6




2024
Power Plant and AI Datacenter partnerships

2025-2026
Multi-MWh-scale TRL 7 pilots




2026
Sign 100's of MWh with partners

Series A now to unlock deployments and sales

# Value Proposition and Technology

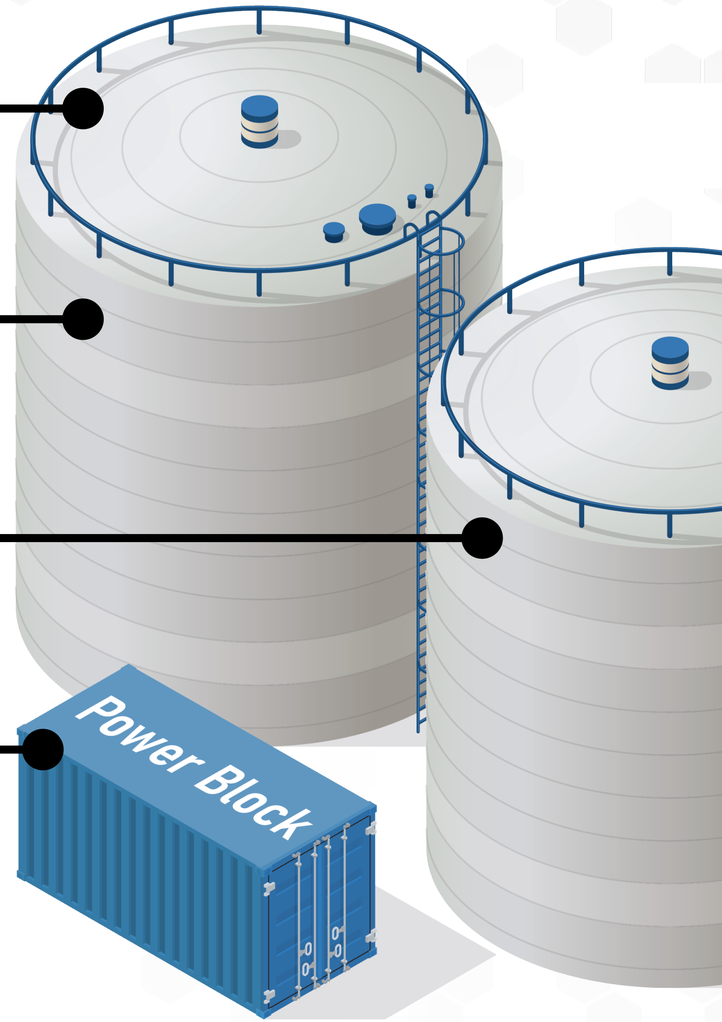
30-40% lower cost than LFP

Repurposed Steel Tanks
Save $40/kWh on installation

Quinone
$20/kWh

Ferrocyanide
$15/kWh

Turnkey Power Blocks from Vanadium OEMs
$6-31/kWh @ 40-8 hours

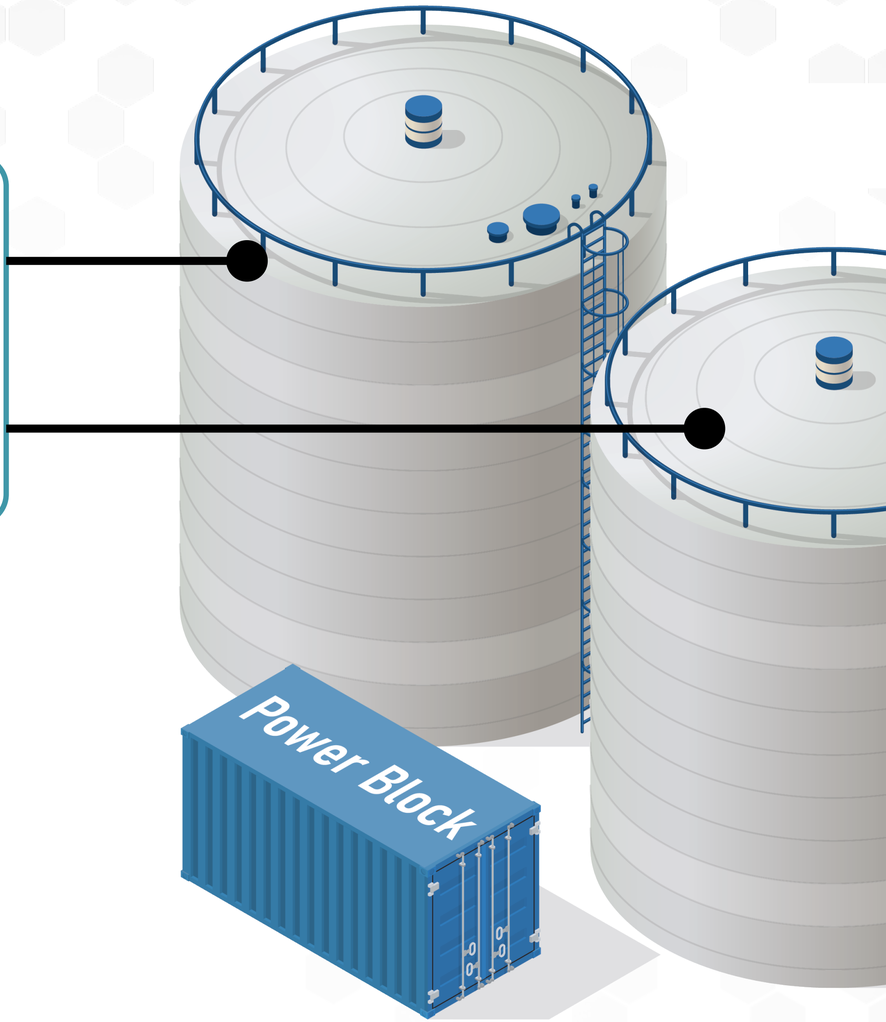



| | |
|---|---|
| Totals | CAPEX $41-66/kWh<br>Installation savings $40/kWh |

# Value Proposition and Technology

30-40% lower cost than LFP

Completely non-flammable



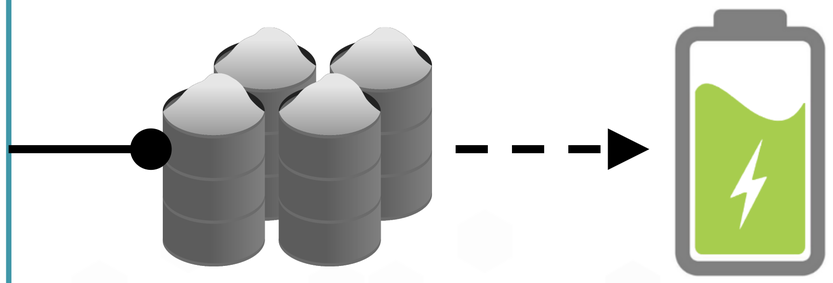

All electrolytes are dissolved in water

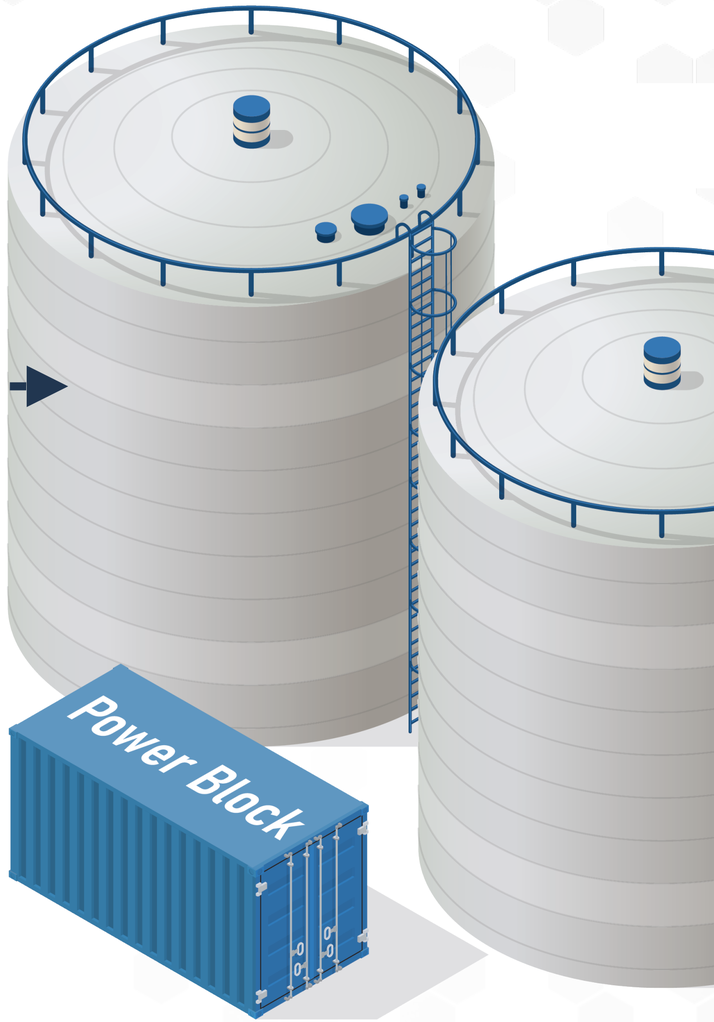
# Value Proposition and Technology

30-40% lower cost than LFP

Completely non-flammable

Made from coal tar or petroleum aromatics






**Phthalic anhydride raw material**

6 MMT/year (2.5 TWh/year at $3.81/kWh)

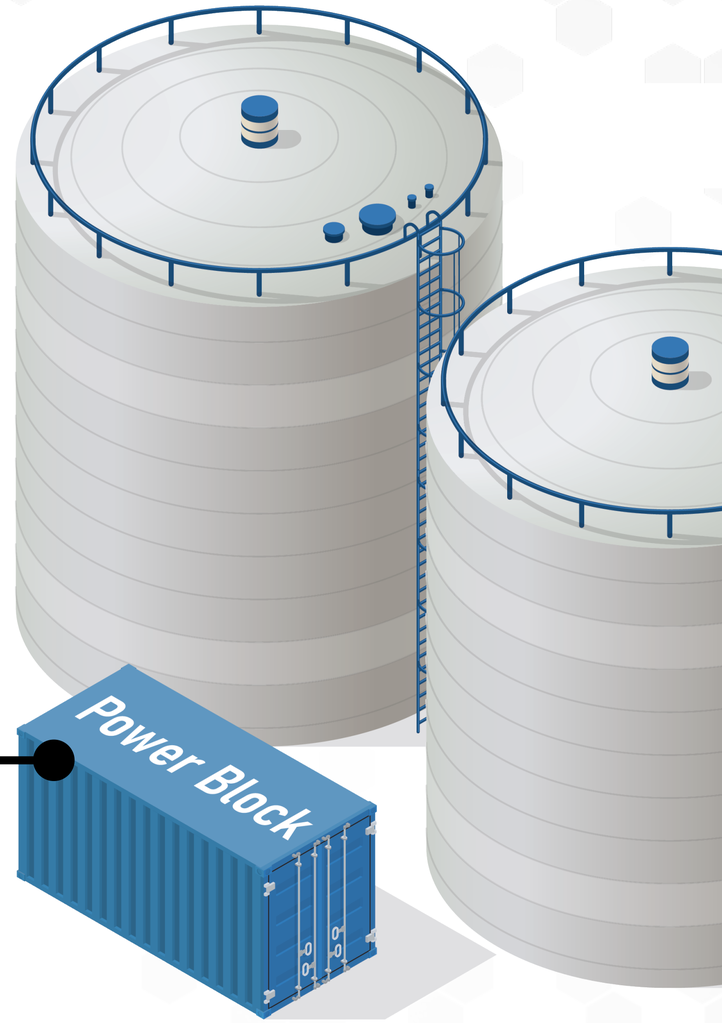
# Value Proposition and Technology

30-40% lower cost than LFP

Completely non-flammable

Made from coal tar or petroleum aromatics

Proven and shovel-ready by 3rd party OEMs




Proven through lab pilots using commercial power blocks.
>1 GW of power blocks were deployed worldwide in 2024.

# Quino Energy has Committed Partners for Front-of-the-Meter Applications

## Increase efficiency of gas power plants



***CO-LEAD INVESTOR***

Global Energy Tech Company

## Renewables integration

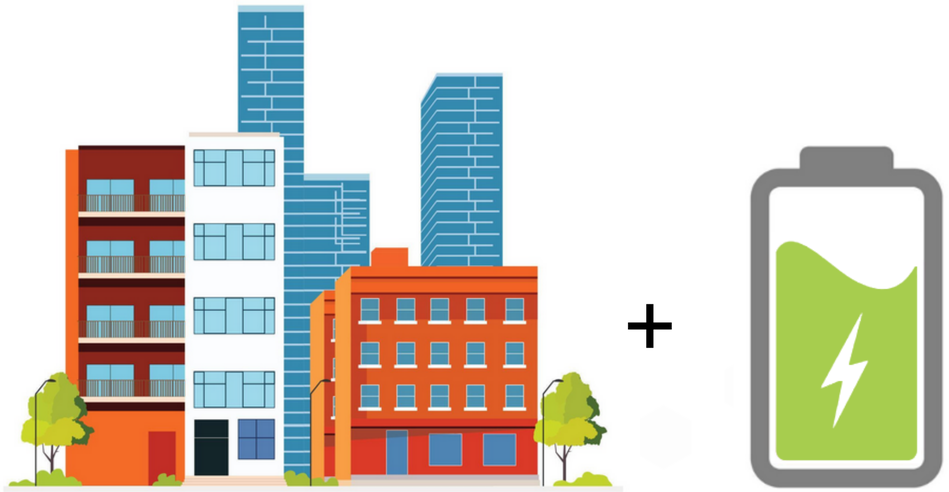


***INVESTORS***

Utility CVCs

# Quino Energy has Committed Partners for Behind-the-Meter Applications

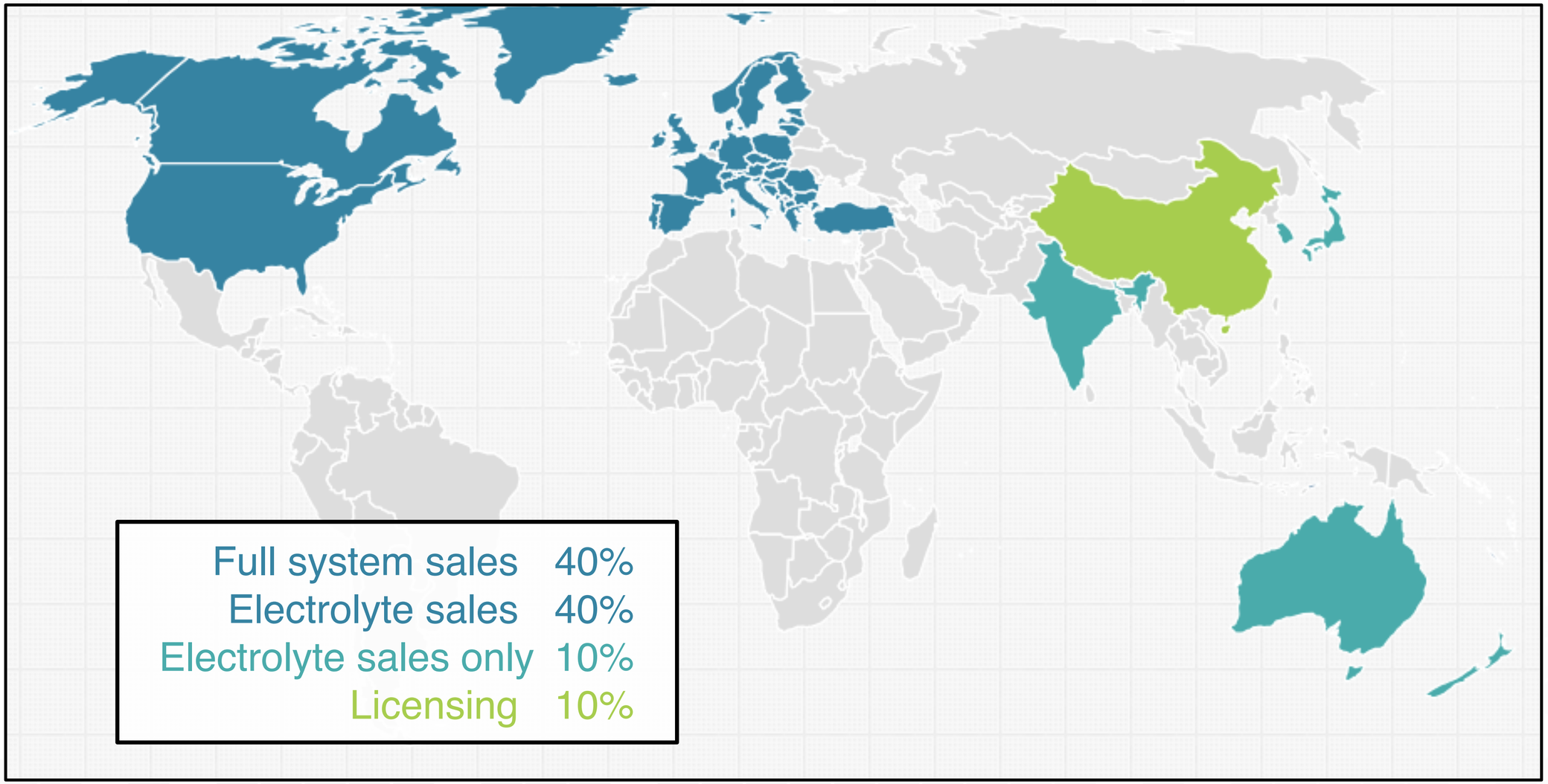
## Urban and Datacenter Microgrids



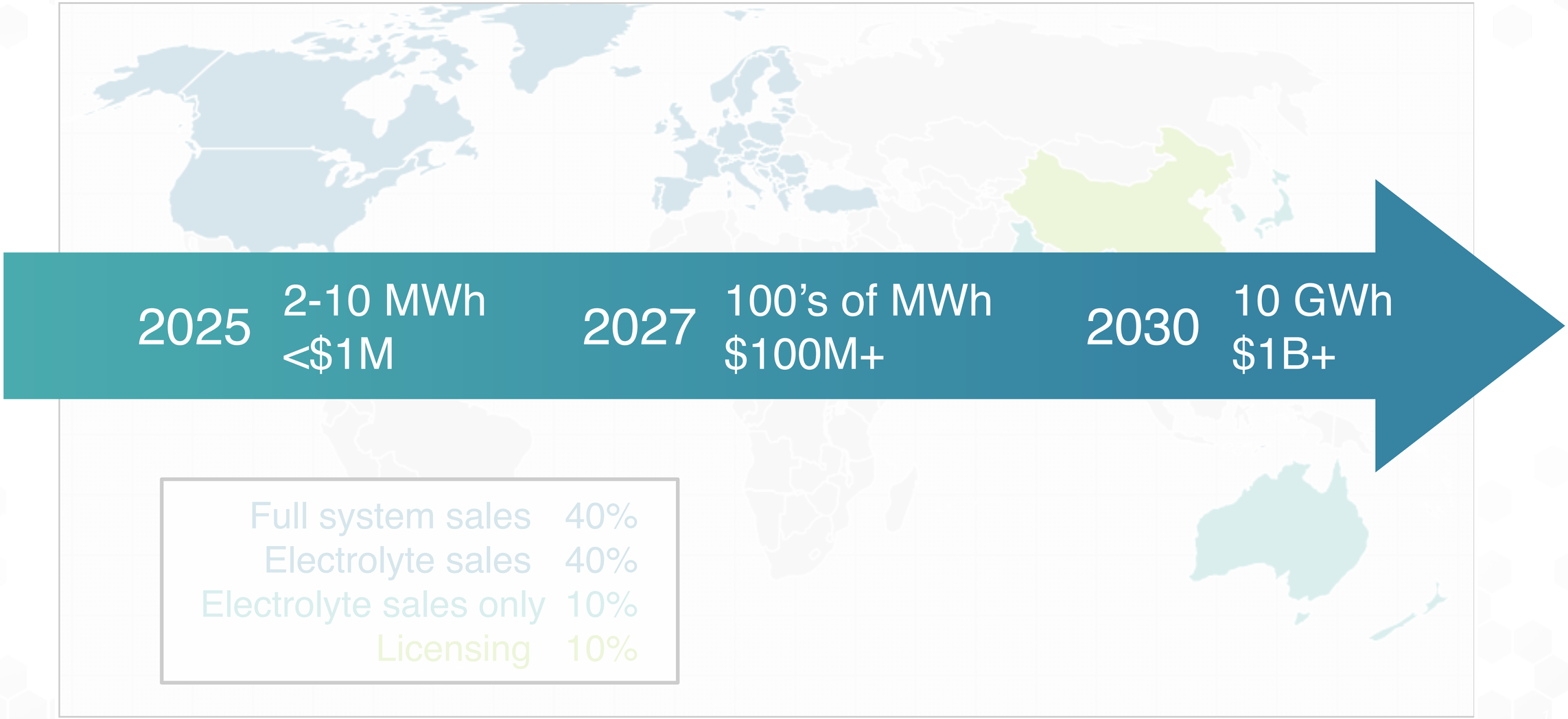
***CUSTOMERS***

Integrators,
Developers,
Flow Battery OEMs

# Multiple Revenue Streams Worldwide
# Enable $1B+ of Revenue by 2030



# Multiple Revenue Streams Worldwide Enable $1B+ of Revenue by 2030



# Executive Summary and Series A Ask

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Get in touch: eugene@quinoenergy.com

PLUG AND PLAY

SV SUMMIT

# STARTUP PITCH

INLYTE ENERGY

## INLYTE ENERGY

Inlyte Energy has reinvented this proven technology for the grid, using the super-abundant materials iron and salt, to create a unique 2-in-1 solution that provides daily cycling as well as long duration backup for data centers, utilities, and commercial and industrial customers.

#PNPTCSiliconValley

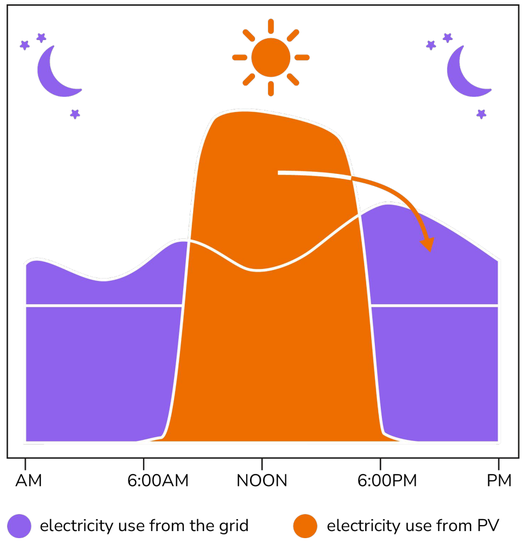
Join us at **pnptc.com**



# INLYTE ENERGY

# Two types of energy storage

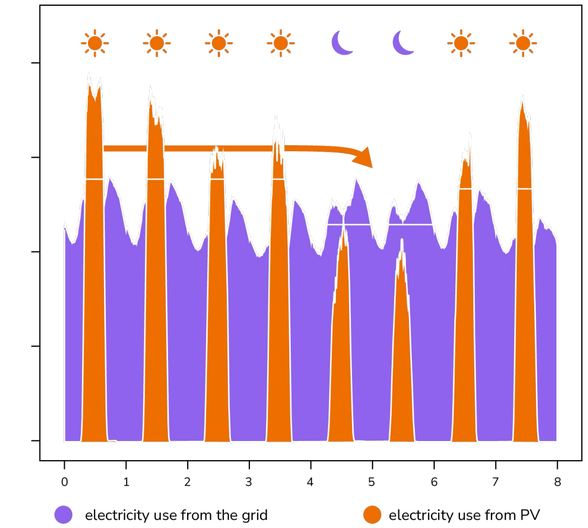
## ENERGY




Daily cycle (4-12 hr)

>$50 B/yr today
>$200 B/yr projected 2030s

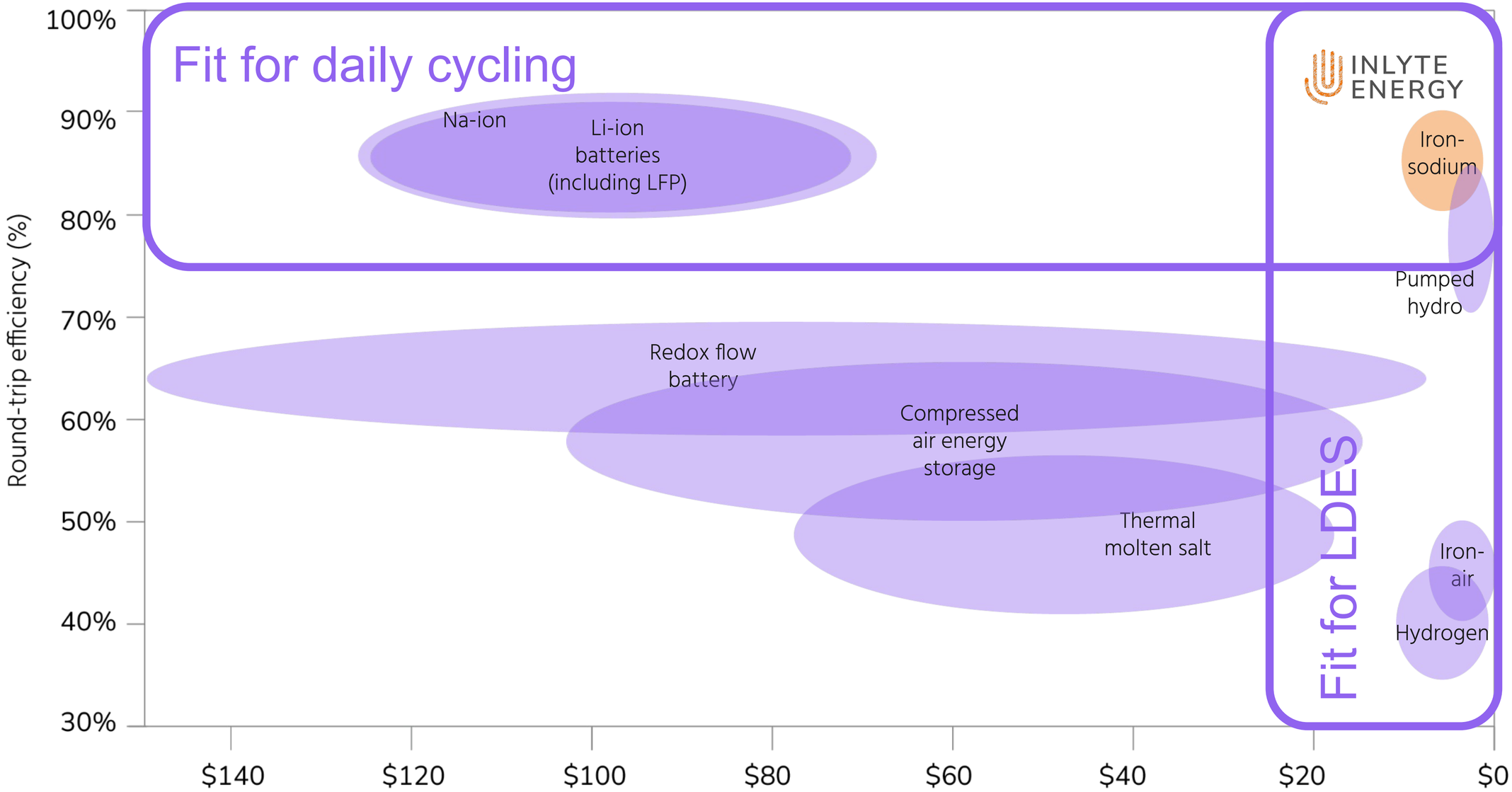
## BACKUP




Long duration energy storage (LDES)

$3 B recent California procurement
>$100 B/yr projected 2030s

# What is needed for both types




+ Safe
+ Long life
+ Compact




**Daily Cycling: Li-ion**



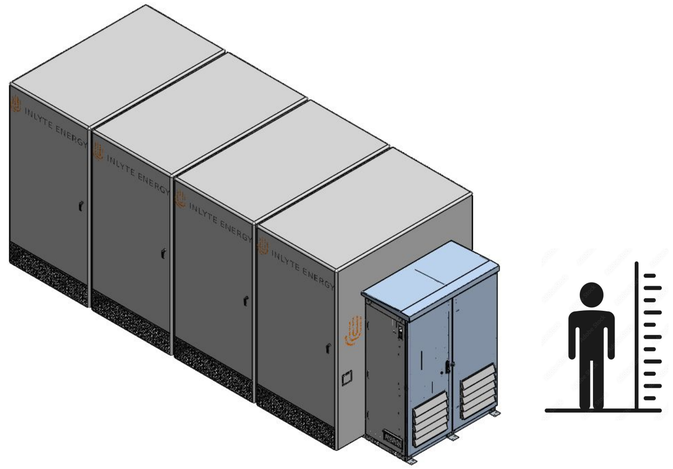

**Multi-day backup: diesel generator**



**Battery for UPS: Lead-acid**

# Iron-sodium 2-in-1 or 3-in-1

## Inlyte LCI 1.0 Product



250 kW / 4.8 MWh

load shifting and
multi-day full site backup

# Daily cycling + LDES utility-scale solution

## Li-ion



Tesla Megapack

| | |
|---|---|
| Power | 1 MW |
| Energy (daily cycling) | 3.9 MWh |
| Energy (resilience backup) | (None) |
| Site areal density | ~80-300 MWh/acre |

**Cost parity on $/kWh (daily) from Inlyte Factory 1**

INLYTE ENERGY



Inlyte UT1.0 x 16

| | |
|---|---|
| Power | 1.08 MW |
| Energy (daily cycling) | 5.76 MWh |
| Energy (resilience backup) | 18.2 MWh |
| Site areal density (daily) | ~75 MWh/acre |

**Essentially free**

# Iron-sodium, made from abundant materials domestically sourced








## $1/kWh

Cost of iron and table salt energy storage materials

vs. $10-30/kWh (LFP)

## $23/kWh

DC-block BESS cost at 10 M cells/yr factory scale

vs. $100/kWh (LFP)

## 100%

Domestically-sourced materials or from allied countries

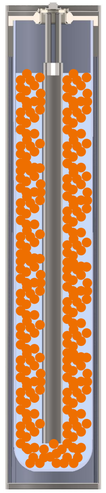
vs. 20-30% (LFP)

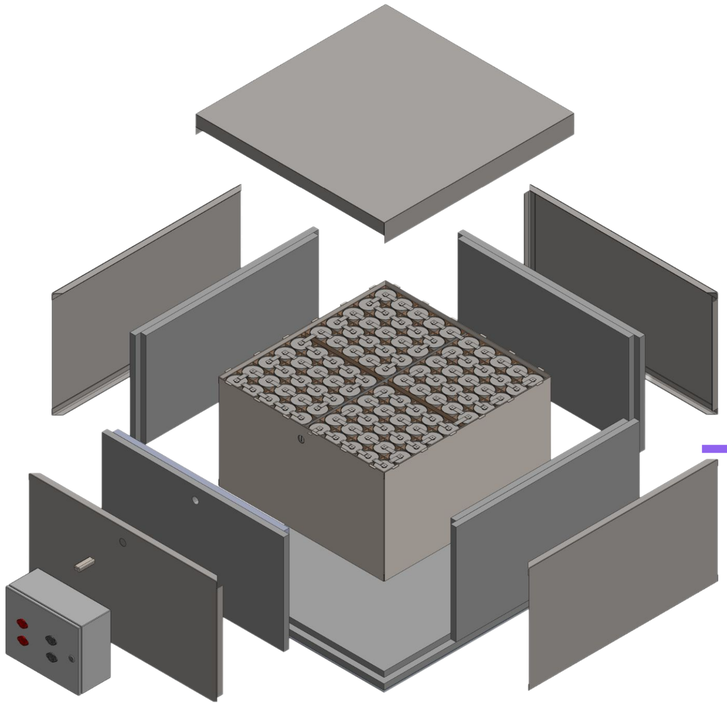
# Chemistry breakthrough rapidly applied to energy storage systems

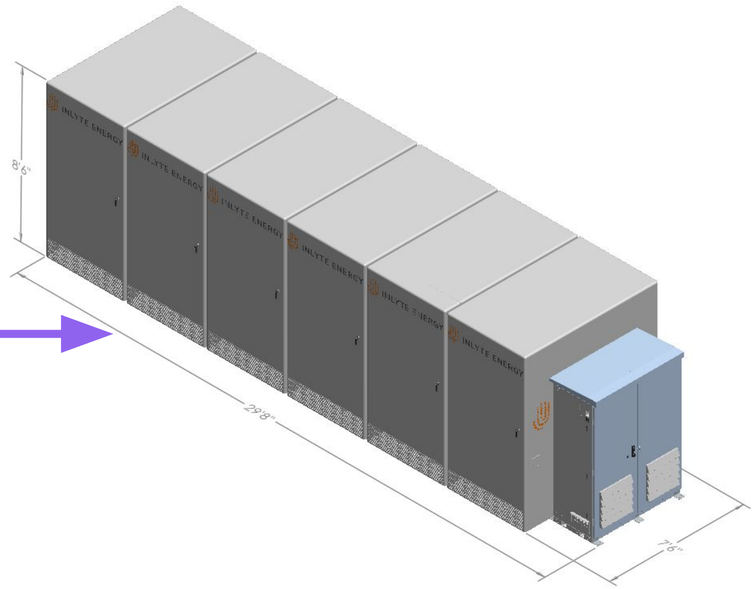
CELL

MODULE

ESS



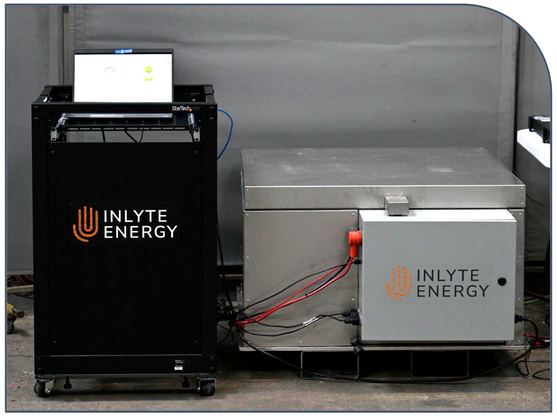




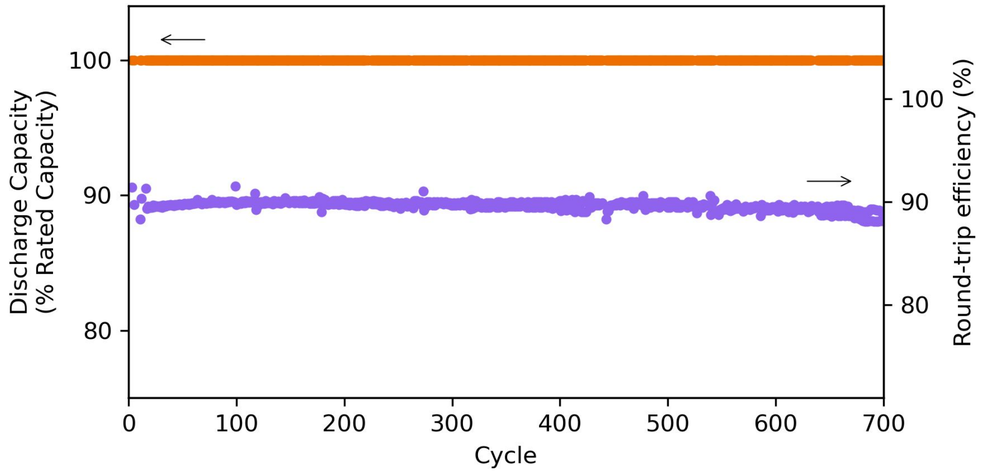

$$Fe + 2NaCl \longleftrightarrow 2Na + FeCl_2$$

# Product: 2-in-1 solution for utilities, data centers, and more





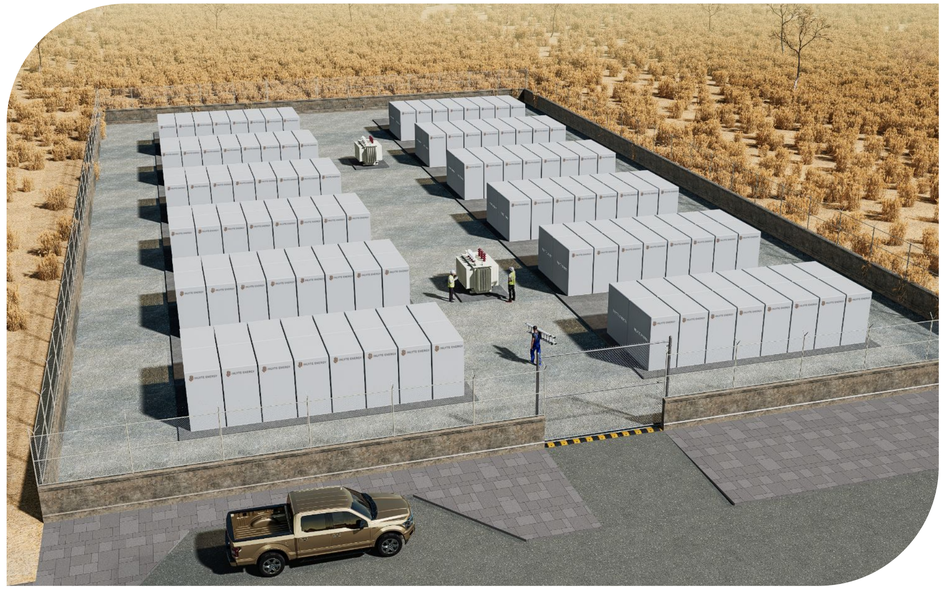

Q4 2024: demonstration of iron cycling stability and Gen 1 module.




| PARAMETER | VALUE |
|---|---|
| Chemistry | Iron-sodium [Na-$FeCl_2$] |
| Rated Power (kW) | 45 kW (8 hour) |
| Total Energy (kWh) | 1500 kWh |
| Rated Energy (8hr) for Daily Cycling | 360 kWh |
| Backup Power | 840 kWh @ 35 kW (24 hr)<br>1500 kWh @ 15 kW (100 hr) |
| Roundtrip Efficiency (DC) | 85% |
| Calendar Life | 20 years |
| Cycle Life | > 7,000 |
| Ingress Protection | IP 55 |
| Grid Connection | Via UL1741 certified inverter<br>480 VAC or 690 VAC, 3-phase \| 60Hz |
| Dimensions | 5’ 10” (L) x 7’ 1” (W) x 9’ (H) |
| Weight | 25,000 lb |
| Controls | Modbus TCP/IP, RTU/RTAC DNP3 interface |
| Standards (Planned in 2026) | UL1973 (battery), UL9540 (AC system) |

# Market demand

Front-of-the-meter
>$40 B/yr global, >10% CAGR



Behind-the-meter
>$10 B/yr global, >20% CAGR




Southern Company

VITAL ENERGY
Solar Powered Solutions

# HISTORY OF THE SODIUM METAL HALIDE BATTERY AND INLYTE ENERGY

INLYTE ENERGY

**1978**
First patent for sodium metal halide (Zebra) batteries

**1987**
Beta Research switches from iron chemistry to nickel chemistry for vehicle use

**2000**
Factory for current-gen sodium metal halide batteries in Stabio, Switzerland commences operation

**2012**
Factory for current-gen sodium metal halide batteries in Schenectady, NY commences operation

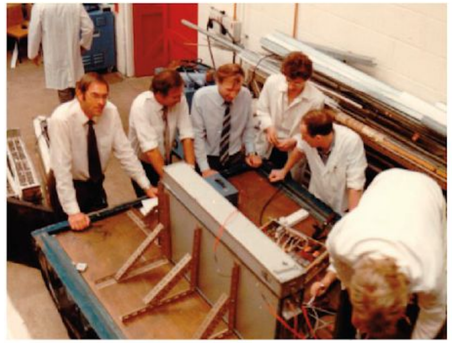
**2022**
Inlyte Energy acquires Beta Research Ltd. to jointly create next-gen sodium metal halide batteries






















**1995**
Daimler Benz test cars powered by sodium metal halide batteries exceed 100,000 km of driving

**2006**
Rolls Royce chooses sodium metal halide batteries to power NATO rescue submarine

**2021**
Inlyte Energy, Inc. founded

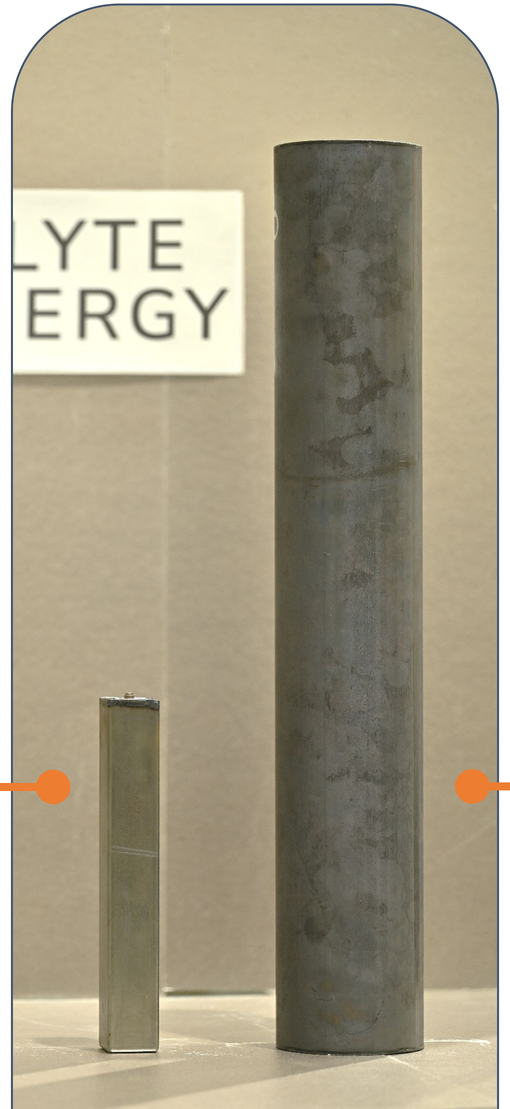
**2023**
Inlyte Energy closes Seed funding round

# Leveraging the 40-year history of the sodium metal chloride technology for speed

Launched Sodium Metal Chloride batteries in the 1980s

Designed for EV application

Legacy cell, “Monolith”
100 Wh
**Nickel**-sodium




Acquired Beta Research in 2022

Optimized for the grid

Inlyte Gen 2
2500 Wh
**Iron**-sodium

# Team



**Antonio Baclig**
*Founder & CEO*
Stanford



**Will Gent**
*Co-Founder & VP Engineering*
Stanford



**Roger Bull**
*Head of UK*



**Amy Hansen**
*Head of Business Operations*
DataRobot



**Ben Kaun**
*Chief Commercial Officer*
EPRI ELECTRIC POWER RESEARCH INSTITUTE



**Alison Armstrong**
*VP Manufacturing*
TESLA



**Dilip Goswami**
*President*
MOLEKULE

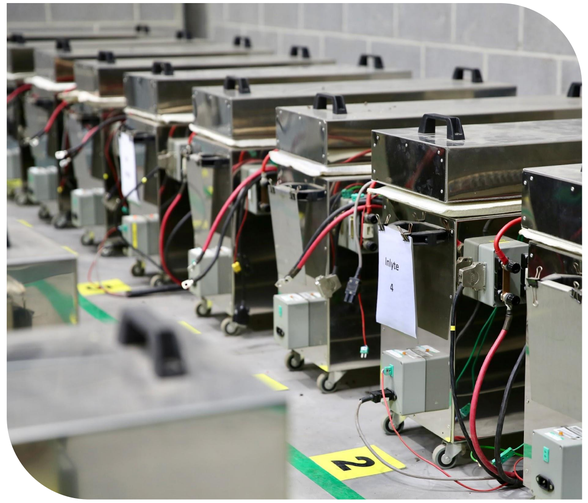
## BACKED BY TOP-TIER VCS AND GOVERNMENT AND INDUSTRY PROGRAMS

At One Ventures · VALO ventures · FIRST SPARK VENTURES · TechEnergy Ventures · Activate · arpa·e awardee · STATE OF CALIFORNIA ENERGY COMMISSION · NATO OTAN Defence Innovation Accelerator for the North Atlantic

SAN LEANDRO, CA | BURTON-ON-TRENT, UK

# We already have the facilities for pilot manufacturing




- Testing capacity for >600 commercial-scale cells
- Pilot manufacturing line capable of MWhs/year



INLYTE ENERGY




# Thank you

Antonio Baclig, CEO
antonio@inlyteenergy.com

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# STARTUP PITCH

Unbound Potential

## UNBOUND POTENTIAL

Unbound Potential has developed the fastest scalable battery.

#PNPTCSiliconValley

Join us at **pnptc.com**

# Unbound Potential®

## The fastest scalable battery

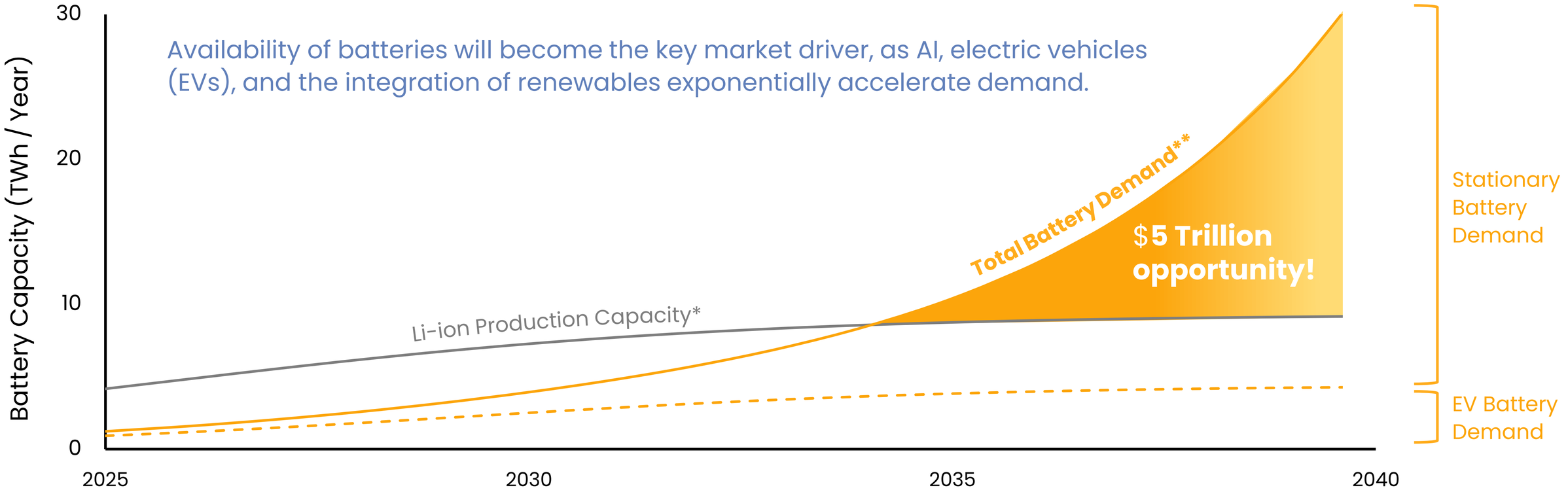
**ETH**
*Zürich Spin-off*

**€ 8M**
*Non-dilutive funding secured*

**€ 6M**
*Ask for pre-seed round*

amazon iqony FlexBase ABO ENERGY PLUG AND PLAY ENERGY SPRIN-D

# The world will need **3X more batteries** than can be supplied by 2040.

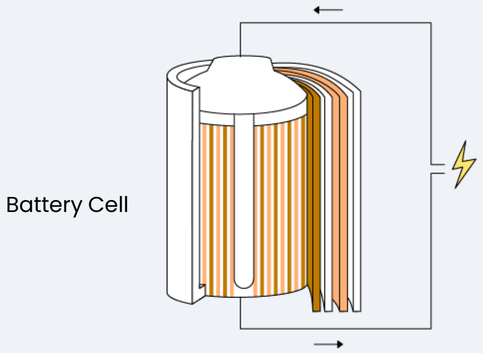



* International Energy Agency (IEA)
** McKinsey + *Nature Commun. Mater.*

**Speed** in scaling production will win the battery race!

# **Tank-based batteries** have an unfair advantage to win the race …

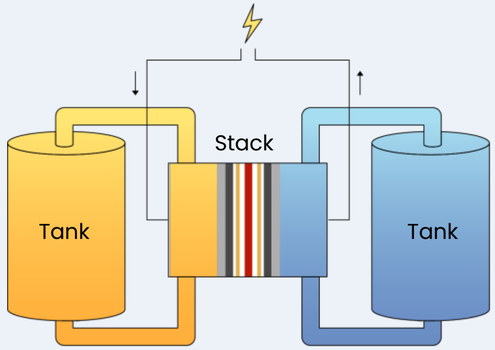
## Cell-based (Li- & Na-ion batteries)




| | |
|---|---|
| **Battery design:** | Energy storage material integrated in cells |
| **Typical factory:** | Megapack factory, California (USA) |
| **Factory cost:** | 5Bn $ |
| **Production rate:** | 1.2 kWh/s |

VS

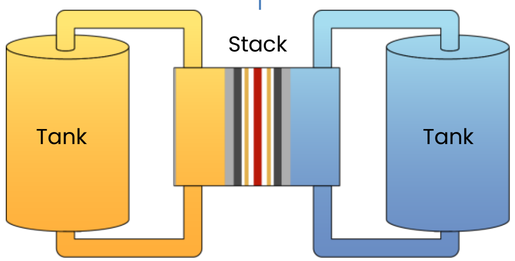
## Tank-based (Flow batteries)



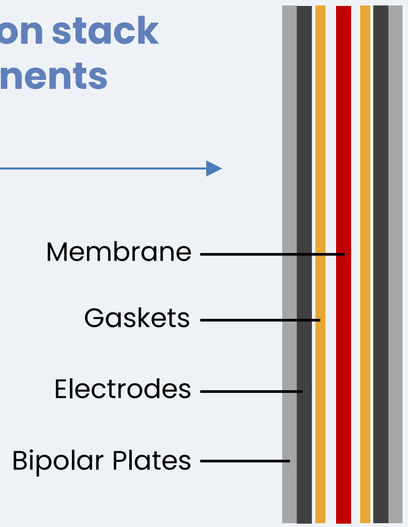

| | |
|---|---|
| **Battery design:** | Energy storage material kept in tanks |
| **Typical factory:** | Chemical production site, Antwerp (BE) |
| **Factory cost:** | 1Bn $ |
| **Production rate:** | 15 kWh/s |

… because they unlock a **60x higher** production rate for the **same factory cost!**

# Common tank-based battery **stacks** have not been designed for speed …




**Common stack components**




## Common stacks are overly complex.

- >200 layered parts per stack
- fragile high-tech membranes
- sealing with tight tolerances

## Stack manufacturing is 10‘000x too slow.

Required stack production rate: ~10 kW/s
Current stack production rate: ~0.001 kW/s

… but **our stack is different**.
Let us explain why.

# Our flow stack platform is tuned for **hyper-speed production.**

**Our stack unit**

**Patents:**
1 granted,
2 pending




## We developed the simplest design …

- No membrane
- 2 main components
- Chemistry agnostic

## … ensuring the fastest manufacturing.

- 2 main production steps
- No tight tolerances

## The outcome?
The battery customers want.

**Low battery cost**
<50 $/kWh in CAPEX

**High Efficiency**
>85%, enabling multiple revenue streams

**Non-flammable**
Compared to li-ion batteries with high fire hazards

# The **fastest growing industries** need large-scale batteries.

We received **45+** unsolicited customer requests, highlighting strong interest in our offer to the market.

*Target Customers*

### Commercial & Industrial energy users

Large scale consumers with on-site production of renewables

amazon (LOI)

"...we need a **cost-competitive** technology for 100s of sites, safe from geo-political risks.."

P&G · DHL · Nestlé

### Energy Infrastructure

Power producers and grid operators

iqony (LOI)

"...we're concerned we can't buy **high-efficiency** storage systems, in 5 years when we need them most."

EDF · enel · RWE

### Artificial Intelligence

Data centers with fluctuating demand and backup requirements

FlexBase (LOI)

"... we can't use lithium as we cannot afford even the remote chance of the system being **flammable**."

Google · aws · Microsoft

# We will generate **€ 100M** in **ARR by 2031**. But how?

Our value chain:




Chemistry production

Manufacturing & Integration

*Potential Partners*

bp
EVONIK Leading Beyond Chemistry
TotalEnergies
BASF We create chemistry
SIEMENS
VOLVO
RENAULT
BOSCH
STELLANTIS
ABB

1. **Direct unit sales**
We sell complete battery systems directly to our target customers

2. **Lean through contract manufacturers**
We don't operate our own factories, but scale through key partnerships.

We enable growth for existing core industries in Europe!

# A **stellar team** building the next-gen energy storage leader.

## Founders



**Dr. Federico Paratore**
Chief of Science & Engineering
PhD in Mech. Engineering



**Dr. Anetta Platek-Mielczarek**
Chief Technology Officer
PhD in Chemical Engineering



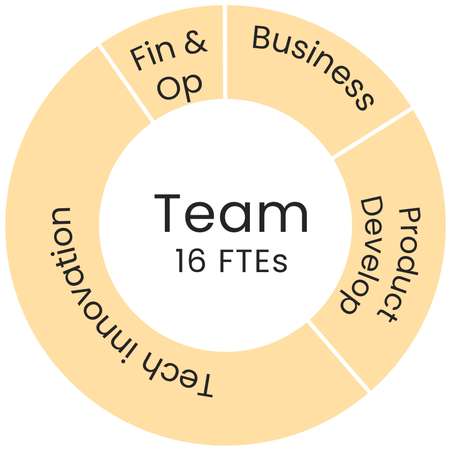
**Dr. David Taylor**
Chief Executive Officer
PhD in Microsystems Engineering



**Dr. Emilio Dal Re**
Chief Financial Officer
PhD in Economics



**Pier Giuseppe Rivano**
Chief Business Officer
MSc in Mech. Engineering




## Chair of board of directors

**The deep tech strategy expert**



**Dr. Carlos Härtel**
former CEO of Germany

## Advisors

**The battery market expert**



**Dr. Mikel Pino**
Head of Energy Storage Europe at

**The energy infrastructure expert**



**Bettina Charrière**
former executive at

**The chemical supply chain expert**



**Dr. Thomas Schuhbert**
Founder & CEO of

# Unbound Potential®

## Join us to power the future.

We are raising **€ 6M** pre-seed round.

Already committed: **€ 3M** (with term sheet)

Cap table: **Fully owned by founders**

Target investor: **Energy or deep tech VC**

Scope of the round: **Two pilot deployments (TRL 7)**


Contact: Pier Giuseppe Rivano (CBO), piergiuseppe@unbound-potential.com

PLUG AND PLAY

SV SUMMIT

# STARTUP PITCH

Blue Century

## BLUE CENTURY

We augment industrial teams to enhance decision-making for MRO and positively impact safety, downtime, cost, and risk.

#PNPTCSiliconValley

Join us at **pnptc.com**

PLUGANDPLAY
ENERGY BATCH 16

Blue Century

# The AI Brain for Industrial Integrity

# We augment industrial teams to enhance decision-making for MRO and positively impact safety, downtime, cost, and risk.

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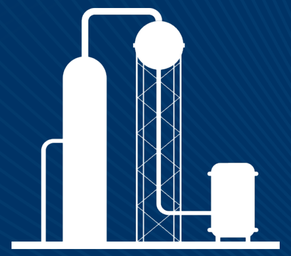
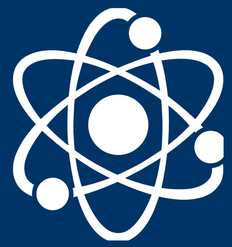
# Targeted Industries & Partnerships



**Oil & Gas**



**Chemical Processing**



**Power Generation**



**Water**

Blue Century Confidential

# The Industrial Integrity Crisis

1. $2.5T+ annual losses from corrosion causing downtime, failures, and compliance issues
2. Aging infrastructure + Retiring SMEs = Critical Knowledge Drain
3. Compliance Risk = Major Liability



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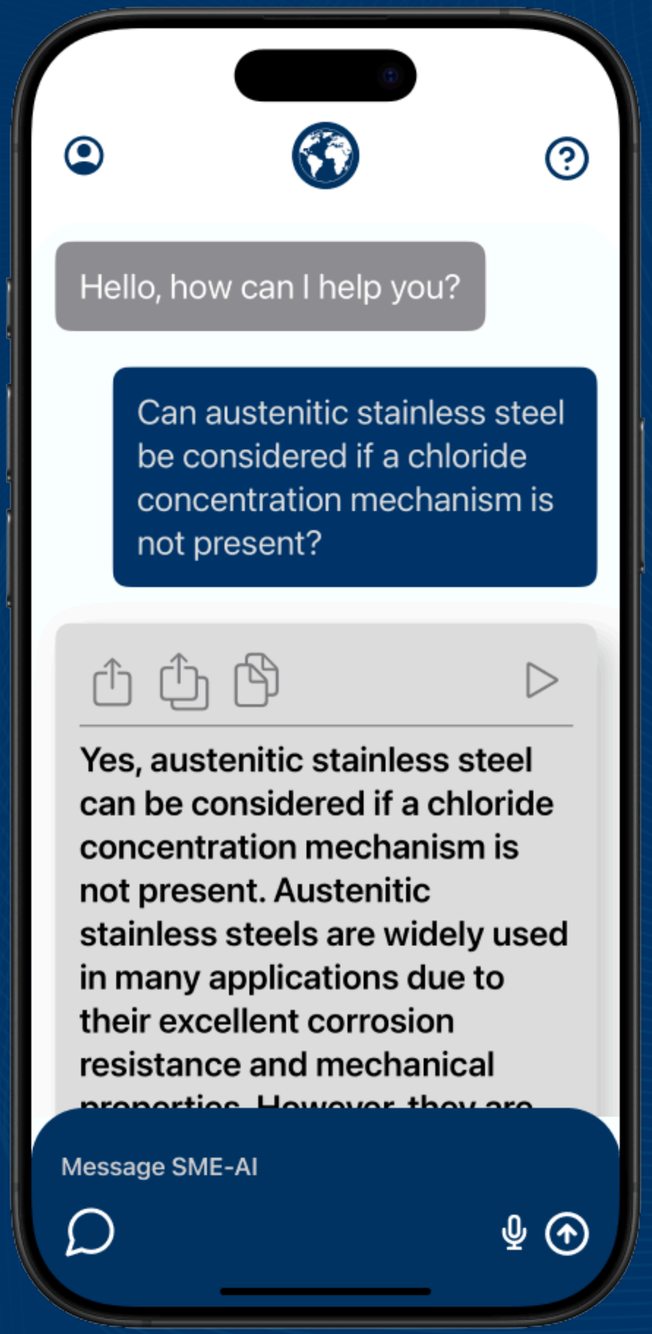
# Our Wedge – SME-AI




1. **AI-powered expert system trained on industry codes and internal reports**
2. **Output compliant repair plans, inspection schedules, and turnaround insights**
3. **Accessible via web and mobile – already testing in real environments**

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# Real-World Use Cases

Blue Century

SME-AI | About Us | Articles & Guides | Contact Us | Profile | Log Out

New Project

**Project History**

- Do I always need to PWHT after weld...
- Create an inspection plan for a cru...
- Create an inspection plan for sour ...
- Create an inspection plan for a rea...
- Create an inspection plan for a Cru...
- Where shoul... inspect a p...
- How can I ... cracking in...
- Create an i... plan for a H...
- Can austenitic stainless steels cra...

Hello, Victor. How can I help you?

Where should I inspect a piping circuit that is susceptible to Microbiologically Induced Corrosion (MIC)?

Monday, March 24th, 2025, 04:42 PM

To inspect a piping circuit susceptible to Microbiologically Induced Corrosion (MIC), you should focus on the following areas:

1. Water-cooled heat exchangers
2. Bottom water layer of storage tanks
3. Piping with stagnant or low flow conditions
4. Piping in contact with certain soils
5. Drain systems and water-containing systems associated with docks and ship loading/unloading facilities
6. Equipment where hydrotest water has not been removed
7. Equipment left outside and unprotected
8. Fire-water systems
9. Dead-legs, vents, and drains
10. Areas with damaged insulation, insulation jacketing, vapor barriers, or weatherproofing

Type your question here and click the send button on the right.

**Asm Metals Handbook Volume 13A - Corrosion Fundamentals, Testing, And Protection - Part 2.pdf**

1038 of 1,297 — Automatic Zoom

and numerous storage tanks exposed to a variety of SCC conditions (Ref 42).

The exposure of shot-peened surfaces to excessive temperatures or to environments that cause excessive general or pitting corrosion should be avoided. Temperatures above 565 °C (1050 °F) will relieve the beneficial compressive stresses and reduce the overall benefits of shot peening. Stress-corrosion cracking can occur once the relatively thin layers of residual compressive stress are penetrated by general corrosion or pitting.

SCC of Carbon and Alloy Steels. Plain carbon steels are susceptible to SCC by several corrodents of economic importance, including aqueous solutions of amines, carbonates, acidified cyanides, hydroxides, nitrates, and anhydrous ammonia. Susceptible steels in common use throughout the petrochemical-processing industry include ASTM A106 grade B for piping, A285 grade C for tanks, and A-515 grade 70 for pressure vessels. Cracking is both intergranular and transgranular; the former occurs in hot hydroxides and nitrates, and the latter in warm acidified cyanide solutions.

The temperature and concentration limits for the SCC susceptibility of carbon steels in caustic soda (sodium hydroxide) are fairly well defined; they have been derived from field experience and reproduced in chart form (Fig. 5). These limits for the other aqueous SCC environments mentioned previously are not nearly as well defined. For example, SCC was not considered to be a problem at temperatures below 88 °C (190 °F) in aqueous monoethanolamine and diethanolamine solutions used for scrubbing carbon dioxide and hydrogen sulfide out of natural gas and hydrogen-rich synthesis gas streams. However, recent experience in petroleum refineries has resulted in general agreement that SCC preventive measures, such as thermal stress relief, must be applied to plain carbon steels used in aqueous amines at all temperatures and concentrations.




**Repairs | Inspection | Turnaround Planning | Compliance QA**

**Instant access to critical procedures on the plant floor**

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# How We Help

1. Urgent, painful customer problem (not “nice to have”)
2. Not a chatbot – domain specific intelligence engine
3. Sticky and hard-to-replicate: trained on industry standards + proprietary field data
4. Built for action from insights – drives decisions
5. Not just for engineers – can be used by anyone in the facility







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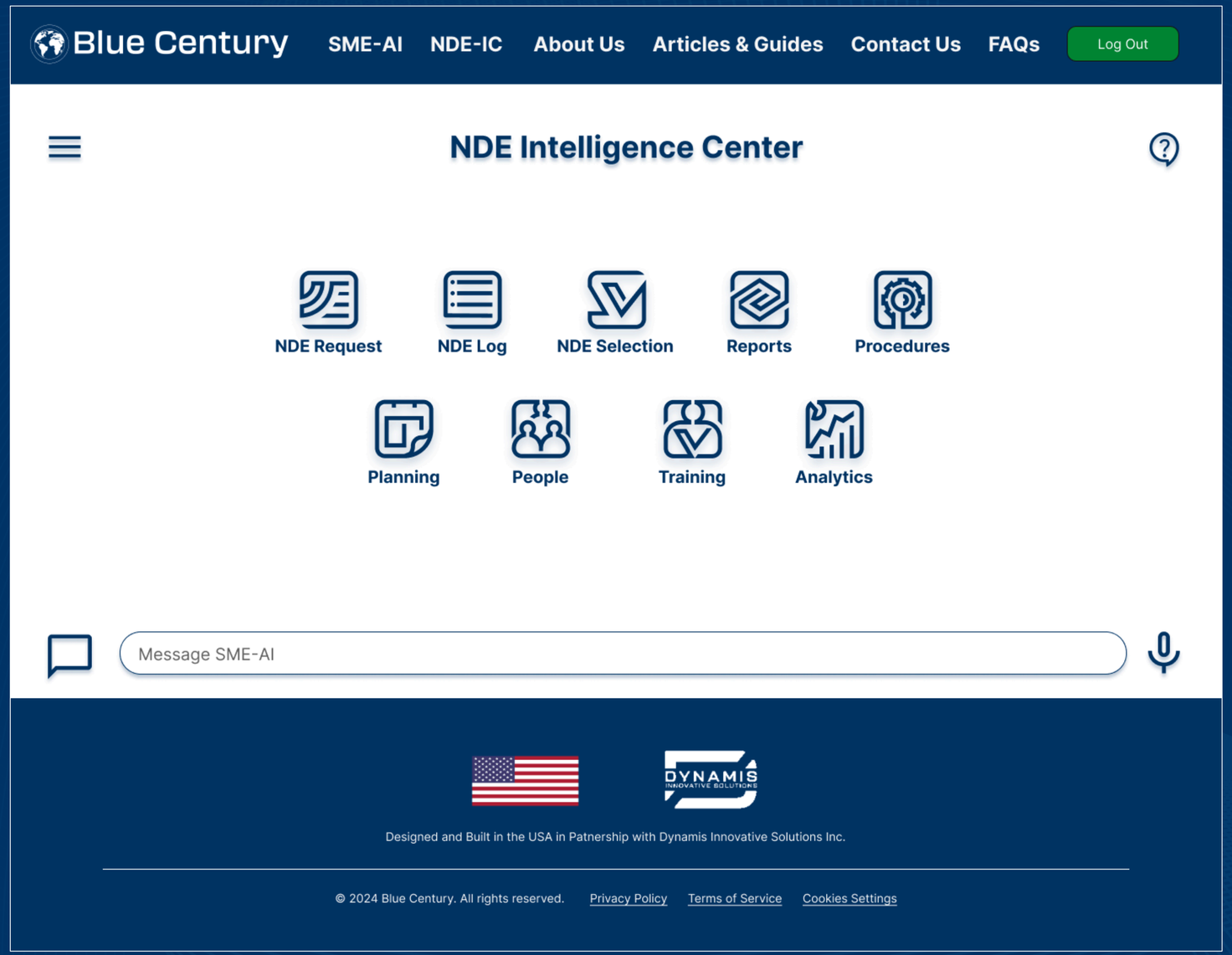
# NDE Intelligence Center




- ✓Centralized Workflow & Metrics
- ✓AI Guidance for Methods & SOP
- ✓Work Orders
- ✓Holistic Analytics
- ✓Fast and Accurate Reporting
- ✓Planning & Scheduling
- ✓On-Demand Training
- ✓NDE Campaigns Repeatable

# Who We Are



**Victor Jablokov**
CEO

***AI Veteran, sold Yap to Amazon***

amazon
ATI SIEMENS energy



**Anton Bagayev**
CTO

***Ex-GE Engineering Systems Lead***

ebay
DASSAULT SYSTEMES



**Bobby Harrington**
CRO & Head of BD

***30-Year Vet Oil & Gas, Ex-Chevron Integrity Leader***

Chevron



**Sergey Neskoromny**
Head of Software

***30+ Years of Technology Development***

wayfair
intel

Blue Century Confidential

# The Ask

| | |
|---|---|
| **Corporate Partners** | SME-AI - Ready To Pilot Today<br><br>NDE-IC - Ready for Piloting August 1st, 2025 |
| **Investors** | Raising $2M seed to finance operations, sales, and accelerate product development.<br><br>Goal: $1M ARR in 18 months. |

Blue Century



Scan QR Code for Contact Information


Victor Jablokov | Founder & CEO

victor@bluecentury.co | +1.781.460.7917

www.bluecentury.co

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# STARTUP PITCH

enline

## ENLINE

Enline provides AI-powered digital twin solutions to optimize energy asset performance and grid reliability in real time.

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Join us at **pnptc.com**

enline

# AI & Digital Twins
# To Monitor and Manage Energy Assets

Optimize. Predict. Thrive.



THE GLOBAL GOALS
For Sustainable Development

ABB Startup Challenge 2024
Power Progress with AI

Start Up
Energy Transition
#SET100 Award 2023

eit | European Institute of Innovation & Technology

TotalEnergies On

info@enline.energy | www.enline.energy

enline

# Paradigm Shifts And New Challenges

**The energy sector** is undergoing multiple **paradigm shifts**, driven by artificial intelligence, decentralized renewables, advanced grid technologies, and a renewed focus on sustainability.

- Grid Congestion & Curtailment
- Lack of Real-time and Predictive System Visibility
- Slow Outage Location & Response
- Renewable Generation / DER Integration
- Load Variability & Voltage Fluctuations
- Fusty Vegetation Growth Management Systems

# enline | The Consequences

Chile curtailed 6TWh of solar PV and wind power in 2024

Power outages highlight vulnerabilities in Brazil's energy sector

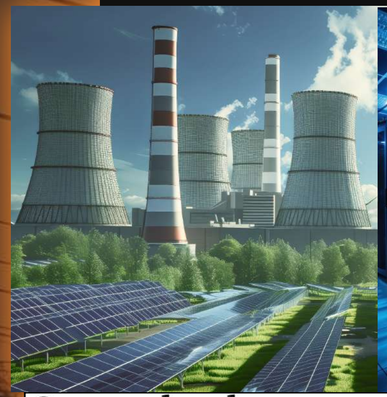
'HISTORIC STORM' | Nearly one million homes and businesses without power across Ireland

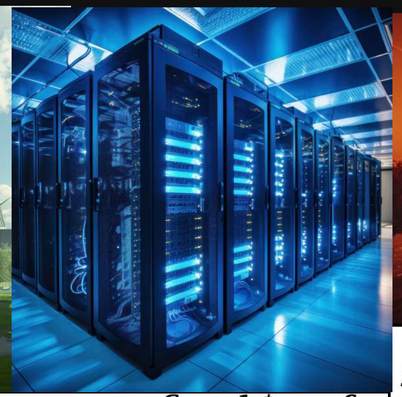
CBS MORNINGS

How the surging demand for energy and rise of AI is straining the power grid in the U.S.

**Green energy gets switched off as power systems fail to keep up**

Rising power costs continue to affect miners

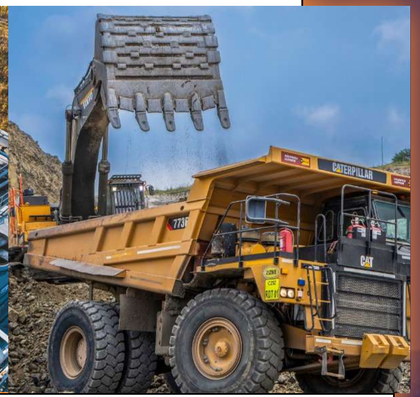












Queensland power company fined $9m for 'catastrophic failure' after explosion and blackouts

*Many of California's Most Destructive Fires Were Caused by Power Lines*

Cascading risks: Understanding the 2021 winter blackout in Texas

Energy demands from AI datacentres to quadruple by 2030, says report

Puerto Rico left in dark by New Year's Eve blackout

HEATHROW AIRPORT CLOSED DUE TO FIRE AT ELECTRICAL SUBSTATION

# enline | Enline's AI-Powered Digital Twin Technology

## Sensorless Electromagnetic Replicas

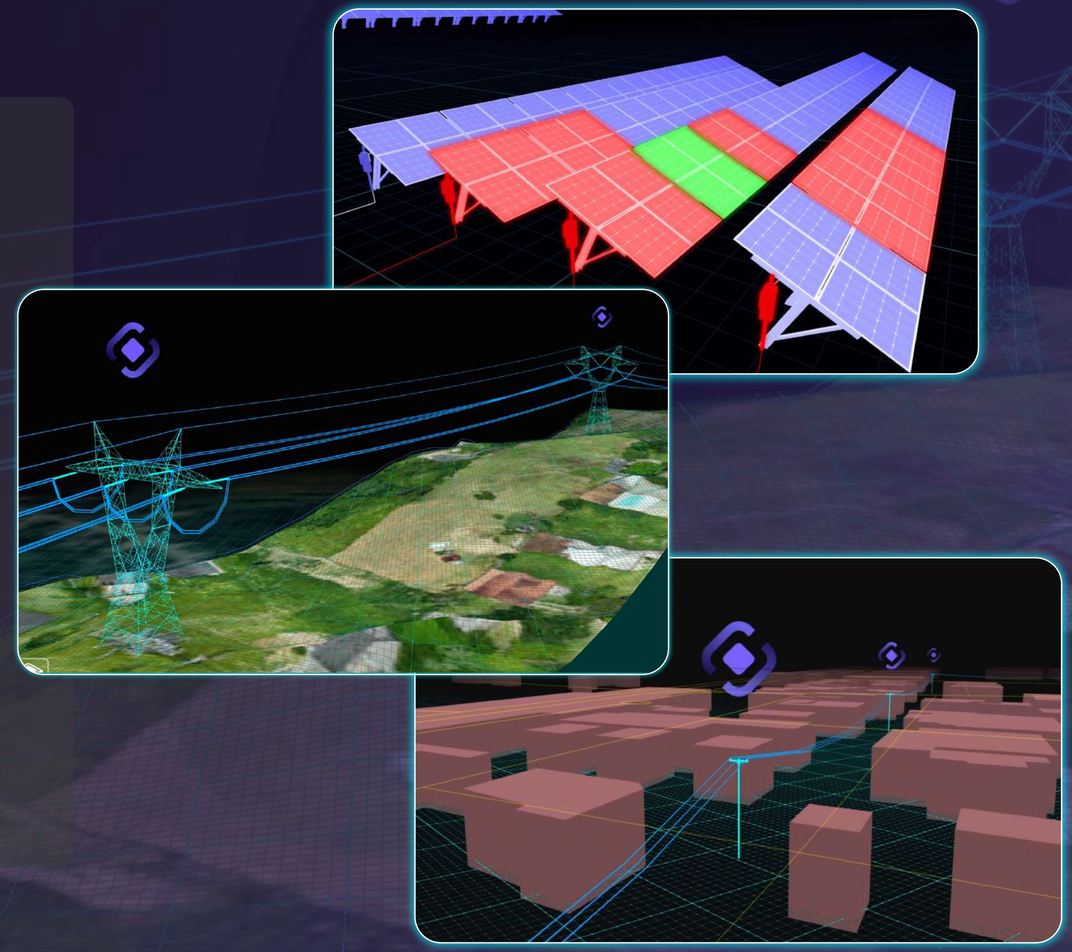
100% coverage of entire lines, grids and power plants without additional sensors.

## Data Science & Artificial Intelligence

Best-in-class AI for physics and power systems.

## Digital Twin Replicas

360° visibility for real-time and predictive monitoring.



enline | The Available Alternatives

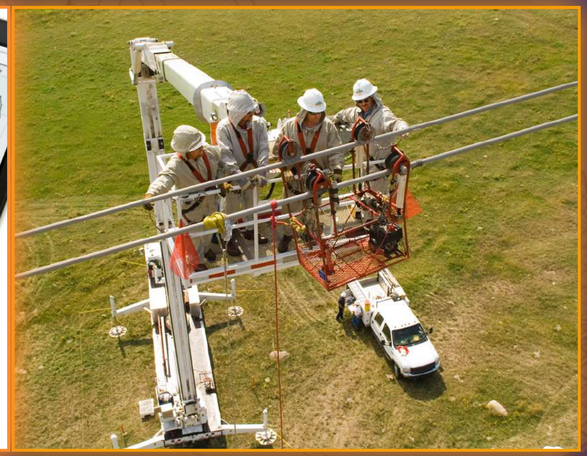
**SLOW**
**SET UP TIME**

**LIMITED ASSET**
**COVERAGE**

**NO PREDICTIVE**
**CAPABILITIES**

**MAINTENANCE**
**HEAVY**



**HIGH COST**
**IMPLEMENTATION***

**FRAGMENTED**
**DATA & SYSTEMS**

**LABOR INTENSIVE**
**& PRONE TO RISKS**

* WITH A SHORT LIFESPAN AND MANDATORY SHUTDOWNS - HIDDEN AWAY IN THE FINE PRINT, JUST LIKE SENSOR-BASED SOLUTIONS OFTEN DO.

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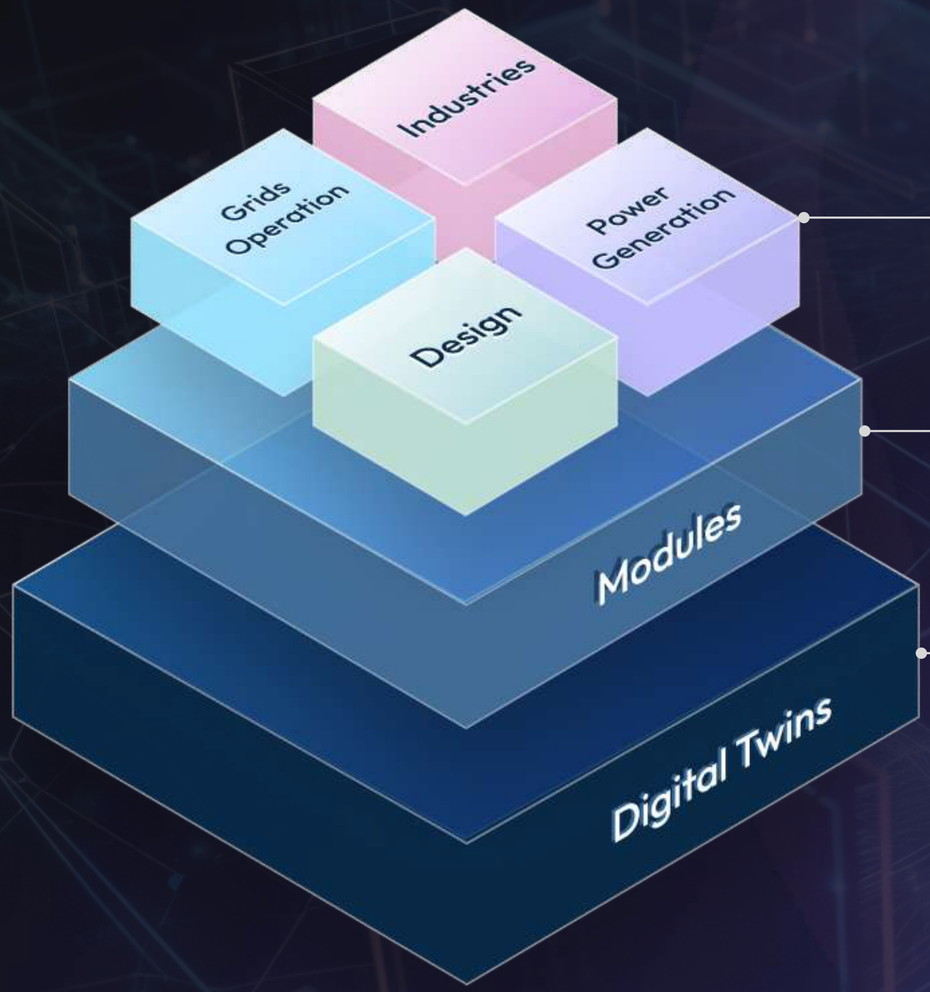
# Enline’s AI-Powered Digital Twins




**Custom modules** working together to solve complex energy challenges .

**Flexible, interoperable solutions** for targeted energy management.

**AI Sensorless Digital Twins** for real-time and predictive insights.

# enline | Our Award Winning Team



**Manuel Lemos**
**Co-founder & CEO**
Former Director
VOITH SIEMENS



**Gabriel Pino**
**Co-founder & CTO**
Former Tech Manager
VOITH SIEMENS



**Martin Andrae**
**CSO / CMO**
Former President & CEO
VOITH SIEMENS



**Edgardo López**
**CPO**
Former Digital Manager
DISTRICUYO / SEIS



**Duarte Fleming**
**CGO**
Former Head of AI Product
SIEMENS



**João Galamba**
**Executive Advisor**
Former Minister of Infrastructures
Government Of Portugal

**> 50**

**PhD's and Masters**

Software Experts, Power System Engineers, Physicists and Mathematicians
AI Data Scientists, IT, Cyber Security

Caixa Capital Risc

Santander

eit InnoEnergy

**Some of our awards and recognitions:**

eit Awards EIT Venture Award 2024

TenneT Taking power further — The Overhead Line Inspection Data Challenge

ABB Startup Challenge 2024 Power Progress with AI

Start Up Energy Transition #SET100 Award 2023

TotalEnergies On

PERSEO IBERDROLA ventures

aws CLEAN ENERGY ACCELERATOR 2.0

Challenge

100 open startups

INITIATE! DUKE ENERGY AWARD DISTRIBUTECH INTERNATIONAL

eurelectric

WIRES

cigre

CURRENT Enabling Network Technology throughout Europe

IEEE

pwc

# enline | Customers In All Continents



# enline | Unique Selling Points

**An integrated system that uses smart modules to boost grid efficiency, reliability, and flexibility.**

## Sensorless Technology

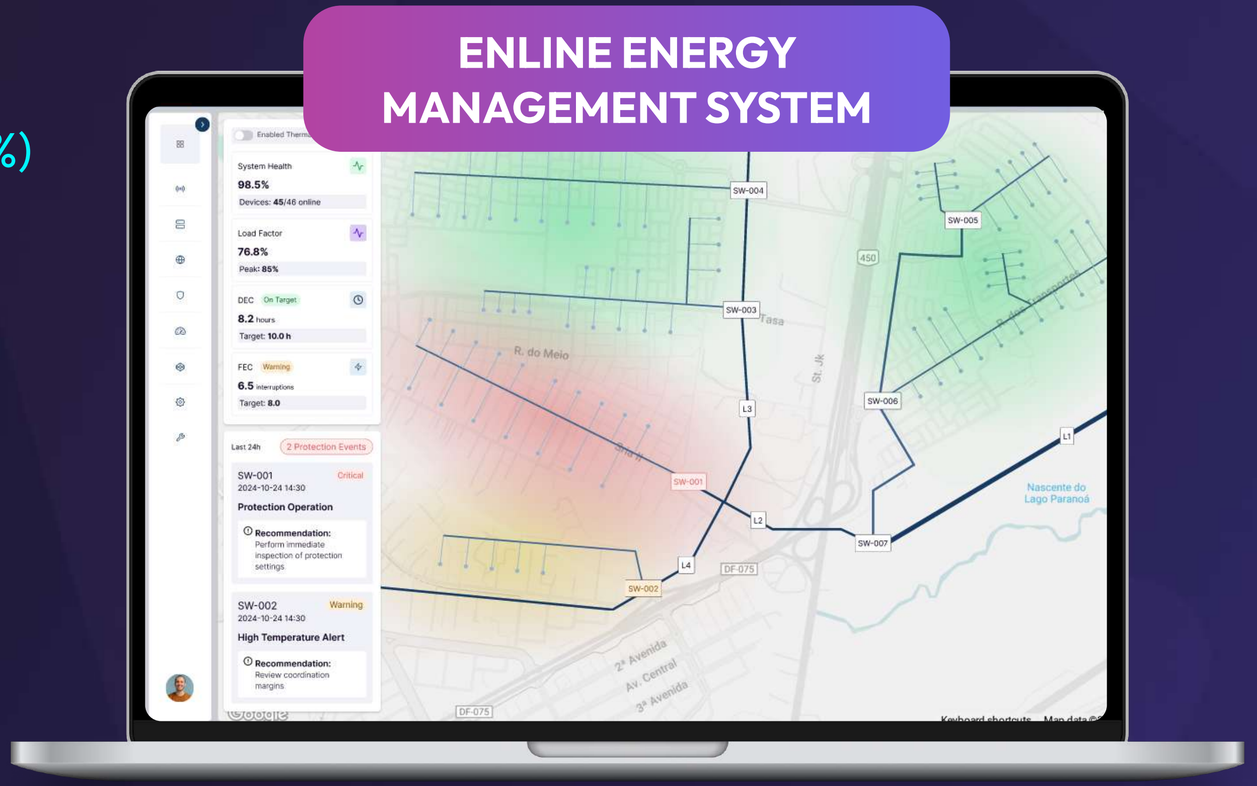
No physical sensors required. Reduces CAPEX (-20%) and OPEX (-35%).

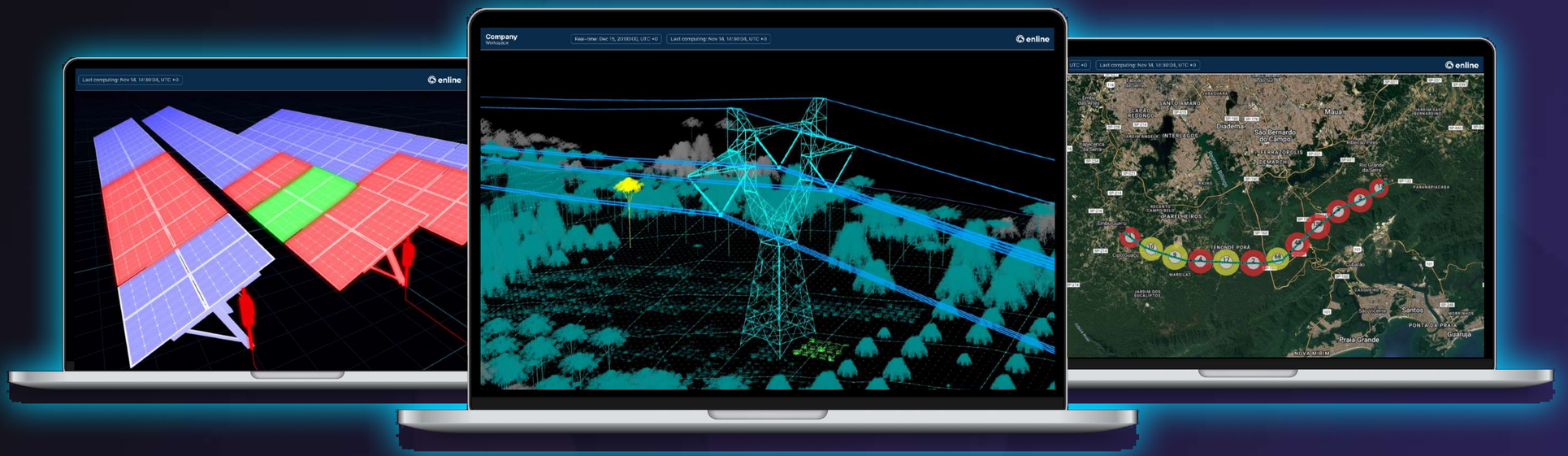
## Fast Implementation

Deploy in weeks vs. months.

## Modular Integration

Seamlessly combine Vegetation Management, DLR, Fault Detection, and more.






# Anticipate the Future, Now!

**Maximize your assets** without changing your existing infrastructure.

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info@enline.energy | www.enline.energy

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# CLOSING REMARKS

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# ENERGY TEAM



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**Rashaad Cooper**

Corporate Partnerships
*Plug and Play Energy*

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