



FALL 2020 FORUM & TRADE SHOW

Advancing Efficiency with Emerging Technologies

November 10, 2020

Sponsored by





SPEAKERS

- Serene Almomen, *Senseware*
- Jesse Thornburg, *Grid Fruit*
- Joe Weaver, *Ario*
- Adam Sledd, *Dominion Energy Innovation Center* (moderator)



High-Velocity IoT Meeting Today's Challenges



Our Mission
is to help
people gain a
sense of security
that they are
aware of what is
happening
in their physical
environment

We help address the
Digital Transformation
challenge

Only about 33% of
companies will
successfully
evolve in the face
of **industry
disruption!**



Enterprise IoT

Complete real-time monitoring solution

3

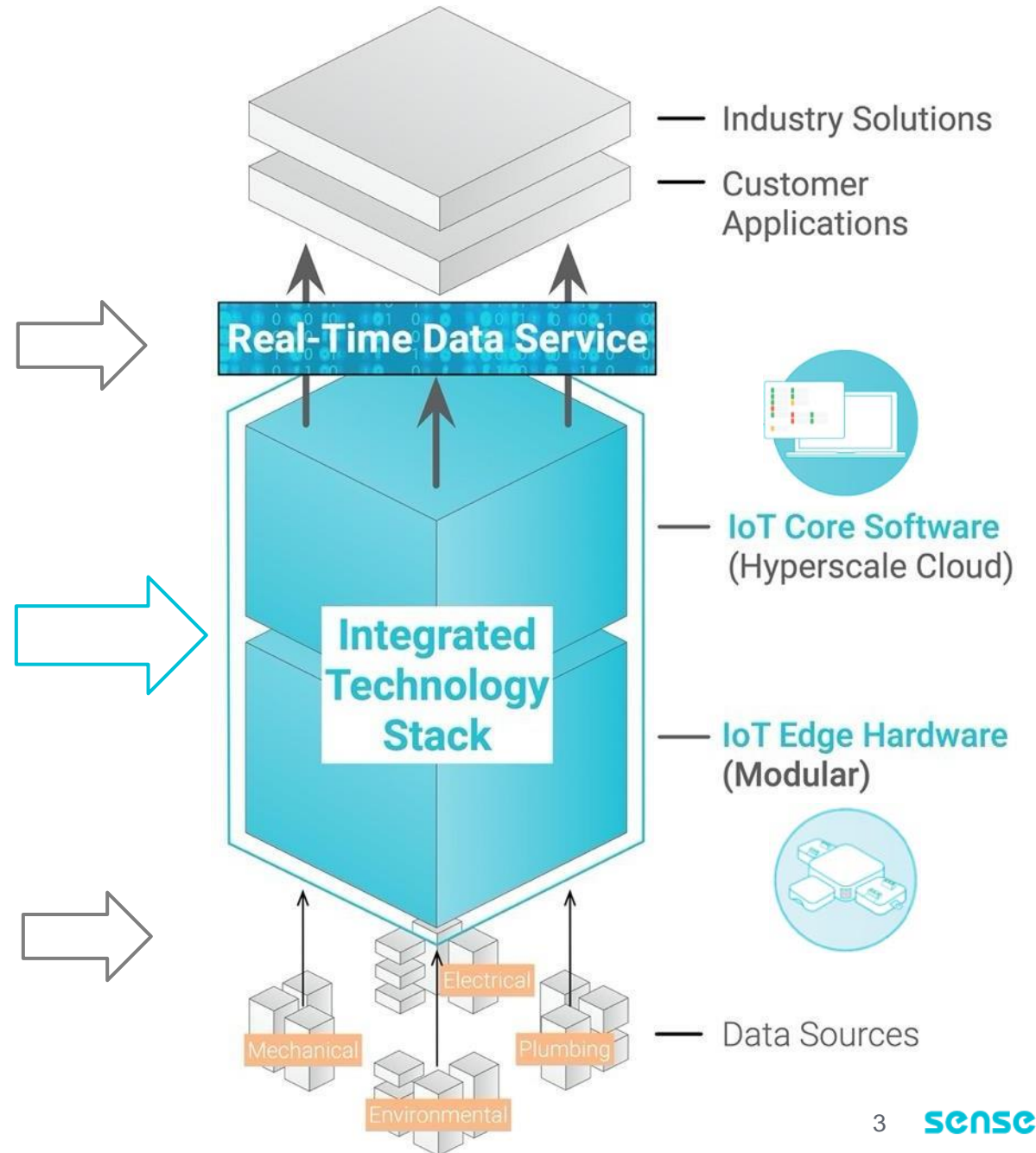
Real-Time Data Delivery
to Customer

2

No-Code configuration;
Switch-On, Zero-Touch
ingestion of data in Cloud

1

Need visibility to new
types of sensor data



IoT Platform Application To Built Environment Complete Lifecycle



Construction Site Monitoring

- Energy Efficiency monitoring
- Leak Detection
- Indoor Air Quality (IAQ)
- Indoor Environmental Quality (IEQ)
- Water main monitoring and shutoff



Facility Management

- Energy efficiency reporting
- HVAC commissioning and recommissioning
- BIM integration of real-time data
- Preventative Maintenance



Environmental Services

- Airborne Monitoring for COVID-19 reopening
- Air filtration performance
- Ventilation dead zone identification
- Infection risk assessment

Empowering People to Resume Life

Measure – Monitor – Verify

Senseware is tackling the global coronavirus challenge with
a comprehensive real time
airborne monitoring & HVAC monitoring solution
accelerating the time to reopen businesses

Locations with Senseware installed can assure all people
that they are in the **safest environment** possible
now and into the future

First to Market with Real-Time Cleanroom Grade Airborne IoT Sensors and Pathogen Detection



Sensors:

T/RH

CO2

PM0.3, 0.5, 1, 2.5, 5, 10

VOCs (including PID)

Ozone

Ion

Bio-sensors (COVID-19 sensor, Bio-aerosol sensor)

Airflow

Application:

Identify stagnant air hotspots where pathogens can remain and are outside UV Lights and HVAC reach

Ensure safe removal rate of pathogens from the air through ventilation and filtration

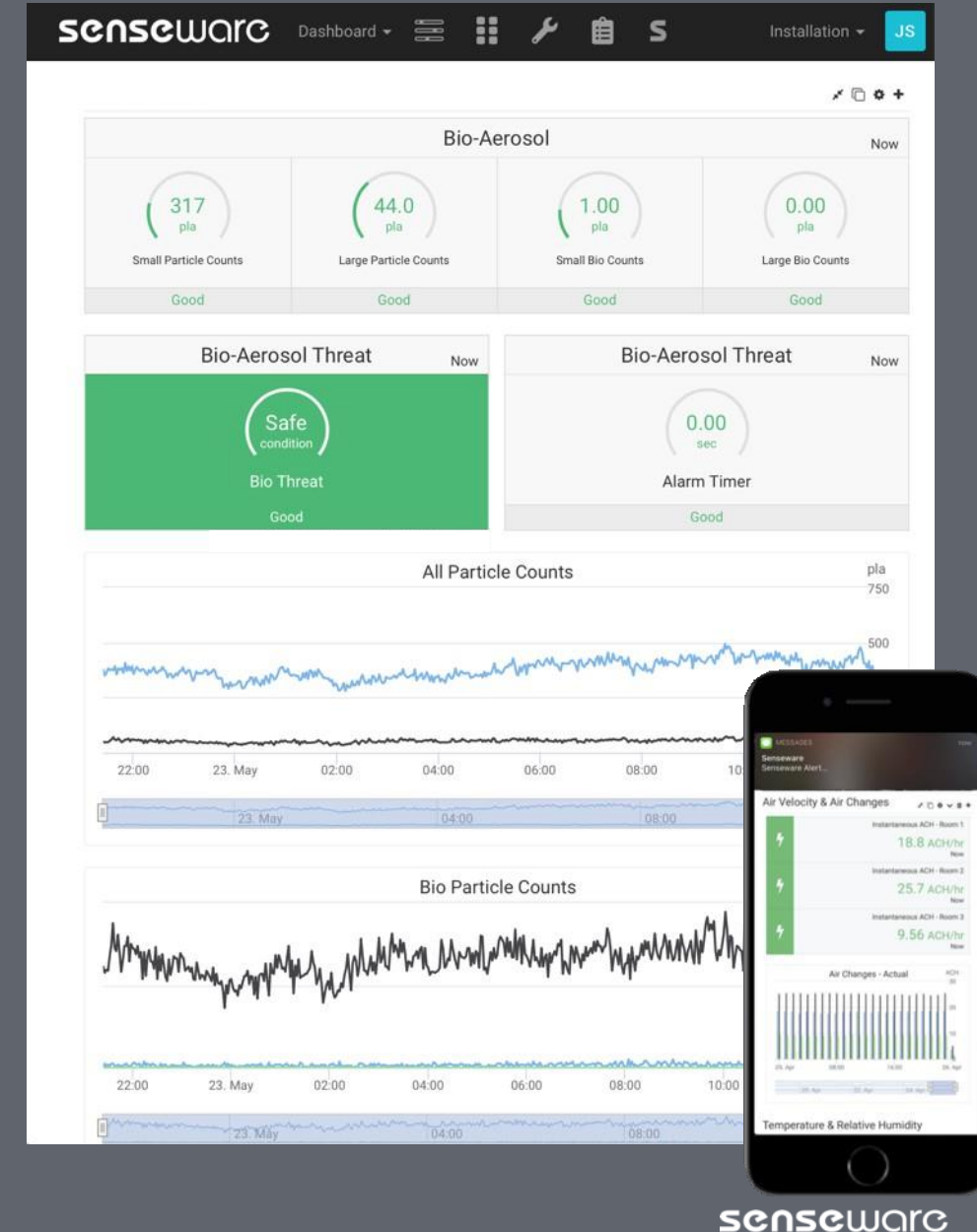
Detect in real-time if pathogens (including COVID-19) are present in a location

Calculate Ventilation Performance Index & Infection Risk Index (patent pending)

Real-time Cloud-based Monitoring, Alerts & Reporting

Email and text notifications allow stakeholders to take immediate action

Real-time dashboards assure owners, tenants, property managers, and other stakeholders that healthy environments are being maintained around the clock





Uniquely Designed to Work with All the Tools that Reduce Pathogens in the Air

Real-time UV Lights monitoring

Ensure effectiveness and impact of air and surface
cleaning and treatment methods

Modular architecture enables continuously adding real-time
monitoring to evaluate effectiveness of new measures

Hyperscale Cloud-based Core Software

Senseware provides actionable intelligence and assurance: **actionable intelligence** from more than a dozen sensors to allow responsible parties to take immediate action if a threat is detected; and **assurance** that all the measures that are put in place to protect people's health are working as they should.



- Floorplan-based dashboarding & real-time analytics tools
- Portfolio-wide view
- Teams management including public facing view-only dashboards
- Mobile & desktop accessible
- Real-time & rule-based email and text alerts with escalation
- Scheduled automated reports
- Enterprise level security, hosted on AWS FedRAMP compliant servers
- Easy to deploy
- Remote device management and maintenance
- Designed for unlimited volume of real-time data processing

Senseware's Innovation

Accelerating Access to the Most Advanced and Best in Class Sensors

Patented modular IoT technology (33 patents)

As new threats surface, Senseware can rapidly build intelligence bearing solutions that can save lives, the economy, and the environment

As new type of real-time data is needed, simply plug in the appropriate sensor technologies to the Senseware existing infrastructures, including novel sensors as they leave the labs

Locations with Senseware installed are insured for the future

Active in Over 1300 Locations

Processing over 150M real-time
intelligence bearing data samples daily





Serene Al-Momen, Ph.D.
serene@senseware.co
senseware.co





AI Optimizing Refrigeration Energy & Maintenance

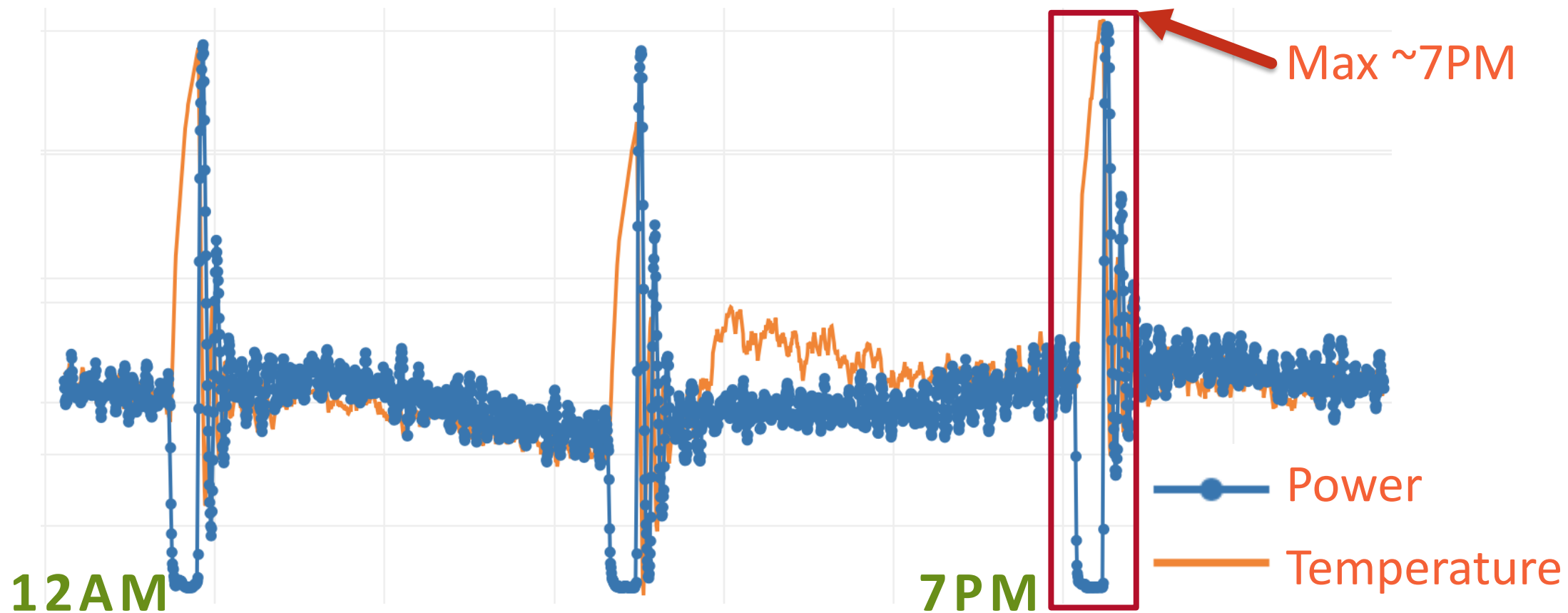
Jesse Thornburg, PhD – CEO





— REFRIGERATORS & FREEZERS:
WASTED ENERGY, HIGH COST

— PROBLEM: COSTLY PEAKS FROM DAILY DEFROSTS

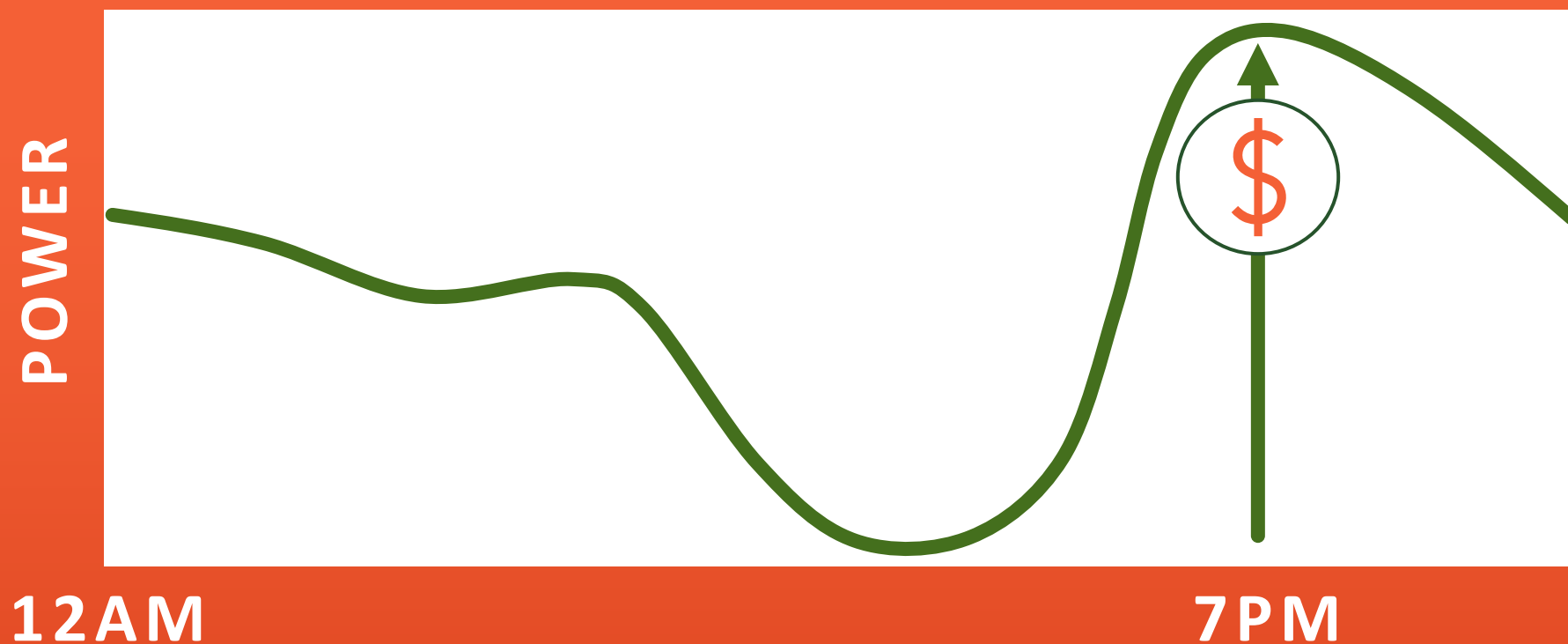


DATA FROM STORE PILOT

ENTROPY+

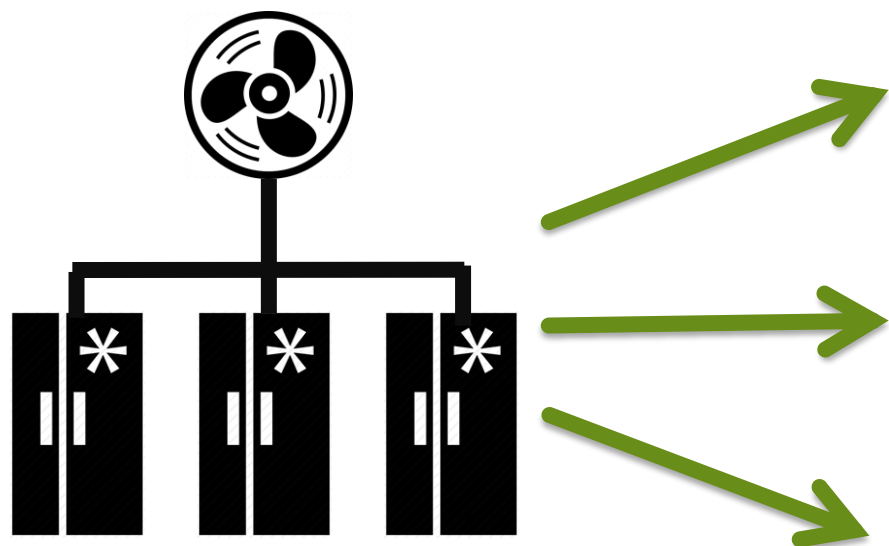
 GRIDFRUIT

PROBLEM: EVENING GRID PEAK STORES PAY PENALTY AND GRID POLLUTES



SOLUTION

BEFORE GRIDFRUIT



POWER



MAINTENANCE



TEMP

WITH GRIDFRUIT SOFTWARE



REGULATIONS



RENEWABLES



PEAKING

AI OPTIMIZING FOR STORE AND UTILITY

— VALUE FOR CUSTOMERS

Savings to Supermarket

\$36k/yr (energy and maintenance)
\$10k in grid rebates



Annual Savings to Grid

Up to \$22.5k/store
4%-15% lower peak demand
5%-15% emissions reduction



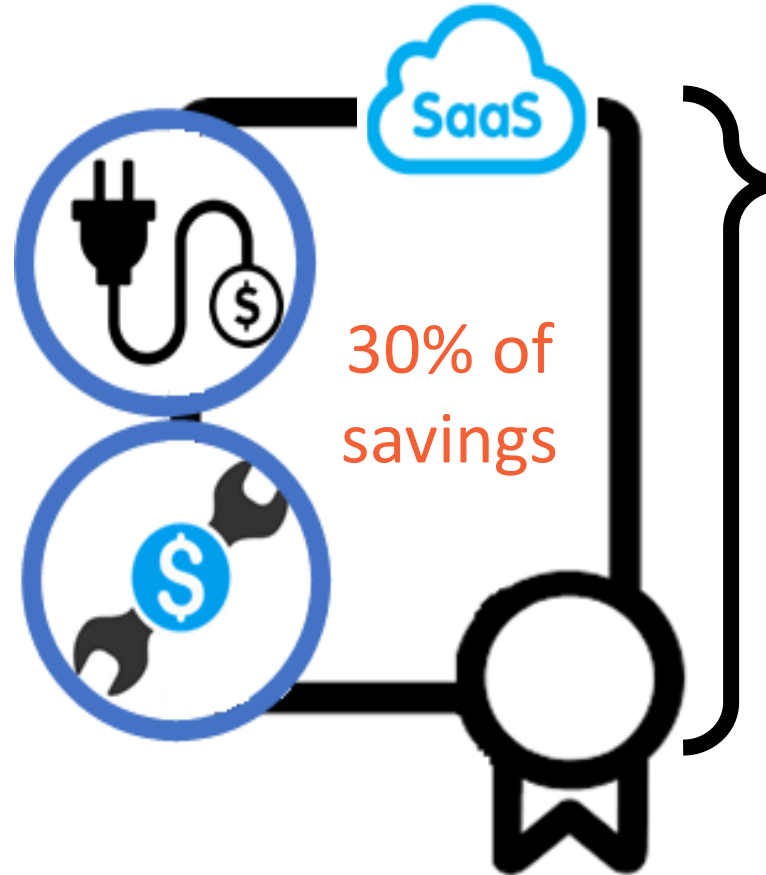
BUSINESS MODEL

Savings per Store

Avg. \$36,000/yr



Pricing per Store



- ▶ SaaS subscription software, AI gives more value over time
- ▶ Low-cost, chain-based customer acquisition (\$10k-\$15k/chain)

THE COMMERCIAL ENERGY MANAGEMENT PLATFORM

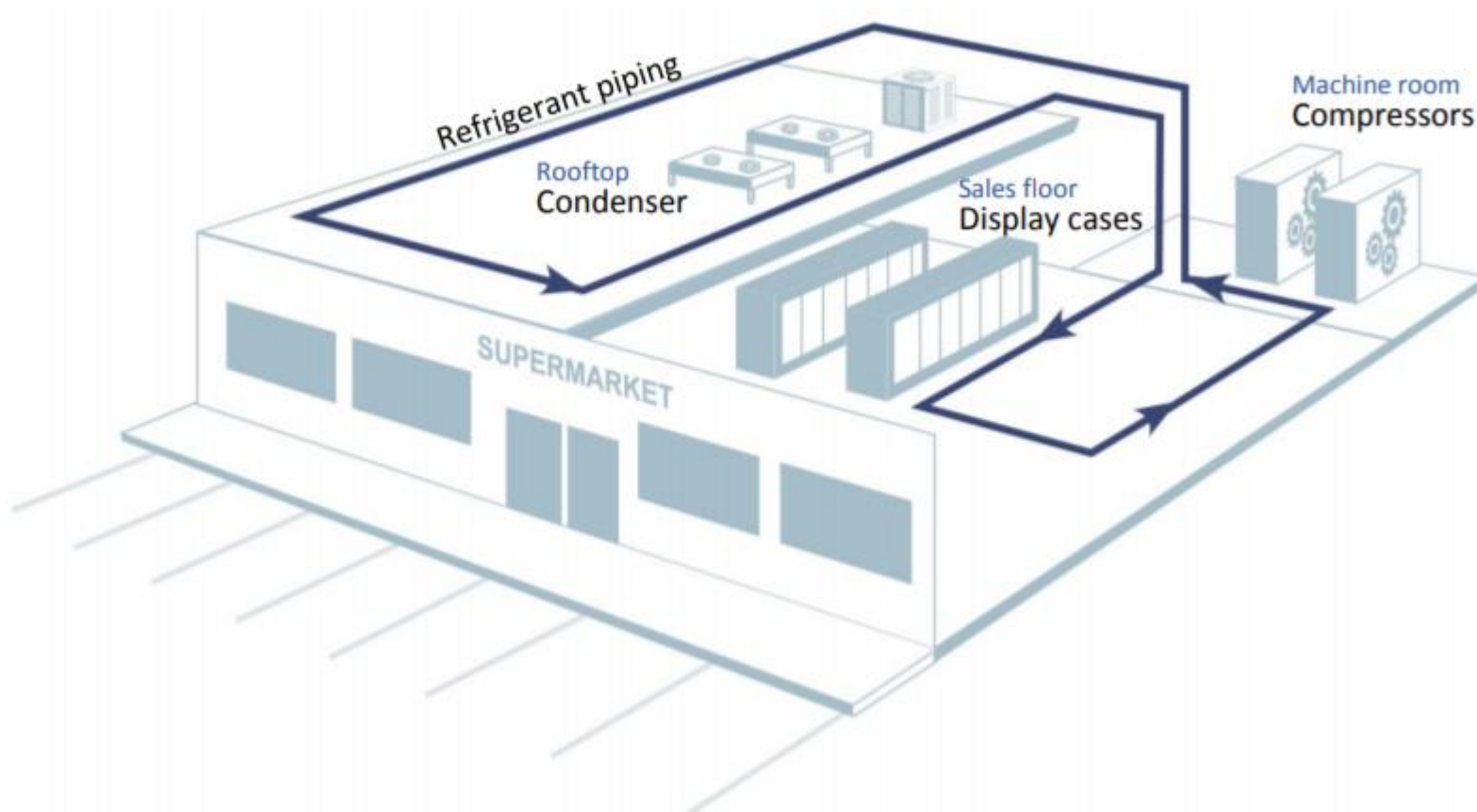
► Coordinating refrigeration with

► HVAC

► Lighting

► Rooftop solar

► EV charging



UTILITY PILOT

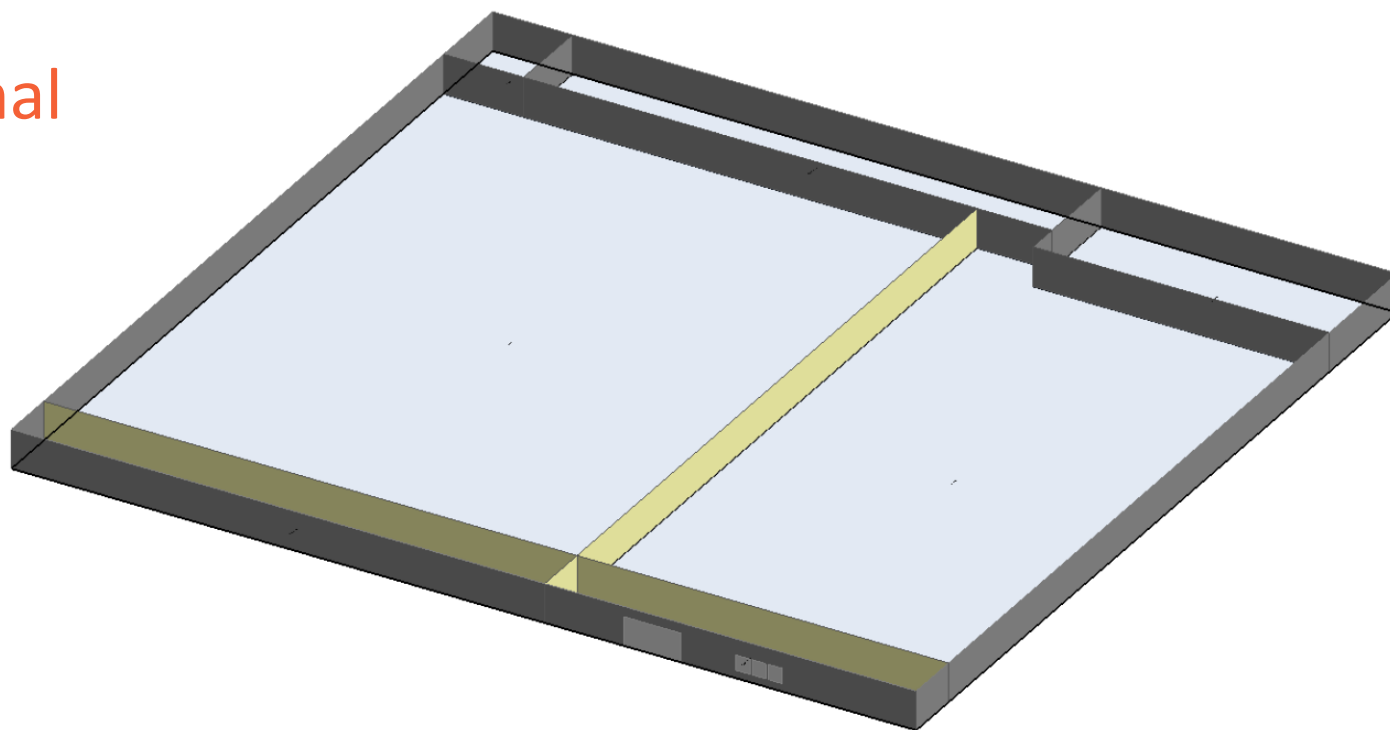


- ▶ Configure SaaS for Walmarts and convenience stores in SCE climate zones
- ▶ Optimized defrost timing for coolers and freezers
- ▶ Staggered defrost spikes across store and utility
- ▶ Extension: Efficiency from optimal scheduling of cycles
 - ▶ 6 hrs leeway in refrigerators, 24-48 hrs in freezers

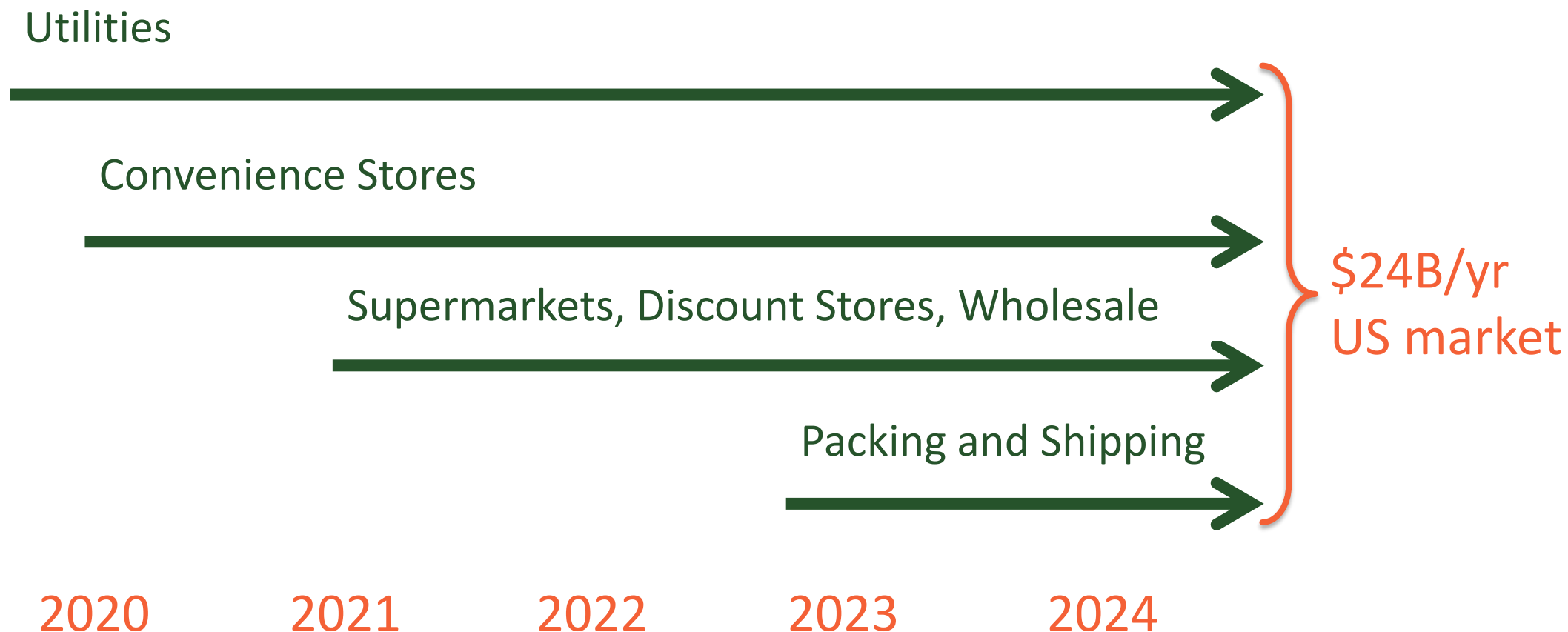


OUR MODELS ANTICIPATE AND AVOID COSTLY EVENTS





- ▶ Physics-based digital twins of stores fill in gaps from data
- ▶ Defrost schedules for minimal monthly store charge
- ▶ Time-of-use pricing (seasonal)
- ▶ Demand charges (minimizing peaks)



GO-TO-MARKET STRATEGY



COMPETITION

	Efficiency & Demand Response	Preventive Maintenance	Utility Rebates from Software
	✓	✓	✓
	✓	✓	✗
	✓	✗	✗
			

TEAM



Jesse Thornburg, PhD – CEO



Javad Mohammadi, PhD – CTO



Carolyn Goodman – Software/Controls



ADVISORS



Afshan Khan
Innovation Works



Evans McMillion, Esq.
757 Accelerate



Prof. Soumya Kar, PhD
Carnegie Mellon University



PARTNERS



innovation
works

pennsylvania
DEPARTMENT OF COMMUNITY
& ECONOMIC DEVELOPMENT



ACCELERATE
POWERED BY  TOWNEBANK



Carnegie
Mellon
University
CTTEC
choice. guidance. expertise.

TransTech
Energy Conference

EPRI

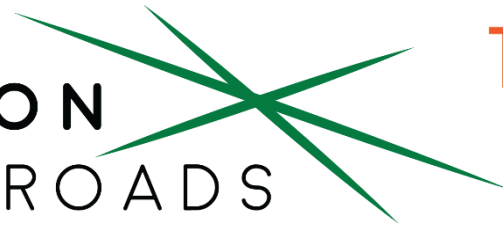


Launch
Tennessee



CORPS
NSF Innovation Corps

INNOVATION
CROSSROADS



OAK RIDGE NATIONAL LABORATORY

 GRIDFRUIT



AI Optimizing Refrigeration Energy & Maintenance

Jesse Thornburg, PhD – CEO

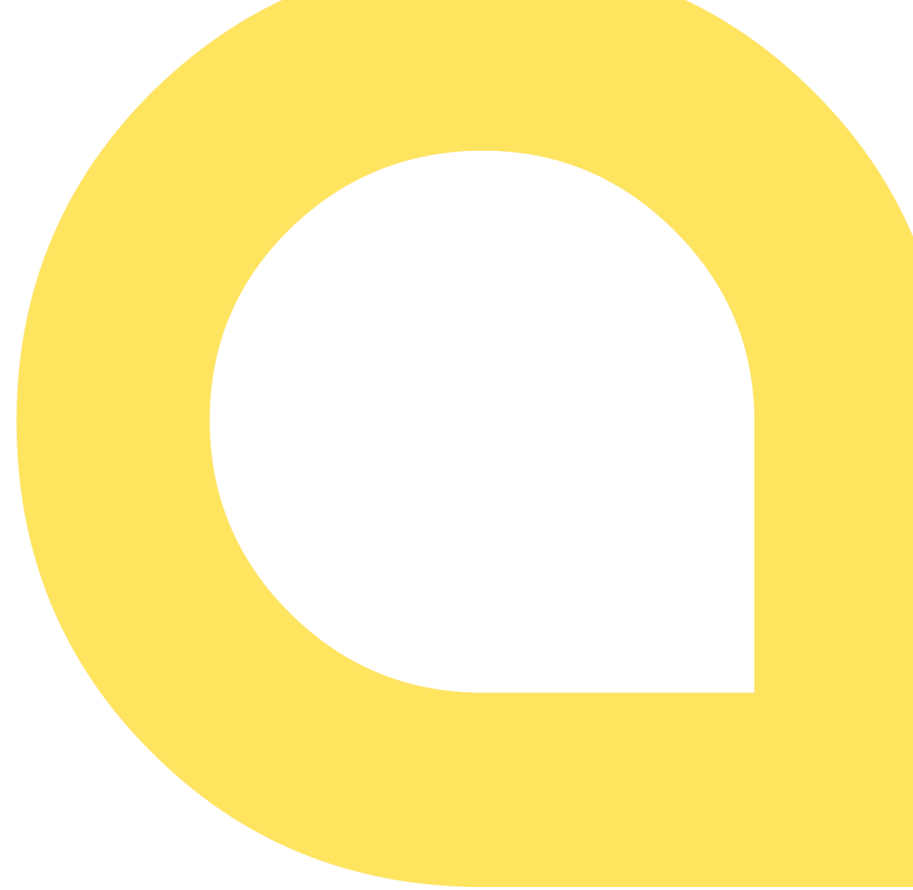
Email: jesse@gridfruit.com

Cell: 828-989-8357

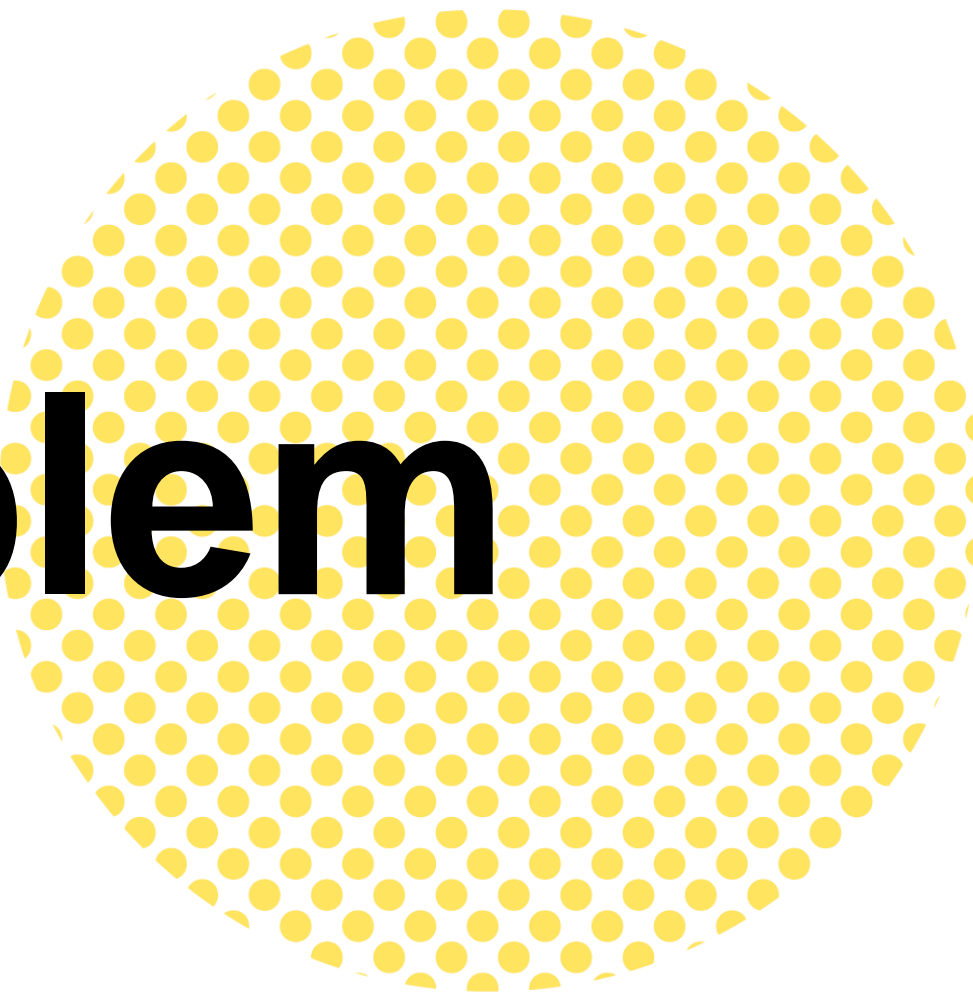




Where data meets life.



The Problem



Retirees take valuable experience with them.



4 million

baby boomers retire every year.



Replacing a lost worker can cost

1.5 to 2 times

their annual salary.

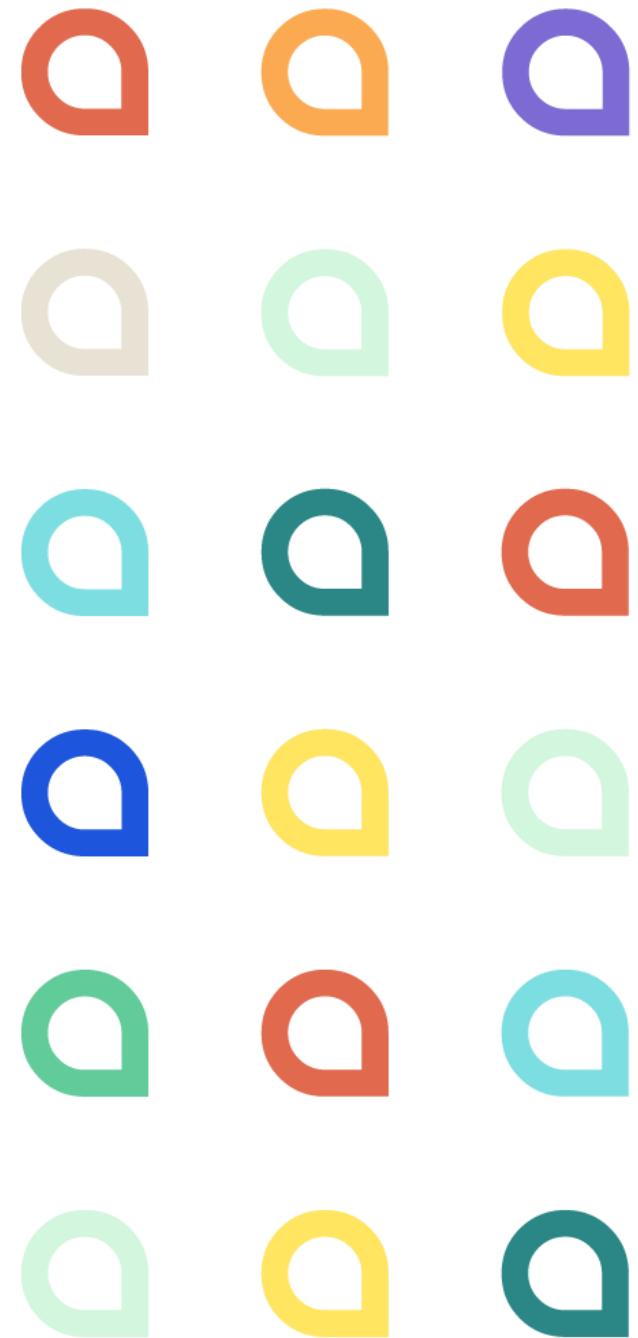


It can take up to

2 years

for a new employee to be as productive as the employee they replaced.

We can help.



Do what you do better.

At Ario, we create **easy-to-use, knowledge-sharing products** that provide information when, where and how it's needed most.



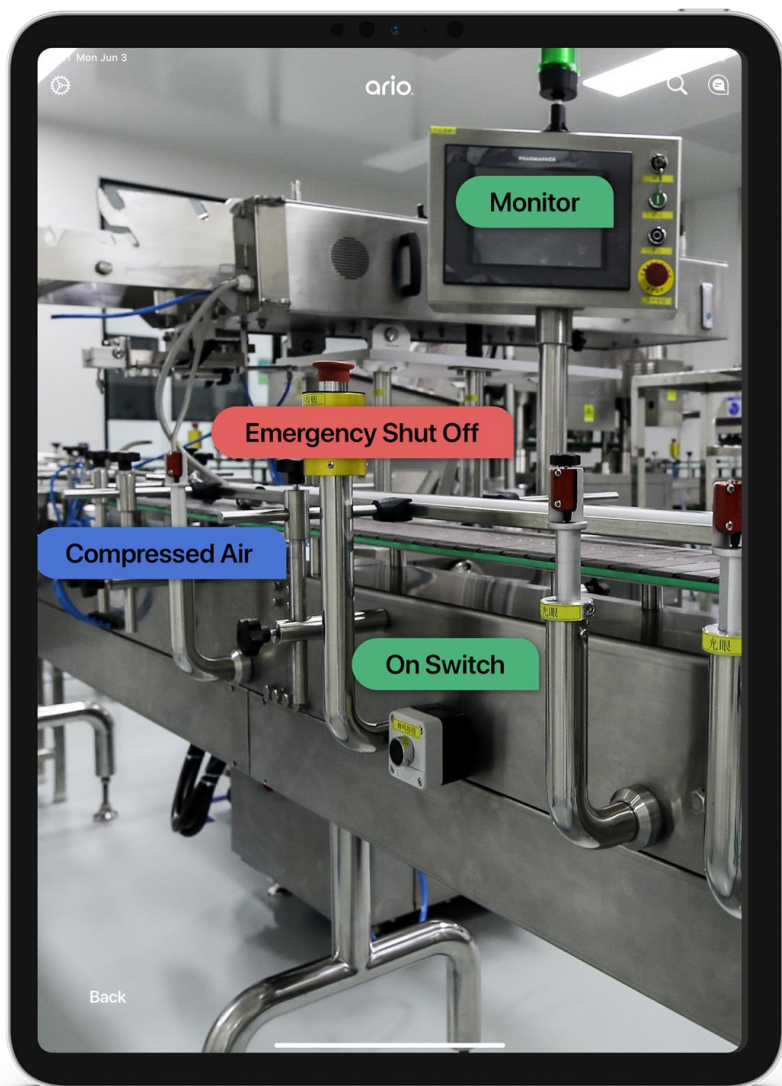
Boost Productivity



Share Knowledge



Reduce Errors

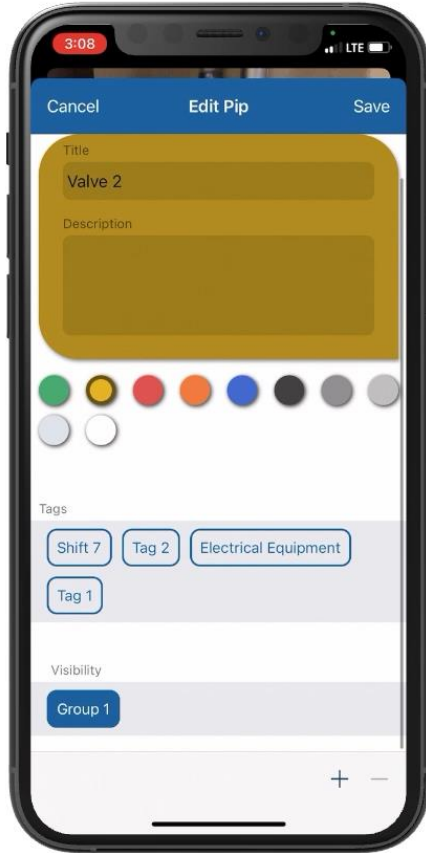


Ario

A Productivity Platform powered by AR

- Place digital resources in the real world using augmented reality
- Build tasks, checklists and courses
- iOS compatible. No expensive, specialized equipment needed

Ario | The Platform

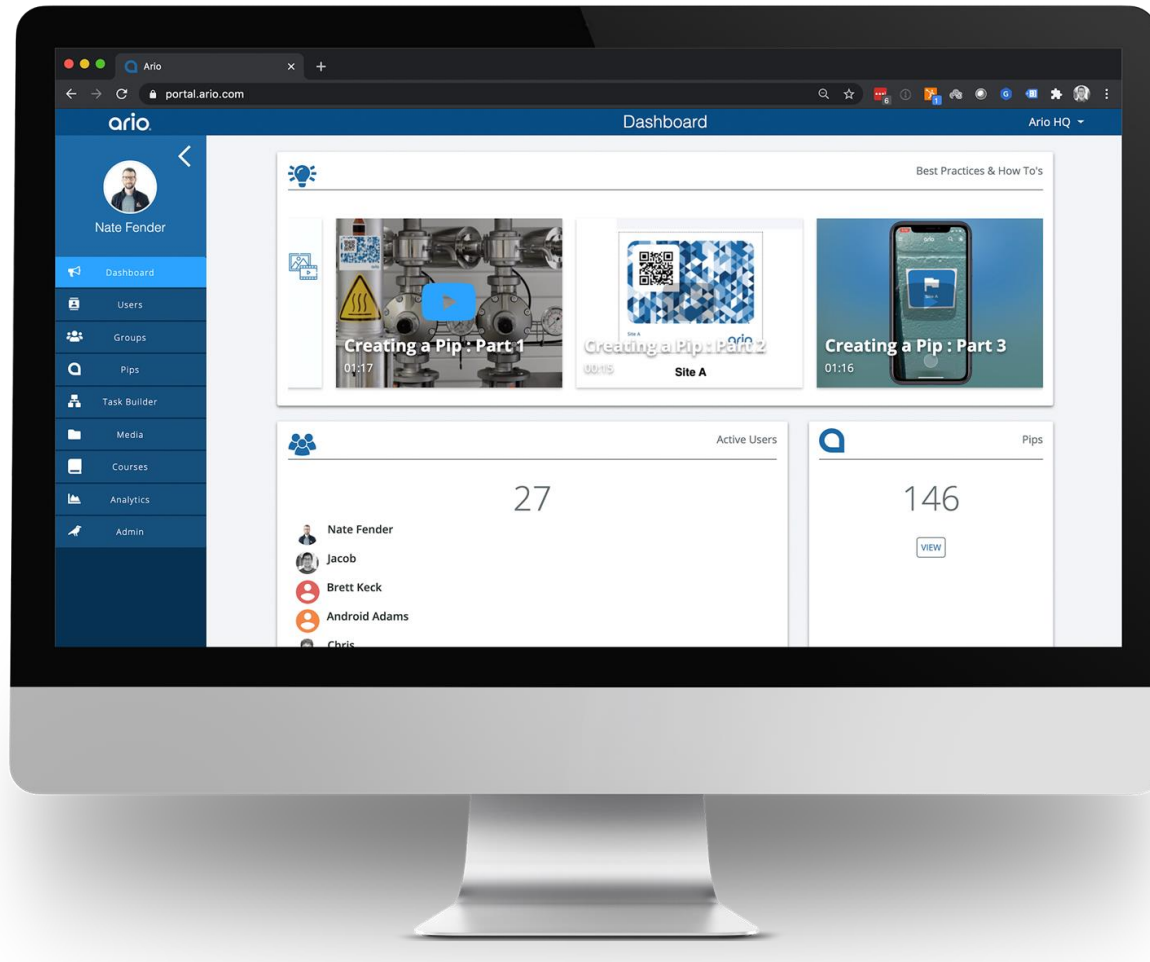


**Put data in
its place.**



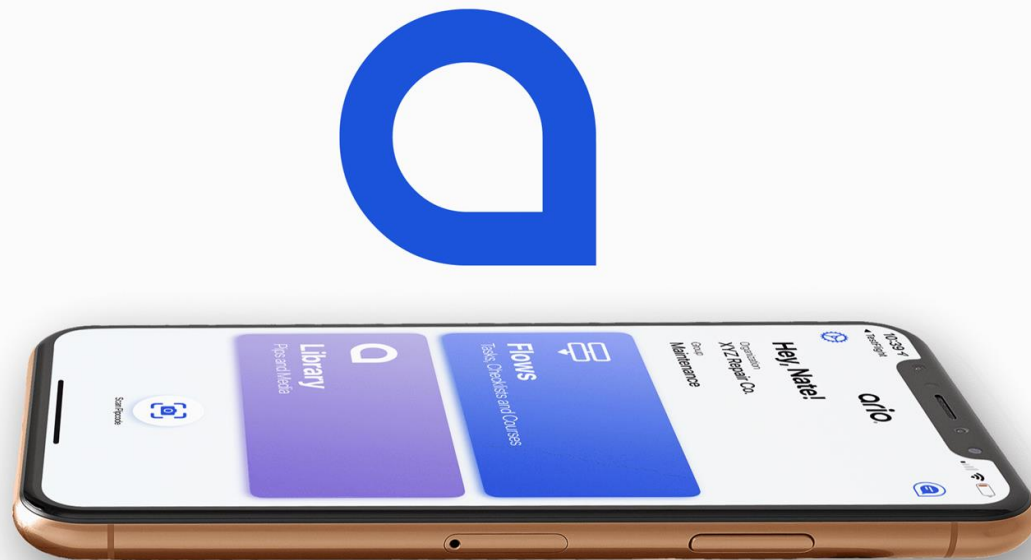
**Connect
any media.**

Manage everything from one central location



- Manage users and content through our portal
- Upload media and resources
- Track team analytics

While using the
Ario Platform, teams
completed tasks
35% faster.



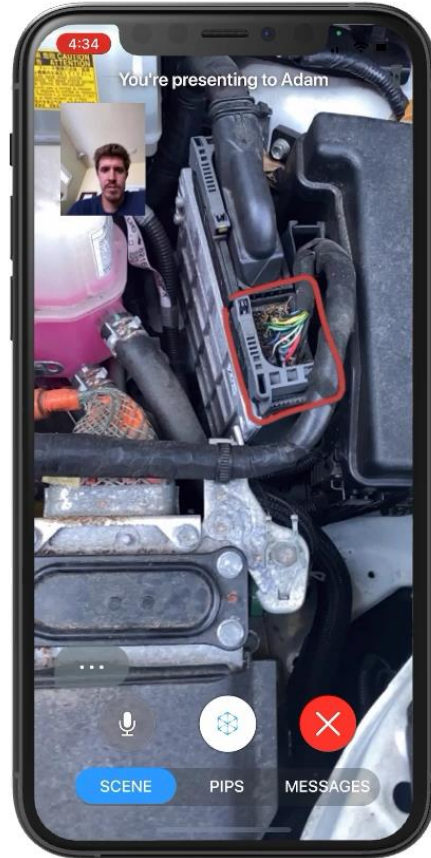
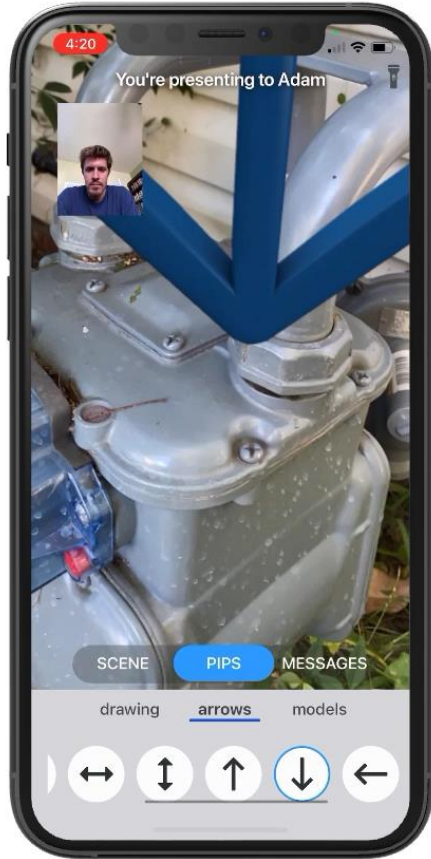


Ario Connect

Two-way video calling enhanced with AR

- Place guidance arrows and symbols in space in real time to share hands-on expertise
- In-app chat for loud environments
- Included in the platform or licensed separately
- iOS, Android and Desktop compatible

Ario Connect | AR video calling



**Show.
Don't Tell.** 



90% of employees
feel that video makes it
easier to get their point
across.

Our products are...



Easy

Easy to create, use
and manage content.




Scalable

Scale to include as
many employees,
devices and
resources as needed.



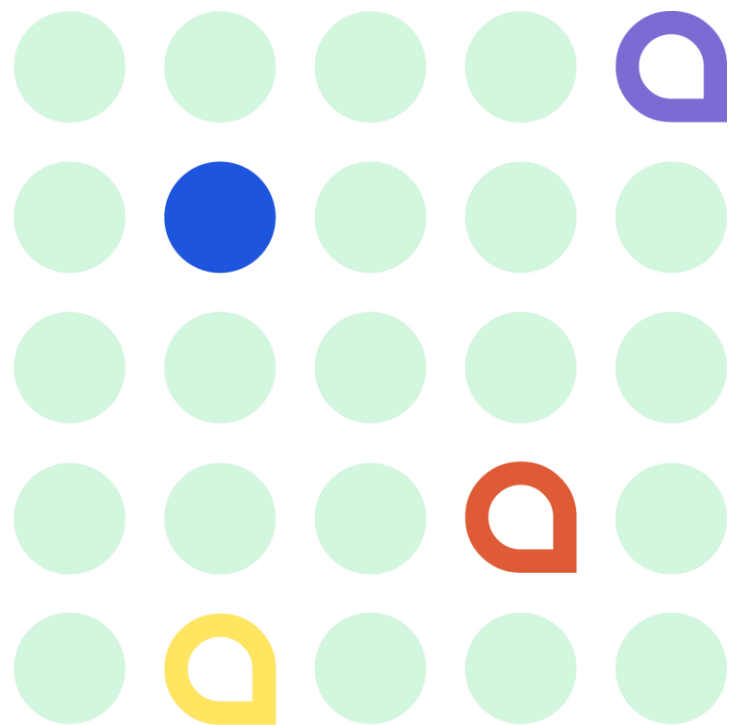
Secure

Okta authentication.
Cloud solutions use
AWS and are
encrypted at rest.



We believe that when people have the right tools and information, **their potential is as big as their imaginations.**

Together, let's see how far we can go.



**How can
we help you?**

The conversation's just getting started.

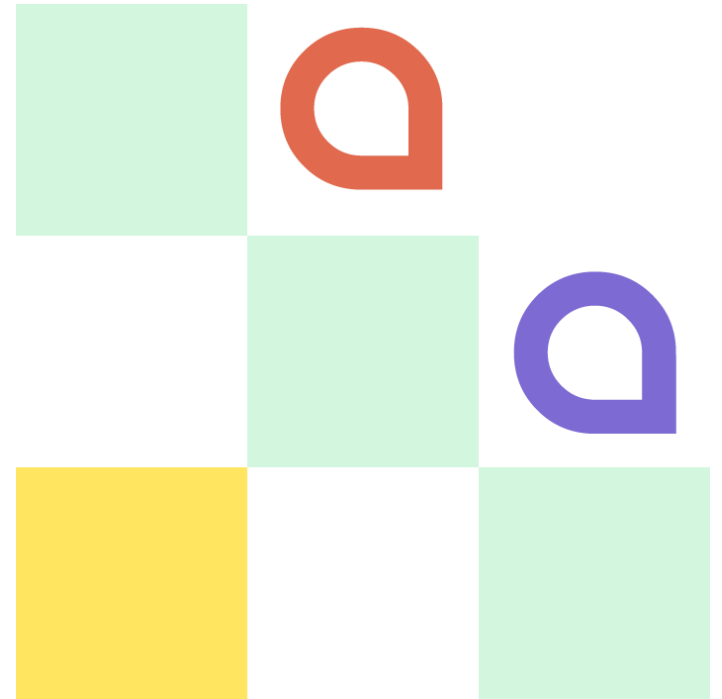
www.ario.com

Joe Weaver

CEO

Email: joe@ario.com

1.757.775.6099



QUESTIONS & ANSWERS

To submit a question,

- Request to share your audio, or
- Use the session chat-box

Thank You to our Panelists

Serene Almomen
serene@senseware.co

Jesse Thornburg
jesse@gridfruit.com

Joe Weaver
joe@ario.com

AGENDA

12:00-12:15 PM	WELCOME & UPDATES
12:15-12:30 PM	EXHIBITOR & NETWORKING SHOWCASE
12:30-1:30 PM	ADVANCING EFFICIENCY WITH EMERGING TECHNOLOGIES
1:30-1:45 PM	EXHIBITOR & NETWORKING SHOWCASE
	LARGE ENERGY USERS: EFFICIENCY OPPORTUNITIES & CHALLENGES
1:45-2:45 PM	ENERGY EFFICIENCY IMPLEMENTATION IN THE TIME OF COVID-19
2:45-3:00 PM	EXHIBITOR & NETWORKING SHOWCASE
3:00-4:00 PM	EXPLORING THE INTERSECTION OF HEALTH & ENERGY EFFICIENCY
4:00-4:30 PM	NETWORKING RECEPTION