THE ENGINE REPORT 2019 & 2020

THE ENGINE
Built by MIT

Building long duration energy storage systems that will enable a 100% renewable gric up to 4 hours. | **Creating safe, unlimited, carbon-free fusion power for the grid in** emissions. | **Decarbonizing every industrial process.** | Industrial thermal separatio **zero greenhouse gas emissions.** | Manufacturing steel produces approximately 8% **1GT of CO2 emissions by 2040.** | Making the chemicals that power our world emit **footprint, 90% less water usage, and 80% fewer GHG emissions.** | The world curre electrify the transportation sector. | **Novel gallium nitride semiconductor techno vehicles.** | Sectors like 5G communications and data centers have pushed the p **systems to unlock supercritical geothermal energy everywhere in the world.** | technologies. | **Automating personalized medicine to cure our toughest diseases.** 750,000 lives per year in the U.S. alone. | **A natural coating that reduces food spoilag** is wasted. | **Making vaccines radically more effective and accessible via a shelf-** sufficient protection from disease, or the vaccine is challenging to transport, prepa **identifying public health problems through sewage analysis.** | Many public he **Developing affordable, simple, and scalable disease detection tools for everyone in t** and mosquito borne diseases are slow, inconvenient, and prone to error. | **Improvi** cells hold the potential to save lives and cure some of our toughest diseases, but man **Using a unique mitochondrial-based approach to discover new ways to treat diseases** diseases remain elusive, even after decades of research. | **Pioneering a new catego health and environmental safety.** | There is an urgent need for new products environmental stressors. | **Delivering drugs to the gastrointestinal tract more effici** colitis impacts almost 1M patients in the U.S. alone. Poor treatment options lead **Connecting space to earth 24/7 to help us better understand and protect our world.** real time imagery from space to keep the planet safe and prosperous. | **Changing** crisis with scarcity of labor, higher prices, fragmented supply chains, and high den **infrastructure with ultra-high-speed, low-power circuits.** | The data centers in and ou limits of speed and energy consumption. | **Quantum software to solve our most co** most important problems in science and industry. | **Miniaturized, mobile sensing so** invisible chemical compounds remains under-recognized, under-utilized, and under- **the benefit of humanity.** | AI is driving an unprecedented demand for computation continue to support Moore's law. | **Powering autonomous machines that thriv** Autonomous vehicles cannot fully predict unexpected behavior, resulting in increas **work radically simple by uniting scientists and lab machinery through software.** **Accelerating the electrification of heavy machinery with solid-state hydraulics.** | He of CO2 emitted annually in the United States. | **Optimizing the resources at the hea** industry is massively inefficient, contributing to tens of billions of dollars of wasted **transportation for all.** | The inefficiency of public transportation drives adoption of e more time on the road for all.

“Core to our mission is helping incredible founders, ideas, and companies scale. To create lasting impact for the world, we must reach everyone.”

Katie Rae,
CEO & Managing Partner

The Engine was spun out of MIT in 2016, with the purpose of supporting startups poised to create a material positive impact on society and the environment.

We had a bold vision for the impact Tough Tech could unlock for the world, but we could never have predicted how these years would play out. The past two years in particular, which this report will aim to detail, have shown us just how widespread and systematic the challenges we face are, and why the time to tackle them is now.

We do this in a few key ways that leverage our proximity to the world renowned research institutions in our backyard: promoting entrepreneurship within science and technology, commercializing Tough Tech, and fostering regional economic development.
Core to each of those tenets is helping incredible founders, ideas, and companies scale. Scaling the access to opportunities and the entrepreneurial community working across Tough Tech; scaling the diversity of backgrounds, viewpoints, and approaches to solving our biggest challenges; scaling the jobs added to our region and the infrastructure that those working on the toughest problems have access to; and scaling the benefits to our community. To create lasting impact for the world, we must reach everyone.

That is what the past two years have been about.

We recently launched a program called Blueprint, which increases the pipeline of academic researchers and post doctorates who are ready to take the leap into entrepreneurship. We put forth policy recommendations for the new administration to ensure we are unlocking more innovation that will benefit the world. Our 155,000 sq/ft expansion project is well underway and slated to open in late 2022 with laboratories, fabrication, and office space for 100 Tough Tech companies. And we continue to convene thousands of people across the growing Tough Tech community during our annual Tough Tech Summit, industry-specific Provocations, and other gatherings.

I’m both humbled and thrilled by the progress of the Tough Tech companies in our portfolio. Commonwealth Fusion Systems published peer reviewed papers showing that their approach to limitless, net-energy fusion power is likely to succeed. Biobot Analytics, E25Bio, C2Sense, and Vaxess Technologies are each working towards commercial diagnostic and therapeutic solutions for COVID-19 and other conditions. Mori showed that its natural coating can extend the shelf life of fresh fruits, vegetables, and protein by 25%-100%, drastically reducing food waste and the need for single use packaging. And Analytical Space recently received a significant government contract to develop and deploy its network of shoebox-sized satellites to help us better understand and protect our world.

We’re excited to apply the UN Sustainable Development Goals to our portfolio of Tough Tech companies. Inside, you’ll find an outline and analysis of how these companies, as well as The Engine itself, fit into the established UN framework.

The two years since our last report have been defined by a pandemic that has taken a tragic human toll and fundamentally altered the way we work and live. The pandemic has only served to sharpen our collective sense of urgency to discover and commercialize Tough Tech companies. This report puts the scope and scale of Tough Tech into perspective and serves as a reminder of why we must continue to create the frameworks to support those solving massive problems, through the convergence of science and technology. We will continue on our journey to do just that — we hope that you can join us.

“The pandemic has only served to sharpen our collective sense of urgency to discover and commercialize Tough Tech companies.”

OUR MISSION

Launched by MIT, The Engine bridges the gap between discovery and commercialization by empowering disruptive technologies with the capital, knowledge, network connections, and the specialized equipment and labs they need to thrive.

Tough Tech companies have historically been underserved and underfunded, leaving many breakthrough inventions stuck inside the lab. This is why we focus exclusively on founders pioneering technology with the genuine ability to transform the planet.

Everything we do is in the service of our founders and their work. We focus on supporting the founders building technologies that will accelerate progress toward a healthier population, a more accessible and adaptive society, and a more resilient world. The Engine rewards confidence and science with capital and access.

We bridge the gap between discovery and commercialization by funding and opening access for ambitious Tough Tech founders, making possible the future they want to see in the world. Our community makes impossible progress, achievable and the difficult challenges, solvable.

Together, we identify and champion the advanced scientific foundation required to connect, support, power, and protect tomorrow's society and environment.

Tough Tech is transformative technology that solves the world's most important challenges through the convergence of breakthrough science, engineering, and leadership.

Our Investment Areas

We look for impact across three general areas that will help the world responsibly adapt to the growth and demands of tomorrow:

CLIMATE CHANGE

Mitigating, adapting to, and ultimately reversing the universal crisis of climate change, with new materials and processes to adjust energy sources, reduce carbon emissions, and redefine energy storage.

HUMAN HEALTH

Enabling a healthier global population through the advancement of biotech and life sciences, by developing foundational technologies to improve health diagnosis and treatment and application of science-driven processes to ensure food security.

ADVANCED SYSTEMS & INFRASTRUCTURE

Adapting and evolving critical industrial systems that provide the backbone of advanced manufacturing and supply chains, the built environment, and space.

A Relationship of Continued Support

We work closely with founders and executives to help them scale and grow their companies to accelerate the path to market.

+ Investment and access to the right capital assets
+ Access to flexible infrastructure
+ Ongoing connection to the right stakeholders across capital, government and strategics
+ Support on scaling the organization and finding the right talent
+ Amplifying their stories and positioning them as leaders in their respective industries

Mapping The Engine's Portfolio across the United Nations Sustainable Development Goals

ACHIEVING A BETTER AND MORE SUSTAINABLE FUTURE FOR ALL

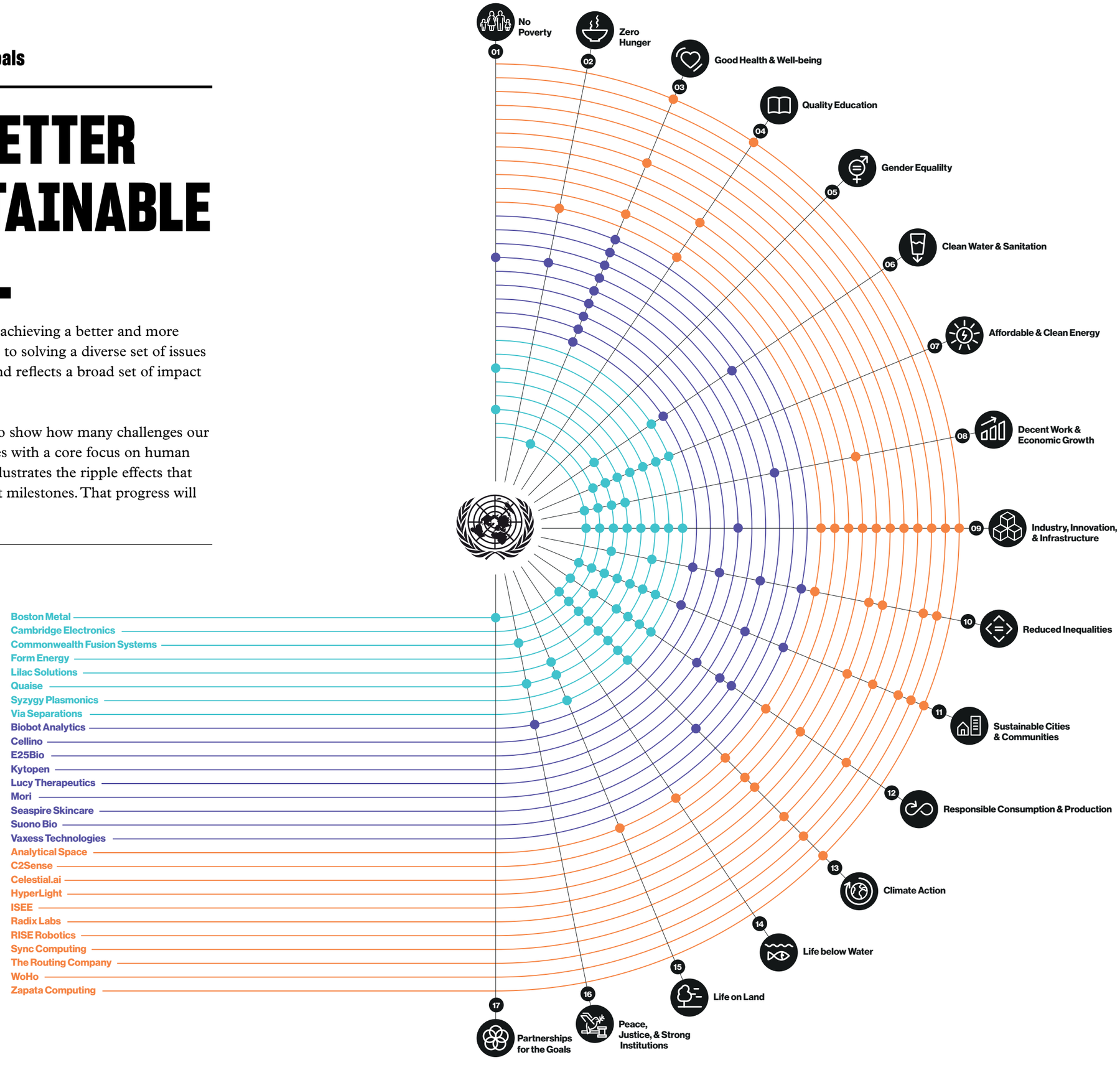
The UN Sustainable Development Goals recognize that achieving a better and more sustainable future for all requires an integrated approach to solving a diverse set of issues together. The Engine's portfolio mirrors this approach and reflects a broad set of impact areas as a whole.

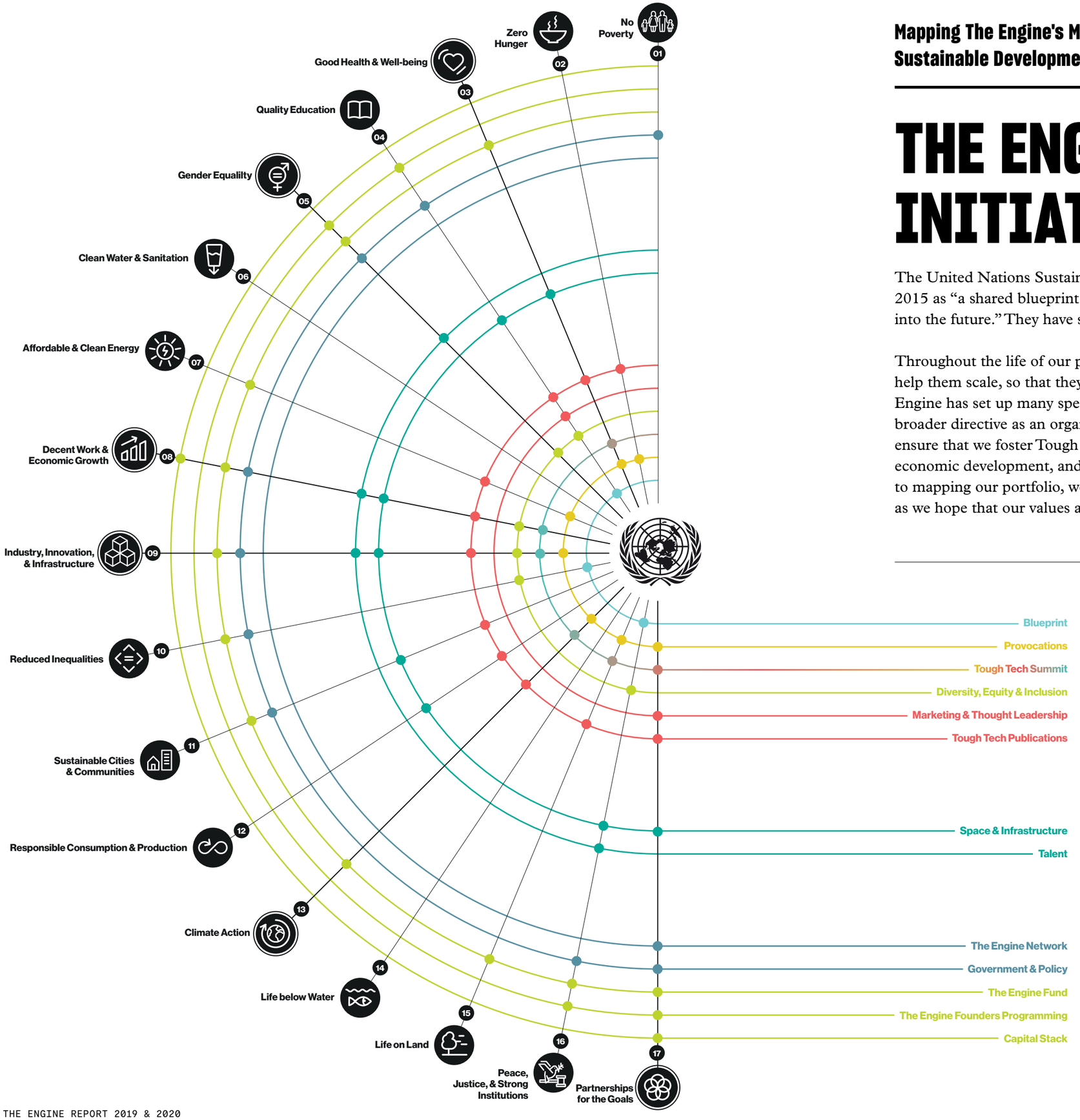
We have mapped the portfolio against these UN SDGs to show how many challenges our companies are working to tackle. For example, companies with a core focus on human health can still have an impact on climate change. This illustrates the ripple effects that will be created as this group continues to hit their impact milestones. That progress will be detailed in the portfolio section of this report.

CLIMATE CHANGE

HUMAN HEALTH

ADVANCED SYSTEMS & INFRASTRUCTURE





Mapping The Engine's Mission Driven Initiatives Across the United Nations Sustainable Development Goals

THE ENGINE'S INITIATIVES

The United Nations Sustainable Development Goals (UN SDGs) were established in 2015 as "a shared blueprint for peace and prosperity for people and the planet, now and into the future." They have since been adopted by all UN Member States.

Throughout the life of our portfolio companies, we work to amplify their mission and help them scale, so that they can deliver impact to as much of the world as possible. The Engine has set up many specialized programs to help our companies scale, to reach our broader directive as an organization, create material positive impact on the world, and ensure that we foster Tough Tech to equitably encourage entrepreneurship, help regional economic development, and commercialize ideas that will change the world. In addition to mapping our portfolio, we mapped The Engine's own initiatives across the UN SDGs, as we hope that our values and efforts reflect the change we want to drive for the world.

FOSTERING ENTREPRENEURSHIP WITHIN SCIENCE & TECHNOLOGY

REGIONAL DEVELOPMENT

ENCOURAGING COMMERCIALIZATION OF TOUGH TECH

IT'S OUR JOB TO MAKE IT EASIER FOR TOUGH TECH TO CHANGE THE WORLD.

"The Engine provides infinitely more than investment. You have a group of companies that are vibrating at the same wavelength, aligned to the same macro trends and same goals. We are working together in a way — we have the same greater purpose."

— **TADEU CARNEIRO,** CEO, Boston Metal

FOSTERING ENTREPRENEUR-SHIP WITHIN SCIENCE & TECHNOLOGY

At The Engine, we help shepherd work from the lab and academia to commercial reality. And we work to ensure the Toughest of Technologies and their potential are highlighted, understood, and communicated to the world. Supporting the founders at the helm of the Tough Tech companies in which we invest is at the core of all we do.

Discovery is just the start. Bringing new science and technology from the lab to market requires a unique set of skills coupled with an entrepreneurial drive. We've designed programming to foster these skills and showcase the potential of emerging ideas to a community that can help commercialize them.

"The Engine is one of the few firms that really walks the walk in early stage Tough Tech investing. They make high risk bets on technical founders whose ideas can make a massive impact, and then follow through with the guidance, patience, and network connectivity needed to navigate a very complex path from lab to market."

— **ILAN GUR,** CEO, Activate

“The Engine’s investments are driven by a mandate, not a particular vertical. I’m constantly using the interdisciplinary nature of the community to our benefit.”

— **SHREYA DAVE,** CEO & Co-Founder, Via Separations

“The Engine has been a critical resource for our early development. They provided us access to a network and team that accelerated customer discovery, product-market fit, and helped us identify key opinion leaders in our industry.”

— **CAMILLE MARTIN,** CEO & Co-Founder, Seaspire Skincare

A Tough Tech startup development program

Tough Tech cannot remain in the lab. We must foster entrepreneurship in the students and researchers who are bringing transformative technologies to life.

Blueprint is a two-month, non-resident program for graduate students, postdocs, and research scientists to explore the commercial opportunities of their scientific breakthroughs.

The program is designed to give future Tough Tech leaders the chance to learn the entrepreneurial process from those who are living it, as well as provide a platform to crystallize the commercial potential of participants' startup concepts.

"I have spent a year trying to learn about starting a company to get our technology to market. As well as many individual conversations, I have been involved with the MIT Smart Start course, I-Corps, and CleanTech Open. While I certainly learned from all of these, what I heard from [The Engine] today was much more on target to the issues we've identified!"

"Blueprint was excellent and I am grateful for the role institutions like The Engine play in supporting early Tough Tech businesses with potential to contribute significantly to a solution to the climate crisis. This is such an important need and I am optimistic it can make a big difference."

BLUEPRINT 2020

THE PROGRAM

+ TECHNOLOGY RISK MITIGATION
+ EXPERIMENTATION PLANNING
+ MARKET DISCOVERY AND SELECTION
+ INTELLECTUAL PROPERTY
+ TEAM BUILDING
+ STORYTELLING

24
PARTICIPANTS

10
INSTITUTIONS

5
VIRTUAL SESSIONS

INSTITUTIONS

Boston University
Harvard University
Columbia University
Northeastern University
MIT
Purdue University
New York City College of Technology – City Tech
University of Michigan
Carnegie Mellon University
Argonne National Laboratory

PROVOCATION NO. 3 MAY 3, 2019

Bringing Transformative Food & Ag Tech to Market

Areas of focus included food and ag tech development frameworks, marketing and consumer perception, government subsidies and regulations, and supply chain optimization. We also asked the question, "What can food and ag industries learn from the innovation and commercialization frameworks of big pharma?"

The Engine Provocations

Provocations are built to convene. They provide a platform for stakeholders across an industry to wrestle with problems and ideas, uncover the challenges and opportunities they need to address, and make the connections they need to solve their biggest challenges.

"It's a really great group that The Engine has pulled together. Very diverse. Very unique perspectives."

— **JON GIEBEL,** Program Lead: Bayer LifeHub Boston, Bayer

"Today was a really wonderful, thought-provoking event. I've had a lot of creative juices flowing — I've been thinking of a lot of ideas about how technology affects the food and product streams. I didn't know what to expect coming here, but I've had a wonderful time and have learned so much."

— **KATE KRUEGER,** Founder, Helikon Consulting

50+ PARTICIPANTS

40+ BUSINESSES

"Coming here, I had absolutely no idea that there were this many people in Cambridge, MA thinking about how farmers like me grow crops, grow food, the systems we use to put it on the table, how we market it, how we fertilize it. Absolutely flattering to know there are so many people thinking about these issues."

— **BENJAMIN RIENSCHE**, Owner & Manager, Blue Diamond Farm

ATTENDEES

ABDUL LATIF JAMEEL WATER AND FOOD SYSTEMS LAB (J-WAFS)
AMAZON
ANALYTICAL SPACE
BARCLAYS
BAYER LIFEHUB BOSTON
BLUE APRON
BLUE DIAMOND FARMING COMPANY
BRYANT AGRICULTURE ENTERPRISE
CAMBRIDGE CROPS
CARGILL
CLOVER FOOD LAB
DAILY TABLE
EFFEM
EVERSOLE ASSOCIATES
EVONIK
FINISTERE VENTURES
FLAGSHIP PIONEERING
FOOD & CITY
FOOD-X
FORTIVE
FREIGHT FARMS
FYTO
GE VENTURES
GINKGO BIOWORKS
GREENLIGHT BIOSCIENCES
IDEO
INARI
INDIGO AG
MASSCEC
MCKINSEY
MIT
NEW CROP CAPITAL
NEW HARVEST
OLIVIA'S ORGANICS/STATE GARDEN
ONE MIGHTY MILL
PAIRWISE
SPOILER ALERT
STARBUCKS
SUSTAINABLE FOOD LAB
TYSON FOODS
USDA/DOE
WEBER SHANDWICK

Tough Tech Summit

Solving the world's biggest problems with Tough Tech requires building a movement. We must unite those working towards change.

For Tough Tech to succeed, it's critical that discussions about the technologies at play, the stakeholders, the founders, and the ecosystems are dynamic, intersectional, and highly engaged. We think the Tough Tech Summit is the opportunity to make those connections and elevate the ecosystem's work, as well as making the act of investing in, or working on, a Tough Tech startup more mainstream.

The Summit has, and will continue to be, a defining thread that pulls through the Tough Tech ecosystem.

We've intentionally designed a two-day Summit united by this single agenda. The Build day focuses on how the ecosystem can better foster innovation and entrepreneurship and features case studies and keynotes with those at the forefront of their discipline. The Invest day focuses on putting early-stage Tough Tech companies in front of those with the resources to propel their technologies to the next level.

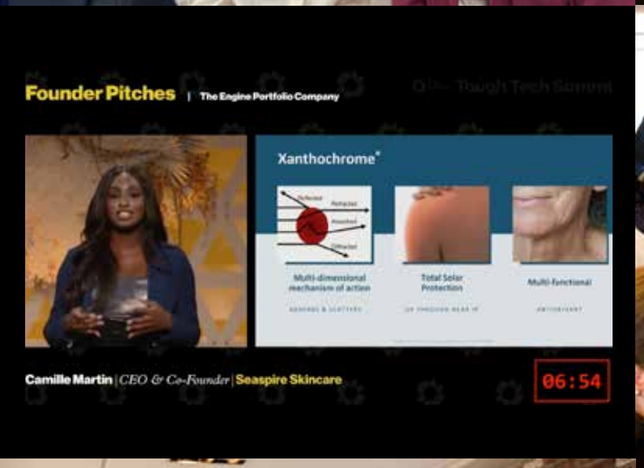
"Solving the global-scale problems Tough Tech companies are tackling requires commitment and collaboration. The only way we solve fundamental challenges in climate, human health, infrastructure, and computing is together."

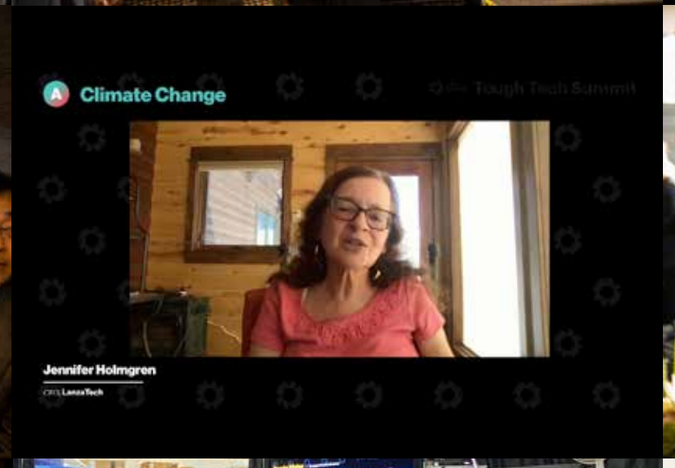
— **KATIE RAE,** CEO & Managing Partner, The Engine

"We have researched the Tough Tech Industry at the Globe, and this Summit has a huge impact on the entrepreneurial community – the sharing of ideas, practices, and knowledge is unmatched for Tough Tech."

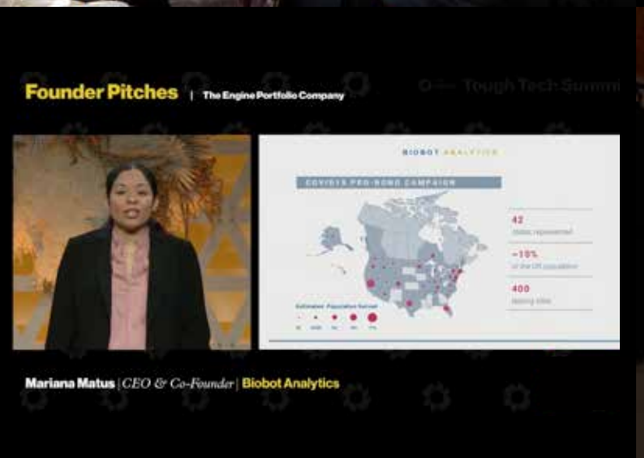
— **LINDA HENRY,** CEO & Managing Director of the Boston Globe; Co-Founder, Hub Week; Board of Directors, The Engine


Fireside Chat
Tough Tech Summit
Mariana Mazzucato
Professor,
University College London (UCL)


Founder Pitches | The Engine Portfolio Company
Tough Tech Summit
Xanthochrome®
Multi-dimensional mechanism of action
Total Solar Protection
Multi-Functional
Camille Martin | CEO & Co-Founder | Seaspire Skincare
06:54


Climate Change
Tough Tech Summit
Jennifer Holmgren
CEO, LanzaTech


2019

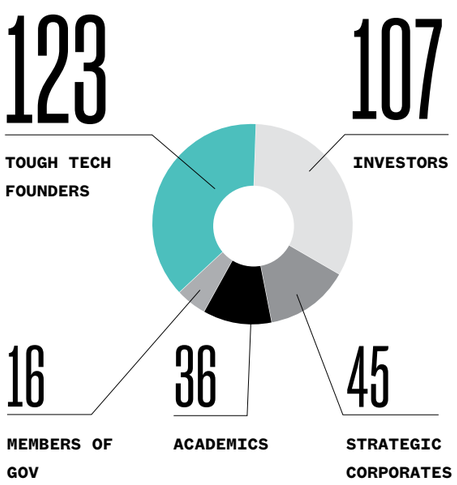

Founder Pitches | The Engine Portfolio Company
Tough Tech Summit
BIOBOT ANALYTICS
COVID19 PED-ROMO CAMPAIGN
42
-18%
400
Mariana Matus | CEO & Co-Founder | Biobot Analytics

TOUGH TECH SUMMIT 2019 10.21.19 | 10.22.19 HOTEL COMMONWEALTH BOSTON,MA

Forging a Path for Tough Tech

500
UNIQUE ATTENDEES

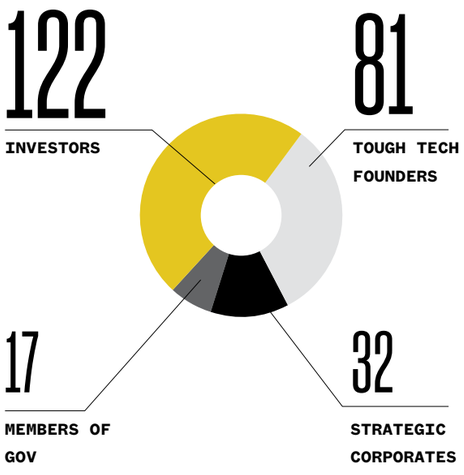
DAY 1
Build



SPEAKERS, MODERATORS, AND PANEL MEMBERS

VINOD KHOSLA
RODNEY BROOKS
KEENAN WYROBEK
JOY DUNN
GEOFFREY VON MALTZAHN
STAN LAPIDUS
JIM MATHESON
NICK DECRISTOFARO
MILO WERNER
MAX LOBOVSKY
DAVIDE LAKATOS
VERN BROWNELL
NED ALLEN
ANDY WHEELER
JAMES GERAGHTY
JOHN SANTINI
JAK KNOWLES
ILAN GUR
SHANNON MILLER
MATT VERMINSKI
ALBERT LEE
KATIE BURKE
PATRICK SOBALVARRO
SANDRA GLUCKSMANN
LOU COOPERHOUSE
RAMYA SWAMINATHAN
TYLER ELLIS
BILLY WOODFORD

DAY 2
Invest



SPEAKERS, MODERATORS, AND PANEL MEMBERS

JOSH DEFONZO
PETER HEBERT
BIJAN SALEHIZADEH
DAVID GAMMELL
CHRISTINE BRENNAN
DIPAL DOSHI
MATEO JARAMILLO
MAX PIERI
ANDREW BOYD
KAREY BARKER
JONATHAN HAUSMAN
BRIAN KORB
CHRIS PIKE
LIBBY WAYMAN
ORIN HOFFMAN
TRAVIS MCCREADY
DAVID STAPLETON
JAMES ZAHLER
TEX SCHENKKAN
ERIC TOONE
BRAD RINGEISEN

10.27.20 | 10.28.20 STREAMING VIRTUALLY AROUND THE WORLD

Streaming Virtually around the World

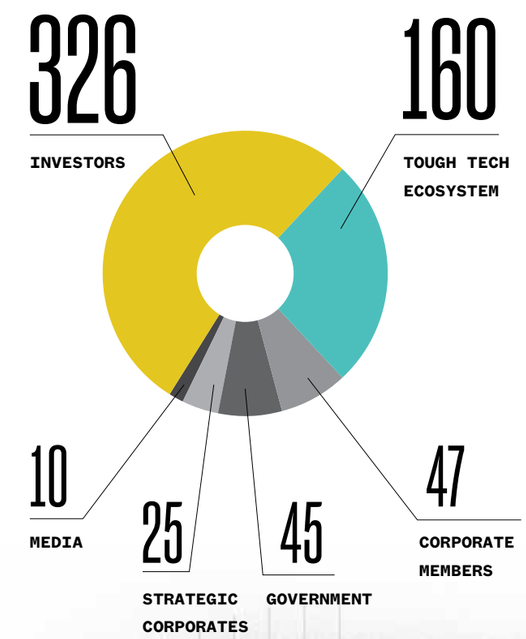
976
UNIQUE ATTENDEES

DAY 1 & 2
Build & Invest

COVID-19 gave us the opportunity to host our first all-virtual Tough Tech Summit. With no space restrictions, attendance was double the 2019 event.

Tough Tech Summit 2020 included two fireside chats, six keynote conversations, and over 24 Tough Tech founder pitches over two days.

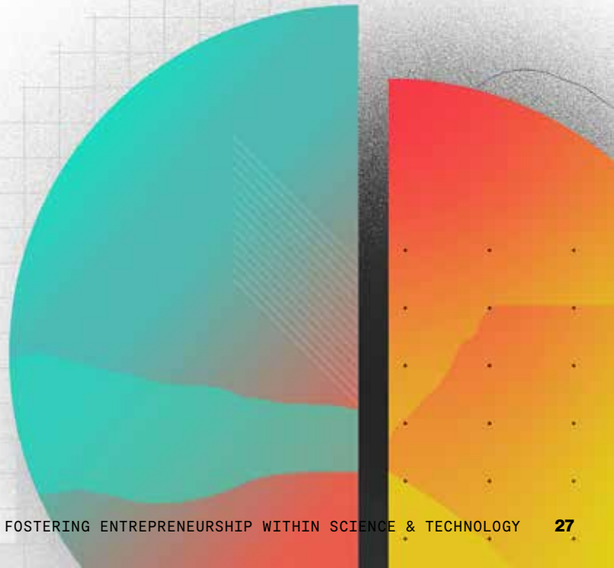
800+
ORGANIZATIONS



SPEAKERS, MODERATORS, AND PANEL MEMBERS

DAY 1 BUILD
ALÁN ASPURU-GUZIK
PAT BROWN
ANN DEWITT
ILAN GUR
JENNIFER HOLMGREN
TOM KALIL
LAURA MAJOR
MARIANA MAZZUCATO
KATIE RAE
MATT ROGERS
DAVID ROTMAN
JULIAN SPECTOR
REED STURTEVANT

DAY 2 INVEST
ANDREW BEEBE
MEETA KAPADIA
JIM MATHESON
RYAN POPPLE
LILA PRESTON
CARMICHAEL ROBERTS
WILL ROPER
DIPENDER SALUJA
LUCINDA SHEN
JONATHAN SOLOMON



Who you invest in matters.

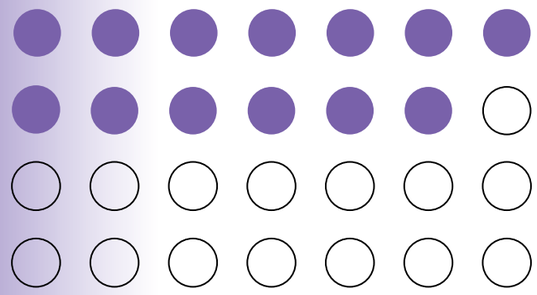
Creating a more equitable and diverse world takes systemic change, an effort that must start as early as possible. We want to broaden the scope of who has access to capital and who has access to the resources to make their dreams a reality — we know that incredible change will result from that access.

A diverse portfolio of founders will hire a more diverse set of employees, they will partner with a more diverse set of advisors, and they will bring new perspectives and approaches towards tackling society's biggest problems.

"One study found that VC firms that increased their proportion of female partner hires by 10% had on average an increase of 1.5% in overall fund returns each year, as well as 9.7% more profitable exits. To put the latter finding into context, the same study noted that only 28.8% of all VC investments have profitable exits."

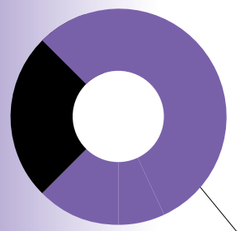
— **VC HUMAN CAPITAL SURVEY:** Third Edition; Deloitte, 2021

THE ENGINE PORTFOLIO COMPANIES:



46%

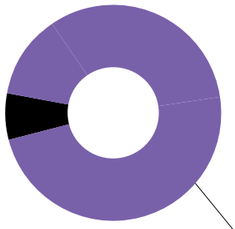
HAVE A FEMALE FOUNDER



75%

OF THE ENGINE PORTFOLIO COMPANIES

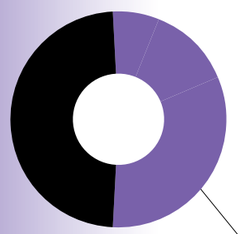
HAVE A FOUNDER WHO IS FEMALE AND/OR AN UNDERREPRESENTED MINORITY (URM)



96%

OF THE ENGINE PORTFOLIO COMPANIES

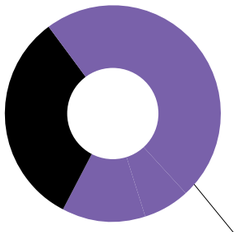
HAVE A FEMALE / URM ON THEIR BOARD OF DIRECTORS



54%

OF THE ENGINE PORTFOLIO COMPANIES

HAVE A CEO/FOUNDER WHO IS AN UNDERREPRESENTED MINORITY (URM)



64%

OF THE ENGINE PORTFOLIO COMPANIES

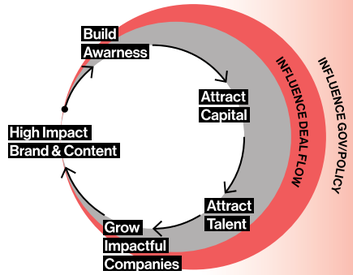
HAVE A FOUNDER WHO IS AN IMMIGRANT TO THE UNITED STATES

** Underrepresented minorities (URMs) include Asians/Asian Americans, Black/African Americans, Latinos, American Indians and Native Pacific Islanders*

Showcasing the importance of Tough Tech to the world.

Whether we are building The Engine's brand or helping a portfolio company build theirs, it all comes back to stories. We invest in marketing, design, and communications to help build awareness of portfolio companies, position them as leaders in their respective industries, and educate future investors, founders, and public.

These stories help build awareness of The Engine, Tough Tech, and our portfolio companies, which helps attract capital and talent and encourages company growth. Our marketing and communications efforts drive a virtuous cycle — by investing in high-quality brand and design, we attract best-in-class founders, capital, and talent. This creates a halo effect that can help influence awareness, policy, and overall deal flow.



"I've been very appreciative of The Engine encouraging and supporting certain workflows like branding and marketing. Without The Engine's help, we would not have undertaken a very successful rebrand."

— **ADAM BEHRENS,** CEO & Co-Founder, Mori

"The Engine has the ability to take the founder's message and amplify it. The education the team has given me on how to do marketing and other related things has been amazing."

— **TREVOR BEST,** CEO & Co-Founder, Syzygy Plasmonics

Media Exposure

THE ENGINE

FEATURED IN

1,335

ARTICLES IN 2020

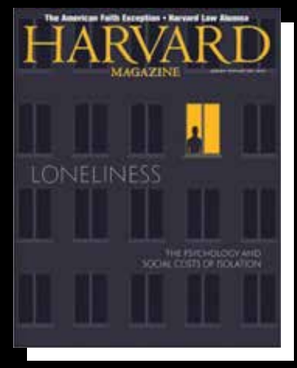
FEATURED IN

1,210

ARTICLES IN 2019

HIGHLIGHTS INCLUDE:

- Fund II Raise coverage in Harvard Magazine, TechCrunch, Forbes, MIT News



2020 PODCASTS:

- Innovating with Scott Amyx, Katie Rae
- Build the Future, Katie Rae
- Tough Tech Today with Meyen and Miller, Orin Hoffman
- My Climate Journey, Katie Rae
- Road Untraveled - VC Perspectives on Navigating COVID, Ann DeWitt

HIGHLIGHTS INCLUDE:

- Fortune: Katie Rae Profile
- Bloomberg TV: Interview with Ann DeWitt

PORTFOLIO COMPANIES

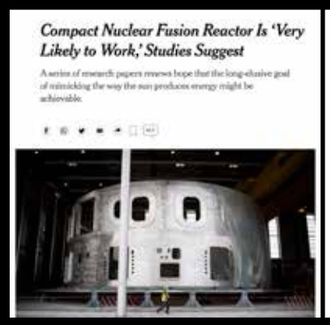
FEATURED IN

9,630

ARTICLES IN **2020**

HIGHLIGHTS INCLUDE:

- Biobot Analytics COVID-19 coverage in New York Post, Newsweek, LA Times, New York Times, and more
- E25Bio COVID-19 coverage in Scientific American, Harvard Magazine, Yahoo News, and more
- Commonwealth Fusion Systems coverage in New York Times, Forbes, Science, and more.
- Form Energy partnership with Great River Energy for their first pilot



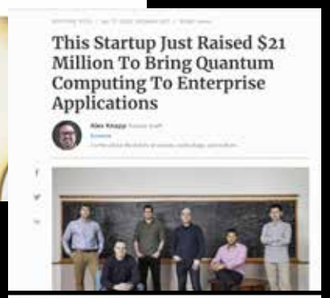
FEATURED IN

7,010

ARTICLES IN **2019**

HIGHLIGHTS INCLUDE:

- Portfolio companies funding announcements
- C&EN's 2019 10 Start-ups to watch including Syzygy Plasmonics & Via Separations
- FastCompany most Innovative Company: Analytical Space



NOTABLE COVERAGE

2020 | **TECHCRUNCH**

Deep tech VC fund The Engine raises $230M for its second fund from MIT and new backer Harvard

"Technical risk is something many VCs like to avoid, but The Engine has built an entire brand and thesis around it. Centered around Kendall Square and the broader MIT ecosystem...Indeed, the firm's portfolio page has to be one of the most interesting in the industry today."

2020 | **FINANCIAL TIMES**

Venture Capital Investors Should Harpoon More Whales

"VCs were all about funding tech breakthroughs but that has got lost," she says. "A lot of VCs look more like private equity companies that do not want to lose any money so they end up backing dog-walking apps rather than quantum computing."

2020 | **SCIENTIFIC AMERICAN**

Who's Brave Enough to Invest in Saving the Planet

"Researchers come to The Engine not because they are trying to make a quick buck but because they have an idea they can't bring alive anywhere else," DeWitt says: "They're compelled into entrepreneurship because of what they're trying to achieve."

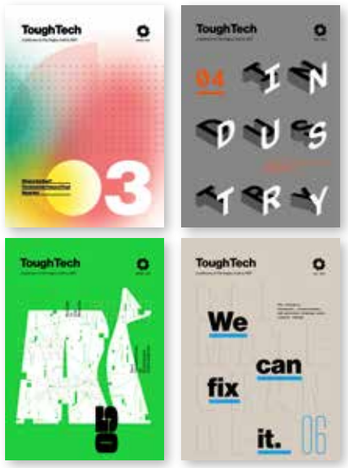
The Tough Tech Publications

Inspired by our portfolio companies and the tides of the Tough Tech ecosystem at large, we produce bi-yearly printed publications that are used to educate, foster investment, and build meaningful relationships. These publications showcase the breadth and depth of Tough Tech with accessible content — interviews, independently researched articles, and analyses by The Engine team — that is amplified across multiple platforms.

PUBLICATIONS

4

THE FOOD & AG ISSUE
THE INDUSTRY ISSUE
THE AI ISSUE
THE CLIMATE CHANGE ISSUE



LIMITED-EDITION PRINT COPIES

450

Per publication

FULL LENGTH ARTICLES

8

- THE FUTURE OF PROTEIN
- GMOS & GENETIC ENGINEERING
- FOOD WASTE
- ADDITIVE MANUFACTURING
- DECARBONIZING INDUSTRY
- SYNTHETIC BIOLOGY
- THE AI INDUSTRY
- CLEANTECH 2.0

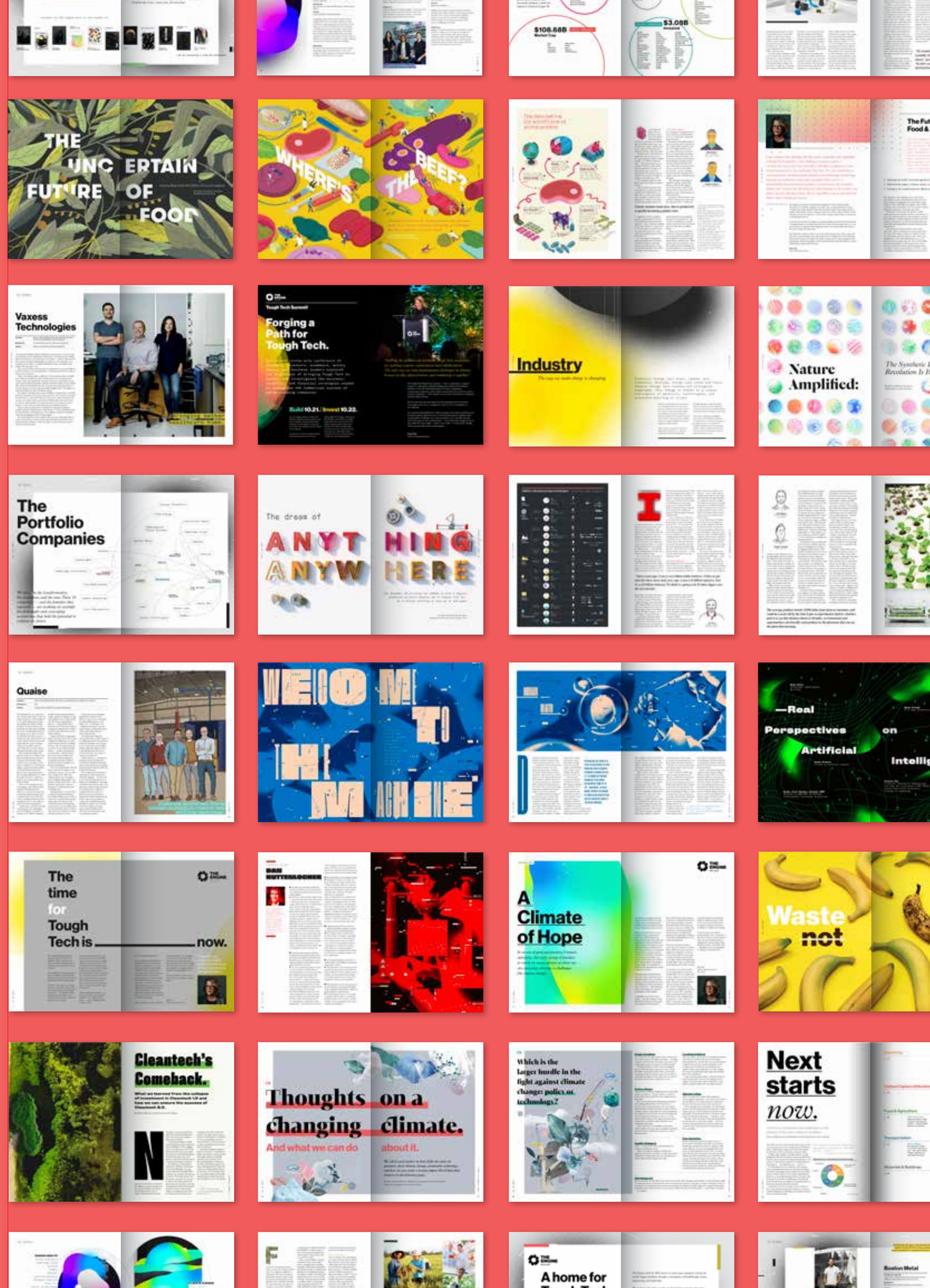
INTERVIEWS

50+

MARKET SURVEYS

14

- FOOD & AG ECOSYSTEM IN NEW ENGLAND
- THE AI INDUSTRY
- CARBON-FREE POWER GENERATION
- LOAD FOLLOWING RESOURCES
- CARBON CAPTURE
- CARBON UTILIZATION & SEQUESTRATION
- ALTERNATIVE PROTEINS
- PLANT GENETICS
- WASTE REDUCTION
- ELECTRIC VEHICLES
- PLANT GENETICS
- WASTE REDUCTION
- ELECTRIC VEHICLES
- AUTONOMOUS VEHICLES
- ALTERNATIVE FUELS
- MATERIALS
- THE BUILT ENVIRONMENT



“The Engine invests in a different kind of founder. They are young, they're hungry. They're not like the seasoned vets that just look at a company as a cap table and a balance sheet. They're people with dreams and ambitions and they're doing this like me — because they love it.”

— **TREVOR BEST**, CEO & Co-Founder, Syzygy Plasmonics

“As COVID-19 hit, we had just closed our first round of funding. The entire team at The Engine worked with us at that moment to help us pivot to monitoring the pandemic. They stepped in and helped us grow from a team of five people to a team of 30-plus.”

— **MARIANA MATUS**, CEO & Co-Founder, Biobot Analytics

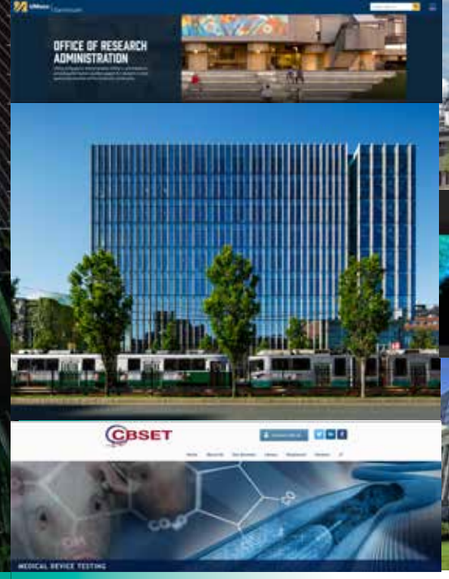
REGIONAL DEVELOPMENT

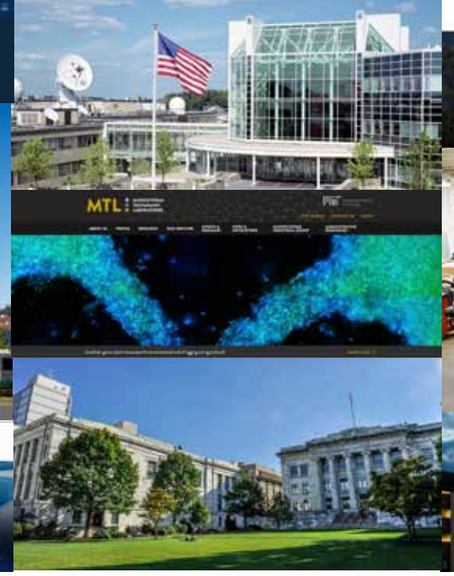
Tough Tech has the potential to transform industries, create millions of lasting and meaningful jobs, place anchor companies into communities, and contribute to regional economic development — both in our home in Cambridge and around the globe.

We've intentionally developed a physical community at our headquarters in Cambridge. One that provides the space, equipment, and people necessary to bring Tough Tech to life with as few impediments as possible. This space, coupled with partnerships and connections across multiple local institutions, gives early-stage Tough Tech companies the opportunity to establish themselves in the region and help cement the Boston metro area as a global hub for Tough Tech.

"I've been inspired by The Engine's success in driving regional innovation and entrepreneurship. The Engine's team does it by identifying promising companies and accelerating the speed to market for their impactful solutions that have the potential to change our world. The unique mix of providing early capital, access to much needed startup infrastructure, and their network of savvy Tough Tech Founders makes them an attractive partner. To have been on their journey with them since inception has been beyond rewarding."

— **SUE SIEGEL,** Chair, Board of Directors, The Engine





↑ *Various partner facilities represented in The Engine Room.*

501 Mass Ave, by the Numbers

Space & Infrastructure

COMMUNITY

77
COMMUNITY EVENTS (LUNCHES, HAPPY HOURS, GAME NIGHTS, ETC)

31
BOARD MEETINGS HOSTED IN-HOUSE

18,799
MEETING ROOM HOURS

7221
VISITORS & GUESTS

200
PEOPLE

~30
COMPANIES

At 501 Mass Ave, teams can move in and get to work without a significant up-front investment for space or equipment. The labs and offices we provide are built out and move-in ready. Providing a flexible and agile solution for real estate lets our teams stay in our region longer and closer to the best resources and talent, their founding partners at local institutions, and their investors.

THE ENGINE ROOM

SHOPS
75+
PIECES OF EQUIPMENT

WET LABS
90+
PIECES OF EQUIPMENT

ENGINEROOM.XYZ PROVIDES ACCESS TO OVER

1,000+
PIECES OF EQUIPMENT IN THE BOSTON METRO AREA

PARTNERSHIPS

MIT · HARVARD UNIVERSITY · Five Years Out · onshape · SOLIDWORKS

“The physical space at The Engine has helped us tremendously. Without it, we wouldn’t have had a place to build our satellites and an office to operate them from.”

— **DAN NEVIUS,** CEO & Co-Founder, Analytical Space

“The Engine’s space was critical for us, having a place where you’re around a diverse and innovative community.”

— **CHRISTOPHER SAVOIE,** CEO & Co-Founder, Zapata Computing

← The Engine's 4th floor lab facilities.

← The Engine's machine shop at 501 Mass Ave.

“Taking advantage of The Engine’s space and all the benefits that go along with it — maintaining a lab, cleaning, having space to work — is one of the best possible things an early-stage company can decide to do.”

— **SHREYA DAVE,** CEO & Co-Founder, Via Separations

To build more, they needed more space to build.

In early 2018, we realized that to fully serve the companies in 501 Mass Ave, we'd need to give them access to more lab and maker space. Construction began in late 2018 and was finished in May 2019. The result? The Engine added 2300 sq/ft of work space and converted nearly 4000 sq/ft to lab and shop space. As of January 2021, all labs are at 100% capacity.

FROM 80/20 OFFICE/LAB SPACE TO 70/30 OFFICE/LAB SPACE

80 OFFICE — LAB 20

70 OFFICE — LAB 30

ADDED

+2300

SQ/FT WORK SPACE

ADDED

+800

SQ/FT BSL2
- 15 BENCHES
- 3 BSCS

ADDED

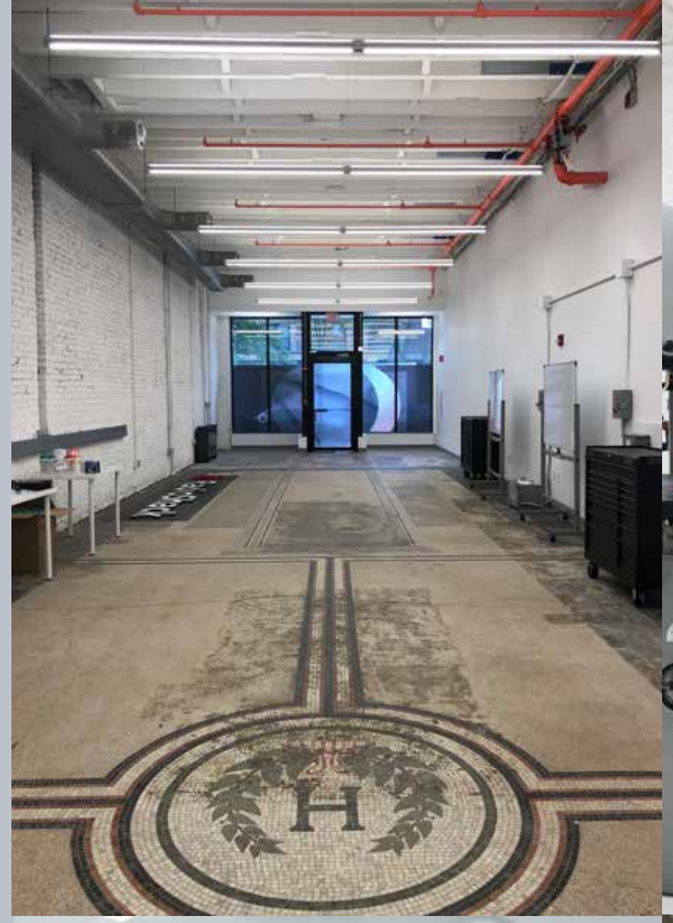
+600

SQ/FT CHEM LAB
- 12 BENCHES
- 2 FUME HOODS

CONVERTED

+2600

SQ/FT SHOPS
- 16 BENCHES
- ELECTRONICS LAB
- MACHINE SHOP



← *Images from The Engine's 501 Mass Ave expansion.*

The Engine Expansion: Opening 2022

We broke ground on our expansion project in June 2019. The effort, to transform what once was a headquarters of The Polaroid Corporation into a 155,000 sq/ft Tough Tech hub, will take another two years. When open, the building will provide 100 companies and 1,000 people access to fabrication space, chemistry and biology labs, office space, and more.

MIT spinoff will expand into old Polaroid building

By Jon Chesto Globe Staff, Updated August 27, 2019, 12:01 a.m.

The Boston Globe

This former Polaroid building will be converted into labs and offices for startups. THE ENGINE

155,000 SQ/FT

100 COMPANIES

1,000 ENTREPRENEURS

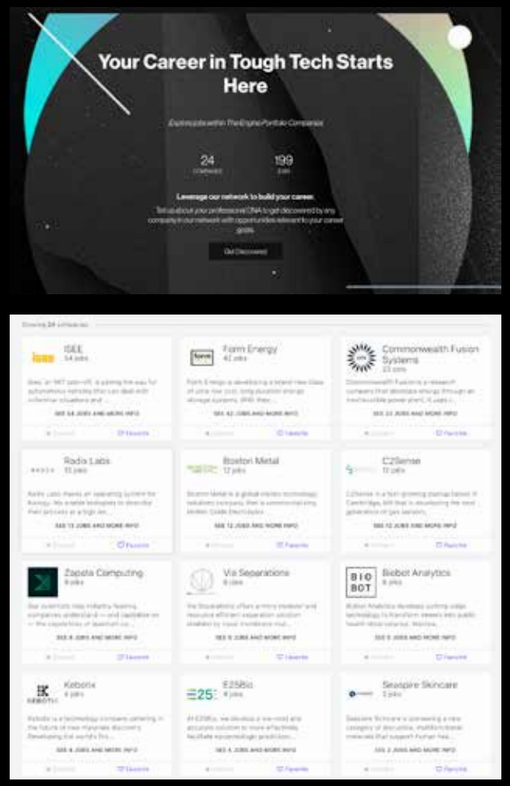
← *Renderings of The Engine's new buildings on Main Street, Cambridge.*

"We have the chance to forge foundational infrastructure that can potentially change the geography of innovation. A thriving hub can propel the Boston region into the future as a magnet for world-changing Tough Tech companies."

— **KATIE RAE,** CEO & Managing Partner, The Engine

Tough Tech takes talent.

Solving the world's toughest problems requires teams of exceptional people. Wherever a Tough Tech company is based, those exceptional people will follow. We do everything we can to unite academia, industry, and entrepreneurially minded people to help the companies in which we invest grow their operations.



ALL THE JOBS. ALL IN ONE PLACE.

Dynamically updated, jobs.engine.xyz unites all job opportunities within our portfolio companies making it easy for those searching for a career in Tough Tech to find and apply for positions.

HIRING AND RECRUITING: PLAYBOOKS FOR EARLY-STAGE TOUGH TECH COMPANIES.

Available to all portfolio companies, the hiring and recruiting playbooks provide the steps, and answer the questions, associated with building a world-class Tough Tech team. Each playbook was written by a team of founders and Tough Tech leaders with deep personal experience building and growing teams.

Topics include:

+ Crafting job listings & recommendations
+ How to interview
+ When to use a recruiter
+ Diversity hiring
+ Setting compensation
+ Closing a hire
+ And more

"The Engine's network has been incredibly good for recruiting. Several executives were introduced to us by The Engine."

— **CHRISTOPHER SAVOIE,** CEO & Co-Founder, Zapata Computing

12/31/19

300

FULL TIME EMPLOYEES

12/31/20

620

FULL TIME EMPLOYEES

ENCOURAGING COMMERCIAL-IZATION OF TOUGH TECH

Breakthrough technology should never remain stuck in the lab.

We help encourage the commercialization of Tough Tech through strategic partnerships, direct action, and fostering awareness at the highest levels of government.

"Tackling one of the most formidable challenges of our generation — the mitigation and reversal of climate change — takes more than just capital, but a network of like-minded and aligned investment partners. The Engine and Breakthrough Energy Ventures share a sharp focus on this important issue and passionate commitment to backing amazing founders. Our collective efforts and coordinated support can help accelerate the speed and expand the scope of what these founders can achieve."

— **CARMICHAEL ROBERTS,** Business Lead, Investment Committee, BEV

"As our lead investor in the seed round, The Engine was instrumental in breaking down apprehensions from other investors in joining our cause. That was a pivotal moment that enabled the company to take its first steps away from the lab and into the commercial journey ahead."

— **CARLOS ARAQUE**, CEO & Co-Founder, Quaise

"The Engine has created a network of highly diverse, highly innovative individuals who really do believe that we all succeed together or we do not succeed at all."

— **AMY RIPKA**, CEO & Founder, Lucy Therapeutics

It takes a Network to build a Tough Tech company.

A network is a powerful thing. We convene the investment, government, regulatory, and corporate communities to help accelerate the progress of those at the helm of early-stage Tough Tech companies.

Many of The Engine's portfolio companies are working on technologies that may augment or build upon the work of existing large corporations and/or policymakers; for these new technologies to succeed, there has to be a clear pathway to commercialization and scale.

We believe that our portfolio companies can and should learn from the lessons of existing large corporations and industry leaders. Where appropriate, the portfolio companies should also tap into the work of these corporations through pilot projects and activities like prototype testing.

PLATINUM MEMBERS

DEVCOM Army Research Laboratory · Breakthrough Energy Ventures · Hyundai Cradle · IMA Sustain Ability · Mitsubishi Electric Changes for the Better · Nitto Innovation for Customers · PNC Bank

GOLD MEMBERS

Arrow Five Years Out · Camber Road · Gunderson Dettmer · Mintz · SVB Silicon Valley Bank

"The Engine has been critical for our success since company inception. The Engine has provided a phenomenal ecosystem for Kytopen to grow and develop into a promising venture."

— **PAULO GARCIA**, CEO & Co-Founder, Kytopen

The Engine Network Programming

Business Development Day

An invite-only event for Tough Tech companies and Strategic Corporates, featuring networking time and one-on-one meetings.

53 1-ON-1 MEETINGS

17 DIRECT REQUESTS FOR FOLLOW-UP / INTROS

17 STRATEGICS ACROSS INDUSTRIES

The Engine Network Founder Meetup

Founders and executives have a chance to connect and strategize.

The Engine Dinners

Leaders of government, industry, and finance participate in collaborative themed dinners.

Tough Tech Talks

Industry leaders, investors, and academics provide insight into how institutions and companies are tackling the big issues at the heart of Tough Tech.

RESPONDING TO THE COVID-19 PANDEMIC
MAY 27, 2020

JAMES COLLINS
FIONA MURRAY
KATIE RAE
MARIANA MATUS
NICHOLAS THOMPSON — MODERATOR
JAMES ROTHSCHILD — HOST

Good policy supports innovation.

Addressing the world's toughest challenges is a complex systems problem, and private capital is just one piece of the solution. Realizing the full impact of Tough Tech innovation requires public and private collaboration to go from breakthrough technology to commercialization to ethical, widespread impact on our economies and societies.

We use our platform to push policy reform for the benefit of the Tough Tech ecosystem. We also help individual portfolio companies engage with the government on non-dilutive funding and regulatory efforts.

Advocates for positive Tough Tech policy

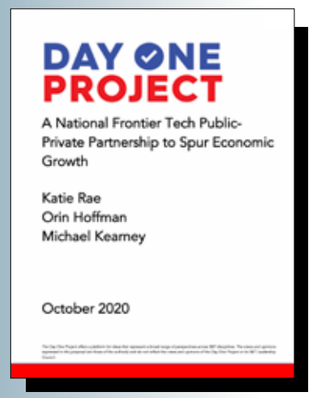
In early 2020, we teamed up with the former Secretary of Defense, Ash Carter, and his team at the Harvard Kennedy Belfer Center, in addition to the Day One Project, to think about how we could move the needle on Tough Tech Innovation at the policy level. We identified several key areas that we feel are critical to making progress, which are captured in these reports:

BUILDING A 21ST-CENTURY AMERICAN ECONOMY

The Role of Tough Tech in Ensuring Shared, Sustainable Prosperity

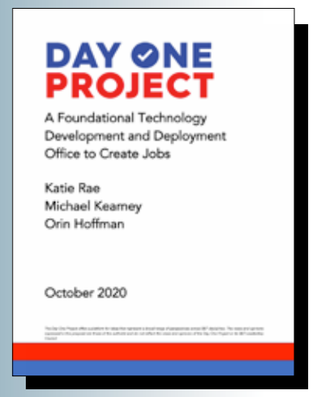
"It is vital to the future American public that we prioritize Tough Tech innovation. If we start building here and now, all of our citizens and the rest of the world will benefit, both economically and socially."

"As the world confronts systematic, interrelated challenges from a raging pandemic to devastating climate catastrophes to a growing chasm of inequality, the United States has the opportunity to make deep commitments to new technological foundations that will usher in the next industrial revolution and greater shared prosperity. Or, we can continue along a business-as-usual path, ceding global leadership and the associated economic value creation elsewhere".



A NATIONAL FRONTIER TECH PUBLIC-PRIVATE PARTNERSHIP TO SPUR ECONOMIC GROWTH

"Frontier tech startups can advance our nation's future global competitive advantage, providing an opportunity to create high-tech and low-tech jobs and reshore other jobs. Coupling investment in the frontier tech innovation ecosystem with workforce training will allow the U.S. to reinvent and revitalize aspects of our declining or offshored industrial sectors and rebuild the country's manufacturing capabilities."



A FOUNDATIONAL TECHNOLOGY DEVELOPMENT AND DEPLOYMENT OFFICE TO CREATE JOBS

"The next administration should create a Foundational Technology Development and Deployment Office within the Department of Commerce that retains flexible financing authority to support market-pull programs for early-stage commercialization of innovative firms."

July 23, 2019

The Director of DARPA visits The Engine

Dr. Steven H. Walker, the Director of DARPA, visited The Engine for a discussion on the agency's past, present, and future and the increasing role of public-private partnerships in Tough Tech. This event provided early-stage companies with a direct look inside one of the U.S. government's most influential proponents of Tough Tech.

Investing in the world's toughest problems.

TOTAL COMPANIES FUND I & FUND II

28

By the end of 2020 our funds had made investments into 28 companies across Tough Tech

FUND I OVERVIEW

27

COMPANIES

FUND II BEGAN MAKING INVESTMENTS FROM

$230M+

IN COMMITMENTS

** Final Fund size over $250M*

NON DILUTIVE

$88M

IN NON-DILUTIVE CAPITAL AWARDED TO OUR COMPANIES SO FAR

ATTRACTING MORE TOUGH TECH INVESTMENT

5.7 : 1

FOR EVERY $1.00 THE ENGINE INVESTED, ITS PORTFOLIO COMPANIES RAISED ANOTHER $5.70 FROM OTHER INVESTORS

THE ENGINE LOOKS FOR 3 KEY INGREDIENTS WHEN MAKING AN INVESTMENT

A founding team with the drive and passion to fulfill their mission.

A groundbreaking science or technology solving a big global problem.

A massive opportunity to transform an industry.

QUAISE ENERGY · wolfo · celestial AI · THE ROUTING COMPANY

BIO BOT · RISE · Lilac solutions · seaspire SKINCARE

sync COMPUTING · SYZYGY PLASMONICS · lucytherapeutics · VAXESS technologies

BOSTON METAL · mori · HYPERLIGHT · EVBIO

RADIX · ZAPATA · Commonwealth Fusion Systems · Cambridge Electronics

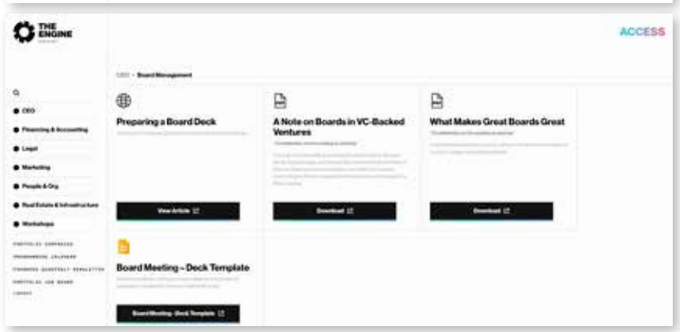
cellino · KYTOPEN · ISEE · analytical space

form energy · VIA SEPARATIONS · SENSE · suono bio

Portfolio Company Programming

Our portfolio company programming initiatives are designed to bring best-in-class programming and resources to Portfolio Companies. Workshops, our annual offsite, and other meetups unite founders and leadership from our portfolio companies to learn, share best practices, and solve common hurdles faced by early stage Tough Tech companies.

+ **FOUNDER ANNUAL OFFSITE**
+ **WORKSHOPS & LUNCHES**
+ **CEO, CTO-CSO DINNERS**



ACCESS

The Engine's Access site is a highly-curated, dynamic database of commonly used legal, finance, and operation templates, helpful documents, and vetted vendors for Tough Tech companies. By giving our portfolio companies access to the right resources to support key business functions, including hiring, marketing, finance, board management, and real estate, we help accelerate their growth.

"I see the programming as an opportunity to connect with the community."

— **WILLIAM WOODFORD,** CTO & Co-Founder, Form Energy

"The Engine ecosystem — and the Boston Tough Tech ecosystem at large — is full of founders and talent going through the same sort of thought processes and the experiences of building companies. You can find people that have gone through the same stage that you're at right now as an entrepreneur, whatever that stage is."

— **BOB MUMGAARD,** CEO & Co-Founder, Commonwealth Fusion Systems

"I have standing check-ins with at least a handful of CEOs in the portfolio. I view them as my personal network now, as friends and otherwise. These connections are exceedingly important to the mental health and success of leaders."

— **ADAM BEHRENS,** CEO & Co-Founder, Mori

Harnessing the Tough Tech capital stack.

Bringing transformative technologies to life requires innovative capital solutions.

Increasing the quantity and diversity of this capital is crucial to the success of Tough Tech's most audacious ideas but requires a deep understanding of a company's techno economic model and of capital tools available.

The Engine's Capital Stack team works alongside our Founders to develop and execute the financial roadmaps that will be crucial to their success. We have built and leveraged a powerful network of capital providers excited to help our founders meet their capital needs.

WE HELP & SUPPORT PORTFOLIO COMPANIES:

+ **BUILD AN UNDERSTANDING OF THE FULL ARRAY OF CAPITAL TOOLS AVAILABLE**
+ **CREATE AN OPTIMIZED CAPITAL PLAN**
+ **ENGAGE WITH CAPITAL PROVIDERS WHO CAN MEET THE NEEDS OF THE CAPITAL PLAN**
+ **EXECUTE THEIR CAPITAL PLAN**

By working one-on-one with our companies to help them navigate and strengthen financing rounds, access non-dilutive options and consider exits, the Capital Stack Team can maximize returns and impact.

The Engine's portfolio companies most commonly raise equity and convertible debt to fund growth. We help founders look beyond those vehicles to find more efficient capital for certain activities, ranging from equipment and lease financing, to sale leasebacks for property, to other strategies. Our companies have also been successful in securing non-dilutive capital, including grants from government, foundations, corporations, and academia.

> **"The Engine played an important role in building an entire ecosystem of later-stage investors and potential partners — we certainly benefited from such a community."**
>
> — **MATEO JARAMILLO**, CEO & Co-Founder, Form Energy

EQUITY AND CONVERTIBLE DEBT RAISED*

$675M

NON-DILUTIVE CAPITAL RAISED*

$88M

TOTAL VALUE OF ALL PORTFOLIO COMPANIES*

>$1.6B

**As of 12/31/20*

THE RISE OF TOUGH TECH EVENT | JUNE 26, 2019

Showcasing a subset of Tough Tech companies to key investors from elite financial institutions up and down the Capital Stack. Leveraging our Capital Stack platform to create a forum for opportunity, awareness, and dialogue between Tough Tech companies and institutions looking to engage.

INVESTORS

50+

VC
PRIVATE EQUITY
INSTITUTIONAL INVESTORS
CORPORATE INVESTORS

ASSETS UNDER MANAGEMENT REPRESENTED

>$4T

2019 TOUGH TECH LANDSCAPE IN COLLABORATION WITH PITCHBOOK

In October 2019, we partnered with PitchBook to shed light on Tough Tech investment, assess the trajectory of VC investment in the field over the last few years, identify areas of particular excitement, and highlight verticals that may need further support from investors, policymakers, and strategic engagement.

The report and the data within have proven to be invaluable tools as we raise our second investment fund. There is no longer any debate that investment momentum in Tough Tech is only continuing to grow.

“The Engine lives and breathes the principles around the convergence of different disciplines, and that makes it special. Not only do they have industry-leading expertise in biotech and pharma, they also bring impressive background in software and hardware. Cellino exists at the interface of all of these specialties, and we’ve benefited greatly from having an investor like The Engine who speaks all of these languages.”

— **NABIHA SAKLAYEN**, CEO & Co-Founder, Cellino

“The Engine is the first venture firm we've seen that is truly investing in platforms and making sure that we are not just focused on a single product for commercial sake, but truly utilizing the platform to solve as many problems with it as we can.”

— **MICHAEL SCHRADER**, CEO & Co-Founder, Vaxess Technologies

PORTFOLIO IMPACT

CLIMATE CHANGE

We work with companies that aim to mitigate, adapt to, and ultimately reverse the universal crisis of climate change with new materials and processes to produce energy, reduce carbon emissions, and redefine energy storage.

"Climate change is the biggest issue of our generation, but we can't let fear paralyze us into preserving the status quo. We must use it as a motivator... we should look at this as an opportunity to leverage human ingenuity and innovation to make meaningful change. The majority of emissions have happened in a single generation; that means we — the people here now — can fix it."

— **BOB MUMGAARD,** CEO & Co-Founder, Commonwealth Fusion Systems

FOUNDERS	MATEO JARAMILLO, YET-MING CHIANG, TED WILEY, WILLIAM WOODFORD, MARCO FERRARA
BACKGROUND	MIT DEPARTMENT OF MATERIAL SCIENCE AND ENGINEERING, 24M TECHNOLOGIES, A123, TESLA ENERGY
INDUSTRY	ENERGY, ADVANCED MATERIALS

BUILDING MULTI-DAY ENERGY STORAGE SYSTEMS THAT WILL ENABLE A 100% RENEWABLE GRID.

THE PROBLEM

Utility-scale renewable energy storage can only deliver power for up to 4 hours.

The challenge at the heart of building a renewable energy grid is not electricity generation, it's making those electrons at the right time and in the right place. Current renewable energy solutions like solar and wind do not adapt well to changing load demands and they do not produce any electricity if the sun does not shine or wind does not blow. Reliable, dispatchable, multi-day energy storage is needed to bridge the gap between those downtimes and transition to a fully renewable grid. Such storage is impossible with current Li-ion battery systems, which cannot deploy enough energy, for long enough, to meet demand.

THE IMPACT

A 100% renewable grid will deeply affect us all. Such decarbonization will eliminate 10Gt of CO_2 emissions per year — or approximately 25% of all CO_2 emissions worldwide. It will render thermal electricity generation from fossil fuels obsolete, providing us with cleaner air, water, and land. The ubiquity of the materials used in Form's system means that throughout the world — wherever there is a Form energy storage system — there will be a reliable source of jobs and positive impact on local industry.

THE BREAKTHROUGH

Form Energy has created a large-scale, multi-day energy storage system built with novel metal-air chemistry. The system uses low-cost, abundant materials that are available throughout the world. Form's systems can be located in any market and scaled to match existing energy generation infrastructure globally. They have the capability to reshape the electric system, making renewable energy available year-round and extending transmission capacity without building new wires.

Modular and scalable, the core technology behind Form's storage system can easily be tested and refined with significantly less risk than other renewable energy technologies that are much more capital-intensive. The materials at the heart of the system are readily available anywhere in the world, simplifying deployment logistics and further reducing barriers to adoption, while keeping costs competitive with existing options.

ELECTRICITY GENERATION

25%

OF GLOBAL CO_2 EMISSIONS

THE POWER SECTOR HAS BEEN DECARBONIZING AT

3%

A YEAR SINCE 2008

https://www.c2es.org/document/decarbonizing-u-s-power/

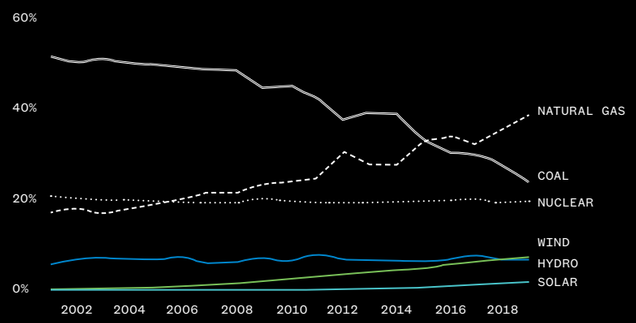
FORM ENERGY STORAGE SYSTEM = 150HR POWER DELIVERY

CURRENT GRID STORAGE = 4HR POWER DELIVERY

THE ELECTRICITY WORLD IS CHANGING, QUICKLY

U.S. GENERATION BY SOURCE 2001-2019

Source: IEA



DELIVERING

150

HOURS OF CONTINUOUS POWER FROM AN AQUEOUS AIR BATTERY SYSTEM.

POWER-PLANT SCALE SYSTEMS CAN INTEGRATE INTO EXISTING ENERGY INFRASTRUCTURE WITH ZERO NEW WIRES.

RETIRING THERMAL POWER GENERATION AND ENABLING RENEWABLES OPENS A $1T MARKET.

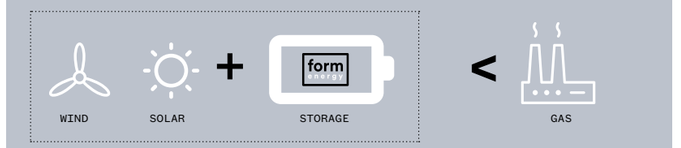
SOFTWARE TO ACCELERATE THE RENEWABLE TRANSITION

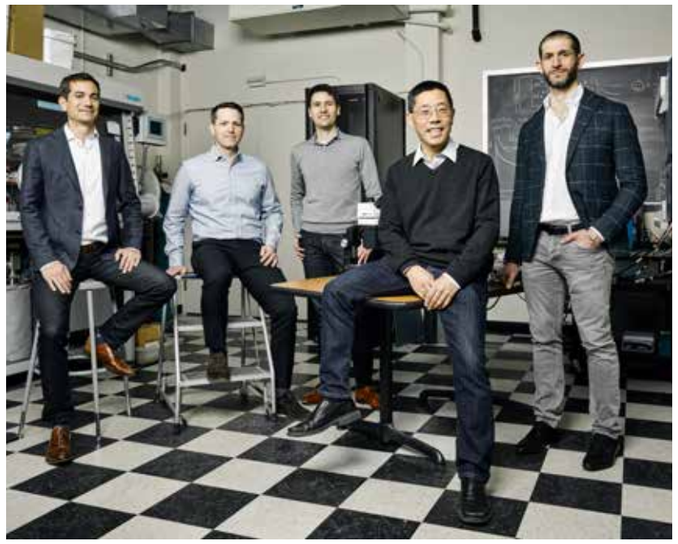
Form Energy has also developed FormWare™, a technology-agnostic software tool to help optimize and expand transmission capacity. The team built these modeling tools to accurately determine the impact of its platform. Available to commercial customers, FormWare can help identify where a Form Energy storage system can make the most impact and the specifications the system needs to do so.

BUILDING A 1MW 150MWH PILOT PLANT

Form Energy is partnering with Great River Energy, the fifth largest electricity generation cooperative in the U.S., to deploy its energy system in the field for the first time. The project will be a 1-MW, grid-connected storage system capable of delivering its rated power continuously for 150 hours, far longer than the two-to-four hour usage period common among lithium-ion batteries being deployed at utility scale today.

WHAT KIND OF STORAGE WOULD IT TAKE TO REPLACE ALL THERMAL GENERATION?



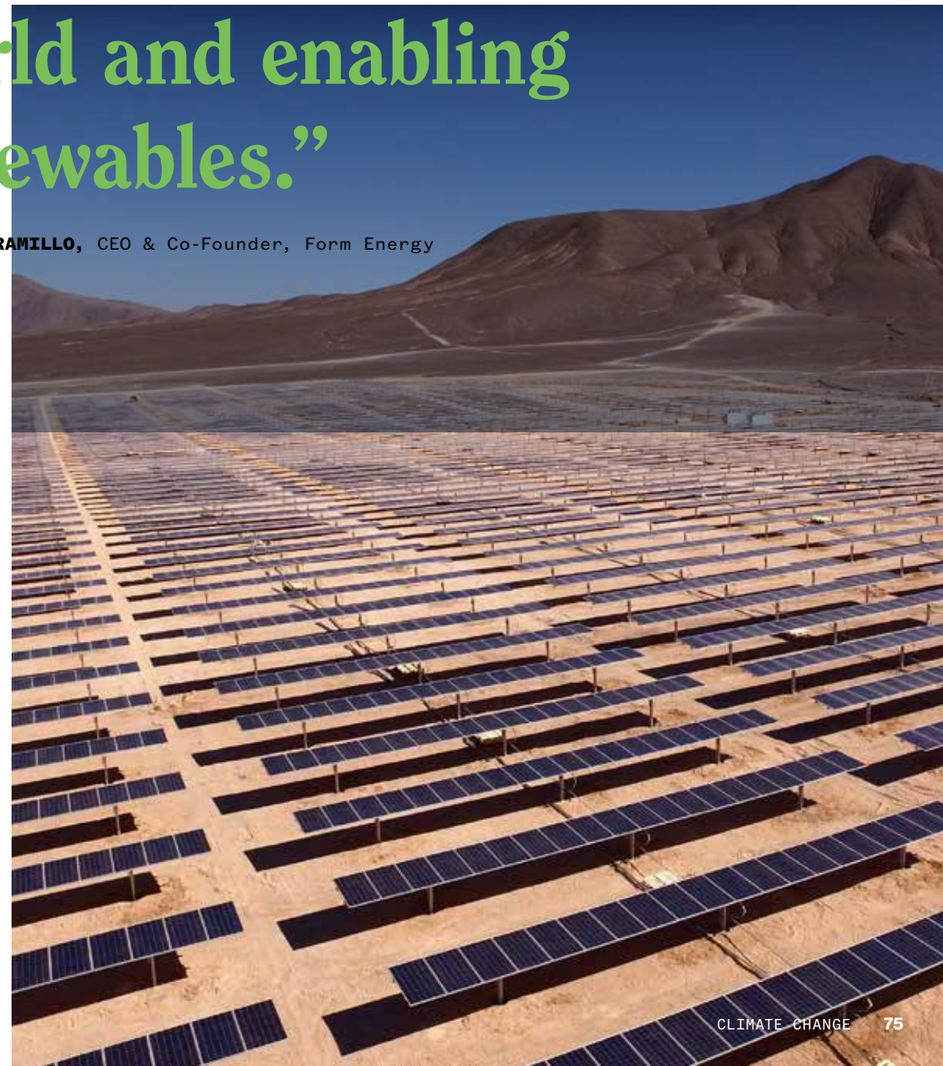


“These are batteries unlike anything else you’ve ever come across before.”

— **MATEO JARAMILLO,** CEO & Co-Founder, Form Energy

“At Form, we are a bunch of modest folks with immodest goals. And we have a goal of retiring all thermal generation in the world and enabling renewables.”

— **MATEO JARAMILLO,** CEO & Co-Founder, Form Energy



Commonwealth Fusion Systems

FOUNDERS	ZACH HARTWING, BRANDON SORBOM, MARTIN GREENWALD, DENNIS WHYTE, BOB MUMGAARD, DAN BRUNNER
BACKGROUND	MIT PLASMA SCIENCE AND FUSION CENTER
INDUSTRY	ENERGY, ADVANCED MATERIALS

CREATING SAFE, UNLIMITED, CARBON-FREE FUSION POWER FOR THE GRID IN 10-15 YEARS.

Photo: CFS

← *Manufacturing magnet components at its Cambridge facility.*

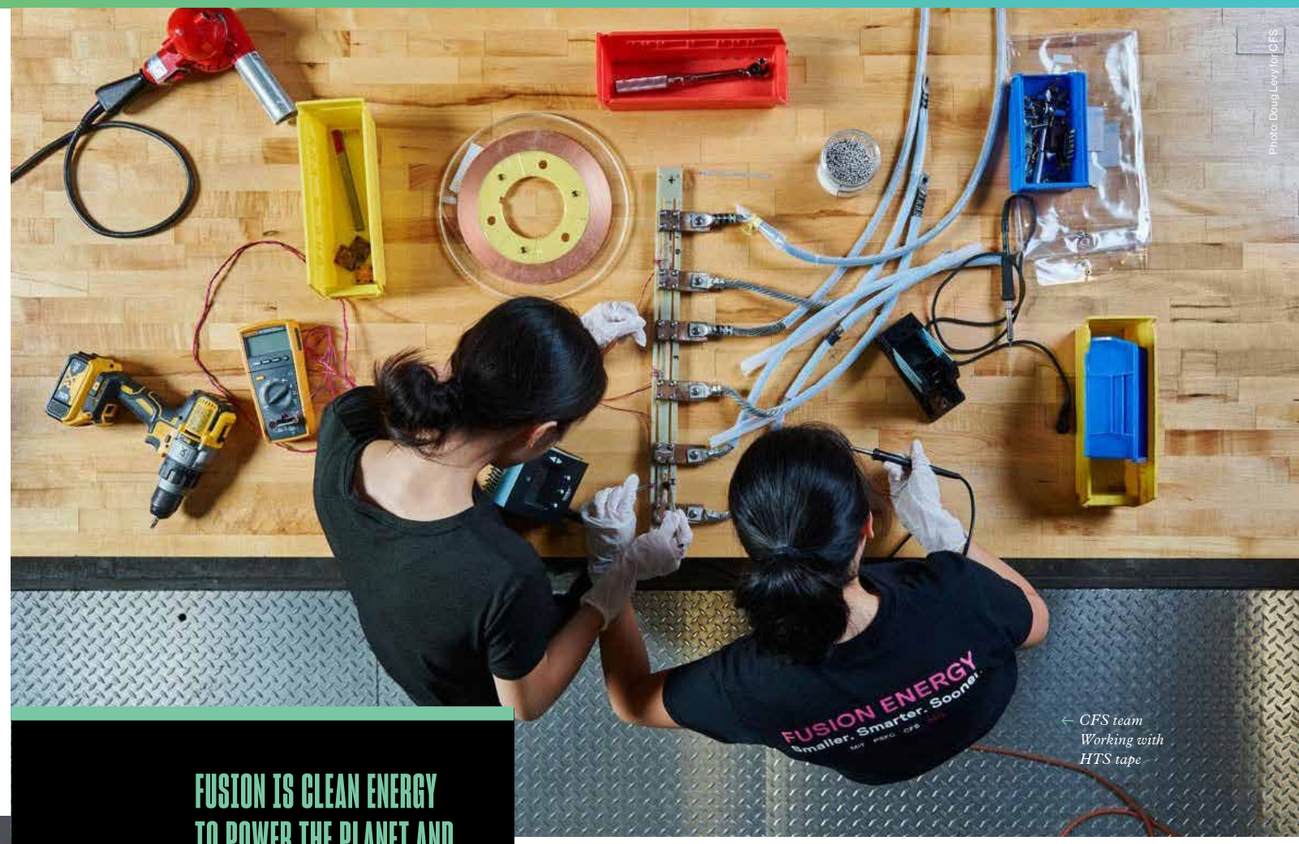


Photo: Doug Levy for CFS

← *CFS team Working with HTS tape*

FUSION IS CLEAN ENERGY TO POWER THE PLANET AND COMBAT CLIMATE CHANGE

- ZERO CARBON
- DISPATCHABLE
- INEXHAUSTIBLE FUEL SUPPLY
- NO THREAT OF MELTDOWN
- NO LONG-LIVED WASTE
- THE DEUTERIUM SOURCED FROM ONE GLASS OF WATER = FUSION FUEL FOR ONE PERSON'S LIFETIME

THE PROBLEM

Energy production is responsible for 25% of all GHG emissions.

Climate change is the problem of the millennium. And energy generation is responsible for more climate-altering GHG emissions than any other sector — 25% of global emissions. Satisfying the world's growing energy demands with clean limitless fusion energy will redefine our relationship with electricity in every sense. It will make traditional fossil fuel power sources obsolete and stop gigatons of CO_2 from entering our atmosphere, slowing climate change in one bold step.

THE IMPACT

It is difficult to overstate the impact of net energy fusion power. When successful, Commonwealth Fusion Systems' machines will provide unlimited energy with zero carbon emissions, forever. To put the power of fusion into perspective: one glass of water contains enough fusion fuel for one person's lifetime. Fusion energy represents one of the world's best hopes to decarbonize the energy sector in time to impact climate change.

THE BREAKTHROUGH

Commonwealth Fusion Systems is using revolutionary new materials and technologies to develop a fusion machine that is smaller, faster to build, and easier to deploy than any other system under development. The team is pioneering a type of magnet built with high-temperature superconductors that will be used to confine a plasma in which fusion occurs. CFS is integrating these new magnets into the proven tokamak approach to fusion to create the fastest path to commercial fusion energy.

ON TRACK TO ACHIEVE POSITIVE NET ENERGY FUSION IN 2025

BUILDING A 20-TESLA LARGE-BORE MAGNET FOR DEMO IN 2021

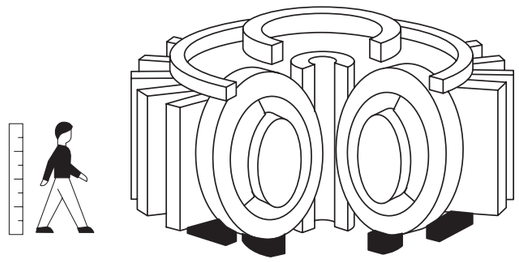
LARGEST MAGNET OF ITS KIND IN THE WORLD

SPARC

WILL BE 50X SMALLER THAN ITER*

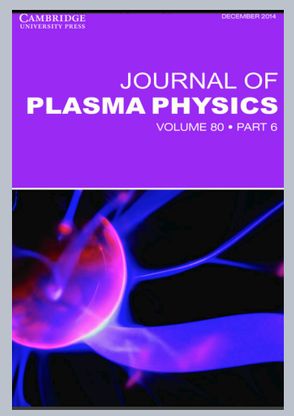
4 DAYS: THE TIME IT TAKES TO BUILD A HIGH TEMPERATURE SUPERCONDUCTING MAGNET

*ITER is an acronym for International Thermonuclear Experimental Reactor. It is one of the largest construction projects in the world and, when complete, will have cost up to $60B dollars. The project is funded by the EU, China, India, Japan, South Korea, Russia, and the U.S.



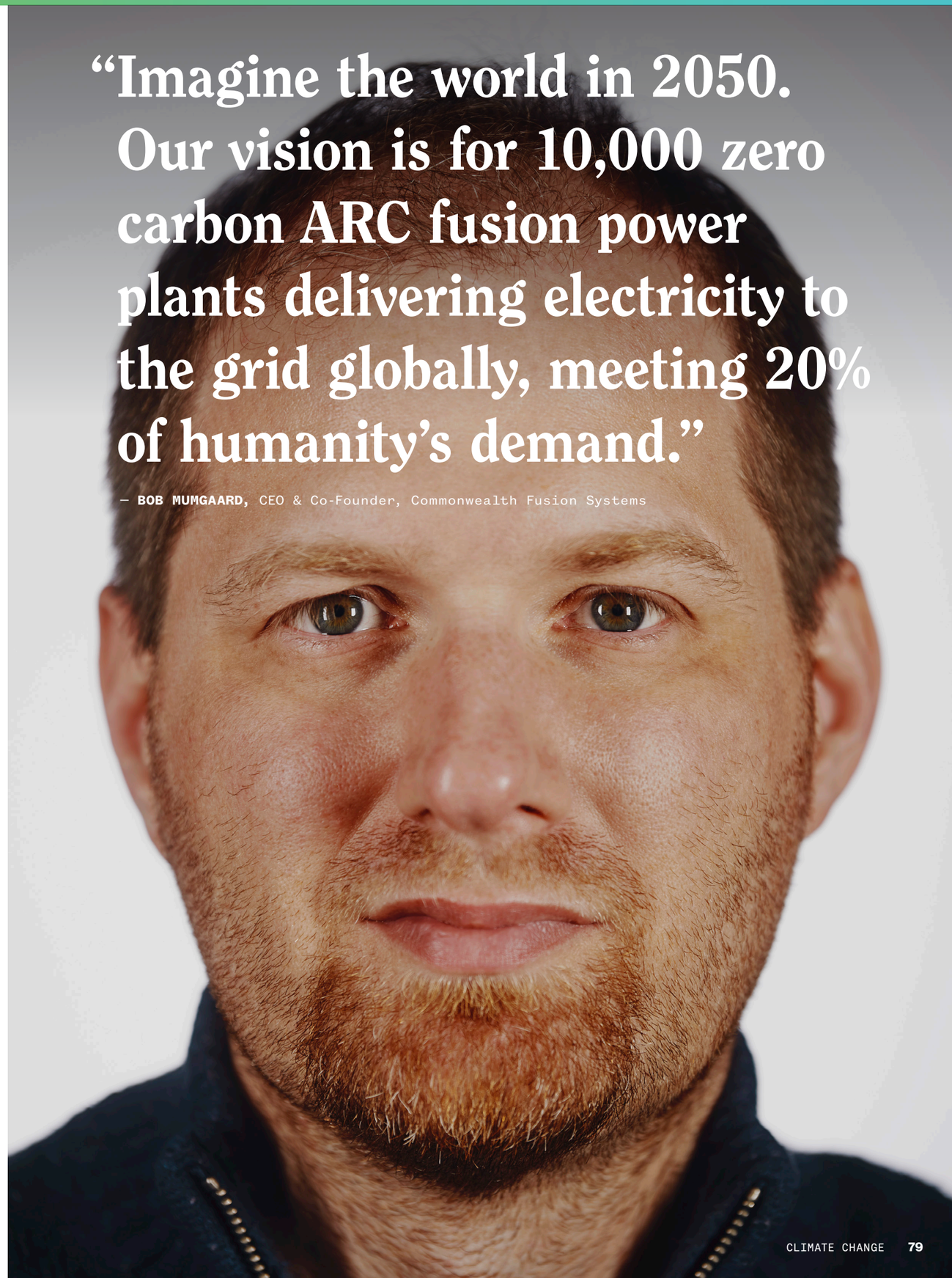
SPARC
COMPACT TOKAMAK MCF

→ *Architectural rendering of proposed CFS campus. Rendering: CFS*



NEW SCIENTIFIC PAPERS PREDICT HISTORIC RESULTS

Seven papers published in the Journal of Plasma Physics in September 2020 validated CFS' approach to commercial fusion energy. According to a release by CFS, they "are the first peer reviewed publications from any private commercial fusion company that verifies a compact fusion device will achieve net energy where the plasma generates more fusion power than used to start and sustain the process, the requirement for a fusion power plant."



"Imagine the world in 2050. Our vision is for 10,000 zero carbon ARC fusion power plants delivering electricity to the grid globally, meeting 20% of humanity's demand."

— **BOB MUMGAARD,** CEO & Co-Founder, Commonwealth Fusion Systems

VIA SEPARATIONS

FOUNDERS	SHREYA DAVE, BRENT KELLER, JEFF GROSSMAN
BACKGROUND	MIT DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING
INDUSTRY	ENERGY, ADVANCED MATERIALS, ADVANCED MANUFACTURING

DECARBONIZING EVERY INDUSTRIAL PROCESS.

Photo: Via Separations

A component of Via's modular filtration system.

Photo: Via Separations

Via Separations targets energy intensive processes at a paper mill, concentrating a stream called weak black liquor and improving the energy utilization of the process by 50%.

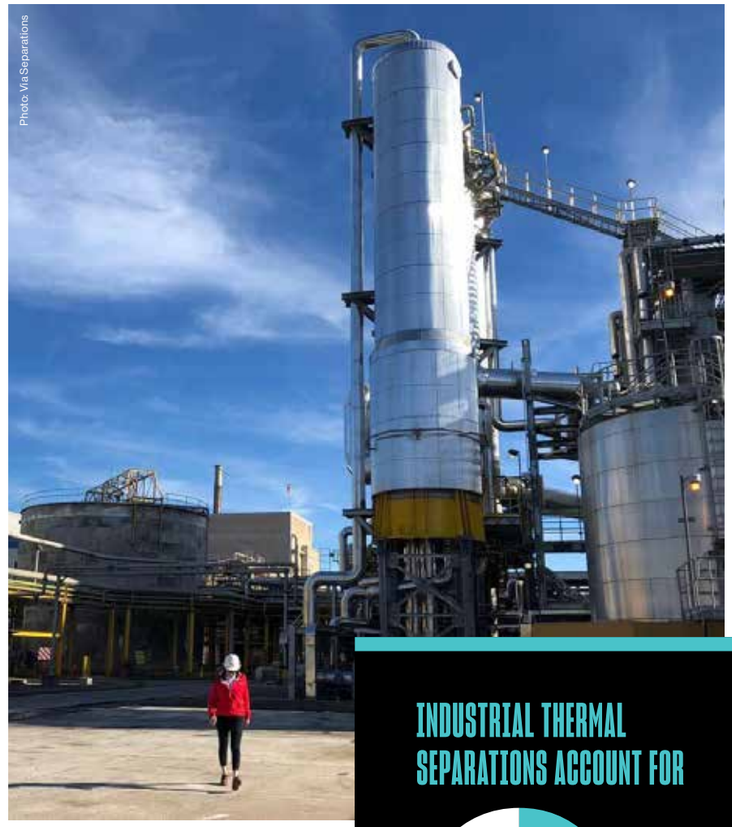


Photo: Via Separations

Via's CEO, Shreya Dave, returns from exploring installation locations at a pulp mill in Chile.

THE PROBLEM

Industrial thermal separations account for 12% of all U.S. energy consumption.
Or roughly the same amount of all the gasoline used for transportation in the U.S.

As a society, we cannot get close to zero carbon emissions without decarbonizing the industrial sector. And there is one process that uses more energy than everything else: separations. The reason why is simple — we use energy to heat materials and boil off the unwanted components. It's like preparing pasta by boiling off all the water in the pot, instead of pouring it through a strainer.

THE IMPACT

Via Separations can reduce cost and increase the throughput of its customers, while simultaneously reducing their energy consumption and emissions. Its technology makes just as much business sense as it does environmental sense, and therein lies its potential to change the way manufacturing is done.

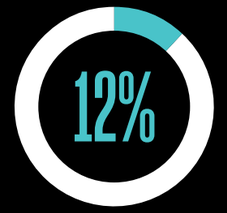
To Via, the pulp and paper industry is a jumping off point to chemical manufacturing, which influences the production of semiconductors, nylon, pharmaceuticals, and more. By giving foundational industries a better way to manufacture their products, Via can positively affect things that people use every day.

THE BREAKTHROUGH

Via Separation's core technological breakthrough is its membrane — its structure and its resilience. Normally, when one thinks of filtration membranes, they are associated with water filtration. Water provides a membrane-friendly environment, unlike the hot and caustic environments seen in chemical processing plants and in the pulp and paper industry.

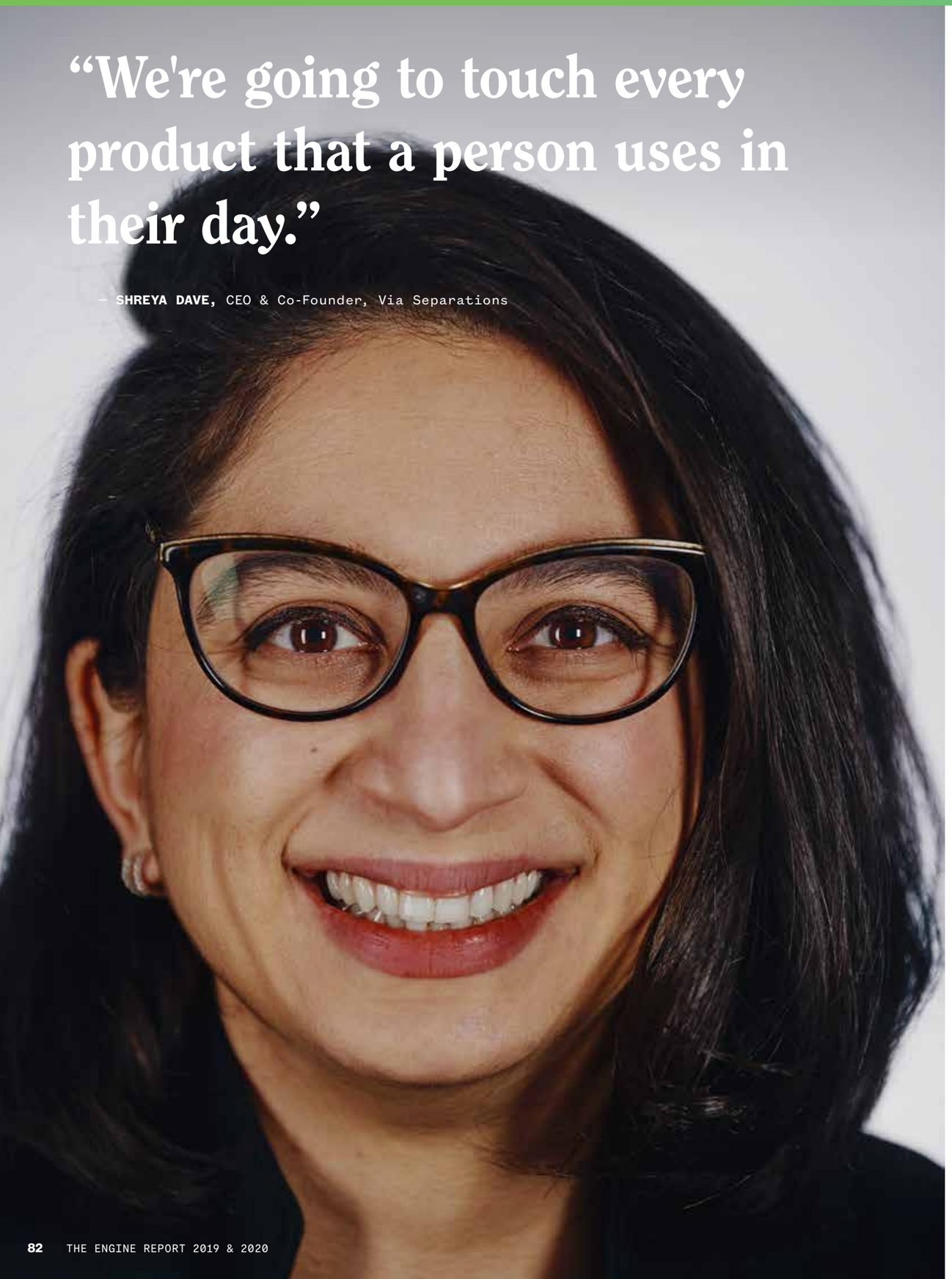
Via's membrane is built from graphene oxide that is both inexpensive and robust. The company can manipulate the size of the links between the sheets of the material, customizing the membrane's pore size to fit the requirements of various applications.

INDUSTRIAL THERMAL SEPARATIONS ACCOUNT FOR



OF ALL U.S. ENERGY CONSUMPTION.

THE U.S. PULP AND PAPER INDUSTRY USES APPROXIMATELY THE SAME ENERGY AS AS ALL OF THE UNITED STATES AIR TRAVEL.



“We're going to touch every product that a person uses in their day.”

— **SHREYA DAVE,** CEO & Co-Founder, Via Separations

ELIMINATE 90%

OF THE ENERGY CURRENTLY USED IN THERMAL SEPARATIONS.

REPLACING BOILING WITH MEMBRANES TO CUT 500M METRIC TONS OF CO_2 EMISSIONS BY 2050.

COMPATIBLE WITH SEPARATION PROCESSES ACROSS MULTIPLE INDUSTRIES INCLUDING:

- PULP AND PAPER
- FOOD AND BEVERAGE
- CHEMICALS
- SEMICONDUCTORS
- PHARMACEUTICALS

“We're transforming manufacturing — one separation at a time.”

TECHNOLOGY DEVELOPMENT

SCALING MEMBRANE MANUFACTURING

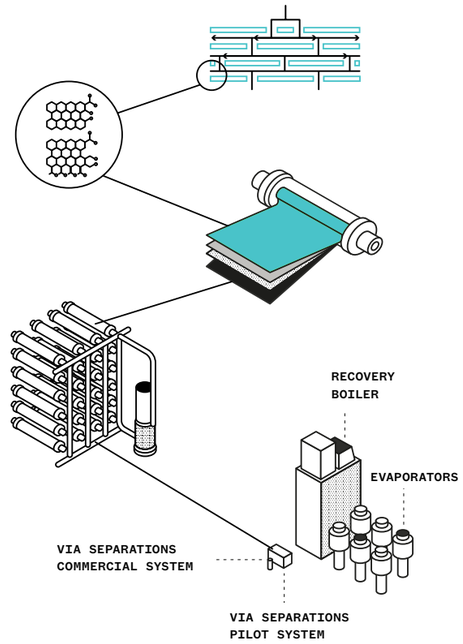
In the past 3.5 years, Via Separations has scaled its manufacturing capability 10,000,000X.

After developing its technology in the lab for over three years, Via's membrane material is now ready to scale. They are shifting from a development-stage organization to a deployment-stage organization. And their customers, faced with a dynamic regulatory environment, are able to see the economic value of membrane separation.

Photo: Via Separations

↑ *Testing a separation platform at Via's in-house lab.*

PROCESS



BOSTON METAL

FOUNDERS	TADEU CARNEIRO, RICH BRADSHAW, ADAM RAUWERDINK, DONALD R. SADOWAY, ANTOINE ALLANORE, JIM YURKO
BACKGROUND	MIT DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING
INDUSTRY	ADVANCED MANUFACTURING, ENERGY

GREEN STEEL WITH ZERO GREENHOUSE GAS EMISSIONS.

← *Pouring molten steel produced by MOE at its Woburn facility*

Photo: Boston Metal

→ *Steel ingots produced by MOE cooling at its Woburn facility.*

Photo: Boston Metal

THE PROBLEM

Manufacturing steel produces approximately 8% of global CO_2 emissions.

Emissions from steelmaking have reached epic levels — if the steelmaking industry were a country, its emissions would be just behind the total emissions of the U.S. and China. If we are to have any hope of decarbonizing a warming world, we must start manufacturing green steel.

THE IMPACT

We cannot run away from steel. It will continue to be necessary for infrastructure, transportation, electronics — everywhere we look. In the future, every industry that works with steel will use a green version of the metal produced by companies like Boston Metal. Technologies like Molten Oxide Electrolysis will allow us to meet the world's insatiable demand for steel, but with zero environmental downsides.

THE BREAKTHROUGH

Boston Metal's unique Molten Oxide Electrolysis process pairs innovations developed at MIT and best practices from the aluminum and steel industries. The technology uses an electrolytic cell that has three components: an anode, a cathode, and an electrolyte — the inverse of a battery. The materials of these components allows ore to be separated into steel and oxygen with zero greenhouse gas emissions.

> **"Boston Metal is re-writing the book of metallurgy."**
>
> — **TADEU CARNEIRO**, CEO, Boston Metal

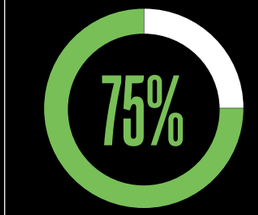
STEEL MANUFACTURING

= 3 GIGATONS

OF CO_2 EMISSIONS WORLDWIDE.

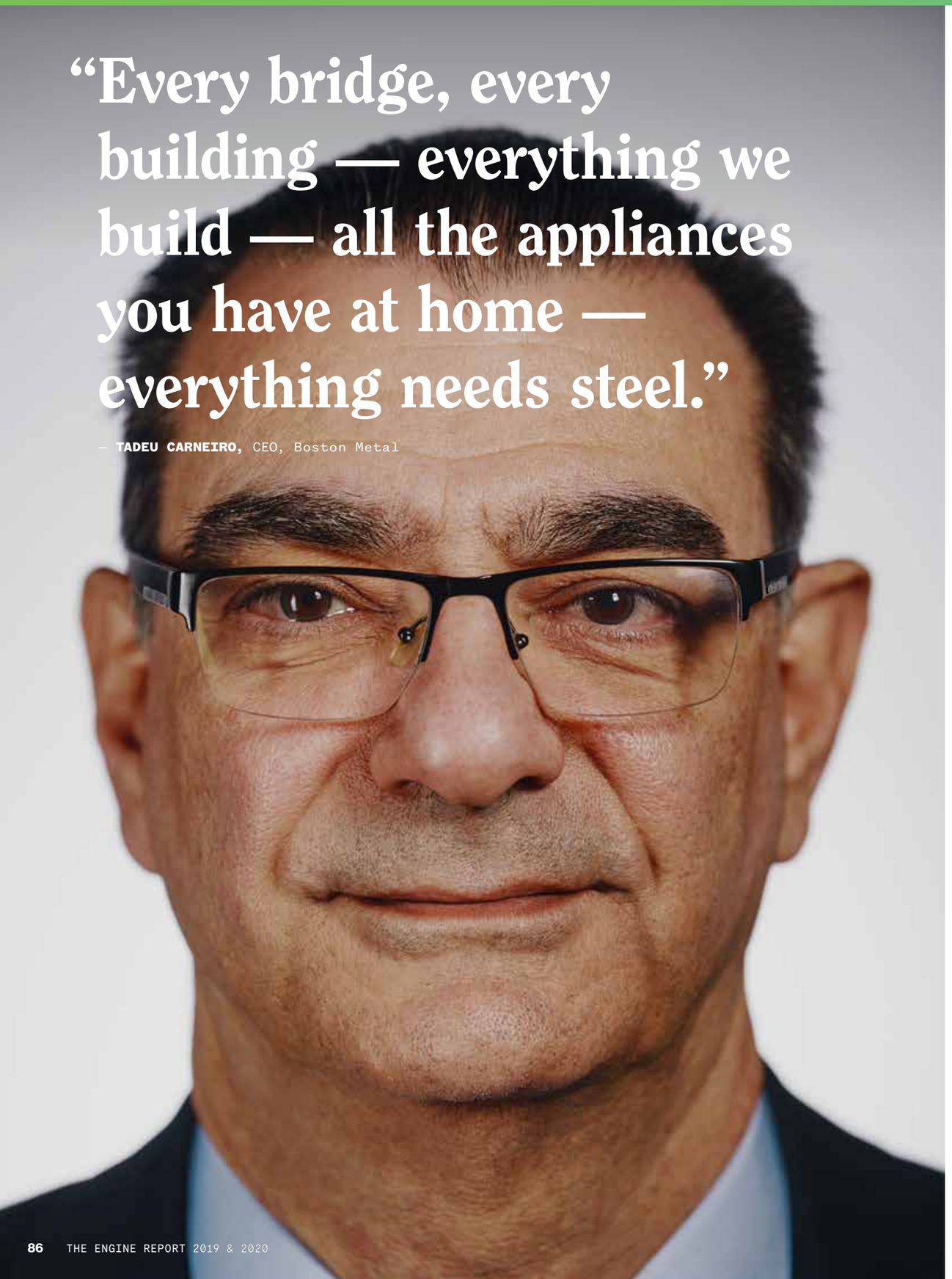
THE WORLD'S DEMAND FOR STEEL IS 2B TONS ANNUALLY, AND IS EXPECTED TO GROW BY 25% IN THE NEXT 30 YEARS.

COAL ACCOUNTS FOR



OF THE STEEL SECTOR'S ENERGY DEMAND.

IEA (2020), Iron and Steel, IEA, Paris | https://www.iea.org/reports/iron-and-steell



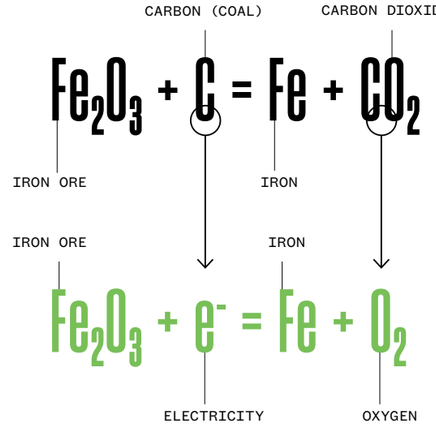
“Every bridge, every building — everything we build — all the appliances you have at home — everything needs steel.”

— **TADEU CARNEIRO,** CEO, Boston Metal

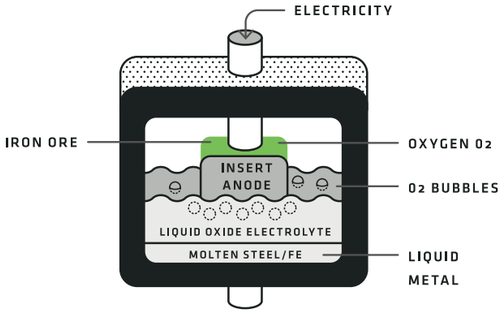
Photo: Boston Metal

← *Testing electronic components*

BOSTON METAL IS REVOLUTIONIZING A 3000-YEAR OLD FORMULA.



MOLTEN OXIDE ELECTROLYSIS PRODUCES HIGH-PURITY STEEL AND OXYGEN, NOTHING ELSE.



ZERO-EMISSIONS PRODUCTION OF STEEL AND ALLOYS AT COMPETITIVE PRICES.

ZERO WATER WASTE. ZERO REAGENTS USED IN PROCESSING.

MODULAR AND SCALABLE STEEL PRODUCTION IS LESS EXPENSIVE THAN TRADITIONAL BLAST FURNACES.

→ *Pouring molten steel. Visualized through a thermal imaging camera.*

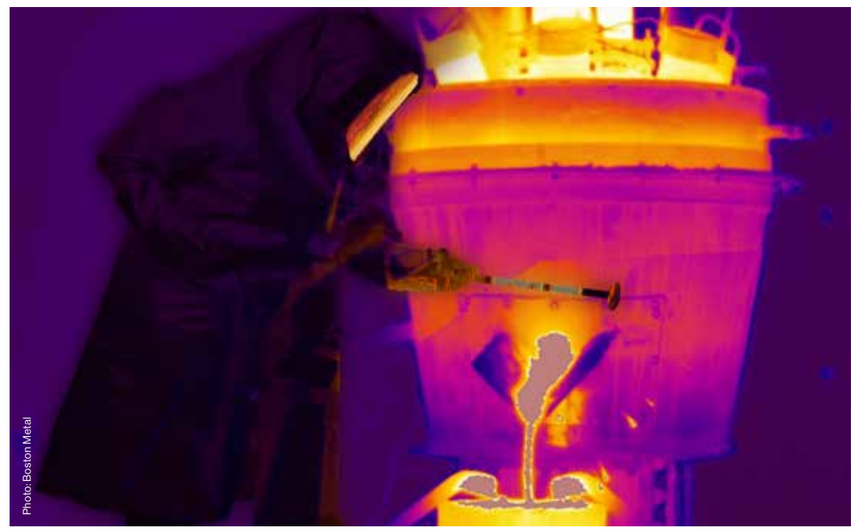


Photo: Boston Metal

SYZYGY PLASMONICS
ENERGY. TECHNOLOGY. SUSTAINABILITY.

FOUNDERS	TREVOR BEST, SUMAN KHATIWADA, NAOMI HALAS, PETER NORDLANDER
BACKGROUND	RICE UNIVERSITY, BAKER HUGHES
INDUSTRY	ADVANCED MANUFACTURING

PRODUCING CHEMICALS USING LIGHT TO REDUCE 1GT OF CO_2 EMISSIONS BY 2040.

THE PROBLEM

Making the chemicals that power our world emits massive amounts of CO_2.

Powering reactions that produce the chemicals directly accounts for 3.6% of global GHG emissions. The problem stems from a process called thermal catalysis in which heat generated by burning fossil fuels is used to trigger chemical reactions. Domestically, most thermal catalysis happens in industrial-scale plants that are scattered throughout the country. Transporting the foundational materials to other facilities is logistically challenging, expensive, and adds to their carbon footprint.

THE IMPACT

By replacing the heat in thermal catalysis with LED light powered by renewable electricity, Syzygy can perform reactions that produce materials and components of plastics, fuels, fertilizers, and other chemicals with far fewer greenhouse gas emissions.

Syzygy light-powered reactors are modular, built from lower-cost materials, and have far milder operating conditions than their traditional counterparts. This means the chemical industry, which is currently reliant on massive, high-cost production plants, can be decentralized, bringing the production of chemicals physically closer to the end user, driving down the costs and emissions associated with distribution.

THE BREAKTHROUGH

Rice University professors Naomi Halas and Peter Nordlander invented the world's most stable and active photocatalyst — the same catalyst that is at the core of Syzygy's reactors. By modifying what the catalyst is made of, Syzygy can tune various types of chemical reactions to produce a wide array of chemicals — one catalyst platform, dozens of possibilities. The company's unique reactor is engineered specifically for the catalyst and uses LED light powered by renewable electricity as its core energy source.

"We care about emissions reduction. We come into work every day because we believe that we can use Syzygy's technology to dramatically reduce carbon emissions in the near term. If we keep going at our current pace, I see that we will have a huge impact before 2030."

— **TREVOR BEST,** CEO & Co-Founder, Syzygy Plasmonics

THERMAL CATALYSIS IS THE PROCESS OF USING HEAT TO PRODUCE CHEMICAL REACTIONS.

RESPONSIBLE FOR

3.6%

GLOBAL EMISSIONS

ESSENTIAL FOR THE PRODUCTION OF:

- PLASTICS
- FUEL
- HYDROGEN
- CHEMICALS
- FERTILIZER [AMMONIA]

Image: Syzygy Plasmonics

← *Syzygy Gen 1 reactor.*

“We’re making a platform that can do many different reactions. It eliminates the combustion of fuel. It allows all these chemical processes to run on renewables. It operates at low temperature, so it can be built out of ultra cheap materials like aluminum. And it is modular and scalable. The long-term potential for this technology is unprecedented.”

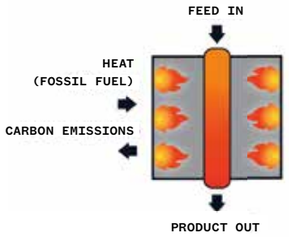
— **TREVOR BEST,** CEO & Co-Founder, Syzygy Plasmonics

→ *A visualization of a photocatalyst nano-particle within a Syzygy reactor.*

Image: Syzygy Plasmonics

SYZYGY’S LIGHT-DRIVEN CHEMISTRY HAS DISTINCT ADVANTAGES OVER THE STATUS QUO

CONVENTIONAL HEAT POWERED REACTOR

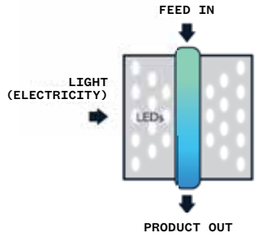


HIGH PRESSURE / HIGH TEMP

EXPENSIVE METAL ALLOYS

FOSSIL FUEL COSTS GOING UP

SYZYGY’S LIGHT POWERED REACTOR



MILD OPERATING CONDITIONS

20X CHEAPER METALS (ALUMINUM)

RENEWABLE COSTS GOING DOWN

REACTOR DEVELOPMENT PROGRESS

	2018	2019	2020
PRODUCTIVITY	MILLIGRAMS	GRAMS	1KG
ENERGY EFFICIENCY	<1%	~30%	~50%
DEVELOPMENT LEVEL	MICRO REACTOR	LAB SCALE REACTOR	PILOT REACTOR

MODULAR AND ULTRA ADAPTABLE, THE SYZYGY REACTOR CAN

- SPLIT AMMONIA FOR H_2
- SYNTHESIZE AMMONIA
- SPLIT HYDROGEN SULFIDE
- SPLIT NITROUS OXIDE
- TRANSFORM GREENHOUSE GASSES
- AND MORE...

FOUNDERS	DAVID SNYDACKER, NICK GOLDBERG, TOM WILSON
BACKGROUND	NORTHWESTERN UNIVERSITY
INDUSTRY	ADVANCED MATERIALS

LITHIUM EXTRACTION WITH A 99% SMALLER FOOTPRINT, 90% LESS WATER USAGE, AND 80% FEWER GHG EMISSIONS.

THE PROBLEM

The world currently cannot meet the predicted 30X increase in demand for lithium to electrify the transportation sector.

Decarbonizing the transportation sector will require a seismic shift towards electric vehicles. These vehicles are powered by batteries made with lithium produced primarily by evaporating lithium-dense brine in massive evaporation ponds. Besides being potentially disastrous for local groundwater, this production method is slow, costly, and will not come close to meeting the predicted 30X increase in demand for the metal. The other method of lithium extraction — hard rock mining — is expensive and environmentally disastrous. The world needs a faster, more efficient, and less environmentally detrimental method of extracting lithium if it is to electrify transportation at a large enough scale to make a difference.

THE IMPACT

By eliminating evaporation ponds, Lilac's platform protects fresh water resources for the communities surrounding lithium brine reservoirs, reduces GHG emissions by 80%, and will help accelerate the transition to decarbonized transportation by providing a plentiful and affordable source of lithium to the producers of next-generation batteries.

THE BREAKTHROUGH

A breakthrough in material science, Lilac's ion exchange beads can extract high-purity lithium from volatile brine resources and be reused multiple times. The Lilac platform uses these ion exchange beads to accelerate the production of lithium from years to hours, eliminating the need for evaporation ponds.

Lilac's unique ion exchange process helps recover lithium directly from brine resources efficiently, affordably, and in a fraction of the time of traditional evaporative methods. Their technology eliminates the need for evaporation ponds entirely. Lilac's process is modular and can be ramped up quickly through pilot and commercial projects. And their novel ion exchange beads can produce high-purity lithium from brine of varying quality.

LITHIUM IS THE NEW GASOLINE

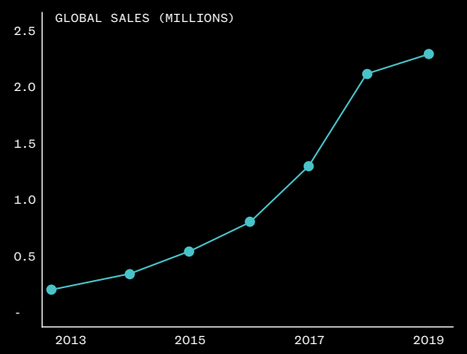
EVS ARE TRANSFORMING THE LITHIUM MARKET

$4B
MARKET TODAY

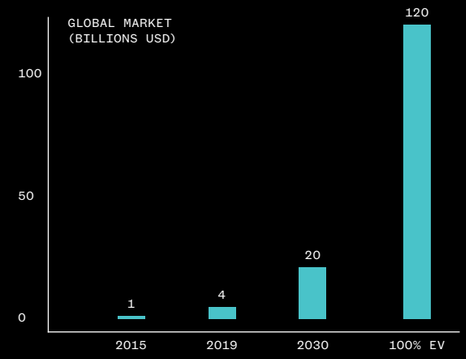
$20B
IN 2030

$120B
WITH 100% EVS

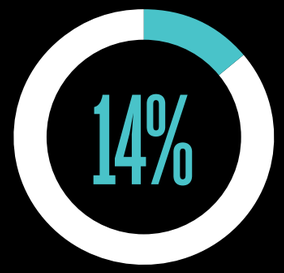
ELECTRIC VEHICLE SALES



LITHIUM TAM



TRANSPORTATION IS RESPONSIBLE FOR



OF ALL GHG EMISSIONS WORLDWIDE

EVS ARE ESSENTIAL TO MITIGATE CLIMATE CHANGE

MANY MANUFACTURERS HAVE THE GOAL OF

100%
ELECTRIFICATION BY 2035

EV SALES HAVE BEEN GROWING 50% ANNUALLY OVER THE LAST DECADE

Source: U.S. EPA

→ *Laguna Verde, Salar de Atacama, Chile.*

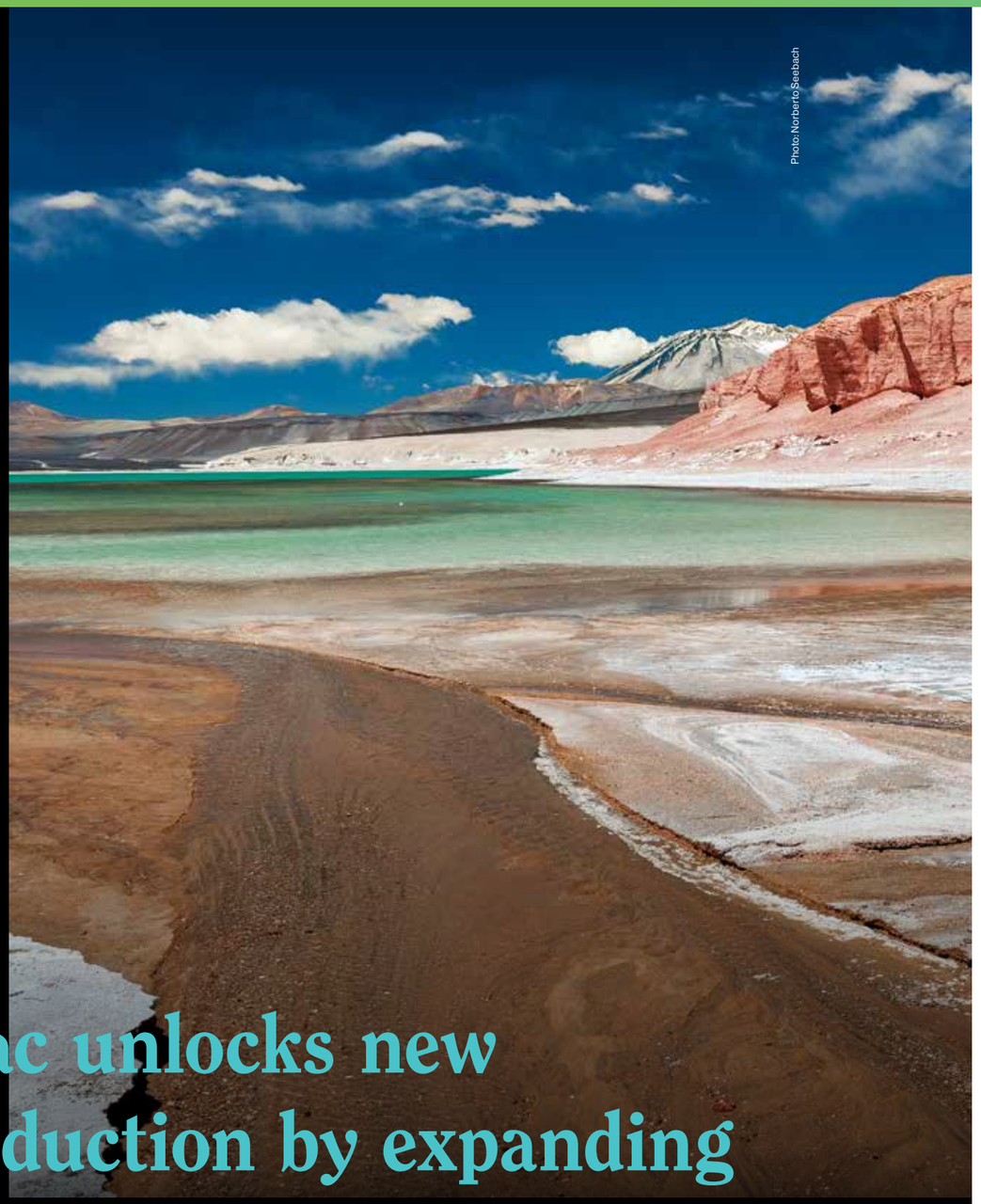


Photo: Norberto Seebach

"Lilac unlocks new production by expanding reserves, streamlining development, and improving reliability."

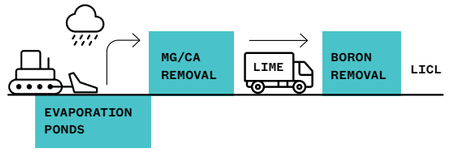
— **DAVE SNYDACKER,** CEO, Lilac Solutions

A NEW LIFE FOR THE SOUTH AMERICAN LITHIUM INDUSTRY

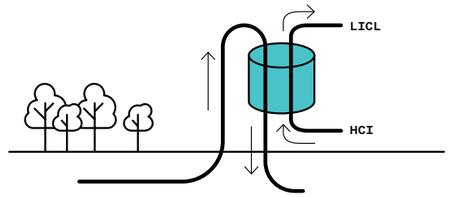
Ten years ago, Chile was the largest producer of lithium in the world. Over the past decade, lithium production in Chile and across South America has failed to keep pace with demand driven by the EV market. This is due, in large part, to the inefficiencies of current lithium brine extraction methods.

Countries like Chile, Argentina, and Bolivia have a tremendous opportunity to supply the world with lithium and create wealth for local communities in doing so. But they need new technology to match demand. Lilac can supply that technology.

CONVENTIONAL PROCESS: EVAPORATION PONDS



LILAC'S PROCESS: PROPRIETARY ION EXCHANGE



↓ *Lilac founding team at its Oakland, CA headquarters. (L-R) Tom Wilson, Nick Goldberg, and Dave Snydacker*

MASSIVE IMPROVEMENT IN ENVIRONMENTAL PERFORMANCE

99% ↓ SMALLER FOOTPRINT

90% ↓ LESS WATER USAGE

80% ↓ FEWER GHG EMISSIONS

LITHIUM BRINE EXTRACTION METHODS THAT ARE

70-98%

EFFICIENT

INDUSTRY STANDARDS 40% EFFICIENT

COMMERCIAL PRODUCTION IN

THE TIME OF CURRENT METHODS

PRODUCTION COSTS OF

$3-$5/kg

DRAMATIC REDUCTION IN COST COMPARED TO CONVENTIONAL EXTRACTION TECHNIQUES

LILAC CAN BRING A PROJECT ONLINE IN TWO YEARS, WHILE EVAPORATION PONDS REQUIRE 5-10 YEARS.

Cambridge Electronics

NOVEL GALLIUM NITRIDE SEMICONDUCTOR TECHNOLOGY FOR MORE EFFICIENT 5G MOBILE DEVICES, DATA CENTERS, AND ELECTRIC VEHICLES.

THE PROBLEM

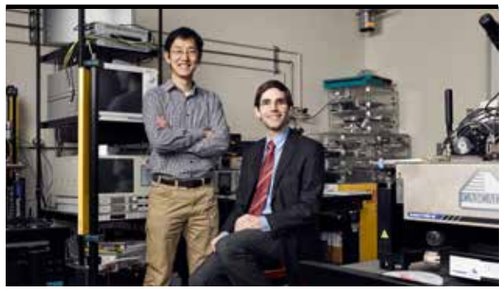
The poor energy efficiency of silicon (Si) semiconductor chips is the most critical problem that prevents the wide adoption of 5G broadband services. The performance of the Si power management chips is also limiting the power delivery to microprocessors of datacenters, not only by constraining the microprocessor performance per server but also by wasting about 15% of the electricity. Even electric cars have their range limited by the inefficiencies of today's Si electronics.

THE IMPACT

Significant energy savings in diverse industrial sectors like 5G, data centers, renewable energy, manufacturing, automotives, and consumer electronics.

THE BREAKTHROUGH

Overcoming the constraints of Si chips by developing a new generation of semiconductor devices and chips based on a revolutionary gallium nitride (GaN) technology. Using a novel three-dimensional structure, Cambridge Electronics' GaN chips promise significant performance improvements in both 5G radios and the power electronics in data centers and electric cars.



FOUNDERS & LEADERSHIP	BIN LU, TOMÁS PALACIOS
BACKGROUND	MIT MICROSYSTEMS TECHNOLOGY LABORATORIES, MIT DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
INDUSTRY	SEMICONDUCTORS, ADVANCED MATERIALS

QUAISE ENERGY

DEVELOPING MILLIMETER WAVE DRILLING SYSTEMS TO UNLOCK SUPERCRITICAL GEOTHERMAL ENERGY EVERYWHERE IN THE WORLD.

THE PROBLEM

The world cannot transition away from fossil fuels with current technologies. This represents a monumental unmitigated existential risk to life as we know it.

THE IMPACT

Quaise unlocks the most abundant, ubiquitous, and powerful clean energy source on Earth: supercritical geothermal energy. It represents a virtually infinite supply capable of powering civilization for millennia. When the company succeeds, humanity gets a clear path to transition its global energy system while preserving its biosphere.

THE BREAKTHROUGH

It is Quaise's novel drilling technology that makes its pursuit of limitless supercritical geothermal energy possible. Fifty years of nuclear fusion research and 100 years of oil and gas activities provide the subsystems and operational and regulatory frameworks to bring Quaise's drilling technology to life.

FOUNDERS & LEADERSHIP	CARLOS ARAQUE, MATTHEW HOUDE, HENRY PHAN, FRANCK MONMONT, PAUL WOSKOV
BACKGROUND	MIT
INDUSTRY	ENERGY, ADVANCED MATERIALS, ADVANCED ENGINEERING

"We have understood for many years what the solution to the climate crisis should include: a patchwork of technology, investment, and regulation that depends on a diverse and motivated group of researchers, innovators, entrepreneurs, policy makers, and business leaders from across the world. As we embark on a critical decade, this group and its bold actions give me hope."

— **KATIE RAE** CEO & Manging Partner, The Engine

HUMAN HEALTH

Building from the deep biotechnology knowledge and leadership of the Boston community, The Engine embraces founders on a mission to empower a healthy, vibrant world through the convergence of biology, materials, engineering, and AI in creating foundational companies.

"If we didn't meet The Engine in our nascent days as a company, Cellino would perhaps not exist today. They took me and Cellino under their wings during our technology incubation and team buildout phase, which was a period of immense creativity and growth for us. The Engine was the perfect place for us because we were encouraged to dream big to have a meaningful impact on the planet. There is no other place like The Engine, and we are eternally grateful for what The Engine has done for us."

— **NABIHA SAKLAYEN**, CEO & Co-Founder, Cellino

cellino

FOUNDERS	NABIHA SAKLAYEN, MATTHIAS WAGNER, MARINNA MADRID
BACKGROUND	HARVARD PHYSICS DEPARTMENT, HARVARD SCHOOL OF ENGINEERING AND APPLIED SCIENCES (SEAS), HARVARD MEDICAL SCHOOL
INDUSTRY	BIOTECH & LIFE SCIENCES, ADVANCED MANUFACTURING

AUTOMATING PERSONALIZED MEDICINE TO CURE OUR TOUGHEST DISEASES.

THE PROBLEM

Diseases like diabetes, heart disease, and Parkinson's claim nearly 750,000 lives per year in the U.S. alone.

We have the fundamental technology to cure some of humanity's most devastating diseases. Induced pluripotent stem cells, which are created by reprogramming common skin, blood, and hair cells to a stem cell state, are then transformed into healthy cells to replace those damaged by disease. The problem lies with manufacturing those healthy cells with the precision and scale necessary to treat millions of patients. Currently, such "manufacturing" is a slow, hands-on, artisanal process that lacks the speed or magnitude to meaningfully impact a sick population.

THE IMPACT

Cellino fills a critical gap in the stem cell industry, the inability to make personalized cells at scale. Cellino engineers personalize stem cells with laser-precision in an automated, software-driven, closed manner. Its novel, multi-disciplinary approach has the potential to manufacture personalized cell therapies at-scale for the first time. Progressing towards scalable stem cell manufacturing is the only way to provide personalized cell therapies to all patients.

THE BREAKTHROUGH

In 2012, Shinya Yamanaka and John B. Gurdon received the Nobel prize for "inducing" mature cells to become stem cells. This discovery made it possible to reprogram an easily-harvested cell (urine, skin, blood, or hair) to its stem cell state. These stem cells can subsequently be turned into various cells and tissues of the body, giving humankind an unlimited supply of patient-specific cells for therapeutic use. Cellino automates the engineering of these cells using label-free imaging and high-speed laser editing. This approach allows thousands of patient samples to be processed in parallel in a single facility.

"We have a diverse spectrum of human beings on our team, and the Cellino platform could produce cells for every one of us. Thinking outside the box is the only way to disrupt the significant manufacturing bottleneck facing today's personalized regenerative medicine industry."

— **NABIHA SAKLAYEN,** CEO & Co-Founder, Cellino

Selectively targeting cells using the Cellino platform.

Image: Cellino

100M+ PATIENTS WORLDWIDE SUFFER FROM DISEASES THAT COULD BE CURED USING REPLACEMENT CELLS AND TISSUES

- ALZHEIMER'S
- PARKINSON'S
- VISION LOSS
- HEARING LOSS
- SPINAL CORD INJURY
- MUSCLE DISORDERS
- HEART DISEASE
- DIABETES

CELL-BASED THERAPIES

2012

INVENTORS OF INDUCED PLURIPOTENT STEM CELLS WIN NOBEL PRIZE

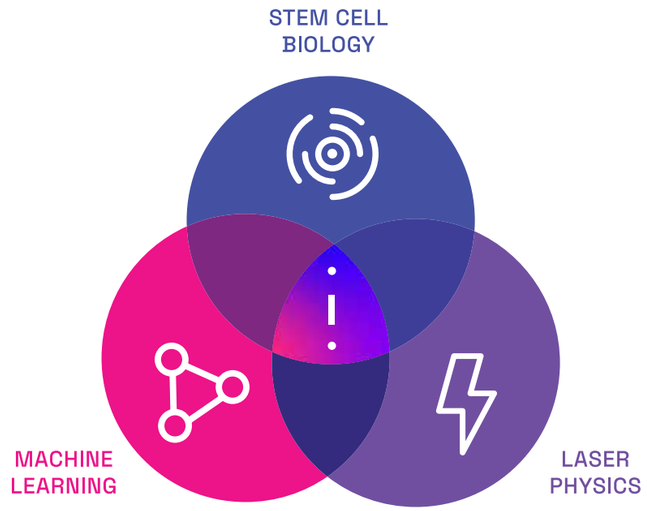
2017

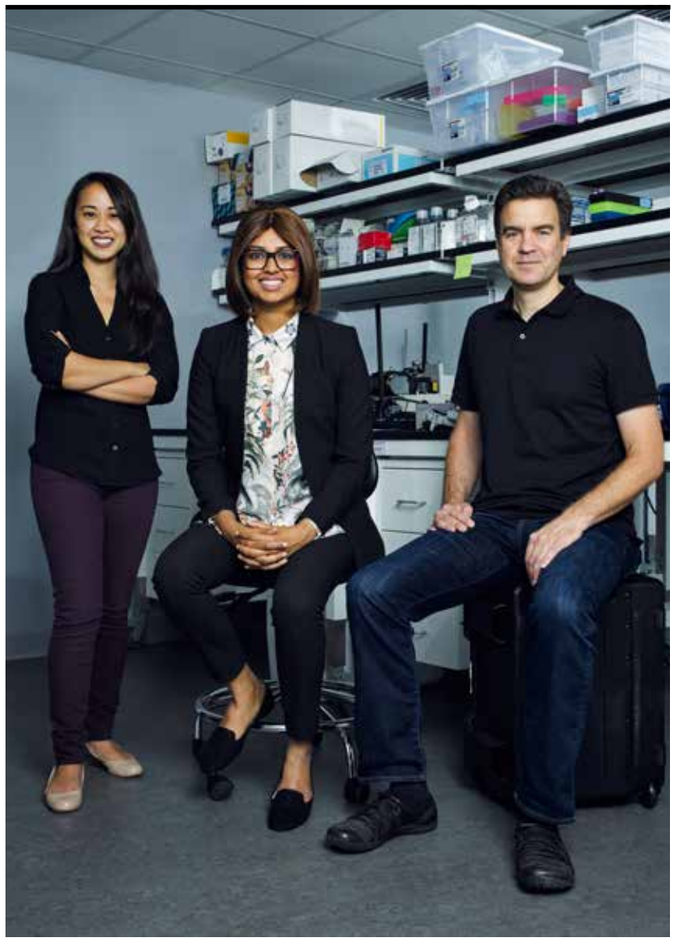
FIRST FDA-APPROVED GENE THERAPY ON MARKET IN U.S.

668

CURRENT CELL-AND TISSUE-BASED CLINICAL TRIALS WORLDWIDE

CELLINO'S MULTIDISCIPLINARY APPROACH





TODAY, PERSONALIZED CELL-BASED THERAPIES REQUIRE MANUAL WORK BY A SCIENTIST

COST OF PRODUCTION:

$300k - $1M

CELLINO TO REDUCE COST BY

1X-2X

ORDERS OF MAGNITUDE IN NEXT 10 YEARS

14

PATENTS PENDING ACROSS BIOLOGY, BIOENGINEERING, HARDWARE/OPTICS, AND SOFTWARE/ML

MANUFACTURING TISSUES WITH SINGLE-CELL PRECISION

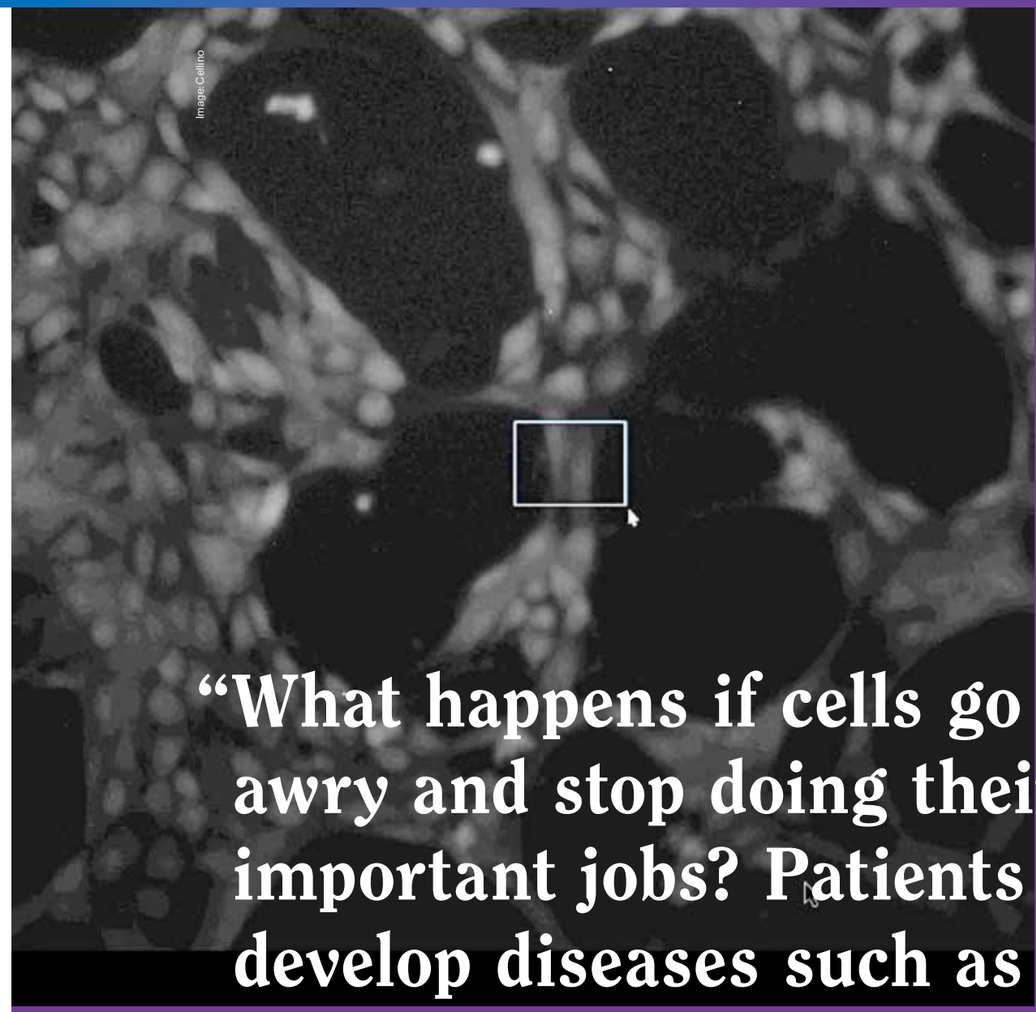


Image:Cellino

← *Selectively targeting cells using the Cellino platform.*

"What happens if cells go awry and stop doing their important jobs? Patients develop diseases such as Parkinson's, chronic heart disease, diabetes, or even blindness. Cellino is working on cell-based therapies to prevent and reverse these debilitating diseases."

— **NABIHA SAKLAYEN,** CEO & Co-Founder, Cellino

Image: iStock/Photo Video

mori

FOUNDERS	ADAM BEHRENS, SEZIN YIGIT, LIVIO VALENTI, BENEDETTO MARELLI, FIORENZO OMENETTO
BACKGROUND	MIT LABORATORY FOR ADVANCED BIOPOLYMERS, TUFTS UNIVERSITY SILK LAB
INDUSTRY	FOOD & AGRICULTURE, ADVANCED MATERIALS

A NATURAL COATING THAT REDUCES FOOD SPOILAGE AND PACKAGING WASTE.

THE PROBLEM

About a third of the food produced globally is wasted.

Aside from leaving people hungry, this waste is a leading producer of all greenhouse gas emissions. And the pandemic has made something abundantly clear: our food supply chain is, in fact, not resilient. "We have more mouths to feed with a system that can break down when disaster strikes. These problems require us to think differently about how we process, package, and distribute our food," says Adam Behrens.

THE IMPACT

Mori will improve distribution and resiliency in the global food supply chain, which in turn will give more of the world access to safe and healthy food that will remain fresher for longer — without the need for single-use plastic packaging.

THE BREAKTHROUGH

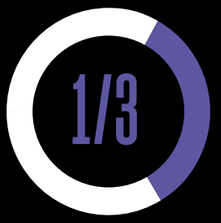
A water-soluble powder made from natural silk protein, Mori's protective coating can be added whenever food is being washed prior to sale. It's designed to integrate seamlessly into existing harvesting and distribution workflows.

Silk has been engineered over millennia to preserve delicate biological systems. Mori takes advantage of silk's natural qualities by breaking down the cocoons of Bombyx mori silkworms and harnessing their protective protein, which are eventually turned into a water-soluble powder, ready to be rehydrated and sprayed onto food.

↓ *Testing its natural coating in the lab.*

It was Benedetto Marelli, a co-founder and professor at MIT, who first noticed the preservative properties of the silk protein working in the Tufts University Silk Lab. The same lab has also pioneered silk as a material to stabilize vaccines and medicines.

Photo: Nathaniel Brewster for Mori



OF THE FOOD PRODUCED GLOBALLY IS WASTED.

Source: UN FAO

$161B

OF FOOD IS WASTED ANNUALLY IN THE U.S.

https://www.usda.gov/foodwaste/faqs

FOOD WASTE IS THE 3RD LEADING GREENHOUSE GAS PRODUCER.

Source: WWF.org

IN THE U.S. ALONE, THE PRODUCTION OF LOST OR WASTED FOOD GENERATES THE EQUIVALENT OF

37M

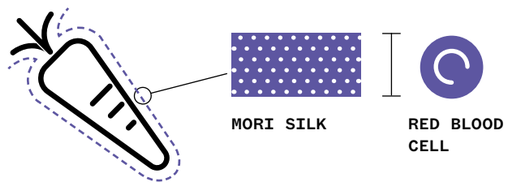
CARS' WORTH OF GREENHOUSE GAS EMISSIONS.

https://www.worldwildlife.org/stories/fight-climate-change-by-preventing-food-waste

AN ALL-NATURAL PROTECTIVE LAYER THAT SLOWS DOWN THE SPOILING PROCESSES ACROSS

- FRUIT
- MEAT
- VEGETABLES
- SEAFOOD

THE MORI SILK PROTEIN COATING IS ONLY MICRONS THICK, NOT MUCH THICKER THAN A RED BLOOD CELL.



MORI'S COATING SEAMLESSLY INTEGRATES WITH EXISTING SUPPLY CHAIN PROCESSES.

INCREASING THE SHELF LIFE OF PRODUCE AND PROTEIN BY

25%-100%

WITHOUT THE NEED FOR SINGLE-USE PACKAGING.

KEEPING LEAFY GREENS FRESHER, FOR LONGER

Leafy greens like arugula or kale that once only lasted 14 days, can remain fresh for more than 20 days with Mori's coating.
By applying its natural silk protein coating to leafy greens like arugula, kale, and lettuce, Mori can improve product resilience and improve freight efficiency, lowering the reliance on a carbon-intensive cold chain. Mori is directly taking trucks off the road — which is good both economically and environmentally. And when the greens arrive at a packaging plant or in-store, they remain fresher for longer.

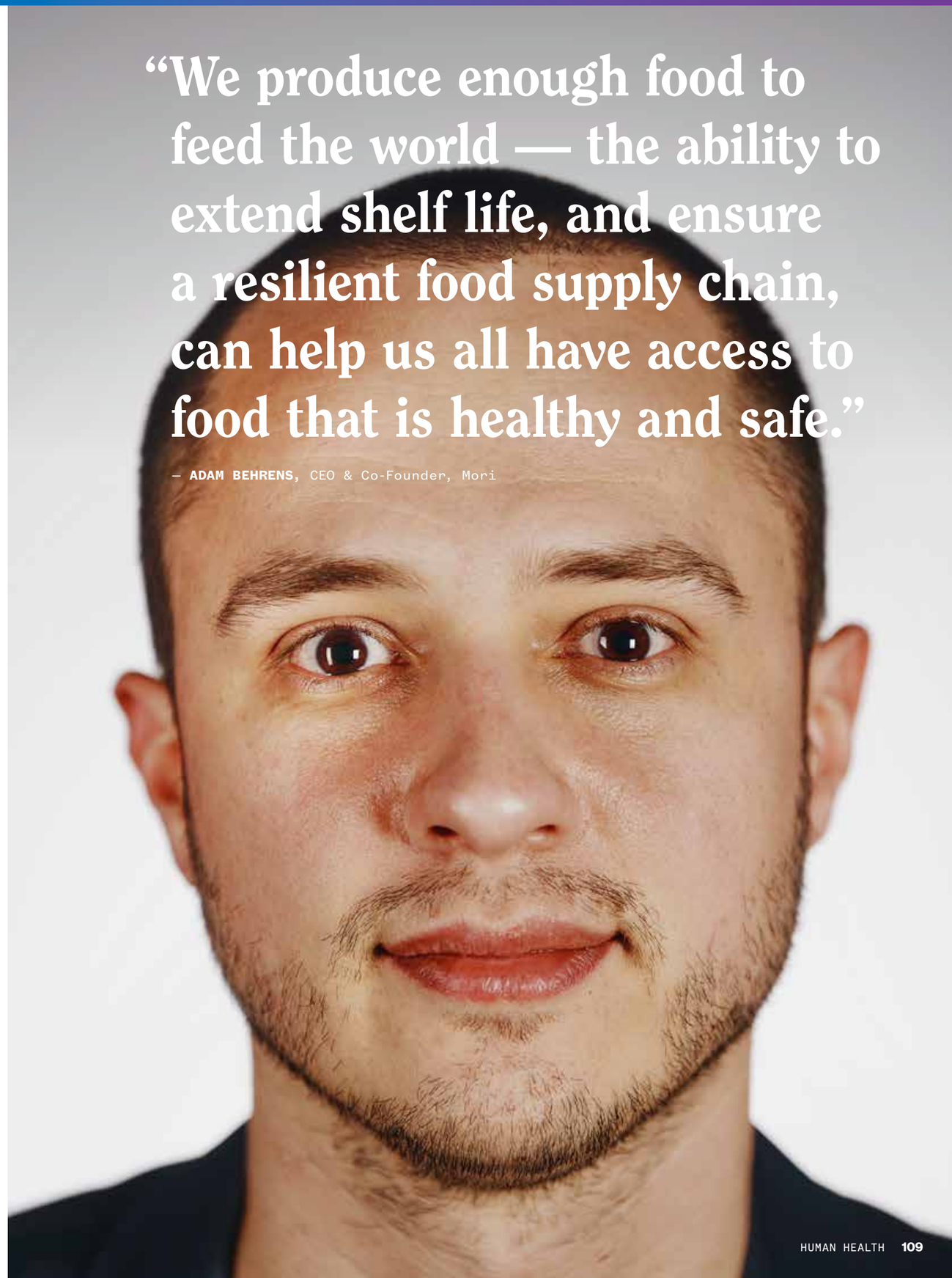
→ *Applying its natural coating in the field.*

Photo: Mori

WITHOUT MORI — 14 DAYS

WITH MORI — 20 DAYS

LEAFY GREENS LIKE ARUGULA OR KALE THAT ONCE ONLY LASTED 14 DAYS, CAN REMAIN FRESH FOR MORE THAN 20 DAYS WITH MORI'S COATING.



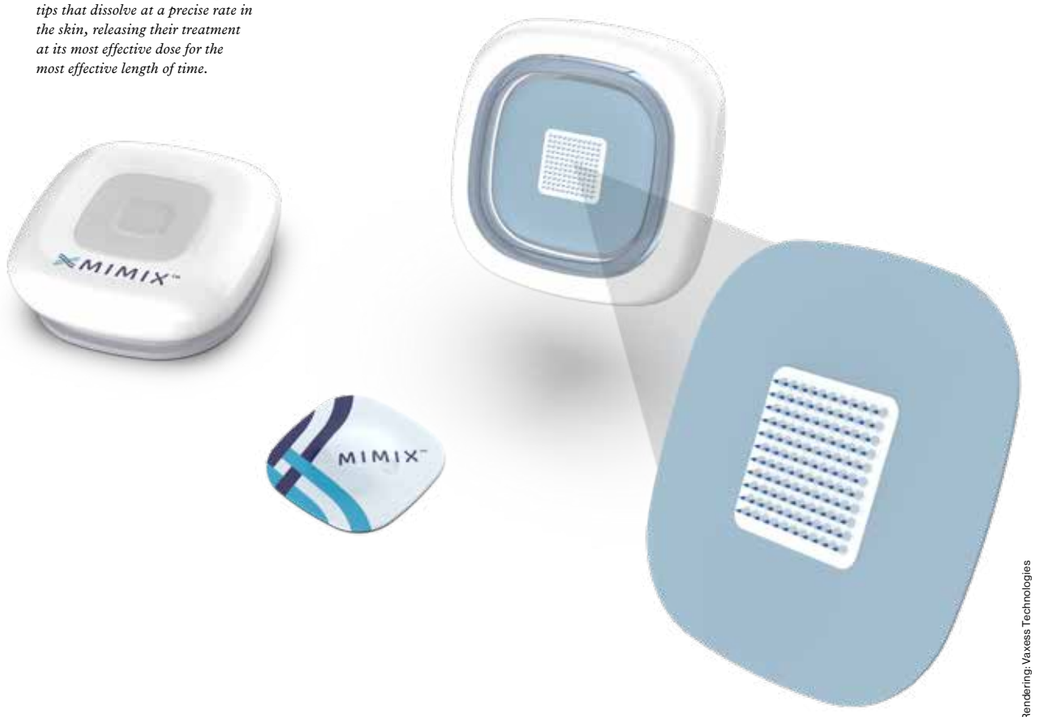
"We produce enough food to feed the world — the ability to extend shelf life, and ensure a resilient food supply chain, can help us all have access to food that is healthy and safe."

— **ADAM BEHRENS,** CEO & Co-Founder, Mori

FOUNDERS	MICHAEL SCHRADER, KATHRYN KOSUDA, LIVIO VALENTI DAVID KAPLAN, FIORENZO OMENETTO
BACKGROUND	HARVARD BUSINESS SCHOOL, TUFTS UNIVERSITY SILKLAB
INDUSTRY	BIOTECH & LIFE SCIENCES, ADVANCED MATERIALS, MANUFACTURING

MAKING VACCINES RADICALLY MORE EFFECTIVE AND ACCESSIBLE VIA A SHELF-STABLE PATCH.

→ *The MIMIX™ patch delivers medicines and vaccines through silk tips that dissolve at a precise rate in the skin, releasing their treatment at its most effective dose for the most effective length of time.*



Rendering: Vaxess Technologies

THE TROUBLE WITH TRADITIONAL VACCINES & THERAPIES

40-60%
EFFECTIVE

REQUIRE REFRIGERATION

EXPIRE IN WEEKS OR MONTHS

MUST BE ADMINISTERED BY HEALTH PROFESSIONALS

- AFFECTED BY LABOR SHORTAGES
- CANNOT BE SELF-ADMINISTERED

OFTEN REQUIRE MORE THAN ONE DOSE

- STUDIES SHOW A SIGNIFICANT PATIENT DROP-OFF FOR SECOND DOSE

2M+
PEOPLE DIE YEARLY FROM DISEASES FOR WHICH THERE ARE VACCINES

Source: WHO

THE PROBLEM

Often, vaccination does not provide a person with sufficient protection from disease, or the vaccine is challenging to transport, prepare, and administer to people who need them, or both.

Traditional needle and syringe administration of vaccines produce suboptimal immune protection. A follow-up booster and/or annual booster injections are often necessary, but patient re-visits to clinics are notoriously inconsistent and result in ineffective vaccination. Delicate therapies like vaccines have a short shelf life, typically requiring refrigeration or freezing until arriving at a clinic for administration to a person. Preparing and administering these vaccines by syringe requires a trained medical professional in a clinical setting, and injections cause discomfort for the patient and problems with sharps disposal. In combination, these factors mean that vaccinations are not reaching as many patients as they could, and that problem only intensifies as resources are constrained.

THE IMPACT

Vaxess Technologies is producing patch-based therapies that are shelf-stable, easily administered, and proven to be more effective than those administered traditionally. MIMIX smart-release therapies can be used across a range of different products, from small molecules to vaccines. After a simple, quick and painless application of a MIMIX patch, vaccine antigens implanted in the skin are released over a period of days to weeks to stimulate a more powerful and durable immune response to fight diseases ranging from the flu to cancer. One application is all it takes to administer a vaccine, and administration can happen wherever people are – at home, at work, and in remote or under-resourced communities – giving more people the opportunity to get successfully vaccinated.

THE BREAKTHROUGH

At the heart of Vaxess therapies is the immunological concept of infection mimicry — the process of activating the immune system in a way to fool the body into thinking a vaccine is actually an infection. This type of activation triggers a much more potent immune response, boosting efficacy rates of vaccines like those for seasonal flu. Vaxess uses a specialized delivery system called the MIMIX Patch to administer therapies. This patch contains hundreds of microneedles consisting of proprietary formulations of silk-and-therapeutic tips mounted on proprietary dissolving bases. Within minutes of a MIMIX patch topical application, the needle base dissolves, the patch is peeled off, and left behind is the implanted slow-release tip – a sustained delivery not possible with other technologies.

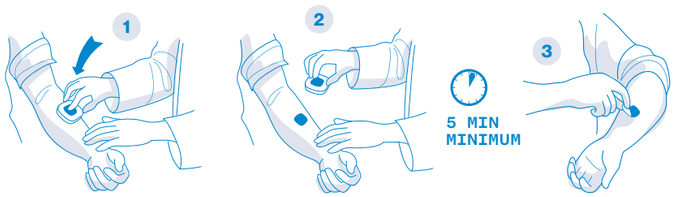
MIMIX COVID-19

THE ONLY SINGLE-DOSE, SHELF-STABLE, SELF-APPLIED SARS-COV-2 VACCINE CANDIDATE

"COVID-19 has highlighted the challenges in getting vaccines into the world quickly. Our platform solves this problem by enabling single dose vaccines that are shelf stable, and it can be mailed directly to people's houses for self administration."

— MICHAEL SCHRADER

- Compatible with any SARS-CoV-2 antigen, proteins, killed viruses, mRNA, and VLP
- **Single Dose:** Enhanced immune response
- **Dose-Sparing:** Less is needed to trigger immune response
- **Shelf-Stable - no cold chain required:** Years of room-temperature storage
- **Self-Applied:** No sharps or specialized equipment



→ *Silk cocoons, the natural raw material for the MIMIX patch.*

Photo: Vaxess Technologies

MIMIX™ SMART-RELEASE THERAPIES MIMIC INFECTIONS TO PRODUCE A POWERFUL AND DURABLE IMMUNE RESPONSE

IN PRECLINICAL STUDY

- **REQUIRES ONLY A SINGLE DOSE**
- **20X ANTIBODIES TO NEUTRALIZE HIV**
- **10X T-CELL RESPONSES**
- **3X PROTECTION AGAINST FLU**

PROTECTION AGAINST FLU MIMIX GOAL

80%

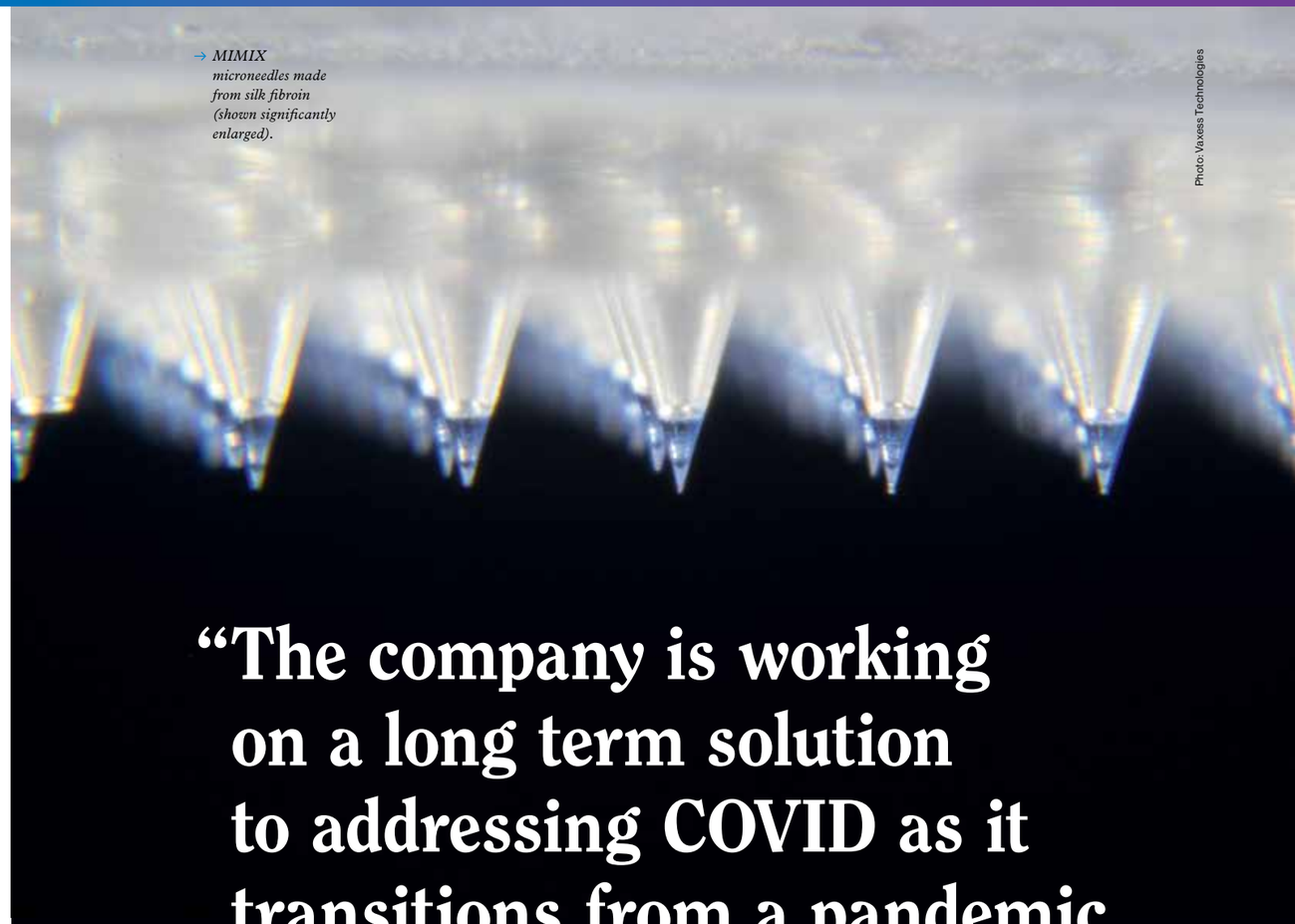
EFFECTIVE

MIMIX VACCINES ARE SHELF STABLE FOR YEARS

- **COMPATIBLE WITH SMALL MOLECULES, VACCINES, AND A RANGE OF OTHER THERAPIES**
- **ELIMINATE NEEDLE AND SYRINGE**

AWARDED GRANTS BY U.S. GOVERNMENT AGENCIES & PRIVATE FOUNDATIONS

- **DARPA**
- **NIH**
- **NSF**
- **BARDA**
- **NASA**
- **BILL AND MELINDA GATES FOUNDATION**

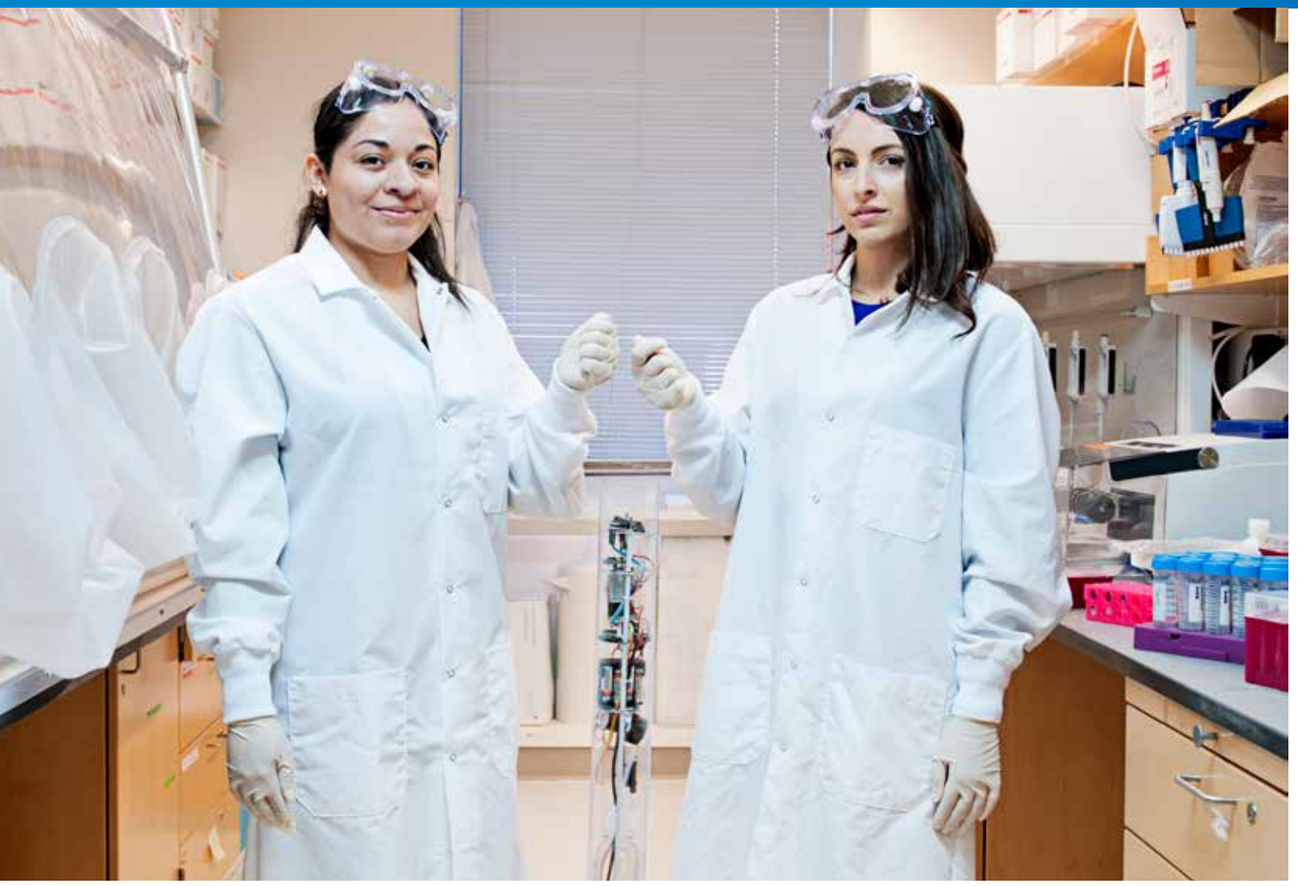


→ *MIMIX microneedles made from silk fibroin (shown significantly enlarged).*

Photo: Vaxess Technologies

"The company is working on a long term solution to addressing COVID as it transitions from a pandemic to an endemic concern. We believe there will be a need for a regular seasonal vaccination. Our approach to addressing this is to combine a seasonal flu vaccine and COVID vaccine in a single, shelf-stable dose."

— **MICHAEL SHRADER,** CEO & Co-Founder, Vaxess Technologies



BIO BOT

FOUNDERS	MARIANA MATUS, NEWSHA GHAELI
BACKGROUND	MIT
INDUSTRY	BIOTECH & LIFE SCIENCES. AI & ML, DATA SCIENCES

PROACTIVELY IDENTIFYING PUBLIC HEALTH PROBLEMS THROUGH SEWAGE ANALYSIS.

↑ *A Biobot sampling kit being deployed in the field.*

THE PROBLEM

Many public health problems are identified only after they have spread too far.

Not everybody that is sick visits a hospital. Not everybody that has a drug issue goes to rehab. The reasons why are many, but the result is the same — an incomplete picture of community health. These incomplete pictures make it difficult for public health officials to stay ahead of what's coming and to react appropriately to ongoing threats like the COVID-19 pandemic or the opioid epidemic.

THE IMPACT

Wastewater epidemiology saves lives. Biobot will help public health officials at every level — from states to cities, towns to corporate campuses — proactively address their community's wellbeing with anonymous data derived from wastewater. The system can measure infectious diseases, drug consumption, antibiotic resistance, nutrition, and exposure to environmental contaminants. In the future, wastewater epidemiology infrastructure will exist in every city and every town. A permanent wastewater epidemiology infrastructure across America will enable us to be proactive in our global response to thwart the next infectious disease outbreak before it becomes an epidemic.

"We aim to create a health database that is independent from hospital reporting systems, free from societal biases affecting who can and can't seek care, and most importantly, rapidly adaptable to new and emerging public health threats," says Mariana Matus.

THE BREAKTHROUGH

Born out of research at MIT, Biobot's core technology uses a combination of sensors and data analysis techniques to extrapolate the scope and scale of public health concerns from relatively small samples of wastewater. The approach directly measures metabolites, viruses, and bacteria excreted by humans.

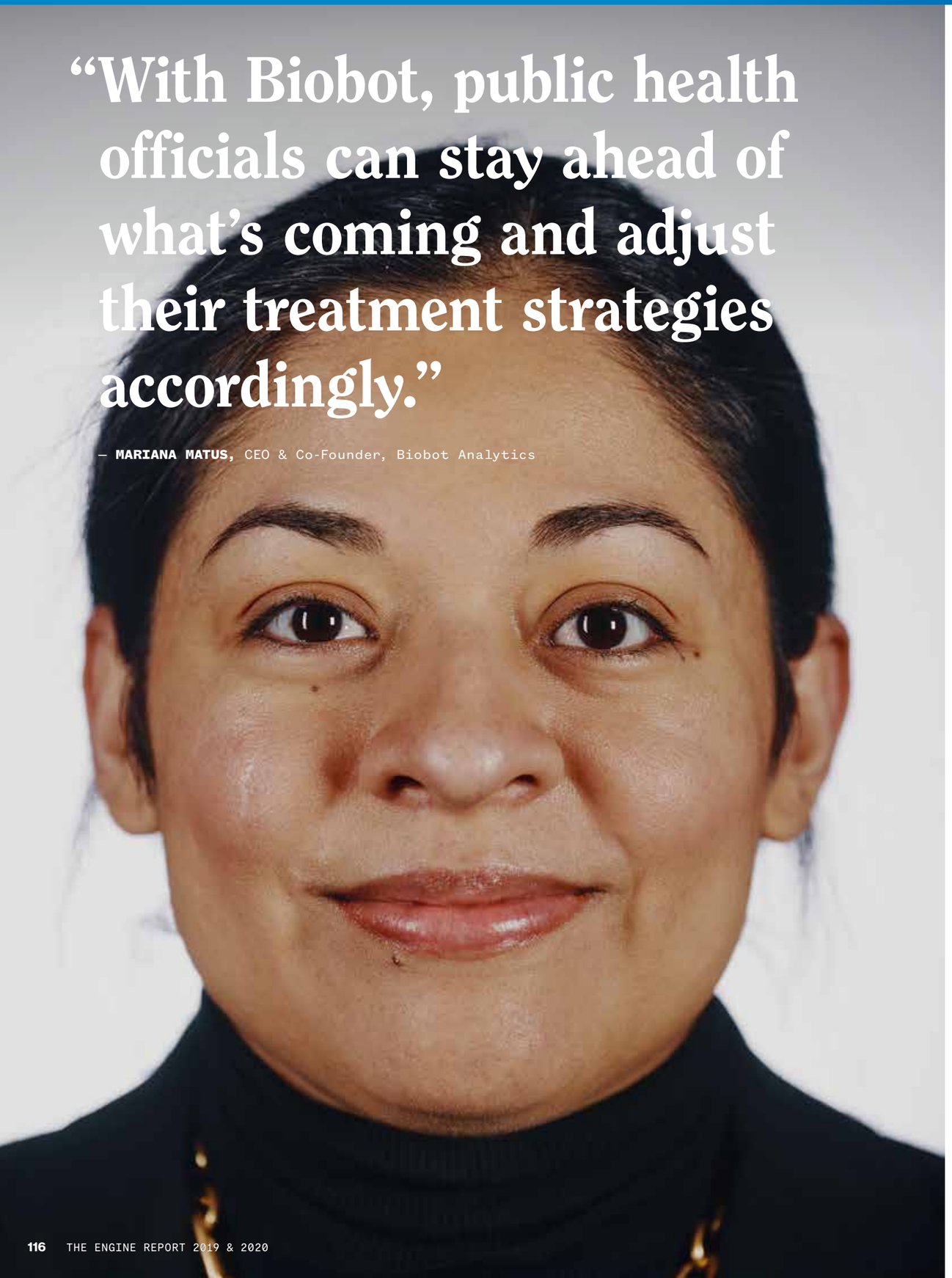
FIRST COMPANY IN THE WORLD TO COMMERCIALIZE DATA FROM SEWAGE

BIOBOT'S PLATFORM CAN DETECT THOUSANDS OF BIOMARKERS OF HUMAN HEALTH

- SARS-COV-2
- ZIKA
- ANTIBIOTIC RESISTANT BACTERIA
- HEPATITIS C
- POLIOVIRUS
- PHARMACEUTICALS & OTHER DRUGS
- NICOTINE
- ALCOHOL
- ENVIRONMENTAL CONTAMINANTS

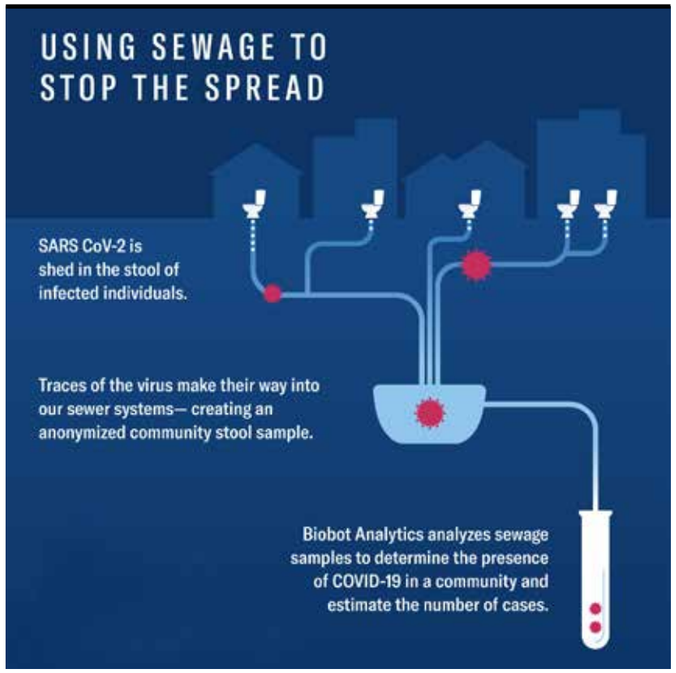
WASTEWATER EPIDEMIOLOGY REVEALS THE TRUE SCOPE OF PUBLIC HEALTH PROBLEMS

WASTEWATER ANALYSIS CAN DETECT BIOMARKERS OF A DISEASE 7-10 DAYS BEFORE SYMPTOMS

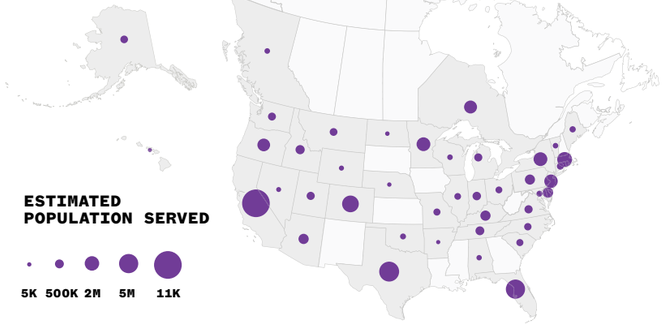


"With Biobot, public health officials can stay ahead of what's coming and adjust their treatment strategies accordingly."

— **MARIANA MATUS,** CEO & Co-Founder, Biobot Analytics



OUR COVID-19 TESTING PRESENCE



360
WASTEWATER FACILITIES

43
STATES & PROVINCES

1835
SAMPLES TESTED

182
LOCAL AGENCIES

IN MARCH 2020,

446
COVID-19 CASES OFFICIALLY REPORTED

BIOBOT DATA ESTIMATED

2,300 - 115,000
CASES OVER SAME TIME PERIOD

DATA REPRESENTS 13% OF U.S. POPULATION & 5% OF THE CANADIAN POPULATION

Early in the pandemic, Biobot Analytics launched a pro-bono COVID-19 testing campaign. Over the course of the campaign, 1,835 samples were tested, the equivalent of administering 442 million tests based on the populations these facilities serve. The campaign is the largest of its kind conducted worldwide to date.

The company's unique platform technology allows local governments and institutional clients to detect spikes in virus concentration that preempt case testing data by 3-7 days, giving them more time to take action.

REOPENING CORPORATE AMERICA STARTS WITH WASTEWATER EPIDEMIOLOGY

Biobot's wastewater testing system is modular and scalable. It can easily be deployed at the building or campus level, giving companies the ability to contain the spread of COVID-19 even if those in the building are asymptomatic. As of February 2021, multiple entities from the U.S. government and Fortune 500 companies have used, or are using, Biobot's technology.

E25Bio

DEVELOPING AFFORDABLE, SIMPLE, AND SCALABLE DISEASE DETECTION TOOLS FOR EVERYONE IN THE WORLD.

THE PROBLEM

Current testing paradigms for detection of infectious diseases such as COVID-19, the flu and other vector-borne diseases such as Dengue and Zika are expensive, time-consuming, centrally-managed, and highly inefficient. This often results in delayed results and spread of the disease due to the lack of quick diagnostics.

THE IMPACT

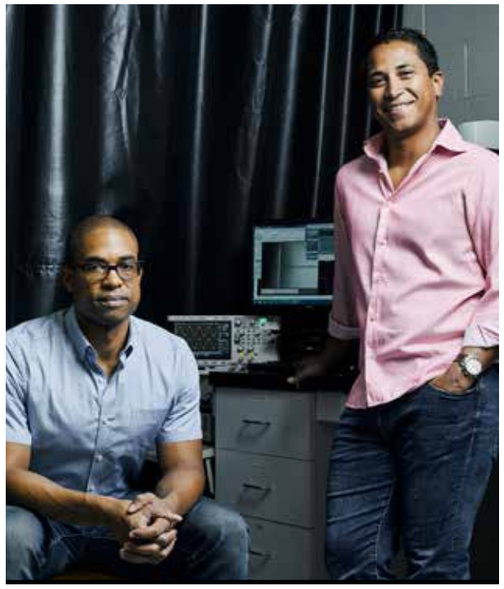
E25Bio believes in the decentralization and democratization of testing; every person should have access to diagnostic testing — anywhere, anytime. E25Bio's rapid tests give consumers actionable information in minutes, not days, thus empowering them to take control of their health faster than ever before.

THE BREAKTHROUGH

E25Bio has developed rapid antigen tests for detection of infectious diseases such as COVID-19, Dengue, Zika, and others. These tests produce results in about 10-15 minutes without the need for any expensive equipment. As of today, the company has regulatory approval in the EU in partnership with Perkin Elmer to distribute their COVID-19 tests and in Colombia for the Dengue test.

FOUNDERS & LEADERSHIP	PRASHANT CHOUTA, BOBBY BROOKE HERRERA
BACKGROUND	HARVARD, MIT, BERKELEY
INDUSTRY	BIOTECH & LIFE SCIENCES

KYTOPEN



IMPROVING PATIENTS' LIVES THROUGH AUTOMATED CELL ENGINEERING.

THE PROBLEM

Engineered cells hold the potential to save lives and cure some of our toughest diseases, but manufacturing them is currently a slow, laborious, and expensive process.

THE IMPACT

With Kytopen's platform, more people will have access to life-saving engineered cell therapies. Its platform will accelerate time to clinic (avg. 6 month time savings), reduce manufacturing timelines (from ~1 month to days), and reduce the overall cost of developing therapies.

THE BREAKTHROUGH

Kytopen has invented a new method of introducing genetic material into cells using continuous processing and electro-mechanical energy. This approach results in highly functional and healthy engineered cells in a fraction of the time and at a higher volume than other methods.

FOUNDERS & LEADERSHIP	PAULO GARCIA, CULLEN BUIE
BACKGROUND	MIT DEPARTMENT OF MECHANICAL ENGINEERING
INDUSTRY	BIOTECH & LIFE SCIENCES, ADVANCED MANUFACTURING

lucytherapeutics

USING A UNIQUE MITOCHONDRIAL-BASED APPROACH TO DISCOVER NEW WAYS TO TREAT DISEASES OF THE BRAIN.

THE PROBLEM

Treatments for our most insidious neurodegenerative diseases remain elusive, even after decades of research. These diseases are caused by more than genetics — the interplay between mitochondria and the nucleus of cells has been under-appreciated.

THE IMPACT

Lucy Therapeutics generates drugs which improve overall mitochondrial control and will address the key aspects of neurological impairment, ushering in an era of meaningful treatments for diseases like Rett Syndrome, Alzheimer's, and Parkinson's.

THE BREAKTHROUGH

Lucy Therapeutics is selecting drug targets based on a deep understanding of the crossover chemical and biological interplay at work in neurological diseases. It has linked neurodegenerative disease to dysfunctional mitochondria in neurons and is pioneering a new class of treatments designed to address such dysfunction.

FOUNDERS & LEADERSHIP	AMY RIPKA
BACKGROUND	UNIVERSITY OF WISCONSIN-MADISON, THE SCRIPPS RESEARCH INSTITUTE
INDUSTRY	BIOTECH & LIFE SCIENCES

seaspire SKINCARE

PIONEERING A NEW CATEGORY OF MULTIFUNCTIONAL MATERIALS WITH EXTENSIVE IMPLICATIONS FOR HUMAN HEALTH AND ENVIRONMENTAL SAFETY.

THE PROBLEM

More than 70% of suncare products contain chemical UV-filters that have been reported to disrupt the endocrine system. These chemical UV-filters can degrade into harmful byproducts that remain in the bloodstream up to 24 hours after a single application at concentrations that exceed safe levels. There is an urgent need for new ingredients and formulations that are safe and effective at maintaining skin health in the face of environmental stressors.

THE IMPACT

Seaspire will expand the availability of natural ingredients that can be used to prevent skin damage and cancers caused by environmental pollutants such as sunlight, smog, blue light, and oxidation. Its natural ingredients will not adversely affect marine life or the environment.

THE BREAKTHROUGH

Seaspire discovered that cephalopod-derived Xanthochrome can function as an SPF-booster, UV-filter stabilizer, and antioxidant with activity that rivals Vitamin C and E but with increased stability. Xanthochrome outperforms current active ingredients found in OTC skincare products in performance, safety, aesthetics, and function.

FOUNDERS & LEADERSHIP	CAMILLE MARTIN, LEILA DERAVI
BACKGROUND	NORTHEASTERN UNIVERSITY
INDUSTRY	BIOTECH & LIFE SCIENCES

suono bio

DELIVERING DRUGS TO THE GASTROINTESTINAL TRACT MORE EFFICIENTLY AND EFFECTIVELY USING A NOVEL PLATFORM TECHNOLOGY.

THE PROBLEM

Ulcerative colitis impacts almost 1M patients in the U.S. alone. Poor treatment options lead to exorbitant medication spending in excess of $10B annually.

THE IMPACT

Suono Bio is pioneering a platform technology for local, ultra-rapid administration of therapeutics in the GI tract that can deliver 10X the drug in only one minute. Suono can also deliver nucleic acids (e.g., mRNA) which today can't be delivered to the GI tract.

THE BREAKTHROUGH

The company's core technology leverages low-frequency ultrasound. Suono's founding team demonstrated that through an ultrasound-induced phenomenon known as transient cavitation, drugs are gently "pushed" into the tissue, achieving ultra-rapid delivery of therapeutics.

FOUNDERS & LEADERSHIP	CARL SCHOELLHAMMER, ROBERT LANGER, GIO TRAVERSO, SCOTT KELLOGG, ALBERT FARINHA
BACKGROUND	MIT DEPARTMENT OF CHEMICAL ENGINEERING
INDUSTRY	BIOTECH & LIFE SCIENCES

"The ambition of these teams to superpower some of the biggest unmet needs in empowering human life will have global impact. They implicitly embrace the responsibility we have to elevate one another, and we are truly proud to support and accelerate their missions."

— **ANN DEWITT**, General Partner, The Engine

ADVANCED SYSTEMS & INFRASTRUCTURE

The Engine backs companies that address the demands of tomorrow. They are building new technologies that enable industries like computing, communication, and manufacturing to be more efficient, productive, and inclusive. They are adapting and evolving critical industrial systems that provide the backbone of advanced manufacturing and supply chains, the built environment, and space.

“I’m motivated by the size of the impact the communion of technology, bold ideas, and flawless execution can bring to an industry. I’m passionate about scaling innovation.

The industry we’re in is not one that can be disrupted in a weekend with a website or an app. It’s one that requires commitment. But with that commitment comes massive opportunity around the world.”

— **ISRAEL RUIZ,** CEO & Co-Founder, WoHo

→ *A rendering of an Analytical Space Fast Pixel cubesat in orbit.*

Image: Analytical Space

analytical space

FOUNDERS	DAN NEVIUS
BACKGROUND	PLANETARY RESOURCES, WHITE HOUSE, HARVARD HBS
INDUSTRY	SPACE, INTERNET OF THINGS

CONNECTING SPACE TO EARTH 24/7 TO HELP US BETTER UNDERSTAND AND PROTECT OUR WORLD.

IMAGING SATELLITES GENERATE DATA TO HELP ADDRESS SOME OF THE WORLD'S MOST PRESSING CHALLENGES

- FOOD & WATER SECURITY
- CLIMATE CHANGE MONITORING
- DISASTER RESPONSE
- NATIONAL SECURITY

REMOTE SENSING SATELLITES SPEND

70%

OF THEIR TIME IN COMMS BLACKOUT ZONES

LIKE GPS, GEOSPATIAL INTELLIGENCE WILL BE EMBEDDED IN ALMOST EVERYTHING WE DO ON EARTH

919

ACTIVE REMOTE SENSING SATELLITES IN ORBIT

>$100B

SPENT BUILDING & DEPLOYING THESE SATELLITES

SATELLITE COMMUNICATION IS SLOW: HOURS TO DAYS FROM IMAGE REQUEST TO IMAGE DELIVERY

THE PROBLEM

Remote sensing satellites lack basic connectivity in orbit. We need real-time imagery from space to keep the planet safe and prosperous.

Advances in AI/ML have enabled new applications for remote sensing satellite data, and these new applications — in disaster response, climate change monitoring, and defense — are fueling demand for data-intensive imagery. To get that imagery to the ground, in real time, the world needs orders of magnitude more downlink capacity. But there's a big problem: remote sensing satellites spend 70% of their time in communications blackout zones. And when they are in the proper positions for downlinks, their data rate is slow, leaving vital information about the surface of our planet stuck in space.

THE IMPACT

Greater visibility of the surface of the Earth, in real time, will help keep the planet safe and prosperous. This visibility will help accelerate disaster relief, more efficiently monitor large-scale agriculture, optimize logistics, monitor and act on the effects of climate change, and more.

THE BREAKTHROUGH

Analytical Space is building a network of small data relay satellites in low-earth orbit so we can access data from remote sensing satellites anytime, anyplace, faster than ever before. This in-orbit communication infrastructure, dubbed the Fast Pixel Network, is backwards compatible with existing imaging satellites, while also pushing the boundaries of the technology that can be placed on new satellites (e.g. hybrid RF and optical data network technologies).

As satellite technology has miniaturized and associated launch costs have shrunk, it is possible for Analytical Space to put an entire satellite network into orbit for less than the costs of a single cutting-edge imaging satellite. The economics of NewSpace also mean that there will be more satellites, with greater imaging capabilities, than ever before.

RESPOND TO EVENTS AS THEY HAPPEN

CONTINUOUS
LOW-LATENCY
LINK TO THE GROUND

>100X

REDUCTION IN TIME FROM IMAGE REQUEST TO DELIVERY

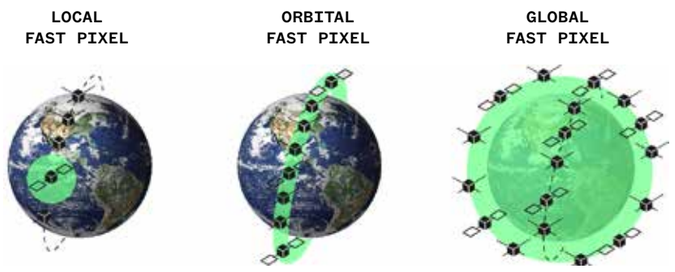
ZERO COMMS
BLACKOUT ZONES

MORE DATA =
MORE INFORMED

6X

AMOUNT OF DATA DOWNLINK CAPACITY

PROGRESSION OF FAST PIXEL℠ SOLUTION



→ *Dan Nevius, Analytical Space CEO & Founder, in the company's satellite command room at The Engine.*

CAPABILITY EVOLUTION - LOCAL FAST PIXEL℠

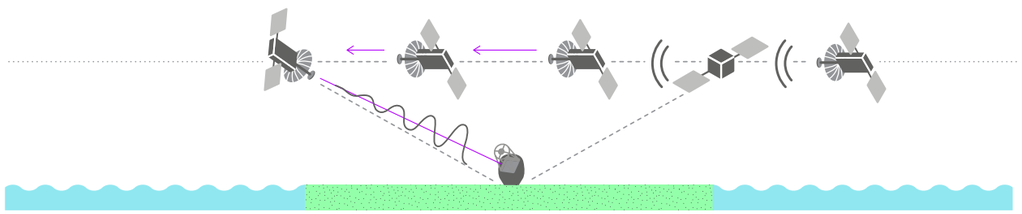
5 ASI DOWNLINKS WITHIN SAME COMM CONE

4 ASI CROSS-LINKS TO TRAILING RELAYS

3 CLIENT CROSS-LINKS TO ASI AT END OF IMAGING CONE

2 CLIENT IMAGES OVER COMM CONE

1 ASI LEAD SATELLITE TASKS CLIENT



OCEAN
70% OF EARTH'S SURFACE

LAND
30% OF EARTH'S SURFACE

"There is a massive demand for advanced satellite imagery for disaster response, climate change monitoring, defense, and more. And we're satisfying that unmet need for data throughput and low latency."

— **DAN NEVIUS,** CEO & Co-Founder, Analytical Space

→ *Assembling a prototype satellite in its Cambridge facility.*

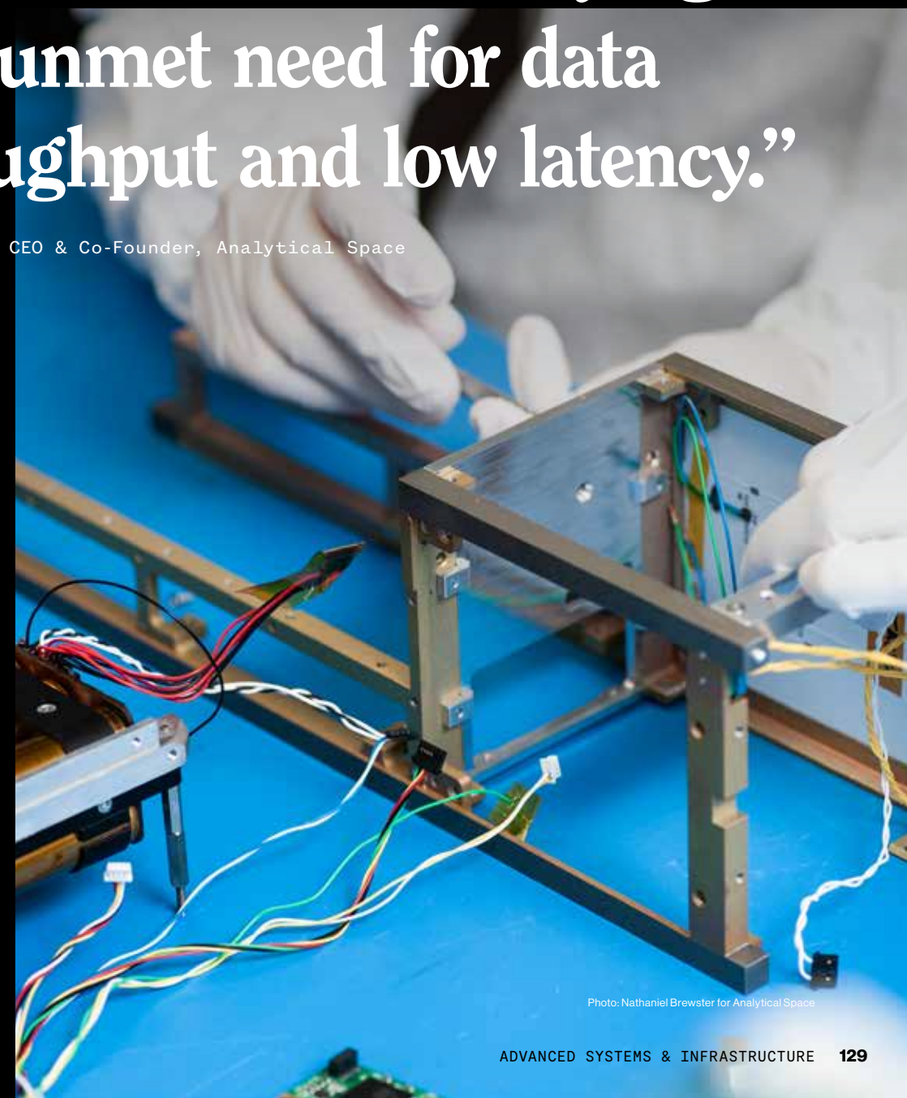


Photo: Nathaniel Brewster for Analytical Space

→ *First prototype design, built and manufactured in Madrid, Spain de-risking product, costs, materials, and timeline.*

FOUNDERS	ISRAEL RUIZ, DÉBORA MESA, ANTÓN GARCÍA-ABRIL
BACKGROUND	MIT, ENSAMBLE STUDIO
INDUSTRY	ADVANCED MATERIALS, ADVANCED MANUFACTURING

CHANGING HOW WE DESIGN AND CONSTRUCT OUR WORLD.

THE PROBLEM

The housing industry is in crisis with scarcity of labor, higher prices, fragmented supply chains, and high demand.

Most large-scale construction projects start from a blank slate, with each step making the final product more expensive and less impactful. This broken process limits what we can do to solve the housing crisis and how efficiently we can create functional spaces like offices and labs. The construction industry hasn't seen significantly improved productivity in more than 60 years — it is fragmented, inefficient, and due for disruption.

THE IMPACT

WoHo will usher in a future of attainable, sustainable, and uncompromising living and working spaces. As Israel Ruiz, WoHo's CEO, notes: "WoHo is building the new generation of intelligent, safe and sustainable spaces. We are raising the standards and expectations for how buildings are created. WoHo is changing how we design and construct our world — so that everyone wins."

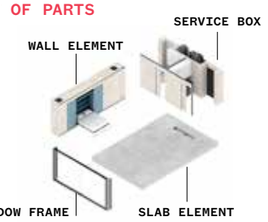
THE BREAKTHROUGH

WoHo integrates techniques, processes, and approaches from different disciplines to solve some of the fundamental problems in construction in a new way. The company is planning to build lean, modular factories that balance automation and handwork close to construction hubs, simplifying the logistics, lowering the costs, and reducing the environmental footprint of its buildings. The team likens its WoHo Production System (WPS) to the automotive industry, with its network of value-add suppliers and assembly lines, with their optimized interplay between human and machine. As of this report, WoHo has completed a pilot factory in Madrid, where all critical components have been prototyped. The team is now invested in Project One which involves the development of their first fabrication facility and residential building in Massachusetts.

WOHO PRODUCT ARCHITECTURE

MODULE

KIT OF PARTS



KIT OF PARTS

MULTIMODAL UNIT OF TRANSPORTATION

- WoHo elements are designed for ultra efficient logistics.
- WoHo's sustainable high performance concrete elements are designed and engineered for efficient living and optimal constructability.

> "We are experiencing an unprecedented need to find new ways to build quality, affordable, sustainable housing, as cost and time efficiently as possible."
>
> — **ISRAEL RUIZ,** CEO & Co-Founder, WoHo

IN THE NEXT

20-30

YEARS, WE WILL NEED 2X THE NUMBER OF BUILDINGS THAT CURRENTLY EXIST

THE CONSTRUCTION SECTOR HAS DECLINED IN PRODUCTIVITY BY 10-20% IN THE LAST 20 YEARS

BY 2025,

1.6B

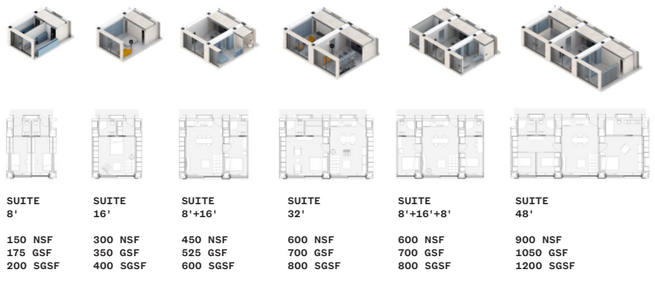
PEOPLE COULD STRUGGLE TO SECURE ADEQUATE, SAFE AND AFFORDABLE HOUSING

200K

PEOPLE MOVING TO URBAN AREAS EVERYDAY

Source: Modular Construction: From Projects to Products; McKinsey & Company, June 2019

WOHO SUITE (RESIDENTIAL) CONFIGURATIONS TO SERVE ADDRESSABLE MARKETS



SUITE 8'	SUITE 16'	SUITE 8'+16'	SUITE 32'	SUITE 8'+16'+8'	SUITE 48'
150 NSF 175 GSF 200 SGSF	300 NSF 350 GSF 400 SGSF	450 NSF 525 GSF 600 SGSF	600 NSF 700 GSF 800 SGSF	600 NSF 700 GSF 800 SGSF	900 NSF 1050 GSF 1200 SGSF

LOWERING THE COSTS OF CONSTRUCTION BY 20%+

SHRINKING PROJECT DELIVERY TIME BY 50%

REDUCING THE ECOLOGICAL FOOTPRINT OF BUILDINGS BY 70%

IMPROVING PROJECT PREDICTABILITY AND CONSTRUCTION QUALITY

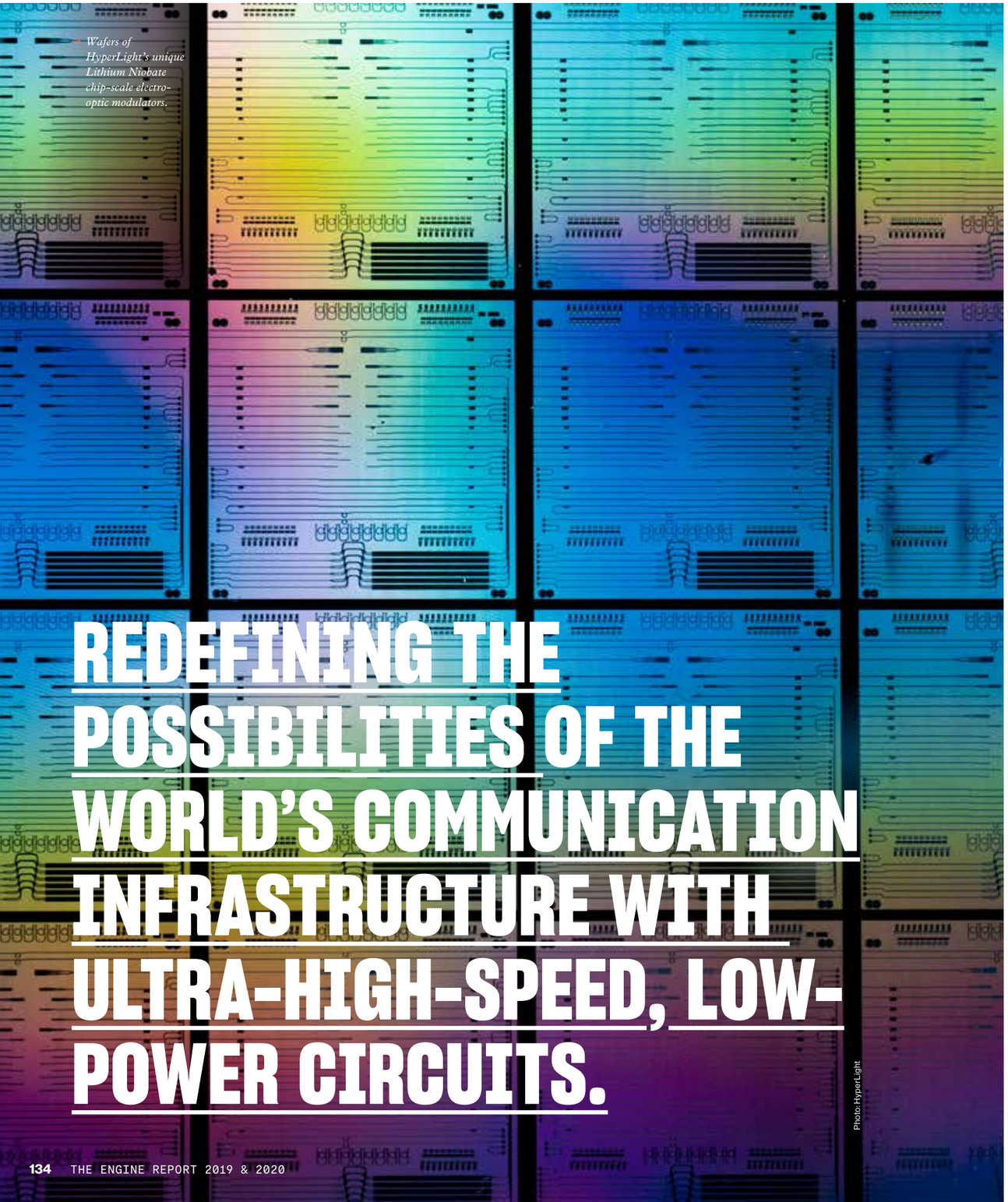
← *WoHo Fabrication space in Madrid, Spain where they manufacture, assemble, and test.*

"WoHo is building the new generation of intelligent, safe, and sustainable spaces. We are raising the standards and expectations for how buildings are created. WoHo is changing how we design and construct our world — so that everyone wins."

— **ISRAEL RUIZ,** CEO & Co-Founder, WoHo

HYPERLIGHT®

FOUNDERS	MIAN ZHANG, MARKO LONCAR, CHENG WANG
BACKGROUND	HARVARD UNIVERSITY LABORATORY FOR NANOSCALE OPTICS
INDUSTRY	SEMICONDUCTORS, ADVANCED MATERIALS, ADVANCED MANUFACTURING



Wafers of HyperLight's unique Lithium Niobate chip-scale electro-optic modulators.

REDEFINING THE POSSIBILITIES OF THE WORLD'S COMMUNICATION INFRASTRUCTURE WITH ULTRA-HIGH-SPEED, LOW-POWER CIRCUITS.

Photo: HyperLight

THE PROBLEM

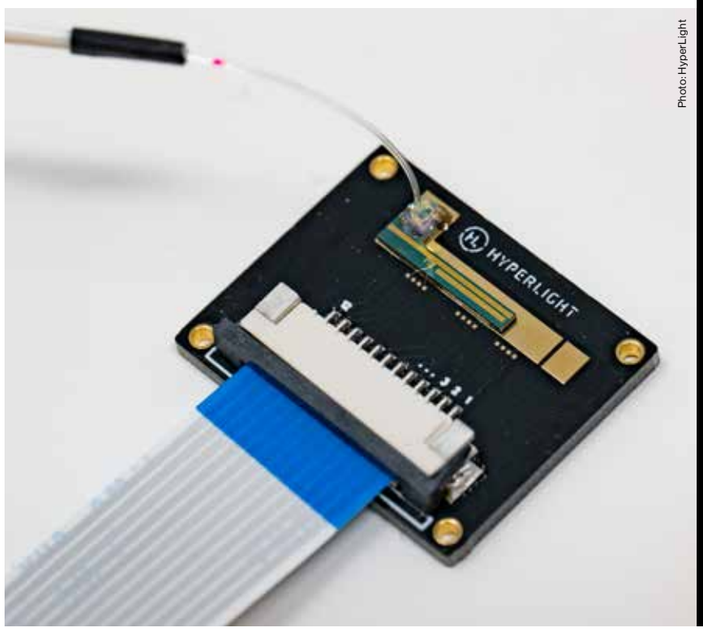
The data centers in and out of which all the world's digital information flows are quickly reaching limits of speed and energy consumption. A significant component of the problem is the material (silicon) used to convert the electrical signals of the computers to optical signals that are transmitted through fiber optic cables. Without significant innovation in material efficiency, the quantity of data and the transmission speed of that data will quickly reach a performance ceiling.

THE IMPACT

The connections between our most fundamental technologies rely on a device to convert signals between electricity and light waves at high speeds: the electro-optic modulator. Until now, electro-optic modulators were the technology of major telecom installations. HyperLight has developed chip-scale electro-optic modulators, the first of their kind anywhere in the world. These chips, and the techniques to harness the true potential of lithium niobate, will help use tomorrow's data for new modeling-heavy approaches to artificial intelligence, machine learning, and more. It will make the connections between data centers, industries, offices, and homes faster and more capable.

THE BREAKTHROUGH

Through work out of the Laboratory for Nanoscale Optics at Harvard University, HyperLight's founding team discovered a method of fabricating thin lithium niobate film modulators with extremely low signal loss. This fabrication method was the first of its kind in the world. HyperLight realized that the integrated optical modulator devices made using their ultra, low-loss chips could meet the growing market demand for ultra high-performance, yet cost-effective optical solutions.



Prototype electro-optic modulator prepped for testing.

Photo: HyperLight

U.S. DATA CENTERS CONSUMED 90B KILOWATT-HOURS OF ELECTRICITY IN 2017

34

COAL-POWERED PLANTS WORTH OF POWER

DATA CENTER POWER CONSUMPTION

3%

ALL ELECTRICITY ON THE PLANET

2%

OF TOTAL GHG EMISSIONS

100M

METRIC TONS OF CO_2 IN 2020

www.vxchnge.com/blog/growing-energy-demands-of-data-centers

80B

CONNECTED DEVICES IN THE WORLD BY 2025

REDUCING DATA CENTER POWER CONSUMPTION BY UP TO

30%

HARNESSING THE SUPERIOR PROPERTIES OF LITHIUM NIOBATE

ULTRA-EFFICIENT ELECTRO-OPTIC MODULATOR:

NEGLIGIBLE LIGHT LOSS OVER ONE METER

WORLD RECORD TRANSMISSION

700GBITS

PER SECOND OVER 10KM OPTICAL FIBERS WITH A SINGLE MODULATOR AND A SINGLE PHOTODETECTOR

"The Engine allows founders to decide what is the best interest for their company. There is not a sense of artificial pressure."

— **MIAN ZHANG,** CEO & Co-Founder, HyperLight

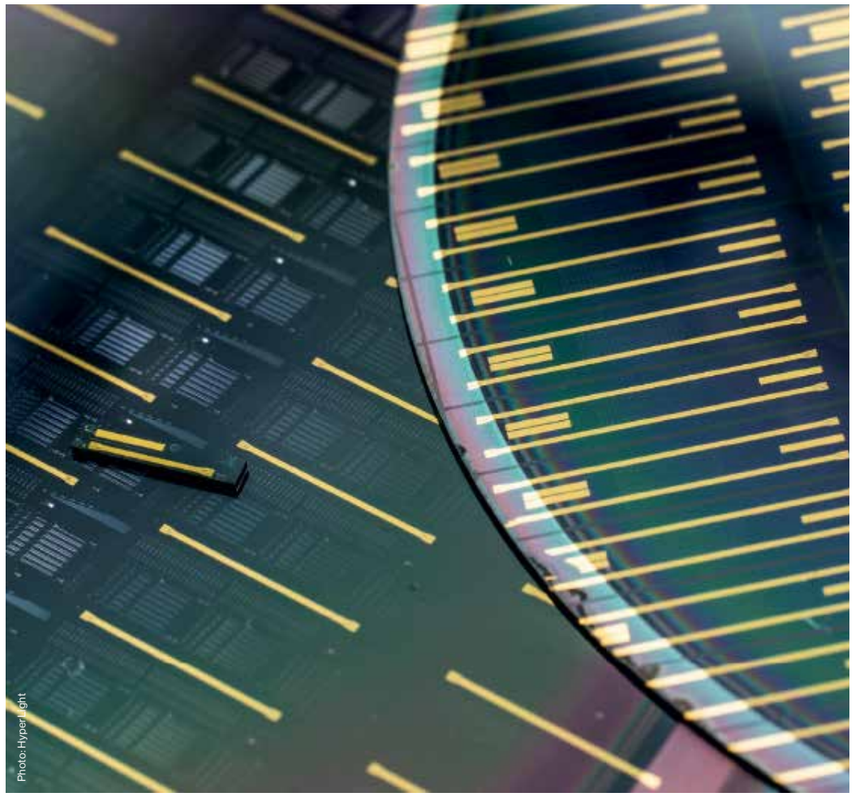
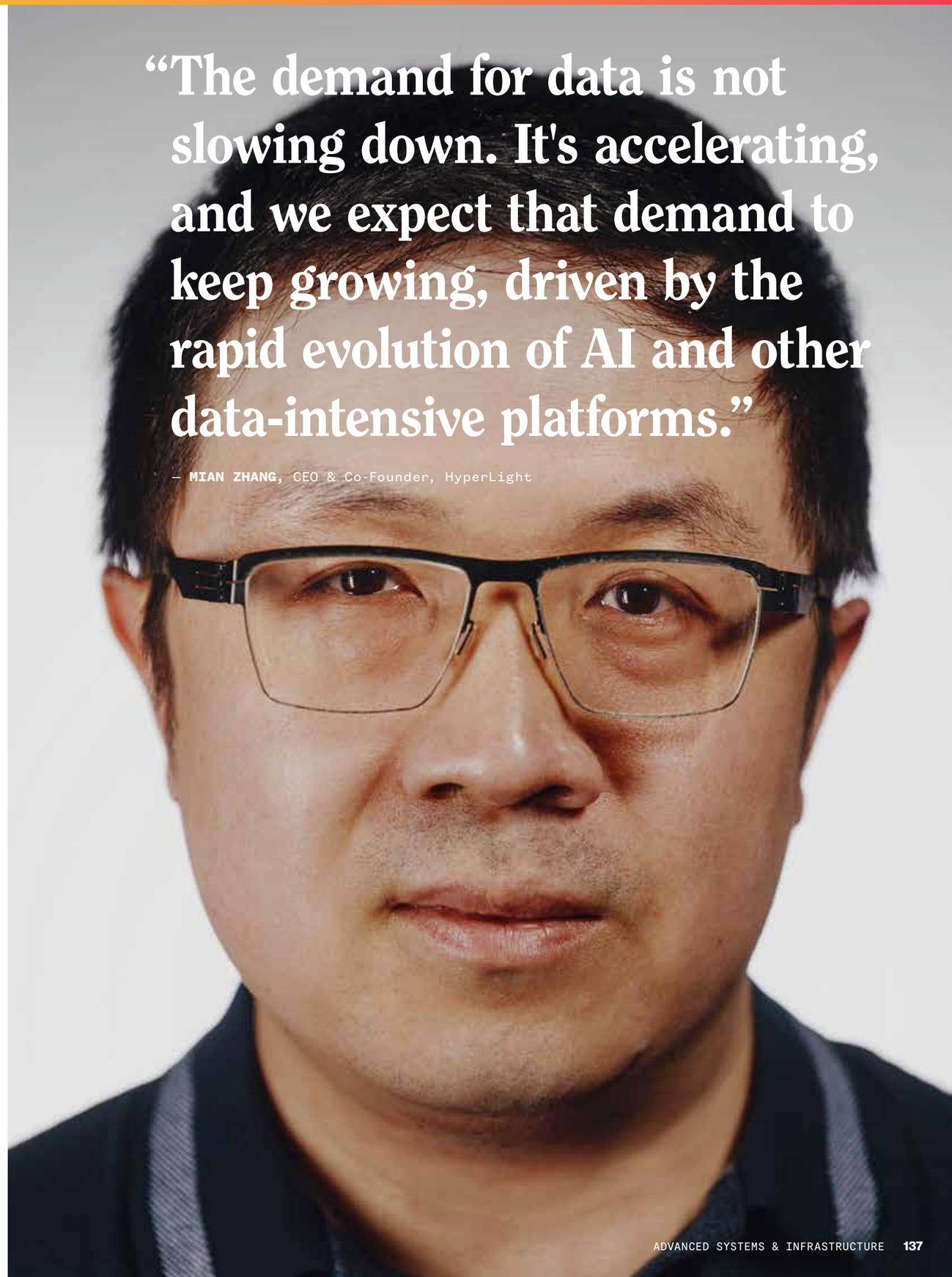
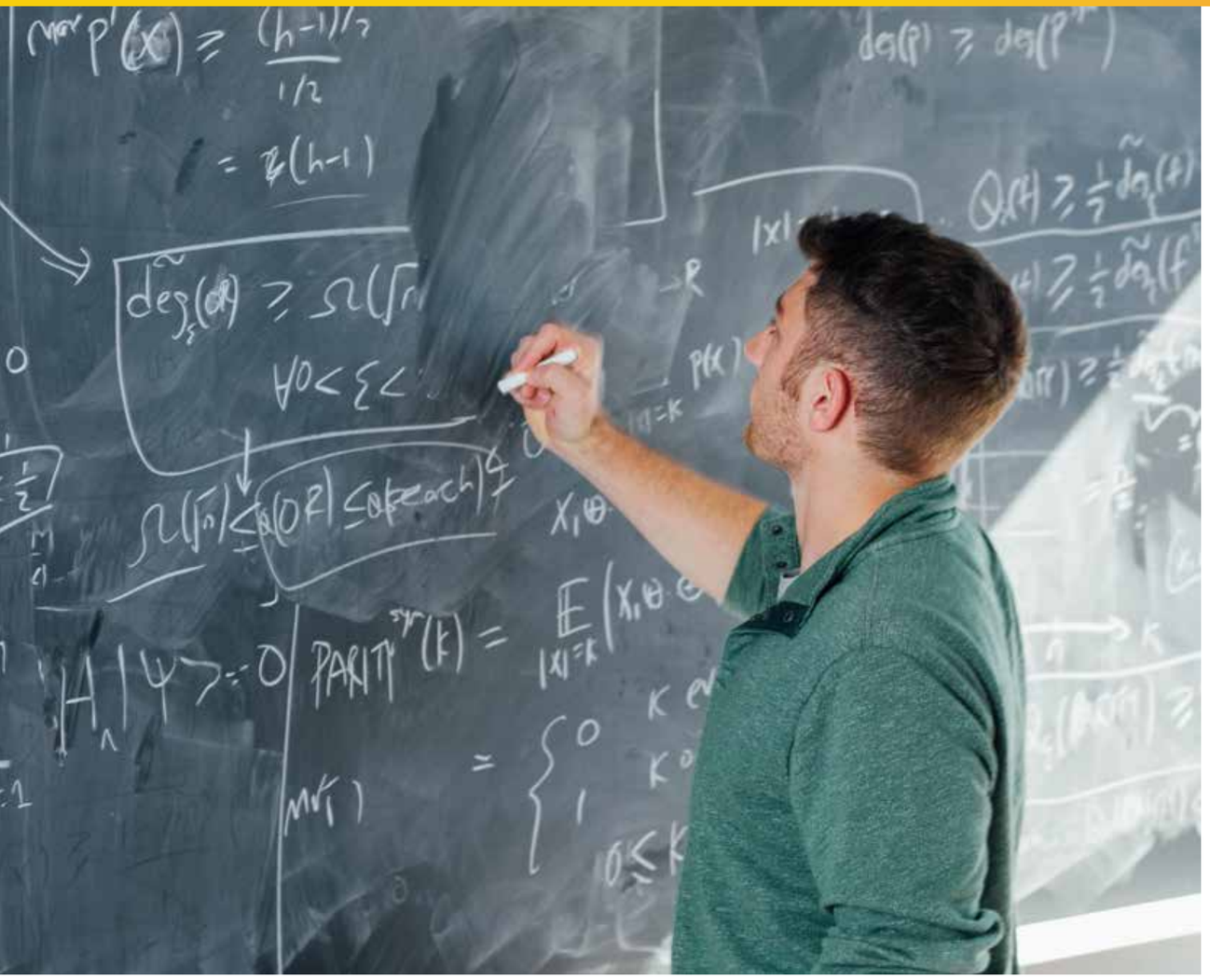


Photo: HyperLight

← *HyperLight's unique Lithium Niobate chip architecture.*

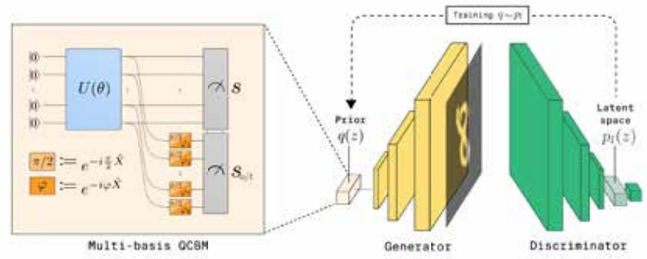




ZAPATA

FOUNDERS	ALÁN ASPURU-GUZIK, YUDONG CAO, PETER D. JOHNSON, JONATHAN P. OLSON, JHONATHAN ROMERO FONTALVO, CHRISTOPHER SAVOIE
BACKGROUND	HARVARD DEPARTMENT OF CHEMISTRY, UNIVERSITY OF TORONTO DEPARTMENT OF CHEMISTRY
INDUSTRY	QUANTUM COMPUTING

QUANTUM SOFTWARE TO SOLVE OUR MOST COMPLEX PROBLEMS.



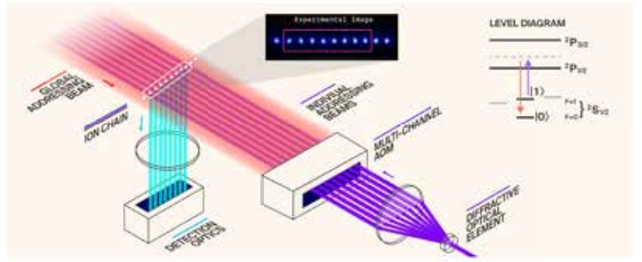


Diagram from a Zapata paper: "Generation of High-Resolution Handwritten Digits with an Ion-Trap Quantum Computer." Published December 25, 2020.

"Quantum-optimized supply chains should also reduce the carbon footprint for entire industries… Optimizing routes by just 5% of U.S. freight trucks alone would reduce carbon emissions by roughly 22M tons each year."

— **CHRISTOPHER SAVOIE,** CEO & Co-Founder, Zapata Computing

["How Quantum Computers Could Cut Millions of Miles from Supply Chains and Transform Logistics"https://www.forbes.com/sites/forbestechcouncil/2021/02/05/how-quantum-computers-could-cut-millions-of-miles-from-supply-chains-and-transform-logistics/?sh=47d7cb7925a9]

THE PROBLEM

Classical computers lack the power to solve the most important problems in science and industry.

Many of the world's toughest problems — things like route optimization, chemical interactions, material simulation and climate modeling — require a specialized type of data-intensive modeling to solve. A quantum computer, with its unique method of computation, can handle this type of modeling exponentially faster than a classical computer. Programming a quantum computer is unlike any other type of computer programming — it requires a special team of scientists and collaboration with those developing quantum hardware.

THE IMPACT

Quantum computing will redefine our understanding of, and ability to simulate, challenges like climate modeling to efficiently combat climate change; materials discovery to create new medicines and green chemicals; artificial intelligence and its ability to think like a human; and more. Zapata Computing is engineering and perfecting algorithmic approaches to those challenges in collaboration with quantum hardware engineers. As quantum hardware continues to progress in capability and reliability, Zapata's algorithms will be there, ready to solve the unsolvable.

THE BREAKTHROUGH

Zapata Computing was born out of pioneering work in Alan Aspuru-Guzik's lab at Harvard University. Its scientific founding team has literally written "the book" on the techniques and approaches that the team has commercialized. 25 quantum scientists and engineers have produced over 495 peer-reviewed publications in the discipline — they are teaching the world how to best program a quantum computer.

← *The Zapata Computing founding team (L-R) Christopher Savoie, Peter D. Johnson, Alán Aspuru-Guzik, Jhonathan Romero Fontalvo, Jonathan P. Olson, Yudong Cao.*

"I deeply believe that quantum software will affect all of humanity. Many of the big problems that we need to solve require the type of predictive modeling quantum computing excels at — things like climate change, global pandemic response, anything that involves massive models."

— **CHRISTOPHER SAVOIE,** CEO & Co-Founder, Zapata Computing

PROBLEM TYPES:

- OPTIMIZATION
- AI/ML
- CHEMISTRY
- SIMULATION & MODELING

INDUSTRIES:

- AEROSPACE & AUTOMOTIVE
- BIOPHARMA
- FINANCE & INVESTING
- LOGISTICS
- MATERIALS
- OIL & GAS

497

PEER-REVIEWED QUANTUM INFORMATION PUBLICATIONS

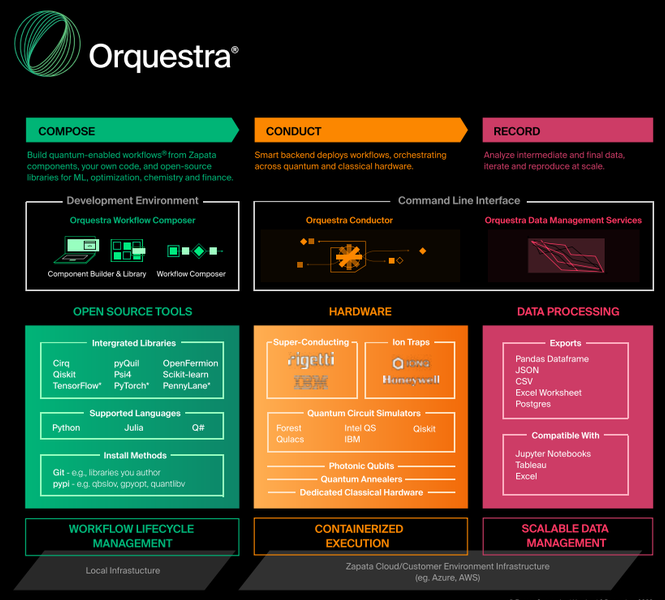
27

QUANTUM SCIENTISTS AND ENGINEERS

BRINGING QUANTUM ALGORITHMS TO LIFE

"Orquestra is the platform that allows us to take our unique quantum algorithms and apply them to mathematical problems in a real environment and business scenario."

— **CHRISTOPHER SAVOIE,** CEO & Co-Founder, Zapata Computing



Zapata partners with quantum hardware companies to optimize the performance of their quantum devices with Orquestra. The company has the algorithms and techniques to leverage the strengths of each device across the full range of quantum technologies, including classical quantum circuit simulators, superconducting qubits, and ion traps.

C2SENSE

MINIATURIZED, MOBILE SENSING SOLUTIONS FOR A HEALTHIER AND SAFER WORLD.

THE PROBLEM

Important molecular information is hidden in the air we breathe, the food we eat, the products we buy, and the medicines we take. Outdated sensing solutions and slow, costly, lab-based analyses limit rapid and wide-spread access to these invisible chemical signatures. As a result, critical information on diseases, toxins, and product integrity has remained under-reported and inaccessible. Until now.

THE IMPACT

Built on a foundation of research and development from MIT, the technology developed by C2Sense has a wide range of applications including sensing platforms to monitor air, food, and water quality, diagnostic tools to bring lab accuracy into the home, and counterfeit detection solutions for products across markets.

THE BREAKTHROUGH

The unique combination of advanced molecular recognition, detection hardware and AI driven software is a fundamentally new way to interact with the world. The technology platforms designed by C2Sense make the detection of invisible compounds and the power of rapid diagnosis readily available and affordable. The company's miniaturized sensing solutions are designed to make the world a healthier and safer place.

FOUNDERS & LEADERSHIP	GEORGE LINSCOTT, TIM SWAGER, ERIC KELLER, JT MANN
BACKGROUND	MIT DEPARTMENT OF CHEMISTRY
INDUSTRY	ADVANCED MATERIALS, INTERNET OF THINGS

celestial AI

CREATING THE MOST IMPACTFUL AI COMPUTING SOLUTIONS FOR THE BENEFIT OF HUMANITY.

THE PROBLEM

AI is driving an unprecedented demand for computation right at the time that the physics of digital semiconductors is failing to continue to support Moore's law. Transistor scaling has hit its limits and AI accelerator companies are struggling to keep pace with demands, particularly in "edge" applications that require greater power and cost efficiency.

THE IMPACT

Celestial has developed a proprietary photonic neural network processor that uses photons (light) rather than electrons to handle data-parallel calculations that are many orders-of-magnitude faster, and more power efficient than in traditional semiconductors. This speed and efficiency will liberate the power of AI in every application, especially at the "edge," where energy use is of paramount concern.

THE BREAKTHROUGH

Celestial's fundamental breakthrough is its opto-electronic system-in-package that includes the photonic neural network integrated with a state-of-the-art AI accelerator chip.

FOUNDERS & LEADERSHIP	DAVID LAZOVSKY, PREET VIRK, MICHELLE TOMASKO
BACKGROUND	INTERMOLECULAR, POET TECHNOLOGIES, NVIDIA, GOOGLE, GROQ, MACOM, TRANSMETA
INDUSTRY	SEMICONDUCTORS, ADVANCED MATERIALS

ISEE

POWERING AUTONOMOUS MACHINES THAT THRIVE ALONGSIDE HUMANS, SEAMLESSLY AND SAFELY IN ANY ENVIRONMENT.

THE PROBLEM

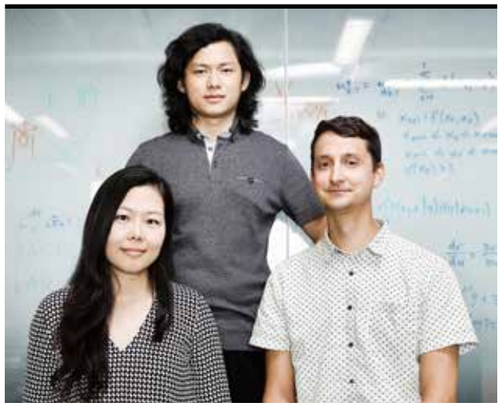
Autonomous vehicles cannot fully predict unexpected behavior, resulting in increased risk and slow rollouts of new technologies. Industries that can benefit from autonomous vehicles, like logistics, remain hamstrung by the lack of capability in current options.

THE IMPACT

ISEE AI enables flexible autonomy. Designed to interact with human environments, its AI nimbly adjusts to the unexpected, delivering the versatility needed to automate complex operations without disruption. It will launch first in shipping yard trucks, giving yard operators higher levels of efficiency and safety than possible with human drivers.

THE BREAKTHROUGH

Designed to interact with human environments, ISEE has created an autonomous system that anticipates unexpected behavior better than any other solution on the market. Its AI platform was born out of cognitive science and artificial intelligence work at MIT.



FOUNDERS & LEADERSHIP	YIBIAO ZHAO, DEBBIE YU, CHRIS BAKER
BACKGROUND	MIT COMPUTATIONAL & COGNITIVE SCIENCE GROUP
INDUSTRY	AI & ML

RADIX

MAKING COMPLEX LAB WORK RADICALLY SIMPLE BY UNITING SCIENTISTS AND LAB MACHINERY THROUGH SOFTWARE.

THE PROBLEM

Today's biology lab is inefficient and prone to human error. Its machines, the equipment tasked with unlocking some of life's most profound mysteries, don't talk to each other. Humans perform repetitive tasks by hand without precise documentation. Reproducibility of results by peers is difficult or impossible.

THE IMPACT

With Radix, biologists will spend less time in the lab and more time focusing on experimental design and analysis. Its software requires no coding and is designed around an approachable user interface.

THE BREAKTHROUGH

Radix has built a programming language that unites biologists and their lab machinery in one automated unit. This programming language is the heart of software that manages both human and machine tasks. It is the first time disparate lab machinery can communicate with one another under the control of one centralized platform.

FOUNDERS & LEADERSHIP	DHASHARATH SHRIVATHSA
BACKGROUND	OLIN COLLEGE, MIT MEDIA LAB
INDUSTRY	ROBOTICS, AI & ML, INTERNET OF THINGS, BIOTECH & LIFE SCIENCES

RISE

ACCELERATING THE ELECTRIFICATION OF HEAVY MACHINERY WITH SOLID-STATE HYDRAULICS.

THE PROBLEM

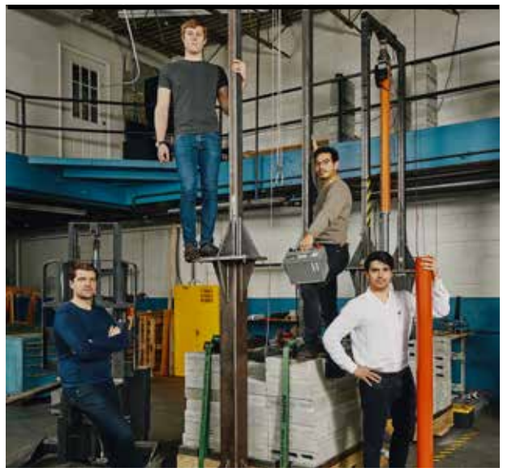
Heavy machinery consumes 14B gallons of diesel, resulting in 154M tons of CO_2 emitted annually in the United States. RISE estimates the global impact is 370% larger, meaning 570M tons of CO_2 are emitted worldwide every year.

THE IMPACT

RISE Robotics has invented a replacement for hydraulic systems that will enable the next era of fully electrified heavy machinery — one that is at once sustainable, robust, and precise. The startup's core technology is an electrically-powered mechanical linear actuator with all the abilities of a hydraulic cylinder, but vastly improved efficiency and control.

THE BREAKTHROUGH

RISE Robotics discovered that high-strength steel cables in an electrically powered and digitally controlled pulley system offered a powerful combination of efficiency, size, and precision. The materials that make the startup's product possible didn't exist until the early 2000's, and the patented use of the material was invented by RISE.



FOUNDERS & LEADERSHIP	ARRON ACOSTA, BLAKE SESSIONS, TOOMAS SEPP, KYLE DELL'AQUILA
BACKGROUND	MIT
INDUSTRY	ROBOTICS

sync COMPUTING

OPTIMIZING THE RESOURCES AT THE HEART OF EVERY CLOUD COMPUTATION.

THE PROBLEM

The $300B global cloud computing industry is massively inefficient and complex, contributing to tens of billions of dollars of wasted time and electricity a year.

THE IMPACT

Sync Computing has developed a technology that can quickly optimize complex cloud infrastructure for cost and time with a single click. By eliminating the guesswork, cloud applications such as big data analytics, machine learning, and scientific simulations can be instantly and optimally deployed to the cloud, saving companies billions of dollars.

THE BREAKTHROUGH

Sync Computing's core technology, discovered during work in the MIT Lincoln Laboratory, uses a radically new circuit architecture for solving combinatoria optimization problems.

FOUNDERS & LEADERSHIP	JEFF CHOU, SURAJ BRAMHAVAR
BACKGROUND	MIT LINCOLN LAB
INDUSTRY	ADVANCED COMPUTING

THE ROUTING COMPANY

ACCESS TO AFFORDABLE AND CONVENIENT TRANSPORTATION FOR ALL.

THE PROBLEM

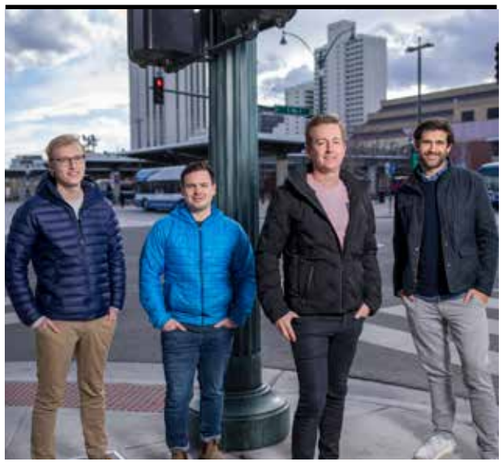
Communities with public transportation hubs may see higher housing costs, driving those who rely on public transit further away from the transit options they need. Trip and wait times are inevitably increased the farther from such hubs one catches a ride. This inefficiency drives adoption of expensive ride sharing services, leading to more traffic congestion and more time on the road for all.

THE IMPACT

The Routing Company is redefining public transit so that it is the most reliable and accessible mobility option. Its optimization platform gives communities of any size, in any place, with any resources, the ability to meet the transportation needs of its people, while reducing traffic congestion.

THE BREAKTHROUGH

Optimization research pioneered at MIT's Computer Science and Artificial Intelligence Laboratory solved the vehicle routing problem at Manhattan scale in less than a second. This was previously thought impossible.



FOUNDERS & LEADERSHIP	JAMES COX, ALEX WALLAR, MENNO VAN DER ZEE, BRADFORD CHURCH, DANIELA RUS, JAVIER ALONSO-MORA
BACKGROUND	MIT, UBER, CANOO
INDUSTRY	AI & ML, TRANSPORTATION

"True technological breakthroughs in foundational areas such as computing, communication, and manufacturing can often move systems and infrastructure into new levels of performance or utility. We look for platform breakthroughs that can also open new doors or even create entirely new industries."

— **REED STURTEVANT,**
General Partner, The Engine

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"The thriving and exciting young companies launched by The Engine are thrilling endorsements of its founding insight: that many promising "tough" technologies need steady, long-term support to bridge the gap between idea and societal impact. Each new founder, collaboration, idea and investment helps bring our dream of an "innovation orchard" to life – and brings the world closer to the kinds of breakthroughs our society needs the most."

— **L. RAFAEL REIF,** President of MIT

Addressing the world's toughest challenges is a complex systems problem, and private capital is just one piece of the solution. The journey from breakthrough technology, to commercialization, to ethical, widespread impact on our economies and societies requires public and private collaboration across all levels of government, industry, academia, and finance.

WE HOPE YOU CAN JOIN US.

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2019 & 2020

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› renewable grid. | Utility-scale renewable energy storage can only deliver power for
r for the grid in 10-15 years. | Energy production is responsible for 25% of all GHG
ermal separations account for 12% of all U.S. energy consumption. | Green steel with
roximately 8% of global CO2 emissions. | Producing chemicals using light to reduce
our world emits massive amounts of CO2. | Lithium extraction with a 99% smaller
The world currently cannot meet the predicted 30X increase in demand for lithium to
nductor technology for more efficient 5G mobile devices, data centers, and electric
e pushed the potential of silicon to its limits. | Developing millimeter wave drilling
the world. | The world cannot transition away from fossil fuels with current
hest diseases. | Diseases like diabetes, heart disease, and Parkinson's claim nearly
ces food spoilage and packaging waste. | About a third of the food produced globally
ible via a shelf-stable patch. | Often, vaccination does not provide a person with
ansport, prepare and administer to people who need them, or both. | Proactively
Many public health problems are identified only after they have spread too far. |
or everyone in the world. | Current testing paradigms for pandemics like COVID-19
ror. | Improving patients' lives through automated cell engineering. | Engineered
eases, but manufacturing them is currently a slow, laborious, and expensive process.
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tect our world. | Remote sensing satellites lack basic connectivity in orbit. We need
. | Changing how we design and construct our world. | The housing industry is in
s, and high demand. | Redefining the possibilities of the world's communication
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“Core to our mission is helping incredible founders, ideas, and companies scale. To create lasting impact for the world, we must reach everyone.”

Katie Rae
CEO & Managing Partner, The Engine