THE EFFICIENT FIFTY
THE LEADING PRIVATE COMPANIES IN INDUSTRIAL AND ENERGY TECHNOLOGY

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Joseph A. Osha, CFA
josh@jmpsecurities.com
415.835.8998

Hilary Cauley, CFA
hcauley@jmpsecurities.com
415.835.8996

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Another year has passed, and this latest edition of the Efficient Fifty finds us seeing robust investment and growth in some places, and slower progress elsewhere. Since the inauguration of the Efficient Fifty three years ago we have focused our company selection process on the concept of making things work more efficiently. This way of thinking is not new – the people who oversaw provisioning of the British Royal Navy more than 200 years ago cared about efficiency. So too did Roman road builders and Egyptian architects. What’s new is the impact that human activity is having on everything from waste in the ocean to reduced freshwater availability to a warmer climate. It has never been more important for the enterprises that make power, manufacture products, and transport goods to undertake those activities as efficiently as possible. This year’s companies are focused on addressing that goal.

The evolution of efficiency technology has been both rapid and uneven. Investment in transportation technology continues, with considerable activity in vehicle electrification, charging infrastructure, and vehicle intelligence. Vehicle intelligence has been the focus of some especially substantial fundraising. Adjacent to transportation is logistics and mapping, with investments in sensor technology and imaging. On the other hand, the pace of technological progress associated with the production and transmission of electricity has been slower, even as declining prices drive growing deployments of wind and solar generation. Our exposure to that area in the Efficient Fifty has declined. Progress in industrial markets is steady, with the best success coming from highly-focused business models.

The 2019 Efficient Fifty reflects all of these developments, as Figure 1 illustrates. Transportation Technology is now its own sector, featuring 11 best-in-class companies addressing a wide range of challenges. The amount of activity here is enormous, and we could fill a book with only transportation-focused companies, but we have endeavored to include only the most differentiated firms. There are a total of 16 companies in Energy Management and Technology, which we have consolidated from two sectors to one. We have seen a lot of progress here but also some challenges. Our Industrial Efficiency exposure at 9 companies is down slightly from last year, while we have added one company to our Food, Water, and Air subsector. Adding sensors to our existing logistics and mapping sector drove some growth, and the new Logistics, Mapping, and Sensor sector includes a total of 11 companies.

Looking at our Transportation Technology sector in a little more detail, we highlight several of the most interesting electric vehicle platforms, including transit bus competitor Proterra, truck developer XOS (previously Thor), and pickup/SUV manufacturer Rivian. We are particularly interested in what we see happening in commercial vehicles. Top vehicle autonomy competitors including Aurora Innovation, Nuro, and Zoox all make the cut, and we once again highlight the fascinating truck platooning platform that Peloton Technology has created. Creating a viable economic model that supports the deployment of charging infrastructure is critical if vehicle electrification is to progress, and we highlight ChargePoint and Volta Charging.
We see a great deal of activity in our broadened Logistics, Mapping, and Sensor category. Investment in sensor technologies has driven growth in LiDAR (Laser Detection And Ranging) and we highlight competitors from Ouster to Innoviz to AEye. To be honest we would expect to see some consolidation, but we believe that large-scale deployment of autonomous vehicles cannot happen without LiDAR. The intersection of orbital and terrestrial imaging technology draws us to firms including Orbital Insight, Planet and Kespry. This year a new addition is flexible warehousing competitor Flexe, which we regard as an innovative solution in a field much in need of efficiency.

Slow change has been a challenge in Energy Management and Technology, and we have made substantial alterations to our selected companies as a result. Gone are many of the distributed energy management companies. We have added several new competitors operating innovative platforms, including LevelTen Energy in commercial energy procurement, Redaptive in efficiency services, Gridium in building energy management and Arcadia Power in consumer engagement. Generate Capital’s infrastructure-as-a-service model has provided an innovative path to financing renewable infrastructure and earns Generate a place on our list. New this year is Uplight, which is the result of a consolidation effort that pulled in Tendril, EnergySavvy, and FirstFuel among others. We continue to include best-in-class technology and service providers in storage and grid sensor technology.

Last year we added an agriculture-focused category, with the objective of identifying efficiency opportunities within food production and distribution. This year we have refined our approach with a broader definition, and our Food, Water, and Air category adds BreezoMeter in air quality measurement. As we did last year, we are featuring Farmers’ Business Network’s unique farmer-centered information and commerce platform, and Apeel Sciences’ technology that enables efficient transportation of produce.

Steady progress is the theme in our Industrial Efficiency category, which includes 9 companies, down from 13 last year. Some broader and more ambitious business models have not worked out, and we’ve pared our selections accordingly. More focused businesses seem to be doing better, and we highlight Element Analytics’ data readiness model, Falkonry’s predictive analytics, and AutoGrid’s power grid expertise. We also include the two industry leaders in smart glass – View and Kinestral – based on our belief that there are huge opportunities for further efficiency gains in commercial buildings.

Each year that we assemble the Efficient Fifty we find ourselves talking to a relatively small group of well-informed investors, and this is reflected in our ranking. DBL Partners and Energy Impact Partners are particularly active, and each are invested in 5 companies within the Efficient Fifty, in line with far larger firms including GE Ventures and Mitsui. We also note a great deal of focus from efficiency-oriented investors including Activate Capital, Obvious Ventures, and G2VP. Given the importance of reducing the impact of human activity on our environment, it is remarkable how much expertise exists within a small group of companies.
This year’s Efficient Fifty companies have raised a total of $9.9 billion since the beginning of 2010, with the biggest year being 2019 at $3.9 billion. Including capital-hungry vehicle technology companies like Zoox and Nuro has had an impact, as have major EV platforms like Proterra and Rivian. Looking at funding activity marketwide, it appears that 2019 may end up showing a decline from 2018, and we think certain sectors, such as LiDAR, may be entering a period of consolidation. We continue to see an appetite for investment in autonomous vehicle platforms as well as platforms in energy procurement.

The mix of larger and smaller companies in this year’s book is comparable to last year, although the number of companies at over $100 million has declined as a result of exits and other factors. We believe that identifying small, high-growth companies is important, which is why we include a few companies just getting to revenue. As a rule, however, we continue to focus the Efficient Fifty on companies that are well into generating revenue, and we note that nine of our highlighted companies are at $50 million or higher.

On the following pages are profiles for each of our Efficient Fifty companies. We hope you enjoy this third edition of the Efficient Fifty. Feel free to contact us, or to request copies of the 2019 Efficient Fifty, at josha@jmpsecurities.com or hcauley@jmpsecurities.com.
FIGURE 1. The Efficient Fifty – Top Private Companies in Industrial and Energy Technology

Source: JMP Securities LLC, Company Disclosures
FIGURE 2. Private Funds Raised by The Efficient Fifty ($m)

Propelled mostly by investments in transportation, 2019 was another big year.

FIGURE 3. Top Funding Activity to Date Within The Efficient Fifty ($m)

View still leads in terms of funds raised, although seven of the top ten companies are transportation-related.
Nine companies are at $50 million or greater revenue, although we note that some profiled companies aren’t disclosing revenue.

Funding has decelerated a bit from last year, although the mix continues to be transportation-heavy.
FIGURE 6. The Most Important Efficient Fifty Investors

DBL Partners, Energy Impact Partners, and Kleiner Perkins lead the field.

Source: JMP Securities LLC, Company Disclosures
AEye

Management
Luis Dussan (Founder, CEO)
Blair LaCorte (President)
Dr. Barry Behnken (Founder, SVP of Engineering)
Ransom Wuller (Founder, CFO)
Dr. Allan Steinhardt (Chief Scientist)
John Stockton (SVP of Operations and Tech Strategy)
Jordan Greene (Founder, Head of Partnerships)

Location
Pleasanton, California

Founded
2013

Revenues
$8M-$10M

Employees
100

Funding Rounds
Series A - $21m
Series B - $40m

Board Members and Advisors
Wen Hsieh
Huang Lee

Key Investors
KPCB
Intel Capital
Airbus Ventures
Aisin
Subaru-SBI

Taiwania
Hella Ventures
LG
SK Hynix
Tyche Partners

Company Description
AEye is the creator of iDAR, a perception system that acts as the eyes and visual cortex for autonomous vehicles. With the use of Dynamic Vixels, an innovative sensor data type that combines pixels from 2D cameras with voxels from LiDAR, AEye is able to give autonomous vehicles the ability to see and perceive like a human driver. This real-time integration allows data to be handled more quickly, efficiently, and accurately at the sensor level rather than being processed at a later point in time. The resulting context allows artificial intelligence to evaluate a scene using 2D, 3D, and 4D information to identify location, track objects, and deliver insights with less latency, bandwidth, and computer power.

Leveraging the unique capabilities of Dynamic Vixel data, AEye’s LiDAR can target and identify objects within 300 meters, 10x to 20x more accurately than a LiDAR-only product at 10x the speed.

Source: Company discussions, I3 connect
AMS

Management
Seyed Madaeni (CEO)
Mark Tholke (Chief Development Officer)
Carlo Woods (CFO)
Jesse Bryson (Global SVP of Market Development)

Location
San Francisco, California

Founded
2012

Revenues
[not disclosed]

Employees
80

Funding Rounds
July 2017 - $34M Series B
July 2016 - $200M Project Financing
July 2015 - $18M Series A

Key Investors
Southern Company
Macquarie Capital
ENGIE
AGL Energy

Energy Impact Partners
GE Ventures
DBL Partners

Board Members and Advisors
Susan Kennedy (Former CEO)
Nancy Pfund
Kevin G. Fitzgerald
Toby Corey
Kelly Warner

Company Description
AMS was formed by a team of energy industry veterans with experience in every aspect of the energy industry, from regulation and finance to technology and analytics. AMS is a SaaS company with a software platform that uses deep learning algorithms to optimize and transact complex energy assets in wholesale markets. AMS’s industry-leading Transactive Energy Management software platform provides its partners with innovative economic optimization services to end-use customers, utilities, asset owners, energy developers, and grid operators.

AMS provides services for developers and owners of behind-the-meter distributed energy resources, front-of-the-meter energy assets, and full portfolios of energy resources. The AMS platform enhances financial returns on all energy asset types by co-optimizing amongst all available value streams, including end-use customer energy bill savings, grid and utility services, and wholesale market participation.

Source: Company discussions
# Apeel Sciences

**Management**
- James Rogers (Founder, CEO)
- Bill Strong (CFO)
- Megan Opp (Chief People Officer)
- Jordan Hudson (VP of Strategy)
- Louis Perez (Co-Founders, VP of Technology)
- Jenny Du (Co-Founder, VP of Operations)
- Erich Klawuhn (VP of Product)
- Jason De Turris (VP of Brand & Marketing)
- Matt Alexander (General Counsel)

**Location**
- Goleta, California

**Founded**
- 2012

**Revenues**
- [not disclosed]

**Employees**
- 200

**Funding Rounds**
- Series A - $5.8M
- Series B - $33M
- Series C - $70M

**Key Investors**
- Andreessen Horowitz
- Viking Global Investors
- Upfront Ventures

**Board Members and Advisors**
- Vijay Pande
- Walter Robb
- Brian Kaufmann
- Yves Sisteron
- Jason Spievak
- James Rogers

**Company Description**
Apeel Sciences is a company that is fighting the global food waste crisis by utilizing nature’s tools to prevent waste in the first place — a sustainable approach to the world’s growing food demands. The company’s plant-derived technology helps USDA Organic Certified and conventional fresh food growers, suppliers, and retailers improve produce quality and extend shelf life, which minimizes food waste from the farm to the retail shelf to the kitchen table. Apeel formulations have been proven effective at reducing the rate of spoilage for dozens of USDA Organic Certified and conventional produce categories, and the company works with partners ranging from smallholder farmers and local organic growers to the world’s largest food brands and retailers.

Founded by CEO James Rogers, Ph.D., Apeel Sciences’ investors include Andreessen Horowitz, Viking Global Investors, Upfront Ventures, S2G Ventures, PowerPlant Ventures, DBL Partners, The Bill & Melinda Gates Foundation, UK Department for International Development, and The Rockefeller Foundation.

*Source: Company discussions*
Arcadia Power

Management
Kiran Bhatraju (Founder, CEO)
Kate Henningsen (COO)
Chris Haines (Head of Product)
Jake Lear (VP, Engineering)

Location
Washington, D.C.

Founded
2014

Revenues
$15M-$25M

Employees
95

Funding Rounds
Series A - $6M
Series B - $25M

Key Investors
G2VP
Energy Impact Partners
ValueAct Capital
Wonder Ventures

Board Members and Advisors
Alex Laskey
Ben Kortlang
Dan Leff
Sameer Reddy

Company Description
Arcadia Power gives both renters and homeowners easy access to renewable energy. The platform integrates with a user’s utility account to monitor how much energy is used, and then matches the customer to more affordable renewable power. The platform is also capable of purchasing renewable energy certificates on the customer’s behalf as necessary. Although Arcadia Power manages the utility account, including payments and transfers, customers are able to monitor energy usage, the billed amount, as well as savings and environmental impact on the company’s dashboard or app. Currently serving over 250K members, Arcadia Power strives not only to drive the transition to clean energy, but to save its customers money in the process. In fact, Smart Rates save households on supply contracts an average of 20% on their energy.

Source: Company discussions
Aurora Innovation

Management
Chris Urmson (Co-founder, CEO)
Drew Bagnell (Co-founder, CTO)
Sterling Anderson (Co-founder, CPO)

Location
Palo Alto, California

Founded
2017

Revenues
[not disclosed]

Employees
500+

Funding Rounds
2019 - $600M
2018 - $90M

Key Investors
Amazon
Greylock Partners
Hyundai
Index Ventures
Sequoia Capital
Shell Ventures
T. Rowe Price

Board Members and Advisors
Chris Urmson
Carl Eschenbach
Ian Smith
Michelangelo Volpi
Reid Hoffman

Company Description
Aurora Innovation is developing a self-driving platform, dubbed the Aurora Driver, which combines hardware, software, and data services to allow vehicles to transport people and goods more safely and efficiently. The Aurora Cloud provides a common interface integrating vehicles powered by the Aurora Driver with passengers and goods, the transportation network, and the fleet-management apparatus that supports the system. Logistic services communicate with the cloud to dispatch and route vehicles between destinations and are able to serve a range of vehicles, including larger platforms, such as delivery trucks. Mobility services request rides from the Aurora Driver over a common API, which is then monitored by the cloud to support the vehicles and occupants once en route.

Source: Company website, i3 Connect, LinkedIn
AutoGrid

Management
Amit Narayan (CEO)
Matthew Lee (CFO)
Quique Schwarz (Chief Data Scientist)
Rajeev Singh (VP of Engineering/Chief Software Architect)
Om Moolchandani (CSO)
Vish Ganti (General Manager, India)

Location
Redwood City, California

Founded
2011

Revenues
$10M-$20M

Employees
115

Funding Rounds
Sept. 2018 - $32M
Oct. 2012 - $9M
May 2016 - $20M
May 2012 - $2.8M
Jan. 2014 - $12.8M

Key Investors
Energy Impact Partners
Envision Ventures
E.ON
ClearSky Power & Technology
Foundation Capital
Stanford University

CLP
innogy
Tenaska
National Grid Ventures
Orsted
Total SA

Board Members and Advisors
Amit Narayan
Austin Bryan
Dan Ahn
Grant Allen
Konrad Augustin
Michael Donnelly

Company Description
AutoGrid’s distributed energy resource (DER) flexibility management software allows utilities, electricity retailers, energy service providers, and owners of large asset portfolios to deliver clean, affordable, and reliable energy. The company’s patented predictive controls technology leverages advanced data science, machine learning, and high-performance computing to predict, control, and optimize all DERs at scale and in real time. AutoGrid has nearly 5,000 megawatts of flexible capacity from distributed generation, storage, and demand response resources under contract. Its solutions help more than 30-35 global energy companies, including National Grid, Florida Power & Light, Eneco, CPS Energy, and NextEra Energy to balance supply and demand, increase grid reliability, integrate renewables, and deliver value-added services to customers. AutoGrid is one of the larger providers of DER flexibility management software in the industry.

Source: Company discussions

Flexibility management supports new utility business models

- Value Streams
  - Wholesale Markets
  - Transmission & Distribution
  - Customer-Sided

- Energy Assets
  - Solar, DG
  - Battery Storage
  - Combined Heat & Power Plants
  - Electric Vehicles
  - Thermostats, Water Heaters
  - HVAC, Lighting
BreezoMeter

Management
Ran Korber (CEO & Co-founder)
Emil Fisher (CTO & Co-founder)
Ziv Lautman (Co-founder)
Ayana Hirt (CFO)

Location
San Francisco, California

Founded
2014

Revenues
$1M - $5M

Employees
50

Funding Rounds
Sept. 2018 - $7.8M
July 2016 - $3.2M
June 2015 - $1.8M

Key Investors
Entrée Capital                       Hella Ventures
Idinvest Partners                   Axess Ventures
Phi Square Holdings                 Goldacre Ventures
Jumpspeed Ventures
Launchpad Digital Health

Board Members and Advisors
Aviad Eyal, Entrée Capital
Martin Rosenbaum, Phi Square
Ran Korber, BreezoMeter
Emil Fisher, BreezoMeter
David Bloom, Goldacre Ventures

Company Description
BreezoMeter provides relevant air quality and pollen data and actionable health recommendations, and is currently available in more than 30 countries, including most of Europe. BreezoMeter has increased the global coverage of air quality data, now available in 83 countries, and added data sources to enrich the coverage already offered. BreezoMeter’s impact is far reaching. Via its partners and customers, BreezoMeter shows people what is in the air they breathe. While some air pollution at high concentrations is visible to the naked eye, many harmful pollutants we are exposed to daily are invisible. A major project undertaken this year has been focused on democratizing air quality data. Via a partnership with search giant Google, BreezoMeter was the source data for its new air quality card, displayed for searches of air quality/pollution in a given location. Air pollution awareness is growing, and BreezoMeter is proud to be at the forefront of progress, helping businesses and cities better engage with their customers and citizens.

Source: Company discussions and website
ChargePoint

Management
Pasquale Romano (CEO & President)
Dave Baxter (Co-founder, VP of Engineering)
Michael Hughes (Chief Commercial & Revenue Officer)
Rex Jackson (CFO)
Colleen Jansen (CMO, SVP - North America Policy)
Christopher Burghardt (Managing Director, Europe)
Eric Sidle (SVP, Engineering)
Lawrence Lee (SVP, Operations and Services)
Bill Loewenthal (SVP, Product)
Jonathan Kaplan (General Counsel)

Location
Campbell, California

Funding Rounds
Nov. 2018 - $240M
Oct. 2013 - $100M
May 2012 - $47.5M
Sept. 2010 - $15M
Feb. 2010 - $14M

Revenues [not disclosed]
Employees [not disclosed]

Key Investors
BMW Ventures
Linse Capital
Siemens
Canada Pension Plan
Daimler
Chevron Technology Ventures

Braemar Energy Ventures
Pho Ventures
Quantum Energy Partners
Clearvision
GIC

Board Members and Advisors
Axel Harries
Jeffrey Harris
Michael Linse
Pasquale Romano
Rick Wagoner

Bruce Chizen
Mark Leschly
Neil S. Suslak
Richard Lowenthal
Roxanne Bowman

Company Description
ChargePoint is the largest electric vehicle (EV) charging network in the world, with charging solutions in locations that EV drivers are likely to use at home, at work or while traveling. With more than 102,200 total charging spots and more than 1,554 Express DC fast spots, ChargePoint is the only charging technology company on the market that provides hardware and software solutions across every use case. Leading EV hardware makers and other partners rely on the ChargePoint network to make charging station details available in mobile apps, online and in navigation systems for popular EVs.

Source: Company discussion and I3 Connect
ecobee

Management
Stuart Lombard (President & CEO)
Scott Cleaver (COO)
David Brennan (CFO)
Jackie Poriadjian-Asch (CMO, CRO)

Location
Toronto, Canada

Founded
2007

Revenues
$100M+

Employees
110

Funding Rounds
May 2018 - $36M
Mar 2018 - $62M
Aug 2016 - $35M

Key Investors
Amazon Alexa Fund                  BDC Capital
Energy Impact Partners             Northleaf Capital
GXP Investments                    Relay Ventures
Thomvest Ventures                  Tech Capital Partners
Ontario Capital Growth Corp.
Export Development Canada
Caisse de dépôt et placement du Québec

Board Members and Advisors
[not disclosed]

Company Description
ecobee is a home automation company focused on saving consumers money, conserving energy, and seamlessly bringing home automation into consumers’ lives. ecobee makes Wi-Fi enabled smart thermostats for residential and commercial applications that save customers in the U.S. up to 23% on their heating and cooling costs. The system is able to pair up to 32 sensors within the home and uses a low-power radio frequency (915Hz) to communicate with the ecobee thermostat for up to two years of battery life. The next-generation smart thermostat ecobee4 comes with Amazon Alexa and far-field voice recognition built in, allowing for hands-free control anywhere in the home.

Source: Company reports and website
## Element Analytics

**Management**
- Andy Bane (CEO)
- Sameer Kalwani (Founder, VP of Product)
- Stephen Walsh (EVP, Sales)
- Sean McCormick (VP, Engineering)
- Cara Hollis (Senior Director of Marketing)

**Location**
- San Francisco, California

**Founded**
- 2015

**Revenues**
- $2M - $10M

**Employees**
- 35

**Funding Rounds**
- Jan 2018 - $15M
- Aug 2016 - $4.5M
- Nov 2015 - $2.5M

**Key Investors**
- Kleiner Perkins Caufield & Byers
- Honeywell Ventures
- GE Ventures
- ABB Technology Ventures
- Mitsui & Co.
- Aster Capital
- Blue Bear Capital

**Board Members and Advisors**
- Andy Bane
- David Mount
- Veery Maxwell

## Company Description
Element Analytics wants to unlock industrial data. The company’s technology enables modern analytics systems to find insights that transform operational performance, which in turn can create hundreds of millions of dollars of value for customers. The Element Platform pulls data from thousands of enterprise sources and automates the creation of millions of data relationships to rapidly build, continuously update, and manage asset twins of industrial equipment. With Element, any person or system can access every reliable data point in the enterprise. The company has invested in building that knowledge in its initial base of energy and industrial customers. Founded in 2015, Element is based in the SoMa district of San Francisco.

*Source: Company discussions*
Enbala

Management
Bud Vos (President & CEO)
James Carr (CFO)
Malcolm Metcalfe (Founder & Chief Research Officer)
Jeff MacAulay (COO)
Trent Bowers (CCO & EVP of Sales)

Location
Vancouver, British Columbia

Founded
2003

Revenues
$5M - $10M

Employees
60

Funding Rounds
April 2019 - $8.8M
May 2017 - $17.5M
Sept. 2015 - $3M
Mar 2015 - $11M

Key Investors
ABB Technology Ventures
National Grid
GE Ventures
Obvious Ventures
EnerTech Capital
Edison Energy Holdings
Export Development Canada (EDC)
Chrysalix Venture Capital

Board Members and Advisors
Bud Vos (President & CEO)
Robert Chiste (Chair, Independent)
Thomas Brady (Independent)
Dr. Cheryl Martin (Independent)
Scott Ungerer (EnerTech Capital)
Andrew Beebe (Obvious Ventures)
Daniel Westerman (National Grid)

Company Description
Enbala Power Networks is focused on making the world's power grids more reliable, efficient and predictable by harnessing the power of distributed energy. Enbala's real-time, energy-balancing platform is transforming energy system operations using a highly flexible approach for creating controllable and dispatchable energy resources. Enbala's platform captures and aggregates available customer loads, energy storage and renewable energy sources to form a network of continuously controlled energy resources. The platform dynamically optimizes and dispatches these resources to respond to the real-time needs of the power system – all without impacting customer operations.

Source: Company discussions
**EnergySage**

**Management**
Vikram Aggarwal (Founder and CEO)
Jamie Biggar (CTO, VP Engineering)
John Gingrich (SVP, New Business Development)
Georg Bettenhauser (VP, Sales & Supplier Partnerships)
Tess O’Brien (VP, Strategic Partnerships)
Philip Gross (VP, Product)

**Location**
Boston, Massachusetts

**Founded**
2012

**Revenues**
$250M [GMV]

**Employees**
35

**Funding Rounds**
- Apr 2018 - $2.7M
- May 2016 - $1.4M
- Sept 2014 - $1.5M
- July 2013 - $0.4M

**Key Investors**
- Clean Energy Venture Group
- Launchpad Venture Group
- Massachusetts Clean Energy Center

**Board Members and Advisors**
- Gail Greenwald
- Kathryn Elmes
- Robert Gervis
- Vikram Aggarwal

**Company Description**
EnergySage is focused on providing a straightforward online marketplace for prospective residential solar customers to understand and compare different offerings. The company’s platform allows users to research different offerings and receive quotes from EnergySage’s network of pre-screened installers. Given the numerous considerations surrounding not only the solar power equipment itself, but also the available financing options, there is considerable value in being able to compare different proposals in a uniform way.

As a result of its unique position, EnergySage collects 2 to 3 million data points per day regarding the market dynamics of the U.S. solar industry. The data, available on the company’s website, is frequently used by government agencies, non-profits, journalists, universities, and investors and offers insights into the broader U.S. solar market.

CEO and founder Vikram Aggarwal founded EnergySage following a 15-year career at Fidelity Investments, where he specialized in private equity investments. He brings a substantial breadth of experience in financial markets to EnergySage.

*Source: Company discussions*
Eos Energy Storage

**Management**
Joe Mastrangelo (CEO)
Mack Treece (CFO)
Jeff Nelson, PhD (Director of R&D)
Daniel Friberg (SVP -- Engineering)
Parth Day, PhD (SVP -- Supply Chain)
Philippe Bouchard (SVP, Development & Marketing)
Jeffrey Wiener (SVP, Sales)

**Location**
Edison, New Jersey

**Founded**
2007

**Revenues**
[not disclosed]

**Employees**
60

**Funding Rounds**
- Oct. 2016 - $52M
- May 2015 - $23M
- Jan. 2015 - $15M
- Dec. 2014 - 2.1M
- Nov. 2014 - $2.5M

**Key Investors**
AltEnergy LLC
NRG Energy
Fisher Brothers
Yorktown Partners

**Board Members and Advisors**
Russell Stidolph (Chairman)
Jim Hughes

**Company Description**
Eos Energy Storage is focused on providing safe, reliable, and cost-effective energy storage solutions. The company’s energy storage technology uses zinc hybrid cathode materials and a water-based electrolyte to deliver cost-effective energy storage and reliability that Eos believes can compete with lithium-ion based solutions. Products are focused on grid-scale storage, and the company reports that it has been able to hit a $160/kWh cost point with its DC battery system. Having recently announced a multi-gigawatt manufacturing JV in Pittsburgh, EOS has secured the necessary footprint to scale.

*Source: Company discussions*
Falkonry

Management
Nikunj Mehta (Founder & CEO)
Dan Kearns (CTO)
Greg Olsen, Ph.D. (SVP, Product)
Crick Waters (SVP, Customer Success)
Sanket Amberkar (SVP, Marketing & Partnerships)

Location
Sunnyvale, California

Founded
2012

Revenues
(not disclosed)

Employees
50

Funding Rounds
June 2018 - $5.5M
Feb. 2017 - $5.3M

Key Investors
Polaris Ventures Start Smart Labs
Zetta Venture Partners Basis Set Ventures
Presidio Ventures Fortive Corporation

Board Members and Advisors
Nikunj Mehta (Founder & CEO)
Parveen Jain
Mark Gorenberg

Company Description
Falkonry’s technology is enabling process engineers to identify early indications of potential downtime, quality problems, and yield declines by recognizing patterns in real-time data. Using Falkonry, industrial leaders are improving their operations by utilizing predictive analytics at commercial scale. The company has invested heavily in its user-ready AI interface for condition discovery and recognition. Falkonry’s interface can use any existing time series data, automatically extract pattern features from the data, and learn to distinguish unique patterns. It then presents its findings as an intuitive timeline to business users and obtains user-defined condition labels, resulting in millions of dollars in saved operating costs.

Source: Company discussions
Farmers Business Network

Management
Amol Deshpande (CEO, Co-founder)
Charles Baron (VP of Product, Co-founder)
Kelby Kleinsasser (VP of Operations)
Maria Olide (CFO)
Ed Rowe (VP of Engineering)
Eric Carnell (General Counsel)

Location
San Carlos, California

Founded
2014

Revenues
$100M-$200M

Employees
300+

Funding Rounds
Nov. 2017 - $110M
Mar. 2017 - $40M
Oct. 2016 - $20M

Board Members and Advisors
Gareth Asten
Andy Wheeler
Nancy Pfund
Randy Komisar

Key Investors
Kleiner Perkins Caufield & Byers
DBL
Google Ventures
Bow Capital
Acre Venture
T. Rowe Price
Temasek

Company Description
Farmers Business Network, Inc. is an independent farmer-to-farmer network. Built by and for farmers, the FBN network allows farmers to share information and enables powerful insights in order to help farmers make the best decisions for their land and profits. FBN members receive comprehensive farm benchmarking, real-world seed performance analysis and field-seed matching, data mapping, and pricing analytics based on over 95 million acre events of real-world precision agronomic data. The FBN Direct platform connects farmers to manufacturer-direct, national, and transparent pricing on ag chemicals, fertilizers, seeds, technology and services. The FBN network has grown to thousands of farms, from 38 states, across more than 14 million acres. Farmers Business Network, Inc. has offices in San Carlos, CA, Geneseo, IL, and a National Operations Center in Sioux Falls, SD.

Farmers Business Network, Inc. blends the best of Midwestern agricultural roots and Silicon Valley technology as a completely independent company representing “Farmers First”. The Farmers Business Network, Inc. mission of democratizing farm information has earned the support of world-class technology investors GV, DBL Partners LLP, Kleiner Perkins Caufield Byers LLP, Bow Capital, Acre Venture Partners, T. Rowe Price, and Temasek.

Source: Company discussions

How It Works
Farmers Business Network® is an independent network of thousands of America’s most advanced farmers.

Agronomic Intelligence
Access farmers’ most advanced analytics driven by the combined intelligence of millions of acres.

Smarter Buying
Cut the bull. Save thousands of dollars with FBN® Direct’s manufacturer-direct input prices & radical price transparency.

Profitable Marketing
Get new opportunities to sell your crop and always know when you are in the money.
FLEXE

Management
Karl Siebrecht (Co-founder, CEO)
David Glick (CTO)
Deirdre Runnette (Chief People Officer & General Counsel)

Location
Seattle, Washington

Founded
2013

Revenues
[not disclosed]

Employees
135

Funding Rounds
Series A - $15M
Series B - $43M

Key Investors
Redpoint Ventures
Madrona Venture Group
Prologis Ventures
Tiger Global Management
Activate Capital

Board Members and Advisors
Karl Siebrecht (Co-founder, CEO)
Edmond Yue (Co-founder)
Francis Duong (Co-founder)
Raj Atluru
Ryan Sarver

Company Description
FLEXE is a leader in on-demand warehousing, helping forward-looking brands create structural flexibility across their warehouse and fulfillment networks. With the use of the FLEXE platform, which spans across 1,100+ warehouses, and a team of logistic experts, retailers and brands use FLEXE to create dynamic e-commerce fulfillment networks and resolve warehouse capacity constraints while paying only for the capacity and services used. As a result, customers benefit from lower transportation and logistic costs and greater product distribution. Serving household names such as Wallmart, Ace Hardware and Staples, FLEXE’s scalable solution is also uniquely tailored to serving earlier-stage, venture-backed e-commerce companies, with examples including Casper and Cargo.

Source: Company discussions
Generate Capital

**Management**
Scott Jacobs (Co-founder, CEO)
Jigar Shah (Co-founder, President)
Matan Friedman (Co-founder, CIO)
Jack Stark (CFO)
Jeff Ross (Managing Director)

**Key Investors**
Alaska Permanent Fund Corporation

**Location**
San Francisco, California

**Founded**
2014

**Revenues**
$1B in Total Asset Value

**Employees**
50

**Funding Rounds**
2017 - $200M

**Board Members**
Scott Jacobs (Co-founder, CEO)
Jigar Shah (Co-founder, President)
Matan Friedman (Co-founder, CIO)
Richard Kauffman (Chairman)
Raj Atluru
Jared Brimberry
Jeff Colin
Jason Fish
Lynn Jurich

**Company Description**
Generate Capital is an investment and operating platform leading the nation’s infrastructure transition, and the only one-stop shop for sustainable infrastructure pioneers. Partnering with leading project developers and technology companies, Generate has established market leadership in many emerging infrastructure classes, including behind-the-meter battery storage, residential community solar, organic waste management, and alternative powered transportation and material handling fleets. As a diversified infrastructure company with operations in power, waste & water, and transport, Generate is built from the ground up to help its partners succeed and scale by providing different types of capital and services to grow emerging asset classes in infrastructure. The company has more than 20 origination partners and $1 billion of assets.

*Source: Company discussions*
Greenwave Systems

Management
Martin Manniche (Co-founder, CEO)
Christos Lagomichos (COO)
Siddhartha Dattagupta (CTO)
Peter Wilmar Christensen (Co-founder, CFO, GM EMEA)
Eskild Hansen (Chief Design Officer)

Location
Irving, California

Founded
2008

Revenues
$100M+

Employees
325

Funding Rounds
Series C - $45M
Series B - $19M
Series A - $12M

Key Investors
EDBI
The Westly Group
E.ON
Singapore Technologies Telemedia
Craton Equity Partners

Board Members and Advisors
Martin Manniche
Peter Wilmar Christensen
Stephen Miller
Nikhil Eapen
Paul Ng
Romulo Pontual
Kevin Wall
Steve Westly

Company Description
Greenwave Systems has created a solution that allows people and the machines they use to connect easily, quickly, and safely. The company’s AXON platform supports a wide range of Internet-of-Things and Machine-to-Machine architectures, with a particular focus on eliminating the challenges that arise from working with different hardware protocols and services. Modular in design and built with security in mind, the AXON platform can be scaled and adapted as the number of connected devices and standards continues to proliferate. Greenwave has established relationships with major OEMs and component suppliers including Qualcomm, IBM, Broadcom and Verizon.

Source: Company discussions
Gridium

Management
Adam Stein (President, Co-founder)
Tom Arnold (CEO, Co-founder)

Location
Menlo Park, California

Founded
2012

Revenues
$2M-$5M

Employees
20

Funding Rounds
Series A - $3.9M

Key Investors
Navitas Capital
Arafura Ventures

Board Members and Advisors
Adam Stein
Tom Arnold
Travis Putnam
Sheeraz Haji (Advisor)

Company Description
Gridium has developed a software solution that can improve building operations, lower energy use and costs, and streamline maintenance communication via an easy-to-use mobile and desktop application. Currently serving over 1,500 commercial buildings spanning 200 million square feet, Gridium works with staff, occupants, and vendors to boost service levels and transparency with the use of its market-leading software for operational analytics and data-driven sustainability. More recently, Gridium announced its new Gridium Alpha unit that is intended to bring costless upgrades to Gridium buildings.

Source: Company discussions
Innoviz

Management
Omer Keilaf (Co-founder, CEO)
Oren Rosenzweig (Co-founder, CBO)
Oren Buskila (Co-founder, Chief R&D Officer)
Amit Steinberg (Co-founder, CTO)
David Elooz (Chief Photonics Officer)
Eldar Cegla (CFO)
Ronen Lovingir (COO)

Location
Rosh Ha'Ayin, Israel

Founded
2016

Revenues
$10M-$25M

Employees
280+

Funding Rounds
2019 - $170M
2017 - $73M
2016 - $9M

Key Investors
SoftBank
Samsung Ventures
SK
China Merchants Capital
Shenzhen Capital Group
New Alliance Capital

Board Members and Advisors
Zohar Zisapel (Co-founder, Chairman)
Emanuel Timor
Ran Achituv

Company Description
Innoviz is a leading manufacturer of high-performance, solid-state LiDAR sensors and perception software that enable mass deployment of autonomous vehicles. The company is supported by tier-one strategic partners, including Magna and Samsung, and plans to introduce its products in BMW vehicles beginning in 2021. Launched in 2017, InnovizPro is a solid-state LiDAR that offers outstanding performance and value for automotive and other applications. InnovizOne is an automotive-grade LiDAR sensor that provides superior 3D sensing for Level 3 to Level 5 autonomous driving.

Source: Company reports, i3connect, Crunchbase
Innowatts

Management
Siddhartha Sachdeva (Co-founder, CEO)
Akhlak Ahmed (Co-founder)
Krishnan Kasiviswanathan (COO)
Eric Danziger (CRO)
Jason Davis (CFO)
David Boundy (CTO, GM - Europe)

Location
Houston, Texas

Founded
2013

Revenues
$20M

Employees
70

Funding Rounds
2019 - $38M
2017 - $6M

Key Investors
Energy Impact Partners
Shell Ventures
Iberdrola Ventures
Energy & Environment Investment
PERSEO
Veronorte

Board Members and Advisors
Siddhartha Sachdeva
Diego Diaz
Rebecca Klein, JD

Company Description
Innowatts is a leading provider of AMI-enabled, predictive analytics and AI-based solutions for utilities, energy retailers and smart energy communities. With the combination of active data from utility smart meters and a wide array of internal and external variables, Innowatts is able to create disaggregated views of customer consumption without the need for additional investments in sub-metering or device-level monitoring. As a result, the system is able to produce highly accurate and time-tested predictive models that can be applied across a wide range of geographic, climatic, operating and regulatory environments. The system currently spans over 21+ million energy consumers and results in up to a 30% reduction in the cost of energy across the energy value chain, while also providing a more reliable and personalized energy experience.

Source: Company reports, i3connect, Crunchbase
INRIX

Management
Bryan Mistele (Founder & CEO)
Joseph Berry (CRO, Automotive)
Madhu Jagannathan (CFO)
Mark Daymond (CTO)
Rose Fechko (CMO)
Scott Sedlik (CRO, Public Sector)
Kristin Lindsay (General Counsel)

Location
Kirkland, Washington

Funding Rounds
2005 - $6.1M
2006 - $10M
2007 - $15M
2011 - $37M
2015 - $36M

Founded
2005

Revenues
$80M - $120M

Employees
350

Key Investors
August Capital
Bain Capital
Venrock
Kleiner Perkins Caufield & Byers
Porsche SE
Intel Capital

Board Members and Advisors
Ajay Agarwal
Brian Ascher
Bryan Mistele
Diane Irvine
John Johnston
Philip Von Hoggen
Kendra Vandermeulen
Mike Gerling
Tony Posawatz

Company Description
INRIX is a provider of connected car services and transportation analytics. The company leverages data from a wide variety of public and private sources in order to enable services including connected vehicles, parking management, dynamic data for city planning and traffic flow optimization. Of particular interest is the ability the INRIX platform offers to identify and alleviate traffic hotspots, a growing problem in urban environments. More recently, INRIX expanded its offering to include solutions for automakers and transportation agencies to aid in the successful deployment of autonomous vehicles. The company’s customers include automakers, governments, mobile communications network operators, and a variety of other enterprises.

Source: Company discussions
K2 Energy

Management
Robert Horito (CEO & President)
Dr. James Hodge (Co-founder, CTO)
David Hu (CFO)
Eric Villarreal (VP, Operations and Technical Sales)
Arsen Khousnoutdinov (BDO)

Location
Henderson, Nevada

Founded
2006

Revenues
$25M - $50M

Employees
41-50

Funding Rounds
2018 - $1.2M

Key Investors
[not applicable]

Board Members and Advisors
[not disclosed]

Company Description
K2 Energy’s lithium-ion battery technology delivers high power and energy density without compromising safety. K2’s cell technology experiences no thermal runaway, has low capacity loss and impedance growth, is lightweight and up to a third of the size of conventional lead acid batteries. It can be cycled to 100% depth of discharge allowing cells, batteries and systems to meet, or often exceed, energy needs and potentially avoid the need for redundant capacity. K2’s battery technology improves power and energy at extreme temperatures and can exceed the performance of other traditional lithium chemistries by up to 2-3x, potentially reducing or eliminating the need for thermal management while reducing total cost of ownership with improved calendar and cycle life.

Source: Company website and reports, i3 Connect
# Kespry

## Management
- George Mathew (Chairman and CEO)
- Jeff Palmer (President)
- Kirk Marple (CTO)
- Langley Eide (COO, CFO)

## Location
- Menlo Park, California

## Founded
- 2013

## Revenues
- $10M - $15M

## Employees
- 70

## Funding Rounds
- Nov. 2017 - $33M
- June 2016 - $16M
- Oct. 2014 - $10M

## Key Investors
- DCM Ventures
- Lightspeed Venture Partners
- G2VP
- Shell Technology Ventures
- Cisco Investments
- ABB Ventures

## Board Members and Advisors
- David Mount
- Jason Krikorian
- John Vrionis
- Langley Eide

## Company Description
Kespry’s drone-based aerial intelligence platform provides critical information and analytics to customers under a 'bring-your-own-drone' model as the company transitions to being more of a processing platform than a drone manufacturer. The fully-integrated, end-to-end, cloud-enabled platform delivers highly accurate imaging to customers at a fraction of the cost and time required by traditional solutions. Important target markets include mining and resource management, as well as catastrophe response and insurance claim processing. Customers include Farmers Insurance, Hancock Claims Consultants, Catastrophe Response Unit (CRU), Fluor, Lehigh Hanson/Heidelberg, Sully-Miller/Colas USA, and Webcor.

*Source: Company discussions*
Kinestral

Management
S.B. Cha, Ph.D. (CEO)
Howard Turner, Ph.D. (Co-founder, CTO)
Sam Bergh, Ph.D. (Co-founder, COO)
Ian Chao (President, Kinestral Taiwan)
Anna Brunelle (CFO)
Alok Gupta (Chief Strategy Officer)
Paul Nagel (Chief Product Development Officer)

Location
Hayward, California

Founded
2010

Revenues
[not disclosed]

Employees
400+

Funding Rounds
Series A $23M
Series B $30M
Series C $94M
Series D $118M

Board Members and Advisors
Samuel Colella
Dipender Saluja
Scott Rocklage
Bruce Sohn
Moohwan Kim
Jung Hoon Lee

Key Investors
5AM Ventures
AGC
Alexandria Venture Investments, LLC
Capricorn Investment Group
Katerra, Inc.
SK Holdings Co., Ltd.
Versant Ventures

Company Description
Kinestral is a leader in smart glass tinting technology, offering superior functionality, appearance, and user experience. Currently focused on commercial windows, the technology is broadly applicable across materials and has strong use cases spanning across numerous end markets, including construction, transportation, and wearables. Rather than looking to deliver complete windows, Kinestral is focused on integrating with building product manufacturing and distribution ecosystems. Currently installed in 14 countries around the world, Kinestral’s solution has positioned itself to scale rapidly. The company’s proprietary manufacturing process supports best-in-class yields and a powerful go-to-market strategy via strategic partnerships with large, global industry participants that should facilitate rapid adoption around the globe.

Source: Company discussions
LevelTen Energy

Management
Bryce Smith (Founder, CEO)
Eric Snyder (CTO)
Vicky Eriksson (Chief of Staff)
Rob Collier (VP, Developer Relations)
Chris Watmore (VP, Analytics)
Andrew Bishop (Product Director)
Jason Tundermann (VP, Business Development)
Jason Mortimer (VP, Sales)

Location
Seattle, Washington

Founded
2016

Revenues
[not disclosed]

Employees
30+

Funding Rounds
2019 - $20.5M
2017 - $6.8M

Key Investors
Prelude Ventures
Techstars 2014 Ventures

Board Members and Advisors
Bryce Smith (Founder & CEO)
Tim Woodward
David Cohen
Satbir Khanuja

Company Description
LevelTen Energy is the leading global renewable energy marketplace and procurement platform. The company's mission is to expand the market for renewable energy by facilitating frictionless clean energy procurement for corporate and other large energy buyers. The LevelTen Marketplace, a comprehensive database of nearly every clean energy project under development in North America, makes it easier for companies of all sizes to meet their renewable energy goals through power purchase agreements (PPAs). The company has also developed the LevelTen Dynamic Matching Engine, which uses proprietary algorithms to process all of that information to match buyers and sellers in optimal ways. In addition, the company has re-engineered the procurement process from end to end, using software to make components like RFP solicitation and PPA performance monitoring more efficient.

To date, Fortune 500 companies have procured more than $1 billion of renewable energy through the LevelTen Energy platform. LevelTen also facilitated a groundbreaking aggregated procurement deal with Bloomberg, Cox Enterprises, Gap Inc., Salesforce and Workday. Founded in 2016, LevelTen is located in Seattle, Washington, USA.

Source: Company discussions
Lumotive

Management
Bill Colleran, Ph.D. (Founder & CEO)
Gleb Akselrod, Ph.D. (Founder, CTO)
Axel Fuchs (VP - Business Development)

Location
Bellevue, Washington

Founded
2018

Revenues
Pre-revenue

Employees
18

Funding Rounds
[not disclosed]

Key Investors
Bill Gates
Intellectual Ventures

Board Members and Advisors
Bill Colleran
Gleb Akselrod
Conrad Burke

Company Description
Lumotive is developing a solid-state LiDAR device for the automotive industry based on beam-steering technology. By leveraging semiconductor devices designed using metamaterials principles, the LiDAR unit is able to achieve an unprecedented combination of high performance and low cost. Unlike a traditional LiDAR system, Lumotive has developed a revolutionary beam steering technology called a liquid crystal metasurface, as opposed to a mechanical device, which enables a truly solid-state system. The approach should allow for rapid and precise beam steering at a commercially viable price point.

Source: Company reports and discussions
Nikola

Management
Trevor Milton (Founder, CEO)
Mark Russell (President)
Kim Brady (CFO)

Location
Pheoniz, Arizona

Founded
2015

Revenues
[Not disclosed]

Employees
200

Funding Rounds
Series D - $265M
Series C - $214M
Series B - $44.0M
Series A - $14.7M

Key Investors
CNH Industrial
Bosch
Hanwha
Worthington Industries
ValueAct

Board Members and Advisors
[not disclosed]

Company Description
Nikola Motor Co. is a pioneer in electrified powertrain solutions for the heavy-duty truck market. Nikola's product offering includes battery-electric ("BEV") and hydrogen-electric ("FCEV") solutions. In addition to manufacturing zero-emission class 8 trucks, the company is also developing a network of hydrogen fueling stations in order to meet hydrogen fuel demand for its FCEV customers.

Nikola's BEV trucks will be sold directly to customers. However, in regard to FCEV trucks, Nikola plans to offer an industry-first "bundle lease" where customers receive the FCEV truck, H2 fuel, and maintenance based on a fixed rate per mile, allowing operators to have excellent insight into total cost of ownership. To date, the company's existing order book reflects more than 14,000 FCEV truck pre-orders, representing approximately $10B of revenue.

Source: Company reports and discussion
Nuro

Management
Dave Ferguson (Co-founder, CEO)
Jiajun Zhu (Co-founder)

Location
Mountain View, California

Founded
2016

Revenues
[not disclosed]

Employees
350+

Funding Rounds
2019 - $940M
2018 - $92M

Key Investors
SoftBank
Greylock Partners

Board Members and Advisors
[not disclosed]

Company Description
Nuro is working to develop and operate a fleet of self-driving vehicles that deliver local goods, helping merchants get products to their customers quickly, affordably, and safely. Led by world-renowned experts in robotics, artificial intelligence, computer vision, and product design, Nuro has been providing driverless deliveries to the general public since 2018. Currently partnered with Kroger in Houston, Texas, following a successful pilot program in Scottsdale, Arizona, Nuro allows customers are able to shop for groceries from any computer or smartphone, and have them delivered the same day for just a small fee.

Source: Company Website, I3 Connect, Linkedin
Orbital Insight

Management
Dr. James Crawford (Founder & CEO)
Kevin O’Brien (CBO)
AJ DeRosa (CRO)
Jim Cook (CFO)

Location
Palo Alto, California

Founded
2013

Revenues
[not disclosed]

Employees
130

Funding Rounds
May 2017 - $50M
June 2016 - $15M
March 2015 - $8.7M
February 2014 - $1.5M

Key Investors
Sequoia Capital
Intellectus Partners, LLC
Lux Capital
Clearvision Ventures
Geodesic Capital
Balyasny Asset Management

Board Members and Advisors
Michael Coles
George Hoyem
William Coughran
David J. La Placa

Company Description
Orbital Insight leverages artificial intelligence and computer vision to analyze petabytes of multi-source geospatial data, including satellite and synthetic aperture radar (SAR) imagery, location intelligence, and vessel traffic (AIS) data, in order to help clients understand what is happening on and to the Earth. By monitoring the world’s geopolitical and economic activities with unprecedented timeliness, Orbital Insight provides the best possible information to inform an organization’s revenue, operations, and policies.

Source: Company Discussion
OSIsoft

Management
Dr. J. Patrick Kennedy (Founder & CEO)
Bob Guilbault (COO)
Michael Siemer (President)
Richard Beeson (CTO)

Location
San Leandro, California

Founded
1980

Revenues
$450M-$500M

Employees
1,350

Funding Rounds
Oct. 2011 - $3.3M
Jan. 2011 - $135M

Key Investors
SoftBank Vision Fund
Mitsui & Co.

Board Members and Advisors
Jenny Linton        Dr. J. Patrick Kennedy
Eric Streed       Virginia Smith
Patricia Kennedy

Company Description
OSIsoft has developed and marketed a broad-based solution for aggregating and managing data from a wide variety of operating environments and application-specific software providers. The platform, dubbed the PI System, captures and structures data from operational equipment—sensors, power supplies, manufacturing tools, even large structures like ships—and serves it up in a coherent manner that allows customers to boost production, save money, improve safety, or conduct analytics. Importantly, PI provides an interface between the highly fragmented operating environment and the more limited number of large data management environments that customers often want to work with. The platform’s value extends from simple data aggregation to more powerful uses, including predictive failure analytics and operational modeling.

Source: Company discussions
Ouster

Management
Angus Pacala (Co-founder, CEO)
Mark Frichtl (Co-founder, CTO)
Darien Spencer (VP, Operations)
Myra Pasek (General Counsel)

Location
San Francisco, California

Founded
2016

Revenues
$10M - $25M

Employees
150+

Funding Rounds
2017 - $27M
2019 - $60M

Key Investors
Amity Ventures
Carthona Capital
Cox Enterprises
Fontinalis Partners
Tao Capital Partners

Board Members
Angus Pacala (Co-founder, CEO)
Mark Frichtl (Co-founder, CTO)
Susan Heystee
Zach Frankel
Isaac Pritzker
David Blau

Company Description
Ouster is developing a spinning LiDAR technology that utilizes a high level of integration, which allows for smaller, less expensive, more robust sensors. The company’s OS-1 sensor is intended for robotic and industrial applications and the OS-2 sensor is intended for the automotive market. The OS-2 sensor offers 240m range and is designed to withstand the stress of real-world shocks, vibrations, and ingress that supporting highway-speed, autonomous driving will entail. In targeting roughly 50% of its business at non-automotive applications, Ouster’s differentiated go-to-market strategy should help the company gain share as those applications involve a shorter time to market as compared to automotive. In recent months, Ouster has signed contracts with NVIDIA and for Postmates’ delivery rover.

Source: Company discussions
Peloton Technology

**Management**
Steve Boyd (Co-founder, CEO)
Dr. Josh Switkes (Co-founder, Chief Architect)
Dave Lyons (Co-founder, CIO)
Chris Gerdes (Co-founder, Board Member)

**Location**
Mountain View, California

**Founded**
2011

**Revenues**
< $1M

**Employees**
67

**Funding Rounds**
Series B - $60M
Series A - $17M

**Board Members and Advisors**
Dr. Lawrence Burns
Imran Kizilbash
Mark Lydon
Ken Arnold
Chris Gerdes

**Key Investors**
Omnitracs
DENSO
Volvo Group
Schlumberger
Nokia Growth Partners
BP Ventures
Intel Capital
Mitsui USA
B37 Ventures
Lockheed Martin
Birchmere Ventures
UPS Strategic Enterprise Fund

**Company Description**
Peloton Technology is a connected and automated vehicle technology company dedicated to improving the safety and efficiency of U.S. and global freight transportation. Peloton offers its technology in cooperation with truck manufacturers, and the requisite hardware and software will be installed on new trucks and integrated with the trucks’ existing throttle, braking and other vehicle control systems. The company works closely with Bendix, a large supplier of braking systems to class 8 truck manufacturers. Peloton is also working with several North American truck OEMs, including close collaboration with Peterbilt, Kenworth and Volvo Trucks.

Peloton’s driver-assisting truck platooning technology, PlatoonPro, integrates throttle and braking control, radar, external sensors, active truck safety systems, and vehicle-to-vehicle communication to allow two Peloton-equipped trucks to travel closer together in order to boost fuel efficiency. PlatoonPro enables safe aerodynamic drafting resulting in ~7% fuel savings across the pair of trucks while maintaining a constant gap between the trucks. Peloton’s new highly automated trucking solution, AutoFollow, connects a fully-automated follow truck with a driver-controlled lead truck to platoon. Robust electronic vehicle-to-vehicle (V2V) communications between the trucks allow the human-driven lead truck to guide the steering, acceleration, and braking of the follow truck. AutoFollow will leverage the skills and experience of a professional driver to reduce many of the technical challenges associated with designing and deploying standalone highly automated trucking technologies.

Source: Company discussion and website
Planet

Management
Will Marshall (Co-founder & CEO)
Robbie Schingler (Co-founder & CSO)
Nathan Dickerman (CCO)
Laura Malinasky (Chief Legal and People Officer)

Location
San Francisco, California

Founded
2010

Revenues
[not disclosed]

Employees
450

Funding Rounds
~$400M Raised to date

Key Investors
Founders Fund
Yuri Milner
First Round Capital
Data Collective
Innovation Endeavors
Draper Fisher Jurvetson
AME Cloud Ventures
Capricorn Investment Group
Industry Ventures
O'Reilly AlphaTech Ventures
Felicis Ventures
Lux Capital
Obvious Ventures
Western Technology Investment
Google
International Finance Corporation (IFC)

Board Members and Advisors
Will Marshall (Co-founder, CEO)
Robbie Schingler (Co-founder, CSO)
Heidi Roizen
Zachary Bogue
Ann Mather
Carl Bass

Company Description
Planet is the leading provider of global, near-daily satellite imagery data and insights. Planet is driven by a mission to image all of Earth’s landmass every day, and make global change visible, accessible and actionable. Founded in 2010 by three NASA scientists, Planet designs, builds, and operates the largest fleet of satellites, as well as online software, tools and analytics needed to deliver data to users. Decision makers in business, government, and within organizations can use Planet's data and machine learning-powered analytics to develop new technologies, drive revenue, power research, and make informed, timely decisions to solve the world's toughest challenges.

Source: Company discussions
Proterra

Management
Ryan Popple (President & Chief Executive Officer)
Amy Ard (Chief Financial Officer)
Josh Ensign (Chief Operating Officer)
Matt Horton (Chief Commercial Officer)
JoAnn Covington (Chief Legal Officer)

Location
Burlingame, California

Founded
2004

Revenues
$150M - $250M

Employees
~500

Funding Rounds
Aug. 2019 - $75M
Sep. 2018 - $155M
June 2017 - $55M
Jan. 2017 - $140M

Key Investors
Kleiner Perkins Caufield & Byers
G2VP
Daimler
General Motors Ventures
Generation Investment Management
Constellation Technology Ventures
Edison International
BMW i Ventures
Tao Capital
88 Green Ventures
Mitsui
Obvious Ventures

Board Members
Jack Allen (Chairman)
Ryan Popple
Michael Smith
Jennifer Granholm
Brook Porter
Jochen Götz
Jeannine Sargent
Constance Skidmore

Company Description
Proterra designs and manufactures zero-emission, heavy-duty vehicles, enabling bus fleet operators to significantly reduce operating costs while delivering clean, quiet transportation to local communities across the U.S. The company has sold over 700 vehicles to 90 different municipal, university, airport, and federal and commercial transit agencies in 41 U.S. states and Canadian provinces. Proterra’s configurable Catalyst platform is capable of serving the full daily mileage needs of nearly every U.S. transit route on a single charge. With unmatched durability and energy efficiency based on rigorous U.S. certification testing, Proterra’s products are designed, engineered, and manufactured in America, with offices in Silicon Valley, South Carolina, and Los Angeles.

Source: Company discussions and website
# Quanergy

**Management**  
Louay Eldada (Co-founder, CEO)  
Tianyue Yu (Co-founder, CTO)  
Patrick Archambault (CFO)  
Enzo Signore (CMO)  
Gary Saunders (CRO)

**Location**  
Sunnyvale, California

**Founded**  
2012

**Revenues**  
[not disclosed]

**Employees**  
120

**Funding Rounds**  
2018 - $45M  
2016 - $90M  
2014 - $34.5M

**Key Investors**  
Rising Tide Fund  
Samsung Ventures  
Motus Ventures  
GP Capital  
Delphi Automotive  
Sensata Technologies

**Board Members**  
Kevin Kennedy (Chairman)  
Karen Francis

**Company Description**  
Quanergy is a leading provider of LiDAR sensors and perception software for real-time capture and processing of 3D spatial data and object detection, identification, classification, and tracking. Differentiated relative to its peers, Quanergy is focused on using optical phased-array technology to create the same scanning effect that mechanically steered lasers do and has successfully established key partnerships with automotive OEMs including Mercedes-Benz and Jaguar. In addition to the automotive market, Quanergy's offering is applicable across several other use cases including security, industrial automation, 3D mapping, mining, agriculture, drones and robotics, among others, resulting in improved safety, efficiency, and quality of life.

*Source: Company website, i3 Connect*
Redaptive

Management
Arvin Vohra (Co-founder, Co-CEO)
John Rhow (Co-founder, Co-CEO)
Joel Ullmann (CMO)
Matt Gembrin (CFO)
Ricky Singh (COO)
Ron Westhauser (Chief Engineering & Data Officer)
Ryan Martineau (Co-founder, EVP - Sales)
John Schinter (EVP, Client Solutions)

Location
San Francisco, California

Founded
2013

Revenues
[not disclosed]

Employees
80+

Funding Rounds
Series A - $25M

Key Investors
CBRE
ENGIE New Ventures
Evergy Ventures
Linse Capital

Board Members
Matt Werner
Michael Linse
Arvin Vohra
John Rhow

Company Description
Redaptive offers a flexible, efficiency-as-a-service program that manages all aspects of a commercial building upgrade and offers several unique advantages to the customer. Redaptive makes the upfront investment in the customer’s facility, assumes all of the project execution and technology performance risk, and covers maintenance cost. Upgrades can cover various systems, including energy, HVAC, and LED lighting, among others. Once the project is complete, a customer is billed for actual metered savings at a level that ensures a customer sees the immediate operating savings from the system’s efficiency upgrade.

With the goal of aligning its interests with its customers, Redaptive’s metering platform enables ongoing savings that extend well past the term of the shared saving model. While energy savings translate to dollars as soon as the project is rolled out, contract flexibility gives the customer options in how to manage timing of capital investments which can be made up front or at any point throughout the term of the contract. This gives the customer the ability to either buy down the project term (accelerating the contract until it retains 100% of the savings) or increasing customer-retained savings within the term of the contract.

Source: Company discussions and website
Rivian

Management
R.J. Scaringe, Ph.D. (Founder, CEO)
Ryan Green (CFO)
Michael Bell (CTO)
Jiten Behl (CSO)
Christopher Brown (CCO)

Location
Plymouth, Michigan

Founded
2009

Revenues
$0-$500K

Employees
400

Funding Rounds
Feb 2019 - $700M
Apr 2019 - $500M
Sep 2019 - $350M

Key Investors
Amazon
Ford
Cox Automotive

Board Members
Joseph Hinrichs

Company Description
Rivian’s EAVs (Electric Adventure Vehicles) are set to hit the market at the end of 2020 and will offer an unmatched combination of performance, capability, utility, and efficiency that will be designed to go anywhere, including over steeper grades, water, and other tough terrain. At the core of every Rivian is a flexible skateboard chassis that houses its quad-motor drivetrain, independent air suspension, intelligent battery management system, hydraulic roll control system, and thermal systems.

The electric drivetrain delivers instant power and torque where it is needed through four independent motors, each with up to 200 hp available to each wheel. As a result, the vehicle is able to achieve active torque vectoring and maximized performance in every situation, be it high-speed cornering or low-speed rock crawling. With up to 180 kWh in battery capacity, the vehicles’ maximum range comes in at 400+ miles.

Source: Company website, i3 Database
Seeq provides insight to process manufacturing companies in a variety of industries. The company uses agile software development techniques which rely on frequent customer touches, demonstrations, and reviews. As a result, Seeq customers enjoy a short time to useful features with a rapid response cycle to customer input and requests. Seeq is supported by a broad set of process automation vendor partnerships, including OSIsoft, Honeywell, and Siemens, and by system integrators for sale licensing and services around the globe. In support of the industry’s transition to cloud-based platforms, Seeq recently expanded its offerings to include solutions delivered via software as a SaaS offering on Microsoft Azure to address customer interest in cloud-based analytic solutions.

Source: Company discussions and website
Sentient Energy

**Management**
Michael Bauer (Founder, President)
James Keener (CEO)
Venkat Bahl (CRO)
Konda Ankireddyapalli (SVP Engineering)
Mark Sloan (EVP Engineering)

**Location**
Burlingame, California

**Founded**
2009

**Revenues**
$40M - $60M

**Employees**
80

**Funding Rounds**
Apr. 2013 - $15M
Apr. 2015 - $7.5M

**Key Investors**
Foundation Capital
Clear Sky Power and Technology Fund
GE Ventures
KCK Group

**Board Members and Advisors**
Steve Vassallo

**Company Description**
Sentient Energy helps to make power delivery safe, reliable, and solar-ready. The company’s main offering is the Grid Analytics System, which allows customers to cover their power distribution networks with easily deployable intelligent sensors for the entire distribution grid, overhead feeders, laterals, and underground, and is supported by powerful analytics. The result is a much-improved ability to identify and analyze potential faults, failures, and other distribution grid events. Sentient Energy partners with leading utility network providers including Silver Spring Networks, Landis + Gyr, Cisco, and AT&T to deploy its RF mesh-based line sensor network. Founder and president Michael Bauer brings a background in both power distribution and broadband communications technology to Sentient.

*Source: Company discussions*
SparkCognition

Management
Amir Husain (Founder, CEO)
Dr. Bruce Porter (CSO)
Usman Shuja (CCO)
Sridhar Sudarsan (CTO)
Vijay Doradla (CBO)

Location
Austin, Texas

Founded
2013

Revenues
>$30M

Employees
275

Funding Rounds
Series A - $16M
Series B - $56.5M
Series C - $100M

Key Investors
March Capital
Temasek
Kerogen Digital Solutions
Hearst Ventures
Dalus Capital
Andrew Liveris
Sustainable Technology Ventures
Blue Horizon e* Ventures
Paul & Ann-Kristin Achleitner
Founders Equity Partners
Richard and Laetitia Garriott de Cayeux

Board Members and Advisors
John R. Allen
Steve Nordlund
Pankaj Patel
John Thornton
John Chambers
Michael Humphrey
Mike Frost
Secretary Robert O. Work
Bob Stearns
Dr. Tom Bradicich

Company Description
With award-winning machine learning technology, a multinational footprint, and expert teams focused on defense, IIoT, and finance, SparkCognition builds artificial intelligence systems to advance the most important interests of society. Its customers are trusted with protecting and improving lives, managing infrastructure, and helping to oversee financial systems across the globe. They turn to SparkCognition for help in analyzing complex data, empowering decision-making, and transforming human and industrial productivity. SparkCognition offers four main products: Darwin™, DeepArmor®, SparkPredict®, and DeepNLP™.

Source: Company discussions
Stem

Management
John Carrington (CEO)
Alan Russo (CRO)
Bill Bush (CFO)
Larsh Johnson (CTO)
Mark Triplett (COO)
Prakesh Patel (VP, Capital Markets & Strategy)

Location
Millbrae, California

Founded
2009

Revenues
[not disclosed]

Employees
160

Funding Rounds
Series A: $10.2M (2012)
Series B: $15M (2013)
Series C: $68M (2015 and 2016)
Series D: $200M (2018)

Key Investors
Angeleno Group                          Greener Capital
Iberdrola                                       Constellation
GE Ventures                          Mitsui & Co.
Mithril Capital Management             RWE AG
Total Energy Ventures               Activate Capital
BNP Paribas                                 Magnesium Capital
Temasek
Ontario Teachers’ Pension Plan

Board Members and Advisors
David Buzby
Paul Leggett
Jorge Acevedo
Anup Jacob
Anil Tammineedi
Eiji Kurihara
Brad Leufkens

Company Description
Stem markets services focused on how energy is distributed and consumed, utilizing digitally connected energy storage technology. The company’s analytics platform optimizes the value of customers’ energy assets and facilitates participation in energy markets, yielding economic and societal benefits while decarbonizing the grid. The company provides energy storage services with no upfront cost and without disruption to existing services for commercial and industrial customers. Stem’s customer-sited energy storage network also provides utilities and grid operators with a fast-acting virtual power plant when it is needed most.

Source: Company reports and website
T-REX

Management
Benjamin Cohen (Chairman & CEO)
Arad Shaiber (CTO)
Scott Miller (CBDO)
Tricia San Cristobal (CPO)

Location
New York, New York

Founded
2012

Revenues
<$5M

Employees
45

Funding Rounds
Sep. 2019 - $15M
Nov. 2016 - $10M
Jan. 2014 - $4M

Key Investors
Citi
The Westly Group
Viola Fintech
Innogy Venture Capital
Macquarie Capital
Partnership Fund for New York City
Ecosystem Integrity Fund
Safeguard Sciences

Board Members and Advisors
Benjamin Cohen
Sasha Brown
Prof. Daniel Tsiddon
Timothy Wang
Michele Trogni
Andy Brown (Advisor)
Jill Denham (Advisor)

Company Description
T-REX is a leading provider of managed data services and enterprise software for structured and project finance. Focused on renewable energy and clean infrastructure and built to empower responsible finance, the company’s SaaS-based solutions fill a critical technology gap across these alternative markets. T-REX’s tech-enabled transparency and efficiency helps unlock liquidity, lowering capital costs (an average of 100bps savings per deal) and mitigating risk associated with complex investments. T-REX’s client base includes a global set of investors, bankers, and financial professionals.

T-REX’s solutions bridge the gap between asset originators and end investors, automating workflow and enhancing transparency, efficiency, collaboration, compliance, and security across the entire investment cycle. T-REX creates significant investment opportunities for the hundreds of billions of dollars of capital across various complex, non-commoditized asset classes and has been used to facilitate $7 billion in issuance since 2016.

Source: Company discussions
TuSimple

**Management**
Mo Chen (Co-founder, CEO)
Xiaodi Hou (Co-founder, President, CTO)
Cheng Lu (CFO)
Chuck Price (CPO)

**Location**
San Diego, California

**Founded**
2015

**Revenues**
[Not disclosed]

**Employees**
500

**Funding Rounds**
Series D - $215M
Series C - $55M
Series B - $20M
Series A - $8M

**Key Investors**
CDH Investments
Composite Capital
Lavender Hill Capital
Mando Corp.
NVIDIA
Sina
UPS Ventures

**Board Members and Advisors**
[not disclosed]

**Company Description**
TuSimple is developing commercial-ready Level 4 fully autonomous driving solutions for the logistics industry's depot-to-depot routes. With the use of its proprietary AI capabilities, TuSimple's perception system is able to identify objects and obstacles, even in adverse weather conditions, to achieve full autonomy over long distance highway driving. The truck is fully integrated with a full suite of sensors and cameras, including two LiDAR units that provide up to 1,000 meters of visibility. When traveling at highway speeds, this translates to 35 seconds of time to react, enabling the system to make the safest and most efficient driving decisions. The company is currently operating self-driving trucks in Arizona.

*Source: Company website and discussions*
Uplight

Management
Adrian Tuck (CEO)
Yoav Lurie (President, COO)
Jaylene Kunze (CFO)
Justin Segall (CSO)
Jake Meier (CTO)
Jennifer Kinney (CPO)

Location
Boulder, Colorado

Founded
2004

Revenues
$100M+

Employees
~300

Funding Rounds
[not applicable]

Key Investors
Rubicon Technology Partners (RTP), formerly Tendril's majority shareholder, and AES Corporation (AES), formerly Simple Energy's largest shareholder; both key investors are strategic partners.

Board Members and Advisors
[not disclosed]

Company Description
Uplight is the result of the merger of Tendril and Simple Energy, combined with the acquisition of FirstFuel, EEme, and EnergySavvy. The company has established itself as the leading provider of end-to-end customer-centric technology solutions dedicated to serving the energy ecosystem. Uplight provides software and services to more than 80 of the world’s leading electric and gas utilities with a goal of accelerating the clean energy ecosystem. The leader in demand side management, energy analytics, utility marketplaces, utility personalization and home energy management, Uplight is able to offer a solution that is a unified, end-to-end offering for its customers. Proven at enterprise scale, and yet nimble enough to deliver innovative solutions quickly, utility leaders at all levels have come to rely on Uplight and its customer-focused digital energy experience.

Source: Company discussion
UVEye

Management
Amir Hever (Co-founder, CEO)
Ohad Hever (Co-founder, COO)
David Oren (CSO)

Location
Stamford, Connecticut

Founded
2016

Revenues
[not disclosed]

Employees
100+

Funding Rounds
2019 - $31M

Key Investors
Toyota Tsusho
Volvo Group Venture Capital
W.R. Berkley Corp.

Board Members and Advisors
[not disclosed]

Company Description
UVEye’s high-end solutions can be used for automatic inspection of vehicles and include a combination of proprietary hardware with machine learning and compute-vision algorithms. Initially developed for deployment within the security industry, UVEye expanded its product offering to address challenges within the automotive industry. The cloud-based system uses a 3D scan that captures a vivid 360-degree image of the vehicle to detect potentially hazardous mechanical issues. The company’s product offerings now include its original undercarriage application (Helios), its 360 solution (Atlas), and its targeted tire application (Artemis).

Source: Company website, I3 Connect
View

Management
Dr. Rao Mulpuri (CEO)
Rahul Bammi (CBO)
Dr. Robert Rozbicki (CTO)
Vidul Prakash (CFO)
Martin Neumann (SVP, Operations)

Location
Milpitas, California

Founded
2006

Revenues
$25M-$100M

Employees
300

Funding Rounds
2018 - $1,100M
2017 - $200M
2017 - $100M
2015 - $150M
2013 - $100M
2012 - $55M
2011 - $40M
2010 - $30M

Key Investors
SoftBank Vision Fund
BlackRock
TIAA Investments
NZ Super Fund
Bain Capital
Madrone Capital Partners

Board Members and Advisors
Dr. Rao Mulpuri
Nigel Gormly
Harold Hughes
Thomas Leppert
Tom Patterson
Tom Cheung
Bill Veghte

Company Description
View manufactures View Dynamic Glass, a new generation of dynamic glass windows that let in natural light and views while enhancing mental and physical well-being by reducing headaches, eyestrain, and drowsiness. In addition, View’s windows reduce glare and heat, improving the energy efficiency of buildings by up to 20 percent. View’s windows are digital, connected, and can be controlled from anywhere, including a smart phone – no blinds or shades required.

Source: Company discussions
Volta Charging

Management
Scott Mercer (Co-founder, CEO)
Chris Wendel (Co-founder, President)
Debra Crow (CFO)
Drew Lipsher (Chief Strategy & Revenue Officer)
Jim Degraw (General Counsel)

Location
San Francisco, California

Founded
2010

Revenues
$25m-$50m

Employees
140

Funding Rounds
Series C - $45M
Series B - $15M
Series A - $4.5M

Key Investors
Virgo Investment Group
Energize Ventures
Activate Capital
Walden International
Schneider Electric Ventures
Idinvest Partners
SK
Nautilus
Ørsted
Autotech Ventures
GE Ventures

Board Members and Advisors
Scott Mercer (CEO)
Chris Wendel (President)
Eli Aheto
John Tough
Anup Jacob
Kathy Savitt

Company Description
Volta is developing electric vehicle charging networks through partnerships with customer-centric businesses, offering a free-to-the-customer charging service that enhances the customer experience while on site. With the support of its brand partners, Volta delivers charging solutions to real estate owners, power to the EV community, and impactful brand stories to everyone. The network is currently able to deliver up to 175 miles of driving range in just 30 minutes and has already delivered over 50 million free electric miles. By providing a seamless, simple, and free charging experience, Volta is focused on accelerating EV adoption.

Source: Company website
Xos Trucks

Management
Dakota Semler (Co-founder, CEO)
Giordano Sordoni (Co-founder, COO)
Pri Balekai (CPO)
Rob Ferber (CTO)
Alex Coates (SVP, Finance)
Saleh Mirheidari (VP, Software)
Kevin Damoa (VP, Supply Chain & Operations)

Location
North Hollywood, CA

Founded
2016

Revenues
<$5M

Employees
40

Funding Rounds
[self-funded to date]

Key Investors
[self-funded to date]

Board Members and Advisors
[not disclosed]

Company Description
Xos, previously Thor Trucks, is focused on the commercial electric vehicle market with operating prototypes in both the class 8 segment and class 6 delivery truck markets. The wide availability of key components has allowed Xos to assemble a drivetrain consisting entirely of third-party parts. This has allowed Xos to act as a systems integrator rather than a manufacturer, allowing XOS to focus on building intellectual property in the battery pack. While servicing and support can be complex, Xos is well positioned given its team's substantial background in truck fleet operations. When combined with fuel and maintenance savings, the TCO analysis works well for electric class 8 trucks being used for short-haul traffic, where Xos will compete directly with Tesla's 300-mile offering. In addition to its class 8 truck offering, Xos has announced several key partnerships within the medium-duty vehicle market including the most recent announcement of its partnership with Loomis Armored US, a cash-in-transit company, to deliver two all-electric armored vehicles.

Source: Company discussions
Zoox

Management
Aicha Evans (CEO)
Jon Foster (CFO)
Jesse Levinson (President, Co-founder, CTO)
Dr. Mark Rosekind (Chief Safety Innovation Officer)

Location
Foster, California

Founded
2014

Revenues
[Not disclosed]

Employees
1,000

Funding Rounds
2019 - $200M (Convertible)
2018 - $464M
2016 - $250M
2015 - $40M

Key Investors
Blackbird Ventures
Composite Capital
CPPIB
DFJ
Grok Ventures
Lux Capital
Primavera
Tencent

Board Members and Advisors
Carl Bass (Chairman)
Aicha Evans (CEO)
Dan Cooperman
Fred Hu
Heidi Roizen
Jesse Levinson (President, Co-founder, CTO)
Laurie Yoler
Mike Cannon-Brookes

Company Description
Zoox is developing a transportation service using fully autonomous electric vehicles that are purpose-built for ridesharing. Currently integrated in proof-of-concept vehicles, the company’s proprietary algorithm is capable of mapping, localization, calibration, sensor fusion, motion planning, vehicle control, object segmentation and tracking, classification, teleoperation, simulation and validation, making Zoox's vehicles uniquely suited for navigating dense urban environments and highway driving. With ~94% of on-road deaths attributed to human error, Zoox not only intends to make roads safer, but to improve vehicle utilization by an order of magnitude under its ride-share model.

Source: Company discussions
Joseph A. Osha  
Managing Director and Senior Research Analyst  
josha@jmpsecurities.com  
415.835.8998

Joseph Osha joined JMP in May 2016 and serves as Managing Director and Senior Research Analyst providing research coverage for the Industrial & Energy Technology sectors.

Prior to joining JMP Securities, Mr. Osha served as chief financial officer of two alternative energy start-ups, Greenfire Energy and Gravity Renewables. Mr. Osha previously spent 18 years at Bank of America Merrill Lynch, where he was a senior semiconductor analyst for a decade, winning recognition in rankings produced by Institutional Investor, The Wall Street Journal, and Bloomberg. More recently, he served as the firm’s Deputy Head of Americas Equity Research, Head of Alternative Energy Research, and Head of Asia ex-Japan Equity Research.

Mr. Osha started at Bank of America Merrill Lynch as a senior electronics analyst based in Tokyo after beginning his equity research career as an analyst at Baring Securities Japan. He holds an MBA and an MA in East Asian Studies from the University of Michigan and a BS from the University of Richmond. He is a Chartered Financial Analyst.

Hilary E. Cauley  
Senior Research Associate  
hcauley@jmpsecurities.com  
415.835.8996

Hilary Cauley joined JMP Securities in November 2017 and serves as a Senior Associate on the Industrial & Energy Technology team.

Prior to joining the firm, Hilary worked at Wolfe Research and Ladenburg Thalmann as an Equity Research Associate. Hilary holds a BS in Finance from John Carroll University and is a Chartered Financial Analyst.
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JMP FACTS AND DISCLOSURES

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JMP Securities Disclosures:
JMP Securities expects to receive OR intends to seek compensation for investment banking services from Tesla, Inc. in the next 3 months

JMP Securities Investment Opinion Definitions:
Market Outperform (MO): JMP Securities expects the stock price to outperform relevant market indices over the next 12 months.
Market Perform (MP): JMP Securities expects the stock price to perform in line with relevant market indices over the next 12 months.
Market Underperform (MU): JMP Securities expects the stock price to underperform relevant market indices over the next 12 months.

JMP Securities Research Ratings and Investment Banking Services: (as of December 5, 2019)

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Stock Price Chart of Rating and Target Price Changes:
Note: First annotation denotes initiation of coverage or 3 years, whichever is shorter. If no target price is listed, then the target price is N/A. In accordance with NASD Rule 2241, the chart(s) below reflect(s) price range and any changes to the rating or price target as of the end of the most recent calendar quarter. The action reflected in this note is not annotated in the stock price chart. Source: JMP Securities.
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RESEARCH PROFESSIONALS

FINANCIAL SERVICES

Alternative Asset Managers
Devin Ryan (212) 906-3578
Brian McKenna (212) 906-3545

Commercial & Specialty Finance
Christopher York (415) 835-8965
Kevin Fultz, CFA (415) 835-8962

Consumer Finance
David M. Scharf (415) 835-8942
Jeff Zhang, CFA (415) 835-8948

Financial Processing & Outsourcing
David M. Scharf (415) 835-8942
Jeff Zhang, CFA (415) 835-8948

Insurance
Matthew J. Carletti (312) 768-1784
Karol Chmiel (312) 768-1786

Investment Banks & Brokers
Devin Ryan (212) 906-3578
Brian McKenna (212) 906-3545

Mortgage Finance

REITs: Agency, Hybrid, & Commercial Mortgage
Steven C. DeLaney (212) 906-3517
Chris Muller (212) 906-3559
Trevor Cranston, CFA (415) 869-4431
Mikhail Goberman (212) 906-3543

HEALTHCARE

Biopharma
Donald Ellis, PharmD (212) 906-3507
Nazibur Rahman (212) 906-3519

Biotechnology
Liisa A. Bayko (312) 768-1785
Jonathan Wolleben (312) 768-1788
Neil Panchal, MD (312) 768-1795
Reni J. Benjamin, PhD (212) 906-3529
Justin H. Walsh (212) 906-3561
Jialiang Liang (212) 906-3503
Jason N. Butler, PhD (212) 906-3505
Roy Buchanan (212) 906-3509

Healthcare Services & Facilities
Peter L. Martin, CFA (415) 835-8904
Jonathan Freed (415) 835-8908

Medical Devices & Supplies
David Turkaly (212) 906-3563
Daniel W. Stauder (212) 906-3535

REAL ESTATE

Housing & Land Development
Peter L. Martin, CFA (415) 835-8904
Aaron Hecht (415) 835-3963
Doug Hansen (415) 835-8934

Property Services
Mitch Germain (212) 906-3546
Corey DeVito (212) 906-3525

Residential Services
Consumer-focused Properties & R.E. Services
Aaron Hecht (415) 835-3963

REITs: Healthcare & Specialty
Peter L. Martin, CFA (415) 835-8904
Jonathan Freed (415) 835-8908

REITs: Diversified, Industrial, Office, & Retail
Mitch Germain (212) 906-3546
Corey DeVito (212) 906-3525

REITs: Residential
Aaron Hecht (415) 835-3963

TECHNOLOGY

Energy Technology & Services
Joseph Osha, CFA (415) 835-8998
Hilary Cauley, CFA (415) 835-8996

Industrial Technology

Cybersecurity & IT Infrastructure
Erik Suppiger (415) 835-3918
Rustam Kanga (415) 835-3914

Internet & Digital Media
Ronald V. Josey III (212) 906-3528
Andrew Boone (415) 835-3902
David Yueh (415) 835-3957

Software
Patrick Walravens (415) 835-8943
Joe Goodwin (415) 869-4477
Mark Chen (415) 835-8930
Joey Marineck (415) 869-4418

ADDITIONAL CONTACTS

Jeffrey H. Spurr
Director of Research
(415) 835-3903

RESEARCH PROFESSIONALS

FINANCIAL SERVICES

Alternative Asset Managers
Devin Ryan (212) 906-3578
Brian McKenna (212) 906-3545

Commercial & Specialty Finance
Christopher York (415) 835-8965
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Financial Processing & Outsourcing
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Insurance
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Daniel W. Stauder (212) 906-3535

REAL ESTATE

Housing & Land Development
Peter L. Martin, CFA (415) 835-8904
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Consumer-focused Properties & R.E. Services
Aaron Hecht (415) 835-3963

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Corey DeVito (212) 906-3525

REITs: Residential
Aaron Hecht (415) 835-3963

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Ronald V. Josey III (212) 906-3528
Andrew Boone (415) 835-3902
David Yueh (415) 835-3957

Software
Patrick Walravens (415) 835-8943
Joe Goodwin (415) 869-4477
Mark Chen (415) 835-8930
Joey Marineck (415) 869-4418

ADDITIONAL CONTACTS

Thomas R. Wright
Director of Equities
(212) 906-3599

Charles Sweeney
Director of Sales & Trading
(212) 906-3573

600 Montgomery Street, Suite 1100
San Francisco, CA 94111
www.jmpsecurities.com