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Cleantech, collaboration, and climate action: driving the clean energy transition through COVID-19

DYNAMO
ACCELERATING ENERGY INNOVATION

Dynamo is a unique global network that provides industry thought leaders with a platform to accelerate the growth of the clean energy economy.

Dynamo Energy Hubs bring together traditional energy companies, governments, cleantech innovators, investors, and entrepreneurs to shape the future of energy.

In collaboration with

IBM®

Contents

Cleantech, collaboration, and climate action

The COVID-19 pandemic caused an unprecedented disruption to the world economy. In April 2020, global lockdown measures peaked with over 4.2 billion people[1] quarantined and the economic downturn that followed presented enormous risks to the energy sector. However, in spite of the pandemic, 2020 has been a record year for clean investment with historic levels of capital committed for clean energy investing and sustainable finance.

The unexpected disruption and uncertainty created new opportunities for innovative cleantech companies and demonstrated the necessity of the clean energy transition, and transforming our aging energy infrastructure systems to meet rising global challenges. The pandemic had foundational effects on the power sector due to drastic shifts in energy consumption, and renewable generation is now more essential than ever before. Governments, businesses, and households were able to 'keep the lights on during the pandemic with cheaper and cleaner energy.

The need for greater collaboration between corporations, governments, investors, and cleantech innovators emerged as a prominent theme of this paper in driving the shift to a cleaner and more sustainable economy.

This paper highlights the success stories of cleantech companies, investors, and corporations that are ensuring the continued energy transition in this time of uncertainty and includes interviews with clean energy and sustainability cleantech companies that were not only able to successfully navigate the challenges of the pandemic, but also thrive. This paper also provides an overview of macro trends in clean energy investments and discusses collaborative technology platforms that enable cleantech innovators to scale and flourish across the energy ecosystem.

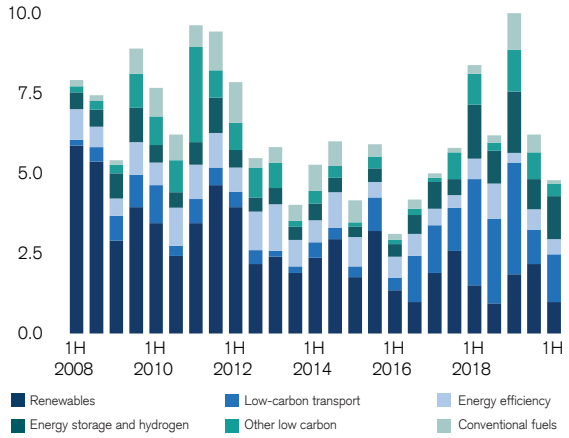
Nimble and resilient cleantechs are the backbone of the clean energy transition.

Cleantech companies, with their unique qualities of ingenuity and ability to pivot and adapt, can be the catalysts for change in these challenging times. Key themes from our interviews include:

- The majority of cleantech companies have been able to close new business or secure investments during the pandemic.
- Many of the cleantech companies said their long-term goals have been unaffected by the pandemic.
- Most cleantech companies were able to react and adapt to the new daily challenges efficiently, while maintaining their usual standards of productivity.
- Many of the cleantech companies have been able to identify new opportunities, initiatives or partnerships during the pandemic.
- All companies highlighted the importance of increased collaboration between cleantechs, corporations, governments and investors.

Clean energy and sustainable investment trends echoed the continued growth and optimism of the cleantech community. Despite the pandemic, this year saw unprecedented levels of investment in Environmental, Social and Governance (ESG) initiatives, technologies, and companies.

Value of global energy-related VC deals, by technology
First half of 2008 to first half of 2020 – ($ in bn)



Source: Axios, based on IEA Energy Technology Perspectives 2020 Report.

As political and social pressure for decarbonization and sustainability mounts around the world, trillions of dollars are projected to be invested in the energy transition over the next few decades.

Meanwhile, the traditional energy system that existed for decades is transforming into a complex ecosystem comprised of myriad stakeholders interacting in increasingly subtle ways. Conventional and centralized power generation is shifting to small-scale distributed resources, breaking down silos but requiring greater connectivity, smarter management, and collaboration. This paper includes several case studies of market-making collaborative Internet of Things (IoT) platforms that support the seamless transition to a modern, decentralized, and resilient energy system of the future that can be nimble in light of disruption and unexpected challenges such as COVID-19.

Over the next few years, as we race to meet emissions reduction targets, the challenge will not be accessing the right technologies, but rather fostering and expanding the collaboration between innovators, governments, corporations, and investors. Only by working in concert will these entities be able to overcome the challenges of the future and implement a clean energy transition to the benefit of all.

The COVID-19 pandemic showed that the participants of the clean energy ecosystem need to work together to effectively leverage synergies to overcome shared challenges and advance the transition to cleaner energy.

This paper, developed in partnership between Dynamo and Credit Suisse, with support and contributions from IBM, highlights success stories of innovative cleantechs, discusses the role of IoT in fostering collaboration and clean energy transition, and clean energy investment trends.

Dynamo is a unique global network of innovative energy companies, investors, cleantechs, and governments that provides industry thought leaders with a platform to accelerate growth of the clean energy economy. Dynamo Energy Hubs break down barriers between these sectors by creating a cultivated network to build trust, enable collaboration, and facilitate commercial opportunities to accelerate the clean energy transition. Dynamo Energy Hubs are located in state-of-the-art environments, which include access to flexible workspace and networking events that enable its members' growth.

Credit Suisse has been a pioneer in the area of sustainable finance and impact investing for two decades. Credit Suisse believes banks and financial institutions have a vital role to play in the future of finance and in shifting global economies toward more sustainable business and economic models. The bank recently established the Sustainability, Research & Investment Solutions Executive Board-level function to drive and execute strategy around sustainability, research and investment solutions. As part of the launch, Credit Suisse outlined a number of commitments to progress in the sustainable finance space; this includes but is not limited to a goal to provide at least CHF 300 bn of sustainable financing over the next 10 years.

IBM helps its clients become more energy efficient, navigate the energy transition, implement new ways to source, manufacture and distribute goods and services in a more sustainable manner, enable safe and renewable sources of energy, and manage resources at a macro level, transforming entire industries. IBM takes a holistic approach to our planet's challenges that combines its innovative technology, data analytics, deep business insight, and industry expertise.

1 IEA Report *"COVID-19 Impact on Renewable Energy Growth"*: https://www.iea.org/reports/renewable-energy-market-update/covid-19-impact-on-renewable-energy-growth.

Cleantech investment trends

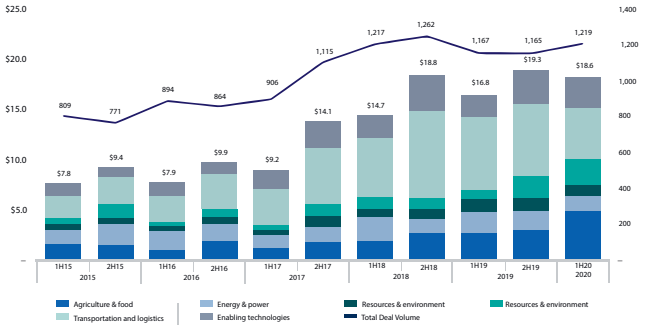
Far from a tumultuous year of neglect or setbacks, 2020 is proving a banner year for cleantech investing and sustainability finance. Investors across the finance world have committed unprecedented levels of funding to Environmental, Social and Governance (ESG) initiatives and sustainable technologies, and major players from Blackrock to BP and Alphabet have made landmark commitments for their organizations that are indicative of broader trends in the market. With $110 tn required to be invested in the energy transition by 2050,[2] further spurred by mounting political pressure globally, there are good reasons to expect this growth to continue.

In May, Blackrock's CEO, Larry Fink, turned heads with his 2020 letter to CEOs declaring that sustainability would be Blackrock's new standard for investing, and a conviction that sustainability-integrated portfolios provide better risk-adjusted returns. With its $7 tn of assets under management, Blackrock committed to double the number of ESG ETF offerings to 150 and boost overall sustainable assets from $90 bn to $1 tn before 2030.

Emerging clean technologies have been met with similar enthusiasm from earlier stage investors; as theCleantech Group reports that the total number and value of investments this year into cleantech companies increased by 4.5% and 10.5%, respectively, compared with the first half of 2019, to a total of $18.6 bn. Agriculture and Food contributed to a record $5 bn due to the increased demand for solutions to the COVID-19 supply chain stock and commercialization of biological alternatives to chemical crop inputs. Energy and Power cleantech companies raised $1.5 bn of equity in 1H 2020, and saw a large volume of follow-on equity rounds.[3] Materials and Chemicals contributed to $1.2 bn of equity raised. Resources and Environment contributed to $2.6 bn, with a record 113 quarterly deals recorded. Transportation and Logistics continues to be the largest contributor, having raised $5.1 bn in 1H 2020. Nevertheless Q2 was the lowest quarter since 2Q 2017.

Figure 1 – Cleantech investments

($bn) (# of deals)



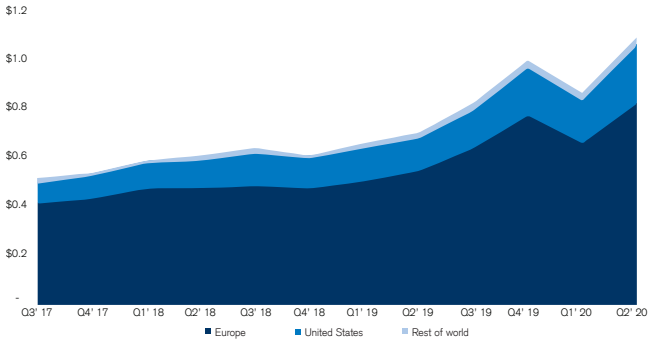
Source: Q2 2020 Cleantech Group, Investment Monitor.
*Excludes outlier deals above $350mm.

In H1 2020, investment in offshore wind totaled $35 bn, up 319% compared to the same period in 2019, and well above the 2019 record full-year figure of $31.9 bn. The first half of 2020 saw sizable investment decisions made on 28 sea-based wind farms. Meanwhile, H1 2020 onshore wind investment was down 21% to $37.5 bn and investment in solar dropped 12% to $54.7 bn.[4] It is expected that the offshore wind sector's global momentum will continue, with a focus on gigawatt-scale projects in the UK North Sea and the first commercial arrays off the U.S. East Coast.

Environmentally-oriented companies have received similar enthusiasm in public markets, and in Q2 2020 total ESG fund assets hit the $1 tn milestone, up 23% from the previous quarter after a Q1 dip. More than 21 sustainable funds were launched in the first half of 2020 in the U.S., and Morningstar expects the number launched this year to be a record.[5]

> **"2020 is providing a banner year for cleantech investing and sustainable finance."**

Figure 2 – Global sustainable fund assets
$ in mn



Source: Q2 Morningstar Global Sustainable Fund Flows Report.

This appetite for public investment opportunities has not been met with fully matching supply. With a few notable IPO exceptions over the last couple of years, including Bloom Energy and Sunnova, many cleantech companies have chosen to remain private or have been acquired by larger strategic companies. This trend may be begin to change with the increasing attention received from Special Purpose Acquisition Companies (SPACs). This year, a number of electric transportation and energy storage companies have announced or closed SPAC combinations, including Nikola Motor Co., Hyliion, Eos Energy Storage, and Fisker. Explicitly ESG-focused SPACs also arrived for the first time this year.

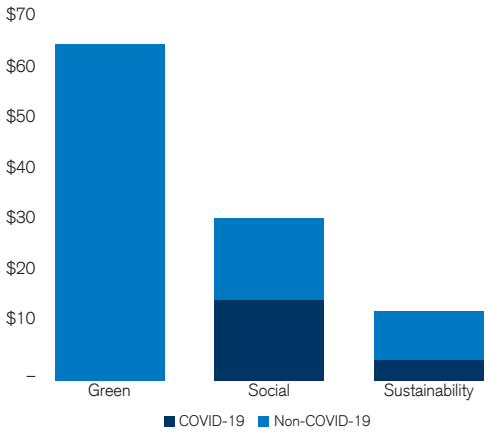
While the technological and social trends underlying these shifts have often been policy supported, the scale of cleantech adoption makes clear that many have moved beyond being policy dependent. This is particularly true for sectors including renewable energy, electric vehicles, and energy efficiency. Other sectors like clean hydrogen will continue to be more tied to substantial policy support in the near term. In July, the EU set a target of 6 gigawatts of installed green hydrogen electrolyzers by 2024, a 24 fold increase from current capacity, and of 40 gigawatts by 2030. The U.S. has yet to make commitments at the federal level. At the State level a growing numbers of incentives and commitments have been made to accelerate cleantech deployment including for EV charging, battery storage, carbon capture, green hydrogen and advanced nuclear.

This meteoric shift in technology innovation and finance has been matched by corporate action as well. In January, Microsoft pledged to achieve carbon neutrality by 2030, and to remove by 2050 all carbon it has emitted since founded in 1975 from the atmosphere.

In February, BP made a momentous commitment to achieve net zero GHG emissions by 2050, a target Shell matched in April.

On the other side of the capital stack, green bonds have also received significant attention, given their rapid growth over the last few years and the broad acceptance of the Green Bond Principles. At the end of Q2, more than $100 bn of sustainable bonds were issued globally in 2020, directing funding across green and social initiatives. While green bonds constituted the majority of these, social bonds had a record quarter of $33 bn mainly issued to address the global pandemic.[6] These bonds benefit from best practices developed for green bonds including use of proceeds and governance. In Q2, International Capital Markets Association (ICMA) also issued a publication of Sustainability-Linked Bond Principles to provide guidance for investors. In early August, Alphabet Inc. issued $5.75 bn of bonds, the largest issuance dedicated to ESG purposes to date.

Figure 3 – 2020 global sustainable bond issuances
$ in bn, amount outstanding



Source: Bloomberg, COVID-19 bonds are based on "pandemic" being the use of proceeds.

Collectively, these trends suggest that while some investors were cautious of cleantech opportunities early in the year, total investing activity has roared back. And the trends that have driven such enormous capital and promising returns in the industry will continue to do so for years to come.

2 International Renewable Energy Agency, Global Renewables Outlook: Energy Transformation 2050.
3 Excludes $1.24 bn investment in battery manufacturer Gotion, and a $507mm investment into Octopus Energy; CleanTech Group Q2, 2020 report.
4 BNEF Clean Energy Investment Trends, 1H 2020 Report.
5 Morningstar Q2, 2020 report.
6 Moody's – Sustainable bond issuances hits record high in Q2 as social bonds surge.

Featured cleantech partners

Arcadia
First U.S. digital utility that gives consumers easy access to clean energy and savings programs.

Bioenergy Devco
Producing renewable natural gas out of waste through anaerobic digestion, advancing the circular economy.

Boundless
Market intelligence and impact analytics for investors, companies and funds.

BrainBox AI
Self-adapted AI technology to optimize the heating, ventilation, and air conditioning (HVAC) of commercial buildings.

Enbala
Grid-balancing software platform that harnesses the value and flexibility of distributed energy resources.

EVgo
The largest public fast-charging EV network in the U.S. and the first to be powered by 100% renewable energy.

GDI
Developer of Silicon-based li-ion battery technology that enables high energy density and faster charging.

LO3 Energy
Cloud-based marketplaces for distributed energy resources (DERs).

The Megawatt Hour
Software that transforms utility data into actionable information and analysis.

Momentum Solar
One of the fastest growing solar companies in the U.S., generating savings for its customers while providing clean power.

Station A
AI-powered clean energy marketplace for the built environment.

Stem
Leader in AI energy storage for large-scale energy storage projects.

Transforming the customer energy experience

Kiran Bhatraju, CEO and Founder
Arcadia

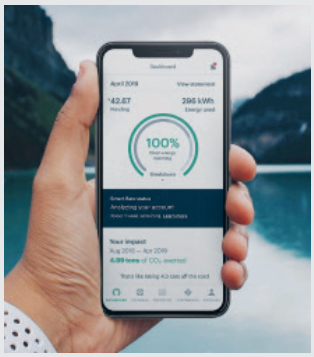
Arcadia is a home energy platform providing clean energy and savings to customers across the U.S. Arcadia is transforming the customer utility experience through seamless billing, access to wind energy, community solar programs, and on-bill financing of energy efficient products.

How do you contribute to the clean energy transition?
Most people do not know that their largest contribution to climate change is their home. Our platform gives customers a choice to support renewable energy no matter where they live, accelerating decarbonization one home at a time. Arcadia helps bridge the gap between clean energy suppliers and consumers by synthesizing energy data and providing a simple billing UX to deliver clean and efficient energy services available in the market.

Can you share an example highlighting your efforts to prioritize public interest during this crisis?
As a residential-focused company, we knew that the pandemic would significantly increase customers' power bills because the weekdays' energy use would look a lot like weekends. Using our unique billing platform, we decided to quickly spin up a peer-to-peer support system we called Good Energy to allow our members help other members with energy insecurity during the pandemic. With a single email, we were able to raise over $200,000 to help members in need.

What do you see as the biggest opportunities?
We see a massive opportunity connecting electrical vehicles (EV) owners to energy markets. Charging an EV can be a confusing process with difficult to understand roaming options, demand charges and time-of-use rates. We want to take the complexity out of the process and deliver simple EV energy plans to anyone that buys an EV. We are working in tandem with multiple OEMs to package an energy plan with the purchase or lease of an EV.

What is needed to accelerate the energy transition?
We believe easy data access and competitive energy markets will accelerate decarbonization. Energy usage data has been locked up with utilities for too long, though nearly 90 million smart meters have been deployed across the U.S. Data can help size and unlock new distributed generation and energy efficiency opportunities that are difficult to personalize and deploy today. Expanding competitive energy markets can also increase the value of demand response and accelerate decarbonization of the energy system, without waiting for regulated utilities to catch up.



Source: Arcadia.

2020 in one sentence...

"This is a year to make us appreciate everything we have, most of all the planet."

Promoting a circular economy through waste to energy solution

Christopher Galle, COO
Bioenergy Devco

Bioenergy Devco is a world leader in the finance, design, construction, engineering, and operation of anaerobic digestion facilities, which create a true source of renewable energy that processes organic waste and reduces air, water, and soil pollution in local communities.

Source: Bioenergy Devco.

How has the COVID-19 crisis impacted "business as usual"?
With Bioenergy Devco's growing number of anaerobic digestors being built throughout the U.S., working remotely and the rise of video conferencing have transformed the day-to-day operations, systems, and processes we have grown to know and love in a pre-COVID-19 world. The evolving nature of the crisis requires a nimble and flexible approach to setting project milestones and timelines, as well as determining staffing needs.

What elements of collaboration have you seen between cleantechs, corporates and governments?
Bioenergy Devco's commitment to create efficient renewable energy that solves the challenge of managing excess organics offers hope for cleantechs, corporates, and governments alike. Recycle, reuse, repurpose is the mantra behind the use of anaerobic digestion. Following this path, we make a positive impact on climate change - even in a post-COVID-19 world. We are dedicated to making improvements with sustainable solutions and keeping the momentum going.

Did you discover any new opportunities?
We have discovered new ways to reach our audience by expanding our virtual presence. Rather than face-to-face conferences, meetings, and events, we sponsor and participate in webinars and virtual meetings to continue the conversation about anaerobic digestion. Working with Dynamo, for example, has connected us with other cleantechs and allowed for solution-based discussions and dialogue.

How has COVID-19 impacted your short/long-term goals?
Besides minor adjustments in our construction timelines, the ability to achieve our goals has remained consistent. We have refocused along with our partners and organics sources as they make adjustments to their business, necessitating a few timeline adjustments or logistics discussions. We are fortunate to say there have not been interruptions, rather ingenuity in managing and repurposing products during this challenging time.

2020 in one sentence...

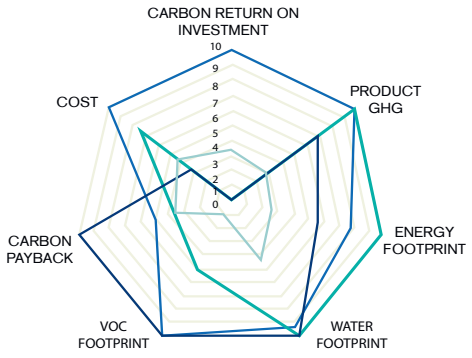
"The unprecedented challenges we face in 2020 are a catalyst for even greater innovation and collaboration in the bioenergy sphere."

Market intelligence for an informed investment decision

Michele Demers, CEO and Founder
Boundless Impact Research and Analytics

Boundless is a market intelligence and impact analytics firm that provides quantitative and evidence-based research and data for investors, companies, and funds.

How do you contribute to the energy transition?
Our research on emerging technologies provides investors with data to drive investment decisions. Using Scope 3 analysis, we are one of the only data providers that delivers clear and accurate insight on the climate and business risks of a company's supply chain.



Source: Boundless.

How has the COVID-19 crisis impacted "business as usual"?
Once COVID-19 hit, everything slowed down tremendously putting new constraints on the decision-making process. Before the pandemic, you could make an investment decision based on future cash flows and growth, but now, there are additional factors to consider like a potential second wave.

Have you been able to raise capital or close a deal during this challenging time?
We have been able to close a few deals with some very impressive emerging technologies. Our services have helped these companies raise funding and tell their story of true climate impact, resulting in greater interest from the investing community.

What elements of collaboration have you seen between cleantechs, corporates, and governments?
The most impressive nature of collaboration we witnessed was the drive and determination of many of these organizations to push forward during these challenging times. The global lockdowns threatened to prevent many conferences and key events from taking place. However, the industry adapted to virtual events, allowing for dialogue on key issues facing the industry and on how we can continue to move capital to transformative cleantech companies.

Did you discover any new opportunities?
There has been renewed interest in our services from sectors like energy storage, green chemistry, alternative proteins and healthcare. In addition to measuring the environmental aspect of our client's technologies, many want to highlight their social impact as well. They want to tell the complete story of the environmental and society-wide changes they are catalyzing.

2020 in one sentence...

"Challenging yet we are excited about the opportunities that lie ahead. If COVID-19 taught us anything, it's that we can't rely on the old way of doing business. The industry must push for enhancements and better ways to bring change to newer technologies in the cleantech sector."

Scalable energy savings for buildings

Sam Ramadori, COO
BrainBox AI

BrainBox AI utilizes self-adapted artificial intelligence (AI) technology to optimize the heating, ventilation, and air conditioning (HVAC) of commercial buildings, one of the largest climate change contributors globally, with a mission to reduce energy waste, improve comfort, and drive the energy transition.

Source: BrainBox AI.

How has BrainBox AI contributed to the energy transition?
When you look at the energy consumed on this planet, one of the largest buckets of energy consumption is commercial buildings at 15%. We have developed a very scalable technology based on AI that takes a huge chunk out of that energy consumption. The real power of our technology is that we can reduce up to 25% of the total energy consumed by a building, and that this solution has no cost up-front for customers, payback is immediate and with light installations required.

How has COVID-19 impacted your "business-as-usual"?
Being a technology company the impact of COVID-19 has been minimal and in fact, we have seen new opportunities with the increased focus on air quality that COVID-19 has brought to us. We have been very lucky in that regard. We also successfully closed our first round of outside capital in April, an important milestone for our company.

Can you share an example highlighting your efforts to prioritize public interest during this crisis?
A few months into the crisis, the Centre for Disease Control and Prevention (CDC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) introduced guidance on how to modify an HVAC system to reduce airborne pathogen particles. Before COVID-19, the goals of our AI technology were focused on energy consumption reductions and improved comfort, but given the flexibility of our technology we added air quality as a factor, and we are offering the solution to the market at no installation cost until the crisis abates.

What elements of collaboration you have seen between cleantechs, corporates and governments?
Our core technology is energy reduction, our next wave of innovation is what we call "Swarm AI" under which we will be able to manage clusters of 50-100 buildings together and improve energy load balancing in the complex supply-demand equation that the energy sector faces every day. We are launching this technology in partnership with McGill University, the National Renewable Energy Laboratory (NREL), a major research laboratory within the U.S. Department of Energy, and other major utilities.

In short, energy suppliers face challenges controlling energy demand coming from millions of homes and thousands of buildings. Once we have implemented our AI technology and have a grouping of a few hundred buildings within a city/region, we can better predict and control the demand side of the equation, which will become increasingly critical as distributed energy systems and renewable energy sources become more prevalent. In Europe where they are pushing the limits on the amount of energy generated by renewable sources, the principal way to accommodate more renewable energy is to influence the demand side. Our Swarm AI technology will allow us to do that and help accelerate the energy transition.

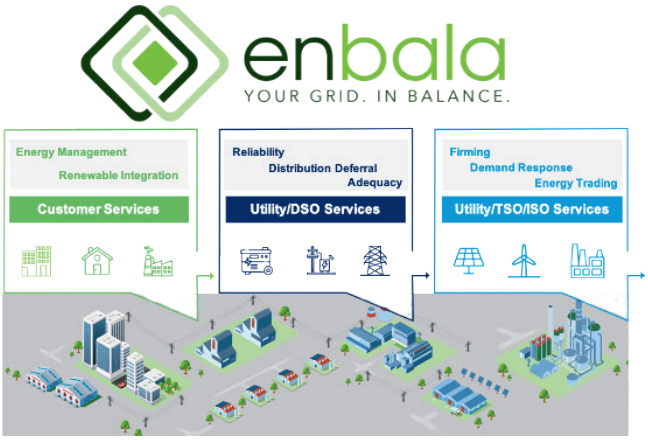
2020 in one sentence...

"A year that shows chaos and opportunity and highlights issues we must solve on a global basis."

Enabling integration of distributed energy resources

Bud Vos, CEO
Enbala

Enbala provides a grid-balancing software platform that harnesses the value and flexibility of distributed energy resources.



Source: Enbala.

How do you contribute to the clean energy transition?
We support electric utilities' transition to a clean energy future, while ensuring the power grid is reliable, cost-effective and resilient to risk. By using a technology-agnostic approach, we collaborate with the industry's most trusted brands, like Honeywell, Tesla, Ecobee, and Amazon, to provide a scalable, future-proof solution.

Can you share an example highlighting your efforts to prioritize public interest during this crisis?
Throughout the pandemic and summer peaking season, Enbala has been supporting our system operators, particularly in South Australia, Oregon, New Mexico and the Northeastern United States by providing a reliable means of controlling a network of diverse and flexible distributed energy resources. Using Enbala's grid-balancing platform, our utility customers were able to meet demand in their service territories without reliance on fossil-fuel burning peaker plants or loss in frequency and efficiency. This enabled predictability and cost savings during a particularly uncertain time.

How has the COVID-19 crisis impacted "business as usual"?
The unanticipated increase in residential loads and decrease in commercial loads caused by the pandemic have overturned the utility industry's knowledge about energy consumption and highlighted the need for a more flexible approach to clean energy and grid operations. By using AI to automatically orchestrate a diverse fleet of distributed energy resources, such as solar, storage, EVs, and controllable loads, Enbala's cleantech solution mitigates risks associated with renewable intermittency/variability, reverse power flows and potential blackouts.

How has COVID-19 impacted your short/long-term goals?
Distributed energy resources can, and should, play a big role in our energy future. The current crisis presents an opportunity to adjust how we meet our energy needs and to modernize the grid in a way that will have a large, positive impact on our planet and economy. Enbala's long-term goals have not been impacted by COVID-19, our mission continues to be creating a sustainable energy future. In the short-term, we have focused our attention on improving our contingency planning and cybersecurity in order to better support our customers and continuously provide affordable and clean power to local businesses, residential communities, hospitals, campuses, and industrial institutions.

2020 in one sentence...

"Who would have imagined the world as it is today?"

Accelerating electric vehicles infrastructure

Cathy Zoi, CEO
EVgo

EVgo is the largest public fast-charging network for electric vehicles in the U.S. and the first to be powered by 100% renewable energy.

How does your business contribute to the energy transition?
Transforming the transportation sector to be clean is essential to addressing climate change. For that to happen, we have to electrify, and for electrification to happen, we need ubiquitous charging infrastructure. EVgo focuses on fast-charging, an essential ingredient of this transformation. What is unique about EVgo is that we put chargers where people are going to be anyway and site the charger power to match the dwell time of a particular parking lot, making it as convenient for drivers as possible.

How has the COVID-19 crisis impacted "business as usual"?
When COVID-19 hit, we saw a 60% drop in the use of our stations, but that has picked back up now. The long-term impact of electrical vehicles (EVs) has not been as significant. Though car sales dropped in the beginning of COVID-19, EV sales dropped less. In addition, the car companies stayed the course with their development plans to deploy EVs. The major OEMs announced over $300 bn of investments in electrifying their fleets and plans to deploy cars in 2021-2024 remain on track.

Additionally, we recently announced a partnership with General Motors to triple the size of the EVgo network to meet GM's plans of bringing 20 new EV models to market by 2023-2024. We need to front-run with infrastructure build for when those EVs hit the market, which is why this partnership is so important.

Can you share an example highlighting your efforts to prioritize public interest during this crisis?
When COVID-19 hit we immediately launched a COVID-19 Care Plan that offered a deep discount for essential workers. We have received a fantastic response from nurses, doctors, and other essential service workers.

Source: EVgo.

How has COVID-19 impacted your short/long-term goals?
COVID-19 has not significantly impacted our short and long-term goals. Transportation is electrifying – the only question is how quickly that transformation will take place. COVID-19 caused the market to slow down, and we are waiting to see how quickly it will rebound. The neat thing about EVgo is that we can accordion up or down because it is a very distributed business. If the market recovers quickly, we can build more stations to meet demand. If it takes longer to rebound, we will build the same number of stations but not as fast.

What elements of collaboration have you seen between cleantechs, corporates, and governments?
The biggest opportunity we see is the deployment of EV chargers through collaboration and private-public partnerships (PPPs). One example, in Virginia there are not enough EVs yet for us to go in and build our own infrastructure system so we have partnered with the government to unlock the EV market through charging infrastructure.

2020 in one sentence...

"Unprecedented year for challenges that revealed new opportunities and an even stronger need for resilience in the energy system."

Advancing safe and reliable energy storage

Rob Anstey, CEO
GDI

GDI is developing an advanced silicon based li-ion energy storage technology, with anodes manufactured via Thin Film Solar equipment, and which utilize existing semiconductor supply chains. This results in fast-charging, highly scalable battery technology that will accelerate the future of clean energy powered electrification and E-mobility.

How has the COVID-19 crisis impacted "business as usual"?
The quarantine allowed for more discussions and collaboration with potential customers and development partners. The lack of office work, commuting and travel created more opportunities to connect. Additionally, while many industries experienced a slowdown, energy storage has become even more important to the economy and we experienced acceleration in our growth, clients, and partners. New technology and materials testing continued at the lab and at pilot-scale, so energy innovation continued to move forward.

COVID-19 has also emphasized the need to scale energy storage manufacturing in the U.S.. The pandemic caused unprecedented disruption to global supply chains that are so important for American companies. Energy storage is critical to the future of the grid and transportation and revitalizing battery manufacturing in the U.S. would create a more resilient and reliable supply chains for the future.

Have you been able to raise capital or close a deal during this uncertain time?
Fundraising has been difficult since face-to-face meetings have historically been part of the investor process. Thankfully, GDI's existing investors helped support us through these challenging times.

Did you discover any new opportunities?
COVID-19 is just a preview of the damage and disruption climate change will bring worldwide. The virus has presented an opportunity to accelerate U.S. clean energy infrastructure and to enable the energy transition.

Governments around the world will invest billions to restore the global economy, which presents a rare opportunity to build a cleaner and more robust economy that creates millions of sustainable jobs. Governments should work with investors and innovative startups to accelerate the transition to the clean energy economy, to decarbonize transportation, to grow the deployment of climate technologies, and to stimulate widespread electrification (powered by clean energy).

2020 in one sentence...

"A wake up call to live differently, a push to work hard now in order to be more resilient in the future; collaboration and community is key to tackling challenges ahead as threats like climate change are too significant for anyone to overcome alone."

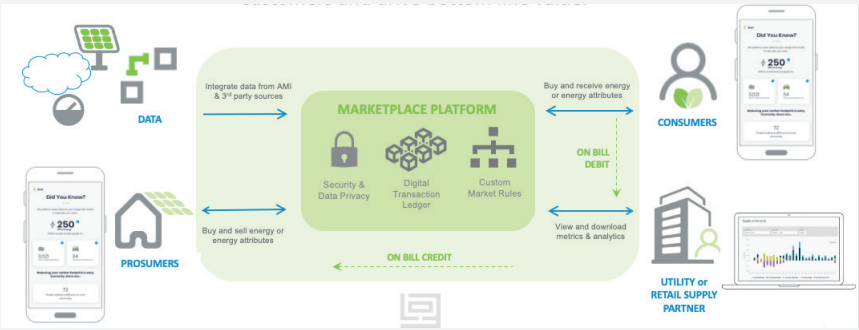
The grid edge of the future

Bill Collins, CEO and Co-Founder
LO3 Energy

LO3 Energy (LO3) deploys cloud-based marketplaces for distributed energy resources (DERs) to transact value 'locally' within the power distribution system. Its platform, Pando, is sold as a white-labeled, enterprise SaaS offering that positions LO3's partners to build customer loyalty while preparing for the grid of the future.

What is Pando?

A configurable, local energy marketplace solution purpose-built to engage customers and drive botttom line value.



Source: LO3 Energy.

How do you contribute to the energy transition?
LO3 partners with incumbent utilities and retail energy providers, leveraging the power of 'community' to incentivize customer participation in the transition to a decarbonized world. The company brings transparency and social equity to the DER value stack via market principles.

How has the COVID-19 crisis impacted "business as usual"?
Crises can be unifying, and COVID-19 brought unexpected clarity to our team as we rallied around a few critical near-term commercial milestones. After the initial shock at the end of Q1, the team efficiently realigned priorities and returned to execution mode. During "business as usual", balancing short-term priorities with long-term goals was a challenge, and the crisis actually helped us strike that chord.

Have you been able to raise capital or close a deal during this challenging time?
Yes, but with substantial effort. We are grateful for our committed partners who have focused on getting deals done. Cutting through the pervasive uncertainty has been by far the biggest challenge. "Uncertainty is paralyzing" is a pretty boring response here, but it is true. Convincing capital partners and commercial partners to make longer-horizon decisions with so many short-term (and long-term) unknowns has not been easy.

Have you discovered any new opportunities?
We found an entirely unforeseen use for Pando. We had previously contemplated solar owners, or "prosumers", being compensated for their excess, exported generation in our deployments. Yet with so many small businesses and households facing challenging economic conditions, we realigned our project with Green Mountain Power in Vermont and launched a new version of Pando enabling financial assistance for those in need. These changes have allowed prosumers to "share" a portion of their net-metered credits with members of their community, as bill assistance.

2020 in one sentence...

"A rapid acceleration of existing trends that highlight the fragile nature of our economies, ecosystems and communities."

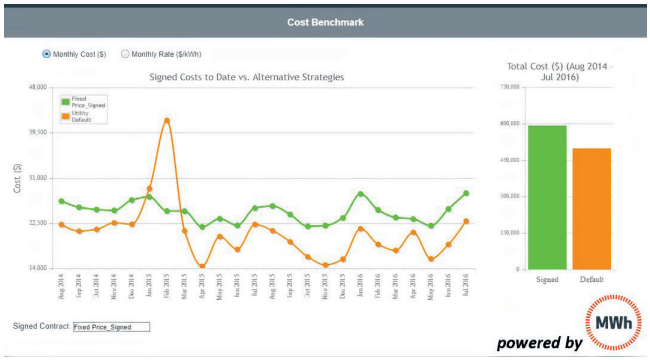
Market intelligence for your energy decision

Deirdre Lord, Co-Founder
The Megawatt Hour

The Megawatt Hour brings transparency to energy decision-making for businesses and non-profits using a software that transforms utility data into actionable information and analysis.

How has the COVID-19 crisis impacted "business as usual"?
The adjustment to remote working was relatively easy; however, we immediately needed to re-think certain decisions. Instead of long-term planning and forecasting, a routine that is well-integrated into our software, we focused on the short-term needs of our clients. Crisis can change our perspectives of time. The global and universal impacts of this crisis have been especially transformative.

What elements of collaboration have you seen



Source: The Megawatt Hour.

between cleantechs, corporates and governments?
The U.S. federal government has provided our customers with financial assistance to navigate the challenges associated with COVID-19. This support has enabled our customers, which include higher education and healthcare, to serve the needs of their patients, their students and their communities. We have seen higher education, healthcare, and even hospitality clients transform their operations practically overnight to improve testing capability, accommodate socially distant learning, and ensure the health and safety of their communities. All of these clients have done so with the expectation that they must prepare a quick and effective response to future outbreaks.

Have you been able to raise capital or close a deal during this uncertain time?
We have closed new business during COVID-19 largely due to our access to utility data and ability to quickly transform that data into a useful planning tool. We found that current clients wanted a deeper understanding of how COVID-19 affected their energy usage and demand.

Our customers like Northwell Health, Cornell University, Richmond University Medical Center, to name a few, wanted a deeper understanding of how COVID-19 affected their energy usage and demand.

How has COVID-19 impacted your short/long-term goals?
The Megawatt Hour has always emphasized the need for transparency and clarity around energy usage, markets, data and information. In the short-term, we have chosen to focus on connecting businesses to clear, concise and transparent data and information.

2020 in one sentence...

"Let's take one day at a time... and ideally each day will include connecting with people and getting outside."

Driving residential solar deployment

Sung Lee, CFO
Momentum Solar

Momentum Solar is one of the fastest growing residential solar companies in the U.S., installing customized solar panels for both residential and commercial buildings. Providing customers with cheaper and cleaner electricity.

How does your business contribute to the clean energy transition?
Momentum Solar's ongoing contribution to the transition to renewable energy focuses on weaving together best practices and developing industry best-in-class processes to accelerate the adoption of home solar. We engage with homeowners to provide detailed information and solar energy production estimates; and integrate advanced data analytics into in-house developed technology to facilitate often complex project management processes. Most importantly, our company serves as an ever evolving platform for innovation and problem-solving for our employees and leaders in the quest to facilitate the transition to clean, roof-mounted solar power.

How has the COVID-19 crisis impacted your 'business as usual'?
Momentum Solar has been recognized not only as one of the fastest growing companies within the solar industry for several consecutive years, we were also among the fastest growing private companies across all industries. The most significant impact to our business as usual was the immediate transition in focus from growth to resiliency. As both a leader in residential solar and as a significant employer in seven U.S. states, our focus was to remain hyper vigilant and to be prepared to adapt to a rapidly changing environment. This meant doubling down on our investment in our leaders and employees, instead of reaching for growth, as well increasing our focus on a customer base that is more sensitive to higher energy cost and usage.

Have you been able to raise capital or close a deal during this challenging time?
The crisis has created an environment that has been extraordinarily conducive to new partnerships, the collaborative pursuit of new business ventures, and the sourcing of additional capital. While completely unanticipated, we have discovered greater opportunities working virtually and meeting digitally by strengthening existing partnerships, or through the exploration of creative financing or strategic transactions. This has been driven in part by a declining pool of high-quality and high-potential companies, coupled with the near-term exigencies of creating catalysts for positive change and near-term opportunity.

Have you discovered any new opportunities?
Increasing home electricity consumption is likely to drive greater awareness of, and sensitivity to, means to mitigate and offset both current expenditures and future electricity rate increases. In addition, the home improvement industry overall has witnessed a meaningful uplift throughout the crisis, which is likely to drive homeowner receptivity to consideration of home solar. We see significant opportunity in homeowners seeking a personalized, consultative approach to the design and completion of their home improvement upgrades.

2020 in one sentence...

"2020 has been a year of tremendous adversity, uncertainty and opportunity - perhaps all in equal measure for participants within the clean energy industry."

Informing decarbonization of the built environment

Kevin Berkemeyer, CEO and Co-Founder
Station A

Station A is an AI-powered clean energy marketplace. The technology evaluates available clean energy solutions for buildings, enables data-driven decisions, and sources the best offers from our provider network.

How do you contribute to the clean energy transition?
Station A uses state-of-the-art AI to connect all available geospatial, financial, and grid-level information about buildings to enable building owners and property managers to start their clean energy transition journey and achieve their energy, emissions, and resiliency goals.

How has the COVID-19 crisis impacted "business as usual"?
COVID-19 changed our customers' priorities and accelerated the transition to a data-driven, software-first approach to clean energy development. We are observing increased emphasis on digitization of energy services and offerings for clean energy providers, prioritization of operational efficiency for clean energy buyers, and a desire for automation of the clean energy development process across stakeholders. These trends are tailwinds for our business, since they increase transparency and structure to the otherwise opaque, manual, and slow process of clean energy development.

What elements of collaboration have you seen between cleantechs, corporates, and governments?
Building owners and property managers are consistently asking for better ways of assessing their clean energy options. Recently, we signed a partnership agreement with Sustainable Capital Finance (SCF), a leading solar project financier, to enable anyone to input an address in Station A and receive a live market solar PPA quote. In Q2 alone, we provided 92 quotes for approximately 90 MW of solar projects. We are continuing this partnership and expanding similar ones with other providers to give buyers more transparency into their clean energy options.

Source: Station A.

Have you been able to raise capital or close a deal during this uncertain time?
Despite the challenges brought on by the pandemic, we closed our Seed Round and set and sustained our all-time usage record in Q2. We are using this capital to grow our business into an AI-powered clean energy marketplace and expand our team.

How has COVID-19 impacted your short/long-term goals?
COVID-19 has solidified our conviction around the need to automate clean energy development in order to achieve our long-term goal of transitioning the world to 100% clean energy. In addition, we have changed the way we approach work as a result of COVID-19, by transitioning to a remote-first work environment and culture, hiring the best and most diverse talent wherever we can find it.

2020 in one sentence...

"2020 has been a year of emotional extremes; from the birth of my second son, to Station A's successful seed round, all against the backdrop of a pandemic and a reckoning with social justice."

Energy storage - core of a distributed system

John Carrington, CEO
Stem Inc.

Stem is a provider of AI energy storage solutions, offering predictive analytics to businesses helping them develop and implement energy strategies for the future.

Source: Stem Inc.

How has the COVID-19 pandemic impacted your 'business as usual'?
From an HR standpoint, COVID-19 has certainly had an impact. It has brought forward opportunities to know Stem's employees better. HR's biggest focus has been to provide resources to employees in need, with efforts to focus on employee safety and health. Most importantly, it has also involved integrating ways to ensure the workforce can continue to work effectively with new tools, training, guidance, and support to maintain open communications. Stem is a software company at the core; collaborating on design and coding is critical. We have created some unique platforms to ensure execution while continuing to advance our roadmap.

Can you share an example of your efforts to prioritize public interest in this crisis?
Stem continues to be very supportive and work closely with grid operators and utilities in need of power. To minimize rolling blackouts in California, our hundreds of energy storage commercial systems in the Los Angeles area (equivalent to over 20,000 homes of virtual power plants) have been called upon multiple times per week in August and September.

How has COVID-19 impacted your short/long-term goals?
Long-term is to be determined. Stem has closed a couple pilot offices already. I have a view that we can remain very effective remotely and might consider quarterly face-to-face meetings. As CEO, in this remote-working environment it is harder to get a feel for day-to-day activities; in the office I can move from team-to-team and check in or join meetings ad hoc. It is much more challenging in this environment.

Short-term goals have not changed; we are executing our 2020 plan and focusing on employee safety, first and foremost.

How has COVID-19 impacted your ability to raise capital or close a deal?
Without the ability to have face-to-face interactions, process timelines have been protracted. Partnering activity has slowed, but Stem has a strong pipeline for opportunities. In general, partnering is not a priority at this point for either party. Regardless, Stem's sales team has been very effective, and our 1H20 was equivalent to the entire 2019, in large part due to our stakeholders and customers being more available. Today, we are hosting 5-7 customer roadshows in a single day which previously required an entire week's worth of travel and hotels.

What elements of collaboration have you seen between cleantechs, corporates, and governments?
There has been a willingness by stakeholders to support each other and find creative solutions. As an example, we are working with utilities to move through the interconnection approval process using remote commissioning tools, enabling faster online outcomes and delighting our customers.

2020 in one sentence...

"2020 is a time to come together professionally and personally to overcome significant new challenges by building on our collective strength."

IBM’s market-making collaborative platforms enabling cleantech growth and smart decarbonization

As the traditional energy system is being replaced by a complex network of dynamic stakeholders, participants are required to collaborate and to interact with new partners to leverage synergies and build resiliency across the network.

IBM is working with forward-thinking businesses and governments to bring their innovations to life through collaborative technology platforms that enable cleantech innovators of all sizes, types and stages of development to scale across the energy ecosystem.

Equigy: balancing and securing the renewable energy supply in Europe

To address the increasing need for flexible power as we switch to a larger share of renewable energy supply in the electricity system, Equigy is tapping into Distributed Energy Resources (DER) to help maintain the grid in balance and ensure security of supply.

Equigy was founded by European Transmission System Operators (TSOs) TenneT, Swissgrid and Terna, to provide a solution that would address the increasing need for flexible power in the electricity system.

Source: IBM

The energy transition is changing the energy supply chain landscape, with large conventional power plants gradually being replaced by decentralized, small-scale resources, and consumption changing, due to growing demand from electric cars, heat-pumps, and other consumer-based devices. This leads to unpredictable fluctuations between supply and demand of electricity.

The TSOs, who are responsible for maintaining the grid in balance, were looking for alternative ways to satisfy the need for flexibility. Traditionally, they relied on large power plants to provide this flexibility. But balancing the grid by firing up carbon-emitting fossil-fuel plants is counter-productive and inefficient. And while it is relatively simple for TSOs to ramp energy supply up or down from a small number of large power plants, the process itself is expensive.

Distributed Energy Resources (DER) were seen as a sustainable alternative to provide this flexibility. There was a challenge though – how to balance and validate these tens of thousands of small energy transactions?

In collaboration, IBM and Equigy developed a Crowd Balancing Platform, a blockchain-based platform that enables small-scale assets, such as electric vehicles, to participate in the energy system through aggregation. It registers and validates the transactions, through an immutable and secured shared ledger, creating the layer of trust needed to operate in a much more decentralized and dynamic ecosystem.

Following from the successful pilots run by TenneT, they realized that standardization and scale were key in enabling this approach. Together with Terna and Swissgrid, Equigy and IBM continue to engage new TSOs, as well as market parties and device manufacturers, to drive the European standards.

Through the Crowd Balancing Platform, Equigy wants to enable consumers to play an active role in the energy system of the future.

City of Copenhagen: reimagining clean built environment

We all know we need to find new ways to reduce our energy consumption and consume it more intelligently. With cities absorbing around 70% of energy use, they are a natural starting place.

The City of Copenhagen has focused on its public buildings as it sets out to become carbon neutral by 2025. Copenhagen is already a role model for sustainable practices. In Denmark, 50% of the electricity supply comes from renewable sources. The remaining 50% will be more challenging to transition. Smart thinking and smart technology are coming together to open new routes to efficiency.

The City operates 3,600 buildings and is aiming to build flexibility into its energy consumption by using its buildings to respond to imbalances in the system. Of the total energy currently powering the City's buildings, 20% – from lighting, heating, ventilation and other systems – is "flexible" and could be turned up, down or off in response to supply fluctuations. On days when renewable energy is scarce, the City would identify the systems within its buildings that could be turned down without compromising the comfort and safety of inhabitants, and channel that energy into other areas.

The City has worked with IBM to build an aggregator. An Internet of Things platform communicates with assets, devices and sensors throughout the buildings to monitor energy use. Blockchain, acting as a virtual meter, enables the City to predict how much each system would have used and registers how much has been saved in the time that it has been turned down. The information is stored securely and used as a basis for invoicing.

Lack of trust is one of the main reasons it has been difficult to tap into distributed energy resources as a source of flexibility. Blockchain measures the value that several small, disparate assets contribute when they deliver flexibility. By doing this, and ensuring all parties see the same information, it builds trust and transparency into the system. And by removing the need to make lots of point-to-point integrations, it saves money for participants.

The aggregator model could be instrumental in transforming Denmark's energy market, addressing an explicit need to build flexibility while helping Copenhagen to reach its climate targets. It could also help to expand the use of flexibility by demonstrating a trusted and attractive market for it.

The City is driven to build something that could benefit the entire region. With success running an initial pilot confined to one sporting arena, The City aims to expand this functionality to all public buildings. The next step would be to do so with water-processing plants, electric vehicles and street lighting.

Conclusion

The disruption that COVID-19 has caused reinforces the importance and power of collaboration between corporations, governments, cleantech companies and investors across the energy system. It demonstrates the important role cleantech companies play in the energy transition, driving adoption of more sustainable technologies. With drastic shifts in energy consumption, renewable power generation and alternative clean energy solutions have become more essential than ever. Investments into clean energy technologies have received record levels and we are excited about what the future holds for the clean energy sector.

"Achieving our climate and energy goals calls for a rapid and smart scaling of clean energy technologies, and cleantech companies can be the catalysts for change in these challenging times," said Kristin Barbato, Co-Founder of Dynamo. "The majority of the cleantech companies interviewed have been able to close new business or secure investments during the pandemic. This is truly inspiring, but to continue this momentum, innovators, investors, corporations, and policymakers have to work even closer and build trust to ensure the clean energy transition. This is why Dynamo's growing network and platform is more important now than ever."

"Despite of a tumultuous period of disruption and unprecedented change, 2020 is proving a banner year for cleantech investing and sustainability finance," said Ted Michaels, Head of Renewables North America at Credit Suisse. "It is promising to see that investors are taking an active role in accelerating capital for clean energy innovation, essential for the energy transition."

Acknowledgments

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