Innovating in bio-based and climate tech solutions
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As the world seeks to decarbonize, many innovative companies and new industries are scaling up to accelerate the technological and infrastructure requirements required to reach net zero.

With over 770 of the 2,000 largest publicly traded companies in the world committed to net zero, and a growing number of countries, cities, companies and other institutions pledging to reduce emissions, innovation will have to occur to support these ambitions to decarbonize. ¹ Despite progress and innovation to directly decarbonize the world through the advancement of renewables and other technology geared towards increasing the efficiency of the built environment, bio-based and climate tech solutions, including the generation of quality carbon credits, are needed to meet near-term commitments.

The need for carbon credits has accelerated corporate and investor focus on solutions that enhance the transparency and quality of the carbon credit market, including credit developers, ratings agencies, and project developers. In turn, this has resulted in increasing demand for voluntary carbon credits in the marketplace, with potential growth of 15x by 2030 and 100x by 2050 when compared to a 2020 baseline.

At the same time, categories such as Forestry and Land Use, Chemical Processing and Industrial Manufacturing and Agriculture have all more than doubled in volume traded over the

¹ Net Zero Tracker: https://zerotracker.net/
In order to meet this growth trajectory, capital has continued to enter the space - predominantly in the form of private equity and venture capital. Deal volume has continued to increase in recent years, with capital raised and deal volume increasing three and two-fold in 2021 compared to 2019\(^4\), respectively. The carbon offset market itself is projected to increase to $200bn by 2050\(^5\), accentuating the need for more capital invested in startups developing technology and bio-based solutions that provide these offsets in the near-to-medium term.

### Investments over time

![Investments over time chart]

Source: Pitchbook analysis.

Though voluntary carbon markets and the companies producing these credits are vital to the long-term success of net zero strategies, it is critical to note that emission reduction at the gross level is also required. Innovative solutions such as emissions monitoring technology and genetically designed crops and fertilizers will allow high emitting sectors such as energy and agriculture to do business more sustainably, while the growth of high-quality carbon credits will allow companies to offset extremely costly-to-abate or impossible-to-abate emissions. As the world continues to decarbonize, the effectiveness of these factors working in tandem will have an outsized impact on the ability of corporates and governments to reach net zero.

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\(^3\) A blueprint for scaling voluntary carbon markets to meet the climate challenge, 2022; McKinsey.

\(^4\) Pitchbook (Sept. 29, 2022); retrieved from Pitchbook database.

\(^5\) Global carbon offsets market could be worth $200 billion by 2050: Berenberg, 2022; SPGlobal.
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Providing comprehensive climate solutions

Angela Schwarz, CEO
Anew Climate, LLC

Anew Climate is accelerating the fight against climate change by enabling our clients to pursue market-based opportunities through Climate Solutions as a Service, or CSaaS.

Tell us about Anew Climate.

Anew Climate (Anew) was recently formed from the merger of durational industry leaders Element Markets and Bluesource. The combined company is one of the largest independent North American marketers of Renewable Natural Gas (RNG), supplying more than 20% of RNG used in transportation markets in North America today. Additionally, Anew is a leading developer of nature-based carbon offset projects domestically and internationally with a sizeable and growing sustainable forest management and agri carbon portfolio.

What trends are accelerating growth in your space?

As corporations receive growing pressure from investors to mitigate their Greenhouse Gas (GHG) footprint, we expect net zero pledges to increase. Likewise starting with the 2015 Paris Agreement, governments have already and continue to set net zero goals which will drive a similar increase in demand for Anew’s portfolio of climate solutions.

What are the main market opportunities or challenges?

The complexity inherent in achieving net zero goals is both an opportunity and challenge. We spend time educating our clients on how and why RNG, carbon offsets, and the many other solutions Anew provides can help the world economy meet its decarbonization goals, and advise them on actionable pathways to measure, reduce, and offset their carbon footprints. Carbon offset markets have been established for over 20 years, with significant market infrastructure. While these markets are not widely understood, they are nevertheless poised to be a significant part of the world’s decarbonization plans. Alongside other market drivers are governmental and societal sentiment which evolves over time with corresponding impact on climate-related policies. Current U.S. domestic policy has been supportive of growth and expansion of decarbonization through a range of incentives and compliance mechanisms as evidenced by the recent Inflation Reduction Act (IRA).

How has collaboration supported your growth?

Our business is built on collaboration. In our upstream carbon project development and RNG marketing and offtake business we collaborate with landowners, municipalities, farmers, and other partners to change operations and behavior in a way which results in GHG benefit. We also collaborate with our peers to educate policy makers and regulatory bodies. Finally, we have developed and continue to explore opportunities to partner with capital providers in an effort to invest in and own real assets and develop these assets in a sustainable manner. An example of this is our Bluesource Sustainable Forests Company subsidiary (BSFC). Anew, through BSFC, institutes improved forestry management practices that prioritize carbon sequestration and forest health, and that generate monetizable carbon credits.

“Accelerate positive climate impact profitability.”
Helping carbon market participants to price and manage risk

Sebastien Cross, Co-Founder
BeZero Carbon

BeZero Carbon contributes to the voluntary carbon markets, helping accelerate the net zero transition by providing companies with a common risk language for the quality of carbon credits.

Tell us about BeZero Carbon.

We are a global ratings agency for the voluntary carbon market, rating carbon credits across every sector, everywhere in the world. To date, we have rated over 250 projects from over 50 countries accounting for over half of credits currently outstanding in the market. Our carbon credit ratings, risk analytics and research allow all participants, from project developers to corporate buyers, to navigate the complexities of the market. Our team combines climate and earth science, financial research, data and technology and public policy expertise.

What trends are accelerating growth in your space?

As more companies set net zero targets, demand has risen for voluntary carbon credits. Interest has been catalyzed by both incoming regulations such as the disclosure requirements proposed by the SEC and initiatives from industry bodies such as the Voluntary Carbon Markets Integrity Initiative (VCMI) and The Integrity Council for Voluntary Carbon Markets (IC-VCM). We have also seen major private sector investment in decarbonization activities and technologies. All of these factors point towards growth, but capital can only be put to work in these areas if the tools to understand the market and its constituent parts are available.

What are your main market opportunities or challenges?

This market has huge potential as it evolves, but it currently lacks the information infrastructure and disclosure standards of more mature markets. That is why we have developed the BeZero Carbon Rating as part of a broader suite of risk analytics we are bringing to market. We believe that transparency and information disclosure standards must improve, and as such we make all our headline ratings publicly freely available on our website.

How has collaboration supported your growth?

Industry collaboration is central to our success. First of all, we believe that ratings are complementary to, not a replacement for, the accreditation process projects go through to issue credits. Furthermore, we believe the widespread adoption of ratings is a crucial step for credits to play a meaningful role in the broader decarbonization value chain. Our ratings can be found on some of the largest exchanges, marketplaces and data providers in the industry, hosted on their platforms through our API technology. This provides more users with an additional risk reference point to understand and compare carbon credits. We are a research-led business and have partnered with a number of industry organizations to produce research informing our users on the broader market.

“Scaling markets for environmental impact.”
Bioenergy Devco is a world leader in the financing, 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.

Tell us about Bioenergy Devco.
Our proven technology uses a scalable naturally occurring biological process to help communities and businesses transform their waste into energy solutions. Headquartered in Annapolis, MD, with more than 250 organics recycling and clean energy generation facilities worldwide, Bioenergy Devco’s anaerobic digesters help fight against climate change by reducing greenhouse gas emissions and dependence on fossil fuels.

How do you contribute to and help accelerate decarbonization?
We partner with businesses, communities, and governments to solve organic waste problems, while producing clean, renewable energy and achieving cleaner air, water, and soils in the process. Anaerobic digestion (AD) helps communities and businesses solve the challenges of organic waste management by reducing methane emissions and dependence on fossil fuels, while generating clean renewable energy and healthy soil products.

What trends are accelerating growth in your space?
Climate goals are a top focus at the local, state, and federal level, resulting in several newly initiated state-level waste diversion laws and the recently passed federal Infrastructure and IRA laws. Government is accelerating natural and technological solutions to climate change, and because AD is a natural climate change mitigation technology using microbes to transform waste into biogas and nutrient-rich soil products, it is gaining prominence in the U.S. AD is emerging as a superior solution to unsustainable waste management systems such as landfilling and incineration.

What are your main market opportunities or challenges?
We see big opportunities nationally because as the U.S. strives to achieve stronger domestic clean energy security, AD offers a non-fossil fuel power source to supplement existing infrastructure with sustainable green energy. Because enclosed AD technology is relatively new in the U.S., one of the biggest challenges we face is the lack of general awareness about the natural, biological process that takes place at-scale, and the many benefits AD offers the food, soil, waste, and energy sectors.

How has collaboration supported your growth?
Bioenergy Devco partners with food companies, municipalities, waste haulers, utilities, and communities in a holistic approach to growth by providing market analysis, product feasibility, permitting, financing, construction, facility management, and operations so that multiple types of organic material can be managed for maximum utilization and resource recovery.

Sustainable waste, energy and soil solutions.
Tell us about Charm Industrial.
Charm Industrial (Charm) is dedicated to permanently removing carbon from the atmosphere by producing bio-oil for: (i) permanent sequestration and (ii) use in making carbon negative steel. Charm was founded in 2018 and is led by Kelly Hering (CTO), Shaun Meehan (Chief Scientist), and Peter Reinhardt (CEO).

How do you contribute to and help accelerate decarbonization?
Charm Industrial leverages plants, or ‘biomass’, to capture CO₂ through photosynthesis. Charm then converts that plant biomass into a bio-oil through a process called pyrolysis, and permanently sequesters the bio-oil underground in geological storage. Charm uses corn stalks as well as forestry trimmings and other biomass that would otherwise decompose or burn, releasing the embodied carbon dioxide back into the atmosphere. By instead putting that embodied carbon back underground through bio-oil sequestration, it removes carbon from the biosphere. Charm transparently shares the full life cycle analyses of each delivery of removal on its public registry. In addition, the global steel industry accounts for ~7% of all emissions, more than double that of air travel. Charm is also commercializing the ability to use the bio-oil we create to transform the raw iron ore into this key steel making input, both avoiding the use of new fossil fuels and also sequestering additional carbon byproducts.

What are your main market opportunities or challenges?
Our main challenge is hiring enough scientists and engineers to scale our technology and improve the efficiency and reliability of our bio-oil sequestration and carbon negative steel making process. The other main challenge is the small number of long-term offtake agreements. Additional long-term offtake agreements would help solidify the demand for permanent carbon removals and create more demand signals to build the carbon negative infrastructure that is desperately needed.

How has collaboration supported your growth?
Collaboration has been a tremendous accelerator to our growth. We have been lucky to collaborate with local partners in Kansas who are small farmers, local governments, and oil field services providers. These organizations have been fantastically receptive to the climate transition. From the beginning, Shopify, Stripe, and Microsoft closely collaborated with Charm to become the largest mainstream customers of carbon removals. Charm’s deep collaborations with key carbon marketplaces and leading climate scientists at firms such as Joro, Carbon Direct, Carbon Plan, Carbon 180, Watershed, Patch, and others, have produced a prototype protocol for bio-oil sequestration as well as transparent calculations of the full life cycle analyses of carbon removal delivery.
Reducing emission through scalable abatement projects

Yohei Shimasaki, CFO
ClimeCo

ClimeCo provides comprehensive, vertically integrated solutions to help clients maximize their environmental assets, minimize regulatory costs, and enhance their sustainability impact.

Tell us about ClimeCo.
ClimeCo started as a carbon offset development company focusing on industrial and technology-based solutions. We have expanded to create nature-based carbon offsets with landscape-scale reforestation projects and innovative products such as plastic credits. ClimeCo also provides advisory services for large corporations interested in understanding their carbon footprint and setting emission reduction targets.

How do you contribute to and help accelerate decarbonization?
We pride ourselves in helping corporations decarbonize no matter where they are in their journey. For some companies, that might mean taking the first step and understanding their carbon footprint. For others, it could be setting meaningful emission reduction targets and helping them establish a pathway to reduce over time. For companies that cannot fully decarbonize today, our carbon offsetting solutions allow them to take responsibility for their emission reductions immediately and economically efficiently.

What trends are accelerating growth in your space?
We are seeing two major trends pushing companies to take action against global climate change. First, companies better understand the material risk that climate change can pose to assets and supply chains. For example, they are anticipating an increase in weather-related disruptions and competition for key natural resources like water. Second, important stakeholders are demanding companies address climate change. Outside of a company’s footprint, carbon offsets and other environmental assets represent an exciting way for companies to contribute to climate change mitigation directly.

What are your main market opportunities or challenges?
Recent attention and finance flowing into the carbon market through investors or companies wanting to purchase offsets have opened the door to bringing many new and exciting carbon offset projects online. We are also seeing an influx in innovative players and technologies that can bring new carbon offset project types to market or technology that reduces the costs of monitoring projects. As far as challenges go, increasing supply can be slowed by administrative challenges or even just the biological reality of how fast a tree can grow.

How has collaboration supported your growth?
We cannot get our work done without good partners. We work in project types across various industries, from nature-based solutions to highly technical industrial innovations. Many of our projects go beyond the environmental attribute and have a significant community development aspect. Our partners must be highly engaged in the community and ensure everyone receives project benefits.

“Innovative market-based climate solutions.”
Featured partners

Pioneering development of carbon negative renewable natural gas

Ryan Waddington, CEO, Chairman and Co-Founder
Cowboy Clean Fuels

Cowboy Clean Fuels plans to utilize subsurface coal seams as geobio-reactors to produce low-carbon renewable gas through microbial action, becoming the gold standard for clean fuels and a critical component of the clean energy economy of the future.

Tell us about Cowboy Clean Fuels.
Cowboy Clean Fuels is an emerging clean energy company based in Denver, CO. Our technology is licensed from the University of Wyoming and is based on over 15 years of technology development. The company leverages naturally occurring biological processes to convert renewable biomass feedstocks into RNG while simultaneously capturing and securely storing CO₂. The process is based on the secondary biogenic natural gas production that has been observed in Coalbed Methane (CBM) reservoirs in the Powder River Basin of Wyoming. Cowboy utilizes vast CBM resources and existing infrastructure to produce the most scalable, carbon negative RNG in the market.

How do you contribute to and help accelerate decarbonization?
Cowboy contributes to decarbonization by geologically sequestering CO₂ removed from the atmosphere and converted to terrestrial biomass through photosynthesis, by leveraging naturally occurring methanogenic bacteria to metabolize the biomass into methane (CH₄) and CO₂ and then leveraging the coal formation’s naturally greater affinity to adsorb CO₂ to securely lock it away for geologic time.

What trends are accelerating growth in your space?
The transition away from carbon-intensive energy is fueling the need for RNG, among other clean fuels. The advantage that RNG has over other clean fuels is flexibility. It can be used for transportation, heating and cooling, and power production, to name a few. Both the emerging carbon markets and the established renewable fuels market managed by the U.S. Environmental Protection Agency (EPA) are enabling RNG producers like Cowboy to develop projects that are highly profitable and in great demand.

What are your main market opportunities and challenges?
Current market opportunities are clean transportation fuel markets, like the EPA Renewable Fuels program and the California Low Carbon Fuels program. But other markets are emerging, including utility green gas programs, green hydrogen production and RNG-fired power production. These emerging markets will move RNG into the mainstream of clean energy, but only if scalable solutions like Cowboy Clean Fuels are deployed broadly.

How has collaboration supported your growth?
Cowboy has many collaborators that have supported our growth, including the University of Wyoming, Western Sugar, current CBM producers, clean fuel consultants like EcoEngineers and Modern West, industry organizations like the RNG Coalition, and clean energy advisors like Dynamo Energy Hub, to name just a few.

“Scalable, carbon-negative renewable natural gas.”
Specializing in environmental performance testing

Scott McCurdy, CEO
Encino Environmental Services

Encino Environmental Services provides emissions testing, leak detection and continuous emission monitoring systems to assist customers to identify, measure and minimize emissions.

Tell us about Encino Environmental Services.

Encino specializes in emissions performance testing of criteria pollutants as well as GHGs; leak detection and repair (LDAR); continuous emissions monitoring systems (CEMS); high-resolution satellite methane detection; and advanced environmental data software for the measurement and minimization of emissions to help ensure regulatory compliance and meeting ESG strategies and objectives. Our mission is to help energy companies meet and exceed their net zero carbon goals to improve climate performance while enhancing regulatory compliance and profitability.

How do you contribute to and help accelerate decarbonization?

Encino supports companies in the development of comprehensive and customized ESG Roadmaps. Through our entire Emissions Management Ecosystem, Encino uses turnkey science-based solutions to help eliminate emissions. The product and service solutions we provide address the existing regulatory and compliance directives. Looking to the future we provide the latest technology for CEMS that elevate the capabilities for decarbonization.

What trends are accelerating growth in your space?

Climate has reached the same level of societal awareness and concern as governance and social issues. Rising demands for action are being reverberated throughout the world and the financial sector. This in turn is promoting a strong need and desire for companies to accelerate their efforts in climate responsibility. Encino’s Emissions Management Ecosystem and advisory services provide the power of industry knowledge around ESG and compliance, helping companies achieve their goals.

What are your main market opportunities or challenges?

Industry leaders are recognizing their role in creating a cleaner energy future and desire to improve their emissions footprint, which provides them with operational efficiencies, opportunities to sell products at a premium and avoid costly offsets. Additionally, opportunities are realized with a reduced reputational and financial risk and the ability to meet increasingly stringent regulatory requirements and investor expectations.

How has collaboration supported your growth?

Our breadth of vertically integrated products and services address a wide array of challenges that face our industry in the environmental market segment of oil and gas. By tailoring a fit-for-purpose strategy, whether it be a specific solution or all-inclusive approach, we are able to best collaborate with our clients to create a successful outcome. Being a trusted advisor and ally for the industry is what has best supported Encino’s growth.

Your ally for cleaner energy.”
Circular solutions driving value from waste

John Dannan, Managing Director
Generate Upcycle

Generate Upcycle is an owner, operator, and developer of organic waste processing infrastructure that provides environmentally sustainable, closed loop solutions which reduce CO₂ emissions while generating renewable energy and other decarbonized products.

Tell us about Generate Upcycle.

Generate Upcycle is a platform focused on the acceleration and expansion of waste-to-value solutions including organic waste, recycling, composting and wastewater treatment. Generate Upcycle operates, develops, and acquires projects that offer zero waste solutions to end customers. Generate Upcycle combines Generate’s existing investment portfolio of North American anaerobic digesters, composting and food waste recovery assets with additional initiatives across biosolids, wastewater treatment, sustainable fuels and nutrient production.

How do you contribute to and help accelerate decarbonization?

Organic waste diversion is a major lever in decarbonization; removing organic waste from landfills reduces the amount of methane released into the atmosphere while creating valuable end products like clean electricity, renewable gas, and organic nutrients. Across more than 20 facilities in the U.S. and Canada, Generate Upcycle currently processes approximately a half a million tons of food waste annually and composts an additional 365,000 tons of organic waste per year.

What trends are accelerating growth in your space?

Customer demand for waste solutions are a major driver as customers are increasingly focused on circular solutions for waste management and alternatives to landfill. Additionally, regulatory frameworks are a major driver including various states’ Low Carbon Fuels Standard program, EPA’s Renewable Fuels Standard, and the recent tax incentives provided for in the Inflation Reduction Act.

What are your main market opportunities or challenges?

On the opportunities side, the market for organic waste is vast, given the sheer volume of organic waste produced annually. In certain jurisdictions, permitting for greenfield waste facilities can take substantial time (over five years), which can constrain the amount of capacity built out to address the total demand.

How has collaboration supported your growth?

To build a sustainable future waste needs to be approached differently – this means working closely with communities to create infrastructure and with businesses to maximize the value of what would otherwise be throwing away. Consumers are rightly demanding a world that wastes less and uses materials as part of a circular economy, and Generate Upcycle provides a set of compelling solutions.

“Circular solutions driving value for all stakeholders.”
Unlocking seed potential for greater yield with fewer resources

Stuart Brown, CFO
Inari

At Inari, we believe in nature-positive seed design—creating a seed that serves the population, the planet, and the people who grow our food.

Tell us about Inari.
Inari is the SEEDesign™ company, using new breeding technology to push the boundaries of what is possible by designing nature-positive seeds for a more sustainable food system. A combination of AI-powered predictive design and a pioneered multiplex gene editing toolbox is enabling Inari to unlock the full potential of seed and advance critical solutions with broad applications for growing more food with fewer resources. Our solutions will deliver nature-positive impacts while creating value for the entire value chain, starting with farmers.

How do you contribute to and help accelerate decarbonization?
We are building a net-positive company by driving forward nature-positive agriculture that feeds people and the planet for generations to come. We are developing crops that will exponentially increase yield with fewer resources. By putting our initial focus on crops such as corn and soybeans, which together cover roughly 60% of U.S. farmland, we aim to substantially reduce emissions and other pollution streams. Plants that can achieve the same or greater yields with less nitrogen can make big strides in decarbonizing agriculture.

What trends are accelerating growth in your space?
There is a growing understanding across industries that delivering natural, human and social returns, in addition to financial returns, is both an opportunity to build trust with customers and a way to mitigate against significant risk exposure while lowering the cost of capital. Meanwhile, investors, policymakers and consumers are recognizing that the agricultural system changes we seed today for a climate-changing world will determine whether there will be clean air, drinkable water and healthy harvests tomorrow.

What are your main market opportunities or challenges?
In the ‘climate-changed’ era we are entering, there is no avoiding the direct dependence of every financial bottom line on a healthy natural world and workforce. While true for every business, this understanding is front and center in agriculture. Inari is building a net-positive business by embedding sustainability into our core business value creation strategy: net-positive seeds. In doing so, we are directly addressing climate change.

How has collaboration supported your growth?
Collaboration with independent seed companies is core to Inari’s business from product design to seed sale. We engage in a product co-development process to deliver optimal seed characteristics. For example, Inari teams designed a ‘future-proofed’ wheat product in collaboration with InterGrain, a leading Australian wheat breeding company. Once market ready, these wheat seeds will reach farmers through InterGrain, a local and trusted advisor.

“Seeding a nature-positive food system.”
Providing novel data to deliver the most accurate weather forecasts

Matt Stein, CEO and Co-Founder
Salient Predictions

Salient brings together world-leading experts to create the new standard in weather forecasting, harnessing this ability to help customers stay prepared, become more resilient, and properly assess climate risk to their business.

Tell us about Salient Predictions.
Salient creates the world’s most accurate two to fifty-two week weather forecasts and industry-specific analytics.

How do you contribute to and help accelerate decarbonization?
Salient is helping accelerate decarbonization in several ways. We help renewable energy operators manage through increasingly volatile weather patterns (water, wind, temperature). This makes renewable energy more reliable, accelerating adoption. We also help agribusinesses maximize crop yield by selecting optimal crops to grow in specific regions based on expected growing conditions.

What trends are accelerating growth in your space?
Privatization of weather forecasts, based largely on the application of advanced machine learning, new in-situ, or direct monitoring, and satellite data sources, as well as rapid private sector innovation cycles.

What are your main opportunities or challenges?
Salient’s main market opportunity is that for business decisions requiring weather insights two to fifty-two weeks in the future, enterprises are starting to migrate toward a forecasted view, as opposed to just assuming continuation of historical trends (climate change is creating more volatility in the weather system). The largest challenge is the need to educate companies on how to use these forecasts and analytics.

How has collaboration supported your growth?
Salient has collaborated on Proof-of-Concepts (POCs) with numerous customers. These POCs are essential as they create rapid product feedback loops between Salient and customers, who in turn are also learning from the market.

“Reducing impact of weather volatility.”
Decarbonizing the chemicals industry through synthetic biology

Garub Chakrabarti, CEO and Co-Founder
Solugen

Solugen brings clean, sustainable chemistry to every industry, making the high-performing, cost-competitive, carbon negative products the world needs.

Tell us about Solugen.
In 2016, we set out to radically transform the chemicals industry. What started as a pledge to first, do no harm, became a promise to bring clean, sustainable chemistry to every industry and every aspect of modern life. In the years since, we have opened the world’s first carbon negative molecule factory and made plans to build many more across the U.S.; we have made scalable synthetic biology a reality, and now we are bringing high-performing, cost-competitive, carbon negative products to the whole world.

How do you contribute to and help accelerate decarbonization?
Solugen commercializes decarbonization technologies with a primary focus on decarbonizing the chemical industry. One primary example of these technologies is our Bioforge, the world’s first carbon negative molecular manufacturing platform.

What trends are accelerating growth in your space?
Consumer preferences for more sustainable materials with a reduced carbon footprint.

What are your main market opportunities or challenges?
To date there are very limited actual scaled commercialized solutions to address these major world challenges, which provides a great opportunity for new disruptive technology to address climate change in a real, tangible, and profitable way.

How has collaboration supported your growth?
Collaboration is paramount. Solugen regularly collaborates with leading universities and research institutions, key existing players and customers in the chemicals and technology industry.

“Profitably scaling disruptive decarbonization technology.”
On-demand crop solutions to create resilient food systems

Adam Litle, CEO
Sound Agriculture

Sound Agriculture is embarking on a new age of agriculture. By leveraging the power of plants and activating the existing soil microbiome, they help create a more agile and resilient food system.

Tell us about Sound Agriculture.

Sound Agriculture is improving how we farm and what we eat through two business lines that lead to better tasting, healthier and more sustainably-grown food. Our flagship product, SOURCE, uses patented technology to activate microbes in the soil that unlock existing nitrogen and phosphorus. It boosts yield and reduces the need for expensive and harmful synthetic fertilizer. On-demand breeding creates custom crop varieties without changing the plant’s DNA. The common goal in our technology platforms is to develop food that is better for people and the planet.

How do you contribute to and help accelerate decarbonization?

In addition to expanding sales of SOURCE, our nitrogen reduction pilot program was specifically designed to replace nitrogen across fields throughout the U.S. It is another step in achieving our overarching goal of reducing 30% of global nitrogen fertilizer. This year we also announced a collaboration with Shell New Energies U.S. on a feasibility study to measure the economic and environmental impact of reducing agriculture-related nitrous oxide (N2O) emissions.

What trends are accelerating growth in your space?

For nutrient efficiency, the market opportunities are accelerating due to: (i) dramatically higher costs for traditional synthetic fertilizer, and (ii) increasing awareness about the damage over-fertilization has for the planet and food system at large. On the consumer food side, people now recognize that what they eat can dramatically impact the land, in addition to their health.

What are your main market opportunities or challenges?

Although nitrogen is essential for crop development, it is often overapplied. While the use of cover crops and reduced tillage has increased, nitrogen reduction practices, such as reducing fertilizer use, have not been widely adopted due to the economic risk associated with yield loss and the lack of data around carbon impact. Our nitrogen reduction pilot underwrites the cost of lost yield to help make this change more feasible.

How has collaboration supported your growth?

Partnerships are essential to accelerating the impact of our work. For example, we partnered with Syngenta to launch SOURCE trials in China, a country that uses more fertilizer than any other country in the world. We have another partnership with Mosaic, which is helping to evolve our product offering by combining SOURCE with micronutrients. Similarly, partnerships with companies like GDM and many others on the on-demand breeding side have helped us develop a broad pipeline of trait validation projects.

“Creating better food for people and the planet.”
Revolutionizing the storage and distribution of renewable power

Paul Mutolo, CEO
Standard Hydrogen

Standard Hydrogen is building a network of multi-functional, onsite produced renewable hydrogen stations to deliver needed benefits to the renewable energy market today, and to energize the zero emissions vehicles (ZEVs) of tomorrow.

Tell us about Standard Hydrogen.
Standard Hydrogen Corp (SHC) is a clean energy company, delivering on the promise of an Emissions Free Everything™ for our customers. SHC is doing this by developing hydrogen infrastructure that generates, uses, and delivers hydrogen at the point of use. This lets us provide solutions for both clean electric power and transportation needs. Our Energy Transfer System (ETS) is approximately the size of a small fuel station/convenience store, and can provide distributed energy storage, support grid-neutral EV charging, and hydrogen for the coming generation of fuel cell vehicles.

How do you contribute to and help accelerate decarbonization?
SHC is committed to powering all of its ETSs or systems using renewable energy such as hydro, solar and wind power. In particular, SHC will use off-peak renewable energy to generate hydrogen, and then redeploy that energy where and when it is needed to minimize or mitigate greenhouse gas emissions that would be created by power production or transportation industries.

What trends are accelerating growth in your space?
Increased attention to the externalities that lead to climate change have driven a great deal of interest in hydrogen generally, and more specifically in the implementation of clean hydrogen resources and use cases. While we welcome the increased understanding, we view it as creating additional urgency to begin larger scale implementation. The provisions of the IRA have also increased the short term economic prospects for electrolytically generated hydrogen.

What are your main market opportunities or challenges?
Simply put, we need the market to understand that energy storage - on a grid level - is necessary to make better use of our existing and future renewable energy assets, and that hydrogen will be a core part of that. In addition, accelerating customers' understanding that hydrogen fuel cell vehicles, across multiple classes, will combine the convenience of a chemical fuel with a zero emission profile is a remaining challenge that we expect to improve with infrastructure deployment.

How has collaboration supported your growth?
Collaboration is essential when developing a meaningful business model. The ETS relies on multiple revenue streams, with potentially very broad and varied applications. It is also worth mentioning that we would simply not be here were it not for the support of our utility partner, National Grid, or the teams at NYSERDA, NY-BEST and Centerstate CEO, who have supported us throughout our existence.

“Standard Hydrogen: Emissions Free Everything.”
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