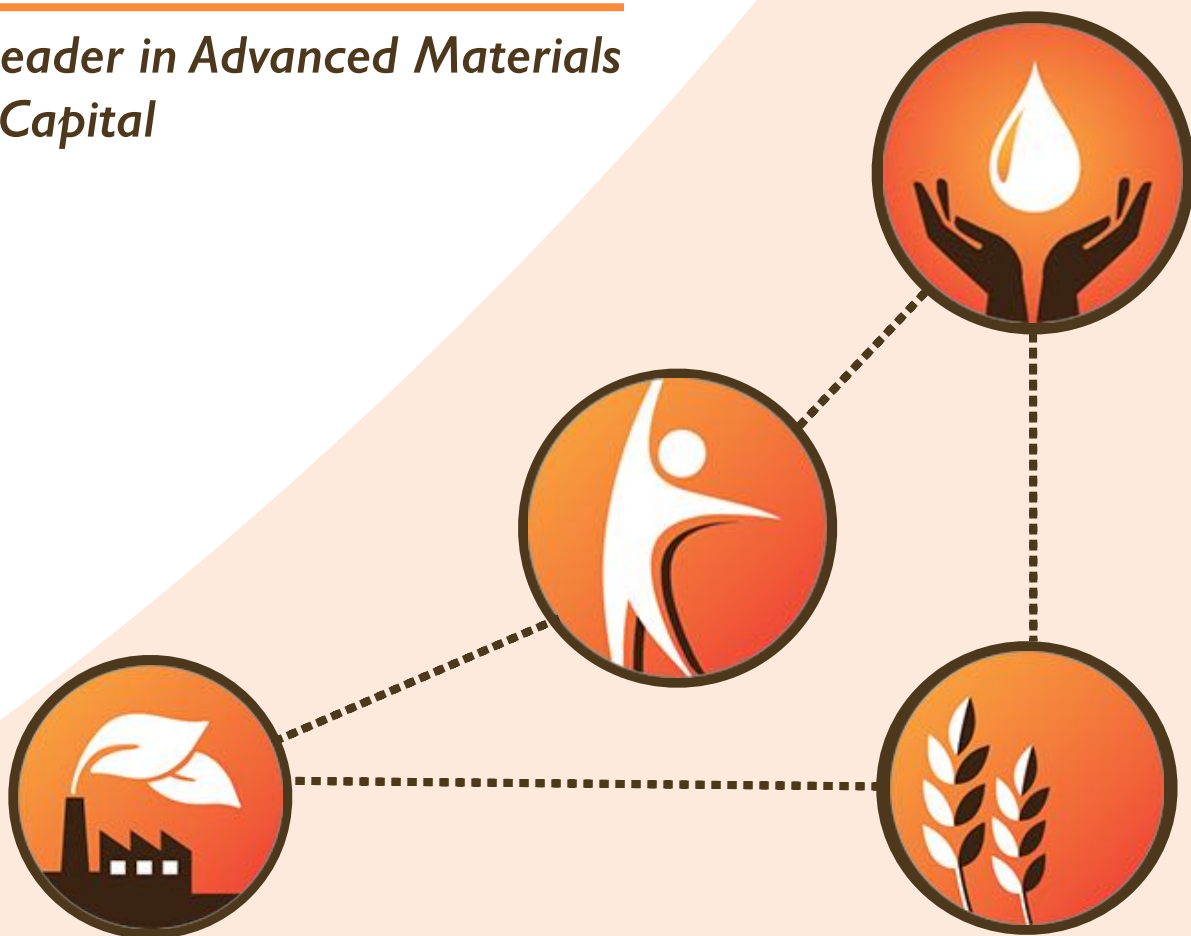




2019 Annual Impact Report

*Global Leader in Advanced Materials
Venture Capital*



“We live in uncertain times. But one thing of certainty is the steadfast commitment of all of the entrepreneurial teams in the Pangaea family to help make the world a better place. Even on days when the news is grim, that is what wakes me up with a spring in my step.”

-Chris Erickson

Founder & General Partner, Pangaea Ventures



Table of Contents

3	Introduction
4	Looking Forward - 2025 Goals
8	2019 Highlighted Investments
12	Materials Have No Boundaries
13	Fund Wide Impact
14	Driving Value with Diversity
17	About Pangaea Ventures
18	Appendix

Introduction

As we publish this report, we have witnessed an unprecedented shuttering of businesses and supply chains around the world. Prior to the COVID-19 crisis, the world seemed to finally be waking up to the realities of climate change. And even the most modern economy in the world, California, suffered from basic energy security issues. Global giants have taken notice of course. Gilead Sciences and others are using modern biotech tools to quickly develop vaccines and treatments for COVID-19. Companies such as Microsoft have pledged to become carbon negative by 2030. Giant utilities such as Con Edison are going all in on renewables and energy storage.

Grand challenges present opportunity, and at Pangaea we believe in the power of entrepreneurship to solve the biggest problems in the world. Breakthroughs in advanced materials, chemistry, and biochemistry married with the best entrepreneurs is the most powerful formula to realize our vision of a better world. At Pangaea Ventures, we are proud to be partnered with companies that share our vision. In this year's issue, you will hear from the CEOs of three such companies. And from a fourth you will hear how diversity can be such a powerful tool for investors to embrace.

Our most recent investment, TruTag Technologies, enables authentication and safety of products such as pharmaceuticals and food. It is thought that 250,000 children die after receiving adulterated or outright fake drugs intended to treat malaria and pneumonia alone. Hazel Technologies has commercialized a technology to increase the shelf life of food. As much as two billion tons of food are wasted around the world each year, creating a huge opportunity in all four of our impact areas. Finally, Modulim is marketing a new imaging paradigm that infers oxygen content and health of tissue. At low cost and low risk, novel diagnostics are a powerful weapon that doctors can leverage to provide earlier and more targeted interventions that improve patient outcomes and reduce healthcare costs.

There is a quote from a famous venture capitalist: "Software is Eating the World". While the power of software cannot be denied, the solutions to the world's biggest problems cannot be solved without advanced materials.

Our vision is "Advanced Materials for a Better World".

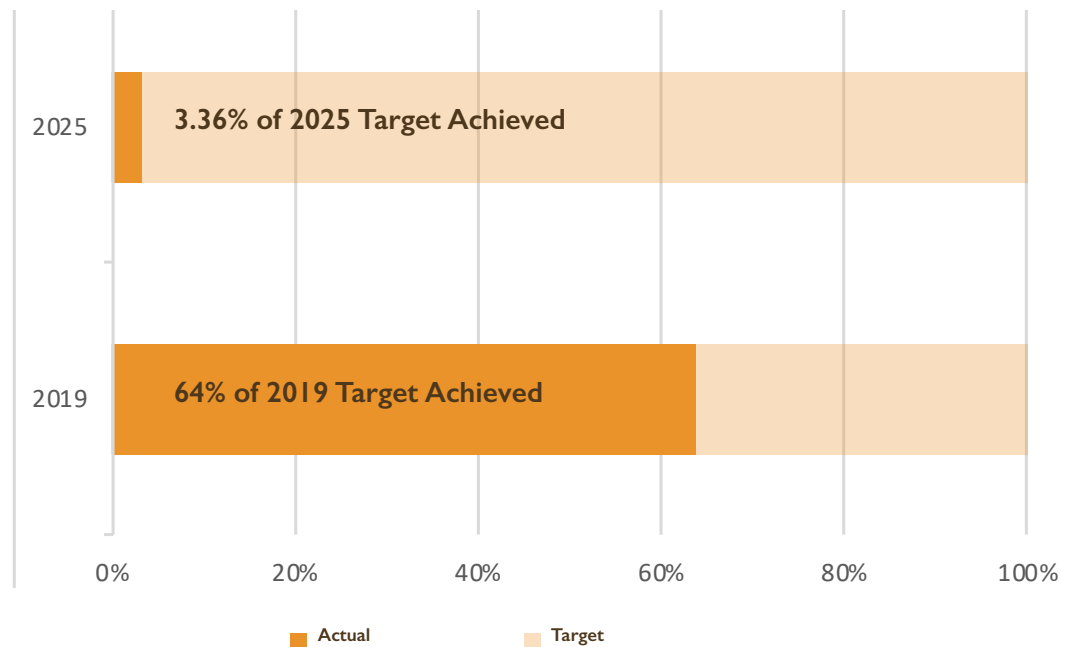
Looking forward - 2025 Goals



CO₂ Reduction

30M Tons Mitigated by 2025

= 6.5M passenger cars driven for 1 year



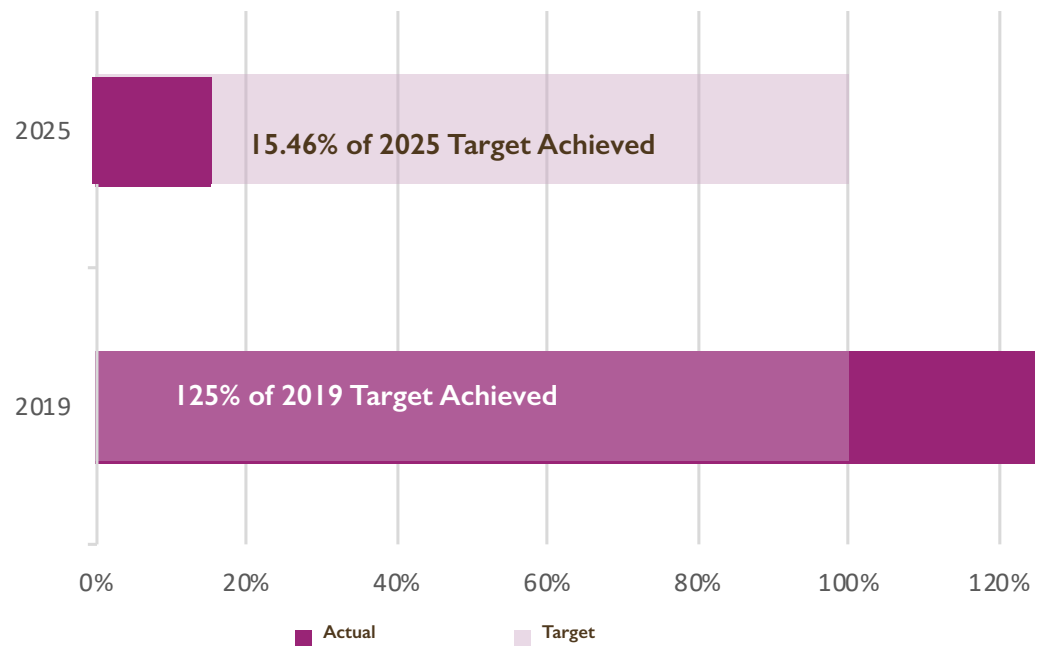
Pangaea's portfolio companies performed well in the area of CO₂ reduction, achieving 65% of their 2019 target, mitigating an estimated 648 kilotons of cumulative emissions. Revenue growth at Cnano was the primary contributor. Cnano's products improve the performance of lithium ion batteries, thus reducing embodied energy and carbon footprint. In September, Cnano successfully completed its IPO on the Shanghai Stock Exchange, a testament to the dominant position of the company in its market. CarbonCure was also a meaningful contributor and with step change growth in licensees at the end of 2019 combined with an initiation of Asian sales, we expect this trend to continue in the coming years. Several other companies are behind target in scaling plans. While we expect broader contribution to CO₂ impact in 2020, it appears as if 2021 may be the year we see broad impact in this category ramp across the portfolio.

Looking forward - 2025 Goals

Lives Impacted
5M People Impacted by 2025
 = Roughly the population of Costa Rica



Highlighted Portfolio Companies



Pangaea's portfolio hit 125% of its 2019 cumulative target, impacting an estimated 612k lives. This performance was driven by a successful year from Redlen Technologies in selling products into the nuclear medicine market, primarily cardiology. We are even more excited about the progress the company is making on its next generation CT imaging platform which promises to become the new imaging paradigm for millions of patients in the decade to come. As Modulim begins to ramp sales of its tissue health imaging product, we are also hopeful their technology becomes a broad imaging platform that can have a meaningful impact on lives.

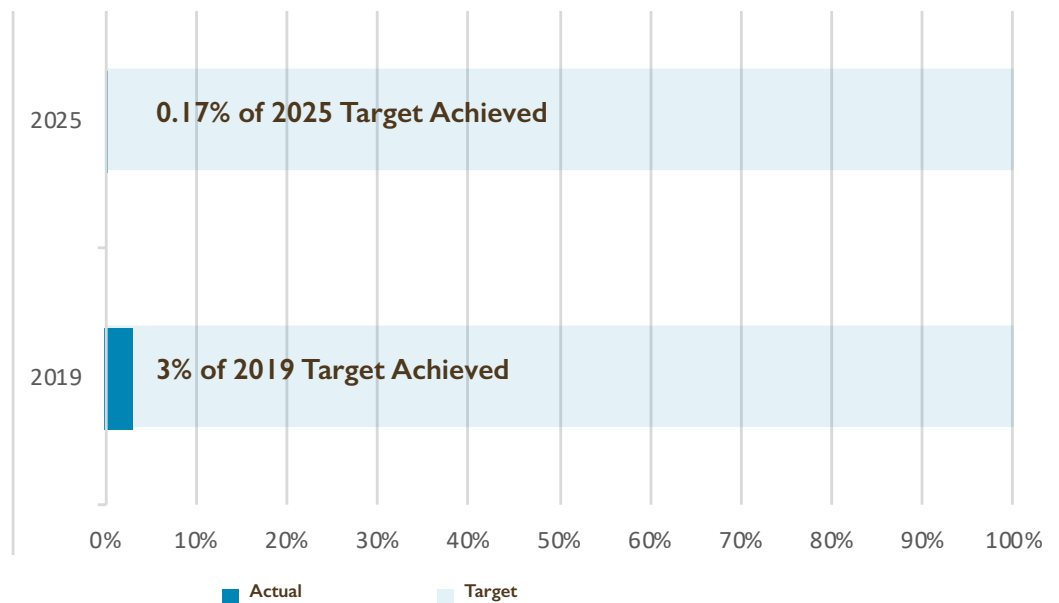
Looking forward - 2025 Goals



Fresh Water Saved or Produced 13B m³ Saved or Produced by 2025

= 4 months water for every household and business in Canada

Highlighted Portfolio Companies



Agriculture is estimated to consume 70% of the world's fresh water. Several of Pangaea's agriculture technology companies fell behind on the commercial launch of their products in 2019, putting cumulative water savings behind target at 15 million m³. With 2020 selling season now well underway, there are incredibly encouraging signs that this will be the breakout year we have been waiting for.

Looking forward - 2025 Goals

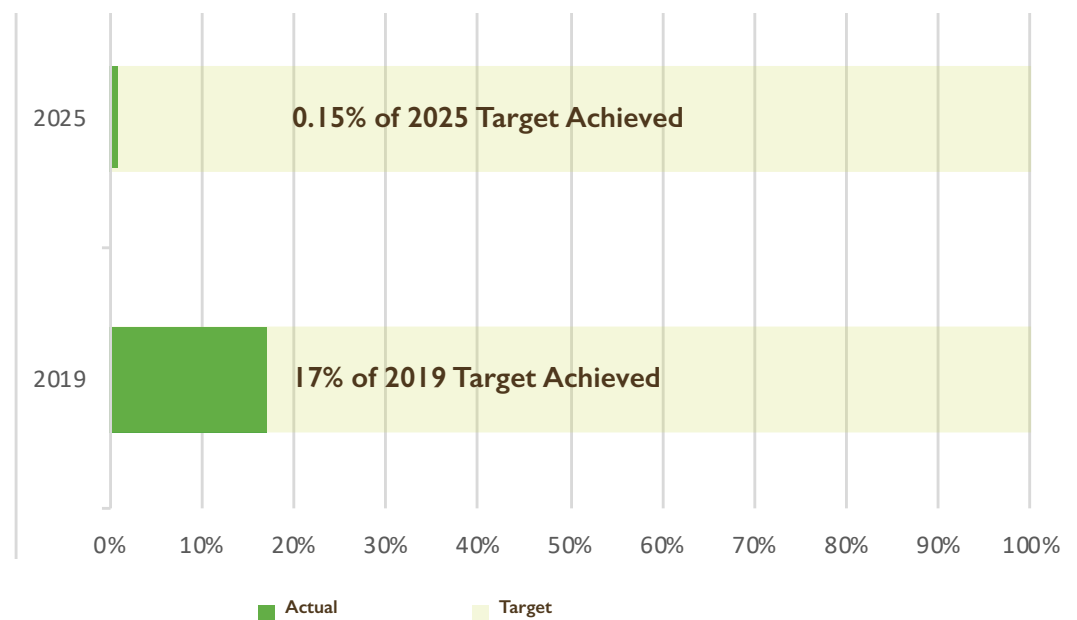
Food Production Increased

5.8M Tons Produced by 2025

= Enough food to feed 165,000 People for a Lifetime



Highlighted Portfolio Companies



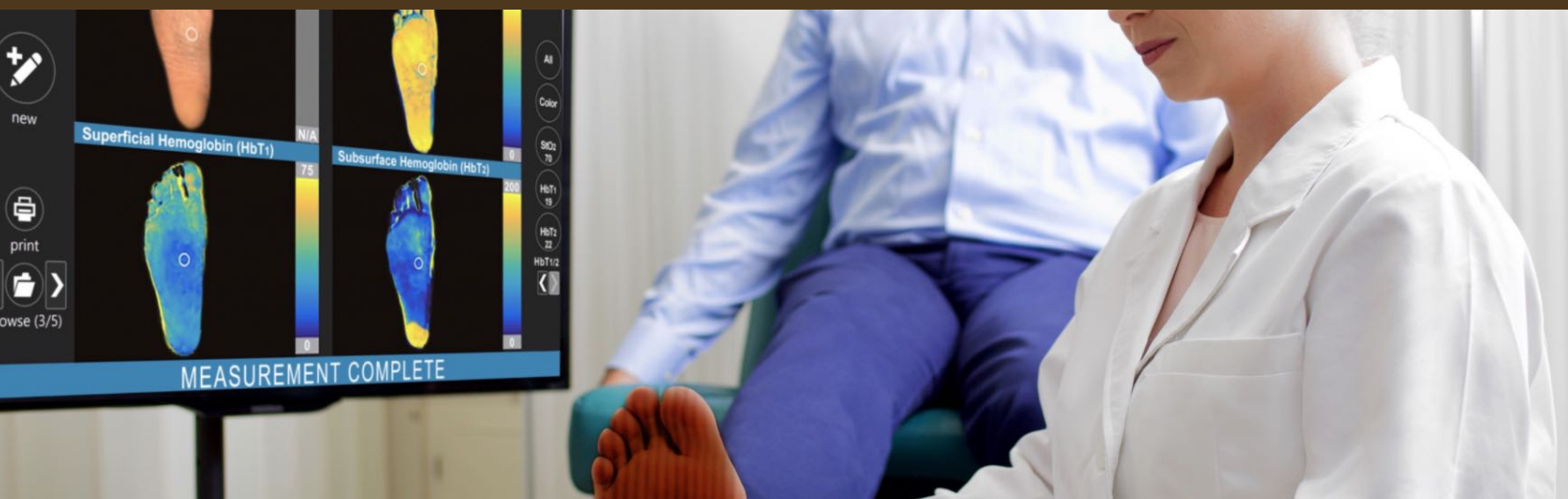
Pangaea's portfolio companies saved or enabled an estimated 8,600 tons of food production in 2019, 17% of target. Performance benefitted from the addition of Hazel Technologies to the portfolio in 2019. An estimated 30-50% of the world's food production is wasted. As such, there is massive headroom for impact in this market. Hazel's food preservation technology can extend the shelf life of produce significantly and with major partners such as Mission Produce, we expect many tons of impact in 2020 and beyond.

2019 Highlighted Investments

Could Food Supply Double Just by Reducing Waste?



Can We Image a Healthier World?



What if Drug and Food Security was Built In?





hazel technologies inc.



Pangaea co-led Hazel Technologies' \$13M Series B financing. Founded in 2015, Hazel's core technology revolves around the release of active, shelf-life-enhancing ingredients from packaging inserts. Sachets are placed in boxes of bulk produce by growers at the time of harvest, extending the shelf-life of produce up to three times by slowing aging and possibly removing fungus or decay.



Interview with CEO, Aidan Mouat



Hazel has developed a simple drop-in solution that extends the shelf life of fresh produce by slowing the chemical process that causes decay. How does keeping perishable goods from spoiling create an environmental impact and reverse global warming?

As a general rule, each metric ton of food that goes to waste produces about 1.6 metric tons of CO₂e as it spoils. This number does not take into account resources wasted during the spoilage process. As a base case, consider the US system: annually, about 24% of the US fresh water supply, 6% of the annual energy budget, and 295M excess gallons of gasoline go to waste as a result of produce waste in the US. Reducing spoilage waste therefore not only lowers the carbon footprint of the supply chain, but has the potential to reduce the resource intensity of food production.

Over the last couple of years, Hazel has treated nearly 1B lbs of produce worldwide with its products. Based on an average of 20% spoilage waste in the food supply chain, and the average 40% reduction in spoilage waste as a result of our technology's usage, we have saved nearly 140M lbs. of produce from waste, and prevented the emission of over 100K metric tons of CO₂e so far.

To combat the global food waste problem, the entire produce supply chain from farmers to retailers has to be optimized. How does Hazel's solution impact different stakeholders across the supply chain?

Common approaches to shelf life preservation rely on industrial equipment and central processing facilities to coat or package the food in special motifs prior to distribution. Hazel's technology platform allows users to functionalize the supply chain segments themselves, by performing "ride-along" treatments in supply chain spaces that enhance shelf life during the very storage and transit processes that typically challenge shelf life.

The modularity of being able to apply a technology into practically any storage environment opens up opportunities to new stakeholders. Hazel's products can not only be used by growers in standard packing environments, but also by other stakeholders in the supply chain: packaging material manufacturers, retailers, and even consumers can use versions of the same technology. Ultimately, we envision a supply chain where Hazel's products have been integrated into every segment of the supply chain from production to consumption, affording maximum production and absolutely minimizing waste.



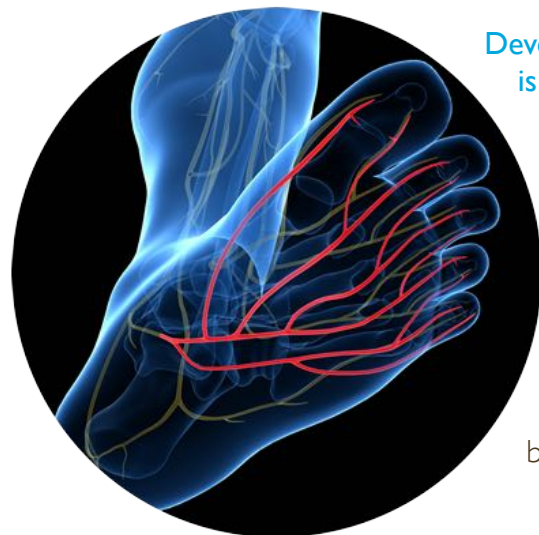


Pangaea led a \$7M Series B financing in 2018. Modulim is dedicated to establishing a new standard for assessing tissue health. Clarifi® Imaging System employs proprietary SFDI technology allowing clinicians to quickly and confidently determine oxygenation levels in subcutaneous tissues for patients with potential circulatory compromise.

Interview with CEO, Richard Oberreiter

Modulim has commercialized a medical imaging technology that uses light to gauge the health of a tissue. How can this technology become a new paradigm in medical imaging that improves lives?

Oxygen is really our lifeblood and its concentration within a given tissue is often an excellent proxy for tissue health. At Modulim, we leverage novel biophotonics hardware along with our proprietary algorithms in order to deliver a doctor deep insights about patient health. Our first product, Clarifi®, which was launched in 2019 is used for the early detection of diabetic foot ulcers, a condition that impacts over one million patients annually in the US alone. This condition can often lead to amputation and costs the healthcare system billions of dollars annually to treat. The good news is that up to 75 percent of cases can be prevented and we believe Modulim’s technology is the most effective solution that can help achieve that goal.



Developing a new medical technology is often the easy part. How is Modulim ensuring this technology will find itself in the hands of doctors around the world?

As we launched Clarifi®, we really focused on working with thought leaders in the areas of podiatry, vascular surgery, and diabetes management in order to get them accustomed to the technology and excited about the powerful data that we can provide. As we move into 2020, it is really about sharing those success stories with practitioner groups that can really drive an exponential rollout of the technology so that we can begin helping the lives of as many patients as we possibly can.



Pangaea led a \$7.5M Series C financing in TruTag Technologies. TruTag provides authentication and tracking solutions that ensure the safety, security, and quality of pharmaceuticals, food, machine parts, and other products throughout the supply chain.



Interview with CEO, Michael Bartholomeusz

Incorporation of covert, low cost authentication solutions is obviously beneficial to companies in their fight against counterfeiting and diversion, but beyond brand protection, what are the underlying positive societal impacts of TruTag's optical barcode technology?

The over one trillion-dollar counterfeit market is larger than the illegal drugs (heroin, cocaine, etc.), prostitution, and human trafficking markets combined. Almost a quarter of this problem, approximately \$240B, resides with products that humans ingest - pharmaceuticals and food. By some estimates, fake antimalarial drugs alone result in the death of many hundreds of thousand people each year.

TruTag's solution not only provides the world's most powerful direct on-dose solution to managing this grave counterfeiting problem, but it has the benefit of simultaneously addressing another very pressing problem - patient medication compliance. It is estimated that only 40% of patients take their medication as prescribed. Since TruTag's solution allows for simple mobile phone verification by the patient on a pill by pill basis, it enables seamless and real-time tracking and engagement between care providers and the patient. This is expected to positively influence patient outcomes and the effectiveness of prescribed pharmaceuticals incorporating TruTag's technology.



TruTag's state-of-the-art hyperspectral imaging hardware and software allows users to address problems across a variety of industries. What are some of the current or potential applications that TruTag can enable to make our world better?

Hyperspectral imaging involves viewing the world around us in hundreds of true colors, compared with the human eye's three. The commensurate wealth of data gathered is orders of magnitude higher than that obtained through standard imaging and machine vision systems used today. Some fields of use TruTag is working in include in-line quality assurance, dermatology, digital pathology, pathogen detection (i.e. Salmonella, Listeria, E. coli), precision agriculture, and food processing (i.e. freshness, bruising, spoilage, and ripeness of foods). In conjunction with the USDA, TruTag's technology has been shown to take the pathogen detection process from 3 or more days in a centralized lab setting to a few hours at point of care. Just this project alone could revolutionize the management of pathogens in the world's food supply chain and water sources.



Materials Innovation has no Boundaries

A trend in recent years has been the deployment of Opportunity Zone impact funds that are specifically focused on lower income, underemployed regions. At Pangaea Ventures, we have a global deal flow lens and regularly connect with entrepreneurs from all over the world. We invest in companies wherever we think we can generate the best returns for our limited partners. And often this is outside of the main technology corridors such as Silicon Valley and Boston. Our portfolio spans from Kalamazoo to Kapolei and Halifax to Saanichton. While these cities may not be on top ten lists of technology hotbeds, the benefits of lower costs and a loyal workforce is often critical to get these technologies to the commercial stage.

Pangaea typically invests as technologies start to scale and we have found that growing teams outside of the main technology hubs can be easier than expected. Lower costs of living and mobility of talent towards high impact companies, especially those backed by brand name investors, can be a draw for high quality talent. Furthermore, over the last decade we have found that improvements in technology enable high performance distributed workforces, especially in the business development, sales, and marketing functions. Pangaea is not an Opportunity Fund, but we certainly see the advantages of investing off the beaten path.

Fund Wide Impact

9 SDGs being addressed by
Pangaea's portfolio

25 Strategic limited partners
connected with start-ups
to help them scale

60% of companies outside of
top 20 cities for VC funding

136 Increase in employees
at active portfolio
companies

60% of portfolio with females
on executive teams

Driving Value with Diversity

Solving the world's toughest problems relies on a creative synthesis of different ideas and perspectives. Often narrow investor lens and decision biases can perpetuate this uniformity in spite of data showing that team diversity is co-related with success. One demographic particularly underrepresented within our deal flow and portfolio is women. While 60% of our portfolio executive teams have women and this is an increase over last year, on an overall composition basis the representation remains low. And our portfolio companies are led by only one women CEO. Let's hear from Anna Rath, CEO of Vestaron, about driving value with diversity and how investors like us can be doing more.



VESTARON
THE POWER OF PEPTIDES™

Vestaron aims to displace our reliance on conventional synthetic pesticides with biological peptides. Vestaron's bio pesticides can match, and in some cases beat, the performance of toxic synthetic chemical products that are widely used today.

Interview with Anna Rath

"We face greater scrutiny as well, particularly in the context of fundraising, but when we are able to clear this hurdle, then the distinctiveness can lead to a mindshare benefit for the company"

Anna Rath - President, CEO & Board Member
at Vestaron Corporation



What do you see as the advantage of being a women leader in the male dominated agriculture industry?

Well, for starters I'm really easy to find at conferences. Seriously, though, I do believe that because female leaders are fewer and further between, we are also more noticed and more memorable. We face greater scrutiny as well, particularly in the context of fundraising, but when we are able to clear this hurdle, then the distinctiveness can lead to a mindshare benefit for the company There is a growing mountain of data from a wide variety of sources demonstrating

the benefits of diversity in leadership teams— from higher returns on equity investment to higher operating and EBIT margins to better business decisions. Given that most leaders in agriculture are men, being a woman typically means by definition that you are bringing this diversity benefit to your company.

Finally, having women at the top of a company certainly helps with recruiting, retaining, and developing women throughout the organization, and this means the company is benefitting from a richer overall talent pool.



In your career, you have been through multiple VC funding rounds. What advice would you give specifically to other female CEO's embarking on a funding round with VCs?

Most of my fundraising advice would be the same regardless of gender – be patient, be persistent, explore every avenue, etc. The advice I would give to women specifically would be to remember that being a female CEO seeking venture financing means that you are an unusual thing, and people tend to be cautious around unusual things. This is backed-up by a Harvard Business Review article showing that male and female entrepreneurs receive different questions from VCs. Men tend to get more questions about potential upside whereas women tend to get more questions about potential downside. No doubt this is partly responsible for the stubbornly abominable statistics regarding the percentage of venture financing going to women-led businesses.

Is there anything VC's could be doing to better ensure that great companies with female leaders are getting the funding they deserve?

There are at least three things I can think of that VCs could be doing to help ensure that companies with female leaders are getting the funding they deserve. The first would be to aggressively recruit and develop female talent within their own ranks, both to generally gain their own diversity benefits (including better business decision making) and to specifically reduce the possibility of gender bias in decision-making. The second is to be champions of leveraging the experience of women who have previously been successful in raising venture capital as independent board members for the boards of their portfolio companies with female CEOs. And the third is to be generally self-aware about whether the fact that it is more rare to see a woman leading a financing effort might lead them to think differently or ask different questions when they do.

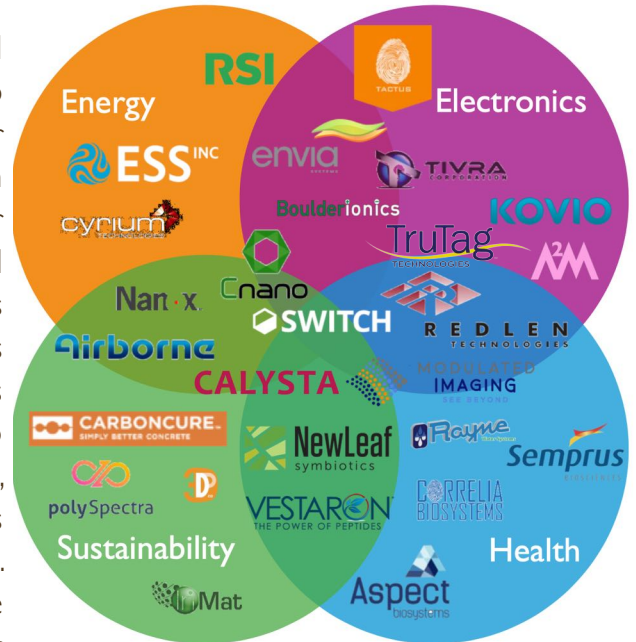


*Two Decades of Investing
in Advanced Materials
Startups to Make our
World Better*



About Pangaea Ventures

Pangaea Ventures is the world leader in advanced materials venture capital. We invest in startup companies using advanced materials to make our world better. Founded in 2000, Pangaea has built an outstanding portfolio addressing multi-billion dollar markets in energy, electronics, health, and sustainability. Breakthroughs in advanced materials are becoming increasingly important for companies to excel in almost any market. Advanced materials are solving fundamental problems necessary to make products more efficient, sustainable, affordable and better performing - key attributes necessary for widespread adoption of any product. Our unmatched materials network spans multiple industry verticals, and includes twenty-five major multinationals as Strategic Limited Partners.



World Leading Strategic LPs



"Pangaea Ventures has built a strong reputation in the venture community. They have high-quality advanced materials deal flow, deep domain knowledge and are a pleasure to work with."

- Larry Meixner
Managing Corporate Executive
Officer/ Chief Innovation Officer/
Chief Technology Officer

Mitsubishi Chemical Holdings
Corporation



Appendix

i.) Impact Methodology

ii.) Portfolio Companies

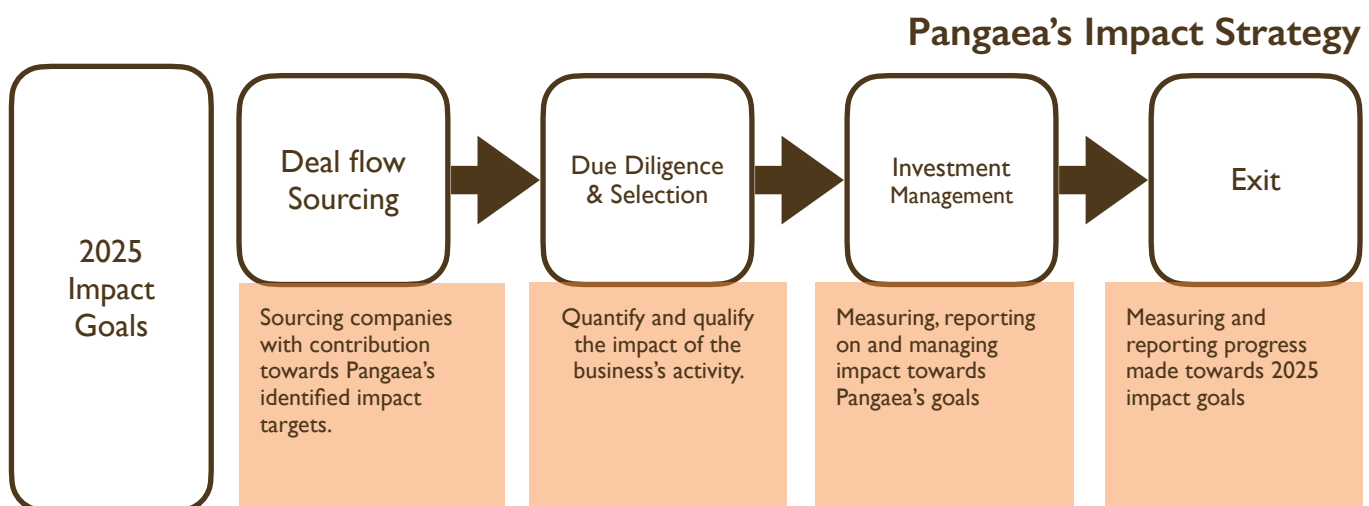
Notes on Impact Methodology

Pangaea's investment process includes a commitment to quantify and qualify the impact of the business's activities. As detailed in our 2018 Impact Report, Pangaea has developed an impact model that enables us to monitor and measure impact creation across industries.

The United Nations Sustainable Development Goals were used as a framework for Pangaea to select a handful of simple and quantifiable metrics that are relevant to the wide number of technologies and markets within our investment scope.



From initial screening and through the due diligence process, Pangaea evaluates opportunity through an impact lens in order to gain insights into the magnitude of the problem being solved and the scalability of the solutions being developed. With the 2025 impact goals in mind, Pangaea's deal analysis include consideration of impact criteria that the technology must address in order to be approved for investment. The impact considerations are not meant to replace financial returns but to provide us with holistic view of potential investment candidates.



Portfolio Companies

Company	Location	Pangaea's Impact Target	SDGs	Focus
AEPONYX™ PHOTONICS IN MOTION	Montreal, Canada	CO ₂ Reduction		Optical switching for high broadband, 5G, and data centers
Airborne	The Hague, Netherlands	CO ₂ Reduction		Automated composite manufacturing
Aspect biosystems	Vancouver, Canada	Lives Impacted		3D bioprinting of tissue for drug screening and regenerative medicine
CALYSTA. MORE FROM LESS	Menlo Park, USA	Food Production & Water		Protein production using methane feedstock
CARBON CURE.	Nova Scotia, Canada	CO ₂ Reduction		Lower carbon concrete using a CO ₂ mineralization process
Cnano	Beijing, China	CO ₂ Reduction & Water		Increases energy density in lithium ion batteries
ESS INC	Oregon, USA	CO ₂ Reduction & Water		Low-cost energy storage with iron-based battery
hazel technologies inc.	Chicago, USA	CO ₂ Reduction Food Production & Water		Freshness preservation solution for produce and fresh proteins
modulim	Irvine, USA	Lives Impacted		Imaging solution for diabetic foot ulcers and wound care
NewLeaf symbiotics	St. Louis, USA	Food Production & Water		Microbial crop treatment for plant health and yield enhancement
REDLEN TECHNOLOGIES	Saanichton, Canada	Lives Impacted		Precision radiation detection and imaging technology
SWITCH	Vancouver, Canada	CO ₂ Reduction		Active control smart film reduces the need for energy-intensive air conditioning in vehicles
tactus	San Jose, USA	CO ₂ Reduction		High impact screen protection for the next generation of display
TruTag TECHNOLOGIES	Emeryville, USA	Lives Impacted		Nanoparticles with unique signature for product safety and authentication
VESTARON THE POWER OF PEPTIDES	Durham and Kalamazoo, USA	Food Production & Water		Peptide based insecticides with performance equaling synthetics



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