

ADHERE GEAR WAVE

Cloud based analytics software and Smart Crates to cut food loss and prevent the creation of methane from food waste for the cruise industry



Spain - adheregear.com -

Problem. Excessive food loss on cruise ships add 8% to their carbon footprint. This waste often ends up in the ocean, causing methane emissions and harming marine ecosystems.

Solution. Our advanced analytics and cloud-based software, paired with Smart crates, continuously monitor food to optimize inventory, reduce waste, and cut methane emissions by preventing loss.

Unique Value Proposition.

1. Real-time monitoring - optimizes food storage, reducing spoilage and waste on cruise ships.
2. Sustainability boosts - cuts methane emissions and helps cruise lines meet net-zero goals.
3. Advanced analytics - provides actionable insights for efficient food management.
4. Cost savings - reduces operational costs through better inventory and waste management.
5. Scalable solution - easily integrates across fleets, improving sustainability at scale.

Ocean Impact. Smart food crates reduce ocean impact on cruise ships by minimizing food loss by 20-50%. This eliminates the need for excessive waste disposal that contributes to methane emissions and operating inefficiencies. Using these crates also reduces reliance on trees for box production. Both protect marine ecosystems, support sustainable practices, and mitigate ocean health issues.

Industry Information. The cruise industry is a key player in global tourism. Despite economic benefits, it faces environmental challenges like high fuel consumption, food waste, and significant and inefficient waste disposal. The industry is eager to adopt innovations like WAVE to enhance sustainability, reduce emissions, and minimize its ecological footprint, while maintaining high-quality travel experiences.

Technology and Intellectual Property.

- Current pursuits:
 - Utility patents - innovative features of the Smart crates and methods of data

collection, transmission and our cloud-based analytics algorithms.

- Design patents - safeguard the novel design elements Copyrights on software code/proprietary software used for data analytics, user interfaces, and integrations Licensing to other cruise lines.

Solution Roadmap. TRL Level - 7

Immediate Next Steps in Development.

Complete the 18 months of POC testing with committed cruise lines with a strategic paid POC to refine machine learning with the onboard cameras, complete food profiles/food recognition, and refine technology to fit operations needs for those committed cruise brands.

Three Greatest Needs in Next 12 Months.

1. Scaling production and operations
2. Raising \$1.5M
3. Expanding the customer base while proving the product's value with a deployment of 250 units

Key Metrics. Food waste reduction rate, inventory accuracy (percentage accuracy of food overstock/shortages), food loss prevention (amount of food saved), methane emissions reduction (amount of methane emissions reduced due to decreased food waste), cost savings from reduced food waste, and environmental impact (quantifiable decrease in pollution and waste, reductions in ocean disbursement and port disposal activities).

Team.

- Robert E Buchanan Jr, CEO, robert@adheregear.com
- James Ward, CTO
- Jason Bettineski, CPO



Problem. How to decarbonize maritime shipping, while maintaining fuel security and operational profitability.

Solution. Flex-fuel power system, designed to expedite the adoption of alternative fuels. We tackle the problem through fuel reforming, to enable existing engines to run on our ammonia-based fuel as well as on traditional hydrocarbons.

Unique Value Proposition. We approach the decarbonization of the maritime industry from a unique perspective. While others focus on designing complex engines with advanced technologies, we tackle the problem from a fuel-centric standpoint. Our reforming pathway offers unparalleled fuel flexibility while maximizing the use of existing products and supply chains. We focus on how ships operate today, and de-risk how they will operate in the future.

Ocean Impact. Our goal is to offer a decarbonization solution for maritime shipping. The industry is currently responsible for 3% of global greenhouse gas emissions (GHG), and this number could increase to 10% by 2030 without any action. Our fuel flexible solution will accelerate the adoption of low to zero-carbon fuels like methanol or ammonia, enabling the industry to fulfill its decarbonization targets and preserve our oceans for future generations.

Industry Information. Maritime shipping is responsible for 90% of world trade and accounts for 3% of global GHG emissions. The industry faces many challenges in reaching ambitious decarbonization goals set by the International Maritime Organization, targeting 30% emissions reduction by 2030 and net-zero by 2050. Investments estimated at \$50B per annum are required to achieve these goals, with the sector facing uncertainty regarding the best transition strategy.

Technology and Intellectual Property.

- Our core technology is fuel reforming, transforming ammonia and other low carbon fuels into fuel mixtures with combustion properties identical to those of traditional hydrocarbons. This approach allows us to

create a drop-in fuel, meaning that a single engine can run on our ammonia-based fuel as well as existing hydrocarbons. We licensed fuel reforming IP from the Colorado School of Mines and are developing our own IP.

Solution Roadmap. TRL Level - 5 ▾

Immediate Next Steps in Development. Continue with the development of a Flex-fuel Ammonia Generator, which is our product demonstration platform.

Three Greatest Needs in Next 12 Months.

1. Financial support for technology development.
2. Connections to ship owners, ports, bunkering developers, etc.
3. Connection to main engine and auxiliary engine developers, their supplier, shipbuilders, etc.

Key Metrics.

- Match fuel-to-power efficiency to hydrocarbon fuels
- Greater than 90% Scope 1 reduction in Greenhouse Gas (GHG) emissions
- Greater than 80% Well-to-Wake reduction in GHG emissions while utilizing “green” ammonia
- Pilot scale projects: 2026
- Deployed product: 2026/7

Team.

- Dr. Rok Sitar, CEO, rok@blazeenergytech.com
- Dr. Jess Hensley, CTO
- Richard Barton, COO

BLAZE SOLUTION: FLEX-FUEL MARINE PROPULSION SYSTEM
Solving alternative fuel flexibility challenge through fuel reforming



Boston, MA, USA ▾ blueiq.us ▾

Problem. Traditional maritime monitoring systems are costly, power-intensive, and lack real-time AI capabilities, limiting effectiveness in environmental protection, maritime security, and autonomous operations.

Solution. BLUEiQ's OpenEar Edge AI sensors deliver real-time acoustic monitoring at the edge, reducing power consumption and cost while enabling autonomous vessels and cloud-based data fusion for enhanced maritime domain awareness.

Unique Value Proposition. Our value proposition is low-power, AI-driven OpenEar sensors that provide real-time, edge processing for maritime monitoring. Unlike competitors, OpenEar integrates with autonomous platforms for real-time detection of vessels and marine life. The Sensor-as-a-Service model offers scalable, cost-effective solutions, while proprietary AI algorithms and cloud-based data fusion enhance maritime domain awareness, delivering high-value insights.

Ocean Impact. Our impact is enhancing marine biodiversity protection, supporting sustainable ocean practices, and improving maritime domain awareness. BLUEiQ enables real-time acoustic monitoring of marine ecosystems, including critical species like dolphins and whales. Our OpenEar technology detects illegal fishing, anthropogenic noise, and unauthorized vessel activity, helping to mitigate environmental damage and promote responsible use of ocean resources.

Industry Information. The maritime technology industry is rapidly evolving with a focus on low cost, autonomous systems, AI-driven sensors, and data fusion for improved maritime domain awareness. Competitors offer towed arrays and surveillance platforms, but BLUEiQ's low-power edge AI sensors and Sensor-as-a-Service model set it apart by providing real-time monitoring and advanced analytics, with a focus on reducing costs and improving efficiency.

Technology and Intellectual Property.

- BLUEiQ's technology is built on OpenEar, a low-power, AI-driven acoustic sensor for

real-time marine monitoring. It integrates with autonomous platforms to detect and classify vessels and marine life.

- BLUEiQ's IP includes proprietary AI for edge processing and patents around software-defined acoustic arrays and AI, enhancing maritime domain awareness and enabling future scalability and integration with larger systems.

Solution Roadmap. **TRL Level - 7**

Immediate Next Steps in Development.

Expanding the OpenEar Sensor-as-a-Service model, refining AI algorithms for vessel and marine mammal detection, and integrating OpenEar onto crewless vessels for data fusion and real-time maritime domain awareness.

Three Greatest Needs in Next 12 Months.

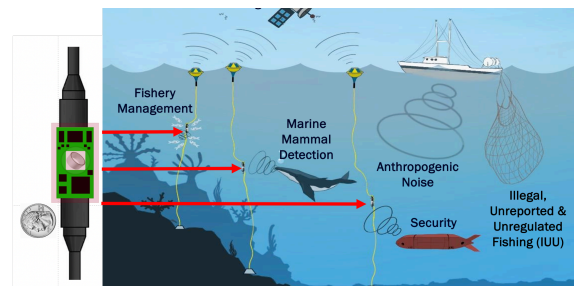
1. Secure funding to develop OpenEar Gen2 sensor.
2. Conduct OpenEar tests to gather data and refine AI models.
3. Expand BLUEiQ customer base to test and validate Sensor-as-a-Service and subscription business model hypotheses.

Key Metrics. Key metrics for BLUEiQ's business would focus on both the technology performance and business growth.

- Revenue growth, customer acquisition, technology deployment, sensor performance, market penetration, data utilization, customer retention, etc.

Team.

- Kim Gavin, *CEO & Co-Founder*, kgavin@blueiq.us
- Rob McGurrin, *CTO & Co-Founder*



Why Choose OpenEar?

- Artificial Intelligence (AI) at the Edge
- Longest battery life in the market
- Minimal data transmission costs
- Small and unobtrusive design

Newark, NJ, USA - carbonbridge.io -

Problem. The transition to mandated, cleaner, lower carbon fuels is underway - but is blocked by availability and adoption costs.

Solution. CarbonBridge ultra low carbon methanol allows for highly economical compliance through blending. This enables a constant decrease in carbon footprint, down to net-zero.

Unique Value Proposition. By using microbes to convert waste gasses into methanol (instead of venting these gasses), we completely bypass the current thermochemical processes from methanol production at 350 ~ 1000 C & 450 PSI and eliminate related supply chain, capital costs and energy cost issues. This means we deliver negative carbon-intensity methanol at prices that are less than 1/3 that of e-fuels, and enables blending with lower cost methanol to meet targets.

Ocean Impact. While the marine sector consumes 3% of the world's energy, its GHG impact is as high as 12% - due to NOx, SOx emissions and particulates in addition to the expected CO2. Ammonia is not yet safe. That leaves biodiesel and methanol as liquid fuel alternatives. We make the lowest carbon intensity methanol for use as direct fuel, and in biodiesel production. And in doing so, we reduce risk, pollution and carbon footprint for the marine sector.

Industry Information. The shipping industry is broken broadly into near-shore and blue ocean - the latter have a harder problem decarbonizing at current pricing of renewable fuels and are at risk of fines from the EU and the US in particular. Our solution meets these key customer needs by enabling blending of our methanol with negative carbon intensity, into regular methanol to meet carbon intensity requirements.

Technology and Intellectual Property.

- Patent what is observable; keep the rest as trade secret, otherwise disclose to prevent others from patenting.
- Trade secrets: fully evolved microbe and optimized formulations.
- Patents: scalable bioreactor systems - from auto-filling and cleaning of bacteria to methanol production. Includes AI/ML based

adaptive systems and decentralization. Filtration system in presence of bacteria and other materials - patent pending.

Solution Roadmap. TRL Level - 5 -

Immediate Next Steps in Development.

- Q4/24: Build one "notebook" reactor cell
- Q2/25: Build a "shelf" of 4 notebook reactor cells
- Q3/25: Deliver 10 MJ / day of energy
- Q4/25: Deliver 30 MJ / day of energy
- Q1/26: Operate a pilot plant for 24,000 MJ / day of energy

Three Greatest Needs in Next 12 Months.

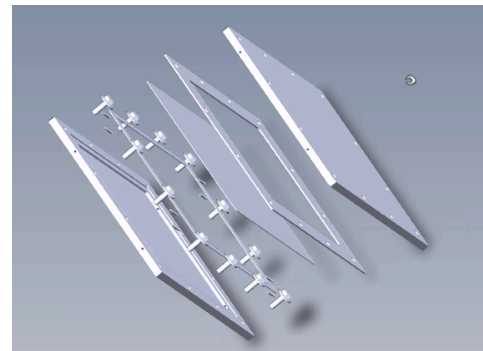
1. Offtake agreements - needed for fundraising, project finance
2. Funding for ARPA-e cost share; talent sourcing, operations
3. Demonstration of full function, scaled-down prototype

Key Metrics.

- Carbon intensity: from -25 gCO₂e/ MJ to -250 gCO₂e/ MJ - the lowest carbon intensity methanol on the market
- Energy efficiency of our process: >75% vs <45% for others
- Methanol production: the result of microbe productivity, microbe density, and available surface area
- Methanol price: we meet today's renewable methanol price, and can meet fossil pricing if needed

Team.

- Manu Pillai, *Co-Founder & CEO*, manu@carbonbridge.io
- Sophia Xu, *Co-Founder & CSO*
- Dr. Ellen Jorgensen, *VP of Biotechnology*



Eyesea

Digitizing marine pollution to empower communities and manage waste efficiently



New Zealand ▾ eyesea.org ▾

Problem. Marine pollution affects ecosystems, health, and economies. Many organizations lack efficient ways to understand, monitor, and manage this pollution.

Solution. Eyesea offers a comprehensive tech ecosystem for pollution detection, recovery, and management through crowdsourced reporting, creating the world's largest pollution database.

Unique Value Proposition. Digitizing marine pollution to empower communities and manage waste efficiently.

Ocean Impact. Eyesea's solution directly enhances ocean health by facilitating efficient waste detection and management, potentially processing up to 350,000 tons of waste annually.

Industry Information. The global waste management market is growing, with increasing focus on sustainable solutions and circular economy principles.

Technology and Intellectual Property.

- Proprietary software ecosystem, including mapping tools and AI-enhanced analysis capabilities.

Solution Roadmap. TRL Level - 7 ▾

Immediate Next Steps in Development.

- Scale operations in India from 2-3 tons per month to 30 tons per month. Enhance AI capabilities in the software ecosystem.

Three Greatest Needs in Next 12 Months.

1. Expand facilities and acquire machinery in India
2. Secure funding for global expansion
3. Develop partnerships with more recycling companies

Key Metrics.

- 5000 volunteers
- 200K reports
- 750 tons
- 50+ corporate members
- 4 innovation awards

Team.

- Graeme Somerville-Ryan, CEO
- Cath Robertshaw, COO
- Marius Suteu, CTO, marius@eyesea.org



Switzerland - kidemis.com -

Problem. Fishmeal in aquafeed formulation is the biggest hurdle for sustainable aquaculture development.

Solution. Plant based fishmeal replacer from upcycled agrifood sidestreams.

Unique Value Proposition. Economically viable sustainable and scalable fishmeal replacer with functional benefits.

Ocean Impact. KIDEMIS mycoprotein is designed to replace fishmeal in the aquafeed formulation by reducing the pressure on ocean ecosystems and supporting the sustainable development of aquaculture. In addition to protein content, our ingredients also bring functional benefits related to the productivity and well-being of fish (ideally helping to reduce antibiotic usage to zero). Our goal is to save annually from destruction up to 1M tons of aquatic species.

Industry Information. Aquafeed is a highly concentrated USD 80B+ industry, which is challenged with finding sustainable and economically viable fishmeal replacers.

Technology and Intellectual Property.

- KIDEMIS uses a combination of several low-value agricultural sidestreams matched with their fungus species to produce top-quality protein solutions for aquafeed and later for animal feed. The novelty lies in proprietary bioprocessing and engineering solutions for solid-state fermentation (SSF), which allows for zero waste processing of the agricultural sidestreams and their conversion to high-productivity mycoprotein.
- **Technology scaling up.** At the moment our technology allows us to produce hundreds of tons per year, we need to scale up technological capacity for at least 10,000 tons annually. This requires the design of a custom bio reactor, which we are developing together with our industrial partner Tetra Pak, we are on good track with scaling our table top reactor into an industrial pilot.
- **IP strategy.** We are lining up several patents to be filed in the coming 6-8 months, covering bioprocessing, technology and aquafeed

application, with the first patent to be filed in the USA at the end of November this year.

Solution Roadmap. TRL Level - 6

Immediate Next Steps in Development. Our goal is to finetune our product with in-vivo trials and create a pilot plant blueprint, based on scaled up engineering solutions.

- **Product validation.** KIDEMIS is actively doing in-vivo trials with the first two cycles successfully finished and 8 more to follow in the coming 10 months. We test: salmon, trout, shrimp and tilapia. In addition to formulation improvement we are also looking at functional aspects, such as improved productivity and well-being of fishes.

Three Greatest Needs in Next 12 Months.

1. Pilot plant blueprint
2. Finalization of in-vivo trials
3. Ramping up garage production to 10 tons

Key Metrics. Saving annually 1M tons of aquatic species, disrupting aquaculture with cheaper and sustainable fishmeal replacer.

Team.

- Dr. Constantin Marakhov, *CEO*, mc@kidemis.com
- Sean Wassermann, *CSO/CTO*
- John Ericsson, *Advisor - Finance and Strategy*



Newlight Marine Technology

Hybrid diesel-hydrogen solution to reduce fuel consumption and emissions in maritime shipping, while regulation is piling up



NY, USA - newlight.blue -

Problem. Maritime shipping accounts for nearly 3% of global CO2 emissions, and current decarbonization solutions are expensive with long ROI periods, making adoption difficult for the industry.

Solution. Newlight's hybrid hydrogen system reduces fuel consumption and emissions by 20% on average, offering a cost-effective, plug-in solution that integrates into existing marine diesel engines.

Unique Value Proposition. Our hybrid diesel-hydrogen solution reduces fuel consumption and emissions by 20% on average, with a short ROI of less than a year. It integrates seamlessly into existing engines without requiring dry docking. Our cost-effective system helps shipping companies decarbonize quickly and affordably while complying with new environmental regulations, providing a scalable, sustainable solution for the maritime industry.

Ocean Impact. Newlight's solution addresses the pressing need for maritime decarbonization by significantly reducing the environmental impact of ships. By lowering fuel consumption and CO2 emissions by up to 20%, our system helps ships transition to cleaner operations without overhauling their engines. In the future, the hydrogen percentage can be increased to work with up to 50% hydrogen, further accelerating progress toward global climate goals.

Industry Information. The maritime industry is under pressure to decarbonize, driven by new regulations and rising fuel costs. Newlight's hybrid diesel-hydrogen system offers a practical solution for reducing fuel consumption and emissions. By providing a scalable, cost-effective alternative that requires no engine replacement or dry docking, Newlight aligns with the industry's push toward sustainable operations and compliance with environmental standards.

Technology and Intellectual Property.

- Patent-pending hydrogen-diesel hybrid system

- Proprietary cycle-to-cycle analysis software for optimizing hydrogen injection
- Tested over 100 hours with fuel savings up to 20%
- System requires no dry docking and integrates into existing marine engines
- Scalable for engines
- Future capability to run on up to 50% hydrogen

Solution Roadmap. TRL Level - 5

Immediate Next Steps in Development. Extended large-scale lab testing, pilot projects on ships with design partners, and ensuring compliance with DNV regulations.

Three Greatest Needs in Next 12 Months.

1. Securing additional design partners
2. Expanding lab testing capacity
3. Ensuring compliance with DNV regulations for system certification and ship integration

Key Metrics.

- Up to 20% reduction in fuel consumption and emissions
- 10% savings on fuel costs
- Less than 1-year return on investment (ROI)
- No need for dry docking

Team.

- Evyatar Cohen Hillel, *Co-Founder & COO*, evyatar@newlight.blue
- Haran Cohen Hillel, *Co-Founder & CEO*
- Idan Avni, *Regulation Expert*



Nucleic Sensing Systems

Biosensor for the autonomous monitoring of environmental DNA



Saint Paul, MN, USA - ns2co.com -

Problem. The unidentified spread of harmful organisms is among the most central global concerns of water and ocean resource managers, and aquaculture producers. However, current detection methods are insufficient.

Solution. We are developing the world's only continuous-flow biological molecule detection machine to autonomously sample and analyze the presence and abundance of environmental DNA (eDNA), RNA, and biological molecules in the field.

Unique Value Proposition. Our competitive advantages are:

1. It is a "laboratory in a box," eliminating the need for separation, concentration, purification, and analysis of samples in a laboratory,
2. Simultaneously tests for multiple organisms,
3. Continuously and automatically test samples onsite, nearly eliminating the risk of false-negative or false-positive results,
4. Recognized as a gold standard PCR-based genetic verification with single-molecule detection.

Ocean Impact. Currently, we use antiquated, inefficient, and time-consuming methods to understand the ocean's changing biology and ecosystems. Society requires a robust monitoring network of not only the physical and chemical properties of our oceans but also its biology. Our technology is capable of monitoring the ocean's biological health. Doing so will empower adaptive and timely management, which we desperately need to protect our oceans.

Industry Information. We will enter the growing \$8B/year U.S. environmental testing market by targeting critical customers in environmental monitoring, aquaculture, and wastewater/water treatment. This market is void of current detection methods that are labor-intensive, limit sampling, and result in a time lag between sample and answer, producing patchy information and limiting mitigative action.

Technology and Intellectual Property.

- "Apparatus and Method for Quantifying Environmental DNA with No Sample Preparation," docket number 9601.006.

- Apparatus and Method for the Detection of Bioaerosols;" U.S. 17/271,494.
- A fluid-type sensor can discriminate between liquids and gasses (U.S. Patent Application No: 63/422,153).
- A reverse transcription sub-module to allow for in-line detection of single-stranded RNA (U.S. Patent Application No: 63/422,160).

Solution Roadmap. TRL Level - 5 -

Immediate Next Steps in Development. For an SBIR III pilot with NOAA, we are making key design changes to our technology to ensure it is robust enough for field deployment. We will then commence a field pilot in New Orleans and San Diego.

Three Greatest Needs in Next 12 Months.

1. To upgrade our technology with new pumps and circuit board
2. Field pilot the technology
3. Raise a seed round of \$5M

Key Metrics. Our key metrics will be vertical specific.

- Aquaculture - disease outbreaks prevention and efficiencies gained in production
- Wastewater - energy efficiencies gained and carbon emissions reduced
- Oceans - number of early detections of invasive species and species of concern (threatened/endangered) detected

Team.

- Dr. Edgard Rudberg, CEO, ed@ns2co.com
- Mark Apfelbacher, COO
- Dr. Cody Youngbull, CTO



Vancouver, BC, Canada ▾ ondeck.fish ▾

Problem. Terabytes of video are collected everyday from our oceans for critical monitoring of fishing and marine ecosystems, but current review methods are too slow, expensive, and cannot scale to meet the growing demand.

Solution. OnDeck automates the analysis of large-scale video with AI. Spanning fisheries, underwater monitoring, and aerial drones, OnDeck enables customers to get the key metrics out of their footage for a fraction of the cost and time.

Unique Value Proposition. OnDeck's Universal Species ID capabilities are unprecedented, and are redefining marine conservation & monitoring by allowing anyone to automatically quantify marine life. Beyond this feature, customers choose OnDeck for reliable industry-leading innovation and plug & play, "it just works" products. Customers include the Nature Conservancy, Indigenous nations, the Department of Fisheries & Oceans, and more.

Ocean Impact.

- Sustainable Fisheries: Timely & accurate fishing data for regulators to reduce IUU fishing, enforce sustainable practices, and ensure the long-term viability of global fisheries.
- Climate Change Mitigation: Tracking shifts in species distribution and ecosystem health, enabling timely adaptations in conservation and management strategies.
- Habitat Protection: Protecting vulnerable ecosystems from illegal or damaging activities, with continuous monitoring to support biodiversity and carbon sequestration.

Industry Information. With climate change and growing fishing pressure driving fish stocks to collapse, fisheries monitoring is one of the biggest challenges facing our oceans. Regulators need to know what is being caught when and where to inform and enforce sustainable management. This is accomplished with cameras on vessels, but the expensive and slow manual video review prevents monitoring from being scaled. The same challenges face underwater cameras with BRUVs, ROVs, as well as aerial drones.

Technology and Intellectual Property.

- Universal Species ID: Identify any marine species, across cameras & conditions, above or below water, without needing labeled training data.
- Find Anything in Video: Search through terabytes of video footage for extremely specific events or objects.
- Patent filings underway.

Solution Roadmap. TRL Level - 7 ▾

Immediate Next Steps in Development.

- Fall 2024: Deliver universal species ID to the Canadian DFO.
- Winter 2025: Video querying in new industries: biodiversity monitoring, environmental impact assessments, offshore wind monitoring, and beyond.

Three Greatest Needs in Next 12 Months.

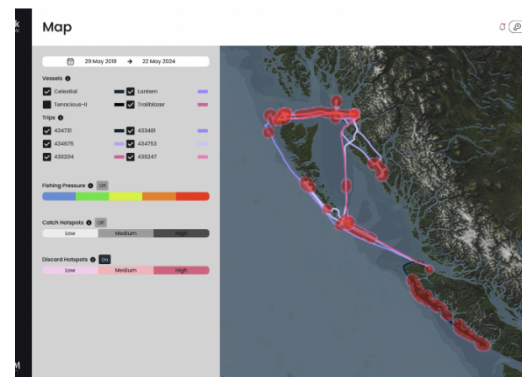
1. Capital to hire 2 engineers + 1 PM/sales.
2. Connection to marine industry with large amounts of imagery to process, including Saab, Kongsberg, MDA, Planet, and more.
3. Insider perspective from technology leaders in the marine industry.

Key Metrics.

- Number of species classified
- Time and costs saved for customers
- Number of fishing vessels deployed with AI
- Percentage of global fishing efforts monitored
- Percentage of MPAs monitored

Team.

- Alexander Dungate, *Co-Founder & CEO*, alexander@ondeck-ai.com
- Sepand Dyanatkar, *Co-Founder & CTO*



Oyster Heaven

Developing ocean resilience projects for organizations that rely on a resilient ocean using oyster reefs



Oyster Heaven
SUSTAINABILITY REIMAGINED

Netherlands ▾

oysterheaven.org ▾

Problem. Oyster reef restoration is imperative for ecological and practical reasons, as they near extinction in exploited areas. However, current technical and business models are inadequate for the necessary large-scale restoration.

Solution. We generate revenue by selling supply chain resilience services to corporations and governments. We've also developed the first scalable, low-cost artificial reef, the 'Mother Reef', made from biodegradable clay.

Unique Value Proposition. Oyster Heaven pioneers ecological restoration and economic viability. It leads the natural capital revolution, generating revenue through ecosystem services. Its 'Mother Reef' technology enables rapid, affordable oyster reef restoration. Demonstrating nature restoration's profitability, Oyster Heaven paves the way for an industry protecting our planet's natural capital.

Ocean Impact. Oyster Heaven's sole mission is to create a positive impact on the ocean through oyster reef restoration. We're not a harm reduction add-on, but a practical solution to revive essential ecosystems. Oyster reefs once safeguarded our coasts, filtered our water, and supported diverse marine life. By restoring them, we can generate revenue in this new emerging industry of natural infrastructure. This allows effective scale for the first time ever.

Industry Information. Nature's undervalued worth is a critical threat. To avert disaster, we must reassess and value nature accurately. This will cause a price correction in natural assets. Oyster Heaven leads, providing crucial oyster reef habitat affordably and sustainably. Our model demonstrates nature restoration's economic viability, paving the way for an industry dedicated to protecting our planet.

Technology and Intellectual Property.

- Our first patent - the Mother Reef - our clay based oyster reef substrate is globally enforced and demonstrated highly effective.
- We have a set of other patents for release next year.

- We are also building a portfolio of trade secrets that enhances the use of our technology and deployment styles.
- We are also developing a significant back end of all the data from our projects to inform future projects, either our own, or those that we consult on.

Solution Roadmap. TRL Level - 8 ▾

Immediate Next Steps in Development. We will reach TRL 9 this year as we start to deploy our first two large-scale projects in the Netherlands and in the UK. Every other element is tried, tested, and demonstrated and patented.

Three Greatest Needs in Next 12 Months.

1. Launch projects in the US
2. Release two further patents
3. Enhance existing artificial reef recipes

Key Metrics.

- Number of new circular jobs created for fishermen deploying the reef
- Number of species supported in the new fishing nurseries created
- Number of kgs of carbon, nitrogen and phosphate managed

Team.

- George Birch, *Business Lead*, george@oysterheaven.org
- Dr. Natacha Juste, *Research and Monitoring Lead*
- Dirk Jan, *Operations Lead*



Problem. Solid waste and wastewater releases harmful chemicals, plastics, and pathogens into oceans. Landfills, especially on islands and coasts, are costly, polluting, and produce the most greenhouse gasses of all disposal options.

Solution. The Phoenix is a mobile waste-to-energy furnace that thermally reduces solid waste and biosolids from wastewater at 2000F without any auxiliary fuel, at less than half the cost of landfill while reducing toxic emissions.

Unique Value Proposition. Our unique zero-fuel technology is perfect for remote communities. Priced at \$400k, comparable to a garbage truck, it processes waste at \$28/ton—significantly less than landfill costs. Our low-temperature plasma furnace minimizes toxins from combustion, exceeding EPA standards. It emits 50% less CO2 than incineration and 25% less than landfills. The mobile, containerized design allows for easy deployment and can generate 30 KW of electricity daily

Ocean Impact. Eighty percent of ocean pollution comes from 1,000 rivers in regions with poor waste management. The Phoenix offers a sustainable solution for these areas, reducing plastic waste to 1% ash, which can be used to make bricks utilizing 80% less concrete. Excess heat can be utilized to co-generate electricity for 20 homes. Steel and glass remain intact through the process and can be recycled, enhancing overall waste management and resource recovery.

Industry Information. After six months of client discovery, including 3,000 outreach emails and 58 meetings, our strategy targets 2 beachhead markets: medical waste and Alaska. Medical waste disposal costs \$400-500 per ton, with some streams requiring incineration. Due to facilities' backlog, the EPA has extended the accumulation period from 90 days to one year. Southeast Alaska ships waste to Washington landfills, while rural communities often resort to open burning.

Technology and Intellectual Property. The technology is currently patent pending.

- Provisional Patent, Application number 63/102,207, filed June 02,2020, Title: METHOD FOR PROCESSING WASTE

USING LOW-TEMPERATURE PLASMA AND DEVICE THEREFOR. First Inventor: Tamara Webb, Second Inventor: Yuen-Li Chan, US Patent application Number: O02.0001US01, European Application Number: 21818756.5, National Phase Application in China - No. 202180040093.9

Solution Roadmap. TRL Level - 6 ▾

Immediate Next Steps in Development. Build heating system for palladium catalyst for CO conversion. Winterize for sub-zero. FEMCA and manufacturing review. Demonstrations and pilots for prospects. Financing pre-production model. Converting paid pilots into sales

Three Greatest Needs in Next 12 Months.

1. Financing or investment to build a pre-production model
2. Sales and marketing support for medical waste disposal market
3. Strategic partnerships to accelerate market traction

Key Metrics.

- Capacity: 500 lbs of waste/hr or 5 tons/day
- Residue: 1-2% ash by weight
- Fuel: self-sustained with waste feedstock
- Energy: 30 KW of electricity/day
- Emissions control: exceeds EPA standards
 - Tests below 50 mg/dscm for particulate. 1 ppmdv for HCL. 1 ng/dscm for dioxin and furans.

Team.

- Tamara Webb, *CEO & Co-Founder*
- Yuen-Li Chan, *COO & Co-Founder*, chan@phoenix-waste.com
- Dr. Andrew Fox, *Senior Engineer*



Seacork Studio

Developing carbon-negative, compostable construction materials from seaweed - starting with architectural acoustic panels

Vancouver, BC, Canada - seacorkstudio.com -

Problem. Acoustic panels are used as false ceilings or interior finishes to reduce noise, however most are made of mineral fiber which has a big carbon footprint and never biodegrades. The industry is valued at \$9.4B → \$13.8B by 2030.

Solution. Compostable & carbon negative acoustic panels made from seaweed, to replace environmentally degrading panels. Our supply chains, products and business model are designed to impact first - regenerating marine ecosystems.

Unique Value Proposition.

- Circular - we upcycle old Seacork products into new ones.
- Biodegradable - excellent fertilizer.
- Local - crafted, sourced & sold locally.
- Regenerative & Carbon Negative - lifecycle enhances local biodiversity, cleans oceans, and removes more CO₂ than it emits.
- Sound attenuating - high-performing acoustic capabilities.
- Cost-Competitive - priced within the eco-friendly acoustic panel market range of \$15-\$35 / sqft.

Ocean Impact. Seaweed sequesters CO₂ & breaks down harsh toxins, cleaning the ocean. Kelp farming requires no inputs (ie. fertilizer or pesticides), no freshwater, nor destruction of habitat. Since the product is not for consumption, it's made of low grade farmed seaweed or of algal blooms ie. Sargassum. The second ingredient is a secret for proprietary reasons, however, it is biodegradable and removed from our waste stream - therefore also carbon negative.

Industry Information. Compared to eco-friendly panels, ours are the only high performing, biodegradable, globally scalable, regenerative, and cost competitive ones. Cork is high performing, biodegradable and cost competitive, however it's not scalable since cork only grows in the Mediterranean. Natural felts are scalable, but low performing and rarely biodegradable because of the backing used. PET felts are high performing, cheap and scalable, but never biodegrade.

Technology and Intellectual Property. Seacork's acoustic testing results proved our panels absorb sound as well as the common mineral fiber panels. Future Seacork product development into thermal insulation boards. As the inventor of this material and its application, IP is crucial to our business. With support from Canadian government funding, we developed an IP strategy with our lawyers, and filed patents in Canada, the US, and a PCT for future filings in Europe, Asia and beyond.

Solution Roadmap. TRL Level - 5

Immediate Next Steps in Development. Scale up manufacturing processes with partner organizations (colleges and contract manufacturers); R&D to non-toxically remove smell; continue material testing as quality control; continue Canadian gov. grant applications.

Three Greatest Needs in Next 12 Months.

1. Raise 250k in grants and non-dilutive funding to fund R&D and manufacturing scale-up
2. Install 1,000 sq ft of panels through 2-4 pilot projects in offices, event spaces & restaurants
3. Secure a stable seaweed supply chain

Key Metrics.

- 50 sq ft panels = captures 10 kg CO₂e (carbon sequestered from growth of kelp & captured within the product, + carbon sequestered from lifecycle of other secret ingredients, - carbon released from processing & manufacturing).
- We expect to sell 50,000 sq ft in the 2nd year of sales, capturing 10,000 Kg CO₂e.
- Seacork production also enhances marine biodiversity & cleans the ocean of toxins.

Team.

- Annie Dahan, *Founder & Bio-based Material Designer*, annie@seacorkstudio.com
- Chris Bardos, *Product Commercialization & Growth Advisor*
- Dr. Spencer Serin, *Seaweed Scientist Advisor*



Soarce

A natural, simple process for converting seaweed into high-performing chemistries for sectors like textiles, cosmetics, & more



Orlando, FL, USA - soarceusa.com -

Problem. Chemical production is outdated - complex manufacturing, resource-intensive, and reliant on toxic, non-renewable chemistries, emitting 7% of global GHGs.

Solution. We offer a clean and simplified biorefinery process where we use non-toxic solvents from fruits and vegetables to refine renewable biomass like seaweed, into high-performing chemicals for textiles, cosmetics, and more.

Unique Value Proposition. Our innovative biorefining process transforms seaweed into high-performance, eco-friendly chemistries. By eliminating toxic inputs and simplifying complex manufacturing steps, we achieve lower CAPEX while leveraging seaweed - a rapidly renewable resource. This allows us to deliver high-performing solutions with reduced emissions, water, and energy usage, giving us a strong advantage in sustainability and performance.

Ocean Impact. We're moving invasive species of macroalgae like sargassum from the ocean that washes up on coastlines and decay, releasing the majority of the runoff and emissions that are absorbed. Removal of these invasive species allows the sea life that requires sunlight to effectively achieve it, fostering a balanced and sustainable ecosystem. By replacing traditional refinery processes we're reducing emissions, water consumption, and harmful runoff.

Industry Information. Textile/fabric/dye mills and brands are increasingly seeking sustainable dyeing methods to replace toxic, water-intensive practices. New EU legislation is banning harmful ingredients like PFAS and has heightened the urgency for eco-friendly alternatives. Biomass Refiners Demand is growing for less harmful solvents that can efficiently extract materials, replacing traditionally toxic options like ethanol and chloroform.

Technology and Intellectual Property.

- Currently we have two patents:

- The Methods and Compositions (Utility Patent) For Sustainable Textile Materials (non-provisional)
- The Methods of Manufacturing (Utility Patent) For Modifying Cellulose Material (provisional)
- 2-word mark trademarks for Soarce & Searamic
- 5 Design trademarks - Soarce (colored), Soarce (non-colored), Soarce emblem (colored), Soarce emblem (no color), and Searamic emblem (no color)

Solution Roadmap. TRL Level - 5

Immediate Next Steps in Development. Launch pilot facility to service customers at larger quantities; selling our nanocellulose and refining fluids at quantities less than 5,854kg or \$1.06M per month.

Three Greatest Needs in Next 12 Months.

1. Close first priced round & find a lead investor
2. Obtain additional provisional patents pertaining to composition of matter & methods of manufacturing for new formulations
3. Scale to our pilot facility selling ~6k kg/mos.

Key Metrics.

- Environmental Certifications: Total certifications like toxicity studies, carbon footprint analysis, ingredient traceability, and sea life restoration.
- Feedstock Yield: Quantity of usable biopolymers extracted per ton of seaweed.
- Active Partnerships: Count of ongoing commercial partnerships.
- Production Capacity: Volume of invasive seaweed extracted and processed.



Team.

- Derek Saltzman, Co-Founder & CEO
- Mason Mincey, Co-Founder & COO
- Patrick Michel, Co-Founder & COS, patrickmichel@soarceusa.com

Orlando, FL, USA ▾ synmatter.co ▾

Problem. 90,000+ ships and marine structures worldwide need constant repair and/or dry docking every 3-5 years for costly maintenance and repainting to deal with corrosion, creating hazardous waste and polluting air, soil and water.

Solution. SynMatter's Smart Particle coating additives are sustainable, highly effective drop-in replacements for zinc and other harmful corrosion inhibitors, delivering the same or longer coating lifetime, reducing coating waste.

Unique Value Proposition. Over the decades, highly effective corrosion inhibitors were used that were later found to be hazardous, e.g. lead (poisonous), chromates (carcinogenic) and zinc (marine pollutant). Smart Particles release sustainable, environmentally friendly corrosion inhibitors on-demand in response to corrosion itself. Smart Particles are adaptable to meet end user demands and new regulations without sacrificing corrosion protection performance.

Ocean Impact. SynMatter's Smart Particles are sustainable, lightweight replacements for the polluting corrosion inhibitors that protect the 90,000+ ships worldwide from corrosion and can extend the lifetime of protective coatings up to 2-fold. Less frequent recoating and replacement reduces the generation of hazardous waste, which leads to healthier and more resilient water systems by limiting ocean exposure to polluting materials.

Industry Information. Corrosion costs the world economy ~\$3.5T a year, affecting marine, oil & gas, defense and infrastructure the most. Protective coatings, a \$17.2B market growing at 5.0%, contain corrosion inhibitors and are applied to ships and other marine assets to protect against the corrosive ocean. Coating companies source chemicals, such as SynMatter's Smart Particles, from raw material suppliers and sell formulated coatings to end users, such as ship owners

Technology and Intellectual Property.

- SynMatter is negotiating an exclusive license (finalized before the end of 2024) to the NASA patent for the original technology.
- SynMatter owns a patent for further improvements of the technology. With the

license and their own patent, SynMatter has freedom to operate.

- SynMatter's founders invented the Smart Particles and hold trade secrets on their production, processing and coating formulation that protect it from competitors.

Solution Roadmap. TRL Level - 6 ▾

Immediate Next Steps in Development.

- Customer evaluations and field testing.
- Identifying toll manufacturer
- Production scale-up with toll manufacturers
- Industry marketing
- Raising institutional investment

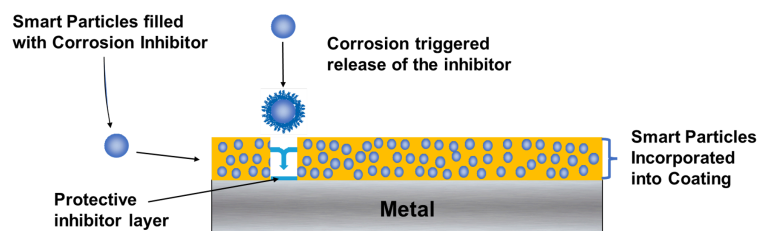
Three Greatest Needs in Next 12 Months.

1. Production scale-up
2. Industry partnerships for evaluation and testing
3. External investment

Key Metrics. Smart Particles reduce protective coating weight 25-50%, extend lifetimes up to 2-fold and lower maintenance cost up to 35%. By also reducing asset downtime up to 50%, they can yield \$100M+ in yearly savings for the marine, defense and energy industries. They replace polluting, poisonous and carcinogenic corrosion inhibitors, prevent waste generation and reduce contamination of the ocean and air.

Team.

- Dr. Jun Zhang, *Founder, CEO, & Chief Scientist*
- Dr. Benny Pearman, *Founder, COO, & Lead Scientist*, benny@synmatter.co
- Dillon Campbell, *Coating & Testing Engineer*



Smart Particle Smart Corrosion Inhibition Mechanism

Problem. The International Maritime Organization aims to cut 400 Gtons/year of CO₂ by 2030, but current technologies struggle to efficiently convert low or zero-carbon fuels, making the transition from fossil fuels challenging.

Solution. ZEM has developed a compact modular fuel cell unit that efficiently converts ammonia directly, achieving over 60% electrical efficiency without the need for a cracking unit and eliminating NO_x or unreacted ammonia emissions.

Unique Value Proposition. ZEM offers smart power generation systems for marine vessels in Emission Control Areas (ECAs) up to 100 nautical miles. Our solutions enable vessels to switch to cleaner fuels, ensuring compliance and environmental responsibility. ZEM is focused on developing systems under 300 kW_e (fPower generation & propulsion applications), targeting this niche market before the wider adoption of ammonia as an energy vector in the marine sector post-2030.

Ocean Impact. Our Direct Ammonia Fuel Cell system will significantly contribute to healthier and more resilient oceans by eliminating CO₂, SO_x, and NO_x emissions. It also reduces marine pollution by preventing oil and harmful substance leaks. By installing an 11MW system by 2030, we can cut CO₂ emissions by 25,980 tonnes per year, making a positive impact on marine ecosystems and supporting sustainable maritime operations.

Industry Information. Ammonia is key to decarbonizing the maritime sector, with forecasts suggesting it could make up 20% to 60% of shipping fuel by 2050. Norway and Singapore are working together to advance ammonia as a fuel, as shown by their MoU signed in April. Recently, a major test on a dual-fuel engine using ammonia took place in Singapore and several shipowners have already ordered dual-fueled ammonia vessels to be ready by operative by 2028.

Technology and Intellectual Property.

- Patent Protection: International patent WO 2024/09501 safeguards ZEM technology.
- Upcoming Patent: A new patent for a 2GEN fuel cell will be filed, covering a novel manufacturing

process to lower costs and enhance market competitiveness.

- Portfolio Audit: An audit of ZEM's fuel system portfolio will be conducted to reinforce technology protection and ensure robust intellectual property management.

Solution Roadmap. TRL Level - 5

Immediate Next Steps in Development. By March 2025, we need to demonstrate a 5 kW Auxiliary Power Unit (APU) with a 1 kW Direct Ammonia Fuel Cell system (GEN 1) as APU on board and onshore and deliver a 1kW prototype unit for research purposes in Emirates.

Three Greatest Needs in Next 12 Months.

1. Standardize manufacturing
2. Optimize stack geometry
3. Finalize system architecture for 2nd GEN cells to reach TRL 7 and launch long-term operational demo units

Key Metrics.

- Electrical Efficiency: Over 60% efficiency in direct ammonia conversion.
- Emissions: Zero CO₂, NO_x, and unreacted ammonia emissions.
- Scalability: Modular design for easy integration in a wide range of vessels.
- Energy density: High gravimetric and volumetric density of PEMFC with cracking unit.
- Fuel Flexibility: Utilizes ammonia, a readily available alternative fuel

Team.

- Professor John TS Irvine, *CEO*
- Dr. Xiangling Yue, *CTO*
- Dr. Alfredo Damiano Bonaccorso, *Commercialisation Officer*, adbonaccorso@zemfuelsystems.com

