# SAVANNAH OCEAN EXCHANGE SOLUTION SUBMISSION

Gabriella Levine, Open-H2O US Director, June 6, 2012

## PROTEI: Open-Source Ocean-Cleaning Sailing Robots

**1. Importance of problem**
**-*Your Solution*: What is the problem and how does your Solution address it?**

Open-H20 is a growing international community of artists, engineers, marine biologists, naval architects, and academics, developing open-source technologies to explore, study and preserve the ocean. Since 2010, the Open-H20 team has collaborated to evolve Protei drones into sustainable vessels capable of collecting data in various marine environments and effectively cleaning the ocean.

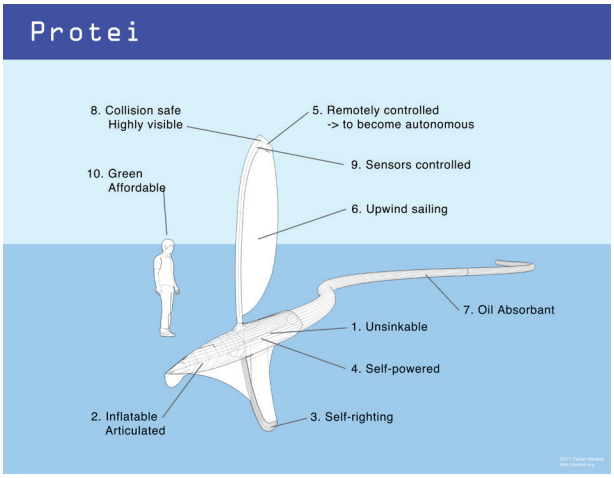


*Fig. 1. Protei Technology Vision*

**THE PROBLEM**

Recent local environmental catastrophes, from the Fukushima Daiichi nuclear disaster to the Deepwater Horizon oil spill, underscore the need for multiple solutions to counteract the global consequences of theses disasters.

*Oil Spills*: The current use of skimmer ships, bacteria and fire to remove oil from marine environments highlights the necessity of advancing oil collection technology. These techniques are not effective enough to efficiently tackle the complexity of today's oil spills. Estimates show that the skimmer ships, often repurposed fishing vessels deployed by the US Coast Guard for the cleanup of the Deepwater Horizon oil spill, collected only 3% of surface oil. Skimmer ships are the most commonly used technology in oil spill cleanup, which demonstrates that there is a need for alternative technologies.

*Plastic Debris*: The Great Pacific Garbage Patch, a mass of plastic debris in the Pacific Ocean two times the size of Hawaii, is a consummate embodiment of anthropogenic pollution. Research on the photodegradation of the trash has found increasing levels of toxins throughout ecosystems and food chains, highlighting the importance of removing this detritus. Collecting this debris poses many challenges as often it is spread unevenly across large areas and mixed amongst marine life.

*Radioactivity*: The environmental impacts of the Fukushima Daiichi nuclear disaster continue to have global effects as radioactive pollution spreads across land and marine environments. The disparity in the results of the data provided by the Japanese government and TEPCO (Tokyo Electric Power Company) and that of local residents points to the demand for an independent agency to monitor radiation levels.

*General Oceanography and Natural Reserve Monitoring:* The lack of available surface marine data limits oceanographic studies. The most popular general oceanographic and climate-monitoring device is the ARGO, a network of about 3500 free-drifting profiling floats that provide mainly

underwater data on the temperature and salinity of the ocean. However, ARGO gathers mostly subsurface data, and their location is uncontrollable, as passively drifting vessels. Collecting surface data in a controlled manner would allow for greater insight into the long term effects that industries such as fishing and farming have on the health of marine ecosystems, as well as the causes behind phenomena like algal blooms and coral reef bleaching.

**THE SOLUTION**

Protei is a seafaring surface vessel, constructed to carry research instruments and environmental clean-up equipment autonomously over long distances on the ocean via wind power. The project was conceived in response to inefficiencies in oil spill relief efforts, and frustration with the unsustainable research and design costs of current robotic oceanic drones. Protei's mission is to provide a locally accessible, economically efficient platform for the development of ocean-cleaning data collecting robotic drones. Our goal is to harness human innovation, technological ingenuity, and creative design to preserve the integrity of our natural resources.

One of the biggest obstacles to effective disaster prevention and clean oceans is the lack of international coordination and collaboration, as the diversity of methods for aquatic disaster relief is vast. Open_H2O wants to create effective remediation techniques through a collaboration platform to determine common evaluation criteria and foster relief efforts. In this way, Open-H2O and Protei will have a global impact.

*Oil Spills*: Protei drones are being designed to sense oil in water through infrared technology, detect leaks in oil drilling sites, autonomously coordinate clean-up efforts, and drag oil sorbent booms to absorb contaminants.

*Plastic Debris*: Through partnerships with interest groups such as Kaisei, a non-profit that leads ocean-cleaning expeditions, Protei aims to sustainably collect and discard the plastic debris contaminating oceans. By leveraging wind power, Protei can transport collection nets to and from remote ocean treatment plants, minimizing the environmental impact of ocean cleaning.

*Radioactivity*: Protei drones aim to facilitate real time offshore measurements of radiation levels, map the path of its spread, detect its activity along coastlines, and pinpoint hotspots of hazardous levels.

*General Oceanography and Natural Reserve Monitoring:* Protei's design allows the drones to be self-righting, unsinkable, collision-safe and hurricane-ready. The unique shape-shifting hull provides superior mechanical control and steering efficiency, maintaining momentum while making tight turns to tack back and forth across the wind. The ability of the drones to navigate rough waters in a variety of weather conditions while not disturbing natural environments allows Protei to provide reliable data.

**-*Your Product or Technology*: Is the product or technology of adequate quality and appeal to establish a high likelihood that it can be brought to market in sufficient quantity to achieve profitability targets?**

Protei's technological development has rapidly accelerated in the past two years with promising advancements. Tests conducted in Japan, Korea, the US, the Netherlands and the United Kingdom, have optimized Protei's sailability, electromechanical systems and electronics. Nine prototypes have measured Protei's trajectory control, maneuverability, material strength, water resistance, payload towing capability, propulsion techniques, steering electronics and electronic design. One such prototype, Protei_006, a three meter long sailboat, demonstrated towing capacity of a potentially oil-saturated boom. Protei_006 is used to conduct ongoing mechanical tests on towing power of larger vessels. Other technology

being tested includes the capability of Protei drones to communicate with other drones, to share data to create optimal networks through environmental-sensing techniques, and to exhibit swarm-behavior.

Open-H20 is committed to creating a product that local communities can use with ease. Using the Open Source Hardware ideal allows Protei's technology to be free to use, modify and distribute the hardware behind the technology. The benefit of the Open Source Hardware platform is that our technology is collectively peer-reviewed so that the broader community accelerates the development of our technology. This process allows for a low cost design and production of affordable remote control boat kits to collect ocean data. Starting September 2012, Protei drones will be market ready.

***-Market Opportunity*: Does it appear that a substantial market exists for this type of product or technology? Is there a credible unmet need this product or technology will satisfy? What action has your Solution taken to meet the market need?**

Interest groups around the world are working to protect coral reefs, preserve sea life, and clean the coastlines. Unmanned vessels for cleaning contaminants on the water reduce health hazards to workers and allow boats to be operated during a storm. There is already a market for unmanned ocean cleaning solutions in the private and governmental sectors, which have developed devices such as the Liquid Robotics Wave Glider used by the Scripps Institute, the UC Santa Barbara's Groovy Drum Skimmer, and Ocean Therapy Solution's V-20 oil-water separating machines. However, these projects are cost prohibitive and inaccessible to local communities and grass-root initiatives.

In 2010, while helping with the oil spill relief efforts in the Gulf of Mexico, Protei founder Cesar Harada found that the general public is looking for better solutions to preserve the ocean. Local residents wanted to get involved in the cleanup efforts, but did not know how. Harada conceived of a fleet of robotic oil collecting sailboats as a remediation tactic that would enable local communities to take a hands-on approach to marine disaster relief efforts.

Through Kickstarter, a website used by authors, film-makers and artists in search of project funding, Harada was able to raise $34,000 from 300 backers, exceeding his goal by 24%. This exemplifies the market viability and investor interest in Protei. With the backing, Harada assembled a team of engineers and built a large-scale prototype of the ocean-cleaning robot, which is evolving into a six meter industry ready vessel.

A 2011 research initiative through Stanford University's course in Global Entrepreneurial Marketing (GEM) determined there is a substantial market for Protei. A web survey administered to a random sample of global participants, and interviews with industry experts, including the head of the Stanford Oceanic Group, found that more than half want to use Open-H20 for research and education purposes.

Protei's fundraising success and market research confirms the need for an ocean-cleaning technology available in the public sector that is financially viable and globally scalable. Our technology fulfills this market need for a locally funded tool for hobbyists, scientists, and even kids, as an educational and informative platform, to raise awareness of the impact of oil and other man-made ocean disasters.

***-Environmental Results and Outcomes*: Is there the ability to track and measure progress towards achieving the expected outputs and outcomes as described by the Solution?**

The Open-H20 workflow allows for rapid prototyping and frequent testing. Tests are designed to address how a flexible hull sailboat maneuvers with regards to trajectory control, energy management and survival of a sailing vessel in the ever-changing ocean environment. Benchmarks are set based on successes and failures of each prototype. Through

this process, Protei constantly evolves to achieve the objectives of reliable data collection and cleanup capabilities.

Protei's long-term success can be measured by the number of boats on the water and their effectiveness. The metrics for measuring each community project's success depend upon the environmental problem that the technology is addressing. For instance with oil spills, its success can be measured by how much oil is collected over time. For data collection, its success can be tracked by the ability to access remote areas and transmit useable data. As an educational platform, success will be demonstrated through increased awareness and local community engagement with coastal marine issues.

**2. Viability of solution**

***-Competition and Competitive Advantage*: Establish the merit of this product/service compared to other competitive offerings in the marketplace. Are there many competitors or few? Are there large organized competitors or is there a disaggregated competitive landscape? What is the opportunity for this offering to credibly penetrate the market?**

As previously mentioned, there are a number of organizations developing oil-spill cleanup and oceanographic data collection technologies, a majority of which are proprietary organizations or governmentally funded ventures. However, these products are not as affordable, adaptable, or replicable as Protei. This makes the product much more economically accessible, and thus gives us a competitive edge as we enter the marketplace (*Fig. 2*).

As captured by the Stanford GEM research, the market landscape includes technologists, enthusiasts, students, research institutions, and sponsors. We have developed a number of strategies to build out our customer base, including social marketing campaigns, conference and symposia presentations, and strategic partnerships. Due to the open-source nature of this project, we have been able to develop relationships with other programs developing new technologies for do-it-yourself (DIY) fabrication of sophisticated hardware. Through sharing knowledge with organizations such as OpenROV, a low-cost telerobotic submarine that can be built with mostly off-the-shelf parts, and DIY Drones, the world's largest amateur unmanned aerial vehicle (UAV) community, Protei and Open-H20 have been able to build a strong business model using insight from these companies.

Protei's unique market position is due to the sailing vessels' shape-shifting hull. Its structure and locomotion is inspired by a deep understanding of

| **Protei** | **Liquid Robotic Wave Glider** | **Repurposed fishing vessel** |
|---|---|---|
| Low cost ($100-500) | High cost ($200,000) | Super high cost ($3,500,000) |
| Open-source | Proprietary design | Proprietary design |
| Made from accessible materials | Made from expensive materials | Made from expensive materials |
| Uses renewable energy | Uses renewable energy | Not sustainable, environmentally destructive |
| Unmanned, operable during a storm | Unmanned | Cannot be operated during rough weather conditions |

*Fig. 2. Comparison of Protei to other products on the market*

the physiology and mechanics of how fish and birds use long tails to stabilize their bodies in the water and air respectively. Our research and testing has shown that a flexible hull provides superior mechanical control and steering efficiency for a sailing robot. The innovation behind Protei's shape-shifting technology allows for efficient maneuverability while dragging a long and heavy payload such as an oil absorbing tail or garbage collecting net. This allows Protei to maintain stability at both low and high speeds, which traditional designs with rigid hulls and rear rudders are not able to do.

**-*Project Timetable* demonstrating product or technology's feasibility**

Open-H2O is developing two sizes of drones. Protei_010, a one meter long boat that is scheduled for manufacturing in the fourth quarter of 2012, is ideal for sensing remote marine data. A six meter long boat, based on the structure of Protei_006, will be able to drag several hundred liters of oil or trash. We plan to manufacture the six meter autonomous ocean-cleaning boat by 2015.

The following timeline outlines the proposed research, prototype, and manufacturing plans for the above vessels:

**September 2012:** Protei_010 ready for manufacturing
**December 2012**: Protei_010 released as beta product
**February 2013**: Protei_010 ready for wide-release
**June 2013**: 6 meter manned prototype
**June 2014**: 6 meter manned beta product
**October 2014**: 6 meter autonomous prototype
**October 2015**: 6 meter autonomous product

**-Clear description of *potential commercial viability* of the product**

The Stanford GEM marketing research project found ample enthusiasm for Open-H20's initiatives. Nearly all participants expressed interest in collaborating in some way with Open-H20 or participating in a workshop on the topic.

Additionally, Protei and Open-H20 will economically and technologically benefit from the increased concern for oceanic preservation, the Internet's capacity to facilitate the formation of connections, the momentum of the Open Source Hardware movement, the emergence of Citizen Science groups, and the rise in popularity of at-home, DIY fabrication with desktop 3-D printers.

**-How will you *measure* progress and success**

Open-H2O has developed criteria to evaluate performance, design attributes, environmental-cleaning goals, and engineering targets for Protei. We use four thematic criteria to measure progress and success.

**Environmental**: Protei quantifies the number of tons-of-oil absorbed or plastic trash collected as well as the amount of usable and significant environmental data collected to determine the environmental impact of products.
**Social**: Social success is measured on the happiness of each project's crew and the community it serves. The greater social impact of Protei can be seen through improvement of social connections and increases in joint efforts towards environmental preservation.
**Technological**: Success is defined by the pace of evolution and the ability of new technology to maintain Protei's high quality and low cost objectives.
**Profit**: As Protei is classified as a B-Corp, success is determined by revenue generated and Protei's ability to maximize a positive environmental impact using those profits.

The progress and success of Protei drones are evaluated using the following technical criteria:

Environmental impact and efficiency; safety and limitation of potential hazards; unsinkability; self-righting capabilities and healing momentum; power sustainability; maneuverability; speed at

different points of sail; operability in different water and current conditions; radius of tacking and jibing; Bollard Pull (pulling power); environmental noise reduction; resistance, turbulence, flow analysis (velocity prediction); material resistance to corrosion, fouling and mechanical stress; cost of production; ease of replicability and distribution; the ability to surpass barriers of local regulations, taxes, insurability; Open Source Software and Hardware standards; and quality of documentation and interoperability.

Additionally, scale and reach of Protei is measured by media mentions, prizes, exhibitions, academic partnerships, and fellowships for staff members. Our successful prototypes have gained international recognition for innovation, open-source design, and pluripotentiality to various fields of oceanographic research, waste reduction, and pollutant mitigation.

*Media mentions*: TED, CNN, Huffington Post, Wired, The Guardian, Scientific American, Vogue, VICE, Motherboard, New Scientist, Good.is, FastCompany, Innovation Daily, Nature.com, Physorg, Hackaday, Zeilen, Bateaux, Treehugger.

*Prizes*: ARS Electronica Hybrid Art Honorary Mention (2012); VIDA Awards for Artificial Intelligence and biomimicry; Fundacion Telefonia (Spain).

*Exhibitions*: Protei has been featured in numerous exhibitions around the world (USA, Netherlands, Brasil, Berlin, UK, Ireland, Japan, Korea, Czech Republic, Turkey) at museums, art fairs, festivals, science centers, maritime exhibitions, and Maker Faires.

*Academic Partnerships*: Protei has built strong academic partnerships with renowned universities, including Stanford University, MIT, ITP at NYU, TU/e Eindhoven, Syddansk University, Hongik University, Seoul, Goldsmiths University of London, and Southampton University.

*Fellowships*: Cesar Harada became a Senior TED Fellow while developing Protei in New Orleans. He has presented Protei around the world at TEDx events.

**3. Global Scalability**

**-*Marketing and Distribution*: Is there a believable explanation of how the market will be captured? What are the keys to market penetration and success?**

Open-H20's mission is to build a worldwide community of engaged participants that can take immediate action to solve local and global environmental issues. In joining the Open-H20 community, participants build, buy and deploy the products. Current marketing initiatives focus on word-of-mouth endorsements and Protei's ability to garner media coverage through community outreach programs, strategic partnerships and participation at industry summits. Print and online distribution of the Protei Handbook, which details the conceptual design and history of Protei as well as instructions for how to build Protei_006, aims to grow awareness for the drones in the marketplace. Protei's emphasis on hands-on techniques and low cost production allows Protei to service the general public's demand for an affordable technology that is user friendly.

Open-H2O's commitment to Open-Source Hardware ensures that Protei's technology costs will remain minimal. Protei's business model is structured on the premise that members of the Open-H20 community will reproduce, improve, and deploy the technology. This community-driven momentum facilitates the production of drones, which would typically require tens of millions of dollars and many years of development, to be built at a fraction of the price at an accelerated rate. This ensures that they are affordable and can be easily reproduced, allowing Protei to grow the global community market share.

**-*Production/Manufacturing*: What is the source of your materials, where is your manufacturing being**

**done, what licensing agreements are you subject to?**

Materials: *Plywood, carbon fiber, fiberglass, resin, aluminum, stainless steel, fabric, electronics*

In September 2012, when the design for the one meter prototype is ready to bring to market (and the designs and materials have been optimized), Open-H2O will find a manufacturer. We have already been in contact with a number of organizations interested in manufacturing the electronics and the mechanical product.

There will be licensing issues to deal with, especially as our hardware is open-source. If we collaborate with a proprietary manufacturer or construction team, we will need a clear contract about what remains open and what can be kept private.

**-Clear description of *plans to bring product or technology to market***

Protei's plan to bring the drones to market is based on a four-pronged segmented market approach to connect Protei to specific target audiences and consumer bases.

*Sensing*: Ocean sciences market
The one meter Arduino + Android model aims to embed Protei technology within the ocean sciences market. It currently represents the most viable long-term revenue stream for Protei as academic, private and governmental research programs can leverage the technology for a variety of sensing initiatives and collection of biological samples. Protei's marine scientists network and attend industry summits to develop strategic partnerships.

*Play*: Toy market
The one meter remote control drone was developed to excite hobbyists. Enthusiasts can build their own or buy pre-assembled kits to play with the shape-shifting drones in ponds, lakes and bays worldwide. Through partnerships with academic institutions, schools and summer camps we hope to extend the Protei brand into this consumer market. Communicating with hobbyists increases exposure of our cause and education platform to create interest and awareness of global marine environmental issues.

*Sailing*: Leisure and competitive markets
The six meter manned model targets sailors, surfers, adventure seekers and sailing aficionados. This market will further Protei's brand within the marine community. As the boats are put to the test, the users will be able to provide feedback that will further Protei's technology. Protei team members are avid sailors, who sail competitively and regularly attend naval trade shows and sailing events.

*Ocean Cleaning*: Environmental and Activist markets
The six meter autonomous drone can be used by environmentalists, activists, governmental entities and local communities to collect data as well as oil, plastic debris and other marine pollutants. Through hands on workshops to engage different stakeholders and the use of social media, Protei continues to grow its position within communities looking for alternative solutions to oceanic preservation.

**4. Business Plan**
**-*Business Model*: How are you making money? How are you reaching your customers?**

Open-H2O spans across many platforms, including universities, government agencies, crowd-funding, non-profit, and industry. Therefore, funding comes from varied sources, as the product improves and the research deepens. This includes venues in the following industries and sectors: Oil production and cleaning; Physical oceanography; Construction; Plastic-trash collection; Nuclear disaster relief; Defense and rescue; Energy and sustainability; Automotive; Environmental advocacy and research; Academia; Entertainment; Philanthropy; Distribution; Materials / Engineering; Agriculture / Aquaculture; Mining (*Fig. 3*).

2010 - 2011: Crowd-funded - 300+ individuals and organizations have "backed" us on KickStarter
2011 - 2012 : Philanthropy - supporters (V2_ Institute for the Unstable Media, DNV)
2012 - 2013 : Sponsorship - individual sponsors, media exposure
2013 - 2014 : Grants - Scientific partners and universities
2014 - 2015 : Sales - customers and users
2015 - 2016 : Operations, data-collection, clean-up - local residents, companies, non-governmental organizations

*Fig. 3. Sources of funding*

**Open-H2O (non-profit) and Protei start-up (B-Corp):** Open-H2O, a non-profit 501(c)(3) organization, develops and licenses Protei and several other Open Source Hardware and Software ventures, all with the goal of ocean-preservation. The Protei technology is used, modified, manufactured and distributed by Protei Inc (B Corp), a spin-off tech start-up. This structure guarantees both the ethical integrity of a non-profit technological development, and allows the proliferation of a commercially-competitive start-up. Both Open-H2O and Protei are based in the San Francisco, California, but they also operate internationally.

***-Intellectual Property*: Is there IP that protects this product/technology? Is it protected by patents or patents pending? Are there difficult-to-duplicate processes or research that protects the uniqueness of the products/technology?**

Recently, patent trolls have slowed down innovation, and many nascent businesses have identified traditional IP as a hindrance to the propagation of new technologies. As an alternative, Open_H2O is an open-source venture, as we believe that open platforms will play a major factor in the next manufacturing revolution and in the social model for collaboration towards environmental preservation.

Many successful companies, including Arduino, MakerBot, DIY Drones, LittleBits, Red Hat and Linux, have proven that a business foundation based on open-source software and hardware is viable and profitable. Protei is a vastly significant project for the open-source hardware community, not only because it facilitates disaster relief on a global level, but also because its whole philosophy and implementation depends on people, wide-scale, willingly participating, collaborating, and sharing unique skill sets.

**LICENSING**:
Protei's work is licensed under the following licenses, according to the type of content:

*Open Source Hardware*: Open Source Hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design.
*Creative Commons - BY - SA - 3.0*: This license lets others remix, tweak and build upon Protei's work even for commercial purposes, as long as they credit Protei and license their creations under the identical terms, by providing a link to our URL.
*GNU General Public License 3.0*: This licence applies to the source code of Protei and requires that people have the freedom to run the program, access the code, and redistribute the program to anyone.
*US Trademark*: The name PROTEI is registered under the serial number #85339997 by the US Patent and Trademark Office.

***-Financials*: Are the financials sufficiently thought out in terms of expense growth and the link with the marketing strategy on revenue? Is there evidence that profit margins can be achieved in the marketplace?**

We have developed a 5 year plan, with estimated figures of profit margin that come from sales of boats (*Fig. 4*).

For Open-H2O, growth means the economic sustainability to maximize the environmental and

| Market Capacity | Units produced and sold per year | Cost per unit (USD) | Turnover GBP (USD) |
|---|---|---|---|
| **Protei – 1m Toy** | 100,000 | 250 | 25,000,000 |
| **Protei – 1m Ocean sensing (Arduino+Android)** | 500 | 20,000 | 1,000,000 |
| **Protei - 6m Sport sailing, manned** | 10,000 | 20,000 | 200,000,000 |
| **Protei – 6m Autonomous, ocean-cleaning** | 200 | 100,000 | 20,000,000 |

*Fig. 4. Market capacity of the vessels*

social impact, and the technological development. We aim to grow to be a sustainable company, not to be a maximum profit generating organization. We have a different agenda than "Business as usual", and we have been backed thus far (*Fig. 5*).

**Financial sustainability**: This will benefit the broader Protei community, by enabling us to develop a widely-used technology.
**Environmental impact**: Our first priority is to serve the environment.
**Social impact**: We aim to grow into a rich, diverse community of people who want to have a positive impact on the world.
**Technological development**: Technology is our means, not our end. We focus on innovation generated by the community, and as Protei becomes a mature technology, we are eager to diversify our range of services and products under the open-hardware and community-generated innovation model.

***Further financial details are attached in the supplemental materials.***

**5.Leadership**
**-*Management Team*: Is the management team experienced in this marketplace and product/ technology? Are they experienced business people? Have they previously been successful or proven they can execute business plans and grow/ sustain business ventures?**

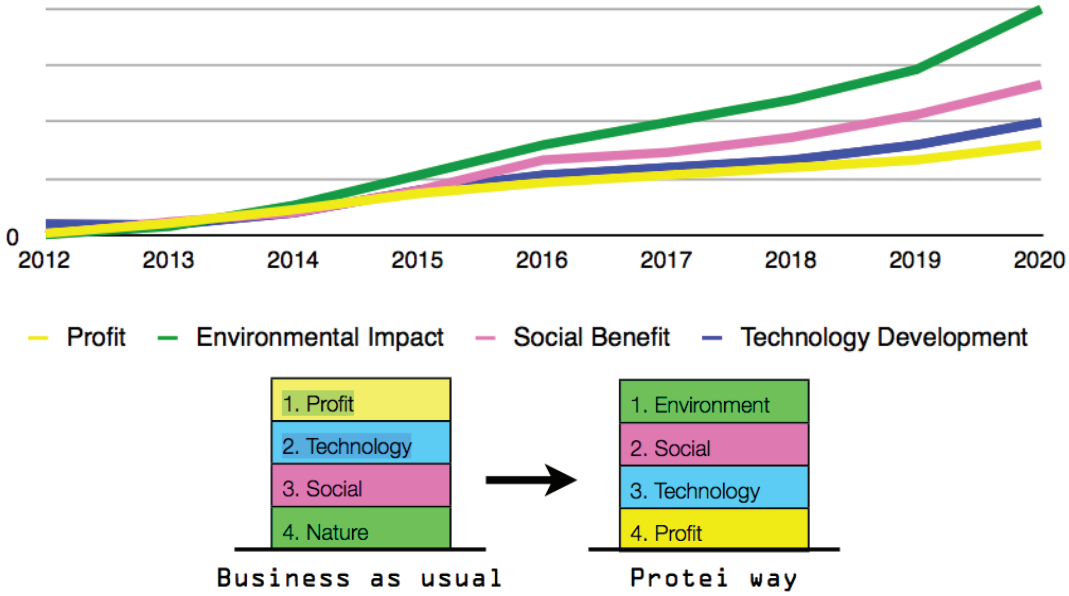


*Fig. 5. Protei's business agenda*

The Open-H2O management team is comprised of people with business experience. These include:

-Ru Mahoney: non-profit organization manager and executive director at Stokes Nature Center (USA).
-Etienne Gernez: Protei academic coordinator, maritime engineer at DNV Veritas Oslo
-Piem Wirtz: Protei project coordinator, Project manager at V2_ lab
-Gabriella Levine: US President, former community developer for Weeels and Starlab
-Peter Keen: Protei Ocean Technologist, Senior Ocean Engineer
-Zenon Chaczko, PhD: Program Head of Information and Communication Technologies, Sydney Univ. of Tech.
-Cesar Harada: Protei coordinator and CEO, former project leader at MIT's Senseable Cities Lab

One of the most important aspects of the open-source community is that we have connections to a varied community, many of whom possess business acumen. This allows for the formation of an organically-formed, international board of extremely capable company managers and coordinators.

**-*Your Leader/CEO*: Has your CEO done a prior venture? Does he/she have the appropriate technical background and expertise? Does he have prior experience growing a commercial venture?**

Cesar Harada has the expertise to run and facilitate Open-H20 to develop the Protei technology and bring it to market. Harada's prior ventures include the World Environment Organization, Nairobi (Kenya), and Open_Sailing LTD., London & Wales (UK). After graduating from the Royal College of Arts in London, Harada has been the project leader for Project SeaSwarm, directing a team of 10 researchers at the Senseable City Lab at Massachusetts Institute of Technology (MIT), developing an oil spill cleaning technology based on super absorbent nano-fabrics. He is currently a TED Senior Fellow, a Social Entrepreneur of the New Orleans Accelerator Associate (USA), and a visiting tutor and MPhil Candidate at Goldsmiths University, London (UK).

*The Protei Team*

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Protei