

US EPA ARCHIVE DOCUMENT

2015 Water Venture Investment Conference at WEFTEC

Meeting Summary Report

Wednesday, September 30, 2015

McCormick Place Convention Center

South Building Level 1, Room S103

2301 S Prairie Ave, Chicago, IL 60616

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EXECUTIVE SUMMARY

The 2015 Water Venture Investment Conference was held on Tuesday evening, September 29, 2015, at the JPMorgan Chase Tower, and on Wednesday, September 30, 2015 in Chicago, Illinois during WEFTEC, the Water Environment Federation's Annual Technical Exhibition and Conference. It was presented by the Water Council and the Water Environment Federation, and underwritten by JPMorgan Chase & Co. This meeting served as an opportunity for water technology companies and water investors to connect.

Mr. Dean Amhaus, President & CEO of the Water Council welcomed the participants and introduced the morning kick-off keynote speaker, Ms. Cynthia Simon, Senior Manager Investor Initiatives at CDP. She discussed the use of CDR data to discover opportunities to invest in water technology. Morning guided sessions then followed where 4 thematic sessions took place. Mr. Scott Mosley of the Water Council described the format: each session featured 5-7 conversation starters - subject matter experts who hosted and guided tables in a conversation around the given theme.

During lunch, the U.S. Environmental Protection Agency (EPA) hosted a Small Business Innovation Research (SBIR) awardee showcase. Mr. Paul Shapiro of the EPA SBIR Program introduced the showcase by briefly describing the SBIR funding process, followed by presentations from representatives from four SBIR awardee companies, and closing remarks from Dr. Barry Johnson of the National Science Foundation (NSF).

The afternoon consisted of two breakout sessions followed by matchmaking sessions. The first breakout featured a presentation by Ms. Susan Preston of The Angel Resource Institute. Ms. Preston gave a background on angel investing in the water sector and stressed its importance in light of growing problems in the global water industry coupled with challenges to investing in water technologies. She was then joined by four other panelists (Sunit Mohindroo, WartHub; Marian Singer, WellIntel; Jose Ramirez, Mikoflot; and Steven Kloos, True North Ventures) to discuss how to vet a water deal. The second breakout session featured Mr. Robert Okabe of the Angel Resource Institute. Mr. Okabe's presentation was entitled "Pitching to Angel Investors".

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ABBREVIATIONS AND ACRONYMS

DOE	Department of Energy
EPA	Environmental Protection Agency
NSF	National Science Foundation
SBIR	Small Business Innovation Research
WEFTEC	Water Environment Federation's Annual Technical Exhibition and Conference

INTRODUCTION AND OVERVIEW

The 2015 Water Venture Investment Conference was held on Wednesday, September 30, 2015 at the McCormick Place Convention Center, South Building Level 1, in Chicago, Illinois. It was presented by the Water Council, the Water Environment Federation, and JPMorgan Chase & Co. This meeting served as an opportunity for water technology companies and water investors to connect. Approximately 125 individuals attended the event over the course of the day.

The event was held at WEFTEC, the Water Environment Federation's Annual Technical Exhibition and Conference. According to the Water Council, this conference is the biggest meeting of its kind in North America and offers thousands of water quality professionals from around the world the best water quality education and training available.

The Water Venture Investment Conference at WEFTEC provided an opportunity for companies to meet and interact with the most active water investors in the industry- angels, venture capital, and corporate venture. Additionally, the conference offered investors the forum to meet start-ups and other like-minded investors interested in the opportunities surrounding acute water shortages and rising demands to deal with wastewater, stormwater and infrastructure.

WELCOME

Dean Amhaus, President & CEO, The Water Council

Mr. Dean Amhaus thanked JPMorgan and the Water Environment Federation for partnering with the Water Council for this event. He noted that the purpose of the day's meeting was to learn more about water and opportunities associated with it. In holding the meeting, the planners sought to bring together stakeholders and foster conversations about water investment. Mr. Amhaus anticipated that the Water Council will continue to carry this initiative forward. He expects that they will hold trainings in other cities and partner with groups across the country.

He then introduced Ms. Cynthia Simon and noted that her organization, CDP, regularly holds conversations with investment firms. Businesses and investors are being threatened by water shortages around the world, and CDP is investigating these risks. He thanked Ms. Simon for speaking today.

MORNING KICK-OFF KEYNOTE

Using the CDP Water Report and Dataset to Discover Opportunities in to Invest in Water Technology

Cynthia Simon, Senior Manager Investor Initiatives, CDP

Ms. Simon thanked the audience for this opportunity to speak. She first explained that CDP offers the only global system for self-reported data by companies, their supply chains, and cities; the data relates to natural capital. In our current global economic system, we do not have a way to measure the significant economic and social externalities which impact the natural capital that is a significant input to certain industries. CDP's goal is to change the system to have natural capital and its value be reflected in the global economic system. They are attempting to enact change by collecting information. This process will lead us towards a sustainable economy, according to Ms. Simon.

CDP is a 15-year-old organization and is headquartered in the United Kingdom. The organization was originally called the Carbon Disclosure Project, but they have re-branded as they expand to other issues beyond carbon, such as water and forests. A milestone for CDP is that their data is now available on the Bloomberg Terminals.

The programs and reports created by CDP focus on climate change, cities, supply chains, water, and forests. CDP derives its authority through investors. The organization requests that companies disclose their environmental risk data, which CDP then analyzes and returns to investors. This information facilitates investors' engagement with companies and impacts their investment decisions. Also, CDP ranks companies based on carbon-related metrics and provides that information to investors. In most cases, the investors are long-term index investors and are not going to change capital allocations. Instead, they will work more with companies over a longer time frame to create change.

Investors have woken up to water, according to Ms. Simon. This is exemplified by the fact that Norges Bank is the lead sponsor in the CDP water program. Overall, industrial supply chains are increasingly interested in water. Ms. Simon then discussed the issues about which water investors are concerned. Investors want to understand if natural resource damages or limitations will impact costs, or disrupt business, future growth plans, brand value, or community relations. Further, there is concern about oil and gas assets becoming stranded. Water plays a role in the viability of some types of industries such as mining. Investors are also wondering if natural resource impacts will create opportunities for new businesses. It is frustrating to work in this space, Ms. Simon said, because there is not enough data, and the data that is available is located in various places. It requires a lot of work to find the information and piece it together.

CDP is focused less on companies that sell water, like utilities, and more on how companies in their normal business practices are impacting water. The organization is targeting sectors where water is significantly implicated. CDP researches each significant market and seeks out companies that have particularly high water resource impact. These companies tend to be in sectors like pharmaceuticals, power generation, apparel, semiconductors, and oil and gas.

In 2015, CDP approached 2,500 companies globally with their questionnaire about climate-change, water, and forest-risk information. However, they would like to expand their information collection to more countries. As a non-governmental organization, CDP sometimes has difficulty conducting projects in the way that they should be done. This limitation is due to lack of proper funding, according to Ms. Simon.

CDP's approach is to score companies. They do not just collect the data, but try to help companies understand the risks associated with water in an effort to bring the issues to the forefront of their business practices. Ms. Simon stated that water is a local issue and involves stewardship at the local river basin level.

CDP's questionnaire tries to understand how the surveyed companies are thinking about water and how they conduct their risk assessments. Some company business analysts do not see the importance of the qualitative portions of the questionnaire. However, these sections are where CDP finds more interesting information, given that quantitative sustainability standards do not currently exist.

CDP's high-level conclusion from their recent survey was that water remains poorly understood by companies. Some of the brand value of water may be difficult to translate into business needs. Room for growth presents opportunities, however. Over the past year, there has been a tremendous acceleration of climate-related issues. In particular, the discussion about carbon expanded last year. CDP's tools will hopefully move the issues forward.

Ms. Simon concluded by explaining how attendees can benefit from CDP data. Investors can become signatories to access its data; membership grants access to the analytic platform. CDP also sells its data to groups that are not investors. Further, companies and individuals can support the water program as sponsors.

MORNING GUIDED SESSIONS

Mr. Scott Mosley of the Water Council welcomed the attendees to the conference and provided some remarks about the format of the day's meeting. In holding the meeting, the Water Council sought to bring investors together to have discussions, with the goal of "delivering the right type of money to the right type of company at the right time." Mr. Mosley then introduced the individuals who would act as conversation starters for the morning sessions. There were four sessions during the morning. Each is summarized below. Each session featured 2 – 3- small groups hosted by 2 – 3 conversation starters- subject matter experts who hosted and guided tables in a conversation around the given theme.

Session 1 - Opps for co-investment between infrastructure investors and technology investors *Clay Norrbom, MD, Global Infrastructure Asset Management*

Mr. Clay Norrbom began the discussion by explaining that his company invests in projects and companies that build and operate water projects at a smaller scale. He asked the group if they thought that in the water space, there is too much capital available for too few opportunities, or too many opportunities without enough available capital to fund them. One participant noted that there is more capital available now for water technologies than at any other point in history. However, investors would be more willing to fund entrepreneurs if water was a less risky investment. Another participant noted that, as evidenced by the large amount of exhibitors at WEFTEC, there are currently many start-up companies and entrepreneurs in the water space.

Mr. Norrbom asked if water relates to other areas of investment, and if it has any unique characteristics that make it suited for the development of "disruptive technologies". One participant noted that changes in this industry are massively incremental. Another participant commented that the water industry generally uses very old technology, so it is ripe for innovation. The group discussed developing areas in the water sector, including reuse, transforming wastewater to energy, and retrofitting water treatment facilities.

Clay Norrbom is a Managing Director at Global Infrastructure Asset Management, a hybrid asset manager, with offices in Chicago and Madison. Clay is a former Director in Citigroup's Global Banking Group.

The following three speakers were leading the other breakout groups, and unfortunately, there are no summaries of their discussions.

Jane Silfen is an associate at Encourage Capital. Encourage Capital is an asset management firm focused on profitable and strategic investments to solve critical social and environmental problems.

Debra Coy is a partner at XPV Capital. XPV is a leading venture capital firm focusing on water investments. XPV is based in Toronto, and Debra is based in the metro Washington, DC area.

Jim Gebhardt recently joined the US EPA to serve as the Senior Advisor on issues related to public and private finance for the municipal water sector. He will support EPA to stand up the new Water Infrastructure and Resiliency Finance Center.

Session 2 - Role of impact, institutional, and SRI investors in funding water technology companies

Camilla Seth, JPMorgan Chase Social Finance

Ms. Camilla Seth explained that at JPMorgan Chase Social Finance, there is a targeted group that focuses on transactions that deliver clear social and environmental benefits. In order to be viable, any socially responsible investment needs to achieve returns at least comparable to regular investments. Ms. Seth explained that JPMorgan has previously focused on impact-oriented international funds, but that they are currently looking at more domestic opportunities. In the landscape of investing, there are more traditional investors who value returns, and then there are investors who want to be involved because of the possibility of social impact. The area of water can be challenging for investors, Ms. Seth stated, because it is directly linked to government regulation. However, it is the policy that creates opportunities.

One participant asked Ms. Seth if an association of impact investors exists. Ms. Seth noted that in the last five years, there has been a focus on creating a field for impact investing. The Global Impact Investing Network creates a virtual table around which investors can gather and share information. Beyond the policy implications, it is important to make the nature of the capital fit the qualities of the entrepreneurs. Ms. Seth also explained that impact returns are difficult to measure. If a company is trying to address a negative externality, receiving returns on investment is a challenge. There are funders, however, that allow for a longer time horizon or provide different sources of capital across the supply chain.

Camilla Seth is the Executive Director of JPMorgan Chase's Office of Environmental Affairs. Previously, she was the Director of Programs and Operations at the Global Impact Investing Network.

The following three speakers were leading the other breakout groups, and unfortunately, there are no summaries of their discussions.

Craig Holland is the Director of Product Development at the Nature Conservancy's NatureVest Program. Craig's focus is on developing products for investment in Green Infrastructure – to provide solutions to storm water runoff, flooding and coastal inundation, and incentive changes in nutrient pollution.

Lynn Broaddus is the president of the Broadview Collaborative and a non-resident fellow at the Brookings Institution. Previously, she was director of environmental programming at the Johnson Foundation at Wingspread where she led the team that issued the "Charting New Waters: A Call to Action on US Freshwater Issues."

Dr. Kim Zeuli is the Senior Vice President and Director of Research at the Institute for Competitive Inner City (ICIC). Kim's research focus is, among other things, industrial clusters and creative financing mechanisms for funding small businesses.

Session 3 - Raising venture capital/corporate venture capital in the water space

John Philospholos, Great Oaks Venture Capital and William Robinson, Silicon Valley Bank

From the perspective of his venture capital firm, Mr. John Philospholos explained that early stage companies focus too much on the product and project. He broke down risk into three basic categories: market (does the product have a market?), product (does a company's technology do what they intend it to do?), and execution (can the company grow?). He explained that an early-stage investor is a value-added investor that can help with critical introductions to later-stage investors.

Mr. William Robinson explained that when looking at investment opportunities, Silicon Valley Bank assesses the value of a technology's intellectual property. Mr. Philospholos noted that the entrepreneur has to match the venture capital firm. There are web-based resources available to help understand which venture capital firms entrepreneurs should be targeting at any given time.

A participant asked if venture capital firms see value from firms that come out of incubators. Mr. Philospholos noted that incubators are good at helping companies get early-stage capital, but that they are not vested in long-term success. A model similar to incubators is the "vertical-specific model," where the incubators can assist entrepreneurs with the analysis of product-market fit. The Water Council has done a good job of building a network of early adopters.

Mr. Philospholos added that venture capital firms are much more likely to invest more money later on if they have a prior history with a company. Early-stage companies who network and build a sense of trust with venture capital firms before they need the actual capital are more likely to receive later funding. It is very important for start-up companies to cultivate relationships with venture capital firms.

John Philospholos is a partner at Great Oaks Venture Capital. Great Oaks is an early stage investor in digital technology companies and is based in New York City. John is based in Chicago.

William Robinson is a Vice President at Silicon Valley Bank. William is on the software team and is based in the Bank's Chicago office.

The following four speakers were leading the other breakout groups, and unfortunately, there are no summaries of their discussions.

John Grant is on the mergers, acquisitions, and alliances team at 3M where he has worked on a number of deals from straight acquisitions to minority investments in a wide range of companies.

Steve Kloos is a partner at True North Ventures. True North is an early stage investor focusing on industries such as energy, food, water, and waste. Prior to joining True North, Steve served as the Advanced Technologies Leader for GE Water and Process Technologies. Steve is based in Chicago.

Debra Coy is a partner at XPV Capital. XPV is a leading venture capital firm focusing on water investments. XPV is based in Toronto, and Debra is based in the metro Washington DC area.

Adam Rein is a Principal at MissionPoint Partners in Boston. MissionPoint is accelerating the transition to a low carbon economy by providing growth capital, knowledge, and a broad network of relationships to companies focused on the clean energy, energy efficiency, and environmental finance sectors.

Session 4 - Filling the pipeline: Accelerating commercialization of water technologies

- the view from incubators, tech transfer offices and national labs

Elizabeth Thelen, The BREW

Ms. Thelen started off the discussion by noting that a common problem for start-up companies is obtaining early-stage funding. This industry needs resources to help companies determine if there is a customer base for their products. One participant noted that the issue with venture capital firms is that they are exclusively revenue driven. There are not more venture capital firms in the water industry because the existing ones are not generating the same returns as firms in Silicon Valley.

In terms of alternative financing sources, many philanthropies are shifting their model from donation to strategic investing, which is creating a space for social impact entrepreneurship. Another participant noted that some investment firms help later-stage companies liaise with the government to remove barriers to product commercialization.

Elizabeth Thelen is the Director of Entrepreneurship and Talent at the Water Council. She runs The BREW – The Water Council’s Accelerator Program.

The following five speakers were leading the other breakout groups, and unfortunately, there are no summaries of their discussions.

Scott Bryan manages core programming and partnerships at Imagine H2O, a nonprofit organization that inspires and empowers people to turn water challenges into opportunities. Startups that participate in the Imagine H2O program collectively represent 1 in every 10 dollars of early stage financing in the water sector.

Dr. Peter Gallant is the President and CEO of Water Technology Acceleration Project (WaterTAP) Ontario. Prior to taking the helm of WaterTAP, Peter was the VP of Business Development and Regulatory Affairs at Veolia Water.

Ian Adams is the Director of Public Affairs at the Clean Energy Trust, providing management, strategy, and policy perspectives for Clean Energy Trust’s public advocacy and venture development programs. Ian’s prior work included roles at the Midwest Energy Efficiency Alliance and at the US Department of Energy (DOE). Previously, Ian held roles at the White House as well as President Obama’s first presidential campaign.

Richard Seline is the Executive Director of AccelerateH2O. He is providing counsel and boots-on-the-ground project management to the launch of Texas’ statewide water technology cluster initiative. He is focusing on existing and emerging technologies in desalination, reuse, conservation, and smart-water.

Dr. Barry Johnson is the Division Director, Industrial Innovation and Partnerships at the National Science Foundation. Prior to joining NSF in March, Barry was a Senior Associate Dean at the University of Virginia's School of Engineering and Applied Sciences.

LUNCH SHOWCASE

Environmental Protection Agency hosted Small Business Innovation Research awardee showcase

Panelists: Randal Mueller, Cadens (“Innovative Water Turbines”); Cy Herring, EP Purification, Inc. (“Low Cost, Efficient Microchannel Plasma Ozone Generator for Point of Use Water Treatment”); Deckard Sorenson, NBD Nanotechnologies, Inc. (“Surface Coatings for Enhanced Efficiency of Industrial Condensers”); and James Langer, Serionix Inc (“Ion-Exchange Fiber Composites for Rapid and Selective Removal of Perchlorate from Water”)¹

Introduction: Paul Shapiro, Project Officer, SBIR Program, EPA

Mr. Paul Shapiro thanked WEF, the Water Council, and NSF for collaborating in this first SBIR event at WEFTEC. He noted this was also the first participation by NSF. Mr. Shapiro asked the water cluster leaders in the audience to stand and introduce themselves.

Mr. Shapiro explained that the government-wide SBIR program, coordinated by the Small Business Administration, is intended to create productive jobs, stimulate technological innovation, commercialize Federally-funded R&D, solve mission agency problems, and increase the number of women- and minority-owned technology companies. Approximately 3% of the 11 participating agency extramural R&D budgets results in roughly \$2.5 billion in SBIR funds being available each year. The programs have a Phase I for proof of concept and a Phase II (with more money and time) that goes from R&D to market entry. Often additional funds are provided to match outside investment. Commercialization milestones include: developing a commercialization plan, demonstrations, customer/partner involvement, outside investment, and income from sales. He noted that SBIR programs do not take an equity stake in the companies.

Mr. Shapiro explained that the presenters (funded by EPA, NSF, and DOE) would make a short “pitch,” including asking for the types of assistance they need. There were both slide presentations and a handout with a one-page version of each company’s pitch (see Appendix C). He said the success of the SBIR companies should encourage entrepreneurs in the audience and asked investors and potential customers to help meet the needs of the presenters.

Randal Mueller, Cadens: “Innovative Water Turbines” (DOE)

Mr. Randal Mueller explained that Cadens, out of Sullivan, WI, received a DOE Phase I Award for their wind turbine technology. The turbine works as a small capacity hydropower unit that can be installed during core infrastructure upgrades on rivers and dams. These upgrades are needed to replace the nation’s aging infrastructure. The product is unique because it is efficient and site-specific, according to Mr.

¹ Two SBIR-Funded companies: Aspen Products Group, Inc. and Nutrient Recovery & Upcycling LLC were not present for the showcase presentations.

Mueller. Overall, Cadens is interested in solutions that link converging technologies. The company's needs include a Board of Directors and first round of funding within the next 12-18 months.

Cy Herring, EP Purification, Inc: "Low Cost, Efficient Microchannel Plasma Ozone Generator for Point of Use Water Treatment" (EPA)

Mr. Cy Herring explained that EP Purification, out of Champaign, Illinois, creates low cost ozone generators to address the growing global need for water purification technologies. Their generators employ microchannel plasma arrays, fabricated by a patented, cost-effective process out of processed aluminum sheet. The generators can produce ozone with high efficiency and at concentrations suitable for water treatment. Mr. Herring explained that their technology is unique because it is low-cost and easily mass producible. In terms of needs, the company is looking to raise roughly \$2 million in the next year to expand their operation.

Deckard Sorenson, NBD Nanotechnologies, Inc.: "Surface Coatings for Enhanced Efficiency of Industrial Condensers" (NSF)

Mr. Deckard Sorenson described NBD Nanotechnologies' surface coating technology. Their pipe coating addresses water and energy inefficiencies in fossil fuel plants by improving the performance of condenser heat transfer rate. This improvement saves plant's energy costs and decreases carbon dioxide emissions. According to Mr. Sorenson, NBD Nanotechnologies is currently piloting their pipe coating at a live power plant. The company is seeking corporate partners for pilot testing and strategic partnership to help accelerate their growth.

James Langer, Serionix Inc: "Ion-Exchange Fiber Composites for Rapid and Selective Removal of Perchlorate from Water" (NSF)

Mr. James Langer of Serionix, Inc. explained that their technology seeks to minimize airborne chemicals such as sulfur dioxide and ammonia, which cause odor and corrode sensitive equipment in both industrial and home environments. Their coating technology may be applied to conventional filtration media. The product is unique because the coating changes color when it expires. Serionix, Inc. is interested in connecting with new customers to evaluate their products and share their needs and experiences with odor control.

Closing: Dr. Barry Johnson, Division Director, Division of Industrial Innovation and Partnerships, Directorate of Engineering, NSF

Dr. Barry Johnson of NSF explained that his division includes programs which create government-industry-university connections designed to increase innovative technology development and commercialization. In addition to the SBIR program, for example, there is the Innovation Corps (ICorps) program that helps create better technology managers by teaming university-based potential entrepreneurs with experienced mentors. About 600 teams have so far been created. Other Federal agencies have created similar programs. He said one priority for NSF now is to address the complex problems at the intersection of food, energy, and water. He thanked the panelists for participating in this session.

AFTERNOON BREAKOUT SESSION

Angel Investing in Water

Susan Preston, The Angel Resource Institute

Ms. Susan Preston first discussed the steps of the entrepreneurial financing lifecycle. The process for financing a young company can be quite convoluted. Potential funding sources include: founder, friends and family, government grants, crowdfunding, angels, angel groups, seed funds, venture funds, institutional equity, and loans/bonds. A company does not necessarily advance linearly through these funding sources; company growth paths can be unique.

Angel investors begin investing at the point of strong capital consumption. These types of investors do not expect profitability, but look for young companies who map out milestones and develop a business plan with the goal of achieving profitability. Ms. Preston urged angel investors not to invest in a company just for a single funding round; the company should have an idea of their overall funding needs for profitability. The average angel investment for a seed-stage company is roughly \$3 million.

Ms. Preston then discussed the characteristics of a high-quality angel investment. Ideal fundable companies have high profit growth potential, broad-based technology with good protection and competitive advantage, a well-defined exit strategy, solid team and growth strategy, and an innovative product in a large market. Ideal investments solve a current “market pain” or strong need. A potential angel investment technology should also be priced competitively with standard technologies.

Ms. Preston then discussed angel investing specifically in terms of the water sector. She explained that the shrinking global water supply and contamination of water highlight the existing space for water technology development that will only grow larger with time. The global water industry is valued at more than \$500 billion and is anticipated to double by 2030. The primary factor that will drive market adoption of water technologies in the United States is economics, followed by regulations and social responsibility. When angel investors are seeking out the “market pain”, Ms. Preston recommended they should focus on technologies in water infrastructure, measuring, monitoring and verification, irrigation and crop science, water treatment and filtration, and desalination.

Angel investors have to address problems that are pressing and imminent, unless they have the ability to allow their funding to sit and percolate with a company until the market stress becomes larger. Examples of these longer term investments include coastal septic systems technologies in the United States, and sanitation and drought resistance technologies in developing countries.

Challenges to investing in water technologies include a lack of clear mandates, publicly available data, and broad public awareness of risk, among others. Overall, Ms. Preston explained, water is simply not yet at crisis level in the United States, and technologies will not advance unless a market pain arises, or stricter regulations are enforced.

How to Vet a Water Deal

Panelists: Susan Preston, The Angel Resource Institute; Sunit Mohindroo, WartHub; Marian Singer, WellIntel; Jose Ramirez, Mikoflot; and Steven Kloos, True North Ventures

Ms. Preston started the session by thanking the entrepreneurs and venture capital representative for attending and offering their thoughts. She then asked the panelists for a brief background of their technology or company.

Mr. Steven Kloos is a partner at True North Ventures, a firm that features both a venture fund and a growth equity fund in an attempt to make long-term investments. Mr. Sunit Mohindroo explained that his company's focus is delivering data that is pertinent to water technology vendors and utilities to the forefront of the energy and retail space. The data can help determine where investments should occur in industry and municipalities. Ms. Marian Singer's company, WellIntel, developed a monitoring device that attaches to the top of home wells and provides groundwater level information to those who are at risk. Mr. Jose Ramirez and Mikoflot have pioneered a simplified onsite wastewater treatment for industrial plants that are smaller in size.

Ms. Preston asked Mr. Kloos what attributes his company values in a potential investment opportunity. Mr. Kloos explained that a good innovation is unique and has a large value proposition. Additionally, the technology should be in a large, mainstream market. His firm conducts ample research before investing because they invest large amounts.

The panelists discussed their process for identifying a "market pain." Mr. Mohindroo explained that he and his colleagues came from software backgrounds and identified opportunities in the environmental sector. They conducted market research with individuals who research and write about water to understand what kinds of data gaps existed. Ms. Singer explained that her company also conducted market research around market needs. Mr. Ramirez and his colleagues focused on how they could offer additional cleaning technologies in the industrial market space.

Ms. Preston then asked what resources and support entrepreneurs typically appreciate having from angel investors. Ms. Singer appreciates when angel investors ask questions. Mr. Ramirez highlighted the importance of having an angel investor who understands the technology as well as the innovator so there is some level of common understanding.

An audience member asked the panelists what their biggest challenges in the sector have been. Mr. Mohindroo explained that finding capital has been challenging because his company straddles the technology and water sectors. They had difficulties determining how they should best market themselves to potential investors. Mr. Ramirez explained that for an entrepreneur, the moment that one realizes their technology is not quite right is challenging. However, this experience can be very valuable, especially if it occurs in the beginning stages of a company. Ms. Singer stated that the transition between the angel and venture capital investing stages was challenging.

In terms of recommendations to other entrepreneurs, Mr. Ramirez noted that it is critical to have an established network of potential individuals who can fund one's venture. The ability to be agile in business decisions is very critical as well. Finally, Ms. Singer highlighted the importance of being introduced to potential investors.

APPENDIX A: LIST OF ATTENDEES

First Name	Last Name	Company
Ian	Adams	Clean Energy Trust
Cristina	Ahmadpour	Isle Utilities
Michael	Anness	Alcoa, Inc
Ahmed	Badruddin	WatrHub Inc.
Britt	Barclay	Cronus Partners LLC
John	Bialk	Quietyme Inc
Len	Bland	Nano Gas Technologies
Lynn	Broaddus	Broadview Collaborative
Scott	Bryan	Imagine H2O
Justin	Bzdek	Symbios Technologies, Inc.
Jean-Loïc	Carré	Business France, French Trade Commission
Michael	Casali	Inventure Capital
Kaitlin	Cheramy	Nelson Schmidt
Francoise	CLERC	Invest Sud de France
Charlie	Corrigan	JPMorgan Chase
Clarisse	Croteau-Chonka	Xomix
Dick	Davie	Pro-Equipment, Inc.
Tony	Dellmier	Microbe Dectectives
Nicole	Desantis	NEWIN
Bill	Dougan	University of Wisconsin-Whitewater
Mary	Eggert	Global Impart Fund
Julius	Enriquez	USEPA
Clement	Erbmann	First Analysis
GREG	ERICKSON	General Graphene
Scott	Fieldler	Nano Gas Technologies
Ross	Ford	University of Chicago
Kerry	Freek	WaterTAP
Dr. Peter	Gallant	WaterTAP
Tanya	Garza	Chromation Partners, LLC
Jim	Gebhardt	U.S. Environmental Protection Agency
Elizabeth	Geib	Wisconsin Economic Development Corporation
Dan	Gieschen	Cadens, LLC
Gene	Goddard	GREATER MSP
Karen	Golmer	New England Water Innovation Network
Jay	Gorman	Raymond James
John	Grant	3M
Jon	Grant	WaterTAP
Jeff	Guild	BlueTech Research

First Name	Last Name	Company
Jeff	Harden	Nano Gas Technologies
Barbara	Harman	International Water Company
Mike	Harris	Lindsay Corporation
Tyler	Hawley	HKS Holdings
Xuan	He	Neptune Diagnostics
Cy	Herring	EP Purification
Lesley	Herstein	WaterTAP
Robbie	Hillis	The Ark Labs
Craig	Holland	THE NATURE CONSERVANCY
Erik	Hromadka	Global Water Technologies
Douglas	Hwang	Pro-Equipment, Inc.
Jake	Hwang	Pro-Equipment, Inc.
Prune	Jakob	Business France, French Trade Commission
Shajan	John	Mahattil International LLC
Barry	Johnson	National Science Foundation
Michael	Jones	Safe H2O Inc.
Yvan	Kedaj	Sud De France Development - SWELIA
Gary	Keller	Xomix
Joe	Klein	HKS Holdings
Steven	Kloos	True North Venture Partners
Melinda	Kruyer	Confluence
James	Langer	Serionix
Oliver	Lawal	Aquiseuse
JEAN-MARC	L'HUILLIER	HELIOPUR TECHNOLOGIES
Barry	Liner	WEF
David	Linz	Center for Technology Commercialization
Jamie	Loucks	Hydro Venture Partners
Brenda	Lucas	Southern Ontario Water Consortium
Manesh	Lunani	Aquasight, LLC
Ben	McConahey	Hydro Venture Partners
Grasshopper	Mendoza	Louisiana Water Network
Egils	Milbergs	Center for Accelerating Innovation
Sunit	Mohindroo	WatrHub Inc.
Dan	Morrow	Safe H2O Inc.
Molly	Morse	Mango Materials
Randal	Mueller	Cadens, LLC
Selman	Mujovic	University of Michigan
Steve	Mustard	National Automation, Inc.
Johne	Neate	Strategies for Change
Scott	Newquist	Aquaback Technologies, Inc.

First Name	Last Name	Company
Clay	Norrbom	Global Infrastructure Asset Management LLC
STEVE	PICOU	Louisiana Water Network
Susan	Preston	Angel Resource Institute
Chuck	Probst	Symphonic Water Solutions, Inc
Tom	Probst	Symphonic Water Solutions, Inc
Marcus	Quigley	Opti
Jose	Ramirez	Mikroflot Technologies
Augusta	Ramirez	Vitenia (Mexico)
Clifford	Ransom	Ransom Research Inc
Adam	Rein	MissionPoint Partners
Mark	Rhoda	WEF
Harrison	Richarz	Iconac
William	Robinson	Silicon Valley Bank
Ann	Rosen	Canadian Consulate General
Sheldon	Rosenfold	Creative Capital
Mark	Roth	Lindsay Corporation
Dave	Russell	PICA Corp.
Noah	Sabich	Cimbria Capital
Thomas	Schuman	Thomas Schuman, LLC
Richard	Seline	AccelerateH2O
Camilla	Seth	JPMorgan Chase
Paul	Shapiro	EPA
Jane	Silfen	Encourage Capital
Matthew	Silver	Cambrian Innovation Inc
Cynthia	Simon	CDP
Marian	Singer	WellIntel
Laurent	Sohier	Helio Pur Technologies
Deckard	Sorensen	NBD Nanotechnologies, Inc.
Robert	Sterner	Magneli Materials, LLC
Kyle	Strigenz	HKS Holdings
Maggie	Theroux	US EPA/ORD
Michael	Thorson	Inventure Capital
John	Tillotson	Water Tech Entrepreneur
Mike	Turillo	Inno360
ADAM	Twarog	EXPORT DEVELOPMENT CANADA
Tuukka	Välimaa	Iconac
Amir	Varshovi	GreenTechnologies LLC
Jutta	Vondirke	Cerahelix Inc
Rachel	Wang	University of Chicago Booth School of Business
Franklin	Woodland	International Water Technologies Corporation

First Name	Last Name	Company
Hans	Wouters	Brightwork BV
Wade	Yankee	International Water Company
Kim	Zeuli	Initiative for a Competitive Inner City
Elias	Zewde	Khafra Engineering
Xiaoshu	Zhang	UCI
Andrew	Ziolkowski	Cultivian Ventures
Jeremy	Adelman	Energy Foundry
Olivier	Bodson	Solvay
Sean	Brady	Brady Risk Environmental
Debra	Coy	XPV Capital
Mark	Fokema	Aspen Products Group, Inc.
Jim	Hart	Cerahelix Inc
Robert	Okabe	Angel Resource Institute
John	Philosopholis	Great Oaks Venture Capital
Anne	Schauer-Gimenez	Mango Materials
Marian	Singer	WellIntel

APPENDIX B: MEETING SCHEDULE

2015 Water Venture Investment Conference @ WEFTEC

Tuesday Sept 29, 2015

Opening Reception & NSF/EPA SBIR Poster Session

7.00 – 8.30 Opening reception & National Science Foundation (NSF) & Environmental Protection Agency SBIR awardee poster session

JPMorgan Chase & Co - 21 South Clark Street, 57th Floor, Chicago, IL

Wednesday Sept 30, 2015

McCormick Place Convention Center - South Building Level 1 - Room S103 -2301 S Prairie Ave - Chicago, IL 60616

Breakfast

8.00 – 8.30 Breakfast

Welcome

8.30 – 8.35 Dean Amhaus, President & CEO, The Water Council

Morning Kick-off Keynote

8.35 – 9.00

“Using the CDP Water Report and dataset to discover opportunities in to invest in water technology”.

- Cynthia Simon, Senior Manager Investor Initiatives, CDP

Morning Guided Sessions

9.00 – 9.45

“Opportunities for co-investment between infrastructure investors and technology investors”

- Clay Norrbom, MD - Global Infrastructure Asset Management
- Jane Silfen – Encourage Capital
- Debra Coy – XPV Capital
- Jim Gebhardt, US EPA Office of Water Infrastructure and Resiliency Finance Center

9.45 – 10.30

“The role of impact investors in funding water technology companies”

- Craig Holland, NatureVest
- Lynn Broaddus – Broadview Advisors
- Kim Zeuli – Institute for Competitive Inner City (ICIC)
- Camilla Seth - JPMC Social Finance

10.30 - 10.45 BREAK

10.45 – 11.30

“Raising venture capital/corporate venture capital in the water space”

- John Philospholos – Great Oaks Venture Capital
- John Grant – 3M
- Steve Kloos – True North Ventures
- Debra Coy – XPV Capital
- Adam Rein – Mission Point Partners
- William Robinson – Silicon Valley Bank

11.30 – 12.15

“Filing the pipeline: Accelerating the commercialization of water technologies – the view from incubators, tech transfer offices and national labs”

- Elizabeth Thelen, The BREW
- Scott Bryan – Imagine H2O
- Peter Gallant – WaterTap Ontario
- Ian Adams – Clean Energy Trust
- Richard Seline – AccelerateH2O
- Barry Johnson – NSF

Lunch Showcase

12.15 - 1.00 – EPA hosted SBIR awardee showcase

Afternoon Breakout Sessions

1.30 – 5.00

For Investors - “How to vet a water investment for angels and investors new to the water space.”

- Susan Preston, The Angel Resource Institute
- Sunit Mohindroo – WartHub
- Marian Singer – WellIntel
- Jose Ramirez – Mikroflot

- Steven Kloos – True North Venture Capital

For Companies – “How to pitch you water technology company to an investor”

- Bob Okabe, The Angel Resource Institute
- Marcus Quigley – Opti
- Adam Rein – Mission Point Partners

- Jeremy Adleman – Energy Foundry

Afternoon Matchmaking Sessions

1.30 – 4.00

- Session A – 1.30 – 2.00
- Session B – 2.00 – 2.30
- Session C – 2.30 – 3.00
- Session D – 3.00 – 3.30
- Session E – 3.30 – 4.00

NSF and EPA Sponsored SBIR Awardees

Company 1 - Absorbent Materials Company LLC – “Development of Activated Swelling Organosilica-Metal Composites Filter Media in Bioretention Systems for Enhanced Remediation of Stormwater Runoff - Wooster, OH – NSF

Company 2 - Aspen Products Group, Inc - “High Flux Nanofiltration Membrane for Emerging Contaminant Control”- Marlborough, MA - EPA

Company 3 - Cadens - “Innovative Water Turbines” – Sullivan, WI – DOE

Company 4 - Cambrian Innovation Inc – “A low-cost real-time bioelectrochemical nitrate sensor for surface water monitoring” – Boston, MA – NSF

Company 5 - Chromation Partners, LLC – “A Photonic Crystal Based Spectrometer for Manufacturing Process Control” – New York, NY – SNF

Company 6 - EP Purification, Inc. - “Low Cost, Efficient Microchannel Plasma Ozone Generator for Point of Use Water Treatment” - Champaign, IL - EPA

Company 7 - Flodesign Sonics Inc – “A novel economic, efficient, environmentally benign, and sustainable multi-component separation technology based on acoustophoresis” – Wilbraham, MA - NSF

Company 8 - Mango Materials – “A Novel Biodegradable Biopolymer from Waste Methane Gas” - Berkeley, CA - NSF

Company 9 - NBD Nanotechnologies, Inc. “Surface Coatings for Enhanced Efficiency of Industrial Condensers” - Danvers, MA – NSF

Company 10 - Neptune Diagnostics – “Early detection of Bulking and Foaming in Wastewater Treatment using Polymerase Chain Reaction (PCR) diagnostics” – Irvine, CA - NSF

Company 11 - Nutrient Recovery & Upcycling LLC- “Phosphate Fertilizer Recovery from Anaerobic Acid Digesters in Sewage Treatment Plants” – Madison, WI – USDA

Company 12 - Serionix Inc - “Ion-Exchange Fiber Composites for Rapid and Selective Removal of Perchlorate from Water” - Champaign, IL - NSF

Company 13 - SupraSensor Technologies, LLC – “Development and Commercialization of Nitrate-Selective Sensors for Precision Agriculture” – Eugene, OR – NSF

Company 14 - Symbios Technologies, Inc. – “Advancing a Novel Low-voltage Electric Arc Method to Oxidize Organic Material in Contaminated Water” – Fort Collins, CO – NSF

Company 15 - TAG Optics, Inc – “Early detection of Bulking and Foaming in Wastewater Treatment using Polymerase Chain Reaction (PCR) diagnostics” – Princeton, NJ – NSF

Potential Discussion Questions

Session #1

“Opportunities for co-investment between infrastructure investors and technology investors”

1. Do opportunities exist for infrastructure and technology investors to co-invest?
2. What sectors offer the most interesting opportunities for co-investment? Wastewater management? Stormwater? Digesters?
3. What do return profiles need to look like to make a co-investment opportunity attractive? Time horizon?
4. What models from other industries (i.e. oil and gas) might make sense in water?
5. What role do public regulatory/rate setting agencies play? A source of deal flow?
6. How can technology companies partner work with infrastructure companies and infrastructure investors?

Potential Discussion Questions

Session #2

“The role of impact investors in funding water technology companies”

1. What constitutes an impact investor?
2. How do entrepreneurs identify an impact investor?
3. Do impact investors have a role in funding water technology companies?
4. How do foundations with water focused programming fund technology?
5. Is non-dilutive capital (grant) available to fund water technology?
6. What innovative financial models are changing how companies receive funding?
7. What role does transaction size play for impact investors?
8. Why is water the last of the “environmental asset classes” to gain traction?

Potential Discussion Questions
Session #3

“Raising venture capital/corporate venture capital in the water space”

1. Why water?
2. What tangential sectors can come into the water space?
3. What are the hurdles in bringing water technology to market?
4. What size deals are happening?
5. How far advanced does a company need to be to approach VC? A strategic?

Potential Discussion Questions
Session #4

“Filing the pipeline: Accelerating the commercialization of water technologies – the view from incubators, tech transfer offices and national labs”

1. What are key technology focus areas?
2. What sector has the most activity?
3. What funding opportunities exist via accelerators?
4. How is the SBIR program a pathway to commercialization?
5. Are accelerators partnering with VC firms
6. Opportunities for capital introductions?
7. Opportunities for demonstration sites?
8. Are accelerators partnering with impact investors?



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APPENDIX C: LUNCH SHOWCASE HANDOUTS

Lunch-Time Presentations

On
Innovative Water Technologies
Funded by the Federal
Small Business Innovation Research (SBIR) Program

I. Introduction

Paul Shapiro
Project Officer
SBIR Program
Environmental Protection Agency

II. Presentations by 6 SBIR-Funded Companies

III. Conclusion

Dr. Barry Johnson
Division Director
Division of Industrial Innovation and Partnerships
Directorate of Engineering
National Science Foundation



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LUNCH-TIME PRESENTATIONS

BY

SMALL BUSINESS INNOVATION RESEARCH (SBIR)-FUNDED COMPANIES

- 1. “High Flux Nanofiltration Membrane for Emerging Contaminant Control”**
Aspen Products Group, Inc. (EPA)
Marlborough, MA
Mark Fokema (fokema@aspensystems.com)
- 2. “Innovative Water Turbines”**
Cadens, LLC (DOE)
Sullivan, WI
Randal Mueller (randal.mueller@cadensllc.com)
- 3. “Low Cost, Efficient Microchannel Plasma Ozone Generator for Point of Use Water Treatment”**
EP Purification, Inc. (EPA)
Champaign, IL
Cy Herring (cy.herring@ep-pure.com)
- 4. “Surface Coatings for Enhanced Efficiency of Industrial Condensers”**
NBD Nanotechnologies, Inc. (NSF)
Danvers, MA
Deckard Sorenson (deckard@nbdnano.com)
- 5. “Phosphate Fertilizer Recovery from Anaerobic Acid Digesters in Sewage Treatment Plants”**
Nutrient Recovery & Upcycling LLC (USDA)
Madison, WI
Menachem Tabanpour (mtabanpour@nrutech.com)
- 6. “Ion-Exchange Fiber Composites for Rapid and Selective Removal of Perchlorate from Water”**
Sirionix Inc. (NSF)
Champaign, IL
James Langer (jlanger@serionix.com)



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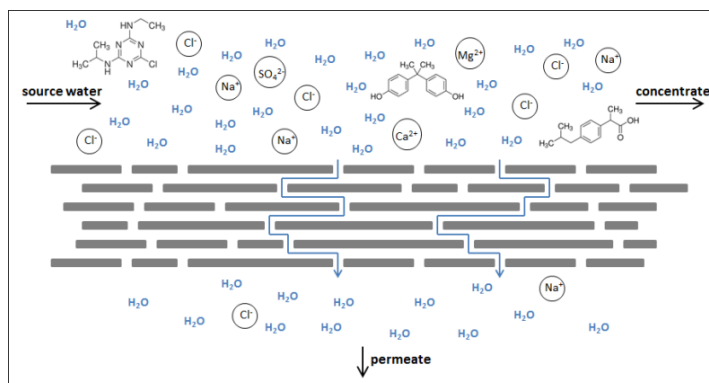


“High Flux Nanofiltration Membrane for Emerging Contaminant Control”

Aspen Products Group, Inc. (EPA)
Marlborough, MA
Mark Fokema (fokema@aspensystems.com)

Problem: A variety of pharmaceuticals, antibiotics, steroids/hormones, flame retardants, perfluorinated compounds, personal care products, and herbicides/pesticides are being found at increasing frequency in the Nation’s natural and drinking water supplies. Existing approaches to producing drinking water from ground and surface sources either do not adequately remove these “emerging contaminants” or are too expensive for widespread application.

Market Size: The global market for membrane-based water treatment technologies is ~\$14 billion. Although nanofiltration accounts for a relatively small part of the overall membrane market (\$0.4 billion), the nanofiltration market is growing at a CAGR in excess of 15% due to rising demand for potable water, reduced freshwater sources, environmental restrictions on industrial and municipal wastewater discharges, and increased demand for water reuse.



Innovation: A higher permeability, fouling-resistant, nanofiltration membrane that rejects emerging contaminants while simultaneously addressing conventional drinking water treatment requirements is being developed. The membrane utilizes a unique two-dimensional structure that is highly permeable to water, but rejects organics and salts. At a water permeability of five to ten times that of traditional membranes, the cost to produce drinking water can be reduced by 14 to 33% relative to existing nanofiltration systems.

Team: Management team with over fifty years startup experience. Over \$100 million in venture capital raised in previous ventures.

Milestones: Membrane media development to be completed in Q3 2016 with medium-scale membrane element demonstrations conducted in Q2 2017. Large-scale membrane element



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manufacturing capacity and demonstrations will be conducted in 2018, with initial product sales realized in 2019.

Needs: Seeking membrane manufacturing and evaluation partners with membrane technology in-licensing interest.



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“Innovative Small, Low-Head Hydropower Turbines”

Cadens LLC (DOE)
Sullivan, WI
Randal Mueller (randal.mueller@cadensllc.com)

Problem: Over 70% of dams in the US will be 50 years or older by 2020, providing a unique opportunity to affordably install small capacity hydropower units during core infrastructure upgrades on rivers and streams.

Market Size: There are 4 GW of renewable energy consisting of >49,000 non-powered, low-head dams in US rivers and streams that are identified by the DOE as being suitable for hydropower. This free, clean energy has yet to be tapped because smaller hydro systems have been too expensive. The value proposition is to give end users an opportunity to leverage existing dams or water flows to generate revenue or cost savings. In isolated systems, for example, local power generation is more cost effective than connecting to a distant grid.

Innovation: Cadens and University of Wisconsin-Milwaukee (UWM) are linking computational fluid dynamics (CFD), Cadens’ turbine design software, and 3D printing. This will enable optimizing the design for each location to create a lightweight, site-specific water turbine. To achieve this Cadens was recently awarded a DOE Phase I STTR grant and has participated in the BREW and WERC Bench accelerator programs.

Team:

Ryoichi Amano (UWM), our PI, is a world-renowned CFD expert.
Bruno Lequesne, our Project manager, is an IEEE Nikola Tesla Award Recipient
Neil Matthes, Duck Creek Engineering, Inc., works on energy distribution systems
Alden Research Laboratory, Inc., is the oldest flow lab in the U.S.
Randal Mueller, Dan Gieschen, and Joseph Millevolte are Cadens co-founders

Milestones:

- Fall 2015 – DOE Phase I field level demonstration in Sullivan, WI
- DOE Phase 2 – third-party pilot project
- Revenue from sales and power generation contracts

Needs:

- Board of Directors
- First round of funding within the next 12-18 months



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“Low Cost, Efficient Microchannel Plasma Ozone Generator for Point of Use Water Treatment”

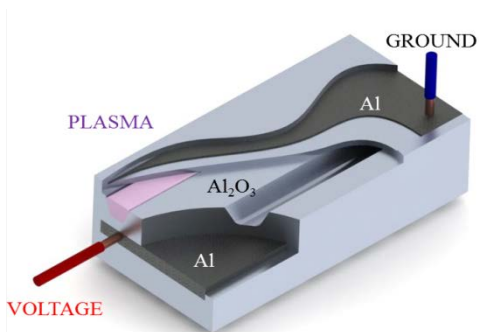
EP Purification, Inc.

Champaign, Illinois 61820

Cy Herring (cy.herring@ep-pure.com)

Problem: The purification of water is of increasing importance to the U.S. and the world. Interest in new approaches to more efficiently purify water is driven by: (1) the appearance of previously unobserved contaminants in municipal water systems, and (2) the long-term environmental effects associated with chlorination.

Market Size: The worldwide water and wastewater treatment industry is expected to sell products totaling ~\$100B by 2019, with a CAGR of > 10% between now and then. We plan to initially target several applications and then move into larger-scale water treatment systems. The initial applications include cooling tower water treatment, ozone laundry treatment, industrial air odor treatment, food processing and storage applications, and potable water treatment.



Innovation: Microchannel plasma arrays, fabricated by a patented, cost-effective process out of processed aluminum sheet are capable of producing ozone with high efficiency and at concentrations suitable for water treatment. Data obtained over the EPA Phase I and II program demonstrate that reactors at least as efficient as those in service today, and yet having a volume < 20% of that of existing technology, will be realized. Furthermore, accelerated aging tests confirm that reactor lifetimes of more than 10,000 hours can be expected.

Team: **Prof. Gary Eden**, member of National Academy of Engineers and world expert on microcavity discharge phenomena, has over 35 years' experience in plasma physics.

Dr. Sung-Jin Park, co-inventor of microcavity plasma technology and its applications.

Dr. Jin Hoon Cho, PI, has 10 years' experience on plasma chemistry.

Dr. Cy Herring, entered the startup community in 1998 and has worked with plasma discharge technologies since 1990. His expertise is on product development and engineering.

Milestones: EPP has obtained an exclusive license with the University of Illinois for the microdischarge technology in use with air, water and wastewater treatment applications. Customer feedback over the past year on desired product features has resulted in the development of 4 models of ozone generators which are currently in limited production. Products are being tested or used in 10 countries.



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Needs: EPI is raising capital for the build-out of a production facility including some personnel and equipment cost. EPP has opened a Series A investment opportunity to raise \$1.6M to \$2.5M over the next 18 months. We have teamed with one investor for \$700k.



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“Surface Coatings for Enhanced Efficiency of Industrial Condensers”

NBD Nanotechnologies, Inc. (NSF)
Danvers, MA
Deckard Sorenson (deckard@nbdnano.com)

Problem: Most fossil fuel plants use water as their working fluid. They heat it to steam in their boiler, run the steam through a turbine to generate power, condense the steam into liquid water, and send the water back to the boiler for reuse. If the condenser performs poorly (with a low heat transfer rate), then the turbines will extract below normal amounts of energy from the steam. This leads to more costly power and higher CO₂ emissions.

Market Size: Improving condenser performance should have wide applicability. A case study forecasting a 300-MW coal fired plant with NBD’s technology shows potential fuel cost savings of approximately \$200,000/year, assuming 50% improvement in the condenser cleanliness factor.

Innovation: Steam that condenses on the cooling pipes in a condenser usually creates a layer of water that acts like an insulator. NBD has developed a coating that, when applied to the steam side of the pipes, repels the water from the pipe and forces it to fall off as small droplets. This “dropwise” condensation greatly improves the heat transfer rate. Applying the coating to a coal fueled plant will improve its efficiency by about 0.4%, leading to about \$160,000 in annual fuel savings for a 440MW plant. The coating also enables additional production of about \$1 million of electrical power per Gigawatt of plant output.

Team: NBD has exclusive use of the patents to the coating material developed by its Principal Scientist, Dr. Bong June Zhang. Additionally, NBD is developing additional coatings in house with exclusive ownership with the help of its senior chemical research team, and Chief Business Development Officer Jonathan Rosen, who has developed several successful biotechnology startup companies.

Milestones: Pilot test planned for the Spring of 2016 and full-scale test at an operating power plant by Spring of 2017. NBD will move to production and income soon after the conclusion of successful pilot testing.

Need: NBD was incorporated in May 2012 and has since raised just over \$6.5MM in financing and won over \$1.9MM in grants. NBD is seeking corporate partners for pilot tests and strategic partnership to help accelerate the growth of this emerging leader in Cleantech.



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“Phosphate Fertilizer Recovery from Anaerobic Acid Digesters in Sewage Treatment Plants”

Nutrient Recovery & Upcycling LLC (USDA).
Madison, WI
Menachem Tabanpour (mtabanpour@nrutech.com)

Problem: Removal of phosphorous from wastewater treatment streams reduces the size and cost of equipment, while producing a useful product.

Market Size: There are two markets. Technology sales: process equipment to precipitate a phosphorous mineral called brushite at the location of highest concentration. Fertilizer sales: competitively priced brushite fertilizer for farmers.

Innovation: The patented technology captures 65% of the total phosphorus entering a facility, is two-thirds smaller than competing technologies, produces high-grade fertilizer, and has a 3-7 year payoff depending on facility size. It

Team:

Company: Menachem Tabanpour, President; Phillip Barak, PhD, Science Director; Mauricio Avila, PhD, Technical Director; Nimi Ehr, Commercialization Manager; Tyler Anderson, Technical Manager

Advisors & Consultants: Strategic Frontiers (sales & marketing), Reinhart Law (legal), Broadview Collaborative (water industry & regulations), Hazen & Sawyer (technology validation)

Milestones:

- Test continuous operation at the Woodridge-Green Valley Wastewater Facility in DuPage County, IL
- Hire business and marketing talent
- Create a robust sales and marketing channel
- Continue R&D

Needs: NRU is preparing to accept investors in the last quarter of 2015. Our first round will seek \$500K - \$1M in funds.



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“Ion-Exchange Fiber Composites for Rapid and Selective Removal of Perchlorate from Water”

Serionix, Inc.
Champaign, IL
James Langer (jlanger@serionix.com)

Problem: Despite early traction in water purification, our customer development directed us into higher value-added applications centered on gas-phase chemical filtration. Airborne chemicals such as sulfur dioxide, trimethylamine, and ammonia are problematic on account of their odor, toxicity, and potential to disrupt sensitive industrial processes and damage electronic equipment.

Market Size: The current annual market for airborne chemical filtration is roughly \$750M.

Innovation: Our proprietary, patent-pending, polymer-based coatings may be applied to conventional filtration media, yielding a functional composite capable of removing odorous or toxic chemicals from the air. The composites are up to 5-10 times faster, more efficient, and at least half as expensive as conventional granular carbon-based sorbents, and also change color when they expire—such as at right (left before, right after use).



Team: **James Langer, PhD** — President; business development lead, 10+ years in separations, water and air purification, multiple award winner at the University of Illinois, raised \$2.4M in private and public funding for new technology commercialization.

James Economy, PhD — Vice President of R&D, Professor Emeritus of Materials Sciences & Eng. at the University of Illinois; National Academy of Engineering, 30+ years industrial R&D management experience at IBM and Carborundum; commercialization track record includes 6 currently marketed inventions.

Tim Hoerr — Principal of Serra Ventures; extensive track record with more than 30 tech start-ups, including major exits in a broad range of industries.

Milestones: We recently engaged in a joint development project with a major appliance manufacturer, and expect to enter into one or more additional JDAs with players in the industrial filtration space. Currently our production capability is roughly 40 kg/day, and we anticipate scaling up the process to accommodate purchase orders and/or commercial sales in Q2 of 2016. Additionally, we are evaluating a potential Series A round in Q1/Q2 of 2016.

Needs: We are interested in connecting with new customers to evaluate our products and share their needs and experiences with odor control and/or protection of equipment sensitive to corrosion.



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ADDITIONAL MATERIALS:

Presentations by Susan Preston, Paul Shapiro, and Cynthia Simon are available upon request. Please contact epawatertech@epa.gov for more information.