

## BlueTech Forum 2016 – 20:20 vision: key takeaways

This year's BlueTech Forum in San Francisco on 1st June brought together industry leaders, entrepreneurs, innovators, end-users and investors for a dynamic day of thought-provoking discussion and learning. There were three main sections: 1) innovation showcase company roundtables – water technology briefings where selected firms presented new developments and case studies; 2) roundtables where views were exchanged on specific technology issues such as nutrients and brine management; 3) thought-leadership panels where wider industry topics from corporate water risk to the future of decentralised water treatment were discussed. Here we present a brief round-up of the some of the main points raised and key takeaways.

### Innovation Showcase Company Roundtables

**Oasys** presented its forward osmosis technology for ZLD, the ClearFlo Membrane Brine Concentrator (MBC), which uses a patented draw solution based on ammonium bicarbonate. It is suited to industrial processes with high levels of salinity where high recovery of fresh water is desirable, such as power and oil & gas. The company has found the greatest traction for its technology in China, which has strict ZLD regulations, but noted that markets such as India, Korea and Taiwan also look promising. The firm's MBC offers 10-15% lower energy consumption vs conventional evaporators alone.

**Spiral Water** discussed its self-cleaning filter technology, primarily aimed at the industrial market, which includes a stainless steel cylindrical filter containing a spiral-shaped wiper, which continually cleans the filter element. Using a cleansing brush that is always spinning means that dirt does not build up, so the pressure differential as liquid passes through the filter is minimal, optimising energy consumption. The filter will currently separate down to the 15 micron level, but the company said it will soon have the capability to deal with particles as small as 5 microns. The filter was developed using a grant from the US government to filter algae for biofuel production, and thus is intended for applications with lower flow and high solids content for now – although it can also deal with pre-treated seawater.



Ashin Gulati, CEO of Spiral Water Technologies, which received the Innovation Award



This year's event took place in San Francisco

IT and data specialist **Apana** presented its cloud-based analytics and hardware system for water asset management. It can be retrofitted into any plumbing system to identify water wastage. Apana presented case studies with Costco and Fetzer Winery, and says it currently has revenues of \$1-2m and is seeking series A funding. The firm says its system makes sense for companies using at least 2,000 gallons of water a day, and is aimed at providing cost saving on water use. The company says its analytics can also be used to monitor and assess flood and water damage risk, and is targeting the insurance industry, as well as hoping it can help businesses reduce premiums.

Meanwhile **Fathom** showcased its back-office billing system for utilities, which the company says can reduce costs by as much as \$10 per bill. The company's software has an open architecture to enable collaboration within the secondary IoT marketplace, enabling third parties to build apps on top of a utility's data. The company tends to go to market via direct sales and by partnering with small meter OEMs.

**Opti** has developed a range of environmental monitoring equipment, including sensor data which integrates with weather prediction software to help manage storm water management systems. The 20-strong company is seeking series B funding and strategic partnerships.

**Organica** specializes in biotreatment at its wastewater treatment plants, which use biofilms in fixed media. The company is active in China, where it says 50% of its projects are retrofits of existing plants. The company's technology does not contain odour treatments upfront, but uses biofilters to trap foul air from screens, sludge beds and aerobic zones.

**NanoSpun** has over 20 patents of its microbial encapsulation technology, licensed out of the Technion Israel Institute of Technology. The first pilot installation has been running in Israel for the past 6 months. Compared to similar technologies developed by Microvi and Lentikats, the rate of mass transfer is greater because the fibrous structure has a larger surface area. The technology works on exothermic reactions.

**Xylem** presented its Oxelia technology, a combination of ozone treatment coupled with a biologically active filtration system used for the removal of trace organics and contaminants for water reuse applications. The company says it is an alternative to RO technology, and that built-in sensors reduce operational costs by around 30% by detecting non-organic contaminants present, in the water. The advantage of using ozone, meanwhile, is that it oxidizes hard to degrade COD so it is 'bio-available' at the biological treatment step downstream.

## Thought leadership panels



### Corporate Water Risk

Moderator: Sheeraz Daniel Haji, Managing Partner, zipdragon ventures

Panelists: Emilio Tenuta, Vice President of Sustainability, Ecolab; Alexis Morgan, Water Stewardship Specialist, WWF; Kirsten James, Senior Manager, California Policy and Partnerships.

Corporate water risk is deemed to fall into three categories; physical, regulatory, and reputational. Industries leading the way in concern over water risk include food & beverage, mining & extractives, textiles and paper & pulp. There appears to be a decoupling between revenue generated and water use – large sales volumes do not necessarily equal large amounts of water used.

It was felt that companies need to engage in water policy discussions collectively; collective engagement leads to increased business, and social capital is generated through advocacy. However, ultimately changes in policy will be driven by economics rather than pressure from consumers, so progressive policies on water will be driven by the “economic voice.”

Corporate water risk cannot be mitigated through improvements in water efficient alone. Industries must consider scaling solutions, and solving cluster problems on a landscape level. Companies have the money to do this, and indeed some firms are beginning to invest in “out-of-operation” areas, for example improvements to the watershed upstream from their facilities.

The panel felt that companies should think first about low hanging fruit, such as greywater reuse and adoption of smart water systems. Innovation will play a key role in shaping policies and implementing them. There is increasing interest in big data, the internet of things, and in using smart-real time monitoring to quantify water risk.



### **IoT, Big Data and Sensors**

Moderator: Helge Daebel, Investment Director, Venture Capital, Emerald Technology Ventures

Panellists: Ralph Exton, Chief Marketing Officer, GE Water; Shane Snyder, The University of Arizona; Trevor Hill, Chairman & CEO, FATHOM

The estimated \$1 trillion infrastructure deficit is not going to be spent, in the view of the panel; utilities will have to make do with current infrastructure for decades – and this will make the ability to monitor parameters such as pressure of paramount importance. We will also have to do more with what we already have: the WHO is set to release direct potable water reuse guidelines in July.

Process optimisation and biosensors will be significant trends. Use of big data will be key. Big data could drive smart water into uncharted territory – a hypothetical example would be to give major corporate water users such as Coca-Cola a large discount for concentrating their water use at night when demand is lower.

It was felt that to make this sector take off, more business cases and successful business models are needed around the use of sensors and big data. From an investor perspective, transitional solutions rather than a “big bang” step change would make the most sense.

### **Decentralized Treatment and Reuse**

Moderator: David Henderson, Managing Partner, XPV Water Partners

Panellists: Christine Martini, Director, Ultra Capital LLC; Robert Kennedy, President, Newterra; Dr Sandeep Sathyamoorthy, Process and Innovation Leader, Black & Veatch; Paula Kehoe, Director of Water Resources, San Francisco Public Utilities Commission (pictured below).

The discussion initially focused on San Francisco, which currently has the lowest water per capita water consumption in California at 44l/d. There are many private developers in San Francisco who want to install decentralised water treatment systems in new developments, and there are already 15 systems in place in the city. States such as New York, Minnesota, Hawaii are also currently installing decentralized systems.



From an engineering and design perspective, the drivers for adopting decentralized systems are: 1) to reduce operator involvement and to build intelligent systems and 2) the need to reduce operational uncertainties caused by aging infrastructure assets. The advantage of decentralized systems are that they are modular. Mobile units (typically used in remote mining and oil & gas sites) can be operated under DBO/BOT models.

Ultra Capital mentioned that in order to finance decentralized systems there has to be a cash flow advantage (i.e. greater volume of sales) compared to conventional systems. Ways of accelerating the adoption of decentralized systems were discussed. One suggested route would be to reduce permit processing times (it takes approximately 5-6 years to receive a regulatory permit in most states).