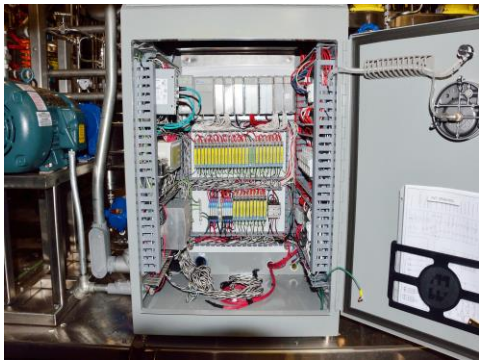
XRCC & Forward Water Technologies Case Study

Xerox Research Centre of Canada helps GreenCentre Canada with a technology to produce fresh water

GreenCentre spins off company, Forward Water Technologies, to revolutionize fresh water production with breakthrough desalination system

Drought and water shortages around the globe are accelerating the need for new approaches to water purification.

Researchers at innovation hub GreenCentre Canada recently created a new, economical approach to desalinate water, spinning out a new company called Forward Water Technologies (FWT). But the effort needed scale-up, pilot testing and developmental support to accelerate commercialization efforts, so the innovation hub for up-and-coming green technologies turned to the Xerox Research Centre of Canada (RCC) in Mississauga, Ont.



FWT Micro Pilot Unit control and data-logging system built by XRCC for hazardous location installation with over 60 instrument-loop input and outputs.

“We’ve accelerated the process by 18 to 24 months compared to a traditional venture capital journey,” said C. Howie Honeyman, CEO of Forward Water Technologies, and the former CTO of GreenCentre. “We’ve saved at least $2.5 million by having access to the depth of Xerox RCC as a whole, tapping into their strong chemical engineering and process design capabilities as needed, without having to create our own.”

Housed within the Xerox RCC facility, FWT is able to demonstrate to investors — using strong engineering principles — that the technology they’re developing has strong economic viability.

“It’s an amazing experience to see investors have that ‘a-ha’ moment when they come into the lab – putting a physical unit in front of people is very compelling,” said Honeyman. “And we’re bringing them into a highly professional environment, which gives us validation. Because Xerox is a recognized brand, there’s a sense of credibility that comes across.”

FWT plans to have a commercial option available by the third quarter of 2018.

Putting the Pieces Together

“The GreenCentre itself is a fairly unique ecosystem, bringing together academic discovery with entrepreneurs and industry partners,” said Pete Pigott, GreenCentre executive director. Since its inception in 2009, GreenCentre has worked with researchers and entrepreneurs to develop green chemistry technologies for industry adoption. Promising innovations are part of a commercialization program that includes technology assessment, application development, market analysis and IP protection.

While several third-party companies specialize in one or two phases of this process, GreenCentre chose XRCC because of its expertise across all phases, from process engineering to Scale-up, pilot testing and developmental support to help accelerate the commericization of energy-efficient, environmentally sustainable technologies. Scientists at XRCC specialize in the design and development of electronic materials, green chemistry, applied nanotechnology, polymer science, engineering and pilot plant scale-up.

FWT is revolutionizing fresh water production through an inexpensive, low-energy de-ionization approach that uses switchable salt to purify water. It will allow for the economical treatment of high salinity water, including difficult-to-treat wastewaters often contaminated with additional impurities in a wide range of sectors. Initial target markets include produced water in the Canadian oil and gas sector and industrial wastewater from power generation and manufacturing. For instance, Canadian-based shale hydraulic fracturing operations often generate contaminated wastewater having in excess of 15 percent weight salt concentrations. FWT has demonstrated that it can extract at least 50 percent of the fresh water from those waste streams, leading to improved water reuse and less waste for deep-well disposal. This technology will also be explored in California to convert similar industrial type wastewater for irrigation.

“While GreenCentre has an advanced chemical lab, it lacked the ability to scale up on an engineering basis, said Honeyman. “We could have built our own, which would have been very expensive, and we didn’t have the deep skills required to bring technologies from the lab to early commerical manufacturing. Or, we could partner with XRCC and tap into those skills very quickly.”

XRCC’s process engineering and scale-up capabilities have allowed FWT to expand its development capacity beyond bench-scale to pilot-scale. Moving the technology ahead so rapidly has allowed FWT to approach the investor and partnering communities with greater confidence.

“We’re creating a hub at Xerox RCC for materials research in Canada, with a pilot plant that can do scale-up activities for clients,” said Marko Saban, director of the Scale-Up Engineering Laboratory at XRCC.

Reducing Overhead to Focus on Results

Start-ups can use seed funding to develop their technologies, rather than spending it on capital expenses. “They can focus less on overhead and more on getting results,” said Saban. “It makes funding more efficient. And we turn their ideas into a scalable, manufacturable process.”

For FWT, that means managing the project from start to finish – from scoping to costing, procurement, engineering and construction of the micro pilot unit, which it will also operate. The Xerox RCC pilot plant has a hazardous area classification, rigorous safety system and highly trained operators, which also accelerates the process when dealing with potentially hazardous chemicals.

“I have not seen anything that we could have plugged into that offered the depth and skill set of Xerox RCC,” said Honeyman. “It’s a direct pathway into millions of dollars worth of capital; the menu of options that I can tap into is incredible. And that comes along with operational expertise.”

GreenCentre’s Pigott said that contracting with Xerox RCC not only saved time and money, but also provided access to capital, processes and expertise. “It would have taken us many years to build that,” he said. “We’ve been able to expedite our business plan and save money. It put us in a position that was well beyond anything we could have imagined.”

XRCC – as a small, nimble organization within Xerox – is able to leverage 40 years of expertise in plant design, with access to cutting-edge technologies. “We’ve been developing Xerox projects for years, turning batch processes into continuous processes,” said Saban. “We’ve built a competency in that area, and we’d like to grow this ecosystem here in Canada and help entrepreneurs and innovators turn their ideas into commercial products.”