



NBIF

ANNUAL REPORT

New Brunswick Innovation Foundation
2011-12



The climb.

The outlook.

Innovation. It's a word you hear and read all the time, everywhere. You see it on products and hear it in speeches so much that it's been reduced to an empty buzzword wrapped in fluff.

But not at NBIF. In fact, innovation is our business. So what exactly is innovation? It's a process that begins with a concept and ends only when it's in use—as a new or improved product, process or service. When we use the word innovation, it's the real deal.

Doing it right means taking one step at a time, until it's ready for that giant leap into commercialization. But it's not a solitary journey. It takes teamwork inside out—engaging a multitude of people with the right motivation and skills.

Innovation is hard, and it can take years to really break through. We do it because we know it leads to a stronger economy for us all. It's why we focus on innovation, and continuously build the systems and infrastructure needed for it to bloom.



NBIF connects research to enterprise

\$ BASIC RESEARCH

There are a number of capital sources available for innovators. But accessing them depends on where the innovation is along the time line from concept to market. In the beginning, more funding is available for basic research.

Basic research generates new ideas, principles and theories, which may not be immediately utilized; though are the foundations of modern progress and development in different fields.

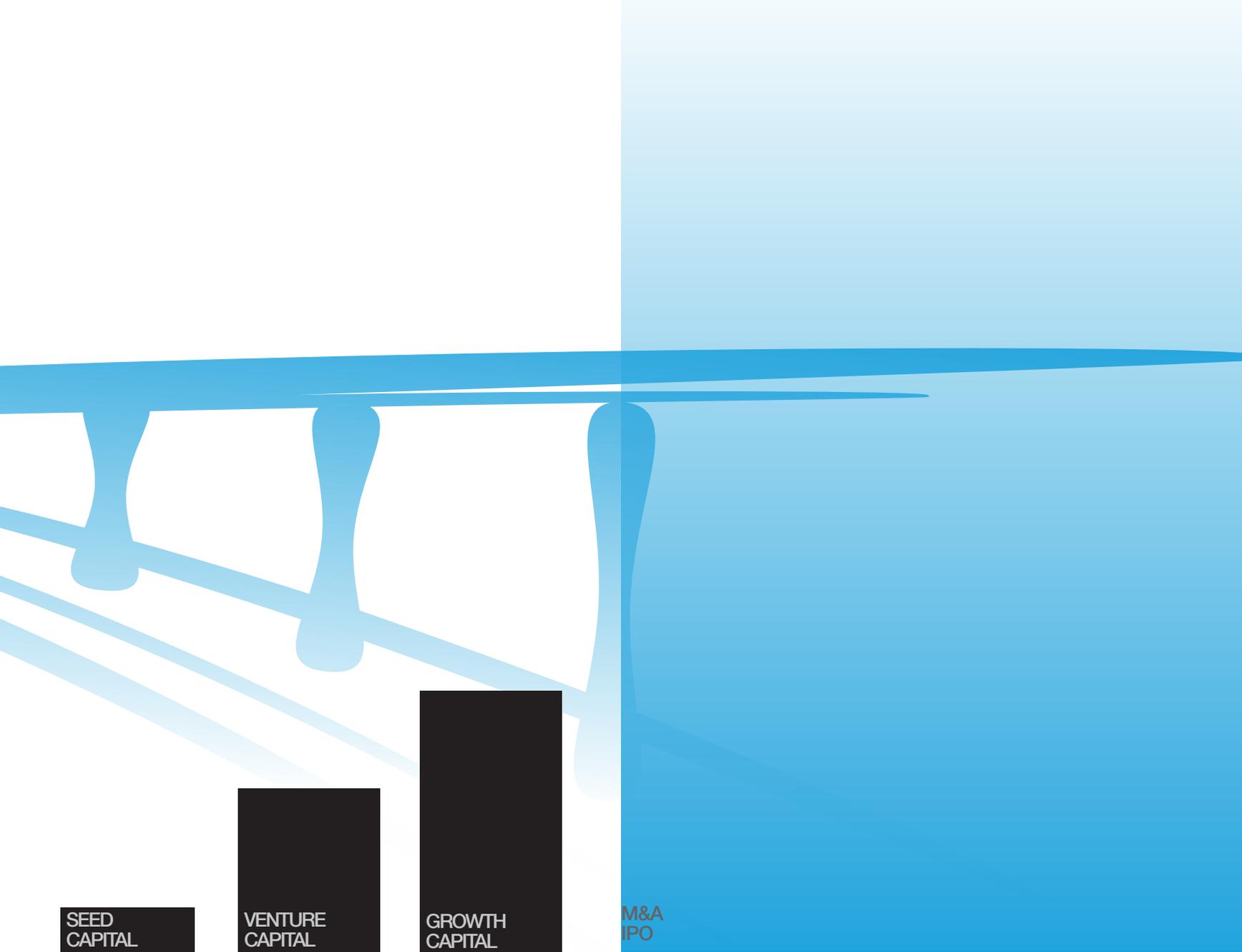
Applied research is a form of systematic inquiry involving the practical application of basic research for a specific business or client purpose.

APPLIED RESEARCH

PROOF OF CONCEPT

On the R&D side, we fund activities like concept validation, prototype creation, and bench testing. On the enterprise side, we work to get R&D into the hands of entrepreneurs, seeding new companies with venture capital. And for those that start to gain speed, we will oftentimes come back with more to help accelerate their growth.

At the other end, on the other side of the bridge, growth companies can raise money through bank loans, mergers, and stock market IPOs. What about during that middle point or pre-revenue stage between R&D and enterprise? Very little. That's why it's called "the valley of death." Brilliant research ends up on the shelf and companies fall.



But not in New Brunswick. At NBIF, our venture capital and R&D funding bridges this financial gap so innovators, researchers and entrepreneurs have the best chance to make it to the other side.

Together, our Venture Capital and Research Innovation Funds support what we think is the very foundation of New Brunswick's innovation-based economy: people. People with the passion and tenacity to turn abstract ideas into commercial opportunities.

Many will make it, and some will not, and those who do, and do it well, will eventually build the bridge themselves. And when it's time for NBIF to sell its stake, all of the money it makes goes right back into the foundation to fund even more innovation and startup companies. This is how NBIF grows, and it's what makes us unique.

Message from the Chair



BUILDING THROUGH COLLABORATION

Innovation is more than a buzzword. It is more than rhetoric. Innovation is the cornerstone of a strong and vibrant economy. As a province, we must continue to find ways to innovate so we can compete and prosper.

New Brunswick benefits from a long, rich history of innovation. Numerous world-class innovations like the SCUBA tank, the thermal pane window, the snow blower, advanced mammography, and internet protocol television—to name a few. They were all patented right here, in New Brunswick. Building from our past, NBIF is enriching the culture of innovation today.

At NBIF, we provide innovators with the capital and support they need to succeed. We step in at a time when most financiers find it too risky. For every dollar NBIF invests, seven more, on average, can be brought to the table, providing our researchers and entrepreneurs with much improved odds for success.

I like that NBIF encourages collaboration. We seek to connect the business and research communities. To that end, last year we introduced the R3 Innovation Challenge, which provided companies with the opportunity to compete for R&D funding. The catch was that they needed to identify a researcher from a New Brunswick research institution to help them address their problem. In front of a sellout crowd of 375 people at R3 Gala, \$100,000 in R&D funding was awarded. Activities like this have proven to make a real difference in shaping the innovation culture in the province.

I have witnessed the tremendous impact that NBIF is having in the province, and look forward to working with the Board of Directors and management team at NBIF to ensure that we continue to fulfill our mandate and contribute to the economic well-being of our province.

DR ROBERT HATHEWAY

Our voluntary board is part of our success

2011-12 BOARD OF DIRECTORS

As an independent, not-for-profit corporation, part of NBIF's success comes from its ability to engage directors with backgrounds that reflect the interests of our clients and stakeholders.

With executive experience in private and public companies, academia and government, each of our directors volunteer their time to support both the Foundation's and its clients' aspirations, goals, and business activities.

The experience and independence of NBIF's Board of Directors gives the organization the status it needs to syndicate with private and institutional investors, and the business community.

DR ROBERT HATHEWAY

CHAIR

President & CEO
The Hatheway Group

MICHAEL JENNINGS

VICE-CHAIR

President
Fraser Speciality Products

BILL LEVESQUE

SEC. TREASURER

Deputy Minister
Economic Development

ANNETTE COMEAU

President & CEO
LearnSphere

LINDA EATON

President
Argus Hearing Center

BYRON JAMES

Clerk of the Executive Council
Province of New Brunswick

DR GREGORY KEALEY

Vice President—Research
University of New Brunswick

MARC LÉGER

Deputy Minister
Post-Secondary Education, Training & Labour

DR RODNEY OUELLETTE

CEO & Scientific Director
Atlantic Cancer Research Institute

GERRY POND

Chairman
Mariner Partners

BETH WEBSTER

Vice President
Populus Global Solutions

Message from the CEO



A NEW CHAPTER FOR NBIF

As a catalyst, NBIF brings ideas, people and money together to stimulate innovation. Our goal is to support innovation that creates economic value, and how we do that is the art of the deal.

Innovation is not easy. It requires sacrifices, and demands passion and perseverance. But when it's done right, with the right people, and at the right time, the rewards can be great.

Take for example our investee firm, Radian6. They set out in 2006 as a start-up company to be the global leader in social media monitoring. And five years later that vision was realized when Radian6 was acquired by Salesforce.com. NBIF was there from the very beginning, providing some of the capital they needed to put their management team in place and get started. The return on our investment was so great, it replenished our entire Venture Capital Fund, and a surplus. These funds are now being used by NBIF to support the next wave of innovative start-up companies in New Brunswick.

This deal is a significant achievement for NBIF. It validates our business model, paves the way for more investment, and marks the start of a new chapter for the Foundation.

A success story like Radian6 does more than create wealth, it opens the door for other entrepreneurs and companies. It strengthens the innovation ecosystem that NBIF and its partners are working so diligently to build.

For NBIF, fiscal year 2011-12 saw the completion of a record number of deals. We invested \$1.3 million into 34 applied research projects and \$1.3 million into nine start-up companies. Another \$1.1 million was invested in the recruitment of research talent under our Research Assistantships and Technicians Initiatives.

As we enter our 10th anniversary year, we expect this momentum to continue and believe that we can play a major role in accelerating it. I am confident that with the continued support of government and our partners, NBIF will continue to make a positive impact on New Brunswick.

CALVIN MILBURY

Growing New Brunswick's investment community

One of NBIF's most important functions is to help its companies and researchers leverage additional funding from other investors and agencies. This is especially important when far away investors and granting agencies require an investment by a New Brunswick-based organization.

In Fiscal 2011-12 NBIF leveraged \$8.4M in funding from venture capital firms, angel investors, and financial institutions, over and above the \$1.3M NBIF invested. Specifically, we helped to leverage a total of \$175M in additional venture capital into our portfolio companies. We also witnessed a marked increase in angel investment activity with a total of \$1.7M being co-invested alongside NBIF in eight of the nine venture capital investments we made. This rise in angel investment bodes well for early stage companies that need equity capital to grow and succeed.

Oftentimes, investment by NBIF is the only way a New Brunswick innovator can access the capital they need to fully fund their project or start-up. While NBIF prefers to partner with other investors, sometimes it invests alone to seed the company. In doing so, we give the company a fighting chance to succeed, and the backing they need to raise more capital as they grow.

NBIF INVESTMENT ACTIVITY

All funds

Fiscal 2011-12

Investment	2011-12	Since 2003
Applied Research	\$ 1,260,570	\$ 14,733,768
Startup & Growth Companies	1,276,462	9,569,046
Talent & Recruitment	1,130,000	11,228,519
Total invested by NBIF	\$ 3,667,032	\$ 35,531,333
Leveraged capital	21,024,623	237,729,244
Total impact	\$ 24,691,655	\$ 273,260,577



Exiting Radian6 - what it means for NBIF

In May 2011, NBIF exited Radian6 for \$9.3 million when it was acquired by Salesforce.com. NBIF helped to launch the company in August 2006 with a seed equity investment of \$50,000. In December 2008, NBIF invested another \$276,973 to help fuel its growth. Together, NBIF's two investments generated a combined internal rate of return (IRR) of 170 percent—28 times the value of the original investment.

Watching Radian6 transform itself from a small start-up company to the global leader in social media monitoring—in just five years—was very exciting for us, and a constant reminder of why NBIF was created. Without the hard work and risk-taking of Radian6's management and staff, none of this would have happened. Their achievement is the real success story. The entire \$9.3 million NBIF earned went back into our Venture Capital Fund to be invested in other companies. Thank you to Radian6 for this tremendous contribution to New Brunswick. They put New Brunswick on the map internationally, and have attracted new investors that had never considered New Brunswick before.

Our Corporate Objectives

To help build an innovation-based economy for New Brunswick, our investment strategy focuses on six activities that we consider critical when it comes to developing the next generation of entrepreneurs and applied researchers.

Growing Capital Markets

NBIF works to grow the province's capital markets by attracting investments by other capital and industrial partners, both inside and outside of New Brunswick and Canada.

Recruiting and Developing Talent

NBIF supports the recruitment and development of outstanding researchers and entrepreneurial leaders by providing them with the funding, expertise and recognition they need to succeed.

Targeting Strategic Industries

To be eligible for our funding, all projects and business proposals must fit within at least one of our strategic industries, represented in the figure opposite, Investment By Strategic Industry.

Leveraging R&D Funding

NBIF works to increase the total infusion of research funding by investing in projects that unlock contributions from industry and national agencies, like the Canada Foundation for Innovation, NSERC, CIHR, NRC and more.

Creating New Ventures and Enterprises

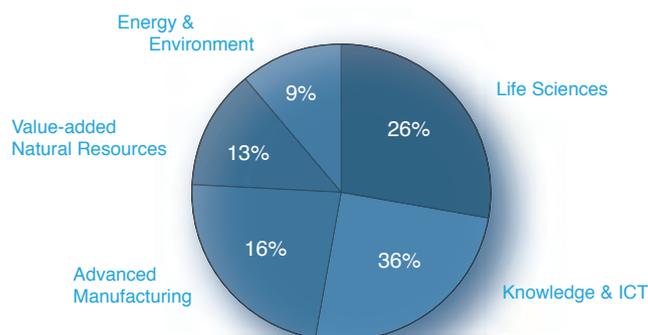
NBIF supports the creation and development of new ventures by offering equity capital, professional support, and networking opportunities to entrepreneurs that focus on innovation.

Funding Applied Research

NBIF supports applied research by funding projects that show potential for commercialization and economic impact on the province, its universities, community colleges and research organizations.

NBIF INVESTMENTS BY INDUSTRY

All funds
Fiscal 2011-12



HOT

Did you know that the first thermal windowpane was invented in Boiestown? By Lawrence St. Clair McCloskey, who received the patent for it in 1917. The inventor wrote, "By use of the alcohol [between the panes], it has been found that the light rays can freely pass through the window, and that the furnishings on the room fitted with a window of this type do not suffer in consequence of their being exposed to the sunlight, while at the same time the temperature of the room is better controlled, being warmer in winter and cooler in summer."

9.6

MILLION INVESTED

83

MILLION LEVERAGED

21

COMPANIES

**venture
capital**

Our New Venture Capital Investments

When companies receive an investment from NBIF, they are getting much more than a simple infusion of cash. Instead, as an equity partner, we take an active role when it's needed to help our portfolio of 21 companies succeed.

Whether it's structuring a deal, managing cash flow, issues of corporate governance, marketing or communications, we take the time to work it out together, all in pursuit of the most favorable outcome for all.

This year saw one of our most active years to date, both inside and outside of the Foundation, closing nine deals to start up three new businesses, and follow-on investments in six of our existing companies (*opposite page*). We also incorporated and completed our investments in the three 2011 Breakthru winners. This brings us to a total of 57 companies that we have helped take flight since our inception in 2003.

ADM Systems Engineering of Saint John spun-off its Software development group and together with the investment of NBIF and others created **RtTech** to commercialize what was a one-off energy saving solution for one client. Its novelty was so great that other companies started asking for it too. After only six months of operations, RtTech has already installed its solution for companies Barrick Gold, Rio Tinto, Cargill and the Irving Group of Companies.

The year also saw the start up of Fredericton-based **CyberPsyc Software**, that makes virtual reality applications to treat phobias. CyberPsyc was a finalist in our 2011 Breakthru Business Plan Competition. Although they didn't win at the time, they continued to develop their technology, until they were investment ready. This goes to show that participating in Breakthru can still lead to an investment, even if the company doesn't win.

Saint John start-up **Spinzo** also received an investment from us to launch their dynamic pricing solution for merchants. Merchants set the original price, which drops as more people join the deal. The merchant sets the lowest price. When the required number of people join the deal, the price locks in. The merchant gets a big prepaid order, and consumers get a substantial saving. Since it operates on a community-based marketing platform, the company decided to first launch in Toronto, with plans to expand to other cities.

New follow-on investments included **Inversa Systems**, whose portable non-destructive imaging technology has attracted the attention of the oil and gas industry after presenting at the Chevron NDE and Pipeline Forum in Houston, Texas.

2009 Breakthru winner **KnowCharge** received an additional investment from NBIF to help the company grow their capacity to meet the demands of large corporations. As Asia is a key market for static protected products, the company has added Chinese partners to build capacity to service the demands in Asia and globally. A key success factor in winning supply contracts with large electronics companies requires evidence that large orders can be filled in the turnaround time they specify.

NBIF also made an additional investment in **Zaptap**, maker of an electronic tag that delivers content to smartphones. Since then, the company has piloted the technology with New Zealand-based clothing brand IceBreaker and NB Liquor. Plus, after several trips to New York City, the company secured a partnership with marketing behemoth McCann Worldgroup, who represents the highest number of brands on the planet.



CyberPsyc has successfully deployed self help phobia treatment software on the Apple App Store and directly from their website via a cloud based service. So far they've marketed applications for people that fear public speaking and are working on applications for dentistry.



KnowCharge has had its materials tested and certified for use within one of the top five US Defence contractors, an important milestone that the company is looking to leverage to grow sales in this segment.



Inversa Systems signed a Strategic Technology Alliance Agreement with EM&I Stantec to further develop the portable non-destructive imaging technology for the offshore oil and gas industry.

Smart Skin Technologies received an additional investment to help them develop their touch-sensitive nanoskin for Molson Breweries' bottling system. After successfully testing their prototype at Molson's Moncton plant, the company has asked Smart Skin to repeat the test at their flagship brewery in Montréal. The company also continues to develop its technology for Golf Pride Inc., the leading maker of golf club grips.

Finally, NBIF increased its stake in **Populus Global Solutions** who have used their ACSiS software to successfully deploy three national health information systems. Having attained international recognition for helping government's save lives and money the business is poised with imminent opportunities for growth.

NBIF NEW INVESTMENTS

Venture Capital Fund

Fiscal 2011-12

Company	Product & Technology	Investment*
Rt Tech Software	Real time system for managing energy overuse	\$ 500,000
Inversa Systems	Portable imaging device for immovable objects	250,381
KnowCharge	Conductive paper for electrostatic discharge protection	200,000
CyberPsync Software	Virtual reality applications for the treatment of phobias	100,000
Spinzo	Dynamic pricing website for merchants and consumers	100,000
Zaptap	NFC tags for sending content to smartphones	50,000
Smart Skin Technologies	Touch sensitive fabric for electronics	40,000
Populus Global Solutions	National-level health information systems	36,081
Total invested, NBIF		\$ 1,276,462

* The amount reported for each investment represents its acquisition cost.

COOL

Did you know that the first self contained underwater breathing apparatus (SCUBA) was invented in Saint John? By James Elliott and Alexander McAvity, who received the patent for it in 1839. The inventor wrote, "instead of supplying air in that manner [with a hose], the individual going under water carries with him a quantity of condensed oxygen gas or common atmospheric air proportionate to the depth of water and adequate for the time he is intended to remain below."



R3 INNOVATION CHALLENGE

Did you know that many business owners don't know that, by collaborating with a university researcher, they can access some of the R&D funding they need? Maybe that's why 90% of people's most innovative ideas stay on their desktop.

So in 2011-12, we created the R3 Innovation Challenge to coincide with our bi-annual R3 Gala. The primary purpose of the challenge was to stimulate R&D activity inside already existing New Brunswick companies, and create a general awareness about how they can indirectly access the funding and facilities they need to create a new product, technology, or betterment. The secondary purpose was to engage and educate the general public about NBIF, and the impact our research activities have on the economy.

To do this, a print, television and Internet campaign was executed with messages targeted at both employers and employees. To assist in educating the general public, CBC Television produced feature stories on each of the finalists and posted them online for a viewers' choice award.

In the end, two out of five finalists were chosen to receive \$50,000 each in research services under the Emerging Project component of our Research Innovation Fund: Breviro Caviar, and Sorcimed.

The R3 Innovation Challenge will also allow NBIF to meet one of its business plan objectives: to create new collaborations between New Brunswick companies and researchers, opening up the possibility of follow-on investments in the research by the participating company, NBIF and other granting agencies.



Caviar from the Shortnose Sturgeon is one of the rarest and most sought after delicacies in the world. Breviro Caviar plans to research and develop an aquaculture system and technique in Charlo, New Brunswick, that speeds up the sexual maturation of the fish.



Sorcimed discovered that chemicals found in shrew venom attach to specific receptor cells in the prostate, ovaries and breasts. As a result, the company proposes to develop a new drug that can be used to deliver other cancer detecting or fighting drugs.



RtTech sells software tools that allows heavy industry to find and fix problems that cause downtime and energy overuse throughout their automated production systems.

Pablo Asiron, P.Eng CEO

NBIF: What exactly does RtTech's energy saving software do for large industries?

Asiron: In real time we're calculating how much energy they should be consuming and they are comparing that against actual consumption. So they can identify areas in the plant where, for whatever reason, they are over consuming. Once that information gets in the hands of the energy monitors, they can actually start pinpointing and looking into the process and see what they need to do to reduce over all energy consumption.

NBIF: Flakeboard, in St. Stephen, was one of your first pilot customers. What results did you get for them?

Asiron: What the software did for Flakeboard was they found parts of the plant that they couldn't see that were idling when not in use, using power. Savings are coming from equipment that they used to keep running. With our software implemented, the company saved \$260,000 last year, and expects to save a half a million this year. It's a great way for companies to increase their profitability, especially in markets where margins are incredibly tight.

NBIF: What is your long-term goal for the company?

Asiron: In the next four to five years, our goal is to reach \$10 million in sales all over the world. We just finished an implementation in Australia. Now that our software is integrated with OSIsoft's P1 system, which big industries use all over the world, it opens us up to great opportunities.

Feature Story on RtTech



Founded
2012

Investment
\$ 500,000

Industry
ITC

Acer Cloud Mobile
Acer E320 Liquid Express
Acer Liquid Glow
BlackBerry Bold 9790
BlackBerry Bold 9900
BlackBerry Bold 9930
BlackBerry Curve 9350
BlackBerry Curve 9360
BlackBerry Curve 9370
BlackBerry Curve 9380
Casio DT-X8
Casio IT-800
Fujitsu Arrows µ F-07D
Samsung Galaxy Nexus
Google Nexus 7
Google Nexus S
Google Nexus Q
HTC Incredible
HTC Droid Incredible 4G LTE
HTC One X
HTC Desire C
HTC Evo 4G LTE
HTC Edge
HTC Ruby
Huawei Sonic
Kuoziro Frontier FT701W
Lenovo K800
LG Optimus Elite
LG Optimus L5
LG Optimus L7
LG Optimus LTE
LG Optimus LTE Tag
LG Optimus Net
LG Optimus Vu
LG Optimus 3D Max
LG Optimus 3 Cube
LG Optimus 4X HD
LG T530
LG Viper
Mobiwire Cosyphone
Motorola Droid Razr
Motorola MC75A HF
Nokia 603
Nokia 700
Nokia 701
Nokia 801T
Nokia 808 Pureview
Nokia C7 Astound
Nokia Lumia 610
Nokia N5
Nokia N9
Nokia Oro
Panasonic Eluga
Panasonic Eluga Power
Porsche Design P'9981
Prada phone by LG
Samsung Ace 2
Samsung Galaxy Mini 2
Samsung Galaxy Note
Samsung Galaxy S Advance
Samsung Galaxy S Blaze 4G
Galaxy S II
Samsung Galaxy S III
Samsung S5230 NFC
Samsung Star
Samsung Avila
Samsung 5260 NFC
Samsung SHW-A170K
Samsung Wave 578
Samsung Wave M
Samsung Wave Y
Sony Xperia S
Sony Xperia Ion
Sony Xperia P
Xperia Sola
Xolo X900



In our print edition you can use your NFC enabled phone to tap this Zaptap tag and experience the power of their breakthrough technology. If your phone is listed on the left, you can do it! But for here, all you need to do is click on the icon to see the video that would instantly appear on your phone

Our 2011-12 portfolio of companies

One of the biggest challenges entrepreneurs face early on is raising the capital they need to succeed. For most, it's a matter of being too small to go public, or too new and risky to obtain a bank loan. We help eliminate that challenge by making a venture capital investment.

From the start, we engage our investees as a minority partner focused on their long-term growth and success. As a shareholder, we can share our business expertise, help management find experts, establish best practices for corporate governance, and prepare the company for the follow-on investments they will need to grow and expand.

NBIF INVESTMENT PORTFOLIO

Venture Capital Fund

March 31, 2012

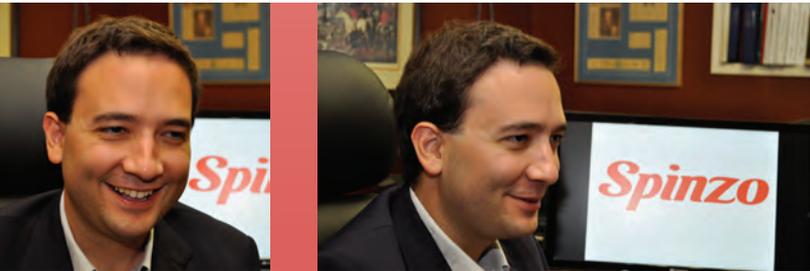
Company	Product and Technology	Investment *
Atlantic Hydrogen	Carbon removal and reselling system for natural gas	\$ 1,000,000
Inversa Systems	Internal imaging technology for large immovable objects	525,000
Open Ocean Systems	iCage™ off-shore aquaculture cage and feeding system	500,025
Advanced Publishing	Digital publishing solution for online content providers	500,000
Encore Interactive	Live Everywhere™ internet TV system for broadcasters	500,000
RtTech Software	Realtime production downtime and energy optimization	500,000
KnowCharge	Electro-conductive paper for protective packaging	350,000
Trumpet Behavioral Health	AutismPro online patient support system	250,000
Populus Global Solutions	National-level health services information system	225,000
CyberPsyc Software Solutions	Virtual reality software for treatment of phobias	100,000
Scene Sharp Technologies	Motion sensing and object identifying camera technology	100,000
Medrunner Health Solutions	e-prescription delivery and drug information system	100,000
ChemGreen Innovations	Plastic production process without toxic emissions	100,000
Spinzo	Online group buying platform	100,000
Zaptap	NFC tag for sending content to smart phones	100,000
SmartSkin	Nanocarbon-based touch sensitive fabric	100,000
Enovex	Carbon dioxide mitigation system	50,000
Trapster	GPS tracking and logging system for deep sea cages	50,000
Trivnet Media Services	Point of sale ordering and content delivery system	50,000
Legacy Lane Fiber Mill	Micro fiber milling process and operation	25,000
MassRule	Online polling software	25,000

* The amount reported for each investment represents its acquisition cost



The advent of the tablet market and miniturization of content delivery has been a real boon for Advanced Publishing Corp, who truly got started "before their time." NBIF thanks them for making our digital version of the annual report possible.

Spinzo



Spinzo optimizes the dynamic pricing concept with a fundamentally different approach that is both exciting for consumers and sustainable for merchants.

Group-buying websites allow consumers to take advantage of deals offered by local businesses. The deal gets activated only after the minimum quantity of deal vouchers has been sold. Current group-buying companies require merchants to provide discounts of at least 50% and keep as commission 50% of the proceeds. There is no flexibility to optimize pricing based on demand and the model alienates the most desirable merchants, ultimately reducing consumer appeal.

Spinzo optimizes the group-buying concept with a fundamentally different approach that is both exciting for consumers and sustainable for merchants. Merchants specify a “sliding scale” price range for a targeted product or service. Users bid the most they are willing to pay for a deal and the price falls throughout the day as cumulative bids meet the pre-defined thresholds.

Spinzo to the rescue



Emmanuel Elmajian Founder & CEO

NBIF: How does Spinzo compare to group buying companies that people are already familiar with?

Elmajian: The company most people are familiar with didn't start with the business in mind. They said, 'Hey we'll give you seventy per cent off a slice of pizza if we get ten people. In many cases the business ends up losing money. We go to businesses and ask, "what works for you?" If we were to sell 20 of your items, then 50, 100, 200, what kind of discounts can you offer for each level of sales? They craft their own pricing, and to the user, it comes a dynamic marketplace where the price literally depends on how many people want to buy it. It's dynamic pricing and it never goes below what the merchant agrees to sell it for. Spinzo earns a portion of the sale only. There are no other fees for the merchant.

NBIF: How did you get started with all of this?

Elmajian: I was working for McKinsey & Company in New York City, after finishing my engineering degree at Waterloo, doing technology consulting for Samsung, Condé Nast, and Rogers. My heart has always been at the intersection of business and technology. I left McKenzie to venture off on my own. I moved back to New Brunswick where it's familiar, where people will hear you out. Spinzo was one of a few ideas I had. So I created a prototype application myself, and I showed people. I showed it to my parents, who are small business owners in Moncton, for the business side, and I showed it to my friends, who understand the consumer side. I asked them, "if this was available, would you use it?" On both sides I got a yes.

Founded
2012

Investment
\$ 100,000

Industry
ITC

16

MILLION INVESTED

103

MILLION LEVERAGED

318

PROJECTS

research and development

46

PROFESSORS
RECRUITED

60

RESEARCH
TECHNICIANS

829

STUDENT RESEARCH
ASSISTANTS

NBIF Research Innovation Fund

Sustaining an innovation-based economy requires a constant interest and investment in research and development. In fact, New Brunswick has some of the most brilliant researchers in the world, many of whom have invented products and processes that have found their way to industry, when R&D truly turns into innovation. After all, an innovation does not really exist until it is actually in use. Some of our most compelling portfolio companies were born from R&D conducted at a New Brunswick research institution including **Atlantic Hydrogen, Inversa Systems, KnowCharge, Scene Sharp, ChemGreen Innovation** and **Smart Skin**.

NBIF's Research Innovation Fund is divided into four components. Concept Validation funding is for research results that are close to commercialization, including prototypes and bench tests. Start-up Grants are used to recruit new outstanding researchers to New Brunswick. Emerging Project funding is for applied research in its earliest stage. Finally, our Innovation Capacity Development Initiative is for large-scale infrastructure projects.

INNOVATION CAPACITY DEVELOPMENT

Research Innovation Fund

March 31, 2012

Researcher	Institution	Project	Investment
Michel Johnson	UdeM	Reducing costs related to professional driver health & performance	\$ 150,000
Stephen Westcott	MTA	Nuclear magnetic resonance spectrometer for green chemistry	98,439
Adrian Reyes-Prieto	UNB	Molecular research of plastids and harmful algae blooms	75,375
P.T. Jayachandran	UNB	15 receivers for the Canadian High Arctic Ionospheric Network	69,860
Jean-François Bisson	UdeM	Development of tools for laser-assisted deposition of industrial coatings	43,817
Igor Mastikhin	UNB	Portable MRI development for industrial use	10,000
Alain Doucet	CCNB	New fuel and pollution-saving technology for blueberry field burners	10,000
William Cook	UNB	Development of electrochemical sensors for high temperature fluids	8,000
Muhammad Afzal	UNB	New biofuel feedstocks from forest and agricultural harvest waste	8,000
Sara Eisler	UNB	Optimization of electronic communication between organic molecules	8,000
Gérard Poitras	UdeM	Optimization of structures subject to coupled fluid interaction loads	8,000
Serge Gauvin	UdeM	Nonlinear optics and electroluminescence in light confinement structures	8,000
Yahia Djaoued	UdeM	Synthesis, characterization and application of transition metals	8,000
Darren Piercey	UNB	Effectiveness of virtual reality environments for psychological treatment	5,000
Pier Morin Jr.	UdeM	Molecular mechanisms that produce extreme cold tolerance in insects	5,000
Luc Martin	UdeM	Regulation of steroidogenesis in adult leydig cells of mice and zebrafish	5,000
Dianne Pruneau	UdeM	Process for assessing adaptation due to climate change	5,000
Gilles Robichaud	UdeM	Elucidating the role of the Pax-5 oncogene in breast cancer	5,000
Ming Zhong	UNB	The effect of Canadian socio-demographics on housing & travel demand	5,000
Total invested by NBIF			\$ 535,491
Contributions from other sources			\$ 3,469,992
Total impact			\$ 4,005,483

This organic molecule, written in Dr. Eisler's hand is, at the basic level, a nano machine. Shaped like a propeller, in one state the blade pitches in one direction, and in its switched state pitch to another.



Sara Eisler, PhD
BIOCHEMIST

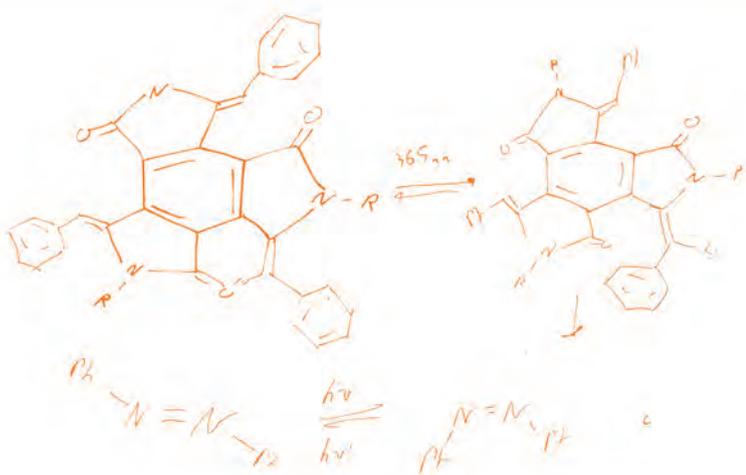
University of New Brunswick

NBIF: What's your dream when it comes to the application of the molecules you are working on?

Eisler: Eventually the idea is to incorporate our molecules into electronic devices, so we can produce them in an inexpensive manner, so they can be used by more people, and in an easier manner than the ones you find today. The way electronics are made now, is that you start with something big and you try to make it small. But there are limitations to miniaturization. We're starting with a single molecule, and then build up to make faster, smaller and more efficient electronic devices.

NBIF: How small do things really need to get?

Eisler: Think about server farms and server sizes. Our degree of connectivity is only going to increase, and we can expend so much energy on keeping all the information we're producing. Every Google search has a footprint, so making components smaller and more efficient means that we can reduce that footprint to a certain extent. A lot of our electronic devices have heavy metals in them, and is a problem when they've lived out their lifetime. Plus, it means we are reliant on having to get metals out of the earth to be able to put into these devices, which can be a political and cultural problem, and can be really expensive. Having the option of using organics, considering carbon is much more available, you want to develop these types of components. It's a long way away before we'll make a molecular computer, because while nature can organize components extremely well, it's pretty hard to take a molecule and add a signal to it, like light, and turn it into a switch. But we will get there.



What's novel about her molecule, compared to today's silicon based computer chips, is that it is flexible, and can fit into a number of configurations. Silicon is a solid state metalloid material that is limited in its application.

Dr. Eisler' is now working on a way to wire the molecules to make the circuits that computers need to operate.

NEAT

Did you know that the variable pitch propeller was invented here? By Wallace Turnbull in Rothesay, in 1928. It allowed the pilot to rotate the blades creating better lift, and reverse them to create a braking effect. The increased lift allowed airplanes to carry far heavier payloads.



Funding The Future

In FY 2011-12, NBIF together with the **Department of Post-Secondary Education, Training and Labor** provided \$1.1 million to hire eight new research technicians and 66 research assistants at New Brunswick universities and research institutions. Research technicians are most often PhD trained scientists that work with our principal researchers to expedite their work. Research assistant positions are filled by exceptional students who do preparatory and supportive tasks in the lab. Together they increase the capacity of our brightest innovators, who often have multiple projects on the go at once.

Another way NBIF helps to increase the innovation capacity of the province is through start-up grants for newly hired professors and researchers, like Drs. Alain Simard and Sandra Turcotte in the table below. To encourage the researchers to relocate to New Brunswick, NBIF provided each with a grant to help them set up their laboratories and get started. Increasing capacity requires a steady flow of new research programs as well. In FY 2011-12, NBIF funded nine emerging projects. **Amber Garber** from the Huntsman Marine Science Centre in St. Andrews, and **Kevin Shiell** at the Centre of Excellence in Agriculture and Biotechnology in Grand Falls, each received funding to turn their research into working prototypes.

EMERGING PROJECTS, CONCEPT VALIDATION & START-UP GRANTS

Research Innovation Fund

March 31, 2012

	Researcher	Institution	Specialization	Investment
Emerging projects	Breviro Caviar	Private	R3 Innovation Challenge winner (see page 12)	\$ 50,000
	Soricimed	Private	R3 Innovation Challenge winner (see page 12)	50,000
	Sean McGrady	UNB	High capacity Anode Materials for Lithium-Ion Batteries	25,000
	Jacques Gagnon	IRZC	Extraction of guanine from herring scales for cosmetics	25,000
	Atef Mohany	UNB	Acoustic resonance of multiple bare cylinders	25,000
	Muhammad Afzal	UNB	Biowaste for value-added renewable solid fuel production	25,000
	Meng Gong	UNB	Process optimization for making laminated wood railway ties	25,000
	Ying Zheng	UNB	Molecular sieve adsorption for dehydration of ethanol	25,000
	André Dumas	UdeM	Effect of purified lignin on growth of Atlantic Salmon	21,000
	Amber Garber	HMSC	Cryopreservation technology for selectively bred Atlantic Cod	19,079
Ying Zheng	UNB	Assessment of biomass resources for liquid transportation fuel	10,000	
	Researcher	Institution	Specialization	Investment
Concept Validation	Amber Garber	HMSC	Atlantic Salmon Selection and Broodstock Development Program	\$ 300,000
	Kevin Shiell	CCNB	Small-scale processing, QA, and packaging system for hops	40,000
	Researcher	Institution	Specialization	Investment
Start-up Grants	Sandra Turcotte	UdeM	Canadian Cancer Society Research Chair, Professor of Biochem	\$ 50,000
	Alain Simard	UdeM	Professor, Biochem specializing in Neuroimmunology	35,000
Total invested, NBIF				\$ 725,079
Contributions from other sources				\$ 8,642,103
Total impact				\$ 9,367,182



Created in 2005, the Centre for Innovation and Technology Transfer for Metals (MITTC) is part of the Collège communautaire du Nouveau-Brunswick (CCNB) in Bathurst.

Alain Doucet CCNB Bathurst

NBIF: Your most recent innovation involved a new way of building blueberry field burners for farmers and companies in that business. What was the problem?

Doucet: To prune blueberry fields, and to get rid of insects, fungi and diseases, they have to be burned about every two years. The current machinery to do that is basically a trailer full of diesel fuel with a blower that gets lit on fire. They were invented back in the 1960s, when fuel was much cheaper, and hadn't changed since. A blueberry field burner consumes about 350 litres of fuel per hour, which is a lot, and it does so in a very inefficient way. There's nothing to direct the flame downward, it creates a lot of black smoke, and if a wind comes along, blows the flame and heat out and away from the targeted area.

NBIF: What did you do to improve the technology?

Doucet: First we put a skirt around the underside of the machine to prevent heat and flame from escaping. Then, using a number of already existing mechanical devices, we put them together in a novel way that directs the heat and flame downwards. As a result of both improvements, the machines don't need to burn as hot to get the job done, saving fuel and the environment.

NBIF: Does this mean everyone has to buy a new machine?

Doucet: No, in fact one of the conditions of the project was that we create something that can be retrofitted for existing burners. Companies and farmers can upgrade and take advantage of the savings without investing in an entirely new piece of equipment.

The MITTC mission is to support entrepreneurs, researchers, teachers and students interested in the economic development of the metal industry in New Brunswick through their research, prototyping, and technology transfer.

The Centre aims to build on its reputation as an agent of change, innovation and economic development by industry, colleges and universities, and is committed to providing all of its customers with R&D services they need to solve problems in their business.

COOL

This will blow you away: did you know that the snow blower was invented in New Brunswick? Robert Harris of Dalhousie, NB, was the first to patent the method that brings a screw auger and a blower together in a way that lets you throw your snow away.



R3 GALA

On March 21, 2012 NBIF presented the recipients of the 2012 R3 Innovation Award for Excellence in Applied Research, bringing researchers and business people together to celebrate the results of R&D and innovation in New Brunswick.

In total, 375 people attended the Gala dinner, co-presented by Cox & Palmer, and sponsored by 18 other organizations—which was a tremendous show of support for this, one of the most anticipated events of the season.

Pandurang Ashrit

Dr. Pandurang Ashrit is Chair of the Physics Department and Director of the Thin Films and Photonics Group at the Université de Moncton. With his team, Dr. Ashrit has developed thin films that stop all of the heat-producing infrared light from passing through windows. He has also developed a smart window that goes from clear to black in 90 seconds.

Dr Ashrit's Story



John Spray

Director of the Planetary and Space Science Centre at the University of New Brunswick, Dr. Spray is a leading expert on what happens when two objects collide in outer space at very high speeds. This has led Dr. Spray to the development of new composite materials designed to protect people and infrastructure on Earth and in outer space.

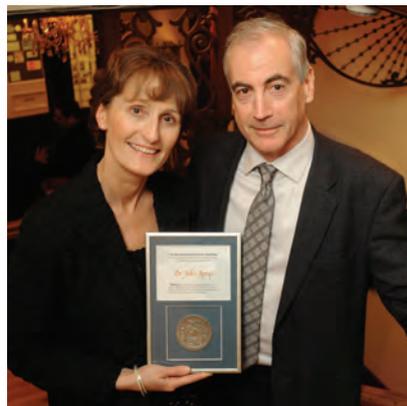
Dr Spray's Story



Jacques Gagnon

Dr. Jacques Gagnon is the Science Director at the Coastal Zones Research Institute in Shippagan. Using fresh fish waste from processing plants, Dr. Gagnon has invented a compound that will prevent people from developing type II diabetes. His results have allowed the program to advance to human trials. He has also developed other compounds for neurodegenerative diseases.

Dr Gagnon's Story



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