



Flow-through Shares for Canada's Biotechnology Industry

Background Materials Supplement

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This document is submitted on behalf of the following biotechnology associations:



Brad Thompson, PhD
Chair, BIOTECanada



Wilf Keller
President & CEO, Ag-West Bio Inc.



Ron Keefe
Chair, Prince Edward Island BioAlliance




Ryan Radke
President, BioAlberta



Doug Janzen
Chair, Life Sciences BC



Lorne Meikle
Chair and President, LifeSciences Ontario



Tracey Maconachie
Executive Director, Life Science Association of Manitoba



Murray McLaughlin
Chair, BioAtlantech



Robert Cervelli
Chairperson of the Board, BioNova



Yves Rosconi
Chair, BioQuébec



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A. Background

The life sciences and biotechnology industry represents, for Canada, a knowledge-based high-tech industry with important socio-economic impacts. Despite the large relative size of the sector, Canadian biotechnology companies have been vulnerable to funding limitations. To generate revenue, biotechnology companies must develop technologies for commercial sale or partner with larger, more mature companies that provide capital and in turn, take the product to market themselves.

The credit crisis has impacted biotechnology companies harder than firms in most other sectors¹. The last two years have been challenging for biotech companies, so it is not surprising that companies have shown an increased interest in other sources of capital as the usual funding sources have become increasingly constrained. They have been adversely impacted not only by the fact that venture capitalists have less money to invest, particularly in new companies versus existing portfolio investments but also the fact that the IPO market in Canada for biotech firms has virtually ceased to be a valid alternative. Canadian biotech firms have turned to innovative or non-traditional sources of capital. Some of these include the selling of tax losses, entering into standby equity distribution agreements (SEDA), out-licensing technologies and partnering with other companies to diversify project risk. Regional and local governments are increasingly interested in developing their own local biotech clusters. The value of municipal, regional, and federal government programs and incentives have been increasingly important for the viability of Canada's biotech companies. The vast majority of the industry is comprised of junior biotechnology companies and these companies normally operate on a high-burn rate, are the primary users of creative financing, and aim to partner with larger firms that have significant liquid capital to help take their technologies through the development pipeline. In the case of junior biotechs, government assistance programs significantly help cash flow and the financing of R&D. As such, junior biotechs are the primary applicants for government assistance programs such as grants and contribution agreements.

i. Risk Capital

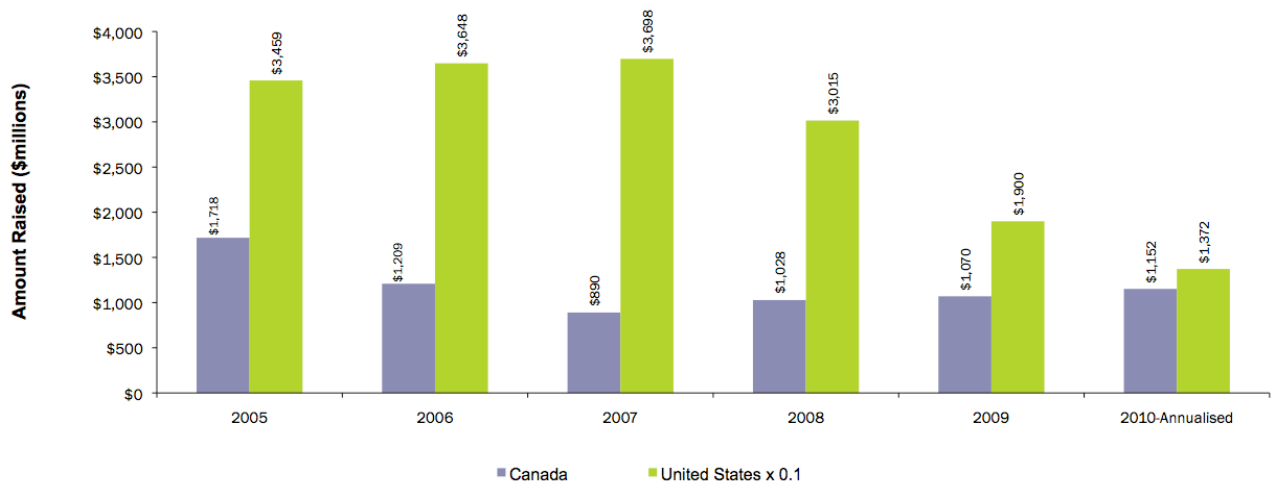
Building a strong knowledge-based economy in Canada requires a robust business environment that facilitates the flow of risk capital. Innovation is crucial for maintaining competitiveness and increasing standards of living but innovative companies are generally considered more risky. Risk capital is essential for a thriving innovation ecosystem and is a long-term endeavor. Building a large pool of successful technology entrepreneurs, venture capitalists, and company managers takes decades. As is the case for many venture capital industries around the world, the Canadian industry has not yet been able to deliver returns to consistently attract institutional

¹ Ernst & Young Beyond Borders 2010



Canadian and foreign investors. As a consequence, fundraising is shrinking and the investment pace by Canadian funds is contracting. Venture capital plays a key part in the success of smaller, start-up companies in the most innovative and promising business sectors. While large established Canadian corporations can access world markets, the vast majority of Canadian public and private companies aren't large enough to tap into U.S. and other world markets. Because venture capital investors tend to seek local opportunities, or work with investment companies with which they are familiar, innovative Canadian ideas must have a well-developed, Canadian venture capital industry to become commercially successful.

Figure 1: New Capital Commitments to VC Funds: Canada vs. U.S.

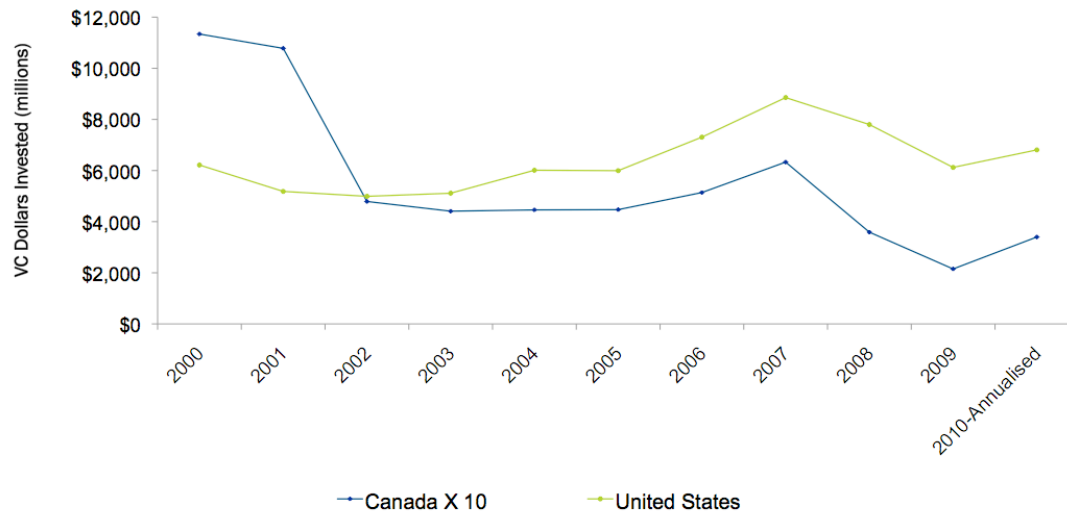


Source: Thomson Reuters, PricewaterhouseCoopers

Canada's venture capital industry, although not as mature and robust as that in the U.S., has experienced a similar decline in attracting new dollars. The institutional investor community no longer invests in the asset class. The influx of new capital into several VC funds, most notably the creation of the Ontario Venture Capital Fund (OVCF) and the Government of Quebec's investment in Teralys Capital, has helped to boost new capital commitments to VC funds. However, without a consistent and concerted effort to continue these commitments to VC funds, the funding gap will continue. There is a need for a fundamental change to the venture capital investment model to ensure the consistent flow of risk capital to VC funds and companies.



Figure 2: Venture Capital Investments in Life Sciences: Canada vs. U.S.



Source: Thomson Reuters, PricewaterhouseCoopers

In 2009, both the funding of Canadian venture capital firms and their investing in Canadian technology companies were at their lowest levels since the mid-90s. Investment in Canadian life sciences firms has taken a dramatic hit over the last 10 years, and although there was an upward trend in the later portion of the decade, the industry has been undercapitalised. Because junior biotechs do not have the risk capital available to them to continue development, much of the industry's huge R&D outlays are going to waste.

Venture capitalists also invest in traditional sectors of Canada's economy, which are not dependant on VC dollars as compared to technology companies. Risk capital provided by retail investors through the public markets, has proven to be a substitute for venture capital in the resource sector.

ii. Business Sector Research and Development

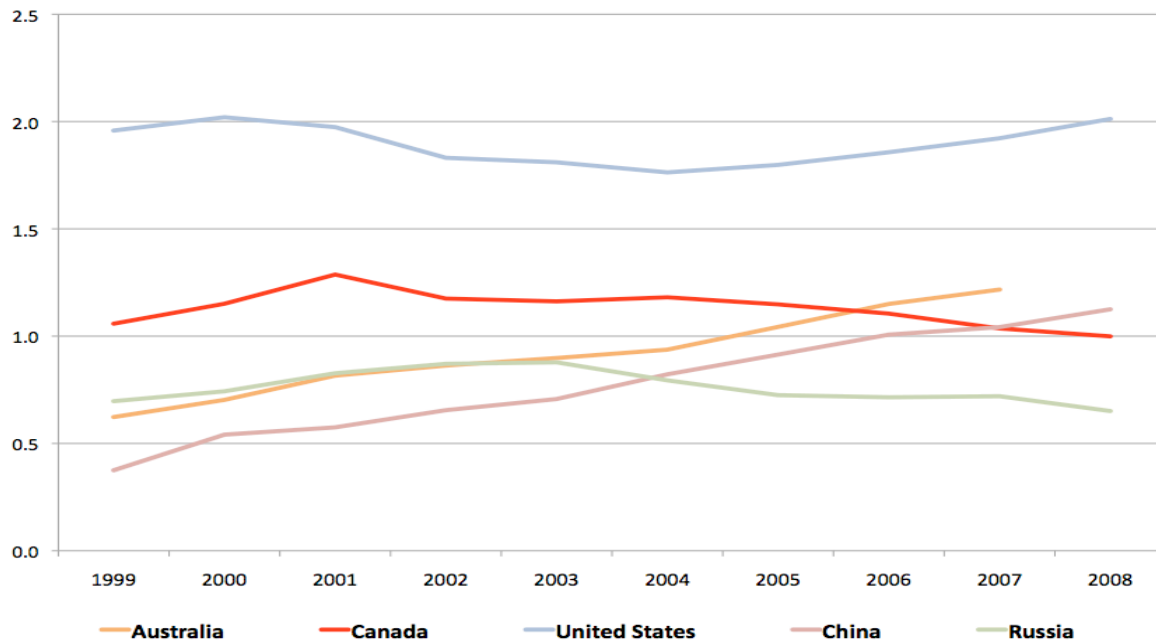
Over the last 15 years, countries in the OECD have consistently increased their business expenditures on research and development (BERD), far outpacing economic growth. The OECD's total BERD/GDP ratio stood at 1.59% in 2007, the year in which many economists and analysts consider to be the beginning of the global recession. Canada's BERD investment in R&D has been relatively unscathed over the last 15 years, with BERD/GDP ratio ranging from 0.99% and 1.19%, representing disproportionate negative growth compared to that experienced in the OECD overall. Simply put, Canada's share of total R&D performed by the business sector consistently has been and continues to be lower and uncompetitive with the OECD². Canada's BERD/GDP ratio is in the leagues of

² OECD. Main Science and Technology Indicators 2010-01.



countries such as Italy, the Czech Republic, and Russia. This benchmark demonstrates that, compared to American and European companies, in aggregate, Canadian businesses consistently under-invest in R&D.

Figure 3: BERD/GDP ratio of Select Countries



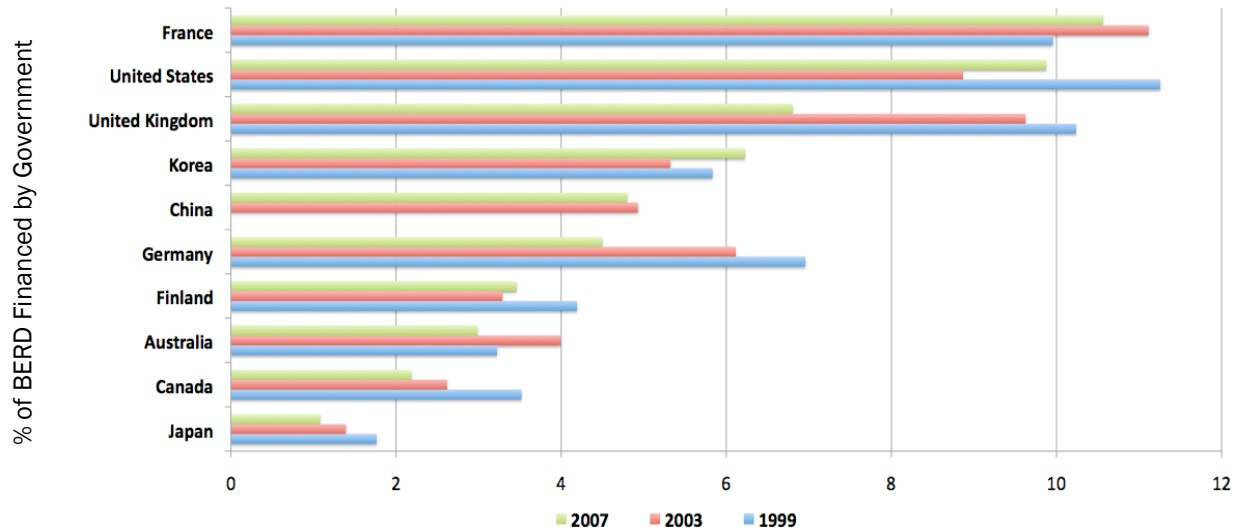
In countries such as Australia, China, and Singapore, business sector investment in R&D has been outpacing economic growth. For example, business sector R&D in China experienced a 400% growth between 1999 and 2007. Considering China's economy grew by almost 200% during this time period, business sector investment in R&D has been outpacing economic growth by a ratio of 2:1.

Relatively low business sector R&D could be explained by the lack of government support for innovative companies. With respect to government support for business expenditures on R&D, expenditures financed by the Government of Canada is among the lowest in the OECD. In 2007, the Canadian government assisted 2.2% of all business expenditures on R&D. Only Japan, with 2.1% of all BERD financed by government, is lower than Canada - this places Canada among the bottom of the ranks for government support of business sector R&D³.

³ OECD. Main Science and Technology Indicators 2010-01.



Figure 4: Percentage of BERD Financed by Government in Select Countries



Biotechnology R&D

In Canada, R&D attributed to the biotechnology sector accounts for approximately 11% of all business-sector R&D. To put this in perspective, the bio-based economy encompasses approximately 7% of Canada’s total GDP, yet the sector accounts for 11% of all business expenditures on R&D. Simply put, Canada’s biotech sector punches above its weight in terms of its investment in R&D. An analysis of the sector’s R&D intensity, results in a BERD/GDP ratio of 2.7% in 2007⁴. Compared to Canada’s overall BERD ratio of 1.04%, the industry invests almost 3 times as much in R&D compared to all sectors.

While the cumulative average growth rate (CAGR) of business sector R&D in Canada has been 7.2% per year between 1999 and 2005, the CAGR of business sector R&D in the biotechnology space during this time period has been 9.8%. Canada’s biotechnology firms are outpacing investment in R&D compared to the aggregate innovation economy.

An analysis of business sector R&D in Canada suggests approximately 55-58% of total expenditures are dedicated to wages and salaries⁵. In the case of Canada’s junior biotechnology companies, between 65 and 70% of total R&D is dedicated to wages and salaries.⁶ This implies the R&D intensity of Canada’s next generation biotechnology firms is primarily associated with employing professional researchers, technicians, and technologists as compared to the average of all businesses performing R&D in Canada.

⁴ BIOTECanada Research Services

⁵ Statistics Canada. CANSIM - Table 358-0024.

⁶ BIOTECanada Research Services



Education Systems

Canadian universities and colleges grant more than 20,000 degrees, diplomas, and certifications in life sciences every year⁷. Commensurate with good public policy, Canada needs to ensure these graduates have domestic employment opportunities. Supporting and growing Canada’s junior biotechs, the backbone of the growing bio-economy, is one way in which we can ensure that the next-generation of minds in life sciences have job prospects available to them.

iii. Innovative Small and Medium Sized Companies

With leading science and technology, Canada can become one of the recognised leaders in global innovation. Financing innovation can be challenging since innovative activities and assets are usually intangible and valuations difficult. Innovative small and medium sized businesses make up approximately 4.2% of all SMEs in Canada, and have greater financing needs than non-innovative SMEs⁸. Several important characteristics of innovative small businesses versus non-innovative small businesses include:

Innovative SMEs	Rationale
Increased likelihood of seeking external financing .	Innovative SMEs normally operate on a monthly burn-rate, depleting their cash much faster than non-innovative SMEs.
Greater likelihood of being turned down by credit suppliers.	Financial institutions consider innovative SMEs more risky than non-innovative SMEs due to their lack of creditworthiness (lack of operating income, poor credit history, insufficient collateral security and fundamental nature of the business).
Use financing rounds mostly for fulfilling working capital (short-term) needs.	Innovative SMEs operate on a burn-rate, giving need to raise more capital for fulfilling short-term gaps in cash flow.
Raise equity as the predominant share of total financing.	Innovative SMEs have greater success raising equity capital than debt capital as equity capital provides reduces burden for principal and interest payments.
Greater likelihood of facing stringent terms and conditions when raising debt.	Financing terms and conditions for innovative SMEs reflect their high-risk profile.

⁷ Statistics Canada. Tables 477-0016 and 477-0014.

⁸ SME Financing Data Initiative, Statistics Canada, Survey on Financing of Small and Medium Enterprises, 2004.



Attributes of Junior Biotechnology Companies

A junior biotechnology firm is one that primarily uses biotechnology for the purpose of developing new products, services or processes. The following characterises a junior biotechnology company:

- No commercial product on the market.
- Little to no operating income.
- Non-taxable position and do not need to deduct R&D expenses.
- Primary asset is intellectual property.
- Involved in speculative/high-risk R&D activities related to biotechnology.
- Dependant on private and public equity (angel capital, venture capital, public equity, etc.) as primary source of risk capital.



B. Discussion

Tax incentives can take a variety of forms including special deductions, or exemptions, accelerated write-offs, refundable and non-refundable tax credits, preferential tax rates, and FTS that benefit both the investors and issuing company. Incentives delivered through the tax system can offer significant advantages over other forms of government assistance such as grants and contribution agreements.

An increasing number of governments around the world are offering special fiscal incentives to business to increase spending on R&D largely because research and innovation are considered key to productivity and growth performance. Many OECD governments are redesigning their R&D tax incentives to make them more effective and in line with global competitiveness and attract foreign direct investment (FDI).

i. Characterising Fiscal Tax Incentives

Fiscal tax incentives are used to attract investors by means of offering them reduced rates of compliance with federal, regional, and/or municipal taxation. The use of investment incentives directed at attracting investors (corporate, individual and syndicate investors) is not regarded as a substitute for making the appropriate investment decision. Incentives may serve either as a supplement to an already attractive enabling environment for investment or as a compensation for proven market imperfections that cannot be otherwise addressed.

Some of the most important factors considered by investors (domestic and foreign) as they decide on investment location are:

- a predictable and non-discriminatory regulatory environment and an absence of undue administrative impediments to running their business;
- a stable macroeconomic environment, including access to domestic and international trade; and
- sufficient and accessible resources, including the presence of relevant infrastructure and human capital.

Canada's fiscal tax rules are globally competitive and in line with our major trading partners as they apply to large corporations. Recent tax improvements resulting in an overall income tax rate on new business investment that is the lowest in the G-7 and below the average of member countries of the OECD have been excellent steps to attract foreign multinational companies and foreign direct investment. However, reducing corporate taxes is largely ineffective for innovative SMEs as they are normally years away from profitability and as such, accumulate and carry-forward substantial amounts tax losses and other tax attributes every year. Alternative measures must be provided to create a level playing field in terms of fiscal tax advantages available to large corporations and innovative SMEs. One method in which many governments have



accounted for this discrepancy has been to introduce tax credits on R&D. Canada's Scientific Research and Experimental Development (SR&ED) tax credit program is globally competitive for domestically owned, private companies, but it is only effective if companies have capital to spend on R&D. The tax credit supports domestic companies and builds the rationale for continuing R&D in Canada, but does not address sustainable capital formation. R&D tax credits are an ex-post form of capital in that they are dependent on R&D performers having sufficient capital to engage in R&D activities, and thereby receive tax credits. Without the availability of risk capital to catalyse R&D projects, the benefit of R&D tax credits to the broad economy is minimal. Fiscal tax incentives designed to encourage greater private investment, such as FTS, are seen as free-market solutions to the risk capital gap.

Several fiscal tax measures exist to facilitate the flow of risk capital in other jurisdictions around the world:

Capital gains tax exemption

Exempting investors from capital gains tax on the disposal of their investment in innovative companies has long been asserted as a tool designed to spur private sector risk capital. Many nations including Australia and the United Kingdom have employed capital gains tax exemptions on investments in qualifying R&D-intense sectors. This method is largely valuable to sectors with a shorter development cycle and time to profitability. As a result of the lengthy regulatory and approval process, the junior biotech sector can take up to 15 years to reach commercialisation and therefore, investors are required to be patient as the value of their investment can be highly volatile throughout this period and ultimately, the materialization of capital gains could be very lengthy thereby acting as a disincentive for investing in biotech.

Relief for capital losses

Another option is to implement a relief for capital losses program that would in essence permit investors to utilise the amount of a capital loss on an investment against the investor's income. This would reduce the potential loss of an investment as the investor would make up the loss by paying less tax than would not be otherwise possible. This incentive is only attractive to individuals with a year-over-year tax liability and as such, is targeted toward high net-worth individuals within the highest tax bracket and those who expect a substantial tax liability at the end of each year.

Flow-through shares

The FTS program permits eligible companies in the resource sector to pass eligible exploration and development expenses to investors in the form of tax deductions. This incentive is of most value to high net-worth individuals in the highest tax bracket and has helped resource companies raise capital for exploration projects by mobilising private-sector capital.



ii. Flow-through Shares

An FTS program for the biotechnology industry would incentivise investors to help finance high-risk R&D ventures, similar to exploration in the mining sector. The FTS program is structured for both public and private companies, but is best suited for public companies. The following description of the FTS program is in general form. (For more information about the federal government's FTS program, interested parties should consult the *Income Tax Act* and the Canada Revenue Agency (CRA)).

The FTS program allows qualifying corporations in the mining, oil and gas, and renewable energy and energy conservation sectors, to transfer exploration and development expenses to the investor in the form of tax deductions. Issuing companies are required spend the proceeds on qualifying exploration and development expenditures in Canada within two years. These expenses are subsequently “flowed-through” or passed from the company to the investor:

- the investor is able to deduct the renounced expenditures against other income thereby effectively reducing the risk of investment;
- the company cannot expense or amortize expenditures that have been renounced to investors and cannot claim tax credits on the amounts renounced;
- and the tax cost of the investor's FTS is reduced to zero.

As a result of the tax benefit accruing to the investor, the tax cost of the investment is deemed to be nil. Furthermore, the investor is required to comply with a two-year holding period and the issuing company must spend all proceeds from the issuance of FTS on qualifying expenditures within a two-year period.

Qualifying expenditures

By permitting the investor to claim the expenditures renounced by the corporation, the investor's after-tax cost of purchasing the shares is reduced. As such, investors in the highest tax bracket benefit the most and this incentive reduces an investor's risk exposure. Offsetting the tax benefits to the investor is the loss of the tax deductions to the issuing company. Generally, corporations in a taxable position do not issue FTS; they would rather claim expenses to limit their future tax liability. Those that are not currently taxable, normally because of the lack of profits, consider the immediate benefits of raising equity financing that would be otherwise unavailable or only available at a higher cost of capital, to be superior to the cost of the renounced deductions. This situation would be even more prevalent in biotech companies, since the renunciation of the expenditures would also mean that biotech companies would claim a lesser amount in SR&ED tax credits.



Time value of money

In general, the foregone tax revenue to the government (as a result of the tax deductions transferred to the investor), will be eventually be recouped as the issuing company will eventually pay corporate tax sooner than it would have otherwise, due to the deductions renounced in favor of the investor. Furthermore, since the tax cost of the investment is reduced to zero, the investor effectively pays two times as much capital gains tax upon liquidation; even if the shares have been disposed at a value lower than the initial purchase. The treasury benefits because all the proceeds from sale are considered capital gains. These two return elements act as revenue generators for the government.

The FTS program is generally viewed as a tradeoff; the tax revenues foregone are eventually reaped as companies become profitable earlier, the companies forgo SR&ED tax credits, and the investors dispose of their investments and pay more capital gains tax.

Risk controls

The Canada Revenue Agency (CRA) reviews all FTS arrangements and audits are carried out to monitor the program. In addition, the CRA already audits the SR&ED program so the overall monitoring costs should not be significantly increased.



C. The Resource Sector Perspective

i. History of Flow-through Shares

The Government of Canada has recognised the economic benefits of supporting exploration and development of Canada's natural resources. The federal government introduced a FTS program for Canada's resource sector in 1954 and extended it to certain aspects of renewable energy technologies (particularly wind power) in the mid 1990s. In recent years, the federal government and some provinces have introduced additional investment incentives for Canada's resource industry.

ii. Federal and Provincial Support Initiatives

In October 2000, the Canadian federal government introduced a 15% non-refundable tax credit. The credit is in addition to the existing 100% deduction of eligible exploration expenditures and is deductible from the federal portion of one's taxes. To distinguish it from the fully deductible regular flow-through, investors are calling this new credit-enhanced version "super" flow-through.

The 'super' flow-through program keeps exploration dollars in Canada, particularly in northern and rural areas, for Canadian projects.

Other jurisdictions consider flow-through and the 'super' flow-through enhancement to be worthwhile programs. A number of Canadian provinces have harmonized their programs with the federal program.

The 'super' flow-through program helps to address the longstanding decline in base metal reserves in Canada. New discoveries help to maintain existing mining infrastructure, including smelters and refineries, and the communities they support. For taxpayers at the highest marginal tax rate the federal 15% non-refundable tax credit, when added to the regular 100% deduction, is equivalent to a 137% exploration expense deduction for federal tax purposes. Several provincial flow-through initiatives have been announced that apply to the provincial portion of income tax relating to eligible expenses in relevant jurisdictions. Ontario (5%), Saskatchewan (10%), Manitoba (10%) and British Columbia (20%) offer harmonizing tax credits. The Ontario tax credit is refundable; the other tax credits are non-refundable.



iii. Program Evaluation and Appraisal

Research on the federal government’s FTS program in the resource sector demonstrates it has been an effective means of providing needed risk capital to junior mining and petroleum companies. This research indicates the issuing of FTS has resulted in incremental increases in spending on mining and development over and above the government expenditure required.

The program has worked tremendously well since its inception in the 1950s and has helped to position Canada as the global leader in the natural resource sector. Similarly, since the federal government expanded FTS to the clean-technology sector in 1996, Canada has become world-renowned in renewable energy technologies.

RESOURCES		CLEAN-TECHNOLOGY
Oil and Gas	Mining	
<ul style="list-style-type: none"> • Economic impact to Canada’s GDP estimated at \$3.56 trillion over the last 25 years. • Federal and provincial tax revenues total \$1.1 trillion over the last 25 years. • Canada is home to the largest number of publicly-traded oil & gas issuers (385) in the world. • Canada’s public markets are home to over 35% of the world’s public oil and gas companies. • More than 40 analysts cover oil and gas companies listed on Canada’s public markets. 	<ul style="list-style-type: none"> • A record \$22.2 billion was raised on the TSX and TSX-V by listed mining companies in 2009. Canada’s capital markets are now the global leader in resource finance. • Approximately 60% of the world’s mining exploration companies are Canadian. • Over 1400 Canadian and international mining companies are listed on Canada’s public exchanges and 50% of these companies’ mineral exploration projects are held outside of Canada. • More than 20% of worldwide exploration expenditures take place in Canada. • Canadian mining companies engage in more exploration projects than companies from any other country. • Over 200 analysts cover mining companies listed on Canada’s public markets. 	<ul style="list-style-type: none"> • Toronto Stock Exchange and TSX Venture Exchange are home to the highest number of clean technology companies (125) in the world. • In 2009, Canada’s clean technology and renewable power companies raised over \$1.5B through the public markets, and have experienced a CAGR of 35% in trading volume between 2005 and 2009. • More than 30 analysts cover publicly-traded Canadian clean technology and renewable power companies.

Sources: Toronto Stock Exchange, Canadian Mining Association, Canadian Association of Petroleum Producers, Natural Resources Canada, Metals Economics Group