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## Leveraging ICT Adoption: *What Can Work for Business?*



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**JPW**INNOVATION  
ASSOCIATES INC.

January 2010

The Information Technology Association of Canada (ITAC) is the voice of the Canadian information and communications technologies (ICT) industry. ITAC represents a diverse ICT community spanning telecommunications and internet services, ICT consulting services, hardware, microelectronics, software and electronic content. ITAC's community of companies accounts for more than 70 per cent of the 572,700 jobs, \$155.3 billion in revenue, \$6.22 billion in R&D investment, \$30.4 billion in exports and \$11.8 billion in capital expenditures that the ICT industry contributes annually to the Canadian economy. ITAC is a prominent advocate for the expansion of Canada's innovative capacity and for stronger productivity across all sectors through the strategic use of technology.

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This report was made possible through the financial support of Accenture Inc., Intel of Canada Ltd., SaskTel and the Government of Canada. ITAC is grateful for their support.



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## Executive Summary

To date, the conventional way of encouraging business investment in information and communication technology (ICT) has been to provide tax incentives, notably, accelerated depreciation for ICT capital assets. Despite the fact that the Canadian government has recognized the importance of ICT adoption for industrial productivity and implemented generous capital cost allowances, ICT uptake by enterprises – small and medium enterprises (SME) in particular – remains a policy challenge. There is a strong feeling within the ICT industry that a *different* policy mix of the incentives is required to markedly improve the adoption and use of ICTs.

This paper provides an updated summary of the existing policies in Canada and other OECD countries and follows on work conducted for ITAC on 2005. (See “Incentives for ICT Adoption: Canada and Major Competitors, by Jacek Warda available at [www.itac.ca](http://www.itac.ca)). However, measures of encouraging ICT adoption by business are diverse and policy initiatives combine many different elements. Adoption strategies include tax incentives, infrastructure development, procurement policies, and R&D support initiatives. An important set of initiatives is aimed at the firm’s capacity to adopt. These comprise incentives for corporate training and organizational change, and information on and demonstrations of best practice and benefits of adopting new technologies. This paper reviews these different policy modes and provides insight on the most appropriate policy mix that could be applied in Canada.

This study finds that except for stimulus measures such as the accelerated capital cost allowance measures announced in the Federal Budget in 2009, there would not be much change in depreciation allowance rates applicable to ICT capital assets in other countries compared with the 2005 ITAC study. And tax credits for purchases of ICT capital assets are virtually non-existent. Tax incentives, however, are not the sole policy instrument that can be applied in support of ICT adoption.

In the area of the direct grant-based measures, in particular, there is an interesting set of technology voucher programs, which operate in many European countries. These are largely small programs run by governments with the objective of stimulating innovation capability of small and medium sized companies. They provide a carrot for small firms to engage in innovation and collaboration. The programs are designed with administrative simplicity in mind. Apparently, there is little managing and administration on the part of government and the recipient companies. Countries such as Austria, Belgium, Denmark, Finland, Netherlands, and the United Kingdom implemented the vouchers, with more attempting to follow this path. This attests to a relative validity and popularity of the program. The voucher programs can be designed to address a narrower objective such as technology adoption. A program can be set that offers vouchers for the purchase of advisory services in e-commerce, systems integration, software, or digital content.

Public procurement is another instrument in the policy mix, with a potential to stimulate technology adoption in the private sector. Government can be an influential customer and partner for the private sector through its contracting out of research and procuring innovative products and services from business. Public procurement policies can play an important role and governments are increasingly interested in using this lever to stimulate business demand for innovative products and services.

Public procurement can at the very least indirectly affect wide technology adoption. Fulfilling “public need, challenge, or demand” does not automatically stipulate that all public procurement must be carried out with the purpose of meeting the direct needs or goals of government. There are instances where purchasing by public sector organizations is directed not only towards fulfilling their own tasks, but also aims to influence and support certain patterns of demand on the part of private consumers, which is often a social goal of public procurement. Such is the type of procurement called catalytic, which potentially is a good option for government to encourage technology adoption.

Collaborative procurement is another form of procurement policy that could encourage technology adoption. It occurs when public authorities or agencies buy jointly with private purchasers and both utilize the procured innovations. In such cases, initial demand from the public sector is very often intended to provide a “launch pad” market that could eventually lead to the development of an equally strong articulation of demand from the private sector. In this context, the role for government is clearly to serve as a lead adopter or a launching customer, and through its testing and validation of new technology, to help in technology commercialization adoption.

Finally, the report indicates that ICTs can create a stronger linkage between business strategy and business value. However, these translational benefits of ICT will not happen unless organizations possess capabilities that would facilitate the take-up of new technology. An important part of this capability is having a knowledgeable workforce with appropriate skills and training. Another issue is that all this has to fit into company business strategy. Therefore, business development skills and having ICT champions in the organization are equally important. These aspects have a direct influence over the company’s readiness for ICT adoption.

The report concludes that it is not possible to expect improvements in technology adoption by small (and at times unprofitable) businesses by relying on limited tax offsets such as accelerated depreciation, which to large extent target only a fragment of the ICT product market (e.g., computers in Canada). A broader range of policies interacting with one another is required. These policies may include direct assistance targeted to technology adoption and catalytic or collaborative procurement led by government as a launching customer.

Success of any policy intervention will not happen if the receptor conditions for assimilating new technologies by small firms are not met. These, in particular, include educating and training employees, and designing effective ICT business strategies. Voucher programs focused on building such capabilities offer a vehicle to strengthen the receptor conditions of the firm for adopting new ICTs.

## Background

Innovation comes not only from R&D but also from the adoption and use of new technologies embodied in capital investment. An example is information and communication technologies (ICT), which are seen as enablers of innovation, productivity, and economic growth in all industrial sectors of the economy. However, studies point to Canadian businesses as slow adopters of ICTs.

There is recognition that adoption and use of new technologies is slow, particularly among the small and medium-sized companies, which is detrimental to Canada's future economic and social prosperity. Economic studies, notably those made under auspices of the C.D. Howe Institute and the Institute for Competitiveness and Prosperity, show that high taxes on investment discourage businesses from buying the new equipment and technologies that improve labour productivity. In the absence of such modernization, production processes age, businesses fall behind, and they have difficulty increasing their employees' incomes.<sup>1</sup>

These studies tend to show that Canada's adoption of ICTs significantly lags behind our major foreign competitors and is an important contributor to our overall productivity gap. According to Canada's Science, Technology and Innovation Council (STIC), Canadian businesses have some 33 per cent investment gap in the use of ICT compared to their US counterparts.<sup>2</sup>

The slow rate of ICT adoption is particularly troubling for Canada's smaller companies. The survey conducted by IDC Canada on behalf of ITAC has found that in spite of having positive perceptions about the value of ICT, a majority of small and medium-sized enterprises (SMEs) see non-ICT investments as being more critical to their economic performance than ICT investments.<sup>3</sup>

In its recent report, the Council of Canadian Academies acknowledges the ICT adoption gap and proposes to "encourage investment in advanced machinery and equipment (M&E) in general," and in ICT, in particular.<sup>4</sup> The Council further states that "such incentives should be designed only in light of a more thorough understanding of the reasons for the relatively slow adoption of ICT in Canada to date." In particular, the Council presumes that one important reason for slow adoption of innovation is a lack of business strategy on the part of small firms.

In a 2006 report, the Telecommunications Policy Review Panel suggests a "smart adoption" policy, which would encompass a more holistic set of incentives designed for small companies. The panel proposes that a national ICT adoption strategy be developed and include tax measures such as an ICT adoption tax credit.<sup>5</sup> Eligible expenditures for the credit would include not only the cost of ICT investment assets but also complementary expenditures related to the effective adoption of ICTs (i.e., skilled personnel, workforce IT training, organization and strategy development expenses such as business process re-engineering, supply chain management, and more efficient marketing and distribution practices).<sup>6 7</sup>

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<sup>1</sup> Duanjie Chen, Jack M. Mintz and Finn Poschmann, *Attention G-7 Leaders: Investment Taxes Can Harm Your Nations' Health*, C. D. Howe Institute, e-Brief, September 20, 2005 p. 1-4

<sup>2</sup> Science, Technology and Innovation Council, *State of the Nation Report 2008*, Ottawa 2009, p. 22

<sup>3</sup> Michael Hyjek and Jamie Sharp, *Does ICT Matter to SMBs in Canada?* IDC Canada, October 2006

<sup>4</sup> Council of Canadian Academies, *Innovation and Business Strategy: Why Canada Falls Short*, April 2009, p. 2

<sup>5</sup> Government of Canada, *Telecommunications Policy Review Panel: Final Report*, 2006, p. 10

<sup>6</sup> ICT investment is defined by Statistics Canada to include investment in computer equipment, communications equipment, and software (which in turn is broken down into off-the-shelf, customized and own-account components).

These are just a few of the recent developments in the ICT policy area that this paper attempts to discuss, compare and analyze. Its objective is to strengthen policy discussion in Canada on the vital role of ICT adoption for innovation, commercialization and productivity growth and the need for designing new policy instruments.

To date, the conventional way of encouraging business investment in ICT has been to provide tax incentives, notably, accelerated depreciation for ICT capital assets. Despite that the Canadian government has recognized the importance of ICT adoption for industrial productivity and implemented generous capital cost allowances (CCAs), the above reports suggest that the ICT uptake by SMEs, in particular, remains a policy challenge.<sup>8</sup> There is a strong feeling in the industry that *different* policy mix of the incentives is required to markedly improve the adoption and use of ICTs. This is particularly important in the case of small and medium-sized enterprises that have the greatest potential for productivity improvement.

### *Organization*

This paper focuses on ICT related policies and programs OECD-wide rather than on picking the countries to compare and analyze. Thus the discussion in the paper is program-driven rather than country-oriented.

The paper provides an update of the existing tax incentives in Canada and other OECD countries but it does not stop at this. It also reviews *new* areas of adoption incentives, especially those comprising direct assistance to new technology adopters. It examines experience with such incentives as ICT grants and subsidies, technology vouchers and special ICT-boosting infrastructure programs in competitor countries. It also discusses public procurement that aims at generating demand for innovative technologies in the private sector. These sections are followed by a section on creating appropriate receptor conditions among small businesses, in particular, to engage in new technology adoption. The report concludes with analytical observations and policy suggestions for technology adoption.

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See Statistics Canada, *Canada's Journey to an Information Society*, Catalogue no. 56-508-XIE, December 2003, p. 3. Available online at: <http://dsp-psd.pwgsc.gc.ca/Collection/Statcan/56-508-X/56-508-XIE2003001.pdf>

<sup>7</sup> Government of Canada, *Telecommunications Policy Review Panel: Final Report 2006*, Chapter 7: Information and Communications Technology Policy, p. 7-37

<sup>8</sup> The 2009 federal budget introduced a temporary (2009-2011) 100 per cent write-off of general-purpose electronic data processing equipment and systems software for that equipment, including certain ancillary data processing equipment – up from a regular annual write-off of 55 per cent of such expenditure allowed since 2007. See <http://www.budget.gc.ca/2009/plan/bpa5a-eng.asp#Business>

## Modes of Support for ICT Adoption

Measures of encouraging ICT adoption by business are diverse and policy initiatives combine many different elements. Adoption strategies include tax incentives, infrastructure development, procurement policies, and R&D support initiatives. An important set of initiatives is aimed at the firm level. These comprise incentives for corporate training and organizational change, and information on and demonstrations of best practice and benefits from use. The focus of these policies has largely been on the adoption of ICT by small companies.

Based on the national policies reviewed for this study, ICT adoption tends to be supported by governments through the following measures:

- Through the tax system: chiefly through accelerated depreciation allowances and only rarely through the tax credits
- Through direct assistance programs (grants and subsidies) aimed at assimilation of ICTs into companies
- Through procurement programs in which government is the main procurer of ICT innovations but the users are companies in the country
- Through building receptor conditions for take-up of ICT investments at the firm level – e.g., training and skill development, management techniques, and organizational change

This paper reviews these modes and provides insight on the most appropriate policy mix that could be applied in Canada.

It should be noted that the first two support instruments – tax incentives and direct assistance – are supply-side instruments. The objective of *supply* measures is to push companies to increase their ICT adoption. Another approach, largely represented by the latter two measures – procurement and receptor building, can be described as a demand approach. The objective of *demand* measures is to induce companies to demand more innovative products and services, and thereby pull businesses to increase their ICT adoption.

## Tax Incentives for ICT Adoption

The business tax system is often singled out as key to realizing Canada's innovation potential. Business taxes – especially on capital – have been high, but are now declining and becoming internationally competitive.<sup>9</sup> Provinces are phasing out taxes on company capital. In 2010, Ontario and British Columbia's provincial retail sales taxes will be harmonized with the federal General Sales Tax (GST), which through its offset system will further reduce the tax burden on business. These are positive business tax developments, which should step up the rate of ICT adoption by Canada's SMEs in the future.

In the short- to medium-term, however, a more immediate option is to stimulate ICT adoption via the corporate income tax system. Tax incentives for ICT adoption are chiefly composed of two items:

- Capital cost allowances (CCA) or accelerated depreciation for ICT equipment
- Tax credits on purchases of ICT equipment

### *Capital Cost Allowances*

In Canada, the increased CCAs were first introduced in Budget 2004 for both computers and broadband equipment. They were raised by 50 percentage points (from 30 per cent for computers and 20 per cent for broadband infrastructure) because of the rapid pace of technological change and resulting obsolescence of ICT equipment, and the fact that the CCA rates in this area have not been adjusted since 1976.

Since, the 2005 ITAC study quite a few things have changed in Canada.<sup>10</sup> In the Federal Budget 2007, computer equipment and related software became eligible for a 55 per cent declining balance capital cost allowance (CCA), up from 45 per cent, to better reflect the useful life of these assets. As a stimulus measure, the Federal Budget 2009 has temporarily raised this CCA rate to 100 per cent (with no half-year rule applicable) for the two-year period.<sup>11</sup> If it expires on January 27, 2011, it will likely return to the permanent rate of 55 per cent (with half-year rule required). Broadband communications equipment does not qualify for the 100 per cent CCA rate.

As a result of the 100 per cent CCA rate, Canadian businesses will be able to fully deduct the cost of eligible computer (including the systems software for that computer) in the first year that CCA deductions are available. Moreover, Budget 2009 extended the temporary 50 per cent straight-line accelerated CCA rate to investment in manufacturing and processing machinery and equipment undertaken in 2010 and 2011. ICT products used as a part of manufacturing equipment will be eligible for the incentive, for which the half-year rule applies.

In the United States, there are two “temporary” features of the US tax code that considerably accelerate the deductions on a wide range of ICT capital assets – wider than the recent CCAs

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<sup>9</sup> Peter Nicholson, *Canada's Innovation Gap: Estimating Its Size, Explaining Its Causes*, Council of Canadian Academies, Presentation to Socio-Economic Conference 2009, Gatineau, QC, 5 May, 2009

<sup>10</sup> Jacek Warda, *Incentives for ICT Adoption: Canada and Major Competitors*, Information Technology Association of Canada, July 2005, <http://www.itac.ca/uploads/research/05july.pdf>

<sup>11</sup> <http://www.budget.gc.ca/2009/plan/bpa5a-eng.asp#Business>

introduced in Canada. These incentives are: the Section 179 expensing deduction, and a first year bonus depreciation of 50 per cent.<sup>12</sup>

First, under Section 179 of the Internal Revenue Code, taxpayers are allowed to write off an amount, up to a certain limit, of investments put in place during the taxation year. This limit was doubled, from US \$125,000 to US \$250,000 (CAD 134,000 to CAD 268,000) in the 2008 Economic Stimulus Act. The higher limit was to expire at the end of 2008. However, the 2009 Economic Recovery and Reinvestment Act extended it to end of 2009.<sup>13</sup> The depreciable property threshold is US \$800,000 (CAD 856,000).<sup>14</sup> If the US \$250,000 deduction is not extended into 2010 and thereafter, the Section 179 deduction is not entirely lost. It will revert to maximum US \$125,000 annually adjusted for inflation with the US \$500,000 (CAD 535,000) depreciable property threshold.

Second, the Economic Stimulus Act provides for 50 per cent “bonus” depreciation, for certain assets purchased in the taxation year. The bonus depreciation provision was to expire at the end of 2008, but has been extended by the Economic Recovery and Reinvestment Act to the end of 2009.

Obviously, the Section 179 deduction is of greatest value to small companies. It is sometimes referred to as the “small company expensing” provision because the size of small business investments is relatively small and fits within the threshold amount, so that the deduction can be fully utilized. The bonus depreciation, however, is of wider application as it is also available to large companies investing in ICT and other eligible capital assets.

Tangible property depreciated under the modified accelerated cost recovery system (MACRS) with a recovery period of 20 years or less qualifies for Section 179 expense deduction.

Both the Section 179 deduction and bonus depreciation are on the top of a regular accelerated depreciation scheme – the Modified Accelerated Cost Recovery System (MACRS) – under which computers and broadband equipment would likely qualify as *5-year property*, meaning the effective depreciation over 6 years, which takes into account a half-year rule. At the end of the sixth year, the asset is fully-depreciated.

If not for the stimulus measures, there would not be much change in depreciation allowance rates applicable to ICT capital assets in other countries compared with the 2005 ITAC study. For example, the following accelerated depreciations are available:

United Kingdom: A new temporary first year allowance (FYA) of 40 per cent (increased from 20 per cent) applies to expenditure on general plant and machinery above the first £50,000 (CAD 90,000) per year that qualifies for the annual 100 per cent investment allowance. The allowance

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<sup>12</sup> See Department of Treasury, Internal Revenue Service, How to Depreciate Property, Publication 946, <http://www.irs.gov/pub/irs-prior/p946--2008.pdf> and *Bonus Depreciation and Increased Section 179 Deduction under the American Recovery and Reinvestment Act*, <http://www.irs.gov/businesses/small/article/0,,id=213666,00.html>

<sup>13</sup> CCH Tax Briefing, *American Recovery and Reinvestment Act of 2009*, CCH a Wolters Kluwer Business, February 17, 2009 p. 4

<sup>14</sup> The Section 179 deduction also contains a provision beyond which the deduction is reduced by the amount by which the cost of Section 179 property placed in service in the tax year exceeds the threshold of US \$800,000 (CAD 856,000). In other words, the phase-out of the US \$250,000 deduction starts when the cumulative value of tangible property exceeds US \$800,000 and the deduction becomes zero at the level of US \$1,050,000 (CAD 1,124,000) of the property.

is available also to broad ICT capital assets that form part of general plant and machinery. For companies, the FYA applies to qualifying expenditure in the 12 months from 1 April 2009.

For the 2008/09 tax year, all businesses have an Annual Investment Allowance (AIA) on the first GBP 50,000 (CAD 156,000) of expenditure on plant and machinery. The AIA replaces the previous system of first-year allowances on plant and machinery expenditure of 50 per cent for small businesses and 40 per cent for medium-sized businesses.<sup>15</sup>

Netherlands: Accelerated depreciation is possible in 2009 and 2010, limited to a maximum of 50 per cent per calendar year. The facility applies to all business assets except for real estate and intangible assets.

Ireland: The Finance Act 2008 introduced a scheme for companies to accelerate tax depreciation on certain energy-efficient equipment so that the expenditure is written off 100 per cent in the year of acquisition. Qualifying categories include ICTs.

Germany: The declining balance depreciation was reinstated for assets acquired or produced after 31 December 2008, but before 1 January 2011. The depreciation may not exceed 2.5 times the amount calculated using a straight line depreciation rate of 25 per cent.

Australia: As a stimulus measure, small businesses can claim an additional investment allowance (the so-called “business tax break”) when they buy certain assets, and when they spend money to improve existing assets until the end of 2009. The measure allows small businesses to claim up to a 50 per cent tax deduction (depending on the level of annual revenues) on eligible assets. The tax break is in addition to the deduction for the decline in value your business is entitled to claim for an eligible asset. ICT assets qualify for the deduction.<sup>16</sup>

#### *ICT tax credits*

Tax credits for purchases of ICT capital assets are virtually non-existent. In 2005, there were two countries offering this type of tax incentive: Japan and Spain. Japan offered a 10 per cent tax credit on a temporary basis until 2006. Spain still offers a 10 per cent ICT tax credit, as a special and relatively comprehensive measure for small companies. It includes the costs incurred for the acquisition of equipment to enable Internet Access (hardware, software), design web sites, e-commerce, and information and communications technologies. Training to carry out these activities is also included in the tax credit base.<sup>17</sup>

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<sup>15</sup> <http://www.businesslink.gov.uk/bdotg/action/detail?type=RESOURCES&itemId=1073789928>

<sup>16</sup> Australian Taxation Office, *Small Business and General Business Tax Break*, <http://www.ato.gov.au/businesses/content.asp?doc=/content/00193781.htm&page=1&H1>

<sup>17</sup> *Innovation as the Explicit Target of Spanish Tax Incentives*, Presentation of the Ministry of Finance, Spain, 2001

## Direct Assistance for ICT Adoption

Direct assistance to business is another important policy tool in supporting technology adoption. Government payments may take the form of a grant or contribution. A grant or subsidy is a direct payment to a recipient and the government does not necessarily receive any goods or services as a result. A contribution requires an agreement between the government and recipient specifying the terms and conditions (e.g., repayments from profits earned) under which funds will be paid to the recipient.<sup>18</sup> Grants and contributions directly affect the cost of ICT investment in the firm. Procurement contracts are another form that stimulates demand for technology purchases. Those are discussed in the following section.

Based on the program review of direct assistance for ICT adoption, and ICT adoption, the following can be argued:

- There are not many programs that specifically target technology adoption.
- Most programs reviewed are under the banner of stimulating innovation via R&D.

In Canada, The Industrial Research Assistance Program (IRAP) run by the National Research Council is viewed as an example of a successful program that promotes the development and use of new technologies by small and medium sized businesses in Canada.<sup>19</sup> In Budget 2009, the federal government has recognized this by allocating \$200 million over two years to IRAP to enable it to temporarily expand its initiatives for small and medium-sized businesses.

IRAP provides expert advice and direct funding to stimulate wealth creation for Canada through technological innovation and aims to stimulate innovation in Canadian SMEs. IRAP is positioned to address the ICT adoption challenge by helping to create the conditions for the production of new technology and its commercialization. However, in its present mandate, IRAP focuses chiefly on pre-competitive assistance to SMEs and not necessarily on commercial adoption of new technology.

In other countries, the direct grant-based programs that are specifically focused on ICT adoption are also few, but include an interesting set of programs in Belgium-Wallonia. These include grants for using the services of a consultant to integrate e-business in SMEs and grants for the creation of an e-business website.<sup>20</sup>

### *Grant for E-business Integration*

Since 2003, the Walloon region awards subsidies to companies that are using the services of an external *consultant* to integrate e-business into their functioning. E-business refers to the running process of a company that is combining informatics and communication networks to

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<sup>18</sup> Lloyd Lizotte, *Federal government payments to industry, 1997-1998 to 2001-2002*, Working Paper 88F0006XIE2004012, Science, Innovation and Electronic Information Division (SIEID), Statistics Canada, July 2004, p. 6

<sup>19</sup> *Six Policies to Improve Productivity Growth in Canada*, Edited testimony by Andrew Sharpe, CSLS Executive Director given to the Senate Standing Committee on Banking, Trade and Commerce hearings on productivity, May 11, 2005, Ottawa, Ontario

<sup>20</sup> The measure is implemented through the Walloon Agency for Telecommunications (AWT) for the Directorate for Economy and Employment of the Ministry of the Walloon Region. See <http://cordis.europa.eu/erawatch/index.cfm?fuseaction=prog.document&UUID=F6E36DA1-AF83-4E81-BE433CE09F8C519E&hwd>

accelerate or automate exchanges with economic actors or consumers, and that aims to facilitate or improve the economic activities of the firm. A consultant is responsible for integrating e-business into the enterprise. The consultant's intervention aims at helping the company develop an e-business project's strategy (e.g., setting up an intranet system, sharing databases between different sites, etc.), defining its specifications, selecting the service providers, and running the project. The consultant is not allowed to be part of the company in charge of developing the project further.

The grant represents 80 per cent of the gross salary of the consultant for a mission from 3 to 12 months. It cannot exceed EUR 5,000 (CAD 7,700) per month. The company applying for the grant selects the consultant among the roster of project managers certified by a specific commission of the Walloon region.

The objective of this new e-business adoption measure is to develop not only the electronic commerce but also to give incentives to enterprises to develop B2B practices and to adapt their functioning to it. More than mere e-commerce, e-business also allows the transporting and networking of important flows of information. Approximately EUR 4 million (CAD 6.2 million) were allocated to the e-business measures between January 2003 and October 2007, out of which there were 108 consultant grants and 333 grants for e-business websites.

#### *Voucher Programs*

Another set of direct assistance policy tools worth consideration in stimulating technology adoption are innovation or technology *voucher* programs, which operate in many European countries, in particular. These are largely small programs run by government with the objective of stimulating innovation capability of small and medium sized companies. They provide a carrot for small firms to engage in innovation and collaboration. Depending on the country, companies are offered coupons in the modest amount of EUR 500 to EUR 7,500 (CAD 770 to CAD 11,550) in order to purchase knowledge-based services from designated independent institutions.

The programs are designed with administrative simplicity in mind. Apparently, there is little managing and administration on the part of government and the recipient companies, except that for larger sums of money, companies may be required to file a progress report. According to the Netherlands' evaluation of its voucher program, one of the longest running programs of this sort in Europe (pilot launched in 2004), in addition to reading and completing a short application form, the SME is required at the end of the project to make a declaration to the effect that the knowledge transfer project has been completed to its satisfaction.<sup>21</sup> On average, the administrative burden of the innovation voucher for SMEs has been estimated at 30 minutes' work.

In general, voucher programs include technology adoption, but mainly as a secondary outcome – the primary objective being receptor capacity for innovation. Countries such as Austria, Belgium, Denmark, Finland, Netherlands, and the United Kingdom offer such vouchers, with more attempting to follow this path, which attests to a relative popularity of the program. (See Table 1).

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<sup>21</sup> Maarten Cornet, Björn Vroomen and Marc van der Steeg, *Do innovation vouchers help SMEs to cross the bridge towards science?*, CPB Netherlands Bureau for Economic Policy Analysis, CFB Discussion Paper No 58, February 2006, p. 20

The voucher programs can be designed to address a narrower objective such as technology adoption. A program can be set that offers vouchers for the purchase of advisory services in e-commerce, systems integration, software, or digital content. This can include access to an ICT expert's advice and services in a similar way to the Walloon grant for retaining an e-business consultant as discussed above.

### *Comprehensive ICT Programs*

In other countries, according to a survey conducted for OECD IT Outlook 2008, governments continue to focus on the adoption of ICTs through broad ICT infrastructure programs. OECD, in particular, mentions the programs of five countries:<sup>22</sup>

*Austria:* Protec II programme supports the implementation of ICT-aided strategic product development in SMEs and is based on the recommendations of an evaluation of its predecessor programme Protec 2002+.

*France:* ICTs-SMEs 2010 program aims to advance ICT uptake in SMEs. Measures include ICT training for SME managers and directors, uptake of software for business intelligence, and enterprise resource management.

*Japan:* Ministry of Economy, Trade and Industry (METI) supports ICT diffusion to SMEs (e.g., through best practices, facilitation of IT investments, ICT training of managers and chief information officers, and technology uptake). METI aims to achieve an ICT uptake within basic business processes in 60 per cent of medium-sized enterprises by 2010 and an uptake of e-commerce by 50 per cent of trade partners of SMEs.

*Korea:* SME Production Digitalization Project introduces measures to lower initial investments and maintenance costs for SMEs, which are clearly lagging behind major companies in their use of ICT solutions for business operations (e.g., integrated systems for supply-chain and customer-relationship management).

*Spain:* The Avanza Plan is intended to increase the use of ICTs in SMEs. The aim is to connect to the Internet 99 per cent of companies with over ten employees and 79 per cent of micro-businesses and self-employed. It also promotes the integration of ICTs in business processes (e.g., electronic invoicing).<sup>23</sup> This plan is intended to enhance the supply and demand of information technology to improve the position of Spain internationally. With an estimated budget of EUR 5.7 billion (CAD 8.8 billion), the plan is to increase ICT investment from 4.8 per cent of GDP in 2004 to 7 per cent by 2010.

It is interesting to note that all these programs are comprehensive, not only providing direct support to small business but also taking account of ensuring that capacity for adoption exists in small companies. This is to be accomplished through training of employees and managers and building awareness about good business practices involving ICT applications.

## Government Procurement and ICT Adoption

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<sup>22</sup> OECD *Information Technology Outlook 2008*, OECD, Paris 2008, p. 319

<sup>23</sup> See [Avanza2 plan](#), and Douglas Lippoldt and Piotr Stryszowski, *Innovation in the Software Sector*, OECD Paris, November 2009, p.116

Traditional approaches to promoting technology adoption emphasize supply side instruments – such as support via grants or tax incentives, or availability and access to venture capital. Public procurement of innovation, meanwhile, is a demand side measure that is becoming increasingly popular internationally.

Public procurement is a third instrument in the policy mix, with a potential to stimulate technology adoption in the business sector and among small companies, in particular. Procurement contracts, normally awarded as a result of competitive bidding, result in the provision of a service or the performance of an activity required by a government department or agency. A contract is not considered a direct assistance, as it represents a purchase of technology by the government, from the firm. The purchase price reflects the cost of technology in terms of wages, materials, and overheads. This does not constitute support in the same sense as a grant or contribution. Contracts, however, may have a grant component to the extent that the service paid for by the government will generate “spin-off” income for the contractor thus bolstering the company demand for adopting new technologies.

Government can be an influential customer and partner for the private sector through its contracting out of research and procurement of innovative products and services from business. Public procurement policies can play an important role and governments are increasingly interested in using this lever to stimulate business demand for innovative products and services. The United States has been doing it for years through its defense and civilian oriented procurement programs. In the European Union (EU), where overall public procurement accounts for 16 per cent of GDP, procurement is getting recognized as a powerful means of stimulating private investment in research and innovation.<sup>24</sup> To exploit the innovation potential of public contracts, the European Commission published a guide on practices, in particular, on how to include innovation in government tenders.<sup>25</sup> Canada has been more of a follower than a leader in this policy area.

Governments can become lead users or launching customers (i.e., entities that are prepared to take the higher initial costs and risks involved in early adoption of an innovation), and they can provide important feedback on the final development of a product or service. In return, they can gain better abilities to use and benefit from the innovation, as well as increase the chance that it meets their specific needs.<sup>26</sup> The Canadian Council of Academies argues that in ICT, government has a catalytic role to fulfill.<sup>27</sup> Public procurement of ICT products and services can particularly support the ICT adoption by small firms because of the supply chain effects and demonstration effects.

Public procurement can at the very least indirectly affect wide technology adoption. Fulfilling “public need, challenge or demand” does not automatically stipulate that all public procurement must be carried out with the purpose of meeting the direct needs or goals of government. Authors of the Fraunhofer study note several instances of procurement where purchasing by public sector organizations is directed not only towards fulfilling their own tasks, but also at influencing and supporting certain patterns of *demand* on the part of private consumers, which

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<sup>24</sup> [http://ec.europa.eu/invest-in-research/policy/pub\\_procurement\\_en.htm](http://ec.europa.eu/invest-in-research/policy/pub_procurement_en.htm)

<sup>25</sup> European Commission, *Guide on dealing with innovative solutions in public procurement comprising good practices, 10 elements of good practice*, 2007

<sup>26</sup> European Commission, *Creating an Innovative Europe*, Report of the independent Expert Group on R&D and Innovation appointed following the Hampton Court Summit, and chaired by Mr. Esko Aho, January 2006, p.6

<sup>27</sup> Peter J. Nicholson, *Canada's Innovation Gap: Estimating Its Size; Explaining Its Causes*, The Council of Canadian Academies, Presentation to Socio-Economic Conference 2009, Gatineau, QC  
5 May, 2009

is often a social goal of public procurement. Such is the type of procurement called *catalytic*, which potentially is a best option for government to encourage technology adoption.

### *Catalytic Procurement*

Unlike direct procurement, based on the direct needs of procuring agency, catalytic procurement is based on needs of other end users, *extrinsic* to the procurer. Catalytic procurement takes place when government is involved in the procurement, or even initiates it, but the purchased innovations are ultimately and exclusively used by private end users. The crucial feature of catalytic procurement is that the state or public sector plays a key role as the *initial* buyer, but it does not purchase the product in question for its own direct use. Rather the intention is to support companies and individuals by providing them with the opportunity to buy new or alternative products. The real market penetration effect is eventually achieved by subsequent private demand. An example is market transformation programs in the energy sector encouraging buying “green” ICT-based solutions. In such cases, the main end-user of the privately developed ICT technology is not the public-sector but private organizations and households.<sup>28</sup>

Yet another example of catalytic procurement may be Canada’s provincial e-health initiatives involving the application of new information technologies in the health sector, notably for the purpose of creating electronic health records (EHR) management systems. Government, in this case, serves as a conduit, to indirectly stimulate or catalyze private demand from health practitioners or similar health-based businesses to procure and share new information technology to meet a more immediate government need of higher efficiency and quality of public health care, and in the long run leading to the development of more innovative health-oriented ICT products and services and their wider adoption.

### *Collaborative Procurement*

Another form of procurement policy that could encourage technology adoption is a *collaborative* procurement of innovative technologies and business solutions. It occurs when public authorities or agencies buy jointly with private purchasers, and both utilize the procured innovations. In such cases, initial demand from the public sector is very often intended to provide a “launching” market that could eventually lead to the development of an equally strong articulation of demand from the private sector. An example is when government purchases energy efficient and/or environmentally friendly ICT office equipment. The same products can also be purchased and used by private firms and individuals, once they become readily available in the market, and government purchasing thus provides one important means of realizing broader societal goals of energy efficiency or environmental sustainability. These goals reflect needs that are broadly shared by society.

A Canadian example of collaborative procurement is the Technology Test Beds initiative recently outlined by ITAC and the Canadian Advanced Technology Association. Technology Test Beds are a vehicle and incubator to conceive, develop, and sustain new technology solutions for government and to help create reference accounts for Canadian technology

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<sup>28</sup> Adapted from Fraunhofer Institute for Systems and Innovation Research, *Innovation and Public Procurement: Review of Issues at Stake*, 2006, Chapter 2, pp. 13-15 and 18 [http://cordis.europa.eu/innovation-policy/studies/gen\\_study13.htm](http://cordis.europa.eu/innovation-policy/studies/gen_study13.htm)

companies pursuing international markets.<sup>29</sup> In this context, the role for government is clearly to serve as a lead adopter or a launching customer, and through its testing and validation of new technology, to help in technology commercialization globally.

A similar but already working collaborative procurement program exists in France. Under the SME Pact, the French government acts as a broker/matchmaker, seeking voluntary commitment from large companies and government agencies to work with small and medium sized firms with high growth potential. It offers assistance under four main categories: technology, legal, purchasing, and strategy.<sup>30</sup> The advantage for smaller firms is that they raise their partnering profile and can benefit from SME Pact services. In addition, the pact ensures that rather than just being a small player in projects, SMEs can help shape such initiatives.

The SME Pact was created as a response to the lack of a level playing field for small companies in French public procurement. In general, small firms face difficulties in landing procurement contracts because of their young age, inexperience, and small size.

Overall, innovation procurement programs investigated in this study represent a collaborative type of the program where shared goals and public-private collaboration is prerequisite to awarding the project. This is similar to technology voucher programs, introduced in several European countries, which subsidize the purchasing of technology advice. (See Table 1 for selected programs.)

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<sup>29</sup> *Industry Issues the Call for Public Sector Technology Test Beds: Aims at New Applications for Government Productivity and Reference Accounts for Ten Thousand Canadian Technology Enterprises Pursuing International Markets*

[http://www.cata.ca/Media\\_and\\_Events/Press\\_Releases/cata\\_pr06300901.html](http://www.cata.ca/Media_and_Events/Press_Releases/cata_pr06300901.html)

<sup>30</sup> There is no direct funding of SMEs. The cost of operating the program is shared by the Comité Richelieu, regional councils, large companies, and OSEO. The budget is not publicly available.

## Building Receptor Conditions for Technology Adoption

ICTs can create a stronger linkage between business strategy and business value. However, these translational benefits of ICT will not happen unless organizations possess capabilities that would assimilate the take-up of new technology. An important part of this capability is having a knowledgeable workforce with appropriate skills and training. Another issue is that all this has to fit into company business strategy. Therefore business development skills are equally important. These two aspects have a direct influence over the small company's readiness for ICT adoption.

### *ICT User Skills*

According to OECD, ICT skills are becoming more differentiated. They seem to be complementary to other skill sets as well. Spurred by the pace of converging technologies from seemingly unrelated fields (e.g., information technology and biotechnology), skill sets are converging themselves and are growing in value as a result, often producing new skills which transcend all others.

Overall, there is an increasing demand for a mixture of skills. It is no longer enough to have only ICT specialist skills. Instead, a combination of other types of skills is sought for (e.g., project management, business, sales, marketing, etc.). ICT job titles advertised on many recruitment web sites are the best evidence of the shift in skill requirements to a multi-skilled and versatile employee. This happens both on the specialist and user sides. In high demand, particularly, are business development and "people" skills.<sup>31</sup>

Compared with the 2005 ITAC study, there has not been much change in training and education tax credits offered in Canada and other OECD countries. In Canada, a notable development was the introduction of the federal apprenticeship tax credit in 2006. Many other provinces also have the apprenticeship tax credits which are targeted at special categories of jobs (e.g., Red Seal) that do not always directly relate to ICT training. Only Quebec has a broader tax credit pertaining to on-the-job training.<sup>32</sup> The credit, however, is restricted to the manufacturing and processing companies only, while many of ICT small companies are in the services sector.

Other countries that have been compared in the 2005 ITAC study – Austria, France, Japan, Korea, Netherlands and Spain – still have education and training tax credits, but their designs have been modified. In the United Kingdom, despite the recurrent calls from industry, the introduction of the corporate training tax credit has not happened. In the United States, there is no training tax incentive at the federal level, but states may possess their own tax incentives which are generally job-creation oriented, not specifically targeted at corporate training of ICT skills.

Despite being supported by a limited number of countries through tax incentives, training – overall – seems to be best suited for comprehensive ICT adoption programs, such as the national direct assistance programs discussed above.

One of the main criticisms of education and training tax incentives is the high deadweight effects, given that some enterprises would be involved in these activities whether the incentives are available or not. Therefore, the incentives may play little role in education/training decisions,

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<sup>31</sup> OECD *Information Technology Outlook 2006*, OECD, Paris, 2006, pp. 218-219

<sup>32</sup> <http://www.pwc.com/CA/en/tax/budgets/2008/quebec-highlights.jhtml>

but simply subsidize activities which would have been carried out in any case. This is especially the case of large companies that have funds to carry out on-the-job training of employees. However, experts believe that the incentives play a positive and fostering role on the education/training demand for other less benefited groups such as very small enterprises.<sup>33</sup>

### *Business Strategy*

The Council of Canadian Academies' report argues that one of the important reasons for slow adoption of innovation, and lower productivity of the Canadian industry thereof, is lack of business strategy on the part of small firms. This also includes lack of ICT champions or people with experience in drafting and implementing business plans, and is generally predicated by lack of business ambition/culture to include change. The Council does not provide any specific recommendations on what to do to improve the business ambition or organization strategy. However, internationally, there are programs that attempt to address these problems.

For example, Ireland offers an interesting policy measure for developing business strategy. Under the Business Innovation Offer of Enterprise Ireland, business innovation is stimulated through the provision of modest levels of financial support to enable small companies to initiate the process of *adopting innovative business practices*. The financial support is usually through the provision of partial support for training and/or business advice.<sup>34</sup>

Yet another measure of similar intent is the Innovation Centre for E-Business (IBIZ) offered in Denmark. The centre generally provides guidance for small firms on how to adopt ICTs into daily business, including organization and management of e-business and its fit into overall business. Both Irish and Danish measures are new – introduced in the last two years – which testifies to a growing recognition of the importance of framework conditions for the introduction of ICT in business. (See Table 1.)

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<sup>33</sup> European Centre for the Development of Vocational Training, *Using Tax Incentives to Promote Education and Training*, Cedefop Panorama Series, Luxembourg: Office for Official Publications of the European Communities, 2009

<sup>34</sup> <http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&page=detail&id=9541&CO=9>

## Analytical Observations

Based on this review of policy measures, technology adoption is addressed chiefly by tax-based incentives, especially favourable depreciation allowances. It is not clear whether these allowances are effective for ICT adoption, however, as evaluations of these instruments are not available.

It is important to remember that tax incentives are not the sole policy instrument that can be applied in support of ICT adoption. Governments increasingly supplement the tax incentives by offering direct assistance programs to ICT adopters. These programs are typically implemented indirectly through general ICT infrastructure programs (e.g., “information society” building programs).

Although general infrastructure programs are important in the long term – as they provide a base upon which to strengthen the effective absorption of new technology – adoption, particularly in the context of small firms, needs to be addressed through specific programs.

The most promising programs with respect to ICT adoption are based on offering firms, an access to new technology and related expertise by providing low cost subsidies or vouchers by government for purchasing such technology. Among the 12 countries examined in this study – six (Austria, Belgium, Denmark, Finland, Netherlands, and the United Kingdom) have instituted low cost programs providing vouchers for purchasing of knowledge and innovation expertise. Similar approach could be taken to offer vouchers for adoption of new technology. As the adoption of technology is very much dependent on firms’ absorptive capacity (developing IT skills of employees, nurturing ICT champions, etc.), voucher programs can help underwrite the initial cost of building such capacity and investing in ICTs in firms.

One of the outstanding issues is that most existing voucher based programs have started in 2005 or later; therefore, their evaluations are not yet available. However, judging by positive evaluations of the longest running voucher program in the Netherlands, and by the fact that five other European countries have embraced the voucher programs, it can be said that these programs are considered to be a positive element of the innovation policy. As such, these programs can be equally useful for technology adoption, by providing small companies with a small outlay of funds that can be spent, in particular, on acquiring expertise in soft or receptor-building components of ICT investment, such as skill training and linking strategy with value through ICT.

Government can also facilitate adoption of technologies by acting as a lead procurer-adopter of these technologies. This can provide the ICT companies with accreditation and validation of their technologies, which can stimulate their adoption by other firms. Two such forms of procurement are seen as particularly valuable from technology adoption perspective: catalytic procurement and collaborative procurement. By procuring ICTs, government can act as a catalyst for the wide adoption of this technology in the nation, through demonstration and supply chain effects. An example offered in this paper was that of green technologies and e-health technologies. Government can also involve in collaborative procurement by becoming the lead user of technology and brokering the use of technology further to the business sector, in particular ensuring that large companies purchase innovative technologies developed by small business. Two such initiatives – Canada’s proposed Technology Test Beds and France’s SME Pact – provide examples of the governments’ collaborative role in technology adoption.

## A Final Word

Overall, it is not possible to expect improvements in technology adoption by small (and at times, unprofitable) businesses by relying on limited tax offsets such as accelerated depreciation, which to a large extent target only a fragment of ICT product market (e.g., computers in Canada). A comprehensive tax credit such as the one advised by the Telecommunication Review Panel might be a step forward as it includes under its banner a number of eligible activities assimilating technology adoption (i.e., asset purchase, education and training, and organizational strategy). Until now, however, there has been little incidence of implementing such tax credit in other countries and no *ex ante* evaluations are available.

As this report argues, a broader range of policies interacting with one another is required. These policies may include direct assistance targeted to technology adoption and catalytic or collaborative procurement led by government as a launching customer.

Success of any policy intervention will not happen if the receptor conditions for assimilating new technologies by small firms are not met. These, in particular, include education and training of employees and designing effective business strategies that allow for the incorporation of new technology adoption plans. Voucher programs, in particular, offer a vehicle to strengthen the building conditions of the firm for adopting new ICTs.

Table 1: Template of Technology Adoption Related Programs – An International Comparison

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
<b>Austria</b>				
Innovation Voucher  Ministry of Transport, Innovation, and Technology (BMVIT) and the Ministry of Economy, Family, and Youth (BMWFJ) <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1325&amp;CO=1">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1325&amp;CO=1</a>	<p>Launched in 2007, Austrian SME can obtain an EUR 5,000 (CAD 7,700) Innovation Voucher through a simple application procedure and spend it in a contract with a public R&amp;D institution or a university that do studies, feasibility analysis, concepts for technology transfer or innovation projects etc. on behalf of the SME.</p> <p>1,000 Innovation Vouchers are available per year and they are granted to applicants on a “first come, first serve” basis. No company can receive more than one voucher per year. The Innovation Voucher is allocated on the basis of eligibility criteria, but without a qualitative assessment of the work done.</p>	<p>To help SMEs innovate</p> <p>To stimulate SME to get in contact with innovation services providers (e.g., research institutes, universities etc.)</p> <p>To establish contacts with new customers</p>	No evaluation yet	EUR 5 million (CAD 7.7 million)
<b>Belgium</b>				
Wallonia - Technology vouchers  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1659&amp;CO=2">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1659&amp;CO=2</a>	<p>Launched in January 2009, the Technology Vouchers aim to be a flexible and simple measure to support SMEs in their innovation efforts. The Walloon Government has entrusted the management of this scheme to the recently created Agency for Technology Promotion (AST). The subsidy takes the form of an electronic voucher of a unit face value of EUR 500 (CAD 770).</p> <p>The same company can benefit from a maximum of 40 technology vouchers per calendar year, corresponding to a total value of EUR 20,000 (CAD 30,800) for a limited expenditure of EUR 5,000 (CAD 7,700). The company cannot own more than 40 vouchers at the same time.</p>	<p>To improve the technological capacity of businesses, whatever the industry</p> <p>To better match the <i>demand and supply</i> for technology in the region</p> <p>To facilitate the access of SMEs to external knowledge, eventually improving their level of competitiveness</p>	None	Overall budget: EUR 16 million (CAD 24.6 million) representing 2,000 vouchers to be distributed by 2013

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
	A wide range of technological services can be paid for by the voucher: tests and preliminary analysis, prototype and testing with clients, preparation of the industrialization			
Wallonia - Grant for using the services of a consultant to integrate e-business in SMEs (RENTIC premium) <a href="http://cordis.europa.eu/era/watch/index.cfm?fuseaction=prog.document&amp;UID=F6E36DA1-AF83-4E81-BE433CE09F8C519E&amp;hwd">http://cordis.europa.eu/era/watch/index.cfm?fuseaction=prog.document&amp;UID=F6E36DA1-AF83-4E81-BE433CE09F8C519E&amp;hwd</a>	Subsidy is awarded to companies that are using the services of an external consultant to integrate e-business in their functioning.  The support is delivered through subsidized loans (including interest allowances). Eligible costs include labour costs and overheads. They cover 80 per cent of the gross salary of the external consultant for a period of 3 to 12 months with a maximum of EUR 5,000 (CAD 7,700) per month.	To help the company in developing the e-business strategy  To help define project's specifications its specifications, selecting the service providers and running the project  To develop B2B practices and to adapt companies functioning to these practices	No evaluation	EUR 3.9 million (CAD 6 million) have been allocated to the e-business measures between January 2003 and October 2007, out of which 108 grants (and 333 grants for e-business websites)
<b>Denmark</b>		.		
Innovation centre for e-business – IBIZ  (Ministry of Science, Technology and Innovation and The Danish Council for Technology and Innovation)	Launched in 2007, the centre provides information, inspiration and guidance to SMEs on how to gain the maximum benefit from ICT in their daily work.  Centre for e-business provides information, events, and guidance about the adoption of ICT to make daily operations of business more efficient. <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9621&amp;CO=3">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9621&amp;CO=3</a>	To provide advisory services for innovation management  To support to organizational innovation including e-business	No evaluation	No direct funding involved
Knowledge voucher (small scale innovation)	The measure consists of a 50 per cent funding of development projects applied for by SMEs who wish to	To expand the utilization of collaboration with knowledge	Program will be evaluated but not	Overall budget EUR 5.3 million

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
projects)  (The Danish Council for Technology and Innovation)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9613&amp;CO=3">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9613&amp;CO=3</a>	use the funding for knowledge acquisition from a public research organization or a member of the Advanced Technology Group (GTS).  The GTS institutes are private independent consulting firms, which develop and sell technological services to private enterprises and public authorities.  The voucher can fund between DKK 50,000-100,000 (CAD 10,000-20,000).  This is two year program - 2008 and 2009.	organisations to a wider group of the Danish SMEs.  To raise the attention of SMEs of the opportunities within utilization of the knowledge of public research and technology institutions.	planned as yet.	(CAD 1.1 million)
<b>Finland</b>				
Digital Product Process 2008-2012  (Tekes – the Finnish Innovation Agency)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1618&amp;CO=4">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1618&amp;CO=4</a>	Digital Product Process concentrates on certain technologies and applications for those technologies.  It is not enough for companies today to reduce costs and have a high level of expertise in special fields to remain competitive. Companies must also know how to <i>use</i> information technology efficiently throughout the entire product process, including innovation process, product development and customer service. The programme is especially targeted at SMEs.	To boost the competitiveness of companies with better use of information technology in product processes.  To increase customer orientation and productivity in company networks that design and deliver products, systems and services to global markets.  To use the technologies to intensify cooperation across organizational and entrepreneurial boundaries.	The program will be evaluated at the end. It will also be subject to interim evaluations.	Estimated 2008-2012 budget- EUR 100 million (CAD 154 million), of which EUR 40 million (CAD 62 million) is financed by Tekes.

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
Purchase of innovation services (Tekes)  <a href="http://www.tekes.fi/rahoitus/yrittajien/astu_hankintaan.html">http://www.tekes.fi/rahoitus/yrittajien/astu_hankintaan.html</a>	Launched in 2008, the program funds procurement of external non-government advisory and innovation support services, which can include commercialization-related services, market studies, use of standards, IPRs, industrial design, and innovation training.  SMEs can apply for a grant which supports purchase of innovation services.	To bring the best innovation related external knowledge and services to SMEs  To encourage SMEs to develop their business activities in a comprehensive way	Not yet evaluated	First-year budget EUR 1.5 million (CAD 2.3 million) – scheme started in 2008
Verso - Vertical Software Solutions 2006-2010  (Tekes)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1636&amp;CO=4">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1636&amp;CO=4</a>	Verso provides financing and expert services for R&D in the field of software development. Verso aims at promoting digitalization and automation of business processes in the following key areas: <ul style="list-style-type: none"> <li>• finance and trade</li> <li>• construction and real estate business</li> <li>• telecommunications</li> <li>• games and entertainment.</li> </ul>	To support the Finnish software companies to reach up the international market of client-specific software products and services.	Not yet evaluated	Verso runs 5 years from 2006 to 2010 with a budget of EUR 120 million (CAD 185 million), of which EUR 56 million (CAD 86 million) is funded by Tekes.
The Research Programme on the Application of Information Technology in Mechanical, Civil and Automation Engineering 2005-2009 (KITARA)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-449&amp;CO=4">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-449&amp;CO=4</a>	ICTs have not been widely adopted in the construction and the mechanical engineering industries. It is expected that ICTs could enable development of new product concepts as well as facilitate servicing and maintenance.  The program is sponsored by the Academy of Finland, the National Technology Agency (Tekes) and the Finnish Ministry of the Environment.	To improve competitiveness of the construction and the mechanical engineering industries	Not yet evaluated	Overall 2005-2009 budget: EUR 8 million (CAD 12.3 million)

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
<b>France</b>				
SME Pact (OSEO-the French Agency for Innovation, Ministry of Economy and Finance and other large private and public research organizations)  <a href="http://www.pactepme.org">http://www.pactepme.org</a>  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=8952&amp;CO=5">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=8952&amp;CO=5</a>	Conceived in 2005, the SME Pact ("Pacte PME") gathers large companies and major government research departments as signatories and potential clients for SMEs.  The Pact consists of three features: Marketplace, a virtual portal where SMEs propose their projects, facilitates meetings between SMEs and large clients; Observatory monitors and provides the information about the Pact; and Laboratories set up working groups to identify best practices and to prepare proposals for decision makers.	To reinforce relations between innovative SMEs and large companies and/or organisations, through commercial procurement and R&D collaboration  To facilitate the development of innovative SMEs	No evaluation but program is closely monitored by government  As a success indicator, over 5 years, the SME Pact has the objective to increase by 5 per cent the share of SMEs as suppliers of large organizations that signed to the Pact	No budget allocated
Innovation Development Contract (CDI)  (OSEO-the French Agency for Innovation) <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9108&amp;CO=5">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9108&amp;CO=5</a>	The Innovation Development contract (CDI) was launched in 2005 by OSEO. The idea was to provide mature SMEs (over 3 years old) with financing support for their innovation programme. This support is made to finance investments with a six year reimbursable loan (EUR 40,000-400,000 or CAD 61,600-616,000).  The idea is to be able to offer services at all stages of SMEs development, either creation or maturation of innovation projects.	To improve innovation support services, in particular for dissemination and technology transfer  To offer services at all stages of SMEs development, including equipment, training and external expertise	The contract had an encouraging start. By 2008, after 3 years, 1300 enterprises have benefited from the CDI. SMEs are more than 10 years old on average	Overall budget for 2005-08 is EUR 358 million (CAD 551 million).
ICT SME 2010  (Ministry in charge of	The ICT SME 2010 program was launched in 2005. The rationale behind the program is that ICT brings changes within management systems, organisations and	To promote the <i>uptake of ICT</i> by SMEs with a focus on shared software and other numeric tools	Not yet. The overall goal is to connect 100,000	Overall budget: EUR 7 million (CAD 10.8

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
Industry in cooperation with the MEDEF – the French business confederation) <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9241&amp;CO=5">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9241&amp;CO=5</a>	<p>processes. SMEs form an ecosystem, a network within each sector. All processes and exchanges that are improved through ICT impact SMEs competitiveness.</p> <p>Project owners can be business confederations, large enterprises (if they share the project's results with SMEs other than its sub-contracting network), etc.</p> <p>Examples of project: a harmonized data exchange system, a tool to improve logistics within a sector etc.</p>	between clients and suppliers, within the same sector	SMEs through ICT network by 2010  By 2008, over 20,000 SMEs were connected	million)
<b>Ireland</b>				
Stimulating Business Innovation or Business Innovation Offer Program  (Enterprise Ireland) <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9541&amp;CO=9">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9541&amp;CO=9</a>	<p>Launched in 2008, the program covers a range of training and development courses and expert services that assist the individual enterprise to be more innovative and respond more rapidly to change.</p> <p>The areas covered include: Supply Chain Management (SCM), e-Business Management Initiative, Automation, Benchmarking, feasibility studies, and Green Technologies. The services are provided by independent consultants and trainers. The target clients are individual enterprises and their managers.</p>	To enable SMEs to initiate the process of adopting innovative business practices	No evaluation but the program is viewed as a useful service by development advisors	Overall budget 2008-2013: EUR 13 million (CAD 20 million)
<b>Italy</b>				
Incentives for Electronic Commerce  (Italy's Second Action Plan for ICT Innovation in Enterprises 2005)	<p>Launched in 2000, the program provides tax credits for investment programs aimed at the development and adoption of IT solutions to carry out electronic commerce activities as well as staff digital training.</p> <p>The assignment of the credit tax is regulated through a call with an evaluation of applications. The minimum</p>	<p>To encourage the quality improvement of on-line offers through advanced solutions for e-commerce</p> <p>To support enterprises performing electronic commerce activities in</p>	Not known if evaluated	Overall budget: EUR 98 million (CAD 151 million)

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
<a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=8857&amp;CO=11">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=8857&amp;CO=11</a>	<p>amount of the investment program is EUR 30,000 (CAD 46,000). The eligible costs include hardware acquisition, software licenses, consultancy services and advertising space online and the costs for personnel training. This measure is directed to all SMEs or SMEs groupings. The tax credit varies according to the beneficiaries ranging from 35-45 per cent of the eligible costs.</p>	<p>their start-up phase</p>		
<p><b>Japan</b></p>				
<p>Innovation Promotion Program</p> <p>New Energy and Industrial Technology Development Organization (NEDO)</p>	<p>Started in 2007, the program provides Grant for Practical Application of Industrial Technology with the purpose of improving the technological level and promoting innovation in Japan.</p> <p><a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9578&amp;CO=81">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9578&amp;CO=81</a></p>	<p>To provide support for efficient adoption of outstanding technologies derived from leading-edge public research programs</p>	<p>Not known if evaluated</p>	<p>Overall budget: CAD 62 million</p>

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
<b>Netherlands</b>				
Innovation Vouchers (SenterNovem)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1096&amp;CO=13">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1096&amp;CO=13</a>	<p>Innovation Vouchers enable SMEs to buy knowledge from public research institutes, and from large companies with R&amp;D expenditures that exceed EUR 60 million (CAD 92 million) per annum, and from foreign research organizations.</p> <p>In 2009 two types of vouchers are available: small and large vouchers, 3,500 of each type. Small vouchers are worth EUR 2,500 (CAD 3,900) each and can be used by SMEs to buy knowledge from knowledge institutes. It stimulates SMEs to make the first step towards knowledge institutes.</p> <p>Large vouchers are worth EUR 7,500 (CAD 11,600). For these vouchers, a mandatory own contribution exists of minimally one-third of the total project costs. The government contributes max. EUR 5000 (CAD 7,700). Entrepreneurs can get a large voucher once a year (in addition to a small voucher). Large vouchers can be used for more complicated questions. Large vouchers can be bundled by entrepreneurs as required.</p>	To increase the demand and utilization of knowledge by SMEs	In 2008 the evaluation of the period 2005/2006 was published. The main conclusion was that the vouchers are a valuable and unique instrument. It is relatively easy to access and reaches a wide audience. Vouchers are also used for innovation in services. Vouchers are especially used by innovative SMEs.	Overall budget for 2006-2008 was EUR 60 million (CAD 92 million). The 2009 budget is EUR 26.25 million (CAD 40.4 million).
<b>Norway</b>				
BIT Program (Innovation Norway)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1096&amp;CO=13">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=-1096&amp;CO=13</a>	Launched in 1997, the programme is to contribute to the development, diffusion and efficient utilization of ICT solutions within e-business in industrial sectors. This is to be achieved through cooperative arrangements within and between sectors, which receive public support in the form of methodology, quality assurance and co-funding. Emphasis is placed on ICT implementation,	To improve the profitability and competitive ability of SMEs through efficient use of ICT and e-business	An analysis of the effects of BIT presented in 2005 shows that companies who have taken part in the programme as	During 2005-2009 the average budget was EUR 3 million (CAD 4.6 million) per year

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
<a href="#">ge=detail&amp;id=7518&amp;CO=14</a>	organizational and managerial change, and competence.		a general rule achieve better results than the average firm in the respective industrial sector.	
<b>Spain</b>				
ES 42 Digital Cities (Ministry of Industry MITYC) <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=8555&amp;CO=16">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=8555&amp;CO=16</a>	This program tries to develop different series of demonstrative pilot experiences in subjects like the e-learning, e-work, e-medicine, etc. It tries to achieve, through the adoption of the new information technologies, a greater degree of interrelation between people, companies, and institutions.	To promote development of services and contents for the Interactive Society  To make use of high speed telecommunication networks	Not known	Not available
<b>United Kingdom</b>				

Country/ Program/Institution/ Website	Program description	Program objectives	Evaluation	Program Budget Indicators
Innovation Platforms (Technology Strategy Board)  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9084&amp;CO=18">Technology Strategy Board</a>  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9084&amp;CO=18">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=9084&amp;CO=18</a>	<p>Launched in 2005, Innovation Platforms bring together government, research funders, and other stakeholders focused on a societal challenge to facilitate the dialogue amongst parties and foster innovation. Their aim is to engage with businesses and the research community by aligning innovation policy and government <i>procurement</i> to deliver quality public services and provide solutions for the market place.</p> <p>The platforms include: Network Security Platform and Intelligent Transport Systems and Services Platform at an initial GBP 10 million (CAD 17.3 million) for each; Assisted Living and Low Impact Buildings platforms at about GBP 5 million (CAD 8.7 million) each. The fifth platform is Low Carbon Vehicles at about GBP 20 million (CAD 34.6 million).</p>	<p>To provide a new way for government and business to work together</p> <p>To generate more innovative solutions to policy and societal challenges</p>	<p>There is a provisional evaluation issued by TSB of the two pilot platforms (Intelligent Transport Systems and Services, and Network Security). The objective of such an exercise was to inquire into their potential impact on the societal challenges to be addressed.</p>	<p>Budget allocation for the period 2008-2011 is GBP 174 million (CAD 300 million)</p>
Innovation Vouchers (The Department of Business Innovation and Skills (BIS))  <a href="http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=1340&amp;CO=18">http://www.proinno-europe.eu/index.cfm?fuseaction=wiw.measures&amp;page=detail&amp;id=1340&amp;CO=18</a>	<p>The program represents a new measure to link small businesses with the knowledge base.</p> <p>SMEs receive a voucher that can 'buy' initial engagement with a knowledge-base institution such as higher or further education institution.</p> <p>Each voucher is worth GBP 3,000 (CAD 5,200) and they are to be spent with the universities operating in the region where the scheme is rolled out.</p>	<p>To overcome cultural or social barriers for SMEs to link with the knowledge base</p> <p>To help with the costs of innovation for SMEs</p> <p>To first-time engagement with the business support system</p>	<p>No formal evaluation yet</p>	<p>Budget 2008-2011 – approx. GBP 3 million (CAD 5.2 million)</p>

Source: Compiled by JPW Innovation Associates Inc. based on Inno Policy Trendchart at <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=262&parentID=52> and on individual country data

Note: CAD=Can \$, EUR=Euro, GBP= Pound Sterling, DKK=Danish Krone; Exchange rate on Dec. 17, 2009, *The Ottawa Citizen*, Dec. 18, 3009, p. F6