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Sustainable Prosperity
 c/o University of Ottawa
 1 Stewart Street
 Ottawa, ON K1N 7M9
 613-562-5800 x2371
www.sustainableprosperity.ca

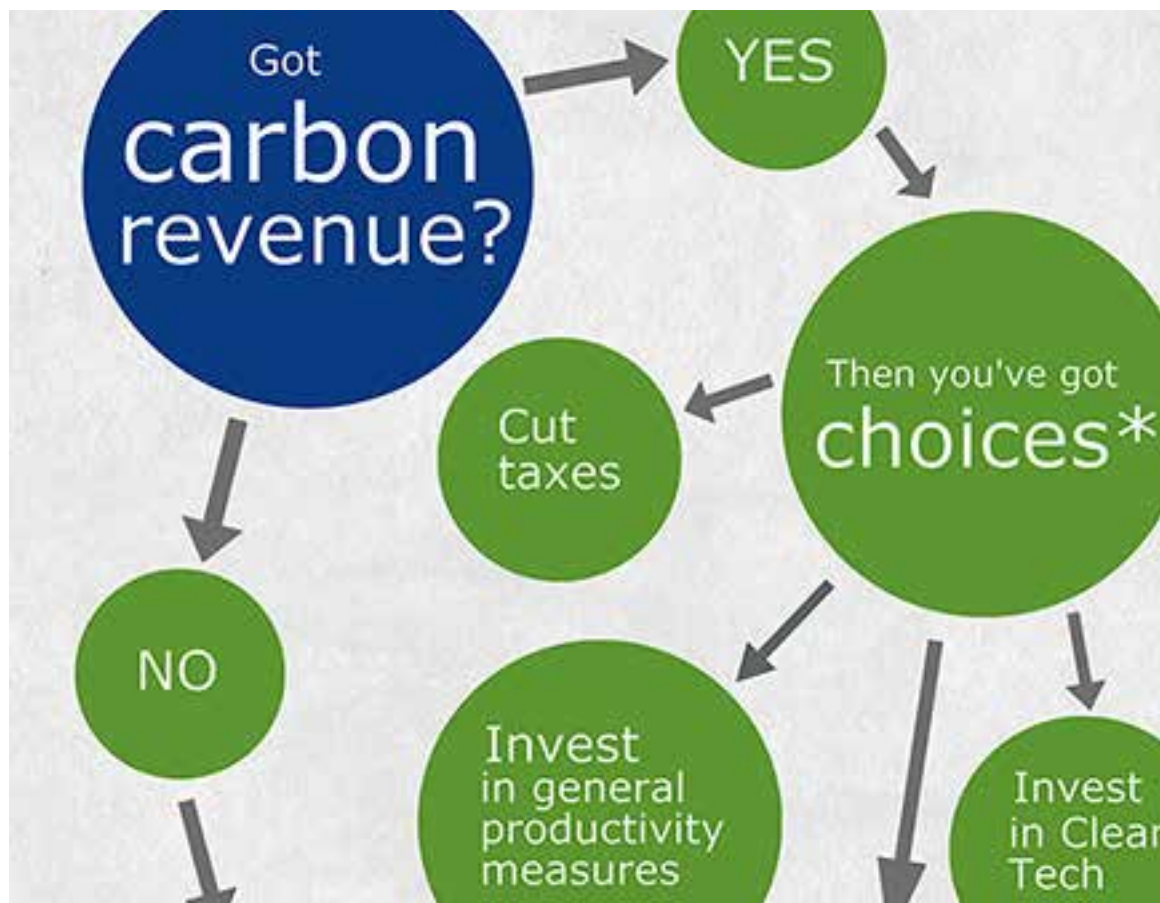
This Issue Summary was written by Adam Baylin-Stern, based on a research paper titled, "Carbon Pricing and Mind the Hissing" by Marisa Beck and Randall Wigle.

The paper is available at:

www.sustainableprosperity.ca/carbon-pricing-and-mind-hissing

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Maximizing Value: Options for Allocating Carbon Pricing Revenue



Key Messages

- Governments implementing carbon pricing as part of their efforts to transition to a low-carbon economy may see the generation of substantial revenue. How to allocate this revenue is a key component of carbon pricing policy design, with the potential to influence the policy's effectiveness, efficiency and public acceptability.
- With carbon pricing revenue, governments can choose to invest in low-carbon technology, reduce existing taxes, spend on redistributive measures (supporting vulnerable population groups or sectors of the economy), and/or target spending to general productivity enhancing measures (such as investing in infrastructure or reducing deficits). The various options differ in terms of their effects on economic efficiency, emissions reductions, and public acceptability.
- To date, jurisdictions with carbon pricing regimes have chosen a variety of different allocation options, with some choosing to divide revenues across more than one option.
- Each jurisdiction's revenue allocation choice reflects its particular priorities and circumstances.
- Carbon pricing regimes are already in place in Quebec, Alberta and British Columbia, with more under consideration or development, including the emissions cap-and-trade system under development by the Government of Ontario. Existing carbon pricing systems in Canada differ in terms of revenue allocation – favouring reducing other taxes, investing in low-carbon technology, or investing in infrastructure.
- With the implementation of new carbon pricing systems, or with price increases in existing ones, there will be an increase in carbon pricing revenues—making it all the more important for policy-makers to consider the various options for revenue allocation.

The Issue

When greenhouse gases like carbon dioxide are released to the atmosphere, their warming effect has a negative impact felt around the globe. However, those causing the emissions do not pay for this external cost they impose on others. The main purpose of carbon pricing is to correct this market failure by creating a price signal that reflects the environmental cost of emitting greenhouse gases, as a means of ensuring emissions of greenhouse gases more closely reflect their full social cost.¹

Carbon pricing policies that generate an explicit price signal—including carbon taxes and cap-and-trade systems²—lead to the creation of revenue. Governments have a variety of options for allocating funds and may consider a variety of objectives in so doing. Looking at the interplay between these options and objectives reveals practical challenges and suggests that each jurisdiction will likely choose an allocation option that best suits its particular context.

This Issue Summary is based on a Sustainable Prosperity sponsored research paper titled “Carbon Pricing and Mind the Hissing,”³ which provides an overview of alternative uses of government revenue from carbon pricing, alongside principles for assessing revenue allocation.

The Knowledge Base

Revenue Allocation Options

Regardless of the form of carbon pricing implemented, there are four general allocation options policy makers may consider when deciding how best to allocate carbon revenue:

1. **Reduce existing taxes:**⁴ Using revenue to cut personal, business, and/or other taxes;
2. **Invest in low-carbon technology:** Supporting low-carbon technology and infrastructure research, development and implementation.
3. **Spend on redistributive measures:** Allocating revenue to population groups and/or economic sectors that may be considered unfairly burdened by the carbon pricing policy; and
4. **Target spending to general productivity measures:** Investing in general productivity-enhancing measures—including investment in areas such as infrastructure, health care and education, and deficit reduction.⁵

Policy makers can consider all these options, using them individually or in combination, in order to achieve the objectives of greatest importance to their jurisdiction. As they determine which option (or options) is best for their particular context, three broad policy objectives may drive their decisions. Different jurisdictions may place greater emphasis on one or more.

Objectives Driving Allocation Options

Under the general category of **Enhancing Economic Efficiency**, governments can use revenue from carbon pricing to address three particular sources of economic inefficiency. First, offsetting distortionary personal and business taxes (which are generally considered to be especially distortionary taxes in that they change the amount and type of economic behavior more than others) can help to increase economic efficiency. Second, while carbon pricing inherently motivates investment in low-emissions products and practices, revenue can be used to support complementary measures that aim to overcome market failures that restrict innovation, which may boost economic efficiency. Third, revenue may be used to help remedy the under-provision of publically provided goods and services (including transport and energy infrastructure, climate change adaptation strategies and education.) resulting in economy-wide benefits.⁶ Similarly, dedicating carbon pricing revenue to deficit reduction may help jurisdictions with fiscal imbalances⁷ to achieve greater fiscal sustainability. Using carbon revenue to address these sources of economic efficiency aims to maximize economic benefit from the policy—potentially even resulting in an outcome in which the economic costs of the carbon pricing policy are smaller than the benefits of the chosen revenue allocation plan (an outcome sometimes referred to as a strong double-dividend).⁸

A second potential objective of policy makers may be **Achieving Emissions Reductions**. The allocation option most likely to result in further emissions reductions are investments in subsidies for low-carbon technology, in support for R&D of low-carbon technology, and in programs encouraging emissions reductions from sectors of the economy not covered by the carbon price (for instance, commercial buildings.) Using revenue for these purposes can help encourage the development and diffusion of low-carbon technologies and practices—especially among private firms and early adopters. Like any low-carbon investments, real emissions reductions only occur if the activities supported by the measures would not have occurred otherwise.

Policy Design Questions for Low-Carbon Technology Investment

Investing carbon pricing revenue in low-carbon technology may be an attractive option because it reinforces the primary goal of carbon pricing: lowering greenhouse gas emissions. Investment in low-carbon technology can be considered to take two general forms:

R&D Investment (Invention Phase ‘Technology Push’)

The focus of investment in the invention phase is on the development of new technologies, which can take the form of R&D grants, targeted tax cuts and policies that lower the costs and risks of innovation.

Adoption Investment (Innovation Phase ‘Demand Pull’)

In the innovation phase, the focus of investment is on the adoption and diffusion of new technologies and practices. This type of investment includes direct subsidies (such as feed-in tariffs), tax credits for those implementing new technologies, public procurement programs and import quotas. The carbon price itself can also be considered a pull mechanism.

To effectively manage technological change, it is generally thought to be important to support both of the above types of investment in tandem.⁹ In fact, low-carbon technology investment and carbon pricing (the push and pull) may raise economic efficiency when used in tandem when compared with using them independently.¹⁰ Where revenues are invested in specific technology efforts, the governance surrounding the awarding of funds and the design of the investment institution are considerations of particular importance. Investing in a variety of forms of innovation may help to reduce the chances of picking the wrong “winner,” interest group capture, and technological path dependence; or may dilute efforts. For more discussion of these issues, see Section 3.2 and Chapter 4 of the original research paper.

competitiveness and prevent carbon leakage (whereby emitting activity relocates to jurisdictions with less stringent emissions reduction policy).¹² Such revenue use can help to maintain the economic contributions of vulnerable sectors, increasing acceptability of carbon pricing. There is some evidence that revenue neutrality (in which the government implementing the policy allocates all the revenue and thus still collects the same amount of revenue despite the carbon pricing policy) and explicit plans for revenue use may be two of the most important factors that influence public perceptions and increase acceptability of carbon pricing.¹³

A portfolio of revenue uses?

There are important trade-offs and interactions among the objectives of enhancing economic efficiency, supporting emissions reductions, and assuring/increasing public acceptability. Some decision-makers might prefer to pursue a variety of revenue allocation options in order to achieve the objective(s) most important for their jurisdiction. Additionally, in the future, with policy stringency likely to increase and carbon revenues likely to rise, combining multiple revenue uses might be beneficial as the incremental benefits of certain options could decline with additional revenue use.

Finally, the choice of revenue allocation option may be driven by the objective of **Supporting Public Acceptability** of the carbon pricing policy.¹¹ Public acceptance depends on how citizens and businesses perceive the fairness and effectiveness of a given measure. For instance, reducing existing taxes on the basis of carbon pricing revenue can increase the acceptability of carbon pricing among those hesitant to see overall tax rates increase; however, the perceived complexity of such mechanisms can lower acceptance for others. Similarly, redistributive measures may increase public acceptability by influencing horizontal equity (for example, by supporting those who live in a region with fewer low-carbon energy options and who would otherwise be disproportionately impacted) and/or vertical equity (for example, by lowering the burden on lower income groups who could see their energy costs rising disproportionately given that they form a greater share of household expenditures.) Subsidies, targeted tax cuts and transfer programs can help to increase fairness along both horizontal and vertical equity dimensions. Equity across sectors can also be considered. Industries such as mining, pulp and paper and cement production, which use a relatively high share of energy as inputs in the production of their products, to make their outputs and who sell their products in markets where their competitors are not subject to a carbon price might be disproportionately impacted. Using carbon

Revenue Use in Canadian Carbon Pricing Regimes

As noted earlier, the four revenue allocation options can be used individually or in combination. Canada’s active carbon pricing systems not only generate revenue differently, but allocate it differently as well. As Table 1 demonstrates, each provincial carbon pricing system has focused primarily on one option for allocating revenue.

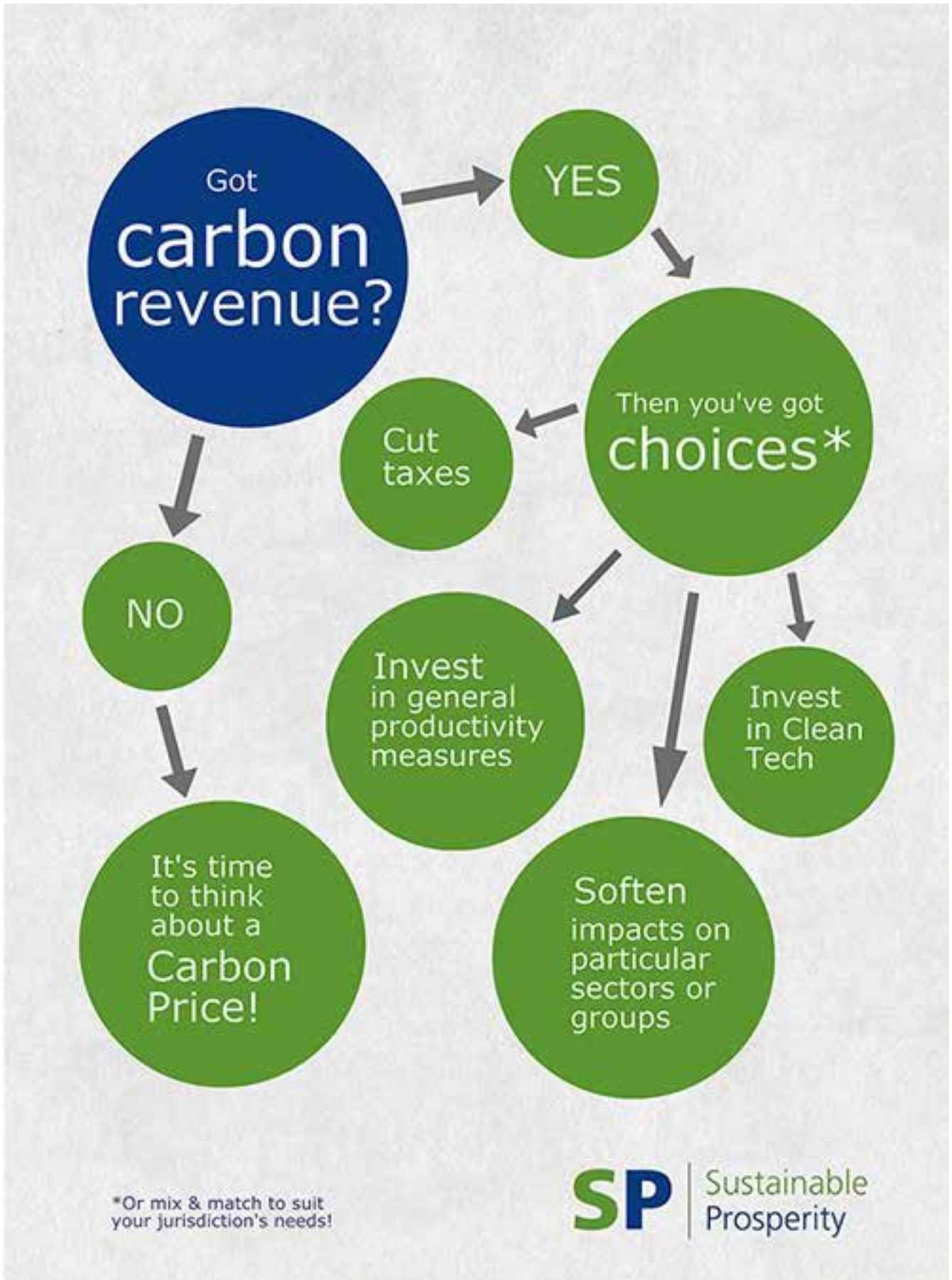
Carbon pricing policy in Canada is evolving rapidly. Alberta has recently renewed and updated its current system²³, with an ongoing climate change policy review opening the door to further change. Ontario recently announced plans²⁴ for a cap-and-trade system, likely to be linked with those of Quebec and California. Early estimates indicate that Ontario’s plan could raise in the area of \$2 billion in revenue each year.²⁵ And a recent fiscal review²⁶ for Nova Scotia came out in favour of provincial carbon pricing.

Implications for Policy Makers

- More and more economic authorities and businesses—fossil fuel companies included²⁷—are calling for carbon pricing. Key to this support is not only recognizing the environmental imperative of transitioning to a low-carbon economy, but also recognizing the opportunity that revenue generation may present.
- Many jurisdictions already benefit from carbon pricing revenue—and may in fact see revenue rising in the future as prices rise—while several other jurisdictions are considering carbon pricing regimes. Taking into account the characteristics and interactions of allocation options can help governments to balance objectives of enhancing economic efficiency, supporting emissions reductions and assuring/increasing public acceptability. Decision-makers will allocate revenue in ways tailored to reflect the unique characteristics and concerns of their jurisdictions.
- For each of the four allocation options described in this Issue Summary, there is a growing body of evidence and knowledge available to help policy makers understand the revenue-use design options and their impacts on the three objectives they might be targeting. The three active Canadian carbon pricing regimes provide a valuable source of analysis and insight for policy makers designing and implementing new regimes, and for the refinement of existing carbon pricing mechanisms.

Table 1: Revenue Characteristics of Canadian Provincial Carbon Pricing Regimes

Province (instrument type)	Revenue Characteristics of Canadian Provincial Carbon Pricing Regimes
British Columbia (Carbon tax)	<p>Revenue: \$1222 million¹⁴(fiscal year 2013-14)</p> <p>Allocation: Revenues are allocated primarily to reduce existing taxes. The government returns all revenue raised in the form of cuts to personal and corporate taxes, along with some measures to address possible impacts to Northern/rural and low income residents. Personal and corporate income tax cuts account for 67% of revenue use.^{15,16}</p> <p>Context: British Columbia’s emphasis on reducing existing personal and corporate taxes and redistributive measures reflects an emphasis on economic efficiency and public acceptance.¹⁷</p>
Alberta (Fee for exceeding established emissions-intensity thresholds)	<p>Revenue: \$83.4 million¹⁸ (2014)</p> <p>Allocation: Alberta uses revenue primarily for investment in low-carbon technology. Revenue raised goes into the independently managed Climate Change and Emissions Management Fund, which allocates revenues to R&D and investment in GHG reduction and adaptation innovations (8%), demonstration of such technologies (42%), and projects that support GHG reduction and adaptation goals (51%).¹⁹ A focus has been on funding early trials of carbon capture and storage technologies.</p> <p>Context: Alberta’s system reflects a motivation to reduce emissions and increase the province’s ability to adapt to climate change throughout the provincial economy, with an emphasis on improving the environmental performance of its fossil fuel industry.</p>
Quebec (Cap-and-trade system ²⁰)	<p>Revenue: \$425 million²¹ (fiscal year 2014-15, expected)</p> <p>Allocation: Quebec uses revenue mainly for investments in low-carbon technology and general productivity measures. Revenue is managed through the Ministry of Sustainable Development, Environment and the Fight against Climate Change’s Green Fund. Revenue is used for transportation infrastructure (51%), energy efficiency and substitution (17%), innovation and R&D (5%) and other projects for emissions reductions and climate change adaptation (19%).²²</p> <p>Context: Québec’s system reflects the province’s specific challenges and vulnerabilities, and a goal to support public acceptability.</p>



Endnotes

1. While there is uncertainty regarding what actual social costs of carbon really are, current carbon prices seen in carbon markets are thought to be much lower than the full social cost. For a recent perspective on this subject, see Moore, F. C., & Diaz, D. B. (2015). Temperature impacts on economic growth warrant stringent mitigation policy. *Nature Climate Change*, 5, 127–131.
2. For additional information on carbon pricing approaches, Canada's Ecofiscal Commission's report, "The Way Forward: A Practical Approach to Reducing Canada's Greenhouse Gas Emissions" is a useful recent reference. Available at www.ecofiscal.ca/reports/wayforward/.
3. Available at www.sustainableprosperity.ca/content/carbon-pricing-and-mind-hissing. As Wigle and Beck write, "The title of this paper refers to a famous quote by Jean Baptiste Colbert: "The art of taxation consists in so plucking the goose as to obtain the largest possible amount of feathers with the smallest possible amount of hissing"."
4. Reducing taxes is sometimes referred to as revenue recycling. However, the term revenue recycling is sometimes used to refer to any use of revenue from a pricing system. Others consider revenue recycling to refer only to the use of revenue to reduce existing taxes. Yet others consider revenue recycling to refer to a carbon pricing that is revenue neutral for government. Due to the lack of common understanding around the term, it is not used in this Issue Summary.
5. Deficit reduction in and of itself is not efficiency enhancing unless the reduced deficit ensures future tax reductions.
6. Investment in education, for example, is a key driver of economic growth.
7. Carbone, C., Morgenstern, R.D., Williams III, R.C., Burtraw, D. (2014). Getting to an Efficient Carbon Tax: How the Revenue is Used Matters. Resources for the Future. Retrieved from www.rff.org/Publications/Resources/Pages/185-Getting-to-an-Efficient-Carbon-Tax.aspx
8. Goulder, L.H. (1995). "Environmental Taxation and the "Double Dividend": A reader's guide." *International Tax and Public Finance*, 2, 157-183.
9. Rennings, K. (2010). Redefining innovation|eco-innovation research and the contribution from ecological economics. *Ecological Economics* 32, 319-332.
10. Jaffe, A. B., R. G. Newell, and R. N. Stavins (2005). A tale of two market failures: Technology and environmental policy. *Ecological Economics* 54, 164-174.
11. Amdur, D., Rabe, B., Borick, C. (2014). Public Views on a Carbon Tax Depend on the Proposed Use of Revenue a report from the National Surveys on Energy and Environment. Retrieved from www.californiacarbon.info/wp-content/uploads/2014/07/NSEE_CarbonTax_071514-1.pdf
12. Carbone, C., Morgenstern, R.D., Williams III, R.C., Burtraw, D. (2014). Getting to an Efficient Carbon Tax: How the Revenue is Used Matters. Resources for the Future. Retrieved from www.rff.org/Publications/Resources/Pages/185-Getting-to-an-Efficient-Carbon-Tax.aspx
13. Amdur, D., Rabe, B., Borick, C. (2014). Public Views on a Carbon Tax Depend on the Proposed Use of Revenue a report from the National Surveys on Energy and Environment. Retrieved from www.californiacarbon.info/wp-content/uploads/2014/07/NSEE_CarbonTax_071514-1.pdf
14. Government of British Columbia. (2015). Budget and Fiscal Plan 2015/16-2017/18. Ministry of Finance. Retrieved from www.bcbudget.gov.bc.ca/2015/bfp/2015_Budget_and_Fiscal_Plan.pdf
15. Canada's Ecofiscal Commission. (2015). Figures and Tables. Retrieved from www.ecofiscal.ca/reports/wayforward/figures-tables/
16. Beaty, R., Lipsey, R., Elgie, S. (2014, July 9). The shocking truth about B.C.'s carbon tax: It works. Retrieved from www.theglobeandmail.com/globe-debate/the-insidious-truth-about-bcs-carbon-tax-it-works/article19512237/
17. Demere, C. (2015). How to Adopt a Winning Carbon Price: Top Ten Takeaways from Interviews with the Architects of British Columbia's Carbon Tax. Clean Energy Canada. Retrieved from www.cleanenergycanada.org/wp-content/uploads/2015/02/Clean-Energy-Canada-How-to-Adopt-a-Winning-Carbon-Price-2015.pdf
18. Government of Alberta (2015). Greenhouse Gas Reduction Program. Retrieved from www.esrd.alberta.ca/focus/alberta-and-climate-change/regulating-greenhouse-gas-emissions/greenhouse-gas-reduction-program/default.aspx
19. Canada's Ecofiscal Commission. (2015). Figures and Tables. Retrieved from www.ecofiscal.ca/reports/wayforward/figures-tables/
20. Some schemes referred to as cap and trade are actually baseline and credit. Under baseline and credit schemes, firms receive allowances in proportion to their current output instead of a fixed number of tonnes. True cap-and-trade schemes are preferred because they are administratively simpler, more transparent and provide economically efficient incentives.
21. Ministry of Finance of Quebec. (2012). Québec and Climate Change: A Greener Environment. Retrieved from www.budget.finances.gouv.qc.ca/Budget/2012-2013/en/documents/climate.pdf
22. Ministry of Finance of Quebec. (2012). Québec and Climate Change: A Greener Environment. Retrieved from www.budget.finances.gouv.qc.ca/Budget/2012-2013/en/documents/climate.pdf
23. Government of Alberta. (2015). Greenhouse Gas Reduction Program. Retrieved from www.esrd.alberta.ca/focus/alberta-and-climate-change/regulating-greenhouse-gas-emissions/greenhouse-gas-reduction-program/default.aspx
24. Government of Ontario. (2015). Cap and Trade System to Limit Greenhouse Gas Pollution in Ontario. Retrieved from www.news.ontario.ca/opo/en/2015/04/cap-and-trade-system-to-limit-greenhouse-gas-pollution-in-ontario.html
25. Wingrove, J. (2015, April 21). Ontario's Cap-and-Trade Regime Seen Raising C\$2 Billion a Year. Retrieved from www.bloomberg.com/news/articles/2015-04-21/ontario-s-cap-and-trade-regime-seen-raising-c-2-billion-a-year
26. Broten, L.C. (2014). Charting a Path for Growth: Nova Scotia tax and Regulatory Review. Retrieved from www.novascotia.ca/finance/docs/tr/Tax_and_Regulatory_Review_Nov_2014.pdf