

UPSTREAM EMISSIONS TRADING: THE GREAT LEAP FORWARD FOR ECOLOGICAL TAX REFORM?

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ABSTRACT

Ecological tax reform consists of removing subsidies to environmentally damaging behaviour and shifting from taxes on jobs, investment and work, to taxes on activities that damage the environment. Since at least 1960, economists have urged the incorporation of environmental costs into the actual costs faced by the individuals or companies carrying out destructive activities. Removing subsidies to destructive behaviours and consumption patterns, charging taxes based on environmental harm and reducing taxes on jobs, investment or income will benefit the economy and the environment. Although there are some constitutional constraints on shifting to ecological tax reform, these are limited and there is a great potential for ecological tax reform from all levels of government in Canada. Both domestically and internationally, a number of governments have begun moving from theory to practice. Moreover, in the last year several initiatives by Canadian governments indicate a new interest in ecological tax reform. This renewed interest comes at the same time as governments search for means to reduce greenhouse gases. It is widely acknowledged that market instruments — either emissions trading or emission taxes — are essential to reducing greenhouse gas emissions. Both these market instruments can involve a major element of ecological tax reform. Indeed, compared to instruments that do not include a tax-shifting element, market instruments that include tax shifting are likely to be more economically efficient, less administratively cumbersome and more equitable for the communities and industries affected by greenhouse gas emission reduction policies. This combination of an idea that is reaching the political mainstream, and a problem crying out for a solution, could see ecological tax reform being the next major trend in environmental law in Canada.

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We can and must get on with the business of redesigning our tax base to reflect environmental costs.

— David Anderson, Canadian Minister of Environment, Globe 2000 Opening Speech, March 22, 2000.

As part of our green economy initiative, the new government will consult on practical ways our tax system can encourage businesses and individuals to shift from environmentally damaging to environmentally friendly practices. We will introduce a pilot project this year,

— Paul Ramsay, BC Minister of Finance, Budget 2000 Speech, March 27, 2000.

INTRODUCTION

Death and Taxes: inevitable yes, but immutable no. The late 1990s and early 21st Century have seen a rise in interest in ecological tax reform — ending subsidies to environmental destruction and shifting taxes from traditional tax bases to activities that harm the environment. In addition, threats of climate change are forcing governments to develop environmental policies that can encourage shifts in technologies and behaviours throughout our economy. These two factors – an idea entering the political mainstream and a crisis crying out for a solution – may make ecological tax reform emerge as the next great wave of environmental law and policy in Canada.

This paper reviews the basics of ecological tax reform, examines the constitutional ability of federal and provincial governments to apply ecological tax reform, and looks at examples of ecological tax reform domestically and abroad. It then examines the challenges posed by climate change, and describes why climate change could propel ecological tax reform from being a novel tool operating on the periphery of environmental law in Canada to becoming the centrepiece in efforts to curb the greatest environmental menace of the 21st Century.



THE THEORY OF ECOLOGICAL TAX REFORM

Ecological tax reform is a reform of the charges levied by government with the intent of improving economic performance and environmental behaviour. It applies to the entire gamut of government charges – from traditional taxes that are primarily aimed at raising general revenue to user fees that are aimed at recovering costs for a specific service. Although the entire range of such charges are sometimes referred to as “taxes”¹ Canadian constitutional law distinguishes between taxes, regulatory fees and proprietary charges such as user fees. This paper uses the term “charges” when referring to the entire range of charges imposed by government.

There are several primary elements of ecological tax reform:

- **Removing Subsidies.** Subsidy removal is intended to ensure that neither the tax system nor government funding support environmentally damaging sectors or activities. Subsidies can include both direct subsidies – for instance, direct federal government support for Atomic Energy Canada Limited – and special tax breaks that favour certain activities – for instance, the ability to immediately write off costs of oil and gas exploration and pass these losses onto shareholders.
- **Green Cost-Covering Charges.** These are charges imposed to cover the cost of a particular environmental service or activity. These can include **user charges** for services provided to the payer of the charge – for instance, waste discharge fees that cover the costs of administering the payer’s permit and treating the payer’s wastewater. Alternatively, they can include **earmarked charges** dedicated to environmental purposes associated with the charge payers activities – e.g. waste permit fees dedicated to general remediation of polluted waters or systemic road tolls paying for the cost of improving the entire transportation system.² Cost covering charges become green when they are imposed in a manner that encourages reduction in environmental damaging behaviour, e.g. permit fees become green when charged on the basis of units of emissions.
- **Sectoral Incentives.** Incentive taxes are taxes primarily aimed at changing environmental behaviour within a sector, without changing the overall costs facing that sector. For instance, an increase in gas taxes for gasoline using lead and decrease on gas taxes for unleaded gasoline was an incentive tax, primarily aimed at phasing out lead in gas.
- **Revenue Generating Taxes for Tax Shifting.** These are taxes intended primarily to raise revenue, without trying to ensure intra-sectoral revenue neutrality. Tax shifting involves placing new taxes or fees on an environmentally destructive activity and reducing taxes on things society generally wants – e.g. jobs, investment and income. Tax shifting is thus characterised by revenue neutrality.

¹ Amy Taylor, Nancy Olewiler and Mark Jaccard, *Environmental Tax Shift: a discussion paper for British Columbians* (Victoria: Ministry of Finance, October 1999).

² Systemic tolls are tolls that are implemented to manage demand for road space and encourage efficient use of roads. They are distinct from project tolls which can divert drivers onto longer routes. Systemic tolling can also be used to fund transit, benefiting both motorists (who benefit from less congested roads) and transit users.

Removal of subsidies, green cost covering charges, sectoral incentives and tax shifting can be categorised as separate elements; however, they are all closely related and overlapping. Payment for a service, such as roads or water through green user fees, creates room to remove or avoid increasing taxes on property or income. It also removes taxpayers' subsidies to road and water users.

Whatever the characterisation, the principles are the same: internalise the environmental costs of activities into those activities; encourage what you want; discourage what you don't want. Classic economists have advocated internalising the costs of environmental harm on the person or activity causing the harm since at least 1960. It should not only lead to a cleaner environment but a more efficient economy. For instance, if the driver of a high polluting car were required to compensate for the incremental health care costs, damage to crops and property, and suffering of asthmatics caused by his vehicle, he might drive less, get a tune up or take his vehicle to the scrap yard.

Internalising the cost of pollution will reduce pollution because it creates an incentive to pollute less. It creates an incentive to consume products that pollute less, to develop and use cleaner technologies, and to shift to more environmentally benign behaviours. In contrast, the prescriptive regulations that are the mainstay of Canadian environmental regulation create an incentive in the opposite direction. Industry has an incentive to prove how expensive more stringent standards will be, as this will aid in efforts to forestall more stringent regulation.

When revenues are raised, other taxes can be reduced. Tax reductions can be chosen to stimulate certain behaviours (e.g. reducing payroll taxes to encourage job creation) and/or ensure equity between income groups and regions. For instance, a tax on vehicle pollution is likely to impact low income earners (who drive less but own older, dirtier cars). This can be addressed by specifically targeting low-income earners in the recycling of revenue (i.e., reducing other taxes paid by low-income earners).

Just as increasing taxes on pollution will decrease pollution, decreasing taxes on productive activities such as jobs and investment will encourage more job creation and investment. For instance, reducing employer paid payroll premiums for employment insurance – essentially a tax on jobs – will make job creation more attractive. Similarly, reductions in corporate income tax will increase investment. A combination of placing taxes on pollution and reducing taxes on consumption – e.g. the Goods and Services Tax — should see reduced consumption of products that pollute or create pollution in their manufacture, and increased consumption of more benign products and services.

While tax shifting might have some negative impacts on the competitiveness of large polluters, tax shifting will increase the competitiveness of other sectors. Moreover, incentives for improved environmental behaviour can, in some cases, improve the competitiveness of high polluting industries.³ Pollution is a form of wasted energy or materials, and strong incentives to reduce emissions can encourage a rethinking of wasteful processes. In one example, a tax placed on ozone depleting substances effectively forced a circuit board manufacturer to develop a new technique that produced better

³ Michael Porter and Class van der Linde, "Toward a New Conception of the Environment-Competitiveness Relationship" (1995) 9:4 *Journal of Economic Perspectives* 97.



circuit boards at lower costs. Engineers with the manufacturer initially thought that elimination of the ozone depleting substances was impossible.⁴

While ecological tax reform is sometimes seen as simply an exercise in internalising costs, a rigid adherence to this concept may be unworkable or unacceptable:

- **Some costs are unacceptable even if they can be measured and internalised.** While the market may be efficient, it is not necessarily fair. Most people accept that certain costs should not be imposed on other individuals, communities, societies or species no matter how much others are willing to pay. Respect for the environmental rights of others to a clean environment and the overriding imperative of sustainability may necessitate either taxes or regulations that go beyond internalisation of environmental costs, especially if these are measured through economic calculations that significantly discount future environmental damage and take no account of equity. In order to ensure that they reach sustainability targets, a number of European countries have imposed taxes that go beyond calculations of environmental costs.⁵
- **Setting the taxes at the right levels.** It is also often impossible to calculate and value with any accuracy the environmental impact of a particular emission in a particular place at a particular time. Similarly, it difficult to know how the market will react to internalised costs. Even if taxes go beyond internalising environmental costs, it is still beneficial to shift taxes from harmless behaviour to destructive behaviour.
- **Adjustment costs.** Shifts in the tax system can create adjustment costs, as existing capital stock (i.e. factories, equipment, pipelines etc.) become less viable or less profitable when environmental costs are internalised. Phasing in ecological taxes over time and alerting the investment community to future directions in ecological tax reform will minimize the loss to economy caused by devaluing investments due to changes in tax structures. Adopting ecological tax reform to reduce an environmental harm at the same time as trade competitors are tackling the same problem using economic instruments will also reduce adjustment costs.⁶ (On the other hand, so long as environmental costs are not internalised, society will suffer unnecessary costs.)

Due to these complications, the process of setting and adjusting green charges is likely to be based more on practical considerations than strict economic calculations. Despite limits to the practical ability or desirability of simply internalising costs and letting the market determine reductions, the idea of harnessing the market to encourage reductions in environmental harm and encourage benign economic activity holds. Ecological tax reform can supplement and complement the regulatory regime. Green taxes can be phased in over time with adjustments made to gauge their impact on pollution and to avoid harsh adjustments.

⁴ Porter, above at footnote 3.

⁵ Paul Ekins "European environmental taxes and charges: recent experience, issues and trends" (1999) 31 *Ecological Economics* 39-62.

⁶ See below at page 23.

FEDERAL AND PROVINCIAL ECOLOGICAL TAX REFORM

There is great potential for the provinces, the federal government and local governments to engage in ecological tax reform. Under the *Constitution Act, 1867*, both the federal and provincial governments have broad powers to implement ecological tax reform. There are, however, several limitations on this power:

- Provincial or municipal ecological charges, if characterized as a tax rather than a regulatory or licensing fees, cannot be indirect taxes.
- Provincial or federal ecological charges, if characterized as a tax or an appropriation of revenue, need to have a clear statutory basis.
- Taxation powers cannot be used as a means of enforcing compliance with a regulatory scheme that is outside the jurisdiction of the government passing the scheme.

LIMITS ON INDIRECT TAXES

The provincial government cannot raise revenue through indirect taxation.⁷ The classic definition of a direct tax is a tax levied on the very person who is intended to pay it. An indirect tax is one levied on one person in the expectation that he or she will pass the cost of the tax on to another person. Thus, personal income tax is a direct tax. A gasoline excise tax paid by vendors is an indirect tax.⁸

Many economists would argue that taxes on pollution are indirect. However, the courts have taken a different approach, focussing on whether a tax is imposed on a unit of a commodity or the price of a commodity (e.g. a sales tax or an excise tax). The mere fact that a company may be able to shift the burden of a tax to the purchaser of its merchandise does not make the tax indirect.⁹ Pollution resulting from the manufacture of a good is analogous to an input, and courts have held that taxes on such inputs are direct.¹⁰

On the other hand, a charge imposed on units of consumer goods that cause environmental harm will be characterized as indirect if not paid by the ultimate consumer.¹¹ There are a number of green charges that could be imposed on marketable commodities. For instance, charges based on the volatile organic compounds (VOC) in solvents have been identified as a means of discouraging smog forming VOC emissions.¹²

⁷ *Constitution Act, 1867*, s. 92(2).

⁸ In *Eurig Estate (RE)*, [1998] 2 S.C.R. 565.

⁹ See *Canadian Industrial Oil & Gas Ltd. v. Government of Saskatchewan* (1977), 80 D.L.R.(3d) 449 (S.C.C.) for a discussion of how courts distinguish between direct and indirect taxes. See also *Simpsons-Sears Ltd. v. Provincial Secretary of New Brunswick* (1976), 71 D.L.R. (3d) 717 at 724, rev'd (on other grounds) (1978), 82 D.L.R.(3d) 321 (S.C.C.). Although the Supreme Court of Canada was equally divided on this point, the decision of the New Brunswick Court of Appeal has been supported by G.V. La Forest prior to his appointment to the Supreme Court of Canada: G.V. La Forest, *The Allocation of Taxing Power Under the Canadian Constitution*, 2d ed. (Toronto: Canadian Tax Foundation, 1981) at 83.

¹⁰ *Cairns Construction Ltd. v. Saskatchewan*, [1960] S.C.R. 619, 24 D.L.R.(2d) 1.

¹¹ *Allard Contractors Ltd. v. Coquitlam*, [1993] 4 S.C.R. 371.

¹² Canada, *Economic Instruments for Environmental Protection: Discussion Paper* (Ottawa: Supply and Services Canada, 1992) at 34 to 35.



Similarly, a tax on the carbon content of fossil fuels would discourage greenhouse gas pollution. Charges on fossil carbon or solvents applied to anyone but the ultimate consumer will likely be beyond the power of provincial legislatures if characterized as a tax.¹³

LEGISLATIVE OVERSIGHT

The *Constitution Act, 1867*, sections 53 and 90, state that Bills imposing taxes must originate in the House of Commons or the provincial Legislatures.¹⁴ The Supreme Court of Canada has indicated that legislatures cannot delegate taxation authority to the Governor in Council or Lieutenant Governors in Council unless they expressly override sections 53 and 90. It appears that the legislature must impose the tax although regulations can set out details and mechanisms for taxation.¹⁵ It is not clear the extent of the details that can be delegated.

While these requirements in no way limit the potential for green taxation, they create a potential pitfall. Either green taxes will need to be based in legislation rather than regulation or delegating legislation will need to specifically override section 53 of the *Constitution Act*.

EXCEPTION FOR REGULATORY AND USER FEES

A major exception exists for both provinces' inability to pass indirect taxes and the requirement for origination of a tax in the House of Commons or provincial legislature. Neither rule applies to charges that are characterized as being regulatory fees or user fees. Indirect provincial charges or charges adopted without clear statutory authority may be upheld if they can be characterized as a regulatory fee or user fee.

For instance, a charge imposed on quarry operators in proportion to gravel production is clearly indirect, in that it will be passed onto gravel consumers on the same basis that it is charged. However, where the charge was intended to cover the cost of repairing road damage caused by gravel trucks, and was part of a system of regulating gravel removal, it was upheld. It was upheld even though revenue was not dedicated to road repair and was somewhat more than the actual costs of road repair.¹⁶ There must, however, be a nexus between the amount charged and the cost of the service provided or the cost of the regulated activity; reasonable attempts have to be made to match revenues and costs.¹⁷ Dedication of fees will help in characterizing a levy as a regulatory fee.

Green cost covering charges imposed by regulation or indirect in their application are likely to be upheld as regulatory fees if dedicated to a purposes such as emission permit

¹³ *British Columbia (Attorney General) v. Canadian Pacific Railway*, [1927] A.C. 934, [1927] 4 D.L.R. 113 (P.C.).

¹⁴ Sections 53 and 90 of the *Constitution Act, 1867*.

¹⁵ In *Eurig Estate*, above at footnote 8, Major J. for the majority states that he does not need to decide whether imposition of a tax can be delegated, but he notes his interpretation that a) s. 53 prohibits cabinet from imposing a tax on its own accord, b) legislatures can delegate control over the details and c) legislatures have the power to exempt themselves from this constitutional requirement.

¹⁶ *Allard Contractors Ltd. v. Coquitlam*, [1993] 4 S.C.R. 371.

¹⁷ *Allard Contractors Ltd. v. Coquitlam*, [1993] 4 S.C.R. 371 and *Eurig Estate (RE)*, [1998] 2 S.C.R. 565

administration, environmental effects monitoring, enforcement, and remediation of harm caused. They are also more likely to be upheld where they are an integral part of an overall regulatory regime. Similarly, sectoral incentives that are not intended to raise revenue may be upheld as a form of regulation.

POWERS FOR ECOLOGICAL TAX REFORM

Although the above limits on ecological tax reform cannot be ignored, they allow both levels of government to carry out substantial ecological tax reforms. Provinces can impose direct taxes on pollution and polluting activities. Given the broad range of provincial powers in relation to the environment, the Provinces can place charges on most of the products that cause environmental harm, provided the revenue is recycled as part of a regulatory regime. In the absence of a federal regulatory regime to reduce greenhouse gases, this likely extends to charges on fossil fuels (even though the federal government appears to have primary jurisdiction over direct emissions of greenhouse gases)¹⁸. Provinces can recycle revenue both through lowering of their own taxes and through credits against federal taxation (if the latter is seen as more of a disincentive to productive activities).

The federal government's ability to adopt ecological tax reform is almost unlimited, subject only to not regulating areas of provincial jurisdiction under the guise of taxation. Taxes on emissions of both local and global pollutants, or the products that lead to environmental harm, are likely to be upheld.

EXPERIENCE WITH ECOLOGICAL TAX REFORM

Although economists have urged ecological tax reform for at least forty years, the last decade had seen increasing attention to the subject by governments.

REMOVING SUBSIDIES

Globally, government subsidization of products that have high environmental costs is a major factor in patterns of resource use. The Organization for Economic Cooperation and Development (OECD) has estimate that the removal of energy subsidies would reduce global emissions of greenhouse gases by eighteen percent by 2050 and yield a 0.7 percent annual increase in real income per person.¹⁹

Although some of the worst subsidies are in developing countries, Canada also subsidizes fossil fuel energy. A 1996 study estimated that Canada subsidized the fossil fuel industry with \$5.9 billion in tax breaks per year: \$3.1 billion to natural gas and \$2.8 billion to oil.²⁰ In the same year a study by the Canadian Department of Finance and Natural Resources

¹⁸ See Rolfe, Christopher, *Turning Down the Heat, Emissions Trading and Canadian Implementation of the Kyoto Protocol*, (Vancouver: West Coast Environmental Law Research Foundation, 1998).

¹⁹ B.A. Fisher et al. "An Economic Assessment of Policy Instruments for Combating Climate Change" in James Bruce et al (eds.) *Climate Change 1995: Economic and Social Dimensions of Climate Change, Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. (Cambridge: Cambridge University Press, 1996).

²⁰ Andre de Moor, Institute for Research on Public Expenditure, and Peter Calamai. *Subsidizing Unsustainable Development, Undermining the Earth with public funds* (Costa Rica: Earth Council, 1996).



Canada compared our tax system's treatment of investments in fossil fuel production to treatment under a neutral tax system that has no tax credits, tax exemptions or preferential tax rates.²¹ The report concluded that conventional oil and gas investments are five to ten percent more attractive under the current system than a neutral system. On top of this, oil and gas companies that do not have sufficient taxable income can transfer write-offs for exploration expenses to shareholders. This can make a conventional oil and gas project up to twenty percent more attractive than it would be in a neutral tax system. Large oil investments such as oil sands projects and the Hibernia offshore development are made up to 21% more attractive by the current tax system.

In the last few years, a number of nations have started to reduce subsidies to energy. Internationally, several developing countries have dramatically reduced subsidies to energy.²²

Domestically, the federal tax system continues to favour mining, oil and gas development over other forms of economic activity, but there have been a few steps in the right direction. The government has divested itself of its interest in the offshore Hibernia oil project. In recognition of the special treatment received by the mining and oil and gas sectors, the year 2000 federal budget plan stated that planned reductions in the corporate income tax rate would not apply to businesses that already received the benefit of accelerated capital cost allowances (e.g. the oil and gas sector).²³

GREEN COST COVERING CHARGES

There are a number of examples of green cost covering charges being levied in Canada and around the world. These include:

- **BC Variable Waste Permit Fees.** Since 1992, under British Columbia *Waste Management Permit Fees Regulation*²⁴ large emitters are charged permit fees based on the amount of their permitted waste. Larger fees are charged for air emissions and more toxic products. Revenue generated by the *Waste Management Permit Fees Regulation* (approximately \$13 million (Cnd), annually)²⁵ is directed to the Sustainable Environment Fund, where it can be used for purposes of managing and reducing waste.²⁶ The permit fees are likely too low to significantly impact behaviour. (The rate on nitrogen oxides is approximately one thousandth of the rate under the Swedish revenue neutral program described below.)

²¹ The study measured the "uplift" given by the tax system. The uplift is equal to [(net present value of tax paid under neutral system — net present value of taxes paid under Canadian system) x 100]/net present value of capital investment.

²² Among other nations, India, Korea and Mexico have stopped regulating energy prices at below international or market levels: see Jose Goldemberg et al. (1998) "Promoting development while limiting greenhouse gas emissions" United Nations Development Programme, p. 126; Subsidiary Body for Implementation, United Nations Framework Convention on Climate Change "National Communications from Parties not included in Annex 1 of the Convention" 14 September 1999 Doc. No. FCCC/SBI/1999/11. ;

²³ Government of Canada, *Budget Plan 2000*, p. 222.

²⁴ *B.C. Reg 299/92*

²⁵ British Columbia Ministry of Environment, Lands and Parks, "Municipal Waste Legislation and Regulations" (June 1, 1999).

²⁶ *Sustainable Environment Fund Act*, R.S.B.C. 1996, c.445, s. 6.

- **BC Tire and Battery Levies.** Under the British Columbia *Social Service Tax Act*²⁷ levies are charged on tires and lead acid batteries. These levies are directed to the Sustainable Environment Fund where they help subsidize recycling or energy recovery from tires.
- **Municipal Water Rates.** The municipality of Vernon, BC, charges \$0.35 to \$0.45 per cubic metre for residential water consumption. This has resulted in a 34% reduction in water consumption.²⁸
- **Seattle Garbage Fees.** Seattle charges \$5.50 per container for residential solid waste. This led to a 70% reduction in household waste.²⁹

SECTORAL INCENTIVES

There are a number of examples from around the world of taxes levied to change behaviour within a sector, without affecting the overall tax burden of that sector.

- **Swedish Revenue Neutral Charge on Nitrous Oxide from Large Energy Producers.** Large combustion energy producers in Sweden (mainly thermal electricity generating plants but also combustion plants in the chemical, metallurgical and pulp and paper sectors are also covered) are charged approximately \$7.00 (Cnd) per kilogram of nitrogen oxides they emit. Smaller plants are exempt because of the relatively high cost of monitoring their emissions. To ensure that this does not give small plants a competitive edge, the revenue from the large plants is returned to those plants in proportion to their production. NO_x emissions from large combustion sources in Sweden dropped 60% per unit of energy input from 1990 to 1995.³⁰
- **BC Special Fees and Rebates to Phase-out Beehive Burners.** In the Year 2000 provincial budget, the government announced its intention to increase permit fees on particulate emissions from beehive and silo burners (highly polluting wood residue burners that government has been trying to phase out). The fees will be partially refunded to firms that invest in the development, demonstration or commercialization of emerging technologies or new uses of wood residue.
- **Ontario and BC Fee-bates.** Under the Ontario Tax for Fuel Conservation, purchasers of inefficient cars pay a fee, and purchasers of efficient cars receive a rebate. The Ontario system was plagued by poor design: 90% of cars are not subject to either the surcharge or the subsidy; the maximum surcharge or subsidy is a small fraction of the purchase price; most consumers only learn of the tax after they have decided to buy a car. Moreover, its implementation likely made it more of a political liability than was necessary: it was initially simply a tax (and continued to be a revenue generator), and was imposed in the midst of a recession.³¹ Nonetheless, while fuel efficiency has

²⁷ R.S.B.C. 1996, c. 431.

²⁸ Taylor, above at footnote 1.

²⁹ Taylor, above at footnote 1.

³⁰ Ekins, above at footnote 5

³¹ International Institute for Sustainable Development *Making Budgets Green. Leading Practice in Taxation and Subsidy Reform* (Winnipeg: IISD, 1994) at 10-11. The rebate available to the most fuel efficient cars (\$100) is a small fraction of the price of a car. The system raised \$30 million in 1992.



remained fairly static in most of Canada, the sale of cars qualifying for the subsidy increased from 2.6% in 1990 to 7.4% in 1992. British Columbia has announced its intent to engage in consultations on adoption of a fee-bate in BC. Because of difficulties associated with the unilateral adoption of fuel efficiency standards by provinces, a fee-bate is feasible means by which provinces can improve fuel efficiency of new vehicles.

TAX SHIFTING

There are a number of environmental taxes that generate revenue used to reduce other taxes:

- **UK Landfill Tax.** This tax was initially intended to be equal to the externalities associated with landfilling . Most of the revenue has been used to reduce employers' payroll deductions, but twenty percent is used to fund land remediation.
- **Dutch Waste Tax.** The Dutch waste tax is set at a level significantly higher than the environmental costs of landfilling or incinerating. At ECU 45 (\$63 Canadian) per tonne of landfill it is high enough to yield significant changes in behaviour. Since it was imposed in 1986, recycling went from 35% to 50% of the waste stream, and re-use of construction waste rose from 12% to 82%.³²
- **Dutch Energy Taxes.** The Dutch have two taxes on energy – a fuels tax and a small energy user's tax. The fuels tax raised almost 1 billion ECU (\$1.4 billion Canadian) in 1998. The revenue from the small energy users' tax that comes from business is used to reduce employer payroll charges. The portion of revenue from households is recycled to reduce income tax. For each of four income groups the energy tax increases and income tax reductions are intended to be equal so that the average energy user in each of the four income groups is no worse or better off.³³
- **Danish Carbon Tax.** Denmark introduced carbon taxation in 1993. If a company's carbon tax bill amounts to more than three percent of the value added to a product by a particular company, the company can apply for a total tax refund if it has undertaken reasonable energy efficiency investments (as determined by a certified energy auditor). A large part of the revenue from Denmark's carbon tax is used to subsidize energy efficiency, district heating projects and demonstration projects.³⁴
- **Swedish Carbon Tax.** Sweden introduced a carbon tax in 1991 to spur innovation of industry in anticipation of EU introduction of a carbon tax. Revenue from the tax is used to decrease taxes on labour and assist in energy efficiency projects. The Swedish taxation rate is equal to 323 Skr per tonne of carbon dioxide (\$57 Canadian per tonne carbon or \$0.14 per litre of gasoline). However, when the EU backed away from a carbon tax, the tax rate for industry was reduced to 25% of that of households. In mid-1997, the rate of the carbon tax on industry was increased to 50% of the normal

³² Ekins, above at footnote 5.

³³ Ekins, above at footnote 5.

³⁴ International Energy Agency, *Climate Change Policy Initiatives, 1994 Update, Volume I OECD Countries* (Paris: Organization for Economic Co-operation and Development, 1994) at 59.

rate after industrial energy consumption had grown due to this reduced rate. Reduced rates are though possible for energy-intensive industries that apply for special tax relief.

- **US Tax on Ozone Depleting Chemicals.** This is the best North American example of a green tax. The tax is imposed on ODCs in proportion to their potential impact on the ozone layer, and ODCs consumed in manufacturing processes are excluded. To allay concerns regarding competitiveness of US industries, imports of ODCs are subject to the tax and the tax is rebated on exports. In addition, imports of products manufactured with ODCs but not physically incorporating them are subject to a level of taxation equal to what the product would have been subject to had it been manufactured in the US.³⁵

The above list of measures is not exhaustive. A number of other tax shift measures, sectoral incentives and green charges have been imposed.³⁶

INCREASED GOVERNMENT ATTENTION

While economists have supported ecological tax reform for four decades, it is only in the last decade that the concept has permeated the consciousness of politicians and seen significant implementation. This international trend appears to be catching on in Canada. In British Columbia, the government is not only experimenting with green charges (as noted above), but in 1999 it released a discussion paper on tax shifting, and it has highlighted tax shifting a part of its environmental and fiscal policy.³⁷ Federally, the National Roundtable on Environment and Economy — a federally sponsored think tank with representatives from different sectors — is embarking on a three year review of ecological fiscal reform. Both environment and finance ministers have committed to changes in the tax system.

THE GREAT LEAP FORWARD: TAX SHIFTING AND CLIMATE CHANGE

"The greatest environmental challenge of the new century is global warming."

— Bill Clinton, State of the Union Address, Year 2000.

"[Climate change is] the most profound economic challenge since the Second World War"

— 1999 Briefing Note to Canadian Federal Cabinet

While experience shows a considerable potential for ecological tax reform, outside Europe, there are few countries that have used green charges as a means to reduce taxes on labour,

³⁵ The legality under international trade regimes of border tax adjustments based on the process by which a product is manufactured is uncertain.

³⁶ See, for instance, Ekins above at footnote 5.

³⁷ Taylor, above at footnote 1



jobs or investment. The government of British Columbia has shown a strong interest in ecological tax reform, but measures under consideration are limited to sectoral incentives aimed at specific shifts in technology. The federal government has shown an interest in a broader range of measures, but has not, to date, taken significant actions beyond the removal of subsidies.

Canada's signing of the *Kyoto Protocol* and its possible coming into force as early as 2002 could change all this. Reducing greenhouse gas emissions will require the use of market instruments that encourage myriad changes in consumption, technology and behaviour. While market instruments can be designed with no element of tax shifting, incorporating tax shifting into market instruments will help make such instruments both more equitable and better for the economy.

THE NEED FOR A MARKET INSTRUMENT

Under the *Kyoto Protocol*, Canada is required to reduce its greenhouse gas pollution by six percent below 1990 levels in the period 2008 to 2012. With emissions having climbed 13.5% above 1990 levels by 1997, and emissions are projected to climb to 27% above 1990 levels by 2010 in the absence of government action,³⁸ Canadian governments need to develop programs that can shift the Canadian economy toward lower greenhouse gas pollution.

To effectively mitigate climate change will require reductions far below those envisioned by the *Kyoto Protocol*. An instrument capable of reversing the current trend should be designed to yield continuing long-term reductions far beyond the timeframe of the *Kyoto Protocol*. Global reductions of fifty percent or more are required to stabilize greenhouse gas concentrations in the atmosphere.³⁹ Canada has amongst the worlds' highest per capita emissions (fourteen time India's and fifty to sixty times most of sub-Sahara Africa's⁴⁰), and will likely be required to reduce emissions by at least fifty percent over the long term.

Effectively reducing greenhouse gas emissions means myriad changes in behavior and technologies. There are numerous steps that governments can take to encourage these changes. These include regulations, education and government investments. However, most economists and greenhouse gas policy experts recognize that significant reductions of greenhouse gas emissions will require the use of market instruments. Market instruments are mechanisms established by government that use price signals to encourage reductions in greenhouse gas emissions. A single instrument can create incentives throughout the economy to reduce greenhouse gas emissions through innumerable changes to technologies, consumption patterns and behaviours. The theory of market instruments assumes that by placing increased choice of control measures in the hands of emitters, emissions will be reduced at the lowest possible cost.

³⁸ National Climate Change Process, *Canada's Emissions Outlook: An Update* (December, 1999).

³⁹ See Joseph Alcamo and Eric Kreileman, *Global Climate System: Near Term Action for long term protection*. (Netherlands: National Institute of Public Health and the Environment, 1996).

⁴⁰ Eileen Claussen, Lisa McNeilly, *Equity and Global Climate Change: the complex elements of global fairness*. (Washington: Pew Center on Global Climate Change, 1998.)

EMISSIONS TRADING VS. CARBON TAX

Under a carbon tax or emissions charge, a charge is placed on emissions. In the context of greenhouse gases, this can be most easily accomplished by placing a charge or tax on the carbon content of fossil fuels. The tax would be highest per unit of energy on carbon intensive fuels such as coal and non-existent on renewable energy sources. Changes to the prices of energy will be reflected in prices for products. Energy providers have an incentive to switch to renewables, manufacturers to switch to more efficient production processes, and consumers to switch to products which consume less energy, especially fossil fuel energy, in their manufacture and use. Figure 1 shows how a carbon tax works. In the absence of a carbon tax, the price of fossil carbon is P_1 , and the quantity demanded is Q_1 . A tax equal to $P_2 - P_1$ raises the price of fossil carbon to P_2 . This reduces demand to Q_2 .

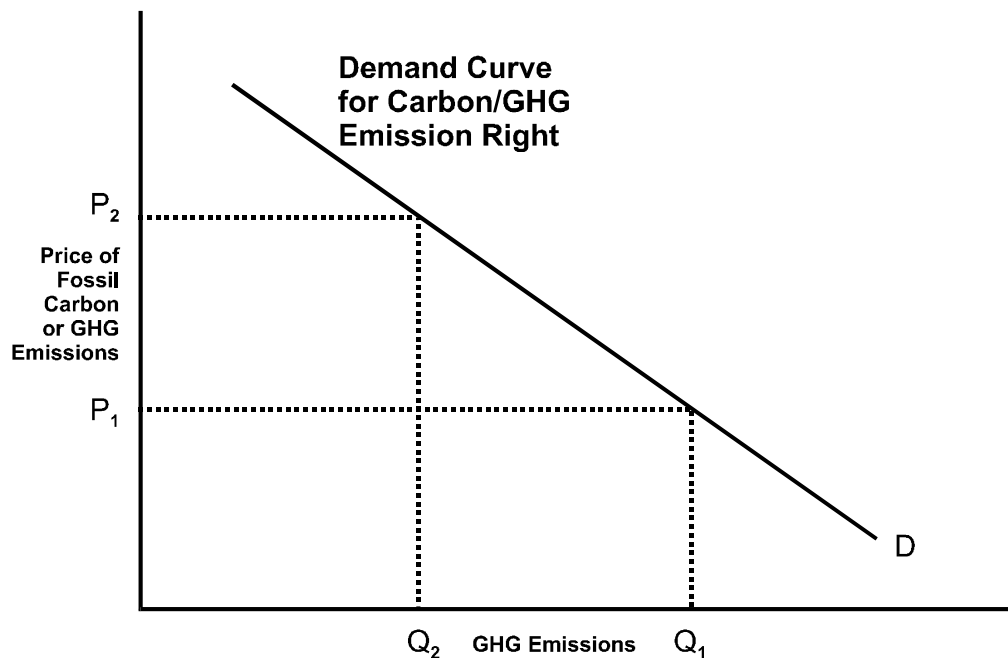
As with carbon taxes, under emission trading programs, individual polluters are given flexibility in how to reduce their emissions. Where an emitter can, at a low or negative cost, reduce emissions or energy use beyond what is required by regulation they can sell an emission reduction credit or an emission allowance to polluters who cannot reduce their emissions as easily. The purchaser of the credit or allowance is then allowed to emit more. Trading itself is not intended to reduce emissions; it is intended to reduce the cost of meeting a government imposed limit on emissions. (However, without trading, the government imposed limits may be impractical or not enforced.)

The essential difference between trading and a carbon tax is that under a trading regime government controls the quantity of emissions through regulatory limits, but the price of emission rights cannot be predicted with certainty. Under a tax, the price is set by government, but the quantity of emissions can only be predicted. Under the example in figure 1, if government sets the quantitative limit on emissions at Q_2 , the price for emission limits will be the difference between the cost of fossil carbon (P_1) and P_2 .

While the choice of carbon tax vs. emissions trading is valid, emissions trading is compatible with tax shifting. Any form of emissions trading in which emission allowances or rights are auctioned will create a stream of revenue that can be used to reduce taxes in other areas. Indeed, as is discussed below, the auctioning of allowances and a substantial tax shift is an inherent component of one of the most attractive emissions trading designs.



Figure 1



THE CHOICES IN EMISSIONS TRADING DESIGNS

Because the *Kyoto Protocol* sets a quantitative cap on greenhouse gas emissions, policy developers have focused on emissions trading as a means to meet Canada's greenhouse gas emissions. In 1998 and 1999, the National Round Table on the Environment and Economy tasked a multistakeholder expert group to examine, develop and assess different emissions trading designs. Three designs were assessed in depth:⁴¹

- **Downstream Greenhouse Gas Emissions Allowance Trading with Voluntary Credit Trading (Downstream Trading).** The core of this program is a government-established cap on total allowable emissions from a defined group of large emitters during a defined reporting period (e.g. a year). Government allocates allowances to emit greenhouse gases, with the total emissions permitted by all allowances being equal to the cap. At the end of the reporting period, each emitter within the system has to hold allowances equal to its emissions during that year. Those sources that expect to emit less than permitted by their allowances may sell their surplus allowances to other sources whose emissions would otherwise exceed the allowances allocated to them. Over time, the number of allowances in circulation can be reduced and thus total emissions are reduced. Allowances can be auctioned or distributed free of charge based on historic emissions or some other formula.

⁴¹ National Roundtable on the Environment and the Economy, *Canada's Options for a Domestic Greenhouse Gas Emissions Trading Program* (Ottawa: NRTEE/Renouf Publishing, 1999).

- **Cap on the carbon content of fossil fuels and other GHG emissions (Upstream Trading).** Under the upstream trading program evaluated by the NRTEE, government sets a cap on the greenhouse gases covered by the program. But rather than limiting actual emissions, the cap is primarily enforced by government allocating allowances to produce/import carbon in fossil fuels. Fossil fuel producers and importers are required to hold allowances for every tonne of fossil carbon they produce or import. Where fossil fuels are exported or used as feedstock in products, the exporter receives an allowance equal to the carbon content of their exports. Capping consumption of fossil carbon effectively caps over seventy percent of Canadian emissions. Emissions of greenhouse gases other than carbon dioxide from fossil fuel consumption can also be incorporated into this program through combining the system with limited downstream trading.
- **Mandatory Performance Standards with Voluntary Credit Trading (Credit Trading).** Under this program large energy users would be subject to mandatory emission performance standards (e.g. x tonnes CO₂ eq. per tonne of steel produced or y tonnes per Kwhr). If a large energy user exceeds the standard (i.e. reduces emissions below the standard) it would be able to generate credits based on measured reductions in emissions below what they would have been if the emitter had simply complied with the standard. Credits can be sold to emitters that are unable to cost-effectively reduce emissions. Manufacturers of products that use energy would be responsible for ensuring that their products meet defined efficiency standards (e.g. x litres per 100 km for car manufacturers). If the manufacturer produces a more efficient product they would be able to generate credits based on the estimated emission reductions resulting from the more efficient product. The reductions would be based on expected life and use profile for the product. Credits produced from exceeding emission performance standards and credits from exceeding product efficiency standards would be fully convertible. Under credit trading, there is no cap on emissions, and total reductions can only be achieved by constantly making standards more stringent.

Under any of these designs increased flexibility can be allowed by recognizing international emission credits or allowances in a domestic trading program.

CONSTITUTIONAL RESPONSIBILITY

Analyses of which level of government would be responsible for implementing a greenhouse gas emissions trading system, consistently indicate that this is an area of federal jurisdiction.⁴² This conclusion, combined with broader federal taxation powers, ensures that there are no constitutional blocks to a combination of emissions trading and tax shifting.

⁴² National Roundtable on the Environment and the Economy, *Legislative Authority to Implement a Domestic Emissions Trading System*. (Ottawa: NRTEE/Renouf Publishing, 1999). See also Rolfe, above at footnote 18



TAX SHIFTING UNDER EMISSIONS TRADING

Tax shifting is inherent in one of the above emissions trading designs and compatible with the other two. Tax shifting is inherent in an upstream trading program. The effect of the upstream trading program is that there is a limited supply of fossil fuels. In order to ensure that demand does not outstrip limited supply, producers and importers will generally limit customer demand by increasing the prices of fossil fuels proportionate to the carbon content of their fuel.⁴³ The amount of this increase in price will be roughly equivalent to either the carbon tax needed to achieve the same reduction or the price of an emissions allowance that would be needed to cover the emissions if government imposed a downstream emissions trading program. Thus, essentially the upstream system is simply an administratively feasible system equivalent to requiring downstream emitters to buy emission allowances. In one system an emitter pays directly for emission allowances; in the other the emitters pay indirectly for carbon allowances.

While upstream fossil fuel producers are able to increase the price of fuel, the costs of lowering emissions would generally be borne by consumers. Thus, fossil carbon producers would reap windfall profits unless either carbon allowances are auctioned or the windfall is taxed away. It would clearly be politically unacceptable for the 250 companies that import or produce fossil carbon to be able to reap such a windfall by placing increased energy costs on the rest of the economy. Thus, it is generally assumed that upstream trading would either involve auctioning of allowances or a windfall tax on importers/producers that receive free allowances.

Tax shifting can also be incorporated into a downstream trading program through the auction of emission allowances and the recycling of revenue, or through combining free allocation with a carbon tax. Although a *gratis* allocation of emission rights is inherent in a system of credit trading, such a system could be combined with a carbon tax.

Thus, of the leading choices for the design of market instrument to reduce greenhouse gas emissions -- carbon tax and the above three emissions trading designs -- tax shifting is inherent in two of the designs (carbon tax and upstream trading), possible in one (downstream trading) and can compliment the other (credit trading).

WHAT MAKES A PROGRAM EQUITABLE?

The burden of costs and benefits are not necessarily different under the different programs discussed above. In each case, distributional impacts will be determined by either how revenue from an auctioned allocation is recycled or allocations are made if emission allowances are distributed *gratis*. There are, however, some significant differences.

First, burden sharing decisions in a credit trading system are indirect – they are a product of emission limits. It is important that standard setting in a credit trading system take place with full recognition that it will determine the distribution of costs and benefits.

⁴³ Depending on the market for different fossil fuels, the price passed on to fossil fuel consumers may not always be exactly proportionate to carbon content. For products where there is a world price (e.g. oil) producers are likely to pass the full premium onto consumers. For products where there is only a limited local market, producers may absorb some of the premium.

Second, in either a downstream cap and trade system with a free allocation of allowances, or a credit trading system, burden sharing is determined prior to the program being implemented. Burden sharing is thus decided – in the form of an allocation formula or emission limits – before the costs of emission reductions are actually incurred and fully known. At this point it will be difficult to determine which companies or sectors are likely to gain and lose: in order to obtain the greatest allocation all sectors are likely to plead the likelihood of hardship in the absence of a significant allocation. In contrast, under a system of auctioned allowances or a carbon tax, recycling of revenue can be determined as the costs to different regions, sectors and individual companies become clearer.

Third, a free allocation to emitters may not compensate the communities, regions or workers (e.g. coal mining towns) that are impacted by climate policy. Unless a free allocation is made to regions, workers and communities dependant on industry that is not viable in a low carbon economy, these groups would depend on compensation from other sources. While emitters that receive the free allocation might choose to reinvest it locally, they could also choose to sell their allocation or use it to invest in other communities and regions.

THE RATIONALE FOR TAX SHIFTING IN CLIMATE POLICY

Not only is tax shifting inherent or compatible with various market instrument designs, there are a number of reasons why governments are likely to incorporate tax shifting into the design of any market instrument for reducing greenhouse gas emissions:

- **Double Dividend: benefiting the economy.** A carbon tax or emissions trading program could generate a huge amount of revenue that can be used to shift taxes away from productive activities. For instance, if 90% of Canadian emissions are captured by the upstream trading program, and integration of the domestic system with international emissions trading sets a price per tonne of CO₂ emissions of \$25, the auction of carbon or emission allowances would generate over \$10 billion in revenue annually in the 2008 to 2012 period. If these revenues are used to reduce distortionary taxes and taxes that discourage work, job creation or investment, the economy as a whole will benefit. Economists generally agree that tax shifting will either offset overall costs of reduction or, by some analyses, yield an overall benefit to the economy.⁴⁴
- **Fair for Communities: producing a stream of revenue that can be used to assist with community transitions.** Any program to reduce greenhouse gas emissions will inevitably impact on employment in sectors such as coal mining. Carbon taxes or auctioning of emission allowances create streams of revenue that can be used to aid such communities in the transition to a low carbon economy. Free allocations to emitters would only compensate shareholders.

⁴⁴ B.A. Fisher et al., above at footnote 19. See also Paige Brown, (March 2000) “Priming the Pump, How Pollution Charges with Revenue Recycling Help the U.S. Economy and Citizens,” Redefining Progress Backgrounder No. 2.



- **Fair for Business: transition tax credits can be made available to firms where transition costs are high.** Free allocation of emission rights is often promoted as a means of compensating emitters for the devaluation of their capital caused by emission limits. Unfortunately, free allocation to emitters is an extremely poor way of compensating adversely impacted companies. Compensating through a free allocation of emission rights requires governments to determine which companies are likely to lose as a result of trading. However, it is often impossible to accurately predict the costs emission limits will impose on different companies. Some large emitters may reap windfalls either because they have low cost reduction opportunities or because increased prices for their products may exceed any increases in their costs.⁴⁵ Moreover, in some cases – e.g. coal mining – the companies facing the greatest costs will not be emitters. Carbon taxes or auctioning of emission rights allows government to direct compensation to the companies (or communities) suffering actual losses.
- **Avoids the biggest barrier to implementing emissions trading.** Using a carbon tax or auctioning emission rights avoids the need to develop a formula for the free allocation of emission rights (or in the case of performance standards and credit trading, it avoids the need to develop hundreds or thousands of performance standards). In Canada, the simplest approach to free allocation – an allocation based on historic emissions – is politically unviable because of its impacts on regional equity. (It would be a windfall to Alberta and impose high costs on British Columbia, Manitoba and Quebec). Other options will inevitably be complex and politically difficult. Free allocation formulas need to be fully defined long before trading begins. In contrast, auctioning emission rights or using a carbon tax allows government to announce the general elements of revenue recycling, making adjustments in annual budgets.

THE RATIONALE FOR AN UPSTREAM EMISSIONS TRADING PROGRAM

In addition there are a number of reasons why upstream trading (which inevitably involves tax shifting) makes sense over other emissions trading designs:

- **Environmentally Effective.** Upstream trading could effectively cap over 90% of Canadian greenhouse gas emissions. This reduces the burden faced by government.
- **Economically Efficient.** By covering over 90% of Canada's emissions and valuing all emission reductions equally, this program helps ensure that the most cost effective emission reductions will occur. In contrast, credit trading is inherently inefficient because free allocation based on production of different products (implicit in the use of performance standards) entails a subsidy to high emitting industries.
- **Administratively Simple.** By targeting fossil fuel producers and importers rather than thousands of emitters, upstream trading is the simplest way of creating an

⁴⁵ According to economic theory, the price of a product is set by the costs faced by the marginal producer. If all producers of a commodity such as gasoline initially have the same production costs, but different emission reduction costs, the producer with the most expensive emission reduction costs will determine the increment in price passed onto consumers. All other producers will benefit from this increase in price which exceeds their increased costs.

emissions trading system. It avoids the need to come up with politically contentious, complicated allocations to individual provinces, firms and sectors.

The National Roundtable's expert group on emissions trading concluded that the upstream trading program had the greatest environmental impact, lowest administrative burden, the lowest transaction costs, and was the most economically efficient and most cost effective of the designs they assessed. (This was for reasons entirely unassociated with tax shifting.). While, the expert group considered the upstream program the least politically feasible of all choices, there was no consideration of the potential for combining the program with a highly visible program for recycling revenue to individuals and companies.

ONE BARRIER DOWN

One of the major barriers to ecological tax reform is the perception that it will put domestic, high emitting industries at a competitive disadvantage. This fear has led to exemptions of high emitting, trade oriented industries from the Scandinavian carbon taxes.

This barrier is likely to be less significant in the context of implementing greenhouse gas emission reductions under the *Kyoto Protocol*. First, there is some evidence that Canadian industry under-invests in energy efficiency (and thus greenhouse gas emission reductions). This means that some reductions will yield lower non-tax costs.⁴⁶

Second, under the *Kyoto Protocol*, competitors in the industrialized world will also be subject to greenhouse gas regulatory regimes. In the case of industry, these regimes are likely to involve either emissions trading or carbon taxes. Competitiveness of high polluting Canadian industries may not be affected in the short term even if national governments of trade competitors adopt different instruments. Although the choice of carbon tax or auctioned emission allowance versus free emission allowance will affect the profitability of Canadian companies, under most designs of emission trading and carbon tax it should not affect companies' competitiveness. (Competitiveness is defined as the ability to produce goods at prices set by the international market.) This is true because Canadian prices will be determined by the marginal opportunity cost of producing a good, and marginal opportunity cost will be the same whether a good is produced by an emitter who has received a free allocation of emission rights or is subject to a carbon tax.⁴⁷

⁴⁶ John Robinson *et al.*, *Canadian Options for Greenhouse Gas Emission Reduction (COGGER): Final Report of the COGGER Panel to the Canadian Global Change Program and the Canadian Climate Program Board* (Ottawa: Canadian Global Change Program Secretariat, September 1993).

⁴⁷ Assume every unit of a product is associated with a tonne of emissions. In the case of a carbon tax the opportunity cost of emitting a tonne of greenhouse gases is the rate of taxation per tonne. So long as the variable cost of producing a good, plus the tax rate per tonne of emissions, is lower than the price of the good in the market place, the producer will be better off producing more units and selling them. In the case of a free allocation, the opportunity cost of emitting a tonne is either the loss of an opportunity to sell a one tonne allowance or the cost of purchasing an additional allowance. So long as the variable cost of producing a good, plus the price per one tonne allowance, is lower than the price of the good in the market place, the producer will be better off producing more units and selling them. The competitiveness impacts in the short term are equal. This assumes that the level of taxation or price of an emission allowance is set by the international market. This is not true in the case of credit trading, because the opportunity cost of producing a



SUMMARY AND CONCLUSIONS

In summary, ecological tax reform has been advocated by economists for several decades as an efficient, effective way of reducing our impact on the planet. Removing subsidies to destructive behaviours and consumption patterns, charging taxes based on environmental harm and reducing taxes on jobs, investment or income will benefit the economy and the environment.

Although there are some constitutional constraints on shifting to ecological tax reform, these are limited and there is a great potential for ecological tax reform from all levels of government in Canada.

Both domestically and internationally, in the last decade a number of governments have moved from theory to practice. Moreover, in the last year several initiatives by Canadian governments indicate a new interest in ecological tax reform.

This renewed interest, combined with the challenge posed by climate change could lead to a major shift in Canada's approach to taxes and the environment. Market instruments – either emissions trading or emission taxes -- are essential to reducing greenhouse gas emissions. While trading is often seen as an alternative to tax shifting, some trading designs inherently involve an element of tax shifting. Other trading designs are compatible with tax shifting. Moreover, there are strong policy reasons for adopting market instruments that include tax shifting as an element. These are likely to prove more economically efficient, less administratively cumbersome and more equitable for the communities and industries affected by greenhouse gas emission reduction policies.

This combination of an idea that is reaching the political mainstream, and a problem crying out for a solution, could see ecological tax reform being the next major trend in environmental law in Canada.

RECOMMENDATIONS

Canadian governments should aggressively pursue ecological tax reform as a means of encouraging truly sustainable development. This should include removal of subsidies to and special tax breaks to activities and products that harm the environment, increasing use of user charges and other green charges that encourage environmentally responsible behaviour and a shifting of taxes from jobs, income, consumption and investment to activities that damage the environment.

In particular, the federal government should begin design of an upstream emissions trading program to reduce greenhouse gas emissions, focussing on different means of recycling revenue. Efforts should be made to ensure an equitable, politically acceptable approach to revenue recycling. Government should move to adopt such a trading program in the 2002 to 2003 time frame to allow a gradual tax shift and smooth transition to the *Kyoto Protocol* limits on greenhouse gas emissions.

unit of the product is only the cost of a one tonne emissions minus the performance standard per unit of production.