



CANADA'S **ECOFISCAL** COMMISSION
Practical solutions for growing prosperity



RESPONSIBLE RISK

How putting a price on environmental
risk makes disasters less likely
July 2018





CANADA'S ECOFISCAL COMMISSION

WHO WE ARE

A group of independent, policy-minded Canadian economists working together to align Canada's economic and environmental aspirations. We believe this is both possible and critical for our country's continuing prosperity. Our Advisory Board comprises prominent Canadian leaders from across the political spectrum.

We represent different regions, philosophies, and perspectives from across the country. But on this we agree: ecofiscal solutions are essential to Canada's future.

OUR VISION

A thriving economy underpinned by clean air, land, and water for the benefit of all Canadians, now and in the future.

OUR MISSION

To identify and promote practical fiscal solutions for Canada that spark the innovation required for increased economic and environmental prosperity.

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Traffic congestion, overflowing landfills, and urban sprawl—these are some of the biggest challenges facing Canadian cities. We look at how new policies can make urban life more livable.



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From carbon pricing to energy subsidies, we analyze the policy opportunities and challenges defining Canada's climate and energy landscape today.



Water

What is the value of the services that provide clean water? We examine new Canadian policy solutions for water pollution, over-consumption, and infrastructure.

For more information about the Commission, visit **Ecofiscal.ca**



A REPORT AUTHORED BY CANADA'S ECOFISCAL COMMISSION

Chris Ragan, Chair
McGill University

Elizabeth Beale
Economist

Paul Boothe
Institute for Competitiveness
and Prosperity

Mel Cappe
University of Toronto

Bev Dahlby
University of Calgary

Don Drummond
Queen's University

Stewart Elgie
University of Ottawa

Glen Hodgson
Conference Board of Canada

Justin Leroux
HEC Montréal

Richard Lipsey
Simon Fraser University

Nancy Olewiler
Simon Fraser University

France St-Hilaire
Institute for Research on Public Policy

Lindsay Tedds
University of Calgary

This report is a consensus document representing the views of the Ecofiscal Commissioners. It does not necessarily reflect the views of the organizations with which they are affiliated.

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Elyse Allan

Karen Clarke-Whistler

Michael Harcourt

Preston Manning

Lorne Trottier

Dominic Barton

Jim Dinning

Bruce Lourie

Paul Martin

Annette Verschuren

Gordon Campbell

Peter Gilgan

Janice MacKinnon

Peter Robinson

Steve Williams

Jean Charest

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SUMMARY FOR POLICY-MAKERS

Risks to the environment from economic activity often generate strong reactions. At one extreme, some see the risk of environmental damage as an unavoidable part of a modern economy that we must simply accept. At the other, some consider these risks unacceptable ones that must be avoided at all costs.

This report aims to take a more nuanced approach. While the costs of reducing environmental risks toward zero can exceed the benefits, the same can be true of leaving risks unmitigated. In most cases, neither eliminating nor disregarding environmental risk is a practical approach.

We explore how policy-makers can manage risks to the environment using economic instruments. In particular, we focus on circumstances where firms can generate private benefits from their activities while society bears the environmental risk. We show how policy-makers can use “financial assurance” policies to address this problem.

To explore both the problem and potential solutions in detail, we consider Canada’s mining sector as a detailed case study. This executive summary provides a high-level review of our findings.

Economic activity comes with risks to the environment

A series of high-profile events have reminded Canadians that economic activity comes with risks to people and the environment:

- In July 2013, a train carrying crude oil derailed in the town of Lac-Mégantic, Quebec. The resulting explosion killed 47 people, and much of the oil spilled into local soil and waterways. Measured in terms of its human costs, it is one of the worst environmental disasters in Canadian history.

- In August 2014, a tailings-pond dam ruptured at the Mount Polley copper and gold mine in northern British Columbia, spilling tailings into Polley Lake, Hazeltine Creek, Quesnel Lake, and the Cariboo River. The tailings contained arsenic, selenium, and various heavy metals.
- In July 2016, a ruptured pipeline owned by Husky Energy spilled approximately 225,000 litres of oil into the North Saskatchewan River. The oil slick travelled downstream, covering 134 km of shoreline and forcing several communities to shut their water intake systems.

Dramatic events of this type are rare; the vast majority of rail transport, mining, and pipeline transport occurs without incident. But they can and do happen.

Resource extraction, transportation of goods, manufacturing processes — in short, many of the pillars of the economy that drive our well-being as Canadians — come with risks. When things go wrong, the environmental damage can be significant, even catastrophic. And the damage can lead to significant costs, whether in the form of health impacts or loss of life, taxpayer-funded cleanup costs, lost income, or reductions in the environmental benefits associated with clean water, air, and soil.

Society — rather than the firms who are responsible — sometimes bears the costs

When environmental damage occurs in Canada, the firm that caused that damage will not necessarily bear the cost. Gaps in existing policies — we call them “liability gaps” — can shift the costs of environmental damage away from firms and onto society.

Liability gaps arise when existing rules do not hold firms fully accountable for the environmental damages they cause. For example, liability rules might limit the circumstances under which firms can be held liable or exclude some types of environmental damage from their liability. Or, to enable risky projects that would not otherwise proceed, policy-makers may place a cap on the level of firms’ liability.

Perhaps even more critically, a firm might avoid paying for environmental damage because it ceases to exist. If the costs of a tailings spill, for example, caused a firm’s liabilities to exceed its assets, the firm can declare bankruptcy or enter insolvency under Canadian law, leaving society to bear its environmental costs.

The Redwater case — which is currently before Canada’s Supreme Court — will have important implications for who bears the cost of bankrupt and insolvent firms’ environmental liabilities in Canada. At issue in the case is who pays for the environmental cleanup of a bankrupt company’s non-producing oil and gas wells. The Court of Appeal of Alberta upheld a lower court’s decision that, in seeking funds to pay for the cleanup, the Alberta government should be treated as any other unsecured creditor and paid out after higher-ranking creditors. The case has far-reaching implications. If the Supreme Court upholds the decision, it will increase the probability that society will bear the cost of bankrupt firms’ environmental liabilities in Canada.

When any type of liability gap exists — bankruptcy-related or not — firms are potentially able to generate private benefits from their activities while society bears the environmental costs. Whenever firms will not bear the cost of their actions, the risks they pose to the environment are *unpriced*.

Leaving risks unpriced can exacerbate them. When firms know they may bear less than the full cost of environmental damage arising from their actions, they have less incentive to take actions that reduce the risk of harm. As a result, overall risk to the environment can increase.

The goal is to manage risk, not eliminate it

When it comes to dealing with unpriced risks, policy-makers face a balancing act. On one hand, addressing unpriced risks with policy can reduce environmental risk and the likelihood that society will bear the cost of environmental damage. On the other hand,

however, these policies are not costless: they can inhibit production and investment, thus reducing the economic and social benefits from economic activity.

Reducing risk toward zero is often not practical since the economic costs of doing so can exceed the environmental benefits. Indeed, to fully eliminate risk would require shutting down the activity that creates it. But similarly, unmitigated risk can have costs that exceed benefits. Leaving liability gaps unaddressed can exacerbate the risk of environmental damage and the possibility of social costs.

Instead, policy-makers can balance these trade-offs by implementing policies that manage environmental risk.

Pricing risk can help manage it

Policy-makers have a number of tools available to manage environmental risk. They can implement *regulations* that ensure certain minimum standards and practices are met and that rule out particularly high-risk activities. Or they can establish *liability rules* that clearly lay out firms’ liability for environmental damage they cause. These are both legitimate ways of managing risk; however, in this report, we focus on a third type of tool — *financial assurance*.

Financial assurance offers a powerful tool for pricing environmental risk. Financial assurance policies require firms to promise or commit funds against potential environmental liabilities. The assurance they provide can come in different forms, for example, cash deposits, environmental bonds, insurance, or industry funds.

Financial-assurance policies can help policy-makers balance trade-offs. They can create economic incentives for firms to take more action to avoid possible environmental damage. They can, should environmental damage occur, provide compensation to those affected. And they can achieve these goals at low costs by harnessing market forces.

Of course, firms may already have *reputational* incentives to limit risk: causing environmental harm can badly damage a firm’s public image, undermining profitability. But in the context of liability gaps, such as the ability to declare bankruptcy, these incentives may not be enough. Financial assurance can help fill these liability gaps.

Financial-assurance policies are not a panacea. For example, they should not replace environmental assessment, which considers much broader issues. But they can serve a valuable role by ensuring that project proponents bear the cost of the risks they pose and limiting the extent to which they can pass their environmental costs to society. This can help reduce the risk of proposed projects, as well as screen out particularly high-risk ones.

Summary for Policy-Makers

Financial assurance instruments price risk in different ways and offer different benefits

Table 1 summarizes the range of different instruments available to price environmental risks, across five main categories. It also illustrates trade-offs: some instruments provide stronger

incentives to reduce risk (*deterrence*), others ensure firms will pay for environmental damage they cause (*compensation*), and others lower costs for firms (i.e., by allowing them to provide assurance more cost-effectively), supporting production and investment (*economic activity*).

Table 1: Summary of financial assurance instruments

Category	Description	Instruments	Effect on policy goals		
			 Reducing risk (deterrence)	 Paying for damages (compensation)	 Minimizing costs (economic activity)
Hard financial assurance from firms	Firms provide liquid assurance that cannot fluctuate in value and is readily available. The assurance is held in trust until the risk subsides.	<ul style="list-style-type: none"> • Cash • Securities • Sinking funds • Trusts 	Strong	Strong	Weak
Soft financial assurance from firms	Firms agree to cover the cost of a potential harm but retain possession of their assets.	<ul style="list-style-type: none"> • Self-assurance • Parent guarantees • Pledges of assets 	Weak	Weak	Strong
Third-party assurance	In the event of a qualifying environmental harm, a third party like a bank or insurer covers the cost. In exchange for this coverage, the firm pays a regular premium.	<ul style="list-style-type: none"> • Bonds • Insurance • Letters of credit 	Limited	Moderate	Moderate
Sector-level assurance	All firms in a sector collectively provide coverage. Individual firms pay a regular premium in exchange.	<ul style="list-style-type: none"> • Industry funds • Mutual insurance 	Limited	Moderate	Moderate
Public assurance	A publicly-administered instrument provides firms with coverage in exchange for a regular premium.	<ul style="list-style-type: none"> • Public funds • Public insurance 	Limited	Moderate	Moderate

Policy gaps in Canada's mining sector are exacerbating environmental risks

As a detailed case study, our report explores how provincial and territorial governments use financial assurance to address environmental risks in the mining sector. It compares mining sector financial assurance regimes in Yukon, British Columbia, Alberta, Ontario, and Quebec. It considers how financial assurance is applied

to the risk of both mining disasters, such as tailings-pond spills, and mine sites not being cleaned up at the end of their life.

Financial assurance policies have become an essential policy tool in managing the risk of mines not being cleaned up at the end of their life. While there is room for improvement in some areas of policy design, all the jurisdictions we consider use financial assurance to help manage this risk. By putting a price on this



Summary for Policy-Makers

risk, Canadian governments help ensure that mining firms have incentives to limit the environmental damage done to mine sites and will bear the cost of their cleanup.

However, in all the jurisdictions we explore, the risk of mining *disasters* is left unpriced. None of the five jurisdictions applies financial assurance against the risk of disaster. If a tailings spill like Mount Polley were to occur in any of these jurisdictions and the responsible company was bankrupted, society would be left to bear the cost. The potential for mining firms to pass on their costs in this way reduces their incentive to reduce environmental risk, exacerbating the risk of a mining disaster.

Our case study underscores how the narrow or incomplete application of financial assurance can exacerbate environmental risk. The conclusions and recommendations we discuss below are drawn from both this case study and our broader analysis.

KEY RECOMMENDATIONS FOR POLICY-MAKERS

Canadian policy-makers should close gaps in existing policies by pricing risk

Policy-makers should make greater use of financial assurance. Increasing the extent to which firms are financially accountable for environmental damage they might cause gives them an incentive to avoid it. In particular, policy-makers should expand policy to price risks that are currently unpriced.

In the mining sector, the lack of financial assurance for disasters represents a missed opportunity to lower the risk and potential social costs of mining disasters.

But at the same time, strong safety regulations and clear, well-established liability rules provide an essential foundation for policies to address environmental risk and liability. Financial assurance should complement these other policies, not replace them.

Policy-makers should estimate risk comprehensively to inform their risk-pricing policies

Estimating risk is critical to determining *how much* financial assurance governments should require. Requiring too much can unnecessarily increase costs, but requiring too little can limit the extent to which financial assurance reduces risk and funds cleanup, should a disaster occur.

Estimating risks well requires considering all relevant sources of risk (i.e., financial, economic, legal, environmental, technological, etc.) and considering the full range of potential damage types (i.e., property, human health, livelihoods, ecosystems, etc.). It also requires taking care to account for low probability and catastrophic outcomes and to evaluate the potential for long-term or perpetual costs.

In the mining sector, for example, rather than using deterministic point estimates to set financial assurance requirements for the risk of non-remediation, policy-makers should use a risk-weighted estimation approach. This would help secure against a site's actual closure costs exceeding its estimated costs and help avoid these costs being borne by society.

Policy-makers should require firms to pay according to their riskiness

Customizing risk pricing to firms' specific context can make policy work better. Firms present different levels of risk based on (for example) their sector, where they operate, their financial context, or the kinds of technologies they use. Asking firms to pay according to their unique level of risk — or “risk differentiating” — can improve outcomes. Policy-makers can use risk differentiation in different ways — either to increase financial assurance requirements for risky firms or to decrease them for less risky ones.

In the mining sector, for example, a number of the provinces or territories we consider in the report already differentiate based on firms' financial risk. Ontario, for instance, requires different levels of financial assurance depending on firms' assessed financial risk. Firms that are more financially vulnerable — and thus more likely to declare bankruptcy — must provide stronger assurance.

Policy-makers should combine risk-pricing instruments when risks are severe

In some cases, individual firms may be unable to provide assurance that can cover the full range of potential costs, especially where high-cost, low-probability outcomes are possible (i.e., where risk has a “fat tail”). Similarly, third-party providers of financial assurance may be unable or unwilling to provide coverage high enough to guarantee full compensation in the event of severe costs.

To address this problem, policy-makers should use tiered financial assurance solutions. In a tiered scheme, firm-level and third-party assurance would provide coverage up to a point. Beyond this threshold, sector-level financial assurance or public instruments would kick in.

In the mining sector, for example, policy-makers should use a tiered financial-assurance scheme to protect against catastrophic mining disasters. Mining operations that pose a significant risk of disaster should provide a degree of assurance themselves, with third-party assurance (where it is available) providing a higher tier. But to cover non-insurable, “fat-tailed” risk, policy-makers should consider broader approaches that *pool* risk across firms or even across sectors (e.g., the United States' Superfund deals with contaminated industrial sites across a range of sectors).

Summary for Policy-Makers

Society should share environmental risks only when there is a clear case for doing so

In specific circumstances, risk sharing between private firms and society more broadly can be justified. For example, in many natural resource sectors, firms pay royalties to government. Because society shares in the benefits of the economic activity, there is a case for sharing in some of the risks as well.

But in other cases, the costs of risk sharing can outweigh the benefits. Risk sharing is an indirect subsidy, and it can create economic distortions that increase the likelihood or severity of costly environmental damage. And because any public costs for cleanup or compensation would be funded from tax revenue, risk sharing can also have a cost to the broader economy.

In the mining sector, there is a case for risk sharing. A number of jurisdictions in Canada already share the risk of non-remediation with mining firms. However, excessive risk sharing in the form of low financial-assurance stringency can tilt the policy environment toward economic activity at the expense of deterrence and compensation.

Jurisdictions in Canada that choose to share in the mining sector's risks should explore alternative ways of doing so, including by sharing in its financial risks rather than its environmental ones. For example, in place of relaxed financial-assurance requirements,

jurisdictions could offer preferential loans. In doing so, they would share in mining's financial risk: Where ventures were successful, loans would be repaid. Where they were not, government would incur a loss. Such an approach could help Canada's mining sector remain globally competitive without compromising on environmental-risk reduction and compensation goals.

Policy-makers should articulate and justify their policy priorities — and then design and implement policies consistent with this vision

Policy-makers should justify their approaches to risk sharing (for example, having less stringent or more narrowly applied financial assurance), and make the case that they present a net benefit to society. Where policy design trades off risk reduction or full compensation from firms in favour of greater economic activity, policy-makers should demonstrate that the benefits of this approach (in the form of greater production and investment) outweigh the costs (in the form of greater environmental risk and potential social costs). Similarly, where policy design trades economic activity in favour of greater risk reduction or compensation, policy-makers should demonstrate how the benefits of avoided risk exceed the costs of reduced investment.

This report shows how financial-assurance policies can put a price on risk to the environment. Financial assurance can support safety regulations and existing laws in managing risk. But it can also do something these tools cannot by harnessing the power of market forces.

By creating incentives for firms to better manage their risk, by funding compensation or cleanup costs, and by minimizing the costs of doing so, financial assurance can ensure we take responsible risks.





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Canada's Ecofiscal Commission
c/o Department of Economics
McGill University
855 Sherbrooke Street West
Montreal, QC H3A 2T7

www.ecofiscal.ca