Canadian Environmental Law Association
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Lung Cancer Prevention: A Tax Credit for Radon Mitigation

Summary

We recommend amending the *Income Tax Act* to provide a tax credit available to individuals and small-scale landlords of 15 percent of the cost of radon mitigation by experts certified by the Canadian National Radon Proficiency Program where a three-month test indicates an indoor radon level above the Canadian radon guideline (currently 200 Bq/m^3).

Federal Government Investment Required:

None. This tax measure would result in net tax benefits to federal and provincial governments in the form of increased tax revenues and health care savings. The provinces would benefit even more than the federal government from such a measure (see attached table for detailed calculations).

Background and Rationale

Radon, a known carcinogen, is a radioactive gas arising from the natural decay of uranium in soil and rock. It is the second leading cause of lung cancer in Canada after smoking and is responsible for 16% of lung cancer deaths annually resulting in over $17 million annually in direct health care costs. Invisible, odourless, and tasteless, it is detected only via a simple and inexpensive three-month test.

Since 2008, Health Canada's National Radon Program has tested over 19,000 federal buildings and about 18,000 homes across Canada, updated radon measures in the National Building Code, developed a certification program for radon mitigators (the Canadian National Radon Proficiency Program), conducted extensive research as well as education and awareness programs, and repeatedly told Canadians that all homes should be tested for radon.

Health Canada data indicate that the radon level in about 7% of homes in Canada (over 600,000 dwellings) is above the Canadian guideline of 200 Bq/m^3.[1] Parts of Manitoba, New Brunswick, Saskatchewan and Yukon have higher levels. But, some level of radon occurs in all buildings with high levels found in all provinces which is why Health Canada recommends that all homes be tested.

Over 600,000 Dwellings Affected

Much new construction in Canada includes radon protection measures. But, an estimated 617,501[2] dwellings need mitigation, most of them older homes. Public uptake of outreach messages on the need to test is limited. A federal tax credit is a logical next step for the National Radon Program and would send a strong signal to Canadians to take this issue more seriously.

Making Radon Mitigation Affordable

Mitigation techniques include sealing cracks and other openings in the foundation/floor, venting and/or Active Sub-Slab Depressurization (installation of a pipe and fan under the basement floor slab to vent radon and prevent entry to the home). Typical mitigation costs range from $500 to $3,000. The federal government can help make radon mitigation affordable by adding radon mitigation as a tax credit under the *Income Tax Act*. We estimate that this tax credit will be revenue-neutral and more likely result in a net annual benefit in the order of $1.6M to $11.4M to federal revenues and $8.29M to $7M to the provinces. The attached table and associated notes explain these calculations and note conclusions about anticipated federal and provincial tax revenues.

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[1] Bequerels per cubic metre, a measure of the number of radioactive disintegrations per second.

[2] Based on tallying Canada Mortgage and Housing Corporation data on occupied housing stock. See attached table for detail on specific calculation.

Total Households*	Houses mitigated	Houses mitigated
5years	80%	20%
617500	494000	123500
Houses mitigated per year	98800	24700

Two scenarios: 80% and 20% of above-guideline homes mitigated across 5 years

Tax credit Calculation

	Tax Credit		
Mitigation ($) per household	15%	Per year 80%	Per year 20%
500	75	7,410,000	1,852,500
1,500	225	22,230,000	5,557,500
2,500	375	37,050,000	9,262,500
3,500	525	51,870,000	12,967,500

Both scenarios assume a tax credit to home owners or small-scale landlords of 15% of the cost of radon mitigation. Mitigation costs typically range between $500 and $3000. Since most affected housing stock will be older it is unlikely to contain Building Code requirements to "rough-in" components of radon exhaust systems. Hence, older homes are likely to need more costly mitigation systems.

Tax calculation for 80% of above-guideline homes mitigated across five years

		Income from mitigations	Corporate Income tax rate**	Provincial tax rate ***	HST****		Input tax credits GST	Input tax credits PST	HST Estimate that will be paid to CRA	
		Per year 80%	federal net tax rate of 15%	Ontario basic income tax rate - 11.5%	Federal	Provincial			Federal	Provincial
	Houses mitigated per year	**98800**	15%	11.50%	**5%**	8%	34%	34%	**5%**	8%
Mitigation cost	500	49,400,000	7,410,000	5,681,000	2,470,000	3,952,000	839,800	1,343,680.00	1,630,200	2,608,320
Mitigation cost	1,500	148,200,000	22,230,000	17,043,000	7,410,000	11,856,000	2,519,400	4,031,040.00	4,890,600	7,824,960
Mitigation cost	2,500	247,000,000	37,050,000	28,405,000	12,350,000	19,760,000	4,199,000	6,718,400.00	8,151,000	13,041,600
Mitigation cost	3,500	345,800,000	51,870,000	39,767,000	17,290,000	27,664,000	5,878,600	9,405,760.00	11,411,400	18,258,240

Tax calculation for 20% of above-guideline homes mitigated across five years

		Income from mitigations	Corporate Income tax rate**	Provincial tax rate ***	HST****		Input tax credits GST	Input tax credits PST	HST Estimate that will be paid to CRA	
		Per year20%	federal net tax rate of 15%	Ontario basic income tax rate - 11.5%	Federal	Provincial			Federal	Provincial
	Houses mitigated per year	**24700**	15%	11.50%	**5%**	8%	34%	34%	**5%**	8%
Mitigation cost	500	12,350,000	1,852,500	1,420,250	617,500	988,000	209,950	335,920.00	407,550	652,080
Mitigation cost	1,500	37,050,000	5,557,500	4,260,750	1,852,500	2,964,000	629,850	1,007,760.00	1,222,650	1,956,240
Mitigation cost	2,500	61,750,000	9,262,500	7,101,250	3,087,500	4,940,000	1,049,750	1,679,600.00	2,037,750	3,260,400
Mitigation cost	3,500	86,450,000	12,967,500	9,941,750	4,322,500	6,916,000	1,469,650	2,351,440.00	2,852,850	4,564,560

* Total number of above guideline homes derived from: CMHC, 2014. Canadian Housing Observer. On-line at: https://www.cmhc-schl.gc.ca/en/hoficlincl/homain/stda/data/data_007.cfm See table CMHC table11_en_w-2.xls. Estimate includes CMHC data on occupied housing stock in 2011 including single detailed, semi-detached, row houses, and other single detached houses that are classified as owned, rented or band. Estimate is conservative since it excludes apartments in detached duplexes and all other low-rise (less than five story) apartment buildings. The choice was made to include dwellings that are obviously less than three stories and in direct contact with the ground. Total of above homes is 8,821,435. The number of above-guideline homes is assumed to be the average of 7 percent of this total, or 617,500, in line with Health Canada's findings: Health Canada, “Cross-Canada Survey of Radon Concentrations in Homes, Final Report” ((March 2012) ISBN: 978-1-100-20115-3, online: http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/radiation/radon/survey-sondage-eng.pdf

** Net corporate income tax rate conservatively assumed to be 15%. Larger firms might pay a higher rate. Since the tax credit and the federal corporate tax rate are both 15% the numbers are the same and the measure is revenue neutral.

*** Provincial tax rate applied for the purposes of these calculations is the Ontario basic income tax rate of 11.5%

**** HST revenues are disaggregated. Federal GST is calculated at 5%. An average of 8% is assumed for PST given the range in level of PST across the country. Input tax credits on sales tax paid by radon mitigation firms assume that about one-third of mitigation services are related to sales-tax applicable costs for purchase of materials.

Conclusion

Federal tax revenue per annum for five years

Under the more aggressive scenario of 80% of above-guideline homes mitigated over five years, a large number of jobs will be created in the radon mitigation sector. Net tax revenue to the federal government is in the range of $1.6M to $11.4M derived from HST revenues. The amount is likely closer to the high end of the range given the reality of older housing stock requiring more expensive mitigation. Under the 20% scenario, federal tax revenue is more modest with an annual benefit ranging between $407,500 and $2.85 million.

Provincial tax revenue per annum for five years

Net tax revenue to the provincial government is in the range of $8.29M to $58M derived from both corporate income taxes and provincial sales tax. Under the 20% scenario, the annual tax revenue is estimated between $2M to $14.5M.

Additional Annual Savings of over $63M in Health Care Costs

Provincial health care costs will decrease from the prevention of radon-induced lung cancer. In constant 2010 dollars, the total direct (drugs, hospitals, physicians) and indirect (mortality) cost of lung cancer in Canada is $398,480,803.[3] Chen et al[4] estimate the Attributable Risk of radon causing lung cancer is 16%. Hence, there is the potential to save over $63.7M in health care costs from the prevention of radon-induced lung cancer.

For more information please contact:

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[3] Public Health Agency of Canada, Economic Burden of Illness in Canada (EBIC) Report, Online at http://ebic-femc.phac-aspc.gc.ca/index.php . Customized report for all direct and indirect costs of bronchus and lung cancers in current and constant 2010 dollars. http://ebic-femc.phac-aspc.gc.ca/custom-personnalise/results-national-resultats.php?report_type=cpi

[4] Chen, J., D. Moir, and J. Whyte. 2012. "Canadian Population Risk of Radon Induced Lung Cancer: A Re-Assessment Based on the Recent Cross-Canada Radon Survey." *Radiation Protection Dosimetry* 152 (1-3): 9–13. doi:10.1093/rpd/ncs147.