



Policy Forum

Green Taxes: Potential Revenue for Illinois?

By Don Fullerton & Daniel H. Karney

In early January 2011, the state of Illinois enacted legislation to raise the personal income tax rate from 3 percent to 5 percent and to increase the corporate income rate from 4.8 percent to 7 percent. Along with a cap on spending growth, these tax increases are projected to reduce the state's budget deficit in 2011 by \$3.8 billion (from \$10.9 to \$7.1 billion).¹ The governor justified the tax increases on the grounds that the state's "fiscal house was burning."² In this note, we neither debate the reasons for the underlying fiscal crisis in Illinois, nor argue the merits of cutting spending versus raising revenue to address the severe budget imbalance. Instead, we analyze an alternative route, the use of "green taxes," that could raise revenue to reduce or eliminate the need to increase income taxes.

In general, green taxes are taxes either directly on pollution emissions or on goods whose use causes pollution. In the revenue-raising context, the basic argument for green taxes can be summarized by the adage: "tax waste, not work." Taxes on labor income discourage workers from engaging in productive activities, and thus hurt society. Taxing waste, by contrast, discourages harmful pollution, and thus benefits society. In addition, the revenue raised from these green taxes can help mitigate the state's fiscal crisis.

While many green taxes could be implemented, we focus on four specific examples that have the potential to raise large amounts of revenue: carbon pricing, gasoline

taxes, trucking tolls, and garbage fees. Indeed, a reasonable set of tax rates on these four items could generate as much revenue as the income tax increase. That is, imposing green taxes could completely fill the \$3.8 billion difference between the projected baseline deficit (\$10.9 billion) and the post-tax deficit (\$7.1 billion).

Below, we omit discussion of many other potentially high-revenue green taxes. For example, Illinois could tax nitrogen-based fertilizers that contribute to nitrogen run-off pollution in streams, rivers, and lakes. These omissions do not imply that other green taxes could not be implemented. Also, the simple analysis here does not include behavioral responses by consumers and businesses. Rather, we apply hypothetical green taxes directly to historical quantities of emissions (or polluting products) in order to obtain an approximate level of potential revenue generation. These estimates are probably high, because we use the simplifying assumption that higher tax rates would not alter behavior (through tax-avoidance). Therefore, the revenue amounts can be regarded as "ceilings."

We proceed by discussing each of the four green taxes and their potential for revenue generation.

Carbon Pricing

In 2008, electricity generators in Illinois emitted almost 100 million metric tons of carbon dioxide (CO₂) according to the U.S. Department of Energy's Energy Information Agency (EIA).³

While the United States has no nationwide price on carbon – neither a tax nor a cap-and-

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¹Fiscal Fallout No. 5, Institute of Government and Public Affairs, University of Illinois. (Source: <http://igpa.uillinois.edu/system/files/documents/FF-5-18jan11.pdf>)

²*Chicago Tribune*, January 12, 2011. (Source: http://articles.chicagotribune.com/2011-01-12/news/ct-met-tax-hike-0113-20110112_1_tax-hike-cigarette-tax-tax-increase-vote)

³EIA Estimated Emissions by State (EIA-767 and EIA-906), State Historical Tables (Source: <http://www.eia.doe.gov/state/state-energy-profiles-notes-sources-data.cfm>)

Table 1: Estimated Revenue from Potential CO₂ Emission Taxes on Electricity Generation in Illinois (2008 Consumption & Expenditure Data)

CO ₂ Price (\$/metric ton)	Total Revenue (\$ billion)	Share of Revenue from Income Tax Increase (percent)	Projected Increase in Retail Electricity Expenditure (percent)
5	0.5	13.2	3.75
10	1.0	26.4	7.5
20	2.0	52.8	15.0
40	4.0	105.3	30.0

Assumptions: (a) 100 million metric tons of annual carbon dioxide (CO₂) emissions in Illinois; (b) no behavioral response by consumers or producers; (c) \$3.8 billion of annual revenue from income tax increases; (d) \$13.3 billion of annual retail electricity expenditures.

trade (permit) policy – some jurisdictions within the United States have imposed their own carbon policies. For instance, a coalition of Northeastern states implemented the Regional Greenhouse Gas Initiative (RGGI) to limit CO₂ emissions using a permit policy. To date, RGGI’s modest effort has already generated close to \$1 billion in revenue for the coalition states.⁴

If Illinois were to adopt its own carbon pricing policy, then even a modest tax rate or permit price could raise significant revenue. For instance, a \$5 per metric ton CO₂ price on emissions from electricity producers would generate about \$500 million in revenue (or 14.4 percent of the \$3.8 billion raised from the income tax hike). If the extra \$500 million in emission taxes were entirely passed on to consumers in the form of higher electricity bills, then the average consumer’s bill would increase by 3.75 percent (where \$13.3 billion is spent annually on electricity in Illinois).

Table 1 reports the possible “revenue enhancement” from the \$5 per metric ton tax, along with three other pricing scenarios. Both the \$5 and \$10 rates are hypothetical prices created by the authors for expositional purposes. In contrast, the \$20 per metric ton price is approximately the carbon price faced by electricity producers in Europe’s Emission Trading System (ETS). At the \$20 rate, a carbon tax in Illinois would generate almost \$2 billion – over half of the tax revenue expected from the recent income tax increase.

Finally, the \$40 tax rate (or carbon price) is an estimate of the optimal carbon price that accounts for all of the negative effects from carbon emissions, according to Tol.⁵ At this price, the revenue from pricing carbon in Illinois matches the tax revenue from the state’s income tax increase.

Gasoline Taxes

Gasoline sales in Illinois are subject to a state excise tax set in 1990 at \$0.19 per gallon. In addition, other state fees and a federal excise tax of \$0.18 per gallon are applied to gasoline sales for a total tax rate in Illinois of \$0.61 per

gallon, according to the American Petroleum Institute.⁶

Several economic studies find that these existing tax rates on gasoline are below the optimal rate to account for all the costs of pollution and time wasted due to traffic jams. For instance, Parry and Small calculate the optimal U.S. total gasoline tax at about \$1 per gallon, which means that the current Illinois rate is about 40 cents too low.⁷ Table 2, line 3 shows that a \$0.40-per-gallon gasoline tax increase would collect approximately \$2.0 billion, or just over half of the \$3.8 billion in expected revenue from the income tax increase. A 40-cent per-gallon gasoline tax increase would also translate into a 12.4-percent increase in the amount that Illinoisans spend annually on gasoline (about \$15.9 billion). Table 2 also includes other alternative gasoline taxes. For example, a 5-cent-per-gallon tax increase would generate \$250 million.

Note that Illinois’s existing \$0.19 per gallon excise tax is not indexed to inflation, so the real revenue accruing to the state from the gasoline excise tax has steadily fallen over time. Table 2 line 2 calculates that simply adjusting the tax rate back to the 1990 purchasing power level would generate \$700 million in revenue. That is, if the State were to reset the per-gallon excise tax to account for inflation since 1990, then the new state excise tax would need to be \$0.33 per gallon, or 14 cents higher than the current tax rate, and the expected increase in revenue that would follow would constitute about 18 percent of the expected revenue from the income tax increase.

Trucking Toll

Every day hundreds of thousands of vehicles crowd Illinois’s roads, highways, and interstates. These vehicles include trucks, and data from the Federal Highway Administration indicates that over 50,000 trucks (six tires and over) cross into Illinois from neighboring states along the interstate highway system.⁸ While these trucks bring

⁶ Source: <http://www.api.org/statistics/fueltaxes/>

⁷ Parry, Ian W. H., and Kenneth A. Small. 2005. “Does Britain or the United States Have the Right Gasoline Tax?” *American Economic Review* 95(4): 1276-89.

⁸ Source: http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/08factsfigures/figure3_6.htm.

⁴ RGGI Website (Source: http://www.rggi.org/market/co2_auctions/results#state_proceeds)

⁵ Tol, Richard S. J. 2009. “The Economic Effects of Climate Change.” *Journal of Economic Perspectives* 23(2): 29-51.

Table 2: Potential Additional Tax Revenue from Gasoline Sales in Illinois (2008 Consumption & Expenditure Data)

Gas Tax Rate Increase (cents/gallon)	Total Revenue (\$ billion)	Share of Income Tax Increase (percent)	Increase in Retail Gasoline Expenditure (percent)
5	0.25	6.5	1.6
14	0.7	18.3	4.4
40	2.0	52.2	12.4

Assumptions: (a) 118 million barrels of gasoline sales per year; (b) no behavioral response by consumers or producers; (c) \$3.8 billion of annual revenue from income tax increases; (d) \$15.9 billion of annual gasoline expenditures in Illinois.

needed goods to Illinois, they also congest the roads, degrade the road surfaces, fill the air with soot, and emit CO₂. They also become involved in vehicle accidents that cost the lives of Illinoisans.

To compensate the state by means of tax revenue, Illinois could impose a toll for long-haul trucks using Illinois's highways. For example, a \$5 per truck toll on 50,000 trucks daily would raise almost \$100 million annually. (In comparison, the existing Illinois toll road system generates approximately \$600 million annually.) The truck toll could be implemented using existing transponder technology deployed at weigh stations along the interstate highways, so it would not require any up-front investment in new infrastructure (though there might be small costs in manpower to implement it).⁹

Garbage Fees

Residents of Illinois generate approximately 19 million tons of garbage per year, more than one ton per person per year. Sixty percent of that waste ends up in landfills. Currently, large municipal waste landfill operators pay state fees that total \$2.22 per ton of solid waste dumped.¹⁰ But few municipalities in Illinois charge fees that were designed to discourage the creation of waste by residents.¹¹ However, empirical evidence shows that taxing garbage at the residential level does reduce garbage production, although the exact garbage taxation mechanism varies by program.¹² For instance, a fee can be levied on garbage bags themselves or on the containers that hold the garbage bags. Regardless, a tax rate equivalent to one penny per pound of garbage would generate almost \$240 million in revenue per year, or 6.3 percent of the expected revenue from the income tax increase.

⁹The constitutionality of state trucking tolls is not clear, because the federal government determines the rules of interstate commerce. However, major portions of the existing interstate highway system are subject to tolls, including the heavily travelled I-95 corridor in Delaware.

¹⁰Source: <http://www.epa.state.il.us/fees/landfill-tipping.html>

¹¹Fullerton, Don and Sarah M. Miller. 2010. "Waste and Recycling in Illinois." *The Illinois Report* 2010, 70-80.

¹²Fullerton, Don and Thomas C. Kinnaman. 1996. "Household Responses to Pricing Garbage by the Bag." *American Economic Review* 86(4): 971-84.

Portfolio Approach

Remember, at issue here is not whether to raise taxes. We presume the state has decided to raise taxes by \$3.8 billion (as done already through the income tax increase). We have merely demonstrated a few alternative ways to raise that revenue by means other than increasing the income tax. These green tax alternatives have the added benefit of discouraging pollution or waste, while raising the needed revenue. (Here, we ignore all other comparisons, such as the relative progressivity of these various alternative tax increases.)

Finally, instead of implementing only one of the green taxes describe above, Illinois could choose to implement several green taxes simultaneously. This portfolio approach with many green taxes would keep rates comparatively low for each individual green tax, but still generate large amounts of total revenue that can add up to a significant share of the total expected revenue from the recent income tax hike. According to the numbers above, for example, a simple and moderate plan could combine the following green taxes and pay for more than half of the needed revenue: (1) a carbon tax of \$10/ton would collect \$1 billion (raising electricity prices by about 7.5 percent); (2) a gas tax increase of 14 cents per gallon would collect \$0.7 billion (raising gas prices by about 4.4 percent); (3) a trucking toll of \$5 would collect \$100 million; and, (4) a garbage fee of one penny per pound would collect \$240 million. In turn, the recent income tax increase could be cut by more than half.

Serious consideration should be given to taxes that provide incentives to reduce the polluting effects of carbon emissions, gasoline use, truck exhaust, and household garbage generation. Recall that we ignore tax-avoidance behavior in this analysis, so the revenue projections here are upper-bounds on actual revenue that would be collected if green taxes were implemented. For actual revenue to fall short of these estimates would normally be a disadvantage, but in this case the taxpayer can only "avoid" these taxes by reducing pollution. If the estimates here are "too high," then the advantage is that we then achieve some pollution reductions along with some revenue.