Noah Perkovich

Economic Analysis for Colorado Senate Bill 19-192 *Front Range Waste Diversion Enterprise Grant Program*

Legislative introduction

Colorado Senate Bill 19-192 *Front Range Waste Diversion Enterprise Grant Program* if passed will create a state-owned enterprise within the Department of Public Health and Environment. The enterprise will collect user's fees at Front Range landfills proportional to the amount of solid waste disposed. The revenue from fees will be managed by the enterprise and allocated as grants to waste management projects intended to increase recycling, composting, and other means of diverting waste from landfills.

Economic Introduction

The main intention of the bill appears to be to address negative environmental externalities associated with disposing of waste at landfills. This paper finds those externalities can be substantial. It also finds that increasing the user's fee on landfills will both reduce the externalities and can provide means for the government to better mitigate them. Though this part is justified, the grant program will distort the waste management market, reducing economic efficiency and possibly redistributing wealth in an unprogressive way. Ultimately this paper recommends not passing SB19-192. Instead it encourages the assembly to develop a more effective waste tax.

Justifying Intervention

Landfills have the potential to create substantial environmental damage. The greatest environmental concern is in leachate. That is when rain water percolates through the landfill and becomes contaminated with pollutants. This water then makes its way into both surface and ground water supply (Peter p.298). This issue is mitigated by lining the sites to contain leachate.

However, this solution is not perfect. More recently noticed, landfills create substantial methane emissions. In the US 24% of anthropogenic methane comes from landfills (Huber-Humer p.33). Methane containing methods are also used but they are only 30% to 40% efficient (Huber-Humer p.34). Both the water and air pollutants are negative externalities directly caused using landfills.

There are other negative environmental externalities indirectly caused by using landfills as well. It costs the environment something for almost every good produced. The more they are disposed of, the more they are replaced with new goods. Recycling, composting, reusing and other types of waste diversion can reduce this issue. For example, the State of Colorado environmental records claim current municipal waste diversion saves over $5 * 10^{12}$ BTU of energy (HP). For scale, this is enough energy to supply more than 48,000 household's non-transportation energy needs for a year at Colorado's average household energy consumption of $103 * 10^{6}$ BTU of energy per year (EIA). Energy production creates lots of environmental impact so saving energy also reduces environmental externalities.

Lastly waste generation is increasing. Waste generation has a positive income elasticity (Richard p.1). That is because when income increases, consumption increases, and when consumption increases, waste increases. So, as our economy grows, the above mentioned environmental impacts will increase. Therefore, remedying the externalities is only becoming more necessary.

Optimal Intervention

The best thing that can be done with externalities is to internalize them. (Pigou) That means someone must be responsible for the damage and bear the costs of repair.

One favorable tool for this is taxation. By imposing a fee for disposal at landfills, disposers will compensate society for the externalities created. The fee will increase the price of disposal at landfills, which will decrease the use of landfills. That decreases the negative externalities created by landfills. Additionally, it could discourage consumption, reducing the environmental externalities from the initial production of goods (Acuff p.15). The higher price will also increase demand for alternative waste management methods.

The higher price of disposal can have one negative effect which needs to be considered. That is if the price of disposal is too high people may resort to illegal dumping. The externalities associated with illegal dumping can very high (Palmer p.194). The bill plans to mitigate this by increasing the fee for littering.

The bill's proposed fee will reduce the use of landfills to a more efficient quantity but it does not fix the damage done by landfills alone. To extract even more social benefit from this market inefficiency, the revenue from the tax could be used to further clean up and mitigate the groundwater and atmospheric pollution from landfills. Unfortunately, the bill does not propose to use the revenue in this way. The flaws with its plan will be discussed in the next section.

Non-Optimal Intervention

It may seem intuitive to reduce landfill use by increasing recycling and other waste diversion. However, it is not always optimal for government to make those kinds of decisions. The bill intends to do this by allocating the revenue from fees to subsidize waste diversion projects like recycling. The subsidies could increase the supply of waste diversion disposal methods, while lowering the price.

Recycling reduces the environmental impact from producing new goods. This is a positive effect. Lower recycling prices have the opposite effect. That is because lower recycling prices encourage consumption, increasing the environmental externalities associated with production (Acuff p.15). Whichever effect is greater determines if the subsidies will increase or decrease the total environmental damage. Regardless it would be more efficient to omit the subsidies all together because they will encourage consumption.

The efficient amount of recycling, composting, and other waste diversion will be achieved by the market if the externalities from landfills are reflected in the price of disposal. The materials that are profitable to recycle will be recycled. The materials that are inefficient to recycle will not be recycled. Subsidies would likely distort the market equilibrium by making recycling profitable in situations where it would not otherwise be.

Legislative Recommendations

Because the economy is growing, waste is increasing. Waste disposal in landfills creates substantial negative environmental externalities that should and can be addressed by government. SB19-192 attempts to address them by imposing a use tax on landfill disposals to internalize external costs. By doing that it could make the waste market more efficient. However, the bill intends to use those funds to subsidize waste diversion projects. It would just be more efficient to use the funds to fix more of the damage from landfills than to subsidize waste diversion, encouraging consumption. Thus, this paper recommends not passing SB19-192 and instead passing a waste tax that allocates revenue to reparation.

Summary

In conclusion, SB19-192 intends to address externalities created by landfill use. Those externalities are substantial and increasing and thus should be addressed. The bill will be mostly successful at reducing the externalities by increasing the use tax on landfills. It could be much more efficient if the collected tax were used to repair damage rather than subsidize suboptimal methods of waste diversion.

Reference

Acuff, Kaylee, and Daniel T. Kaffine. "Greenhouse Gas Emissions, Waste and Recycling Policy." *Journal of Environmental Economics and Management*, vol. 65, no. 1, 2013, pp. 74–86., doi:10.1016/j.jeem.2012.05.003.

EIA, "Household Energy Use in Colorado." *Https://Www.eia.gov/Consumption/Residential/*, 2009, www.eia.gov/consumption/residential/reports/2009/state_briefs/pdf/CO.pdf.

HP Records Manager WebDrawer - Solid Waste - Annual Reports - Annual Solid Waste Diversion Totals 2007-2017, Colorado Environmental Records, environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/411895.

Huber-Humer, M., Gebert, J., & Hilger, H. (2008). Biotic systems to mitigate landfill methane emissions. *Waste Management & Research*, *26*(1), 33–46. https://doi.org/10.1177/0734242X07087977

Palmer, Karen, and Margaret Walls *. "Optimal Policies for Solid Waste Disposal Taxes, Subsidies, and Standards." *The Economics of Residential Solid Waste Management*, 2017, pp. 95–107., doi:10.4324/9781315240091-6.

Peter Kjeldsen , Morton A. Barlaz , Alix P. Rooker , Anders Baun , AnnaLedin & Thomas H. Christensen (2002) Present and Long-Term Composition of MSW LandfillLeachate: A Review, Critical Reviews in Environmental Science and Technology, 32:4, 297-336,DOI: 10.1080/10643380290813462

Pigou, A. C. *The economics of welfare / by A. C. Pigou* Macmillan London 1920

Richard, C. Porter, Richard C.. The Economics of Waste, Routledge, 2002. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/ucb/detail.action?docID=592557.