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The True Cost of Free Pollution Permits

A Redefining Progress Issue Brief

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The Nature of Economics

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Climate policy—in particular, cap-and-trade legislation—is moving quickly through the 110th Congress. As it does, various interested parties are making claims and recommendations that have potentially enormous implications for both the economy and the political sustainability of climate policy in the future. These assertions are often based on erroneous economic analysis, or worse, are made in the service of unmitigated self interest.

One of the most far-reaching decisions facing lawmakers is whether, under a cap and trade system, permits should be sold to polluters or given away for free. This decision will not only determine the flow of potentially trillions of dollars through the economy, but also the overall cost of climate policy. The difference between the two options is economic in nature, but the impact would reach far beyond the economy. If climate policy is implemented in a way that is excessively costly and if those costs are borne by a disproportionate few, the political base of support for action on climate change will almost certainly fracture well before we've made necessary progress in the reduction of greenhouse gasses.

One of the most far-reaching decisions facing lawmakers right now is whether, under a cap and trade system, permits should be sold to polluters or given away for free.

When Free Isn't Free

While it is a common understanding that auctioned permits will result in higher energy and other product prices much the same way that an equivalent fee on carbon emissions would, it is often erroneously assumed that free permit allocations will not, i.e., if emitters receive carbon permits for free, there will be no costs to pass on to their consumers. Though intuitive, this reasoning is incorrect. Cap and trade systems increase energy and product prices because of the scarcity they introduce. That scarcity is what drives the price increases, not the method of permit distribution.

Consider a cap and trade system in which emission permits are distributed to polluters for free. To reduce greenhouse gasses, fewer permits than polluters want are distributed. For a polluting company to maintain production levels, it will need either to undertake some costly abatement or buy a permit from another polluter. In either case, production costs will go up, and it will pass as much of those costs onto its customers as it can. If it is able to raise prices to cover some or all of the increased costs, its competitors will also raise their prices. No company, after all, will want to leave money on the table.

If, on the other hand, the polluter cannot raise its prices to cover the cost of buying a permit or abating emissions, its next choice is to reduce emissions by cutting back on its output. Of course, as supply falls, prices will increase.

Though presented here as an either-or scenario, in reality, emissions reductions are likely to be achieved by a combination of abatement where it is economical and output reductions where abatement costs are higher than the market will bear. The end result is that free emission permits will indeed cause higher prices, and will in fact increase prices by same amount as if the permits were sold. This scenario has played out in existing cap and trade systems and is beyond dispute in the economics profession.

While energy and product prices will rise identically whether permits are sold or given away for free, the decision of whether or not to sell permits has enormous economic implications. The first is obvious: Who actually bears the cost of reducing pollution? Under an auctioned cap and trade system (or an emissions fee), emitters reduce their pollution levels and pass some or all of the costs of abatement onto their consumers in the form of higher prices. For every ton of carbon that is still emitted, polluters must pay the government either the carbon fee or permit price. Under an equivalent free or grandfathered cap and trade system, emitters also reduce their pollution, and output prices still rise

by the same amount. In this case, however, emitters do not pay for their emission permits yet still enjoy the benefits of higher prices for their products. The end result is equivalent to a government imposed tax that companies levy on their customers but then keep for themselves.

The resulting windfall benefit to emitters from a cap and trade system with free initial distribution of permits can be quite large, and depends on a number of factors including the stringency of the emissions reduction target. It is possible to identify a simplified upper-bound estimate of the windfall gain.[1] For a 10% reduction in emissions, the annual economic value of the permits under a cap and trade system would be at least 18 times the annual aggregate costs of abatement. For a 50% reduction, the value would be at least twice aggregate costs. More sophisticated attempts to quantify the windfall value in work by Bovenberg and Goulder (2000)[2] estimate that holding the entire coal, oil, and natural gas industries economically harmless (fully compensating them for the lost revenues and reduced asset valuations) would require less than 20% of the revenues from a carbon tax or permit auction. Full grandfathering to these industries would thus overcompensate them by a factor of more than 5.

In absolute terms, the potential windfall is huge. Because climate proposals typically start with relatively mild reduction targets that become more stringent over time, the cost of cutting emissions, the price of a permit, and thus the value of the permit pool to be distributed begins relatively low and increases as the cap tightens. Many feel that, in the medium term, permit prices are likely to approach $30 per ton of CO_2. [3] At $30 per ton of carbon, the total value of carbon permits to be issued would range well above $100 billion annually. In the long run, carbon prices of $100 per ton may well be possible. If so, the value of the permit pool would reach into the hundreds of billions annually.

Even under mild assumptions, free permit distributions would represent the largest windfall distribution of wealth in this country's history. Households, businesses and industrial energy consumers will transfer their wealth to the owners of energy producing companies, already among the richest corporations in the world.

A Better Way

From a macroeconomic standpoint, this transfer of wealth is neither good nor bad when taken in isolation. Gross Domestic Product (GDP) is indifferent to lump-sum transfers of this nature, as they are merely shifts of wealth from one pocket of the economy to another and do not affect aggregate wealth or income levels.

In reality, giving permits away for free does not occur in isolation, and therefore can be enormously expensive. Specifically, by increasing the cost of producing goods and services with fossil-based energy, a cap and trade system creates a disincentive for such production. As a consequence, output and employment will fall. If permits are sold, however, the policy that causes the problem simultaneously provides a mechanism that can be used to help solve it. When the government collects revenues from permit sales, it can put those revenues to economically productive uses, such as reducing taxes on labor and capital gains that diminish the incentive to work or invest. Using carbon revenues to reduce such taxes will partially or fully offset the macroeconomic costs of the carbon policy as reduced tax rates spur job creation and investment. Similarly, if the government invests some or all of the revenues in technology promotion policies that reduce the costs of carbon abatement, the economic cost of meeting any given cap will fall, as the economy becomes less carbon intensive.[4]

A survey of the economic literature on the subject proves the point. Generally speaking, economic assessments of carbon policies fall into two categories: those that show very high costs of meeting the environmental goal (costing as much as 4% off of GDP and destroying millions of jobs) to ones with either very low economic costs or even net

[1] The preceding argument is true for competitive markets where prices are set at the margin. The electricity market is one important, if partial, exception. Almost all electricity sold at the wholesale level is unregulated, and many states have initiated processes to deregulate retail electricity prices to various degrees. Roughly half of the electricity sold in retail markets is at least partly price regulated. Under regulated electricity pricing, it is unclear how much emitters would be able to increase their prices if they receive freely allocated permits. Regulated retail electricity accounts for about 20% of all carbon emitted annually.

[2] See Bovenberg and Goulder (2000). "Neutralizing the Adverse Industry Impacts of CO_2 Abatement Policies: What Does It Cost?" in Behavioral and Distributional Impacts of Environmental Policies, edited by C. Carraro and G. Metcalf. Chicago, IL: University of Chicago Press.

[3] This is due to the fact that many expect carbon capture and sequestration technology (CCS) to become commercially viable at $30 per ton over the next several decades. In the long term, prices may rise above that level as the most economical CCS opportunities are used up and more expensive means of emissions reductions are employed.

[4] Because technology promotion policies can only reduce the cost of meeting a target, it is unlikely that such an investment strategy alone could completely offset the macroeconomic cost of meeting a carbon reduction target. If there are existing taxes that are more economically costly than a carbon tax per dollar of revenue generated, using a carbon tax to reduce them could result in economic growth rates that are higher than would have occurred in the absence of the carbon policy.

economic benefits (a difference of generally less than 1% of GDP and employment). While the results of these studies rely on a large number of variables, there is one finding that is strikingly consistent. Researchers who found high costs of action against climate change unanimously assessed policy approaches under which permits would be given away for free. Those who found either low costs or net economic benefits examined policy packages that recycle carbon revenues in a variety of economically productive ways.[5]

Even proposals to auction carbon permits and then rebate the revenues to individuals on a per-capita basis fall into the high-cost category, because they do not create any new incentives for job or capital creation. While such a policy has clear distributional benefits, it does not offset the economic disincentive created by the carbon cap in the way that funding greenhouse gas-reducing technological development or cutting other existing taxes would. There is thus a tradeoff between offsetting distributional inequities, which could best be achieved through some type of direct reimbursement, and maximizing aggregate economic benefit, which would best be achieved through financing appropriate research, development, and deployment or by offsetting other existing taxes.

There is no reason why all of these options could not be used in concert to generate a specific policy outcome. For example, Elliot et. al. (2004) found that the bottom 20% of households are responsible for about 15% of carbon emissions in the U.S.[6] Under the assumption that 100% of carbon abatement costs are passed forward onto consumers, it would be possible to fully compensate the bottom 20% of households for rising energy and product prices by using 15% of the revenues from a fully auctioned cap and trade system for a lump-sum transfer to those households. At the same time, research has shown that for any broad based energy tax, carbon tax, or cap and trade system, investing 15% of the tax or auction revenues in existing but under-deployed energy efficiency technologies and policy options could reduce household energy demand enough to offset higher energy prices and keep household energy bills constant.[7] This would leave a large majority of the tax or auction revenues to devote to economically productive uses, such as tax cuts, industrial programs, renewable and energy efficiency research, transition assistance for adversely impacted workers and communities, or other uses.

A final issue that is often raised with carbon policy is the impact that it will have on international trade. Specifically, if the U.S. adopts a climate policy that raises the price of energy and other commodities, trading partners who do not adopt a similar policy will have a price advantage in both domestic and international markets. Manufacturing industries in particular already face significant competition from developing countries whose production costs are already lower and which are unlikely to adopt climate change mitigation policies. Higher energy prices would increase the price advantage enjoyed by developing countries and could lead to further erosion of domestic and international market share, particularly by energy intensive industries. One way to avoid this is through the use of border tax adjustments. Border tax adjustments would require that products imported to the U.S. pay a tax equivalent to the costs domestic producers face as the result of climate policy. At the same time, U.S. exporters would receive a rebate equal to the carbon charge embodied in their products. This would eliminate the price advantage that climate policy would otherwise confer on our trading partners both in domestic markets and internationally.

A critical issue here is whether or not border adjustments are consistent with the World Trade Organization mandates. It seems clear that border tax adjustments are WTO legal under a carbon tax. A less strong case can be made for legality under a cap and trade system where all permits are sold. If permits are given to polluters for free, border tax adjustments are almost certainly not WTO legal because they would subject trading partners to a higher tax regime than domestic producers, a practice WTO rules explicitly forbid.

[5] In Burtraw et. al. (2001) The Effect of Allowance Allocation on the Cost of Carbon Emissions Trading RFF Discussion Paper 01-30, researchers estimated the cost of meeting carbon reduction targets in the electricity sector under free and auctioned permit distributions and found that a system of free distributions cost the economy as a whole roughly twice what the same system would cost if the permits were auctioned to polluters instead. This finding holds despite the fact that the revenues were not used to reduce other taxes but were instead returned to consumers in lump-sum distributions. If the authors had included the additional economic benefits of cutting existing taxes or other productive uses of the revenues, the efficiency gains from auctioning would have been still higher.

[6] Elliot, Matthew et. al. (2004) African Americans and Climate Change: An Unequal Burden. Redefining Progress: Oakland, CA.

[7] See: Geller, et. al. (1993). Structuring an Energy Tax so that Energy Bills Do Not Increase. American Council for and Energy Efficient Economy: Washington, DC. Barrett and Hoerner (2002) Clean Energy and Jobs: A Comprehensive Approach to Climate and Energy Policy. Economic Policy Institute: Washington, DC. Hanson, Donald and John A. Laitner (2004) "An Integrated Analysis of Policies that Increase Investments in Advanced Energy-efficient/Low-carbon Technologies." Energy Economics, vol. 26 pp 739-755. Maryland Department of the Environment. (2007). Economic and Energy Impacts from Maryland's Potential Participation in the Regional Greenhouse Gas Initiative. MD Department of the Environment: Annapolis.

WTO legality is unclear under a mix of free and auctioned permits. It is likely that all of these issues will require WTO rulings to clarify the legality question further.

How we implement carbon reduction policies is, economically, at least as important as carbon reduction targets themselves. Relying on carbon pricing alone, and particularly a grandfathered cap and trade system, would produce needlessly high and regressively distributed economic costs. For any given reduction target, a well-designed mix of carbon policy, tax policy, and targeted investments will generate lower economic costs and may even yield an economic benefit.

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