Sightline INSTITUTE

Sightline Research Backgrounder

Why Free Allocation of Carbon Allowances Means Windfall Profits for Energy Companies at the Expense of Consumers

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SUMMARY

Sightline supports auctioning permits in carbon cap and trade programs. That's because handing out free permits allows firms to capture windfall profits at the expense of consumers.

While there are misconceptions about the economics of allocation, real world experience in Europe shows us that free permits equate to windfalls for polluters. And there is agreement among economists that free permits and auctioned permits add up to the same costs for consumers. Sightline prepared this memo to explain why.

CONTENTS

1. ALLOCATION ECONOMICS: A SIMPLE EXPLANATION

Why will energy companies raise prices even if they're given carbon permits for free?

The simplest explanation may be an analogy from economists Kristen Sheeran and James Barrett:

> Try buying World Series tickets from a scalper. Would he charge you any less if he found the tickets on the ground? Of course he wouldn't. Like energy, the street price of World Series tickets is based on supply and demand. The supply and demand for tickets is the same no matter how much the scalper paid for them, and so the price he charges you will also be the same no matter how he got them.
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> Of course, the scalper would much rather get his tickets for free - and that's precisely the point. Polluters are financially much better off if permits are given away instead of auctioned, but the cost of cutting emissions and the resulting effect on energy prices will be the same no matter how the permits are delivered. [1]

A permit to emit carbon is like a World Series ticket. It has a value in the marketplace; and any owner of permits will attempt to sell them to the highest bidder, rather than just giving them away. That's true regardless of how the owner acquired the permits (whether through an auction or free allocation) and regardless of who buys them (the firm's own customers or some other entity).

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1. Kristen Sheeran and James Barrett, "A Critical Question in Climate Debate," *Baltimore Sun*, January 8, 2008.

2. ALLOCATION ECONOMICS: MORE DETAIL

Let's take a look at how the system would work if permits were given away for free:

- Let's say that WidgetCo is given free permits, and that the market price for permits is $10 per ton. And let's say WidgetCo releases one ton of CO2 to make each widget.
- When WidgetCo's managers decide whether to produce a widget, they have to ask themselves: "Should we use up a permit so we can sell yet another widget? Or is it better to simply sell the permit?"
- If WidgetCo sells the permit, it nets an easy $10 profit. So the company won't bother to make another widget unless it can make *at least as much money* as it can by selling a $10 permit.[1]
- So, to recoup the $10 profit they could have made by selling a permit, WidgetCo raises prices by just about $10 dollars per widget. (If they don't raise prices, then they'd be better off just selling permits, rather than widgets.)
- In the end, WidgetCo's sales may fall a bit from higher prices. And when its sales fall, its emissions fall too. But WidgetCo won't mind losing a few sales because they will be making $10 more per widget.
- In fact, the only people who won't be happy are widget consumers. They'll be paying higher prices, while WidgetCo reaps the profits – all thanks to free permits.

In the real world, the dynamics depend on the specifics of WidgetCo's markets. If the company competes with firms that aren't operating under an emissions cap, it may not be able to pass on the full costs of unsold permits to consumers. Or if WidgetCo is operating in a tightly regulated market (such as the Western electricity market) then it may not be legally allowed to raise consumer prices to cover the opportunity costs of unsold permits.

But if WidgetCo has a captive market with high demand for its products (if widgets are gasoline, for example) then it will pass most of the opportunity cost of its unsold

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1. In a competitive market, WidgetCo simply doesn't make much money from selling an additional widget. Supply, demand, costs, and prices are all balanced so that WidgetCo's barely profits, or possibly loses money, from selling an additional widget. (That's what economic theory says, and it's largely borne out in practice.)

permits. Energy prices will go up, and any firm that was given free permits will reap the unearned profits.

Note that *selling* permits, rather than giving them out for free, does not change the underlying dynamic of price increases for consumers. No matter how permits are allocated—whether through auctioning, grandfathering, or some other form—firms will attempt to charge consumers for the market cost of the allowance. Consumer prices will go up exactly the same amount, regardless of how the permits are distributed initially.

A permit auction system, on the other hand, gets the system off to the right start. Financial incentives can spark innovation, speed least-cost efficiency measures, and encourage start-ups with smart ideas for clean energy sources. The revenue can cushion consumers from higher prices and fuel public efficiency and infrastructure investments.

3. WHAT HAPPENED IN EUROPE?

Don't take our word for it. Take a look at the one real-world case where cap and trade was used for carbon emissions -- Europe. Under the EU's Emissions Trading Scheme (ETS), almost all of the permits were given to polluters for free.[1] And, as it turned out, firms reaped windfall profits from consumers based on the market value of the permits they were given.

That's what the bipartisan National Commission on Energy Policy found in a March 2007 paper:

> Recent experience with the Emission Trading System (ETS) now being implemented by the European Union (EU) suggests that **the potential for windfall profits, far from being purely hypothetical, is borne out by empirical evidence, with utility companies that received free allocations under the EU program having realized substantial gains.** [2]

What was the effect for consumers? The Commission's report continues:

> …an allocation approach that gives all allowances for free to directly affected industries will have the overall effect of transferring some wealth from the broad public (in this case consumers) to those industries.

The International Energy Agency independently studied Europe's system and came to the same conclusion. In a February 2007 report the Agency said:

> **If any evidence is needed of the CO2 pass-through into electricity prices, it was provided by the abrupt fall of the CO2 price in May 2006,** as market players were made aware of the excess quantity of EU allowances for the year 2005. The fall by EUR 10/tCO2 was immediately followed by a drop in wholesale electricity prices of EUR 5-10/MWh. This electricity price adjustment can be directly attributable to the CO2 [permit] price fall, itself not connected to other energy market movements that could also affect electricity prices.[3]

In other words, permit prices dictated the rise and fall of consumer prices, even when permits had been free for energy producers. And when an energy research group at the University of Cambridge looked at the European experience, they also agreed:

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1. Jos Sijm et al., "CO2 Cost Pass Through and Windfall Profits in the Power Sector," Electricity Policy Research Group, University of Cambridge, May 2006, web link, page 2.
2. National Commission on Energy Policy, "Allocating Allowances in a Greenhouse Gas Trading Program," March 2007, web link, page 11.
3. Julia Reinaud, "CO2 Allowance and Electricity Price Interaction," International Energy Agency, February 2007, web link, page 5.

> …in theory, power producers pass on the opportunity costs of freely allocated emission allowances to the price of electricity. For a variety of reasons, however, the increase in power prices on the market may be less than the increase in CO2 costs per MWh generated by the marginal production unit. This is confirmed by empirical and model findings, showing **estimates of CO2 cost pass through rates varying between 60 and 100 percent for wholesale power markets in Germany and the Netherlands.**[4]

That is, specific market conditions may influence price outcomes, but the not method of allocation.

At first, the European Union gave away permits for free. Now the EU is rewriting their program to correct the mistake, and to ensure that new permits are auctioned. The Western Climate Initiative can do it right the first time around, saving enormous headaches and delays.

4. Op. cit. 1, page 26.

4. REVIEWING THE LITERATURE

Economists agree that energy prices will go up by the same amount whether emissions permits are auctioned or handed out for free. (Entries are listed by date of publication.)

Center on Budget and Policy Priorities

Robert Greenstein et al, "Designing Climate-Change Legislation That Shields Low-Income Households from Increased Poverty and Hardship," November 8, 2007, web link.

> "…auctioning a significant share of the emissions permits will have no effect on energy prices, which will increase — and by essentially the same amount — *regardless* of how many of the permits are auctioned rather than given away. This is because the emissions cap will limit the supply of energy produced from fossil fuels, and market forces will drive up the price for that energy to the point where the demand falls to equal the supply." (Page 3)

Congressional Budget Office

Peter R. Orszag, "Testimony: Approaches to Reducing Carbon Dioxide Emissions," November 1, 2007, web link.

> "Giving allowances away to companies that supply fossil fuels or that use large quantities of fossil fuels in their production processes could create "windfall" profits for those firms. The reason is that the cap-and-trade program would still result in higher prices for consumers and households but would not impose additional costs on those firms. Even if the companies received allowances for free, they would still raise prices to their customers because the cost of using an emission allowance for production—rather than selling it to another firm—would be embodied in the prices that they would charge for their goods and services." (Page 2)
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> "…price increases stem from the restriction on emissions and would occur regardless of whether the government sold emission allowances or gave them away." (Page 7)
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> "Distributing allowances at no charge to specific firms or individuals is, in effect, equivalent to collecting revenue from an auction of the allowances and then distributing the auction proceeds to those firms or individuals. In other words, the government could either raise $100 by selling allowances and then give that amount in cash to particular businesses and individuals, or it could simply give $100 worth of allowances to those businesses and individuals, who could immediately and easily transform the allowances into cash through the secondary market." (Page 14)

Political Economy Research Institute, University of Massachusetts Amherst

James K. Boyce and Matthew Riddle, "Cap and Dividend: How to Curb Global

Warming While Protecting the Incomes of American Families," November 2007, web link.

> "If the permits are given free-of-charge to energy companies – based, for example, on their historic levels of sales of fossil fuels – the result is a windfall gain to these firms, or more precisely, to their shareholders." And, "This is what happened when the European Union introduced carbon permits for electric power generation and gave them free-of-charge to utility companies." (Page 4 and Note 6)

Congressional Budget Office

"Trade-Offs in Allocating Allowances for CO2 Emissions," August 25, 2007, web link.

> "Because most of the cost of the cap would ultimately be borne by consumers, giving away nearly all of the allowances to affected energy producers would mean that the value of the allowances they received would far exceed the costs they would bear. As a result, that allocation strategy would increase producers' profits without lessening consumers' costs. In essence, such a strategy would transfer income from energy consumers—among whom lower income households would bear disproportionately large burdens—to shareholders of energy companies, who are disproportionately higher-income households." (Page 2)

California Air Resources Board, Market Advisory Committee

"Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California," June 30, 2007, web link.

> "The free allocation of emission allowances generates rents—that is, profits beyond the normal expected return to capital —to recipients of the free allowances. The rents come from the value of emissions allowances, which in turn is driven by the scarcity of allowances under the cap-and-trade program. When allowances are given out for free to generators, generators capture these rents. When allowances are given out for free to LSEs, consumers enjoy the rents (in the form of lower electricity prices) to the extent that LSEs cannot claim the opportunity cost of allowances as a variable cost. There is substantial analytical and empirical evidence that free allocation can generate very large rents and increase profitability for those entities that receive free allowances." (Page 48)

National Commission on Energy Policy

"Allocating Allowances in a Greenhouse Gas Trading Program," March 2007, web link.

> "…if [firms] receive free allowances in proportion to their emissions—will not only be effectively compensated for their costs, but can expect to realize substantial profits… In simple terms, however, the argument goes as follows: under a greenhouse gas trading program, the market price of goods

> and services throughout the economy will rise to reflect the value being placed on carbon emissions. That is because, for every ton of emissions released, some entity somewhere in the energy chain will have to submit an allowance that has real monetary value. That monetary value (or price) is set by the market also receive large, up-front payments in the form of free allowances, those payments can easily exceed any net costs that companies experience as a result of implementing emissions reductions and charging higher prices. *In other words, firms that receive free allowances and experience increased revenues from higher prices get reimbursed twice—once by government and once by the consumer*." (Page 10)

International Energy Agency

Julia Reinaud, "CO2 Allowance and Electricity Price Interaction," February 2007, web link.

> "Economic theory explains why, under a cap-and-trade system, the price of emissions ought to be treated as a marginal cost. As a generator holds allowances, the production of CO2-emitting electricity competes with the possibility to sell the unused allowances. This so-called opportunity cost of CO2 allowances, equal to the CO2 market price, is therefore incorporated in operators' decisions to generate electricity. So far, EUA have been distributed for free to installations. Whether or not the full opportunity cost of such free allowances finds its way to end-user electricity prices depends on several elements including: contractual agreements between suppliers and end-users, regulatory frameworks, but also the elasticity of demand and the rules used by governments to allocate EU allowances."

Electricity Policy Research Group, University of Cambridge

Jos Sijm et al., "CO2 Cost Pass Through and Windfall Profits in the Power Sector," May 2006, web link.

> "This paper shows that, in theory, power producers pass on the opportunity costs of freely allocated emission allowances to the price of electricity. For a variety of reasons, however, the increase in power prices on the market may be less than the increase in CO2 costs per MWh generated by the marginal production unit. This is confirmed by empirical and model findings, showing estimates of CO2 cost pass through rates varying between 60 and 100 percent for wholesale power markets in Germany and the Netherlands." (Page 26)

Electricity Policy Research Group, University of Cambridge

Robin Smale et al., "The impact of CO2 emissions trading on firm profits and market prices," 2006, web link.

> This analysis of cost pass-through in EU Cement, Steel, Newsprint, Petroleum, and Aluminum manufacturing sectors finds that the aluminum smelting industry (1 plant) in England will cease to exist while, "For other sectors, the ostensibly toughest policy scenario, where the CO2 price is d30/t, leads to the largest increase in profits. This is because, although the CO2 price, and hence marginal cost rise, is significant, the grandfathered allowances are more valuable. As the proportion of allowances to be grandfathered remains high in these scenarios, the effect of receiving such a valuable allocation dominates the higher marginal costs. If the high CO2 price were associated with a much lower proportion of allowances being grandfathered, the profit impact would be expected to be markedly different." (Page 41)

Congressional Budget Office

"Shifting the Cost Burden of a Carbon Cap-and-Trade Program," July 2003, web link.

> The paper reviews several economic models that estimate the share of freely allocated credits required to offset company losses. These are estimated at 14 percent, 6 percent, and 5.5 percent at the sector level. Free allocation in excess of these shares would result in windfall profits. See especially Table 1.

Climate Policy Center

"Allowance Allocation Under a Carbon Cap-and-Trade Policy," September 2003, web link.

> "By grandfathering greenhouse gas allowances, the U.S. government would confer economic rents on the firms that receive allowances… Indeed, grandfathering potentially promises large windfall profits for energy industry firms… Full grandfathering would produce such large windfall profits that it might result in political scandal." (Pages 18-19)

Resources For the Future

Lawrence H. Goulder, "Mitigating the Adverse Impacts of CO2 Abatement Policies on Energy-Intensive Industries," March 2002, web link.

> "By compelling fossil fuel suppliers to restrict their outputs, the government effectively causes firms to behave like a cartel, leading to higher prices and the potential for excess profit. To the extent that the environmental policy enables the firms to retain these rents – such is the case under a CO2 policy involving freely offered tradeable permits – the firms can make considerably higher profit under regulation than in its absence. Correspondingly, the government needs to leave with firms only a fraction of these potential rents in order to preserve the profits of the regulated industries." (Page 19)

Center for Clean Air Policy

Anne E. Smith and Martin T. Ross, "Allowance Allocation: Who Wins and Loses Under a CO2 Control Program?" February 2002, web link.

> "Although a cap-and-trade program with all allowances auctioned would have severe effects on the coal industry (a predicted 65 percent loss in equity value in 2010) and would hurt other energy-related sectors (oil and gas extraction, refining, gas distribution, and electricity generation would feel equity losses in 2010 of between four and eight percent), the average losses in each sector could be offset by grandfathering them only nine percent of total U.S. allowances." (Page 28)

Resources For the Future

Dallas Burtraw et al., "The Effect of Allowance Allocation on the Cost of Carbon Emission Trading," August 2001, web link.

> "[Electricity] producers can expect to do the best under grandfathering because it represents a substantial transfer of wealth to producers from consumers. In fact, producer profits and asset values increase substantially compared to the baseline (absent a carbon policy), making producers better off with a carbon policy than without, but leaving consumers substantially worse off. Even though grandfathering appeared to be the intermediate approach with respect to its effect on electricity and natural gas prices, it is the most extreme approach with respect to transfers of wealth." (Page 4)

Resources For the Future

Peter Cramton and Suzi Kerr, "Tradable Carbon Permit Auctions: How and Why to Auction Not Grandfather," May 1998, web link.

> "Advocates of grandfathering usually fail to point out that, if the permits are given to energy companies, consumers will still pay the higher energy prices. It is the carbon cap itself that will determine the price increase. Regardless of whether the government auctions permits or gives them away for free, the same energy price should be expected. The marginal cost of controlling carbon is not altered by grandfathering, only the initial ownership of carbon rights. The only difference is that the energy companies, not the taxpayers, pocket the extra revenue." (Page 2)