

WRITTEN TESTIMONY OF A. DENNY ELLERMAN
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My name is Alfred Denny Ellerman. I am an economist and have recently retired after seventeen years as a Senior Lecturer at the Sloan School of Management at MIT where I have been associated with two research groups, the Center for Energy and Environmental Policy Research and the Joint Program on the Science and Policy of Global Change. My testimony reflects my personal beliefs and should not be taken to represent the positions of MIT or of any of the research groups with which I have been associated.

My field of specialization is energy and environmental economics and for the past fifteen years my research has focused on the use of tradable permits for regulating air emissions. During this time, I have been involved in extensive assessments of the US cap-and-trade programs for regulating SO₂ and NO_x emissions and most recently with the European Union's CO₂ emissions trading program. The results of this research have been reported in numerous articles and other presentations and most prominently in two books presenting ex post evaluations of the US SO₂ trading system and the EU's CO₂ trading system. The appendix to this testimony provides a list of the published results of this research, which is the basis of the testimony that I am presenting today.

More specifically, today's testimony is limited to the allocation of the tradable permits, or allowances, created by these systems. These allowances are the distinctive feature of cap-and-trade systems and their distribution and surrender against emissions

provides the essential mechanism by which these systems operate. The specific points that I will make are the following.

- 1) Allowance allocation is unique only in the explicitness and transparency with which the allowance value, or scarcity rent, created by the cap is distributed.
- 2) The dichotomy between auctioning and free allocation is incomplete and misleading in confusing the means of distributing allowances with the recipients of allowance value.
- 3) Allocation is deeply political and, I would suggest, even a philosophical issue concerning the appropriate uses of the newly created allowance value, which is best addressed by the legislative branch.

Allocation is unique only in its explicitness and transparency

Any constraint on emissions, whether it be by means of a cap, a tax, or a prescriptive regulation (also known as “command-and-control”), will limit those emissions, thereby giving value to the right to emit and creating what economists call scarcity rent. The most familiar example of scarcity rent is the purchase price or rent paid for the use of land.

When a cap is chosen as the means to limit emissions, the scarcity rent is embodied in the allowances that must be surrendered by regulated entities in an amount equal to their emissions. Allowance value is a more convenient term than scarcity rent, but we should always remember that the value embodied in allowances reflects the scarcity created by the cap.

When a tax is chosen as the means to limit emissions, the scarcity rent takes the familiar form of tax revenues. For a tax that would be expected to have the same effect on emissions as a cap, the tax revenues will be the same as allowance value on an ex ante basis. The ex post result may differ according to the way each of these alternatives

operates in response to departures from expectation. As you are well aware, collecting tax revenue is not the end of the process. Those revenues will be used (or we might say in this context, “allocated”) in some manner. In this sense, the tax alternative to cap-and-trade shares the explicitness and transparency of allocation in cap-and-trade. In fact, if it is decided that all allowances will be distributed entirely through auctioning, the allocation issue is identical, namely, deciding what to do with the tax or auction revenue. In this limiting case, the difference in the nature of allocation between the cap-and-trade and tax alternatives is very slight. In both cases, the government is the immediate recipient of the scarcity rent and it must decide what to do with it.

When prescriptive regulation is chosen as the means to limit emissions, the scarcity rent is equally present but very well-hidden. This may make the enactment of prescriptive regulation easier, but there should be no mistaking that a scarcity rent is created and allocated, usually through the subsequent regulatory process. A familiar form of creating and distributing this rent is the imposition of more demanding standards on new facilities than on those existing at the time the legislation or regulation is imposed. A perfect example is the new source performance standard under the existing Clean Air Act, which has increased the value and extended the useful lives of existing facilities to the benefit of the owners of those facilities. More generally, any difference in regulatory treatment between new and existing facilities, or among existing facilities (as often occurs in the regulatory process), will make the favored facilities the effective recipients of the scarcity rent created by this form of regulation.

And, if the prescriptive regulation has the same effect on emissions as a cap, the rents thereby created and received by the favored facilities will be equal in value to that

embodied in allowances. Thus, when a cap-and-trade system distributes allowances entirely through free allocation, the result is very similar to that resulting from an equivalent set of prescriptive regulations. The main differences, setting aside efficiency and effectiveness, are that the allocation is neither explicit nor transparent and the scarcity rent is attached to the favored facilities instead of being separable and tradable as allowances.

The auction/free allocation dichotomy is incomplete and misleading

Allocation debates are often framed as a choice between auctioning and free allocation. This dichotomy is incomplete and misleading in focusing on the means of distributing allowances instead of the recipients of the newly created allowance value. Either means of distributing allowances can be and have been used to benefit any desired recipient.

For example, three percent of the allowances in the US Acid Rain or SO₂ trading program are auctioned, but the revenues are returned to the regulated entities from whose free allocations the auctioned allowances had been withheld. Conversely, allowances could be allocated directly and freely to various entities that do not have an obligation to surrender allowances equal to emissions, such as is proposed in the House-passed Waxman-Markey legislation. These recipients will receive the allowance value by selling the allowances freely allocated to them to regulated entities facing a requirement to surrender allowances equal to emissions.

From the standpoint of allocation, what matters is not so much the means by which the allowances are distributed as it is the identity of the ultimate recipient. The

most that can be said of the auctioning/free allocation dichotomy is that there is a presumption concerning the immediate recipient of the allowance value, namely, the government for auctioning and regulated entities, usually corporations, for free allocation. However, this need not be the case and it has not always been so.

The ultimate and real recipient of allowance value depends on a number of conditioning factors. When allowances are auctioned by the government, the funds so produced can be used for any number public purposes, such as reducing taxes on labor or capital, encouraging certain activities (energy R&D, energy conservation, faster deployment of renewable energy, carbon capture and sequestration, or nuclear energy), paying for other government programs (health care, social security), reducing government deficits, or compensating incumbent emitters or even households. All of these alternative uses imply different recipients for the newly created allowance value.

Some examples can be cited. In the only cap-and-trade program for which complete auctioning has been adopted, the Regional Greenhouse Gas Initiative in the northeastern US, most participating states have chosen to dedicate auction revenue to funding renewable energy and energy conservation programs. In the few auctions that have occurred in the European CO₂ emissions trading system, auction revenues have been used for defraying the government expense of administering the program (Ireland), as a general revenue (Denmark), and for climate related purposes (Germany and the UK).

Whatever the public purposes being served, all of the allowance value will flow ultimately to households in proportion to the extent that particular households provide labor or capital services to favored activities or that particular households are beneficiaries of the designated public purposes. Even deficit reduction, which would have

no direct impact, will have a differential effect on households in that the borrowing needs of government will be thereby reduced leading to lower interest rates, which will benefit borrowers and disadvantage savers.

It is also possible to by-pass all of these public purposes and distribute the allowance value directly to households in what could be seen as compensation for the increased costs that households will inevitably bear. Although this could be done by free allocation, in which case households would sell the allowances to regulated entities, a far simpler and more efficient means of distributing allowance value to households would be to auction the allowances and distribute the proceeds directly to households.

When allowances are freely allocated to regulated entities, typically corporations, whether those entities will benefit depends first on whether the entity is price-regulated. If the regulated entity is subject to some form of cost-based price regulation, as are many electric utilities, the allowance value would, in theory, pass through entirely to the rate payers of that utility, who would receive the allowance value in reduced electricity rates. Since no cost is incurred for the freely allocated allowances, there is no cost to recover in retail rates. If the corporate entity is not price regulated, as are some power generation companies and most other corporations, free allocation results in higher profits for those corporate entities. These profits may offset other losses that the corporation may incur as a result of incorporating the cost of carbon in the prices of the products produced by these entities, but the profits will still be higher by the value of the free allocation than they would be in its absence.

In this case of corporate recipients that are not price regulated, it is important to note that the corporations receiving the free allocation are only the immediate recipients

of the allowance value, and not the ultimate recipients, in the same manner as the government in the case of auctioned allowances. Any increase in profits will be subject to federal and state corporate income taxes so that somewhat more than a third of the allowance value will be returned to government. The remainder will accrue to shareholders as dividends or increases in equity value, whether the shares are held directly or through mutual funds or pension funds.

Thus, it is not enough to simply say that allowances should be auctioned or allocated freely. The real issue is the use to which the newly created value will be directed and the households that will thereby ultimately receive the benefit of the allowance value.

Allocation is a deeply political and even philosophical issue

The eventual and inevitable trickling down of allowance value to households, along with that of carbon cost, makes allocation an issue of equity, with all that that term implies of immediate political pressure and broad philosophical concerns, as well as one of deciding the share of society's resources that will be subject to public direction. The equity implications are principally regional and by income and others are better qualified than I to address these issues.

As for the mix of publicly and privately directed activity, a clear distinction must be made between the reallocation of resources occasioned by the cap and the reallocation associated with allocation. The decision to limit greenhouse gas emissions necessarily implies a reallocation of society's resources towards reducing these emissions and that decision will itself create winners and losers. In both the market-based means of

accomplishing this objective—cap-and-trade or a carbon tax—the exact reallocation of resources is determined by consumers and producers as they adjust to the new price on greenhouse gas emissions.

However, as previously noted, the cap also creates a scarcity rent and the allocation of that rent has additional implications for the allocation of society's resources. The diagram attached to this testimony illustrates the relative magnitudes of the resources required for abatement and those associated with the scarcity rent. In this diagram, the horizontal axis reflects emissions with business-as-usual emissions given a value of 100 and the vertical axis represents the marginal or incremental cost of an additional unit of emission reduction. The units depicted here are without denomination and are purely illustrative. The diagonal line reflects the relationship between the two when abatement is efficient, namely, that the cost of the next ton of abatement is always higher than the last one. The two shaded areas reflect the total resources associated with abatement (the triangle labeled cost) and the scarcity rent (the rectangle) when a 25% emissions reduction is contemplated. As can be easily visualized, the relation between these two areas will vary depending on the emission reduction being chosen, as well as the slope and curvature of the line representing the marginal cost of abatement.

Two limiting cases can illustrate the effect of allocation on the mix of public and private endeavor. First, imagine a case in which the allowance value is completely auctioned and the all the proceeds are used to fund additional expenditure programs. In this limiting case, the mix of publicly and privately funded activity would shift to the public sector by an amount equal to the scarcity rent.

For the opposite limiting case, imagine that the proceeds from the auctioning of allowances—the rectangle—are distributed entirely and directly to households.

Government expenditure would be no greater in this case than it was before the limit on greenhouse gas emissions was enacted. Households would still pay whatever they are going to pay for the carbon content of the goods and services they use, but they will also receive a compensating payment of their share of the scarcity rent that is created by the cap. If the distribution to households was per capita, those consuming products with a higher than average carbon content would face a net cost, while those with a lower carbon footprint would receive a net benefit.

One could argue for either of these polar cases on grounds of public policy or philosophical preference, or for any mix of the two, and this mix might change over time. Equally valid public policy arguments can be made for allocating resources to particular public purposes and for directly compensating consumers for the increased carbon costs that they will bear. Philosophical preferences enter the discussion not only concerning the equity implications of different uses but also concerning the appropriate mix between public and private endeavor.

In setting forth these two limiting cases, I do not suggest that either is per se desirable or not. As legislators, you recognize that consensus lies somewhere in the middle: that some of society's resources should and will be dedicated to public uses and equally that government need not, and indeed cannot, determine the use of all of society's resources. My closing observation is that no one is better qualified than you, the elected representatives of all the people, to weigh the pros and cons of all the competing uses and

to decide the appropriate use of the scarcity rent that is created by any constraint on emissions.

END OF WRITTEN TESTIMONY

TWO ATTACHMENTS FOLLOW

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