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# Allocation of Allowances and Consumer Impact

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**Introduction**
This paper briefly compares and contrasts the economic implications of alternative systems for allocating emission allowances among generators of electric power. It focuses on the alternatives of grandfathering allowances or requiring their purchase.[1] Although many possible variations exist for both grandfathering and purchase systems, this analysis avoids such issues to focus on the implications of grandfathering per se and purchase per se.

With Congress considering an extension of tradable emission allowances, the economic issues surrounding the allocation of allowances are timely and important. The system used for allocating allowances not only affects the distribution of wealth and income among Americans. It can also either degrade or enhance the cost-effectiveness with which emissions are reduced, thereby affecting overall national productivity and prosperity. By inference it will also affect the productivity and growth rates in the economy as a whole.

Despite the importance of the allowance allocation issue, it is poorly understood. The confused and confusing state of current U.S. markets for electricity doubtless exacerbates the difficulty. The various systems for allocating emission allowances have quite different implications in regulated markets than they have in deregulated ones.[2] With a nation divided in the organization of electricity markets, analyzing allowance allocation choices requires a "split screen view."

**"Windfall Profits"**

**Overview**
Figure 1 summarizes the impact of the policy combinations on windfall profits.

(Figure 1)

| Allocation Method | Deregulated | Regulated |
|---|---|---|
| Purchase | NO | NO |
| Grandfathered | YES | NO |

**Purchase + Deregulation = No "Windfall Profits"**
No windfall profits would accrue where generators (in deregulated markets) are required to purchase emission allowances. In this case the power generators would purchase the allowances needed to generate electricity. Operating costs would rise by the value of all of the emission allowances consumed.

Under deregulation, when generators are required to purchase allowances, the power generators would raise rates enough to offset the costs of the allowances. Under

deregulation a more subtle relationship exists in which, at least for industrial consumers of electricity, rates at any given time of day reflect the generating costs of the most expensive to operate power plant required to meet the existing level of demand. Financially, the average generator would about break even, perhaps a bit less because higher electricity rates would inhibit the growth in demand. (Individual generators may be net winners or losers.)

**Grandfathering + Deregulation = "Windfall Profits"**
In contrast, also in the context of deregulated markets, grandfathered emission allowances would yield one-time "windfall profits" for power generators. With grandfathering of allowances, in deregulated markets, power generators receive two rounds of compensation for the allowances that they must use to produce electricity.

Under such a system:

**1.** Government grants power generators free of charge the emission rights that are required to generate electricity. The value of this grant anticipates and largely offsets the generators' added costs of consuming the allowances.

**2.** Then, however, the operation of the deregulated market allows generators to recoup the costs of the allowances a second time, in this instance in the form of higher rates from consumers.

The "windfall profit" for generators results from this double dip. It might be wrongly supposed that, if a power generator received enough allowances to avoid having to buy more, he would not raise his prices to reflect the costs of the allowances.

Not so. Every kilowatt-hour produced requires the generator to surrender some of his grandfathered allowances. If the electricity sold does not yield enough revenue to cover all the costs of generation, transmission, and distribution, plus the market value of the emission allowance that has to be surrendered as a result of the power generation, the generator would be better off not producing the electricity and selling the emission allowance instead.

To quote a recent EPA analysis:

Giving up allowances that could be sold for $2.50 will reduce a producer's net profit by just as much [$2.50] whether they [the allowances] cost anything initially – for the same reason that inherited gold sells for the same price as gold that is earned. In the terminology of economics there is an "opportunity cost" of using allowances even if they were acquired for free, because in using them the owner loses the opportunity of selling them.[3]

So power producers will recover the costs of allowances from consumers. Thus, the initial government grant of allowances amounts to a large one-time boon to the power generators.

**Purchase + Regulation = No "Windfall Profits"**
In such a system, the cost of purchasing emission allowances and using them to produce electricity would raise the average cost of power generation. The regulators would normally allow these costs to be passed on to rate-payers. The profits of generators would be largely unaffected except in so far as they were diminished over time as a result of slower growth in demand. Even in that case, though, all previously invested capital, would still be earning an economic rate of return.

**Grandfathering + Regulation = No "Windfall Profits"**
Under regulation, power generators that receive grandfathered allowances would also not realize windfall profits. With grandfathering, the regulators would, in effect, act as if the value of the grant of allowances cancels out the opportunity costs of having to use allowances to generate electricity. As a result, a grandfathered allowance system would have little net impact on average rates.[4]

**Consumer Prices and Cost-Effectiveness**
Achieving cost-effective emission reductions requires that producers and consumers face prices that fully account for the costs of any harmful emission occasioned by the production or use of specific goods or services. If either producers or consumers are shielded from these costs, they may not take all available cost-effective actions to reduce emissions. This assessment recognizes that shifting consumer purchase patterns away from goods and services that cause high amounts of harmful emissions is an integral part of a cost-effective market response.[5]

Two categories of costs must be accounted for:

**1.** The costs of all measures to abate emissions, and

**2.** The social costs of those emissions that persist after all efficient abatement measures have been implemented.

The value of the emission allowances consumed in producing a good or service is the measure of this second category of costs. Hence, if consumer prices did not reflect the price of emission permits, two inefficiencies would occur:

**1.** Consumers would not have a strong enough incentive to shift their buying patterns in the direction of goods and services that entailed lower consumption of electricity thus biasing the economy toward too much electricity and emission levels that were too high.

**2.** Potential suppliers of lower emission energy sources would have to compete against competitors who were shifting some of their production costs to those harmed by emissions.

Thus, policy combinations that have the most impact on consumer electricity rates are also the combinations that cause the most cost-effectiveness emissions reductions.

## Cost-Effectiveness

### Overview

As suggested by the above analysis the various permutations of policy options should produce parallel results with regard to price impacts and cost-effectiveness. Figure 2 illustrates the pattern of consumer price impacts.

**Consumer Price Increases**
(Figure 2)

| Allocation Method | Deregulated | Regulated |
|---|---|---|
| Purchase | YES | CRUDELY |
| Grandfathered | YES | NO |

Figure 3 illustrates the parallelism between the impact on consumer prices and the cost-effectiveness of the various policy permutations.

**Cost-Effectiveness**
(Figure 3)

| Allocation Method | Deregulated | Regulated |
|---|---|---|
| Purchase | YES | CRUDELY |
| Grandfathered | YES | NO |

### Purchased + Deregulation = Cost-Effective Abatement

Under deregulation with purchased allowances, producers must consider the opportunity costs of using allowances in determining the trade-off between abatement measures and consumption of allowances. Moreover, the costs of both abatement measures and the consumption of allowances are reflected in consumer rates. The emission control system is therefore as cost-effective as possible.[6]

### Grandfathering + Deregulation = Cost-Effective Abatement

Under deregulation grandfathering allowances should produce very similar results to purchasing allowances. The windfall profits that accrue to power generators are a one-time transfer from consumers to producers. The transfer has no implications for the cost-effectiveness of the emission abatement effort. Indeed it is neither a net gain nor a net loss to society, merely a transfer.

Under deregulation with grandfathered allowances, generators would have economic incentives to incorporate the opportunity costs of allowances in their decisions. Because generators would be able to include those opportunity costs in the prices faced by consumers, consumers would have incentives to trade-off efficiently between electricity consumption and consumption of other goods and services. And electricity producers relying on non-fossil fuel based sources would receive appropriate incentives to stay in the market, to enter it, to expand, and to invest in new technology.

**Purchase + Regulation: As Cost-Effective As Regulated Markets Can Achieve**
As in all other permutations, purchase systems produce the correct (i.e., cost-effective) incentives. Because of average cost regulation the rate signals to consumers would be attenuated and imprecise. But the opportunity cost of allowances would at least be reflected in average rate levels. Power generators should have full economic incentives to account for the opportunity costs of allowances in their production decisions.

**Grandfathering + Regulation = Cost-Ineffective**
As with purchase-based systems, grandfathering should produce relatively good economic incentives for utilities to trade-off efficiently between emissions abatement and the consumption of permits. This would be a matter of internal cost accounting and cost minimization and should work despite the lack of linkage to the rate-making process.

However, with grandfathered allowances, costs of consuming the allowances themselves would not be accurately reflected in the rates paid by electricity consumers. Failure of rates to reflect the costs of emission allowances consumed in generating electricity undermines the cost-effectiveness of emissions reduction efforts. Here, then, is the bright line difference in the implications of grandfathering allowances and requiring utilities to purchase them.

**End Notes**

[1] In this analysis, “grandfathering” refers to a one-time allocation of allowances based on some historical criterion. The allocation is assumed to be non-updating, that is, current economic behavior is assumed not to change future allocations of emission allowances.

[2] Very broadly speaking, deregulated electricity markets work like competitive markets in other economic sectors in that consumer prices track the marginal cost of production. This generalization is, though, only partially true in that even in “deregulated” markets it is often only industrial customers who face rates reasonably approximating marginal costs of production. Thus, even most “deregulated” electricity markets still partially exhibit the inefficiency of a uniform price across all times of day for most categories of customers.

[3] “Economic Analysis of Alternative Methods of Allocating NOx Emission Allowances,” prepared for the Acid Rain Division Office of Air and Radiation, United States Environmental Protection Agency; prepared by ICF Consulting, pg. 10

[4] An exception to this generalization would occur to whatever extent a utility had either a surplus or a shortfall of allowances and, thus, made net purchases or net sales in the allowance market. In the case of a utility needing to make net purchases, presumably the regulators would permit the purchase costs to be passed along to ratepayers. Conversely, a utility with a net surplus of emission allowances would be forced to lower electricity rates to offset the additional revenue from selling allowances. In this instance economic regulation would force a rate decrease even though the marginal costs of generating electricity had actually gone up to reflect the social harm caused by pollution.

Even in the case of a utility making net purchases of allowances, however, rates would not be permitted to rise enough to reflect the higher marginal costs of power generation. So long as the utility received some grandfathered allowances, the regulators would insist on subtracting the value of the grandfathered allowances from the costs of the allowances that the generators consumed in producing electricity.

[5] This analysis ignores the so-called tax interaction effect that occurs when any price boosting policy initiative exacerbates the inefficiencies caused by the existing tax system. This effect is hard to quantify accurately, is probably relatively small, and would be susceptible to amelioration through tax reform.

[6] This assertion is subject to the caveat that, as alluded to earlier, the partial state of deregulation may mean that the rates paid by most electricity consumers reflect the costs of production very imperfectly.