Hearing on

Costs and Benefits for Consumers and Energy Price Effects Associated with the Allocation of Greenhouse Gas Emissions Allowances

WRITTEN TESTIMONY OF KAREN PALMER

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Summary of Testimony

This testimony focuses on the effects of different methods of allocating carbon dioxide (CO_2) allowances on the price of electricity paid by consumers and the cost of a cap-and-trade program. The traditional approach of allocating emissions allowances to electricity generators will result in regional disparities in the electricity price effects of a climate policy, in part because of different regulatory frameworks across states. In those states where prices are set by regulators, the price of electricity will not reflect the value of emissions allowances that the utility obtained free of charge. However, in regions with deregulated generation markets, the value of emissions allowances used to produce electricity will be reflected in the electricity price even if they were received for free. Two ways to reduce this disparity are to auction a greater share of allowances or to allocate allowances to local distribution companies instead of to generators. As regulated entities, local distribution companies are expected to pass the value of the free allocation on to their customers, thus reducing the impact of a cap-and-trade policy on electricity consumers. However, this approach is likely to result in higher allowance prices and thus could ultimately leave households worse off than they would be if more allowances were auctioned. Greater reliance on a cap-and-dividend approach, under which a portion of the value of emission allowances is distributed to households on a per capita basis, could improve the delivery of compensation to households and lower the overall cost of the policy.

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Mr. Chairman, thank you for the opportunity to testify before the Senate Committee on Energy and Natural Resources. My name is **Karen Palmer,** and I am a senior fellow at Resources for the Future (RFF), a 57-year-old research institution based in Washington, DC, that focuses on energy, environmental, and natural resource issues. RFF is independent and nonpartisan, and shares the results of its economic and policy analyses with environmental and business advocates, academics, government agencies and legislative staff, members of the press, and interested citizens. RFF neither lobbies nor takes positions on specific legislative or regulatory proposals. I emphasize that the views I present today are my own.

From both scholarly and practical perspectives, I have studied the performance of emissions cap-and-trade programs, including evaluation of the sulfur dioxide (SO_2) emissions allowance trading program created by the 1990 Clean Air Act Amendments. I have conducted analysis and modeling to support both state and regional efforts to design trading programs, including the Regional Greenhouse Gas Initiative in the Northeast and the California carbon dioxide (CO_2) cap-and-trade program under AB32. Currently I serve on the New York State RGGI Advisory Committee, advising the New York State Energy Research and Development Authority on how to use the RGGI allowance auction revenue, and on the New York State Independent System Operator Environmental Advisory Council. Additionally, I serve on the EPA Science Advisory Board's Environmental Economics Advisory Council. Recently, with colleagues at RFF, I have conducted economic analysis of mechanisms to contain the costs and the variability of costs of implementing climate policy.

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Today I will focus on the effects of different methods of allocating CO_2 allowances on the price of electricity paid by consumers and the cost of a cap-and-trade program. The electricity sector is responsible for 40 percent of U.S. CO_2 emissions, but, according to the recent EIA analysis of the Waxman Markey cap-and-trade bill, it will be responsible for over 80 percent of total domestic CO_2 emissions reductions from energy use during the early years of the program.

I want to highlight four main points about cap and trade and allowance allocation within the electricity sector:

- The traditional approach of allocating emissions allowances to electricity generators will result in regional disparities in the electricity price effects of a climate policy, in part because of different regulatory frameworks across the states.

- There are different approaches to dealing with these disparities that have different consequences for economic efficiency.
- Allocating allowances to local distribution companies, the approach included in the American Clean Energy and Security Act (H.R. 2454), addresses this issue, but in a way that increases cost for the economy as a whole. The particulars of the approach outlined in the legislation may be difficult to implement in practice.
- Greater reliance on a cap-and-dividend approach, under which a portion of the value of emission allowances is distributed to households on a per capita basis, will achieve the goal of compensating consumers and do so at a lower cost.

The allowances created by an emissions cap-and-trade program could be allocated in several different ways. Historically, under most cap-and-trade programs, including the Title IV SO_2 program and the first and second phases of the EU Emissions Trading Scheme, allowances have been primarily distributed for free to electricity generators based on some fixed measure of historic fuel use or emissions levels. One notable exception to this practice is the Regional Greenhouse Gas Initiative (RGGI), a program to cap emissions of CO_2 from electricity generators in ten northeastern states that took effect in the beginning of this year. Nearly 90 percent of the CO_2 allowances created by RGGI are sold in a series of quarterly auctions. The auction approach will also be used to distribute a majority of the allowances in the next phase of the EU Emissions Trading Scheme.

Addressing Regional Disparities in Electricity Price Effects of Climate Policy

Allocating allowances for free to generators will have differential impacts on electricity prices across states depending on how electricity generation markets are regulated. In those states where prices are set by regulators based on average cost of supply, the price of electricity will not reflect the value of emissions allowances that the utility obtained free of charge. Regulated utilities are only allowed to recover costs that they actually incurred (plus an allowed regulated rate of return on investments) from utility customers. However, in regions with deregulated generation markets, the value of emissions allowances used to produce electricity will be reflected in the electricity price even if they were received for free. Thus, a federal cap-and-trade policy with free allocation to generators will have an uneven effect on electricity prices across states. The effect would be striking. The change in electricity prices around the country would depend more on regulation and market structure than on the CO_2 emissions associated with electricity generation and consumption.

One way to reduce the differences in price effects across states would be to auction a greater share of the allowances. Auctioning and free allocation have similar effects on electricity prices in states with deregulated electricity markets. There, electricity producers will charge a price for electricity that makes it worthwhile to use an allowance to produce electricity instead of selling the allowance to another firm for its full value. In regulated regions, when generators have to pay for the allowances that they require to produce electricity, the costs of those allowances also will be reflected in the prices consumers pay for electricity. So, the disparity across states in price effects will be reduced, but it will lead to higher prices for consumers in regulated regions.

Note that moving from free allocation to generators to greater use of an auction will reduce differences across states in the effect of the CO_2 regulation on electricity price, but it will not eliminate those differences. Price impacts will vary across regions depending importantly on the mix of fuels used to supply electricity in the state. Generally the states with the most CO_2-intensive generation—those that rely largely on coal—tend to be the states with lower costs. Research that I've conducted with colleagues at RFF indicates that even when 100 percent of the allowances are sold in an auction, consumers in those coal-intensive states continue to have electricity prices that are well below the national average as shown in **Exhibit 1**. This figure displays the anticipated regional electricity price impacts of a cap-and-trade program like Waxman Markey, but assuming that 100 percent of the allowances are sold in an auction. Regions are arrayed according to the emissions intensity of electricity generation. Not surprisingly, those regions with the greatest CO_2 intensity have the largest price effects, but it is worth noting that they continue to have electricity prices well below the national average.

Allocating allowances to local distribution companies is another approach that overcomes regional differences due to regulation and is the option incorporated in H.R. 2454. Local distribution companies are the regulated entities that distribute electricity to households and analogous entities exist for natural gas. These companies are regulated everywhere, even in states where electricity generation markets have been deregulated. As regulated entities, the distribution companies are expected to act in the public interest and thus to return the value of any emissions allowances that they receive for free to the customers that they serve. This approach will cushion the price impacts of a climate policy for electricity consumers in both deregulated and competitive regions, and can eliminate regional disparities in the price effects of a cap-and-trade regulation.

Exhibit 2 illustrates the distribution of price impacts of a cap-and-trade program according to the size of the market subject to a price effect of the magnitude indicated in the categories on the horizontal axis. The top panel shows that under the auction the price impacts are largest, but they are fairly similar between regulated regions (indicated by blue) and deregulated regions (indicated by yellow and labeled as competitive). The middle panel shows how allocating allowances for free to generators helps consumers in regulated regions, but not in deregulated regions. The last panel shows how allocation to local distribution companies can lower the electricity price effects and restore symmetry in impacts between regulated and deregulated regions.

Efficiency Effects of Allowance Allocation

So far I have focused on the distributional effects of allocation on electricity prices across regions, but there are important economic efficiency consequences that should not be overlooked. An auction approach to allocation will yield the most efficient outcome because it ensures that the full costs of more CO_2-intensive forms of electricity generation are passed along to electricity consumers. Under this approach, consumers have a sense of the true costs of the electricity they use and thus have the appropriate incentives to reduce their consumption. However, this alignment of incentives is achievable only at the political cost of higher electricity prices.

Allocation to local distribution companies mutes the electricity price effects of cap and trade across all regions of the country and while this has political appeal, unfortunately it raises the cost of a cap-and-trade policy overall relative to an auction approach. This increase in overall cost occurs because when consumers see lower electricity prices, they have less incentive to conserve electricity and generators will use more CO_2 allowances. Greater emissions reductions will have to come from other sectors and this will raise the cost of emissions allowances. As indicated in the bottom panel of Exhibit 2, in order to achieve the same level of domestic reductions, the CO_2 allowance price could be as much as 12 percent to 15 percent higher with allocation to local distribution companies as it is with an allowance auction. Consumers will not be insulated from this higher overall cost. The smaller increases that they see in their electricity bills as a result of allocation to distribution companies will come at the cost of higher increases in the price of gasoline and goods and services that have a high transportation cost component.

Hence, it is important to ask the question: Are households better off because of the effort to subsidize their electricity prices? In fact, on average, they are worse off because the value of other goods and services will be higher as a result and households will face a greater overall cost from climate policy.

Important Issues Related to Allocation to Local Distribution Companies

Despite these efficiency concerns, allocation to local distribution companies has many proponents, especially as a transition strategy to soften the impact on household electricity costs in the near term and give consumers an opportunity to adopt more efficient appliances as existing ones wear out. In that spirit, H.R. 2454, which initially allocates 30 percent of the allowances to electric distribution companies and another 9 percent to natural gas distributors, calls for allocation to local distribution companies to last until 2026, when it begins to phase out, and it will be completely phased out by 2030. The logic of a transition period has appeal, but the twenty-year horizon is much longer than necessary to provide the opportunity for households and businesses to make a transition to more efficient capital investments. H.R. 2454 also includes some provisions that seek to limit the extent to which this approach to allocation mutes incentives for conservation. The details of these provisions and other aspects of how the policy is implemented have important implications for consumers.

One important feature of allocation to local distribution companies is the basis for apportionment of the allowances among companies. How this approach to allocation affects consumers in different regions will depend on the basis for the apportionment. A variety of different metrics are available. For example, if allowances are apportioned based on the share of the national population within a distribution company's service territory, then consumers in more populous states will benefit relative to those in other parts of the country. If allowances are apportioned based on the emissions intensity of electricity consumed within a distribution company's territory, the coal-intensive states will see more of the benefit. In H.R. 2454, apportionment to local distribution companies is based on a combination of two criteria: electricity consumption and CO_2 emissions, with each having a 50 percent share. Our research suggests that this approach results in higher effective per kWh subsidies to utilities in the Midwest and the lowest subsidies to utilities in the Northeast and on the west coast.

The second important feature is related to how allowance values appear on monthly electricity bills. The goal of allocation to local distribution companies is to compensate households for the costs imposed by climate policy. If this compensation could be distributed in a form that is independent of the amount of electricity that a consumer purchases—in other words as a fixed amount of money per month—then, in theory, it would not diminish consumers' incentives to conserve electricity relative to an auction approach. H.R. 2454 seeks to make this happen by directing that the allowance value be used to reduce the fixed part of the electricity bill "to the maximum extent possible."

In practice, however, this approach is nearly unworkable. The organization and presentation of electricity bills are the prerogative of the local distribution companies with oversight from state public utility commissions. Electricity bills typically do not separate the fixed and variable portions of the charge in this way, especially for residential class customers. **Exhibit 3** provides an example of a recent residential bill from Maryland. In order to see how the total bill breaks down into different categories of cost, we have to go to the second page of the bill. What we find is very little in the way of fixed charges. Even the parts of the bill for arguably fixed costs (those that don't vary with the amount of electricity consumed) such as distribution tend to be expressed in volumetric terms. The two exceptions to this are the small monthly customer charge of $6.65 and the $2.75 RGGI credit, which is a distribution of a portion of the RGGI CO_2 allowance auction revenue back to Maryland electricity consumers. This leaves a net of just under $4.00 per month in fixed charges, roughly 2.5 percent of the total $161 bill. This suggests little room for a fixed charge refund and little reason to believe that the customer would be able to find it if it were there.

Moreover, arguably, most customers don't read page two when they pay their electric bills. As a busy soccer mom and professional woman I can tell you that customers do not tend to distinguish between the fixed and variable components of the bill. Instead they focus on the total bill or, perhaps, the average charge per kWh if that information is presented. If either of those goes down, customers probably figure that electricity got cheaper and their consumption would be likely to increase based on these simple measures of electricity cost.

The problem is compounded further if one appreciates the incentives that a fixed-charge rebate creates for a proliferation of customer accounts. Property owners may have an incentive to open new accounts to earn additional rebates. In addition, households vary substantially in size and composition. A rebate that is fixed on a per-account basis will not match any criteria of equity with respect to household composition. Finally, we cannot ignore the enormous numbers of families in multi-unit residential buildings. While economists would argue the benefits of separate metering for these buildings, it is often not done. A rebate per account would invite controversy and strategic behavior as a consequence.

One might expect more sophisticated behavior from commercial- and industrial-class customers, who might recognize their true marginal production costs. The implementation of the rebates to consumers, however, will require oversight of state-level public utility commissions to determine, for example, how much of a rebate to the fixed portion of a bill a large customer should receive compared to a small customer. If they were to receive the same size rebate it would seem unfair, or even potentially absurd if they were of very different size. But, if they

receive different rebates, then those rebates would actually hinge on the volume of electricity they consume, so we are right back at the beginning. H.R. 2454 acknowledges this complication for industrial customers, and the final version of the proposed legislation allows for rebates to industrial customers to be placed in the variable portion of the bill. In any case, the final outcome of this particular feature of implementation actually will be decided in 50 different ways across the states, where Public Utility Commissions interpret their missions to protect the public in different ways. The outcome is beyond the reach and determination of the legislation as currently specified.

Cap and Dividend and Other Uses of Allowance Revenue

If, as noted above, the ultimate goal of allocation to local distribution companies is to compensate residential electricity consumers for the costs imposed by a climate policy, then another way to achieve that compensation would be to distribute some portion of the value of the allowances directly to households through a mechanism other than the electric bill. Such an approach, known as cap and dividend, would avoid the pitfalls of lowering electric bills and incentives to conserve and yet would help to offset higher costs of electricity and other energy-intensive goods and services that households consume.

Research at RFF suggests that narrowing the scope of allocation to local energy distribution companies and substituting a cap-and-dividend approach for it could improve both the efficiency and effects on households of the policy. Such an approach redirects the portion of the allowance value going to local distribution companies (both electric and gas) intended for ultimate distribution to commercial and industrial electricity consumers, as well as the portion scheduled to go to home heating and low-income households, to a cap-and-dividend allocation, leaving only the residential portion of allocation to local distribution companies intact. Such a reform of the H.R. 2454 policy would improve its efficiency, reducing the CO_2 allowance price by roughly 14 percent in 2015, and lowering the annual cost to households by nearly $80, roughly half of the cost they incur under allowance allocation to local distribution companies as specified in the legislation.

Allowance revenues could also be used for a host of other purposes. One approach that is popular with economists would be to use allowance revenue to lower income taxes. This would bring economic efficiency benefits because it reduces the disincentives for work and productive activity associated with income taxation. Another option would be to use some portion of allowance revenue to promote program goals through direct investment in research and development in clean energy technologies or by providing tax breaks for private research and development as well as direct investment in new technologies for particularly vulnerable industries. In several of the RGGI states, a large portion of the CO_2 allowance revenue is being directed toward investment in energy efficiency programs and this policy experiment should provide important lessons for federal initiatives in this regard.

Exhibit 1. Electricity Prices and CO_2 Emissions Intensity under the American Clean Energy and Security Act with an Allowance Auction (2020)

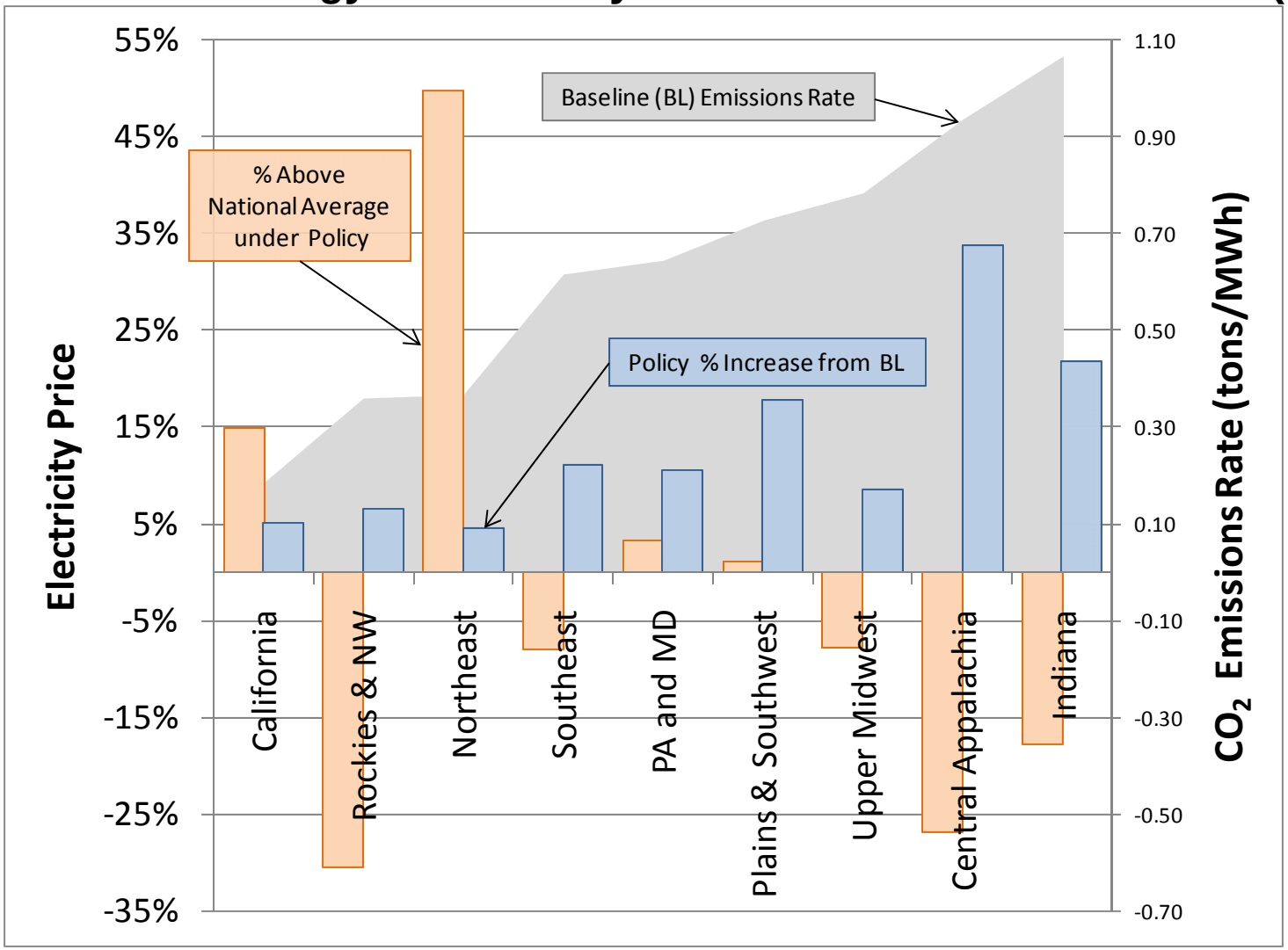
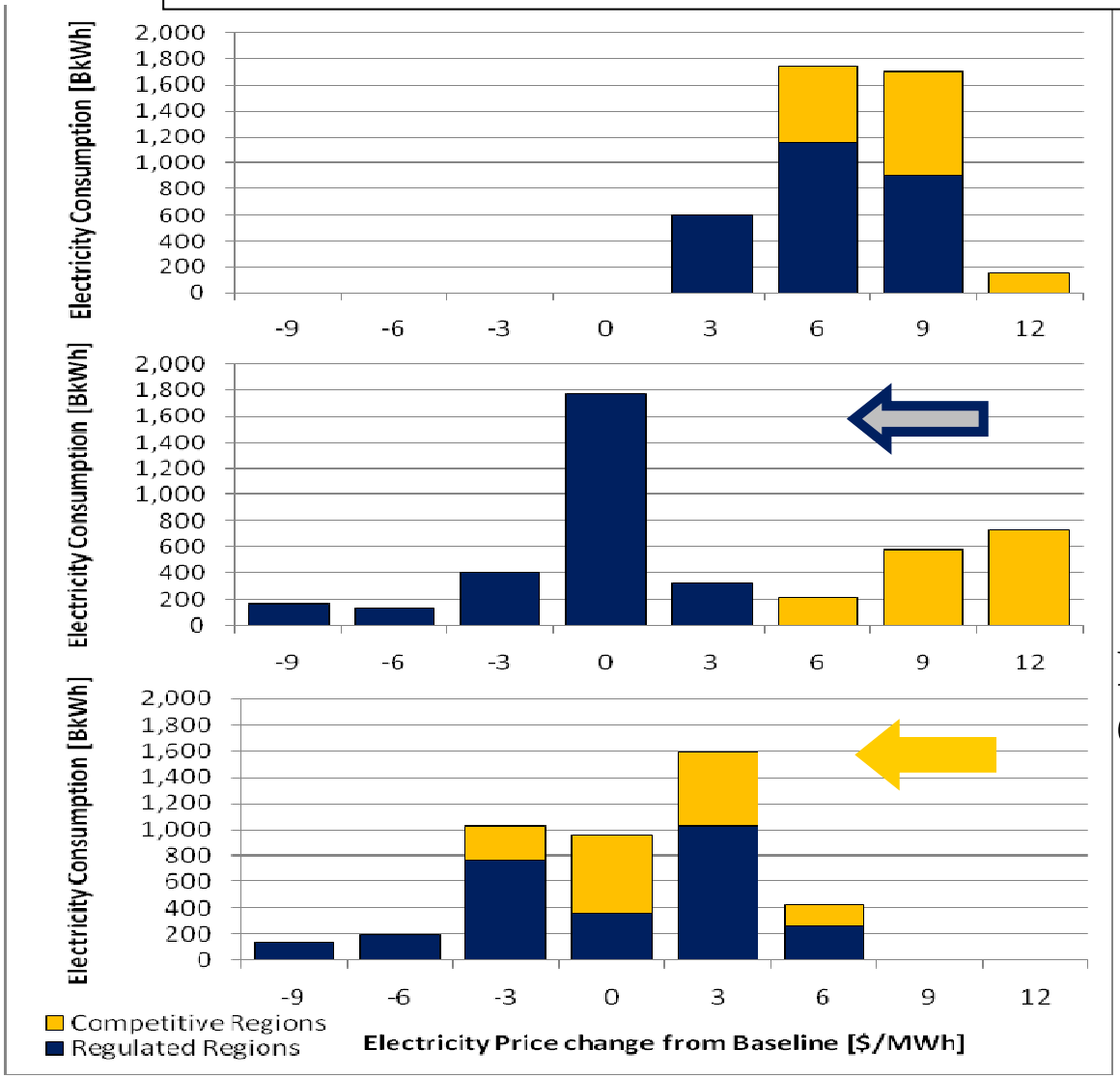


Exhibit 2. Electricity Price Effects of Allowance Allocation



Auction

Efficiency Advantage
Lowest Social Cost
but Higher Prices

Free Allocation
to Generators

Reduces Price only
in Regulated
Regions

Free Allocation to
Consumers (LDCs)

…But, Allowance
Price Increases
by 12-15% With
Subsidy to Elec.
Consumption

Exhibit 3. Example Electric Utility Bill from Maryland (Pepco)

Account Details

Services for Jul 14, 2009 to Aug 12, 2009:

Summer rates in effect

Distribution Services:

Customer Charge		6.65
Energy Charge	First 800 KWH x 0.0323000	25.84
	Next 120 KWH x 0.0324166	3.89
Demand Side Management Surcharge	at 0.0000390 per KWH	0.04
Franchise Tax (Delivery)	at 0.0006200 per KWH	0.57
Universal Service Charge		0.37
MD Environmental Surcharge	at 0.0001550 per KWH	0.14
Gross Receipts Tax	at 2.0408000%	0.77
RGGI Rate Credit		2.75 CR
Montgomery County Energy Tax	at 0.0053396 per KWH	4.91
Administrative Credit	at 0.0010550 per KWH	0.97 CR
Total Charges - Distribution		**39.46**

Generation Services:

Energy Charge	920 KWH x 0.1278700	117.64
Procurement Cost Adjustment	at 0.0010110 per KWH	0.93
Total Charges - Generation		**118.57**

Transmission Services:

Energy Charge	920 KWH x 0.0034800	3.34
Gross Receipts Tax	at 2.0408000%	0.07
Total Charges - Transmission		**3.41**

CURRENT CHARGES THIS PERIOD **$161.44**