Testimony of Nathaniel O. Keohane, Ph.D.
Director of Economic Policy and Analysis
Environmental Defense Fund
Before the
Committee on Environment and Public Works
United States Senate

October 28, 2009

INTRODUCTION AND OVERVIEW

I am honored to be here today as this chamber addresses one of the most important aspects of one of the most important areas of legislation any of us will get a chance to see in our lifetimes.

Environmental Defense Fund is a leading national nonprofit organization representing more than 500,000 members. Since 1967, we have linked science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems. We have long championed market-based approaches to environmental issues, and helped design the highly successful acid-rain program created in the Clean Air Act Amendments of 1990. As Director of Economic Policy and Analysis, I oversee EDF's economic analysis of climate change policy and help to shape our advocacy. Before coming to EDF in 2007, I was an Associate Professor of Economics at the Yale School of Management, where I taught for six years. I have published a number of peer-reviewed academic articles on a range of subjects in environmental economics, and have authored or edited books on market-based environmental policy and the economics of environmental law.

Congress has an unprecedented opportunity right now — in these next few months — to put the American economy on a strong footing for the twenty-first century. Earlier this year, the House of Representatives took a crucial first step, passing comprehensive climate and energy legislation (H.R. 2454). Now it's the Senate's turn.

The centerpiece of climate legislation will be a mandatory and declining cap on carbon. A carbon cap will harness the efforts of entrepreneurs and innovators throughout our economy — ensuring that America will lead the world in making the next generation of clean-energy technologies. And the investment unleashed by a carbon cap will help jump-start our economy today, while paying rich dividends later — in the form of cleaner air, enhanced energy security, and most of all a livable planet to pass on to our children and grandchildren.

In the process, a carbon cap will transform a portion of the public commons into a valuable asset. That asset is a public trust, and allocating its value wisely and equitably is a crucial test of any climate bill.

In my testimony today, I will offer my perspective — as an economist and public policy expert — on how that test can be met in a way that strengthens our economy. The principles are straightforward: Invest in the transition to a new, growing clean-energy economy. Prevent carbon leakage while preserving American jobs. And above all, protect consumers. After presenting these guidelines, I briefly review how allowances are allocated in the legislation proposed by Senators Kerry and Boxer (S.1733), as amended in the Chairman's Mark released last week.

The bulk of my testimony focuses on the allocation of allowance value to households. Under S.1733, households would receive allowances via three channels: (1) allowances given to local electricity and natural gas utilities for the benefit of residential ratepayers; (2) auction revenue dedicated to fully compensate low-income households for any increases in energy costs; and (3) auction revenue used to fund a broad-based consumer dividend. Through these three channels, households would receive fully 43% of the available allowance value over the lifetime of the program — adding up to hundreds of billions of dollars in present value going to American families.

This multi-pronged approach to protecting consumers makes a great deal of sense. Because low-income households are vulnerable even to small changes in energy costs, they should be fully protected. Because we all have a stake in solving climate change, a generous broad-based consumer dividend must be part of the package. And because how electricity is generated varies widely in different areas of the country, using local utilities as a channel for allocating allowance value is a natural and straightforward means of accounting for regional variations.

I close by discussing how the allocation of allowances to local distribution companies, or LDCs, can be crafted to ensure that consumers benefit. First, legislation must leave no doubt that the value of allowances given to LDCs will translate into benefits for consumers, and must back up that commitment with strong monitoring and enforcement provisions. Second, legislation should guard against undue economic gains for industrial users. Third, the LDC allocation should be distributed to consumers in a way that keeps electricity and natural gas bills low, while preserving economic incentives for energy efficiency and conservation.

PRINCIPLES TO GUIDE ALLOWANCE ALLOCATION

Here are three broad guidelines for allowance allocation.

1. Invest in the transition to a growing clean-energy economy. Allowance value can provide additional incentives to accelerate the deployment and development of new technologies, overcoming market failures that hinder the adoption of energy-efficient technologies and limit the returns to research and development. In the agricultural sector, allowance value can not only help farmers manage the transition, but can also give them a leg up in taking advantage of the tremendous economic opportunity provided by the market for offset credits. And because

some climate change is inevitable, allowance value can also be invested in adaptation — enhancing the resiliency of human and ecological communities and helping them cope with a changing climate.

2. Preserve and strengthen American manufacturing by preventing carbon leakage. Particularly in the early years of a cap-and-trade program, allowance value can help manufacturing industries make a transition to a low-carbon economy while remaining fully engaged in global markets for their products. Carefully designed policies will prevent emissions leakage to uncapped countries, safeguarding the environmental integrity of the cap while and strengthening American businesses and workers. Allowance value should be distributed in a way that preserves incentives for cost-effective abatement and avoids windfall profits.

3. Protect consumers. Consumer protection is the bedrock principle of allowance allocation. A substantial portion of the allowance value should be directed to households. Moreover, by using multiple allocation channels, Congress can achieve multiple goals: providing targeted assistance to low-income consumers; fairly reflecting geographic differences in how energy is generated, in order to protect households, farmers, and small businesses; and at the same time providing broad coverage to American families. The integrity and credibility of the program must also be preserved. Allowances allocated for the benefit of consumers must be accompanied by strong safeguards to ensure that consumers receive the value.

In sum: Consumers, jobs, and the transition to a clean-energy economy are the guideposts. These principles are consistent with the Blueprint for Legislative Action put forward by the US Climate Action Partnership, a coalition of businesses and environmental groups of which EDF is proud to be a founding member.

Auction vs. free allocation is less important than it seems

Note that I have not said anything about the fraction of the allowances that is auctioned rather than given away. That may be surprising, because there has been a good deal of concern in the media and elsewhere about the supposed drawbacks of free allocation.

Despite all the attention it has received, the split between auctioning permits and giving them away turns out to be a red herring. From an environmental point of view, the allocation of allowances doesn't have any bearing on the emissions reductions that are achieved. And from an economic point of view, the distinction between auctioning and freely allocating allowances matters much less than how the value of those allowances is distributed.

First, let's consider the environmental performance of the program. It's pretty obvious that the atmosphere doesn't care whether the allowances are auctioned off or given away. From an environmental perspective, all that matters is the cumulative emissions into the atmosphere. That's the job of the cap, which ensures that we achieve the reductions scientists tell us we need.

In fact, as I noted above, a wise allocation of allowances can even enhance the environmental outcomes achieved by the legislation — by preventing emissions leakage, driving technological innovation and deployment, jumpstarting emissions reductions on farms and forests, and helping communities adapt to climate change.

Perhaps more surprisingly, the economic performance of the program also does not hinge on whether the allowances are auctioned or freely allocated. Under a cap-and-trade program, the economic incentive to reduce pollution comes from the price of allowances — which will be determined by the cap, not by how allowances are distributed. In the jargon of economics, there is an opportunity cost associated with holding allowances, regardless of whether a firm got those allowances for free or had to buy them from the government.

Because the value of allowances is independent of how they are distributed, so is the incentive to reduce pollution. In fact, as a general rule, whether allowances are auctioned off or freely allocated will not have any impact on the cost-effectiveness of the program.[*]

If the auction versus allocation split doesn't matter for the environmental performance of the bill, and it doesn't affect the economic incentives, surely it matters for distribution? Wrong again. Distributional impacts depend on who gets the value of the permits — not whether they are sold at auction or not. After all, being given permits worth $1000 is no different than receiving $1000 in auction revenue.

In sum, it matters little whether the value of allowances is distributed directly (through free allocation) or in the form of auction revenue. As I will discuss below, *how* the allowance value is distributed does play an important role. But first, let me review the approach to allocation in the proposed legislation.

THE APPROACH IN THE PROPOSED LEGISLATION

One of the common criticisms of the House-passed bill, which we are sure to hear applied to the Senate legislation, is that it supposedly gives away most of the allowances for free – the implication being that they are given to "big emitters who don't need them." In fact, that conventional wisdom gets the story almost entirely backwards.

[*] This result is a standard tenet of economic theory, going back to Ronald Coase's seminal article in 1961. A more recent body of work in the environmental economics literature shows that using revenue from allowance auctions to reduce marginal tax rates on labor or capital can provide a boost to overall economic efficiency. However, this result hinges on the *use* of allowance value to reduce pre-existing taxes, not the mere fact that allowances are auctioned. Hence it is entirely consistent with my basic argument: what matters is how the value of allowances is distributed.

Over the life of the program, the cumulative value of available allowances under S.1733 would be distributed as follows: *

- Households: 43%

  Channeled to consumers through allocations to LDCs; an energy refund program for low-income households; and a broad-based consumer dividend.

- Small businesses: 8%

  Distributed by electricity and natural gas LDCs to commercial ratepayers.

- Public purposes: 25%

  Funding for public purposes such as worker training, technical assistance to farmers, clean energy research and development, and the protection of vulnerable ecosystems.

- Industry: 24%

  Most of this category goes to energy-intensive trade-exposed industries, to prevent carbon leakage and ensure a level playing field for U.S. businesses and workers. Other industries will receive smaller allocations to offset compliance costs. These allocations would phase out almost entirely by 2030.

When you add it all up, 76 percent of allowance value would go to households, small business, and public purposes (see Figure 1). This breakdown is very similar to that in H.R. 2454.

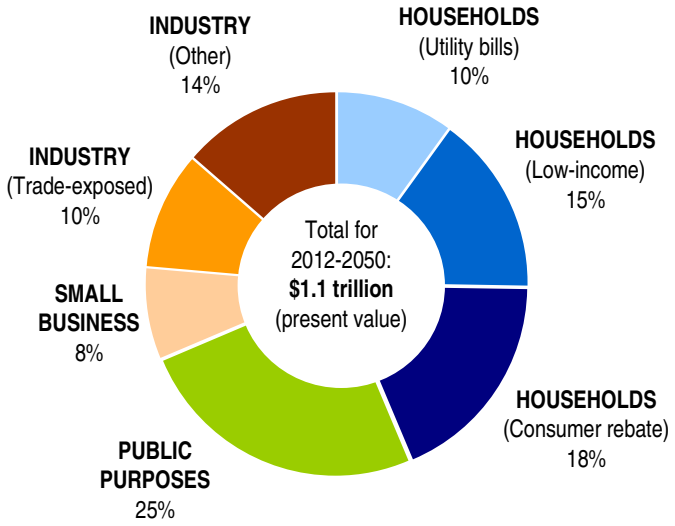


Figure 1: Allocation of available allowance value under S.1733. *Source*: Author's calculations.

* All allocation percentages refer to the percentage of available allowances, defined as the number of allowances available for distribution after subtracting off the allowances withheld for the Market Stability Reserve (§726) and directed to the Treasury for deficit reduction.

FOCUSING ON HOUSEHOLDS

The bedrock of allowance allocation is consumer protection. All of us have a common stake in sound and effective climate legislation. And while there has been a good deal of discussion about "cost containment" in climate legislation, the simplest and best way to contain costs for American families is to return a significant proportion of allowance value to them.

How S.1733 directs value to consumers

S.1733 channels allowance value directly to households in three ways. First, to address regional disparities in how electricity is generated, roughly 39 percent of available allowances in the first phase of the program (2012-2030) will go to local distribution companies (LDCs) that deliver electricity and natural gas to residences, commercial businesses, farmers, and manufacturers.

Households would receive allowances according to the residential share of the electricity and natural gas distributed. LDCs are regulated by state commissions, and the value of allowances would have to benefit energy consumers. What's more, as I describe in more detail below, the legislation includes clear and stringent provisions requiring LDCs to demonstrate how they will pass the value on to consumers before they can receive a single allowance.

Second, S.1733 sets aside 15 percent of allowances to be auctioned off, with the revenues to fund an energy refund program for low- and moderate-income households. This is crucially important, as low-income households in particular are least able to weather even small and temporary increases in energy prices. The Center for Budget and Policy Priorities, a think-tank that focuses on poverty alleviation, has estimated that a similar 15 percent allocation in the House-passed bill, in conjunction with other provisions (such as the LDC allocation), will be sufficient to fully compensate the poorest one-fifth of households for costs related to energy prices that may affect them.

Third, most of the allowances in the later years of the program would be returned to all households through a broad-based consumer rebate. Over the life of the program this amounts to nearly one-fifth of available allowance value — the biggest single category of allowance allocation in the legislation.

It's easy to get lost in all the percentages. But in a sense the true test of allowance allocation boils down to just one number: the estimated cost to American households.

Analysts at the Environmental Protection Agency have looked closely at the differences between S.1733 and the House-passed legislation, concluding that on balance "the differences between the bills result in relatively small differences in estimated costs and may even cancel each other out on net."[*] In short, the conclusions from the EPA's analysis of the House-passed legislation remain relevant. That analysis used two of the most highly respected, peer-reviewed economic

[*] U.S. Environmental Protection Agency, "Economic Impacts of S.1733: The Clean Energy Jobs and American Power Act of 2009," October 23, 2009, p. 2.

models available. It looked only at the costs of reducing emissions, and ignored the benefits from averting the catastrophic consequences of unchecked climate change, not to mention cleaner air and greater energy security.

Even just looking at the cost side of the ledger, EPA's analysis of the House-passed bill projected that over the entire life of the bill, the annual cost to the average household will be just $80 to $111 (in present value). That is just 22 to 30 cents a day for the average American family. The same conclusion was reached independently by the Energy Information Administration (the statistical arm of the Department of Energy) and the Congressional Budget Office. In its analysis of H.R.2454, EIA estimated the average annual household cost to be just $83, while CBO's figure for the year 2020 was $160 ($93 in present value). Each of these estimates works out to be less than the cost of a postage stamp per day per household.

The value of a multi-pronged approach

As discussed above, the proposed legislation envisions multiple channels to direct allowance value to households. That's important, because households differ along a number of dimensions (in particular geography and income), and multiple channels provide a way to address these dimensions separately.

First, allocating a portion of the allowance value to low-income consumers can address concerns about the impact of higher energy prices on those people who are least able to respond. While the overall impacts will be very slight — recall the consensus estimates of less than the cost of a postage stamp a day for the average household — even that amount can be a stretch for consumers who are already struggling to afford basic food and shelter. As noted above, setting aside 15% of allowances is sufficient (in conjunction with the LDC allocations) to make low-income households whole. In fact, an analysis by the Congressional Budget Office estimates that low-income households will see a net gain from the allocation provisions — receiving more in the way of allowance value than they will face in terms of increased energy expenditures.

Second, a broad-based consumer dividend provides a natural way to compensate consumers for increases in energy costs that do not vary by region, such as transportation fuels. Such a consumer rebate also captures the fundamental reality that the value of the carbon cap is a public asset, and one that should be used as much as possible for the common good.

Finally, giving a portion of allowances to local electric and gas utilities for the benefit of customers can address geographic disparities. This is particularly true for the electric power sector, since a price on carbon will have different impacts on different areas of the country, depending on the types of fuel used to generate electricity. Even as we look ahead to a new clean-energy economy it is only fair to take into account our starting point — current patterns of electricity generation that have emerged over time, for geographical and historical reasons unrelated to the challenge of solving climate change. As we build a new low-carbon energy infrastructure, these disparities will disappear, and the LDC allocation can be phased out accordingly.

I want to be careful not to exaggerate the extent of regional variation in carbon dioxide emissions. On the contrary, total household emissions vary much less across regions than is commonly assumed. As Figure 2 shows, CO_2 emissions from households in different regions are grouped around the national average, with the highest and lowest emitting regions of the country less than 15% (5 tons) above and below the national average. Moreover, the largest single source of household emissions is the indirect emissions associated with the production of non-energy-related goods and services — a category that does not vary by region.

Nonetheless, it is <u>also</u> the case that to extent household emissions do vary among regions, the differences are largely due to electric power generation. This conclusion — evident in the chart below — is made even clearer by Figure 3, on the next page.

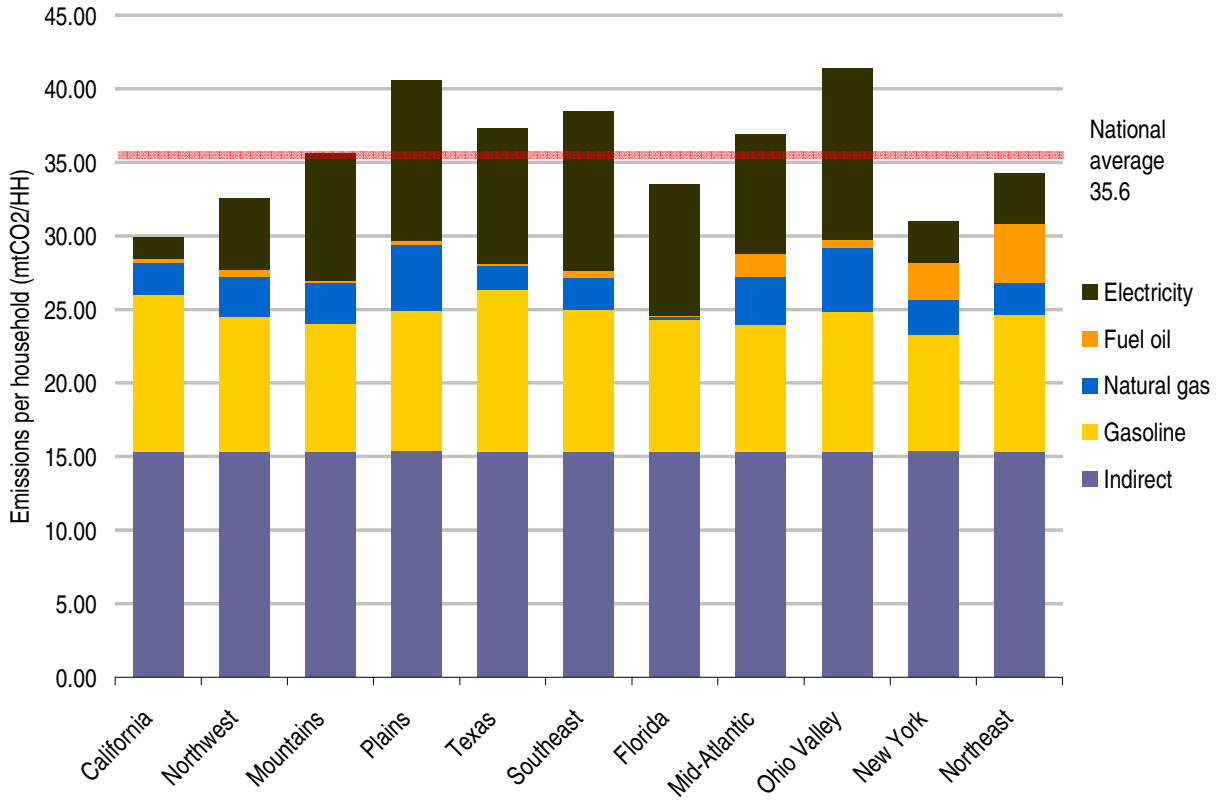


Figure 2: Household carbon dioxide emissions by region. *Source*: Author's calculations based on data in Dallas Burtraw, Richard Sweeney, and Margaret Walls, "The Incidence of U.S. Climate Policy," RFF Discussion Paper 09-17-REV (June 2009).

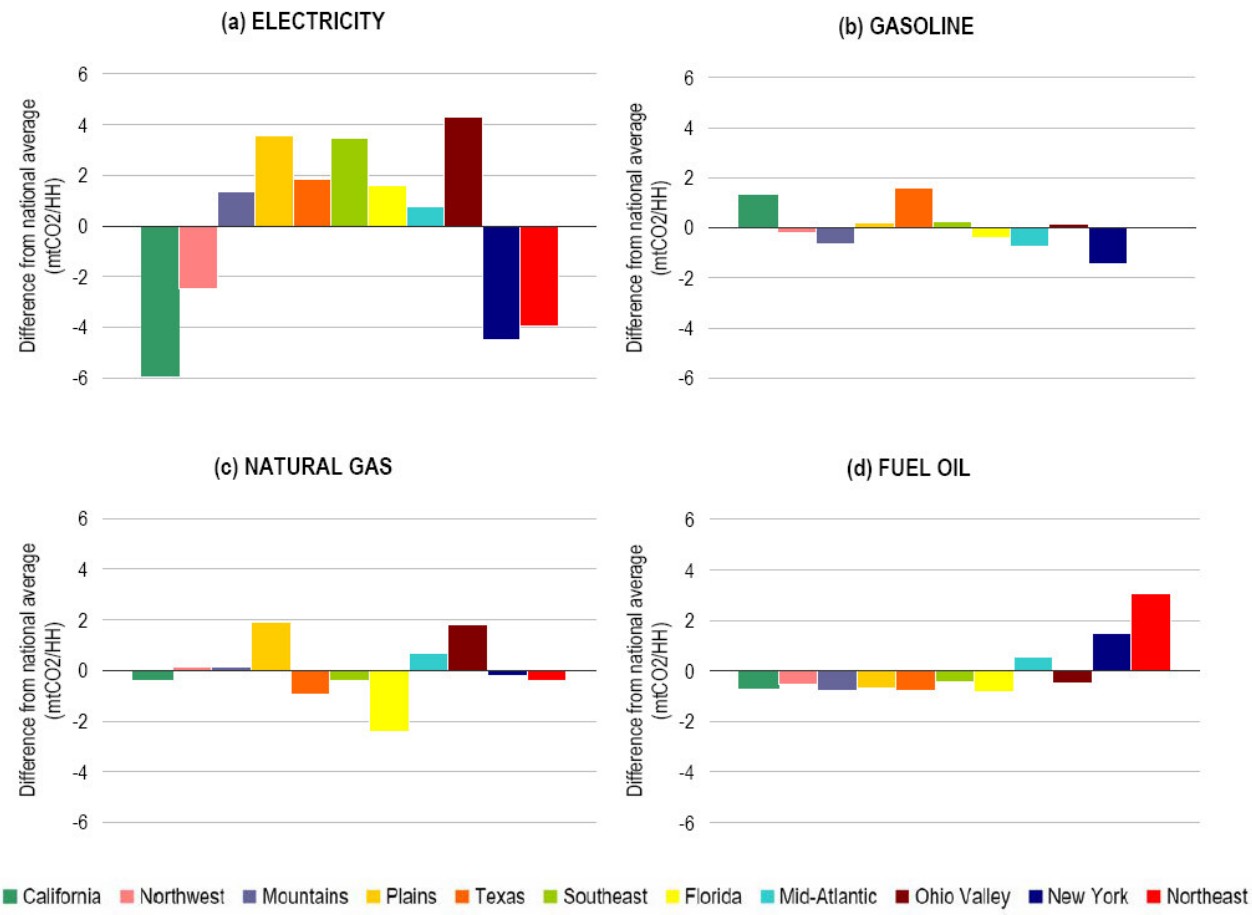


Figure 3: Regional variation in household direct emissions by region and fuel type. Bars represent deviations from national averages; the vertical scale is constant across the four graphs. *Source*: Author's calculations based on data in Dallas Burtraw, Richard Sweeney, and Margaret Walls, "The Incidence of U.S. Climate Policy," RFF Discussion Paper 09-17-REV (June 2009).

Each panel in Figure 3 presents regional variation in household CO_2 emissions from a single fuel type, measured as a deviation from the national average. The vertical scale is constant across the four panels for ease of comparison. As the figure shows, electricity is by far the most significant source of regional variation in emissions.

Taken together, Figures 2 and 3 offer powerful support for a multi-pronged approach to allocating allowances to households. On the one hand, Figure 3 shows that there is significant regional variation in emissions from electric power generation – underscoring the importance of channeling some household allowance value via local utilities. On the other hand, both charts suggest that once electricity generation is accounted for, there is little remaining variation among regions – suggesting that a broad-based dividend is appropriate, in combination with a targeted allocation for low-income households.

KEY DESIGN ISSUES IN THE ALLOCATION OF ALLOWANCES TO LDCS

Three design issues are crucial in channeling allowance value to households via local utilities. First, Congress must ensure that consumers receive the value of those allowances. Second, Congress should take steps to prevent industrial users from receiving undue economic gains. Third, Congress should do its utmost to direct local utilities (and the state commissions that regulate them) to distribute the allowance value in a way that cushions households against higher electricity costs while preserving incentives for energy conservation and greater energy efficiency.

Ensuring that consumers receive the value of allowances

The rationale I have laid out for giving allowances to local utilities depends crucially on the full value of those allowances being passed on to consumers in the form of lower utility bills. That cannot be left to chance: it must be guaranteed in the legislation.

The language in S.1733 addresses this issue in several ways. In particular, the legislation:

- requires that local electric distribution companies "shall pass through to residential retail ratepayers as a class their ratable share … of the value of emission allowances that reduce electricity cost impacts on such ratepayers" (§772(b)(5)(D) in the Clean Air Act as amended by Division B, Title I, Subtitle A, section 101 of S.1733);

- directs the EPA Administrator to prescribe guidelines for LDC allocation that include requirements for LDCs to pass on the full value of allowances, along with measurement, verification, and reporting requirements (§772(b)(5)(E));

- makes the allowance allocation to an LDC contingent upon the completion and periodic updating, by the state commission or other regulatory body, of a public rulemaking process incorporating these requirements, along with a published report (§772(b)(6));

- requires LDCs to submit plans for the use of allowance value along with annual reports detailing the actual disposition of allowances (§772(b)(7));

- mandates annual auditing by the EPA Administrator to ensure that allowance value is used for the benefit of ratepayers, along with periodic (triyearly) in-depth reports by the General Accounting Office and the Administrator evaluating the use of allowance value and the effectiveness of the program in containing costs (§772(b)(8));

- specifies that a violation of any of these requirements is a violation of the Act and is subject to enforcement (§772(b)(9)).

Similar language is included in §773 of the bill with regard to natural gas local distribution companies.

Preventing double-counting and undue economic gains for industrial users

My testimony has focused on the allocation of allowance value to households. Of course, some fraction of allowance value may be allocated directly to firms in the industrial sector. One prominent example in the proposed legislation is the output-based rebates for trade-exposed industries, designed to prevent carbon leakage and level the playing field for American workers and manufacturers. Another example pertains to the LDC allocations: industrial ratepayers would receive their ratable share of the allowance value under S.1733 (as is also the case under H.R. 2454).

Allocating allowance value to industrial sources can play an important role in smoothing and accelerating the transition to a clean-energy economy. Nonetheless, the ultimate purpose of allowance allocation should be to protect American families, both by cushioning consumers against increases in the cost of goods and services and by preserving American jobs. Any allocation to industrial entities should take that ultimate purpose into account, and ensure that shareholders do not capture undue economic gains.

Two concrete approaches can help in these tasks. First, since the number of allowances is limited, it makes sense to ensure that allocations to industry are tailored as closely as possible to the underlying need. In the case of LDC allocations, a potential concern is emissions due to the electricity that is consumed by energy-intensive trade-exposed (EITE) industries. If allowances are given to LDCs for the electricity they distribute *and* to manufacturers for the electricity they consume, the potential for double-counting arises. While S.1733 includes language designed to prevent double-counting, the most straightforward solution would be to include both direct and indirect emissions as part of the EITE allocation — while focusing the LDC allocation on households and small businesses. Congress should also use the best available data on emissions and manufacturing output in determining the appropriate EITE allocation — and should direct the EPA Administrator to do the same when implementing it.

Second, in providing allowance value to firms (including via LDCs), Congress should recognize the wide disparity in the ability of firms in different sectors to pass along their costs to consumers. The relevant task here is to determine what economists call the "cost pass-through rate," defined as the fraction of an increase in input costs that a firm can pass on to its customers. When cost pass-through rates are high, there is less need (or justification) for giving allowances to firms. Instead, in such instances the value of allowances should be given to the end consumers, who will ultimately bear their cost.

In turn, the cost pass-through rate depends on standard economic measures of price sensitivity — what economists call the elasticity of demand and supply. When demand is less elastic than supply — that is, when consumers respond less readily to price changes than producers do — the cost pass-through rate will be high. This will be the case, for example, when few substitutes are available for a product. The degree of competition among producers also plays a role.

Evidence on cost pass-through rates varies, but studies have generally found them to be near 100% for many consumer goods. (The Congressional Budget Office, for example, typically assumes full cost pass-through in its analyses of legislation.) Of course, for particular industries the cost pass-through rate may be substantially lower.

It is important to note that the degree of pass-through applies to changes in costs at the margin – that is, costs that depend on how much a firm produces. An important implication is that even if firms receive "lump sum" compensation (e.g., a check for their share of allowance value that is not tied to electricity consumption), they will still tend to pass on the cost of allowances to their own customers – creating the potential for undue economic gains, or "windfall profits."

To address these concerns, Congress could follow the same approach as in the provisions of S.1733 dealing with allocations to merchant coal generators – namely, requiring a study to be carried out determining the allocation has resulted in windfall profits, along with a requirement that allocations be adjusted if necessary (cf. §772(c)(5)).

Preserving incentives for investments in energy efficiency

Care must also be taken to ensure that the method of allocating allowances does not dampen the incentives to take advantage of cost-effective, common-sense ways to reduce energy use. The LDC allocation should be passed along to consumers in a way that preserves the price signal from the carbon cap, while compensating them directly for any increase in price.

The most straightforward way to achieve this would be to divide up the residential share of allowances equally among households, and send each household a check for that amount every month or quarter.[*]

Of course, this is not the only possible approach. Increased energy efficiency also reduces household expenditures, by lowering consumption. Utilities could be given the latitude to invest allowance value in demand-side energy efficiency programs — provided that they can demonstrate that those programs are cost-effective and result in real reductions in household bills.

S.1733 prohibits distribution of allowance value "based solely on the quantity of electricity delivered" to a given ratepayer and expresses a preference "to the maximum practicable" for fixed credits or rebates (§772(b)(5)(C)). The importance of the price signal is also enshrined in the

[*] In the case of commercial and particularly industrial users, who vary greatly in size, the appropriate amount might vary among categories of users, or might be tied to the average energy use of similar customers. But the principle remains the same: the amount of the rebate to any individual customer should not depend on the actual amount of energy consumed. This is particular important in the case of industrial users, who generally face much greater opportunities for cost-effective energy efficiency and therefore have more "elastic" (price-sensitive) demand for energy. On the other hand, as already pointed out, lump-sum compensation to industrial users can result in windfall gains. Congress should pay careful attention to these issues in order to preserve the incentives for energy efficiency while avoiding imparting undue economic gains to industry.

annual auditing provision, which directs the EPA Administrator to "assess the degree to which electric local distribution companies have maintained a marginal price signal while protecting consumers on total cost using the value of emissions allowances" (§772(b)(8)(A)). Even so, greater guidance may be needed to further clarify the meaning of "consumer benefit," to preserve the price signal while compensating consumers, and to express a preference for the straightforward and simple approach of sending households a check.

CONCLUSION

Allowance allocation is sometimes caricatured as complex, but the basic principles are easy to grasp. Invest in a new, growing, clean-energy economy. Prevent carbon leakage while preserving American jobs. And above all, protect consumers, by ensuring that a significant portion of allowance value is returned to households. Focusing on these principles can produce lasting legislation that tackles climate change, provides real energy security, and strengthens the American economy. The House legislation provides an excellent start. Now it's time to finish the job.