Statement to House Committee on Energy and Commerce, Subcommittee on Energy and Environment

Hearing on Consumer Protection Features of Climate Change Policy
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Chairman Markey, ranking member Upton and members of the Committee:

My work on environmental issues at the American Enterprise Institute is presently focused on clarifying the scope of the challenge of reducing U.S. greenhouse gas (GHG) emissions by 80 percent from 1990 levels by the year 2050—a level of emissions that the U.S. last experienced around 1910, when our population was about 92 million people. But as our population in 2050 will be about 420 million people, our per capita GHG emissions shall have to be around 2.5 tons (down from 19.5 tons today, and 10 tons in 1910), a level last seen in the U.S. around 1875 or earlier. *Achieving this target essentially requires replacing virtually the entire fossil fuel energy infrastructure of the United States over the next four decades*.

Obviously such a target cannot be made in a single leap, and like many other organizations and researchers AEI is trying to get a grasp of various scenarios of developing and scaling up potential technologies, and what policy choices might be effective. Emissions trading is the first step under active consideration at the moment.

It is very hard to estimate with confidence either the total cost of emissions trading or the cost to individual consumers without knowing the details of the policy, especially the issue of how many permits will be allocated according to historic emissions baselines versus auctioned, and by what means we attempt to keep consumers whole through some scheme of rebates or tax credits. Public and private sector estimates span a wide range from very low to very high, from about $600 to $1,500 per household. In general we should take President Obama at his word, as he expressed it to the *San Francisco Chronicle* last year, that "Under my plan of a cap and trade system electricity rates would necessarily skyrocket. Businesses would have to retrofit their operations. That will cost money. They will pass that cost on to consumers." Budget director Peter Orszag has reiterated this point in recent weeks.

These aspects of the issue are well known. Less well understood is what I call the asymmetries of energy use throughout the U.S. that complicate the task of ensuring equity in distributing the costs of emissions reductions. In brief, it is very difficult to design a program that will not involve, in practice, much higher costs to consumers

in some states than others. *Attempts to keep consumers whole will likely entail an income transfer from high energy using states to low energy using states, and especially from high carbon energy states to low carbon energy states.*

These distributional variations do not stem merely from different industrial, efficiency and energy source profiles of the states, but also from important climate differences among the states. Households in northeastern and midwestern states must use more energy for heating in the winter, while southern and Gulf Coast states use more energy for cooling in the summer than Pacific coast states, regardless of energy source. The easiest way to grasp this point is to compare the Department of Energy's calculations of "degree heating" and "degree cooling" days—a measure of temperature variation from the national average—for different regions and states.[1] States in the upper midwest have roughly twice the amount of degree-heating days as states on the west and gulf coasts. (See Table 1.)

State/Region	Degree Heating Days	Degree Cooling Days
U.S. Average	4,524	1,242
Pacific Coast	3,226	755
New England	6,612	441
West North Central	6,750	949
East North Central	6,498	731
Mid-Atlantic	5,910	665
South Atlantic	2,853	1,982
East South Central	3,603	1,564
West South Central	2,286	2,447
Mountain	5,209	1,308

Table 1: Degree Heating and Cooling Days by Census Region, 2007

This is one—but only one—of the drivers of differences in per capita energy use among the states. The industrial mix also plays a role, of course, as do regional transportation differences. In general the further west one goes from the eastern seaboard, the further people drive, and the longer the distance goods have to be transported.

As a first pass at grasping the disparate impact of carbon pricing on consumers in different states, Table 2 displays a comparison of energy use, average household electricity rates, and the proportion of electricity generated from coal and the proportion generated by renewables or non-GHG sources such as nuclear and hydro

[1] Degree heating and cooling days are deviations above and below the mean daily temperature of 65 degrees F. For example, a weather station recording a mean daily temperature of 55 degrees would report 10 heating degree-days.

power. Washington state, which generates most of its electricity from hydro and nuclear power and enjoys some of the lowest retail electricity rates in the nation, will not likely experience significantly higher electricity costs from emissions trading; indeed, its power suppliers might be in a position to reap some windfall profits if it call transmit power to other states if and when we upgrade our national grid. Indiana ratepayers, by contrast, will almost surely pay sharply higher rates under any scenario.

The dilemma is this: Any simple rebate scheme based on income levels, such as a vastly expanded LIHEAP, will result in an income transfer from states like Indiana to states like Washington (in the case of this particular pairing, from a state with lower median income to a state with higher median income). One can envision a more supple program taking these disparities into account and targeting through various schemes the highest cost states such as Indiana. (California consumers, meanwhile, will wonder why they aren't receiving any price relief while paying some of the highest retail electricity costs in the nation.) However, in addition to the bureaucracy necessary for such an approach (which can be relied upon to generate some unexpected results), the tradeoffs implied threaten to vitiate the policy goal; i.e., if free permit allocations or rebates are targeted at consumers, it may slow the capital formation necessary for technology upgrades. If our goal is to replace fossil fuel energy rapidly, emissions trading with equity protection may not deliver satisfactory results.

State	Avg Household electricity rates (cents/KwH)	% electricity from coal	% from renewables/non-carbon (nuke or hydro)	Per Capita Energy Consumption (million BTUs)
U.S. Average	11.47	50	25	
California	14.76	0.1	40.5	232
Oregon	8.41	8.8	57.3	301
Washington	7.74	11.6	79.3	322
Indiana	9.47	95.1	0.1	454
Ohio	10.21	84.8	13.2	340
Kentucky	8.24	95.8	0.1	469
Massachusetts	17.74	27.8	18.3	230
New Jersey	15.55	11.6	53.5	301
Pennsylvania	11.38	51.8	40.5	317
Maryland	13.84	54.3	39.5	259

Table 2: Individual State Energy Comparisons