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Cap-and-Dividend: A State by State Analysis

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- A tax or a cap limiting carbon emissions effectively creates property rights; a cap-and-dividend vs. cap-and-trade system puts these rights in the hands of citizens vs. polluters².
- Recent national carbon cap proposals widen income gaps whereas a cap-and-dividend system would have a progressive impact on income distribution nationwide. In every state the majority of families come out ahead: the dividends they receive more than offset the impact of expenditure increases.
- Cap-and-dividend offers a way to secure durable public support for an effective policy to wean the economy from dependence on fossil fuels.

Distributional Aspects of Cap-and-Dividend at the National Level

A cap-and-dividend policy limits the quantity of carbon dioxide (CO₂) entering the U.S. economy, auctions permits to the firms that supply fossil fuels, and returns all or most of the auction revenue to households in the form of equal per capita dividends. The cap-and-dividend policy will have a progressive impact on income distribution nationwide. Households with smaller-than-average carbon footprints pay less in higher fuel costs than they receive as dividends; households with larger-than-average carbon footprints pay more than they receive. In general, lower and middle-income households will come out ahead, for the simple reason that they consume much less carbon than upper-income households. Overall, roughly three-quarters of American families will obtain positive net benefits in purely monetary terms, not counting the environmental benefits that are the main rationale for a carbon-pricing policy.

¹ Economics for Equity and the Environment Network (E3) is a nationwide network of economists developing arguments for environmental protection with a social equity focus. For more information, please contact Kristen Sheeran, Director, at ksheeran@e3network.org. E3 is a program of Ecotrust.

² For more information please see Policy Brief No. 18, *Carbon Cap and Carbon Tax: Differences and Implications* online at http://www.e3network.org/briefs/Aylward_Carbon_Cap_and_Carbon_Tax.pdf



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To illustrate, we assume that the permit price is \$25 per ton of CO₂³, all permits are auctioned and 80% of the revenue is returned to the people as dividends. The annual carbon charge, the cost to consumers from higher prices for fossil fuels and for other goods and services that use them in their production and distribution, resulting from a carbon cap ranges from \$135 per person in the lowest-income decile (tenths of the population ranked by per capita income) to \$618 per person in the highest. Each household receives the same per capita dividend, \$386⁴. As a percentage of income, the lowest decile sees a 6.5% gain while the top decile sees a 0.3% loss; the bottom seven come out ahead, the eighth breaks even, and the ninth (like the tenth) experiences a net cost. A more aggressive policy, with a more ambitious schedule for emission reductions and/or fewer offsets, would generate a higher price. This would increase the magnitude of the impacts of the cap-and-dividend policy, but it would not alter their distributional incidence.

A climate policy that incorporates cap-and-dividend is likely to dedicate some fraction of carbon revenues to other national uses, while returning the rest to the people as equal dividends. One potential non-dividend use of carbon revenues could be transitional adjustment assistance to help workers, communities and firms that stand to be affected adversely by the economy's shift away from fossil fuels. Another could be investment in renewable energy technologies to increase supply of non-carbon energy sources.

State-by-State Impacts of Cap-and-Dividend

Compared to differences across income brackets, the differences across states in household impacts of cap-and-dividend are small. Variations are due to differences in income, consumption patterns, and carbon intensity of electricity. For example, per capita income varies from about \$11,500 in Mississippi to about \$21,000 in Connecticut. Per capita expenditure on electricity by the median household in each state ranges from \$195/year in California to \$458/year in Virginia. The carbon intensity of electricity varies widely across the states. North Dakota, a state that is heavily reliant on coal-fired power plants, emits 1134 kg of CO₂ per megawatt hour (MWh). Vermont, where the main power sources are nuclear and hydro, emits only 73 kg CO₂/MWh. Taking these differences into account, the impact of higher fossil fuel prices only ranges from \$239 in Oregon to \$349 in Indiana for the median-income family.

The difference between results expressed as a percentage of income is also not terribly large. The biggest impact is in West Virginia, where the costs from higher fossil fuel prices are equivalent to 2.4% of median income, and the smallest impact is 1.4% in Connecticut. This is mainly due to West Virginia's relatively low incomes: while the state median carbon charge is

³ For more information on carbon pricing, please see *The Social Cost of Carbon* available online at: http://www.e3network.org/papers/SocialCostOfCarbon_SEI_20100401.pdf

⁴ All monetary figures are in 2003 dollars.



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only 4% above the national median, its median income is almost 25% below the national level. Even so, Connecticut, the state with the highest median income, pays but a little more in dollar terms than the median West Virginian.

To put these interstate differences in perspective, we can compare net impact of the cap-and-dividend policy on median households to the per-capita spending impacts of two major items in the federal budget: defense spending and farm programs. In the case of defense spending, the ratio between the top ten and bottom ten states is more than 11:1. In the case of farm programs, it is 190:1. In the case of cap-and-dividend, it is 2½ :1.

Cap-and-dividend vs. Recent Carbon Proposals

Whereas cap-and-dividend returns carbon revenue equally to each person, the American Climate and Energy Security (ACES) Act would have given away 85% of carbon permits and auctioned the remaining 15%. This system effectively allocates revenues in a variety of ways that eventually returns a proportion to households unequally. The Congressional Budget Office (2009) estimates that roughly two-fifths of the resulting income would flow to households in the top 20% of the nation's income distribution – an outcome that would disproportionately benefit upper-income states as well as upper-income individuals. In a cap-and-dividend system, on the other hand, each quintile receives an amount equal to its share of the population: 20%. In addition to the differences in distributional effects, a drawback of ACES style carbon permits is that the impact on households is less transparent than the cash-in-hand provided by dividends.

Conclusion

The transition to a post-carbon economy cannot happen overnight. It will require decades of sustained policy, including steadily rising carbon prices, to drive it forward. An attraction of cap-and-dividend is that the return of carbon revenue to the American people is highly visible: it comes back as cash in their wallets. Cap-and-dividend clearly sends the carbon price signal, while at the same time maximizing public awareness that families can come out ahead no matter how high carbon prices rise. The policy's underlying premise – that we are all equal co-owners of our nation's share of the carbon storage capacity of the atmosphere – is likely to have wider public appeal than the premise that the air belongs to polluting corporations.

For reasons of both economic fairness and transparency, therefore, cap-and-dividend offers a way to secure durable public support for an effective policy to wean the economy from dependence on fossil fuels. A proactive U.S. policy, in turn, will be a crucial condition for an effective international agreement to confront the global challenge of climate change.