

MEMORANDUM

To: EAAC Revenue Subcommittee
From: James K. Boyce
Re: Dividends
Date: December 30, 2009

This memo discusses the return of carbon permit auction revenues as equal per capita dividends to the public, a policy sometimes termed “cap-and-dividend.”¹

This policy option was singled out in Governor Schwarzenegger’s May 22, 2009 letter to the EAAC:

There is one idea in particular I would like you to explore among other options: the concept of returning the value of allowances back to the people, including through an auction of allowances and distribution of auction proceeds in the form of a rebate or dividend.

The memo reviews (i) rationales; (ii) precedents; (iii) distributional impacts of carbon pricing; (iv) distributional impacts of cap-and-dividend; (v) criticisms; (vi) taxability of dividends; and (vii) logistics of dividend disbursement and eligibility.

Rationales

There are three fundamental rationales for cap-and-dividend:

1. *The principle of common ownership of nature’s wealth:* A consequence of any policy to limit use of a resource – to manage scarcity – is the creation of property rights. Cap-and-dividend starts from the premise that rights to the property created by the introduction of carbon permits belong in common and equal measure to all.² Cap-and-dividend is akin to a “feebate” arrangement in which individuals pay fees based on their use of a scarce resource that they own in common, and the fees are then rebated in equal measure to all co-owners. In this case, the scarce resource is the California’s share of the carbon storage capacity of the atmosphere; the fee is set by the carbon footprint of each household; and the co-owners are the people of the state.

¹ This is a revised and expanded version of the author’s memo of the same title dated August 6, 2009.

² To clarify: Carbon permits themselves are not property rights. Just as buying a parking permit is not the same as owning the parking lot, buying a carbon permit is not the same as owning the property created by a carbon cap. A carbon permit allows the holder to “park” carbon in the atmosphere. The property may be owned by the government (if permits are auctioned and the revenue is used by the state); by firms (if they receive free permit allocations); or by the people (if permits are auctioned and the revenue is returned to the public).

2. *Protection of household real incomes:* A second rationale is to protect the real incomes of households from the impact of higher fossil fuel prices resulting from the cap. The motivation here is similar to others under the heading of compensation. If the amount paid by households in higher prices is returned as dividends, the household sector as a whole is “made whole” by the policy. The net impact on any individual household varies depending on its carbon footprint. Those with larger-than-average carbon footprints pay more than they receive in dividends; those with smaller-than-average carbon footprints receive more than they pay. Since carbon footprints are correlated with income, lower-income and middle-income families generally receive greater net benefits from the policy than upper-income households. Across the entire income spectrum, however, every household has an incentive to reduce its carbon footprint in response to market price signals: those who reduce them most obtain the greatest net monetary gain.

3. *Securing durable public support for the carbon policy:* A cap on carbon emissions will increase the prices of gasoline, electricity, and other commodities in proportion to their carbon content. A cap that does not have this effect is not a binding cap. For political sustainability, it is important to anticipate public reactions to higher fuel prices and to craft a policy design that voters will accept or, better yet, positively welcome. Cap-and-dividend’s democratic premise – that California’s share of the atmosphere’s carbon-absorptive capacity belongs to its people – and its visible contribution to family incomes may improve the carbon policy’s prospects for survival over the long haul.

Precedents

Three precedents for a cap-and-dividend policy are the Alaska Permanent Fund, which distributes dividends from oil revenues equally to all residents of that state; the “Climate Change Consumer Refund Account” provision of the American Clean Energy and Security Act (ACES, also known as the Waxman-Markey bill) now before the U.S. Congress; and the “Carbon Refund Trust Fund” of the Carbon Limits and Energy for America’s Renewal (CLEAR) Act, introduced in the U.S. Senate by Senators Maria Cantwell and Susan Collins in December 2009.

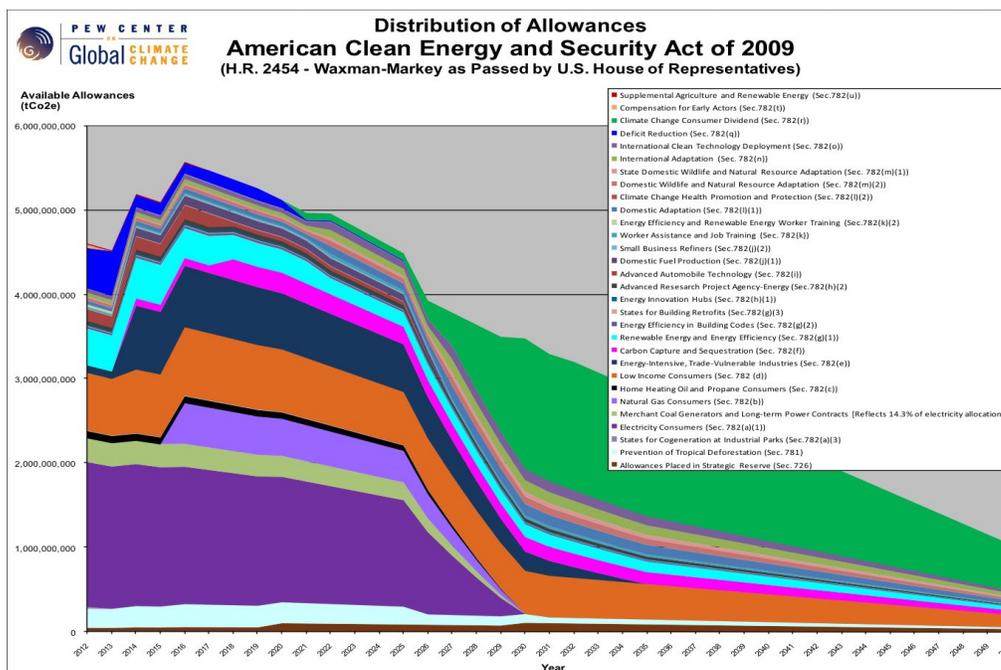
The *Alaska Permanent Fund*, established in 1976 under the leadership of Governor Jay Hammond, recycles oil-extraction royalties to the public as equal per-person dividends. Last year the dividend per capita amounted to \$2,069 (in addition to a one-time “resource rebate” of \$1,200). Apart from operationalizing the core principle of common and equal ownership of natural wealth, the Fund demonstrates that it is administratively feasible for state governments to define eligibility and disburse dividends to residents. A major difference, of course, is that the Alaska Permanent Fund gives residents an incentive to support higher oil extraction, whereas cap-and-dividend results in the opposite incentive: a tighter cap yields increased dividends (assuming inelastic demand for fossil fuels, i.e., a 10% increase in prices is associated with a less-than-10% reduction in demand, and hence higher total revenue).

The **Climate Change Consumer Refund Account** that is proposed in section 789(a) of the ACES bill provides that:

In each year after deposits are made to the Climate Change Consumer Refund Account, the Secretary of the Treasury shall provide tax refunds on a per capita basis to each household in the United States that shall collectively equal the amount deposited into the Climate Change Consumer Refund Account.

The share of the Climate Change Refund Account in the proposed allocation of allowance value in ACES over time is shown in Figure 1. The refund, depicted by the green area in the top layer of the graph, begins in the 2020s and grows to about 50% of allowance value in the 2030s and 2040s. While ACES is not a cap-and-dividend policy in its initial years, it substantially turns into one over time.

Figure 1: Distribution of Allowances Proposed in ACES



Source: “Federal Climate Change Policy: Allowance Distribution,” presentation of Judi Greenwald to the EAAC, July 1, 2009. Available at http://www.climatechange.ca.gov/eaac/meetings/2009-07-01/documents/Presentation_Judi_Greenwald_Waxman-Markey_Allocation.pdf.

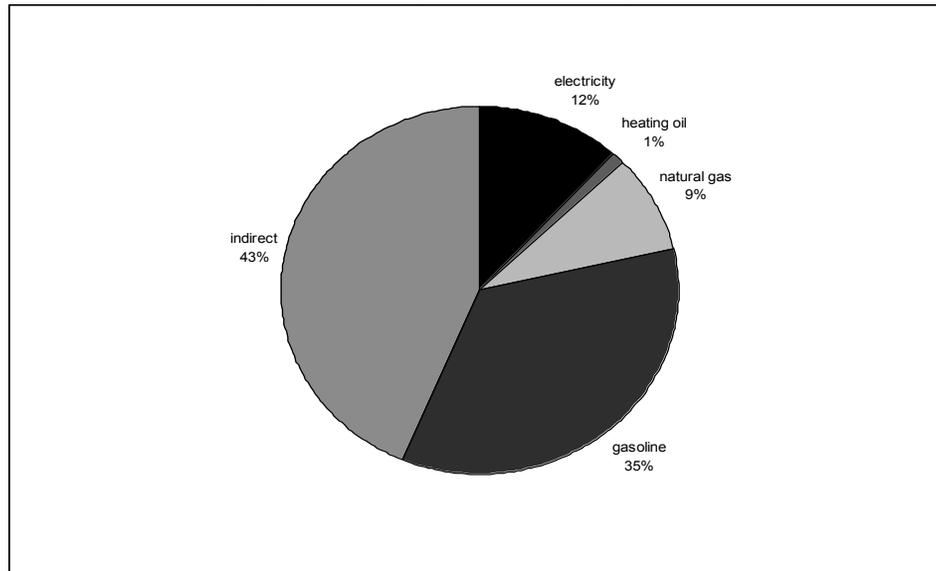
The **Carbon Refund Trust Fund** that is proposed in the Carbon Limits and Energy for America's Renewal (CLEAR) Act, introduced at the federal level by Senators Maria Cantwell and Susan Collins in December 2009, would return 75% of allowance value to households as monthly per capita dividends. The remaining 25% is devoted to investments in energy efficiency, clean energy, adaptation to climate change, and transitional adjustment assistance.³

³ U.S. Senate Bill 2877, Carbon Limits and Energy for America's Renewal Act, section 5(b)(4).

Distributional impacts of carbon pricing

The gross cost to a household from carbon pricing is a function of the amount of fossil carbon embodied in the production and distribution of the goods and services it consumes (the household's "carbon footprint"). The breakdown across expenditure categories for the median California household is shown in Figure 2.⁴

Figure 2: Carbon Footprint by Expenditure Category: Median CA Household



Source: Calculated using the methodology of Boyce and Riddle (2009).

Because lower-income households generally consume less than higher-income households, they typically have smaller carbon footprints. Differences across income brackets in California are shown in Figure 3. In the highest decile, carbon emissions per capita are roughly six times greater than in the lowest decile.

As a *share* of their income, however, the poor consume more carbon than the rich – that is, more carbon per dollar – as shown in Figure 4. This is largely because fuels and electricity account for a larger share of their household budgets, whereas upper-income groups spend a higher share on other items. In the absence of offsetting transfers of allowance value, putting a price on carbon therefore is regressive: the higher prices arising from the introduction of carbon permits takes a larger share of income from the poor than from households in upper-income brackets.

⁴ Based on data from the 2003 Consumer Expenditure Survey, the 2003 Input-Output Tables and the 2002 Benchmark Input-Output Tables. Source: James K. Boyce and Matthew E. Riddle, "Cap and Dividend: A State-by-State Analysis," Amherst, MA: Political Economy Research Institute and Portland, OR: Economics for Equity and the Environment Network, August 2009, Figure 3. Available at http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/green_economics/CAP_DIVIDEND_states.pdf.

Figure 3:
Carbon Footprint by Income Decile
in California
(metric tons CO₂ per capita)

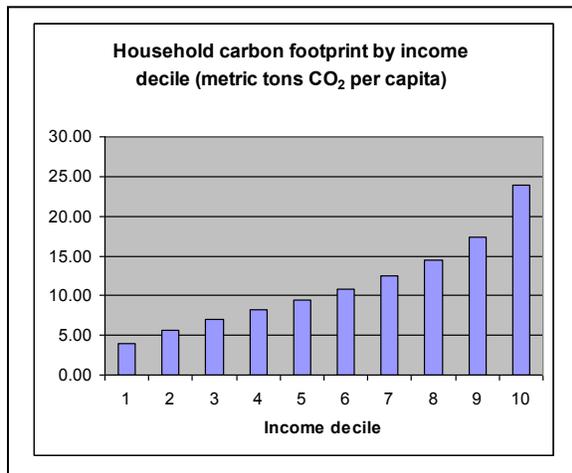
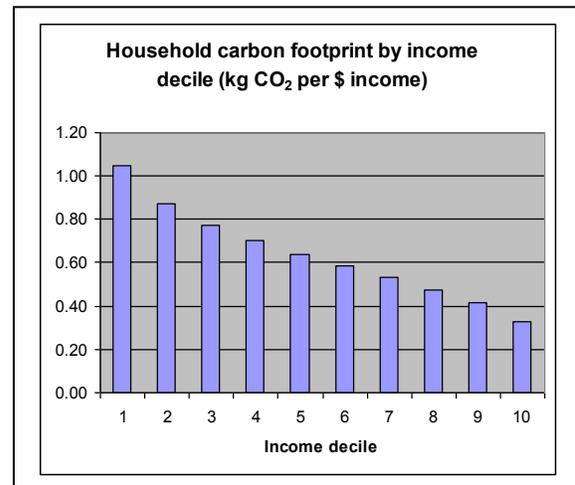


Figure 4:
Carbon Footprint by Income Decile
in California
(kg CO₂ per dollar)



Source: Calculated using the methodology of Boyce and Riddle (2009).

Table 1 shows the breakdown of carbon footprints by income decile and expenditure category. Direct fuel consumption looms larger in the expenditure basket of low-income households, accounting for 69% of the total carbon footprint in the lowest decile. In the highest decile, by contrast, indirect consumption (via other goods and services) accounts for more than half of the total carbon footprint.

Table 1: Carbon Footprint by Income Decile and Expenditure Category in California
(metric tons CO₂ per person per year)

Income decile	Income per capita (\$/yr)	Carbon footprint per capita (metric tons CO ₂ per person per year)					Total
		Electricity	Gasoline	Natural gas	Heating oil	Other goods and services	
1	3788	0.78	1.41	0.49	0.07	1.21	3.96
2	6545	0.97	2.15	0.66	0.09	1.84	5.71
3	9062	1.09	2.69	0.77	0.10	2.38	7.03
4	11752	1.20	3.16	0.86	0.11	2.92	8.26
5	14841	1.31	3.61	0.95	0.12	3.52	9.51
6	18603	1.42	4.07	1.03	0.12	4.23	10.87
7	23494	1.54	4.55	1.12	0.13	5.12	12.46
8	30469	1.68	5.08	1.22	0.14	6.35	14.47
9	42186	1.87	5.71	1.33	0.16	8.35	17.43
10	72895	2.22	6.63	1.51	0.18	13.36	23.90
Mean	24889	1.41	3.91	0.99	0.12	5.10	11.54
Median	16616	1.37	3.84	0.99	0.12	3.86	10.17

Source: Calculated using the methodology of Boyce and Riddle (2009).

Distributional impacts of cap-and-dividend

Because gross costs to households are based on their carbon footprints, while dividends are paid equally to all, the *net impact* of cap-and-dividend is distributionally progressive. Table 2 illustrates this point, showing how California households would be affected by a *national* cap-and-dividend policy with a permit price of \$25/ton carbon dioxide, 100% of permits auctioned, and 80% of auction revenue returned as dividends. In this scenario, lower-income deciles see substantial net benefits; middle-income deciles are “kept whole” with dividends more than offsetting the impact of higher fuel prices; and the top two deciles see net costs. Overall, roughly eight in ten California households come out ahead in monetary terms – without counting the environmental benefits that are the carbon policy’s main objective.

Table 2: Impact of National Cap-and-Dividend Policy on California Households by Income Decile

(\$25/tCO₂; 100% auction; 80% of revenue distributed as dividends)

Income decile	Income per capita (\$/yr)	Carbon footprint per capita (metric tons CO ₂ per person per year)					Total
		Electricity	Gasoline	Natural gas	Heating oil	Other expenditures	
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Source: Boyce and Riddle (2009, Tables 3, 4, 5 & A.1).

A *California-only* cap-and-dividend policy will yield somewhat different numbers than a national policy, even with the same carbon price and same revenue-allocation parameters, among other reasons because (i) the carbon footprint of the average California resident is below the national average, largely due to energy efficiency policies that have reduced per capita electricity consumption, so Californians fare better than average in a nationwide policy; and (ii) imports and exports (at the state level, i.e. from/to out-of-state) account for a bigger fraction of consumption and carbon emissions, respectively, than at the national level. All else equal, the former would result in lower net benefits than those reported in Table 2, while the latter would result in higher net benefits. But the

broad pattern would persist: lower-income households gain, the middle class is protected, and upper-income groups bear a net cost.⁵

Outcomes for individual households could differ from these broad patterns. In any income bracket, those who respond more strongly to the market price signals produced by the cap will fare better than those who do not curb consumption of fossil fuels. Upper-income households with carbon footprints below the norm for their bracket could get positive net benefits; lower and middle-income households with disproportionately large carbon footprints could come out behind.

Criticisms

Criticisms of dividends fall into three classes: (i) other priorities for revenue (or allowance value) allocation; (ii) universal coverage versus targeted beneficiaries; and (iii) regional disparities.

1. *Other priorities* include all non-dividend allocations of allowance value whether via free permits or auction revenue uses. Some of these are transitional in nature: compensation and at least some investment functions are in this category. Some are more permanent: general government revenue (and tax-shifting with the potential “double-dividend” efficiency gains) is in this category. In the case of transitional priorities, the policy mix between dividend and non-dividend allocations could change over time with the share allocated to dividends gradually increasing, as in ACES.
2. *Universal coverage* is sometimes criticized on the grounds that dividends would be received by people who “don’t need them.” The Center for Budget and Policy Priorities has proposed instead that dividends be targeted to low-income households.⁶ The provision for refunds to low-income consumers in ACES (Section 782(d)) embodies this approach. Targeted payments may be viewed as an adequate response to the compensation rationale for dividends. But they do not respond to the common ownership rationale. In addition, universal coverage may have political appeal; witness the durable public support for Social Security. Means-testing also would impose the extra administrative costs.
3. *Regional disparities* result from cap-and-dividend when carbon footprints differ by location. At the national level, inter-state disparities in net impact are modest, and much smaller than those of many other federal policies including defense

⁵ For estimates of the distributional impact of a California-only cap-and-dividend policy, see the memorandum to EAAC from Cathy Kunkel and Daniel M. Kammen dated November 2, 2009: http://www.climatechange.ca.gov/eaac/documents/member_materials/Kunkel_and_Kammen_Cap_and_Dividend_memo.pdf.

⁶ Robert Greenstein *et al.*, “Designing Climate-Change Legislation that Shields Low-Income Households from Increased Poverty and Hardship,” Washington, DC: Center for Budget and Policy Priorities, May 9, 2008. Available at <http://www.cbpp.org/files/10-25-07climate.pdf>.

spending and farm programs.⁷ Within California, differences in the carbon-intensity of the electricity supply would contribute to regional disparities, but these are modest since electricity accounts for only 12% of the median household's carbon footprint (see Figure 1). Any regional disparities arise from carbon pricing – not from dividends – so they are equally relevant for other policies on allocation of allowance value.

Taxability of dividends

The taxability of dividends may affect decisions regarding the share of allowance value to be allocated to this purpose: if dividends are taxable, a fraction of the allowance value flows back to government, becoming available other uses; if they are non-taxable, a larger share of allowance value is needed for non-dividend uses to obtain the equivalent result.

The Carbon Limits and Energy for America's Renewal (CLEAR) Act, introduced at the federal level by Senators Maria Cantwell and Susan Collins in December 2009, would return 75% of allowance value to households in the form of non-taxable dividends.

One argument in favor of taxable dividends is that governments (local, state, and federal) will be impacted by higher fuel prices, as well as consumers. Nationwide, government consumption accounts for about 14.4% of carbon emissions: the federal government accounts for 3.6%, state and local governments for the other 10.8%.⁸ To protect government purchasing power or “keep government whole,” a return flow of carbon revenue is needed.

Because income taxation is progressive, larger taxable dividends are preferable on equity grounds to smaller non-taxable dividends with equal government revenue. Compared to taxable dividends, taking the government's share “off the top” by reducing dividends is equivalent to a head tax: it would take an equal dollar amount from each person regardless of income level, and hence would be regressive. From the standpoint of a California-only carbon policy, however, an advantage of non-taxable dividends is that this prevents allowance value from flowing out of the state as federal income tax payments.

Logistics of dividend disbursement and eligibility

Dividends can be disbursed via (i) electronic benefit transfer (EBT) cards, (ii) direct deposit into bank accounts, (iii) checks in the mail, or (iv) tax refunds. The first two methods – together known as Electronic Funds Transfer – are widely used by federal and

⁷ Boyce and Riddle (2009), Figure 6.

⁸ James K. Boyce and Matthew Riddle, “Keeping the Government Whole: The Impact of a Cap-and-Dividend Policy for Curbing Global Warming on Government Revenue and Expenditure,” Amherst, MA: Political Economy Research Institute, Working Paper No. 188, November 2008, Table 1. Available at http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_151-200/WP188.pdf.

state agencies to distribute recurring payments to individuals; today more than 80% of federal benefit payments are disbursed electronically. For example, EBT cards are widely used for Social Security payments and are the primary delivery vehicle for food stamp payments.⁹ The federal CLEAR Act (Cantwell-Collins bill) proposes to use electronic transfers as the principal vehicle for monthly dividend payments.

Checks in the mail are a more costly means to deliver payments, but may be preferred by some individuals. Tax refunds require that the recipient file a tax return, so this method would be likely to result in some gaps in coverage; in addition, tax refunds as a means of dividend disbursement would rank lower than the other vehicles in terms of visibility.

Eligibility for dividends will need to be defined (as, for example, the state has done in establishing residency requirements for in-state tuition at public universities). In the case of the Alaska Permanent Fund, which has more than 25 years of experience in distributing per capita dividends, in order to be eligible a person must have been an Alaska resident for the entire preceding calendar year (or, in the case of infants, must have been born during that year and have an eligible Alaska resident sponsor). Applicants for dividends in Alaska supply a Social Security Number and other identification information.¹⁰

⁹For details, see Boyce memo to EAAC, “Electronic Funds Transfer”, December 13, 2009. Online at http://www.climatechange.ca.gov/eaac/documents/member_materials/Boyce%20memo%20on%20Electronic%20Funds%20Transfer%2012-13-09.pdf.

¹⁰ For details on logistics of the Alaska system, see <http://www.pfd.alaska.gov/>.