

To: Jessica Spiegel

From: Kriss Sjoblom, Washington Research Council

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Subject: New forecasts of E2SSB 5126, WAC 173-446 allowance prices and revenues

Table 1, below, shows estimates of compliance costs through the year 2040 under E2SSB 5126’s cap and trade system drawn from the Washington State Department of Ecology’s recently released “Preliminary Regulatory Analysis” report, based on forecasts prepared for the Department by the consultancies Vivid Economics and McKinsey & Company (Ecology 2022). All dollar amounts in the Ecology report are adjusted for inflation to constant 2022 values.

Column (1) shows total projected emissions for each year in metric tons of carbon dioxide or its equivalent (MTCO_{2e}). To ease the transition, certain industries will receive free allowances for a period of time. Column (2) shows the quantities of free allowances projected to be distributed each year in MTCO_{2e}. Column

Table 1: Cap and Trade Compliance Costs

Year	Total Emissions (MTCO _{2e}) (1)	No Cost Emissions (MTCO _{2e}) (2)	Emissions Net of No Cost Emissions (MTCO _{2e}) (3)	Average Allowance Auction Price (2022\$) (4)	Compliance Cost at Current Year Auction Price (2022\$) (5)	Transportation Emissions (MTCO _{2e}) (6)	Transportation Compliance Cost at Current Year Auction Price (2022\$) (7)
2023	56,944,519	27,770,514	29,174,005	\$58.31	\$1,701,136,232	25,322,621	\$1,476,562,031
2024	52,905,144	24,313,109	28,592,035	\$61.21	\$1,750,118,462	24,324,667	\$1,488,912,867
2025	48,306,209	20,911,727	27,394,482	\$64.76	\$1,774,066,654	22,781,288	\$1,475,316,211
2026	44,062,212	17,863,091	26,199,121	\$69.96	\$1,832,890,505	21,569,978	\$1,509,035,661
2027	41,441,506	16,472,860	24,968,646	\$76.91	\$1,920,338,564	20,274,925	\$1,559,344,482
2028	38,893,574	15,549,870	23,343,704	\$84.01	\$1,961,104,573	18,925,473	\$1,589,928,987
2029	36,491,645	14,775,690	21,715,955	\$92.76	\$2,014,371,986	17,565,816	\$1,629,405,092
2030	33,801,018	13,379,075	20,421,943	\$100.23	\$2,046,891,347	16,213,716	\$1,625,100,755
2031	31,231,324	12,301,798	18,929,526	\$92.57	\$1,752,306,222	14,945,625	\$1,383,516,506
2032	28,841,787	11,291,038	17,550,749	\$92.63	\$1,625,725,880	13,767,914	\$1,275,321,874
2033	26,668,227	10,339,180	16,329,047	\$96.74	\$1,579,672,007	12,722,462	\$1,230,770,974
2034	24,523,838	9,414,141	15,109,697	\$99.73	\$1,506,890,082	11,696,959	\$1,166,537,721
2035	22,625,592	8,571,184	14,054,408	\$64.35	\$904,401,155	10,792,201	\$694,478,134
2036	20,461,573	7,802,783	12,658,790	\$58.58	\$741,551,918	9,706,842	\$568,626,804
2037	18,366,041	7,147,518	11,218,523	\$58.79	\$659,536,967	8,609,366	\$506,144,627
2038	16,267,008	6,491,767	9,775,241	\$59.72	\$583,777,393	7,514,189	\$448,747,367
2039	14,487,824	5,901,589	8,586,235	\$46.39	\$398,315,442	6,514,496	\$302,207,469
2040	12,799,423	5,318,133	7,481,290	\$44.49	\$332,842,592	5,583,374	\$248,404,309

(3) shows the difference between the values in columns (1) and (2); this difference is the projected quantity of emissions that must be covered by auctioned allowances each year. Column (4) shows the forecasted average allowance auction price for each year. According to the Vivid/McKinsey forecast, the average auction price of an allowance to emit one metric ton of carbon dioxide or its equivalent (MTCO_{2e}) will be \$58.31 for auctions conducted in 2023, the program’s first year. The price rises steadily to a peak of \$100.23 in 2030 and then zigzags downward, reaching \$44.49 in 2040, the last year shown in the table. Column (5) shows estimates of allowance costs for each year, which are calculated by multiplying the quantity of emissions in column (3) by the allowance price in column (4). Allowance cost is \$1,701 million in 2023, rises to \$2,047 million in 2030 and then declines. Column (6) shows transportation emissions by year, while column (7) shows the allowance costs associated with these emissions.

Table 2, below, looks at transportation compliance costs per gallon of motor fuel, which is a scale more comprehensible to the typical citizen than the aggregates in Table 1.

Table 2: Compliance Cost per Gallon of Motor Fuel (2022 dollars)*

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Allowance Price (MTCO _{2e})	\$58.31	\$61.21	\$64.76	\$69.96	\$76.91	\$84.01	\$92.76	\$100.23	\$92.57	\$92.63
Compliance cost per gallon:										
Gasoline (10% ethanol)	\$0.466	\$0.490	\$0.518	\$0.560	\$0.615	\$0.672	\$0.742	\$0.802	\$0.740	\$0.741
Diesel (4% biodiesel)	\$0.570	\$0.598	\$0.633	\$0.684	\$0.752	\$0.821	\$0.907	\$0.980	\$0.905	\$0.905

*The data in this table should not be construed as a forecast of fuel prices. The basic rules of supply and demand have impacts on the price of gasoline and diesel. Additionally, local taxes and fees also affect the cost of gasoline and diesel to consumers.

The first line in the table shows the Vivid/McKinsey forecast of average auction allowance prices for the first 10 years of the cap and trade system. On the second and third lines, these metric-ton prices are translated into projected costs per gallon of gasoline and diesel using carbon dioxide emissions coefficients from the Energy Information Administration (EIA 2016). I assume that gasoline consumed in Washington includes 10 percent ethanol, and that diesel fuel includes 4 percent biodiesel.

The peak per-gallon compliance costs occur in 2030: 80.2¢ for gasoline and 98.0¢ for diesel. Note: these projected compliance costs are imposed on fuel distributors, and the ultimate cost to vehicle owners will be determined by the dynamics of the competitive wholesale and retail transportation fuels markets.

Table 3, on the following page, compares the Vivid/McKinsey forecasts of allowance prices and auction revenues to the state from the price and revenue forecasts presented in the E2SSB 5226 fiscal note (OFM 2021; see page 121 of the pdf). The fiscal note forecasts are in current dollars. I have deflated them to 2022 dollars using the CBO forecasts of the price index for gross domestic product (CBO 2021, 2022). The revenue numbers in column (2) of Table 3 differ from the compliance cost numbers in column (5) of Table 1 because of “banking”: an allowance purchased in one year may be retained to satisfy an allowance obligation in a future year.

For the first 12 years (2023-2032, comprising the first three compliance periods) the allowance prices forecasted by Vivid/McKinstry are much higher than the prices forecasted in the fiscal note. The divergence between revenues is even greater, as Vivid/McKinsey consistently forecasts greater quantities of allowances will be sold than the fiscal note forecasts. Over the full 2023-2040 period, the total revenue forecasted by Vivid/McKinsey is nearly three times that forecasted by the fiscal note: \$21.9 billion versus \$7.4 billion.

Table 3: Cap and Trade Auction Revenue

Year	From Ecology's Preliminary Regulatory Analyses		From 2SSB 5126 Fiscal Note	
	Allowance Price (2022\$)	Auction Revenue (2022\$)	Allowance Price (2022\$)	Auction Revenue (2022\$)
	(1)	(2)	(3)	(4)
2023	\$58.31	\$2,144,980,394	\$23.18	\$448,954,991
2024	\$61.21	\$1,622,832,228	\$24.61	\$445,816,776
2025	\$64.76	\$2,117,864,284	\$26.15	\$431,830,503
2026	\$69.96	\$1,686,622,451	\$27.83	\$423,097,413
2027	\$76.91	\$1,647,262,551	\$28.40	\$467,663,935
2028	\$84.01	\$1,534,063,251	\$30.41	\$451,741,870
2029	\$92.76	\$1,387,142,730	\$32.66	\$429,662,264
2030	\$100.23	\$1,229,838,047	\$35.30	\$399,421,206
2031	\$92.57	\$1,265,277,251	\$37.60	\$418,203,202
2032	\$92.63	\$1,251,230,540	\$41.16	\$409,600,181
2033	\$96.74	\$1,285,393,752	\$43.83	\$409,005,100
2034	\$99.73	\$1,265,767,790	\$46.75	\$406,579,064
2035	\$64.35	\$742,608,488	\$50.01	\$402,325,574
2036	\$58.58	\$656,152,689	\$53.59	\$395,477,831
2037	\$58.79	\$631,913,251	\$57.56	\$385,570,975
2038	\$59.72	\$614,926,226	\$61.93	\$371,842,372
2039	\$46.39	\$453,667,316	\$66.81	\$353,688,947
2040	\$44.49	\$375,508,002	\$69.52	\$355,977,917

Sources

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