

# **Appendix B**

## Updated Costs and Benefits Analysis

# Updated Cost and Benefits Analysis

On August 30, 2022, the California Air Resources Board released the Notice and Staff Report for the proposed Advanced Clean Fleets (ACF) regulation. As a result of modifications described in the Notice of Public Availability of Modified Text and Availability of Additional Documents and changes to the baseline, both the costs and the benefits of the proposed regulation have changed. This attachment provides updated information on the emissions, health, and cost benefits of the proposed regulation.

## I. Changes Since the Release of the Staff Report

### 1. Changes to the Legal Baseline

Modifications were made to the emissions estimates in the baseline since the Staff Proposal was released on August 30, 2022. On October 6, 2022, the Office of Administrative Law approved the Heavy-Duty Inspection and Maintenance (HD I/M) program, which became effective on January 1, 2023.<sup>1</sup> That program establishes a smog-check program for heavy-duty trucks by requiring periodic emissions testing and expanded enforcement strategies that ensure the vehicles' emissions control systems are properly functioning throughout the vehicles' life.

The Federal Clean Truck Program (CTP) was adopted by the U.S. Environmental Protection Agency (U.S. EPA) on December 20, 2022 and published in the Federal Register on January 24, 2023.<sup>2</sup> This regulation applies to 2027 model year or newer heavy-duty vehicles and engines certified to federal emission standards. This program sets new, more stringent emissions standards that cover a wider range of heavy-duty engine operating conditions compared to current standards, and it requires these more stringent emissions standards to be met for a longer period of time of when these engines operate on the road. Federal engines enter California when they cross state lines or when they are purchased used in California. The federal CTP did not affect the emissions of vehicles certified to California Heavy-Duty Omnibus Regulation.

Both the HD I/M and CTP decrease tailpipe criteria emissions from combustion-powered heavy-duty vehicles and increase their costs. These changes have been reflected in the Legal Baseline.

### 2. Changes to the Proposed Regulation

Modifications to the proposal that impact cost and emission estimates include accelerating the 100 percent zero-emission vehicle (ZEV) sales requirement, the new waste and wastewater fleet provision, and the new requirement that new internal combustion engines be certified to California emission standards. Other modifications to the regulation such as

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<sup>1</sup> Cal. Code Regs., tit. 13, sections 2193, 2195 through 2199.1

<sup>2</sup> U.S. Environmental Protection Agency, Control of Air Pollution From New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards, 2023 (web link: <https://www.federalregister.gov/documents/2023/01/24/2022-27957/control-of-air-pollution-from-new-motor-vehicles-heavy-duty-engine-and-vehicle-standards>, last accessed February 2023).

changes to the exemptions are expected to have a negligible impact on vehicle inventory and costs for the analysis period and have not been modeled.

Staff have modified the proposal by accelerating the proposed requirement that all medium- and heavy-duty engines meet ZEV requirements from 2040 to 2036.

Staff have added a new provision affecting compressed natural gas (CNG) powered trucks owned by public or private waste and wastewater fleets involved in municipal diversion of organic waste. This provision applies to any CNG vehicle owned by wastewater fleets and front loaders, side loaders, rear loaders, roll-off trucks, and transfer trucks owned or operated by waste fleets. Vehicles affected by this provision are moved to the ZEV Milestone Group 3 schedule requiring 10 percent ZEVs in 2030 ramping up to 100 percent ZEVs in 2042. This provision provides additional time to these fleets before they must transition these vehicles to ZEVs.

Finally, the proposed changes would require California-certified engines when new internal combustion engine (ICE) vehicles are purchased. This means cleaner engines are purchased when exemptions are granted or with the flexibility to add ICE vehicles by fleets complying with the ZEV Milestone option.

In conclusion, the changes to the regulation result in higher criteria and greenhouse gas (GHG) emission benefits than the proposal in the Staff Report. However, because the criteria emissions of the Legal Baseline have decreased compared to the Staff Report, the criteria emission benefits of the proposed regulation are smaller when compared to the updated baseline.

GHG benefits are slightly lower than the baseline before 2036 due to the delayed waste and wastewater fleet implementation, but are higher than staff's proposal in the Staff Report starting 2036 due to the earlier 100 percent ZEV sales requirement.

## **II. Emissions Analysis**

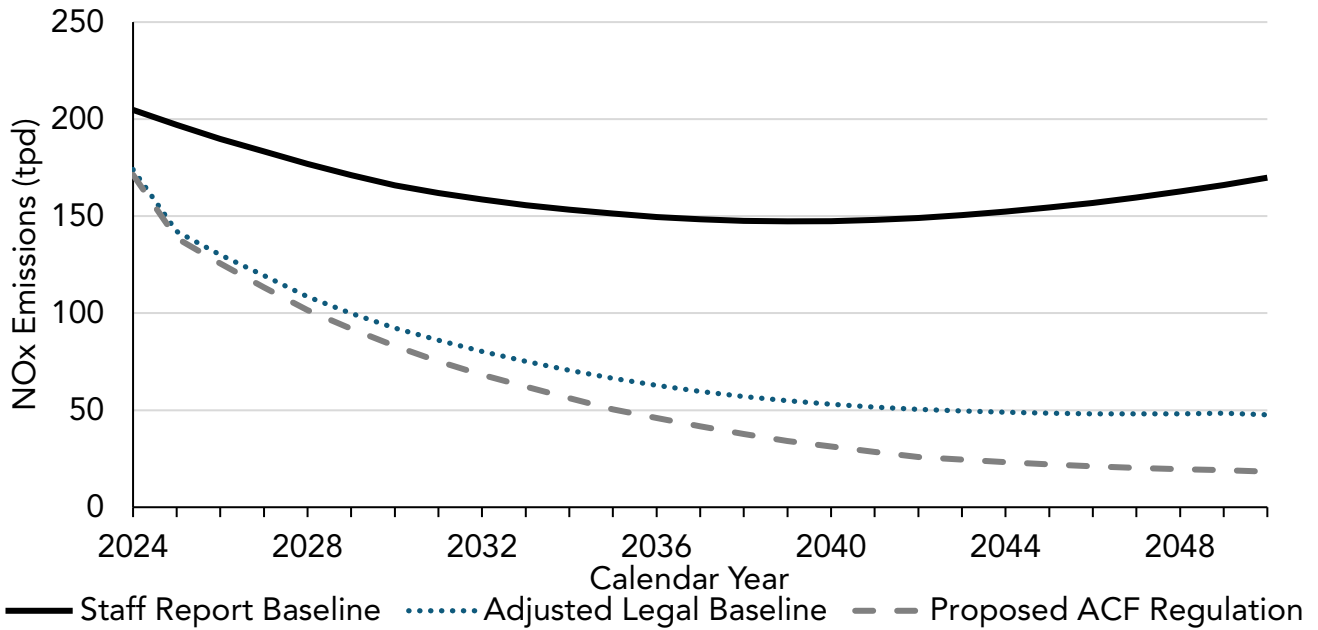
This section describes the updated criteria and GHG benefits of the proposed regulation. Unless otherwise stated, all methodology is the same as in the Staff Report Appendix F: Emissions Inventory and Results.

### **A. Criteria Emissions**

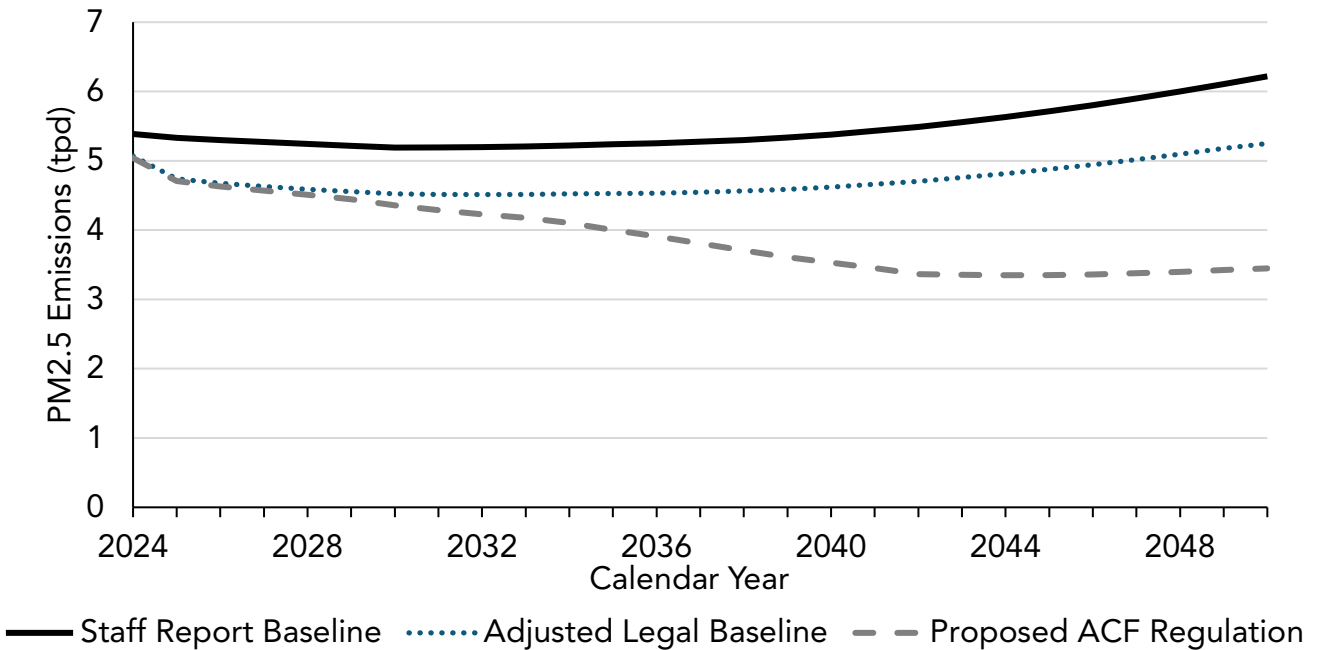
In the following figures, Staff Report Baseline includes regulations finalized as of August 30, 2022, and does not include the HD I/M or federal CTP regulations, Adjusted Legal Baseline includes all regulations approved at the time of the release of the 15-day changes including the HD I/M and federal CTP regulations, and Proposed ACF Regulation includes the proposed regulation in addition to the Legal Baseline. Emissions and emission benefits have both declined due to the updated Legal Baseline.

Figure 1 and Figure 2 display the tank-to-wheel oxides of nitrogen (NO<sub>x</sub>) and fine particulate matter (PM<sub>2.5</sub>) emissions, respectively, of the Staff Report Baseline, Adjusted Legal Baseline, and Proposed Regulation in short tons per year.

**Figure 1: Projected Statewide NOx Tank-to-Wheel Emissions, Staff Report Baseline, Adjusted Legal Baseline, and Proposed Regulation**



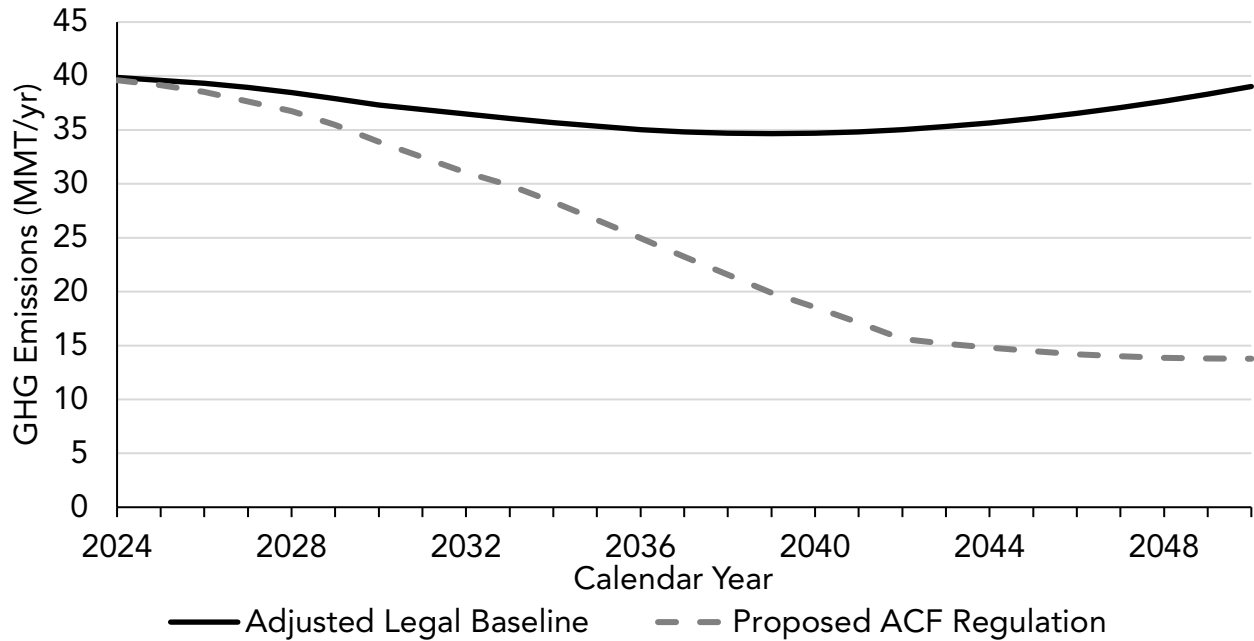
**Figure 2: Projected Statewide PM2.5 Tank-to-Wheel Emissions, Staff Report Baseline, Adjusted Legal Baseline, and Proposed Regulation**



**B. Greenhouse Gas Emissions**

Figure 3 displays the well-to-wheel GHG emissions under the Legal Baseline and proposed regulation. Note that there are no significant differences in GHG emissions between the Staff Report Baseline and Legal Baseline as neither the HD I/M regulation or federal CTP affect GHG emissions.

**Figure 3: Projected Statewide Greenhouse Gas Tank-to-Wheel Emissions, Adjusted Legal Baseline, and Proposed Regulation**



### III. Health Benefits

Table 2 and Table 3 show the updated health benefit incident quantification and monetization, respectively. These results were calculated using the same methodology described in the Staff Report Chapter IV, Section A. The health benefits have declined compared to the values in the Staff Report due to the lower anticipated benefits in comparison to the Adjusted Legal Baseline.

**Table 1: Regional and Statewide Avoided Mortality and Morbidity Incidents from 2024 to 2050 under the Proposed Regulation**

Air Basin	Cardiopulmonary mortality	Hospitalizations for cardiovascular illness	Hospitalizations for respiratory illness	ER visits
Great Basin Valleys	2 (1 - 2) †	0 (0 - 0)	0 (0 - 0)	1 (0 - 1)
Lake County	2 (1 - 2)	0 (0 - 0)	0 (0 - 0)	1 (0 - 1)
Lake Tahoe	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)	0 (0 - 0)
Mojave Desert	41 (32 - 50)	6 (0 - 12)	7 (2 - 13)	16 (10 - 22)
Mountain Counties	24 (19 - 29)	2 (0 - 4)	3 (1 - 5)	8 (5 - 11)
North Central Coast	11 (9 - 14)	2 (0 - 4)	2 (1 - 4)	6 (4 - 9)
North Coast	5 (4 - 6)	0 (0 - 1)	1 (0 - 1)	2 (1 - 2)
Northeast Plateau	2 (1 - 2)	0 (0 - 0)	0 (0 - 0)	1 (0 - 1)
Sacramento Valley	112 (87 - 137)	14 (0 - 28)	17 (4 - 30)	41 (26 - 57)
Salton Sea	30 (23 - 36)	4 (0 - 9)	5 (1 - 9)	14 (9 - 19)
San Diego County	117 (91 - 143)	17 (0 - 34)	21 (5 - 37)	46 (29 - 63)

Air Basin	Cardiopulmonary mortality	Hospitalizations for cardiovascular illness	Hospitalizations for respiratory illness	ER visits
San Francisco Bay	222 (173 - 272)	36 (0 - 70)	42 (10 - 75)	119 (75 - 163)
San Joaquin Valley	399 (312 - 487)	50 (0 - 98)	60 (14 - 106)	141 (89 - 193)
South Central Coast	33 (25 - 40)	5 (0 - 10)	6 (1 - 11)	14 (9 - 19)
South Coast	1528 (1195 - 1869)	262 (0 - 514)	313 (73 - 553)	767 (486 - 1050)
<b>Statewide*</b>	<b>2,526</b> <b>(1,974 – 3,090)</b>	<b>401</b> <b>(0 – 786)</b>	<b>478</b> <b>(112 – 844)</b>	<b>1,177</b> <b>(745 – 1,611)</b>

**Table 2: Statewide Valuation from Avoided Health Outcomes (Million 2021\$)**

Year	Avoided cardiopulmonary mortalities	Avoided hospitalizations for cardiovascular illness	Avoided hospitalizations for respiratory illness	Avoided ER visits	Annual total valuation
2024	8	1	1	4	\$87.53
2025	11	1	2	5	\$111.27
2026	14	2	2	7	\$150.62
2027	20	3	3	10	\$212.93
2028	23	3	4	11	\$243.87
2029	27	4	5	13	\$287.61
2030	34	5	6	17	\$360.45
2031	42	6	7	20	\$441.82
2032	49	7	9	23	\$512.32
2033	55	8	10	26	\$572.06
2034	63	10	11	30	\$658.05
2035	73	11	14	35	\$767.81
2036	81	13	15	38	\$848.74
2037	90	14	17	43	\$946.20
2038	100	16	19	47	\$1,051.12
2039	111	18	21	52	\$1,164.60
2040	120	19	23	56	\$1,259.02
2041	130	21	25	61	\$1,366.02
2042	142	23	27	66	\$1,487.97
2043	147	24	28	68	\$1,543.27
2044	153	25	29	71	\$1,600.14
2045	158	26	30	73	\$1,657.26
2046	164	27	32	75	\$1,715.82
2047	169	28	33	78	\$1,773.71
2048	175	29	34	80	\$1,831.85
2049	181	30	35	83	\$1,890.84
2050	183	30	36	84	\$1,918.64

Year	Avoided cardiopulmonary mortalities	Avoided hospitalizations for cardiovascular illness	Avoided hospitalizations for respiratory illness	Avoided ER visits	Annual total valuation
Total	2,526	401	478	1,177	\$26,461.51

## IV. Cost Analysis

This section provides an updated cost analysis of the proposed ACF regulation. This section only lists changes since the release of the Staff Report. For more information on the core assumptions used in this cost analysis, see Chapter X of the Staff Report.

### A. Updates to the Cost Modelling

#### 1. Incorporation of the Inflation Reduction Act

On August 16, 2022, President Joe Biden signed the Inflation Reduction Act of 2022 (IRA). This landmark piece of federal legislation establishes several provisions which will reduce costs of medium- and heavy-duty ZEVs and accelerate the ZEV market. Some of the most significant provisions include tax credits of up to \$40,000 per ZEV and 30 percent for alternative fuel vehicles infrastructure, \$3 billion dollars to convert the Postal Service fleet to zero-emissions, up to \$45/kWh for the production of batteries in the US, \$3 billion in grants and \$20 billion in loans to support zero-emission manufacturing in the US. These provisions encourage significant investments in ZEV manufacturing and accelerates ZEVs into the market. The fleet-focused provisions improve the total cost of ownership and lowers upfront cost for vehicle as well as infrastructure.

For the purpose of this analysis, two specific provisions are now modeled: the Qualified Commercial Clean Vehicle tax credit for vehicles and the Alternative Fuel Vehicle Refueling Property Tax Credit applicable to electric vehicle supply equipment (EVSE). Other provisions within the IRA are expected to potentially reduce costs associated with a widespread ZEV transition further but are unable to be quantified at this time. As a result, this analysis conservatively underestimates the impact of the IRA.

Staff’s analysis estimates commercial fleets will receive \$2.3 billion in additional cost savings due to the IRA’s available tax credits. This is in addition to estimated \$2.0 billion that staff projects would come to California under the Advanced Clean Trucks regulation.

#### a) Qualified Commercial Clean Vehicle Credit

The Qualified Commercial Clean Vehicle Credit is available for qualifying ZEVs purchased before December 31, 2032. Because this is a tax credit, it does not apply to public agencies. The tax credit is the lesser of:

- 30 percent of the ZEV’s total cost
- The incremental cost of the ZEV
- For vehicles with a gross vehicle weight rating above 14,000 lbs., \$40,000, otherwise \$7,500

This credit does not reduce the amount of sales tax or excise tax paid on the vehicle, nor does it affect any other values which depend on vehicle's base price such as registration fees.

### **b) Alternative Fuel Vehicle Refueling Property Tax Credit**

The Alternative Fuel Vehicle Refueling Property Tax Credit is available for ZEV infrastructure placed in service before December 31, 2032. Because this is a tax credit, it does not apply to public agencies. The credit is for up to 30 percent of the charger's cost, up to a limit of \$100,000 per site. This analysis assumes the amount of credit received per charger is the lesser of 30 percent of the charger cost or \$5,000 given that high power chargers will quickly run into the per site limit.

## **2. Updated Fuel Costs**

The California Energy Commission (CEC) published updated Transportation Fuel Demand Forecasts on January 5, 2023.<sup>3</sup> Staff have updated the fuel costs for gasoline, diesel, natural gas, electricity, and hydrogen to reflect the updated forecast.

Based on these updated projections, the average 2024-2050 fuel cost for each fuel has changed by the following:

- Diesel: 10.0 percent higher
- Gasoline: 10.3 percent higher
- Natural gas: 1.2 percent higher
- Electricity: 10.8 percent lower
- Hydrogen: 8.1 percent higher

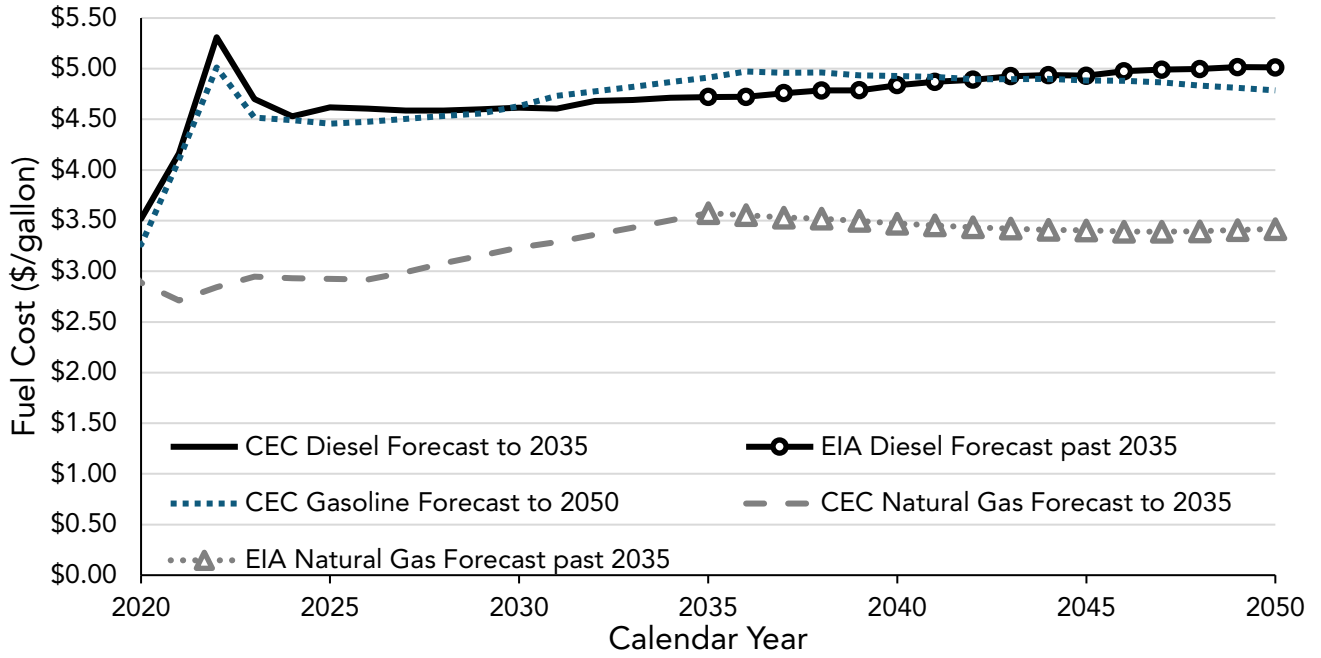
These updated values have changed the cumulative cost of the regulation from 2024-2050 by -\$21.5 billion representing a decrease to the cost of the regulation. Figure 4, Figure 5, and Figure 6 display the updated fuel price projections.

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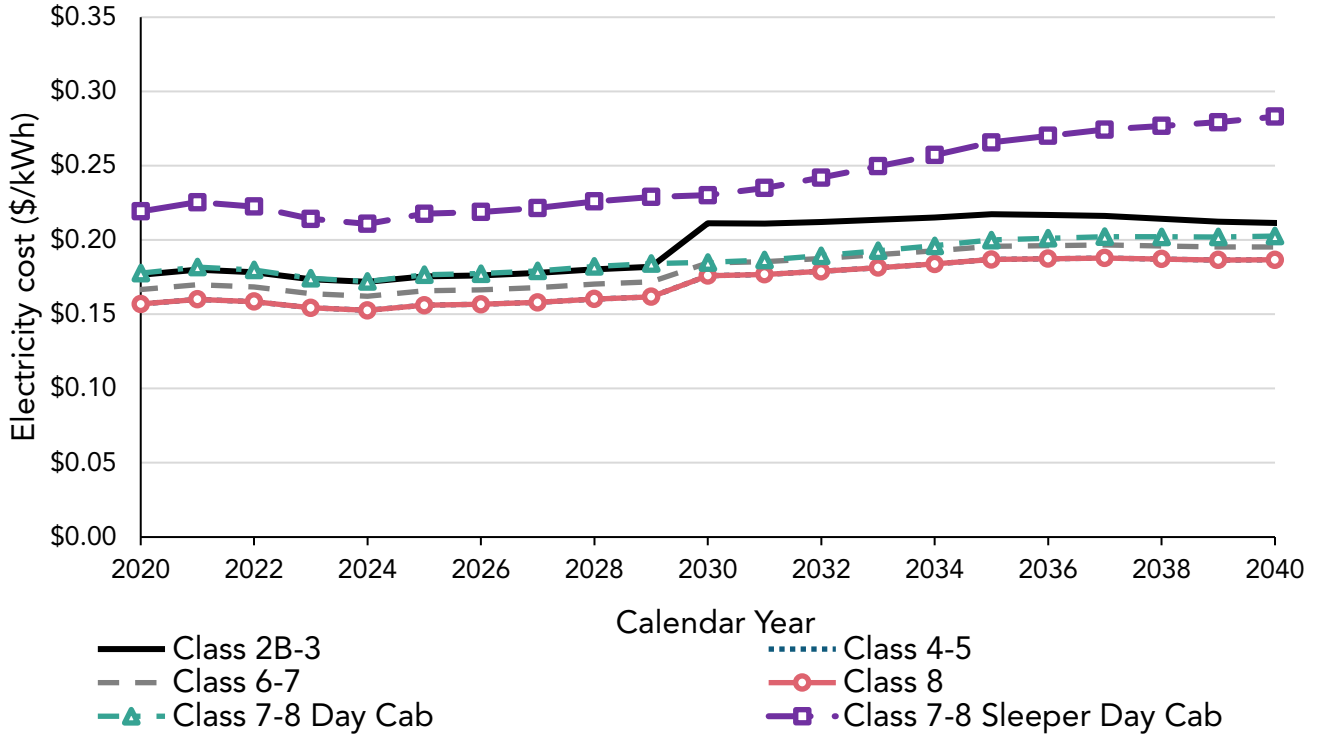
<sup>3</sup> California Energy Commission, Transportation Fuel Price Forecasts, 2023.



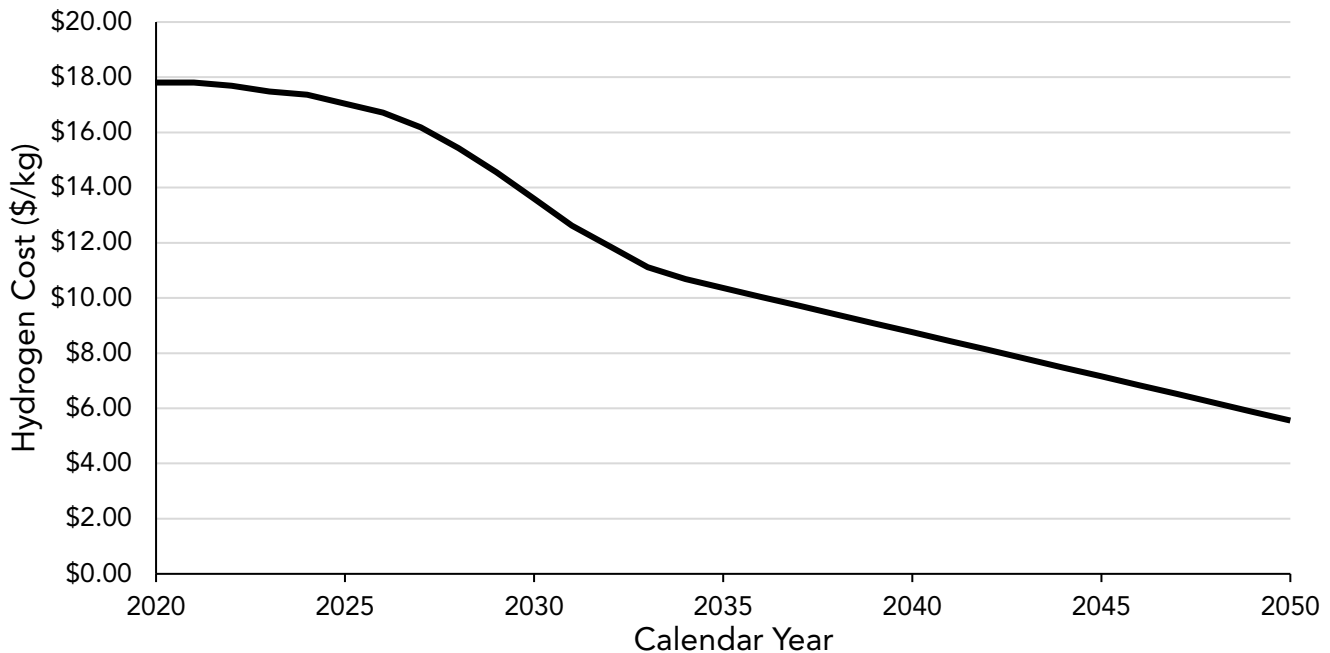
**Figure 4: Gasoline, Diesel, and Natural Gas Price Forecasts**



**Figure 5: Electricity Price Forecasts**



**Figure 6: Hydrogen Fuel Price Forecasts**



### **3. Corrections to Cost Modelling**

The following corrections were made to the cost model:

- Vehicle costs: Vehicle costs for the 2026 calendar year were incorrectly calculated, this error was corrected. This correction has changed the cost of the regulation by  $-\$0.11$  billion representing a decrease to the cost of the regulation.
- Vehicle costs: The assumed component cost for hydrogen fuel cell storage remained flat from 2021 to 2035 instead of declining linearly. This error was corrected. This correction has changed the cost of the regulation by  $-\$0.20$  billion representing a decrease to the cost of the regulation.
- Infrastructure costs: The cost of Class 2b-3 and Class 4-5 chargers listed in the table "Charger Power Ratings and Infrastructure Costs Per Vehicle" was incorrectly stated to be \$5,000 instead referenced value of \$2,800. The cost was correctly modeled in the cost model so there is no impact as a result of this change.
- Infrastructure costs and maintenance bay upgrades: Costs for EVSE, infrastructure upgrades, and maintenance bay upgrades were incorrectly calculated in 2048-2050. This error was corrected. This correction has changed the cost of the regulation by \$1.1 billion representing an increase to the cost of the regulation.
- Registration fees: In the Staff Report, staff modeled that all vehicles paid a Transportation Improvement Fee of \$171 for vehicles with a cost between \$35,000 and \$60,000 and \$192 for vehicles with a cost above \$60,000. This fee is only applicable for vehicles with an unladen weight below 10,000 lb. Staff have updated the modelling to only include this fee for Class 2b-5 vehicles. This correction has changed the cost of the regulation by  $-\$0.001$  billion representing a decrease to the cost of the regulation.

- Heavy-duty inspection and maintenance costs: The HD I/M regulation requires regulated vehicles to pay an annual compliance fee of \$30 which does not apply to ZEVs. This additional cost was not included in the Modified Baseline appendix to the ISOR and has now been modeled. This correction has changed the cost of the regulation by -\$0.11 billion representing a decrease to the cost of the regulation.

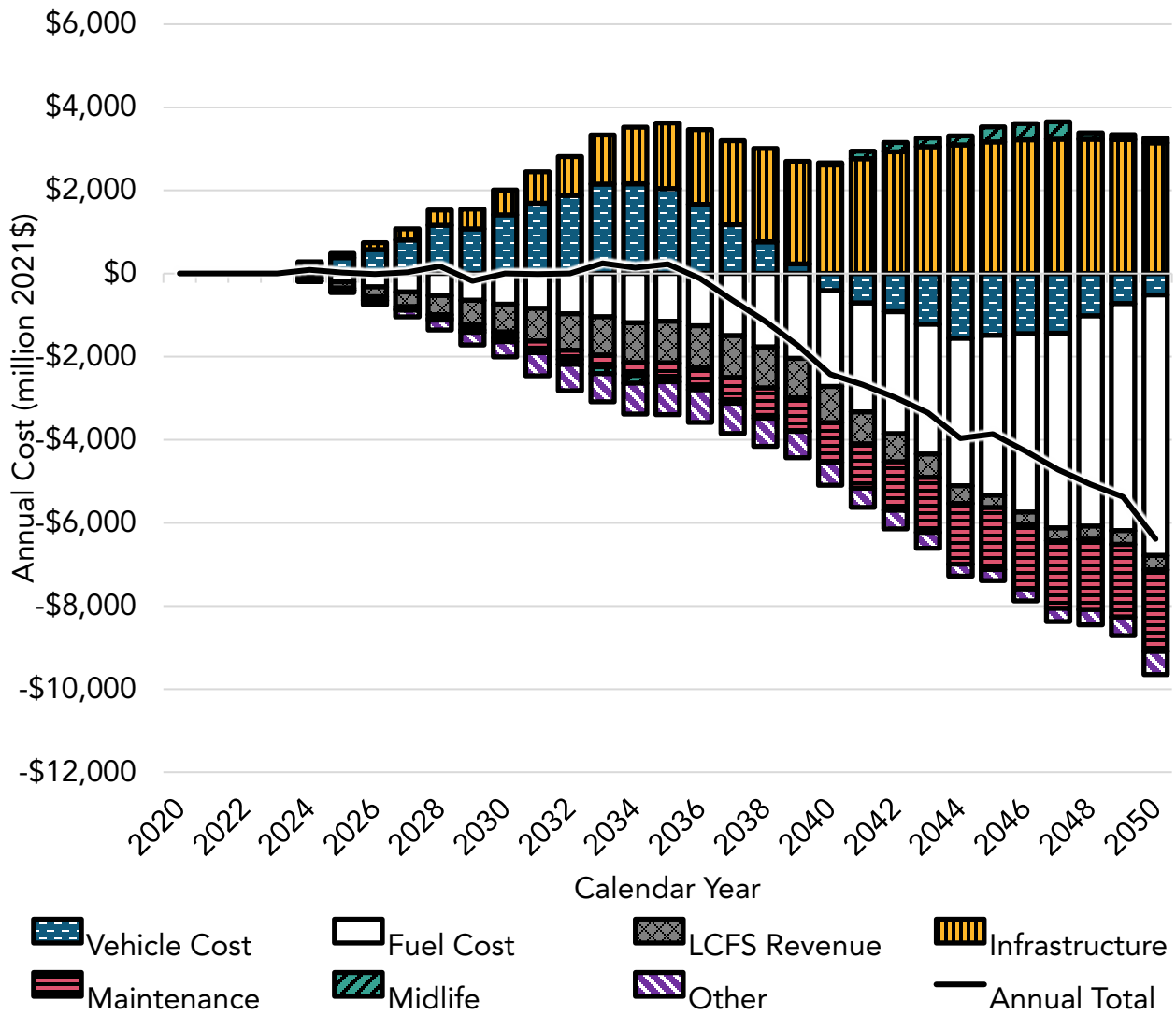
## B. Total Cost

The proposed ACF regulation would increase the number of medium- and heavy-duty ZEVs purchased in California relative to the Adjusted Legal Baseline scenario. This means that all costs would be above and beyond the costs already expected with the Advanced Clean Trucks regulation. The increased ZEVs sales have higher upfront capital costs initially for the vehicle and infrastructure investments, but lower operating costs over time resulting in net savings for truck transportation in California. When assuming all costs are borne by fleets operating in California the proposed regulation results in a net cost of -\$48.0 billion between 2020 and 2050 compared to the Legal Baseline scenario. This represents a substantial net decrease in costs and does not include indirect health cost-savings. In Figure 7, the cost components are grouped as shown in Table 3. Figure 7 and Table 4 illustrates the incremental difference in upfront and operational costs, referred to as the total cost of ownership, between the proposed regulation and the Legal Baseline scenario. Note that the incremental cost increases and decreases are mainly due to the number of ZEVs purchased in a given time frame, the actual incremental cost of ZEVs is declining steadily over this timeframe.

**Table 3: Summarized Cost Items**

<b>Cost Category</b>	<b>Components</b>
Vehicle Cost	Vehicle Cost, Sales Tax, Federal Excise Tax, Residual Values, IRA Qualified Vehicle Credit
Fuel Cost	Gasoline, Diesel, Electricity, Hydrogen Fuel Cost, Fuel Taxes
Low Carbon Fuel Standard (LCFS) Revenue	LCFS Revenue
Infrastructure	Charger Costs, Infrastructure Upgrades, Charger Maintenance, IRA Alternative Fuel Vehicle Property Tax Credit
Maintenance	Vehicle Maintenance Costs, Maintenance Bay Upgrades
Midlife	Midlife Costs
Other	Diesel Exhaust Fluid Consumption, Registration Fees, Depreciation, Insurance, Transitional Costs, Reporting Costs

**Figure 7: Total Estimated Statewide Incremental Total Cost of Ownership of the Proposed Regulation Relative to the Legal Baseline Scenario (million 2021\$)**



**Table 4: Statewide Incremental Total Cost of Ownership of the Proposed ACF Regulation Relative to Legal Baseline Scenario (million 2021\$)**

Year	Vehicle Price	Sales and Excise Tax	EVSE & Infrastructure Installation	Maintenance Bay Upgrades	Fuel Cost	DEF Consumption	LCFS Revenue	Maintenance Cost	Midlife Costs	Registration Fees	Transitional Costs	Residual Values	Depreciation	Insurance Cost	HD /M Costs	Reporting Cost	Total*
2024	\$84	\$130	\$43	\$17	-\$95	-\$1	-\$81	-\$26	-\$4	\$2	\$43	\$0	-\$34	\$12	-\$1	\$3	\$90
2025	\$338	\$128	\$98	\$11	-\$201	-\$3	-\$147	-\$57	-\$9	-\$3	\$29	-\$81	-\$93	\$18	-\$3	\$3	\$26
2026	\$472	\$168	\$165	\$16	-\$322	-\$6	-\$240	-\$90	-\$17	-\$10	\$38	-\$62	-\$147	\$25	-\$4	\$3	-\$10
2027	\$761	\$268	\$261	\$80	-\$442	-\$10	-\$353	-\$140	-\$29	-\$21	\$59	-\$219	-\$217	\$36	-\$7	\$3	\$36
2028	\$1,060	\$199	\$368	\$89	-\$530	-\$13	-\$461	-\$179	-\$39	-\$32	\$59	-\$96	-\$286	\$39	-\$9	\$3	\$180
2029	\$1,108	\$312	\$474	\$85	-\$646	-\$18	-\$575	-\$219	-\$61	-\$45	\$57	-\$346	-\$341	\$50	-\$11	\$3	-\$166
2030	\$1,406	\$393	\$600	\$146	-\$738	-\$25	-\$673	-\$285	-\$87	-\$62	\$80	-\$387	-\$417	\$63	-\$15	\$4	\$15
2031	\$1,755	\$437	\$760	\$181	-\$843	-\$32	-\$783	-\$350	-\$112	-\$81	\$0	-\$501	-\$502	\$75	-\$18	\$4	\$4
2032	\$1,984	\$361	\$938	\$187	-\$972	-\$38	-\$872	-\$405	-\$124	-\$99	\$0	-\$465	-\$558	\$80	-\$21	\$4	\$16
2033	\$2,283	\$252	\$1,175	\$175	-\$1,044	-\$43	-\$922	-\$449	-\$170	-\$116	\$0	-\$377	-\$573	\$77	-\$25	\$4	\$267
2034	\$2,341	\$359	\$1,361	\$222	-\$1,183	-\$51	-\$963	-\$529	-\$188	-\$144	\$0	-\$542	-\$595	\$80	-\$29	\$4	\$166
2035	\$2,244	\$316	\$1,577	\$266	-\$1,150	-\$59	-\$1,004	-\$587	-\$129	-\$168	\$0	-\$516	-\$616	\$79	-\$33	\$4	\$254
2036	\$1,718	\$93	\$1,796	\$302	-\$1,257	-\$67	-\$1,016	-\$709	-\$120	-\$196	\$0	-\$143	-\$550	\$62	-\$36	\$4	-\$86
2037	\$1,241	\$64	\$2,026	\$323	-\$1,497	-\$75	-\$1,009	-\$850	-\$92	-\$229	\$0	-\$130	-\$431	\$48	-\$40	\$4	-\$611
2038	\$862	\$49	\$2,244	\$318	-\$1,766	-\$84	-\$986	-\$986	-\$62	-\$264	\$0	-\$146	-\$325	\$35	-\$43	\$4	-\$1,111
2039	\$399	\$64	\$2,472	\$337	-\$2,044	-\$94	-\$950	-\$1,127	-\$11	-\$299	\$0	-\$234	-\$228	\$27	-\$47	\$4	-\$1,687
2040	-\$333	-\$179	\$2,614	\$279	-\$2,303	-\$102	-\$872	-\$1,233	\$52	-\$325	\$0	\$97	-\$82	\$7	-\$51	\$4	-\$2,378
2041	-\$574	-\$102	\$2,765	\$299	-\$2,616	-\$110	-\$776	-\$1,358	\$184	-\$357	\$0	-\$37	\$61	-\$6	-\$54	\$4	-\$2,625
2042	-\$700	-\$32	\$2,934	\$323	-\$2,934	-\$120	-\$677	-\$1,488	\$224	-\$388	\$0	-\$190	\$126	-\$13	-\$58	\$4	-\$2,934
2043	-\$1,167	-\$357	\$3,053	\$209	-\$3,123	-\$124	-\$558	-\$1,535	\$207	-\$398	\$0	\$300	\$228	-\$32	-\$60	\$4	-\$3,297
2044	-\$1,536	-\$249	\$3,098	\$166	-\$3,544	-\$127	-\$428	-\$1,624	\$218	-\$415	\$0	\$222	\$353	-\$42	-\$62	\$4	-\$3,909
2045	-\$1,460	-\$173	\$3,171	\$210	-\$3,850	-\$131	-\$297	-\$1,698	\$360	-\$427	\$0	\$143	\$396	-\$44	-\$64	\$4	-\$3,800
2046	-\$1,406	-\$105	\$3,218	\$209	-\$4,287	-\$135	-\$305	-\$1,759	\$388	-\$436	\$0	\$59	\$394	-\$42	-\$67	\$0	-\$4,207
2047	-\$1,398	-\$73	\$3,231	\$193	-\$4,682	-\$140	-\$313	-\$1,817	\$422	-\$444	\$0	\$31	\$378	-\$40	-\$70	\$0	-\$4,652
2048	-\$996	-\$58	\$3,232	\$183	-\$5,057	-\$144	-\$321	-\$1,870	\$152	-\$452	\$0	\$34	\$339	-\$37	-\$72	\$0	-\$4,996
2049	-\$718	-\$48	\$3,226	\$172	-\$5,469	-\$148	-\$330	-\$1,920	\$113	-\$460	\$0	\$44	\$273	-\$35	-\$75	\$0	-\$5,299
2050	-\$534	-\$40	\$3,147	\$110	-\$6,272	-\$159	-\$343	-\$2,078	\$119	-\$496	\$0	\$59	\$212	-\$33	-\$79	\$0	-\$6,309
<b>Total*</b>	<b>\$9,235</b>	<b>\$2,177</b>	<b>\$50,047</b>	<b>\$5,106</b>	<b>-\$58,867</b>	<b>-\$2,058</b>	<b>-\$16,252</b>	<b>-\$25,369</b>	<b>\$1,187</b>	<b>-\$6,364</b>	<b>\$365</b>	<b>-\$3,482</b>	<b>-\$3,234</b>	<b>\$489</b>	<b>-\$1,054</b>	<b>\$83</b>	<b>-\$47,992</b>

\*Note: Totals may differ due to rounding.

### C. Cost-Effectiveness

Table 5 shows the updated net cost and benefits to California for the proposed ACF Regulation and Alternative 1 and 2 from the Staff Report when compared to the Legal Baseline. Changes to costs due to tax and fees are removed from benefits as these savings to fleets are a cost to government, resulting in no net benefit. The benefit-cost ratio is then calculated by taking the ratio of total benefit and total cost.

**Table 5: Total Statewide Benefit and Cost Comparison to Adjusted Legal Baseline of the Staff Proposal, Alternative 1 (Combustion) and Alternative 2 (Acceleration) (billion \$2021)**

-	Total Costs	Cost-Savings (benefit)	Health Benefits	Tax and Fee Revenue	Total Benefit*	Net Benefit**	Benefit: Cost Ratio
<b>Proposal</b>	\$68.7	\$116.7	\$26.5	-\$36.6	\$106.6	\$37.9	1.6
<b>Alternative 1 (Combustion)</b>	\$5.9	\$3.4	\$4.3	\$0.9	\$8.6	\$2.7	1.5
<b>Alt 2 (Acceleration)</b>	\$107.1	\$172.1	\$38.2	-\$61.7	\$148.6	\$41.5	1.4

\*Total benefit is the sum of cost savings, health benefits, and tax and fee revenue.

\*\*Net benefit is the total benefit minus the total costs.