

Benefits of adopting key medium- and heavy-duty vehicle emissions control policies in U.S. states

Medium- and heavy-duty (M/HD) vehicles, including trucks and buses, emit climate-warming greenhouse gases (GHGs) as well as air pollutants that are harmful to human health. In July 2020, fifteen states and the District of Columbia, together representing roughly 35% of the U.S. M/HD market, signed a Memorandum of Understanding (MOU) to work together on a transition to M/HD zero emission vehicles (ZEVs).¹ Zero-emission vehicles are powered by electric motors and not internal combustion engines. The signatories of this Multi-State MOU share a goal of 30% M/HD ZEV sales by 2030 and 100% ZEV sales no later than 2050. Many of these same states are pursuing new engine standards for diesel engines to address inequities in exposure to nitrogen oxides and ozone pollution. The combined efforts of these U.S. states are accelerating the national transition toward the cleanest combustion engines and zero-emission M/HD vehicles.

A major step these states and DC could take is to adopt a series of key M/HD regulations. California has two regulations that are cornerstones in the state's effort to reduce emissions from heavy-duty vehicles and promote ZEVs: the Advanced Clean Trucks (ACT) rule, which requires the sale of at least 30% zero-emission trucks by 2030, and the Heavy-Duty Vehicle Omnibus rule, which requires a 90% reduction in NO_x emissions from model year 2027 engines. States could go even further and adopt a 100% ZEV sales requirement, as the New York State legislature has done or the California Air Resources Board proposes to do under a new Advanced Clean Fleets rule.

The adoption of these measures would dramatically reduce GHG and air pollution emissions; modeling by Sonoma Technology, Inc. (STI) demonstrates by how much. Table 1 shows expected cumulative reductions from 2020 to 2050 of key air pollutants—nitrous oxides (NO_x) and fine particulate matter (PM_{2.5})—as well as GHGs,

¹ The signatories are California, Colorado, Connecticut, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, Washington, and the District of Columbia. "Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding," (2020, July 14), <https://www.nescaum.org/documents/multistate-truck-zev-governors-mou-20200714.pdf>. Additional signatories since 2021 are Virginia, Nevada, and Quebec. STI did not model results for California or Hawaii, but did model results for non-signatories including Delaware, Illinois and New Mexico.

measured along the whole lifecycle of M/HD vehicles (WTW CO₂e), of key policies yet to be adopted in each state. These states and DC could potentially save substantial amounts of air pollutant and GHG emissions from M/HD vehicles compared to no further policy action.

Table 1. Emissions reduction potential of adopting remaining key M/HD policies in U.S. states

State	2020-2050		
	NO _x (U.S. tons)	PM _{2.5} (U.S. tons)	WTW CO ₂ e (million metric tons)
Colorado	119,263	967	77.06
Connecticut	25,148	194	20.21
D.C.	5,276	50	2.71
Delaware	22,519	157	16.37
Illinois	252,240	1,885	187.77
Maine	34,786	266	28.59
Maryland	120,920	926	60.33
Nevada	46,991	328	19.69
New Jersey	60,490	373	26.60
New Mexico	99,288	671	74.14
New York	72,840	-	9.96
North Carolina	192,628	1,389	149.48
Pennsylvania	282,147	2,079	129.68
Rhode Island	15,900	119	11.49
Vermont	9,880	74	8.08
Virginia	130,507	884	106.78
Washington	61,030	354	25.57

Detailed estimates by state, year, rule, vehicle category, and pollutant are posted at <https://theicct.org/benefits-ca-multi-state-reg-data/>.

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Contact: Ray Minjares, ray@theicct.org

www.theicct.org

communications@theicct.org

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