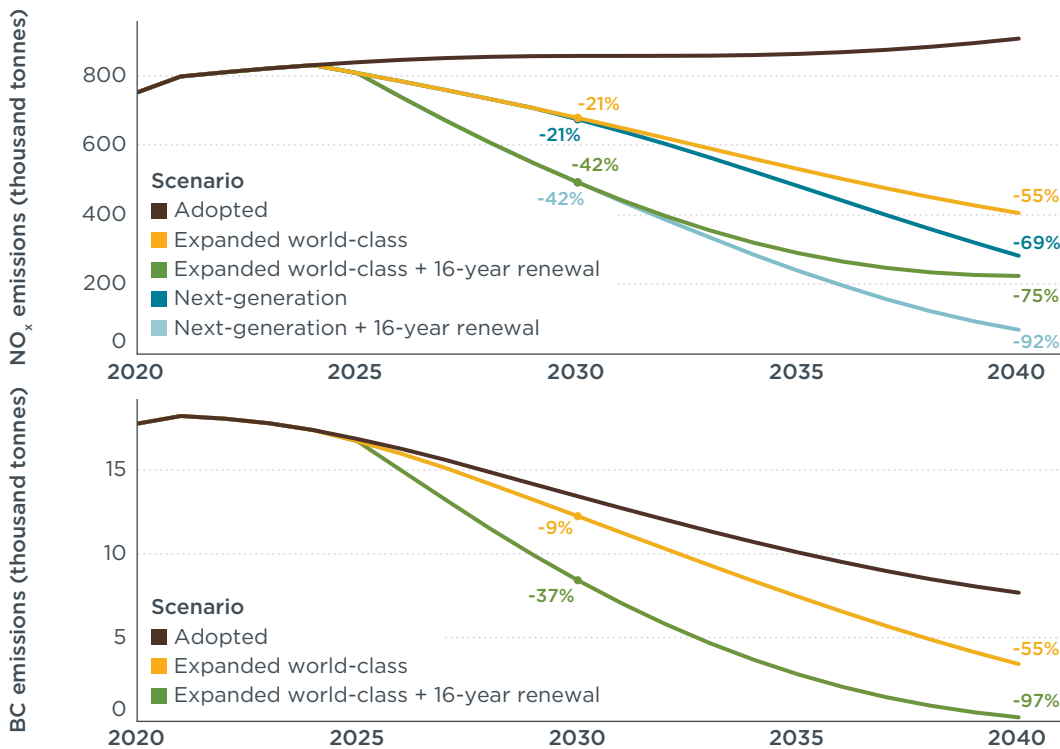


# Climate and health benefits of policies to address emissions from heavy-duty vehicles: Indonesia

## BACKGROUND

Among transportation subsectors, on-road diesel vehicles are the leading contributor to air pollution and associated disease burdens. In addition to the impact of emissions on air quality and public health, black carbon from diesel engine exhaust severely affects the climate as the particles produce significant near-term climate warming. A new ICCT paper quantifies the health and climate benefits of key policies for reducing air pollutant emissions from heavy-duty vehicles (HDVs) in the G20 economies. Building off this research, the benefits for Indonesia were analyzed under five scenarios:

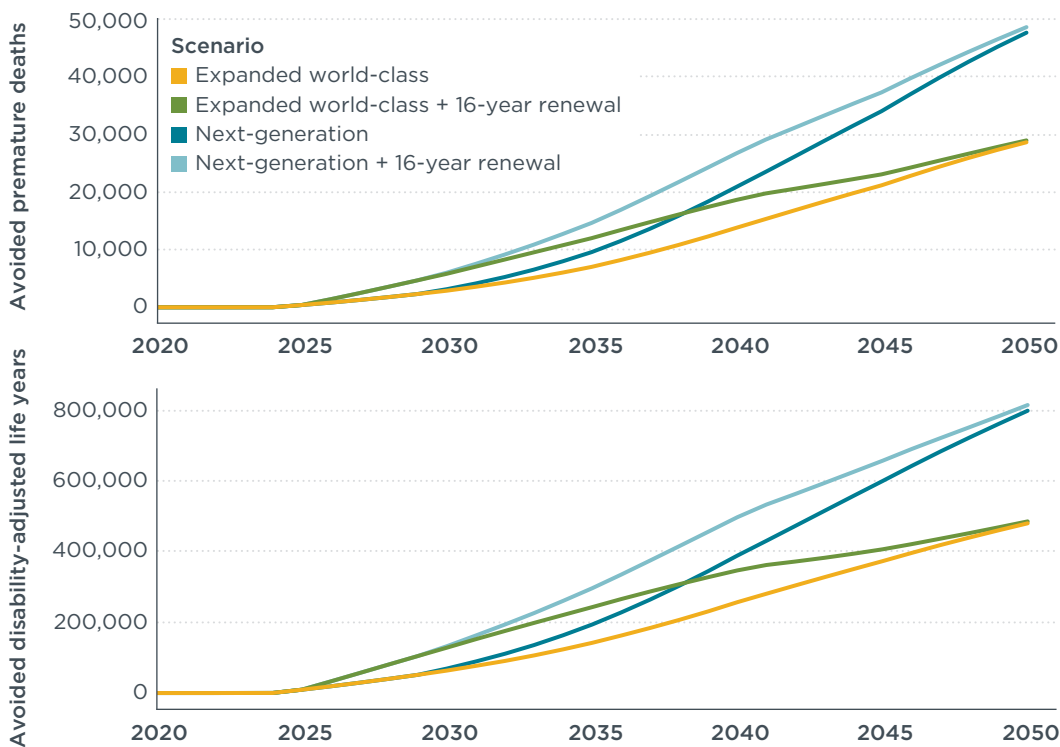
- » **Adopted:** Policies adopted by December 2020, including Euro IV-equivalent standards by 2022.
- » **Expanded world-class:** In addition to adopted policies, we assume that Indonesia will implement Euro VI-equivalent standards in 2025.
- » **Expanded world-class and 16-year accelerated fleet renewal:** Accelerated fleet renewal policies are added to the **expanded world-class** scenario, resulting in 100% of in-use HDVs meeting Euro VI equivalents and next-generation standards 16 years after they are applied to new vehicles. Pre-Euro VI-equivalent vehicles are assumed to be gradually replaced over this time period.
- » **Next-generation standards:** Building upon the **expanded world-class** scenario, Indonesia would implement next-generation emission standards in 2030, with 90% reduction in NO<sub>x</sub> emissions rate from Euro VI-equivalent levels.
- » **Next-generation and 16-year accelerated fleet renewal:** Building upon the **next-generation** scenario, 100% of in-use HDVs would meet Euro VI equivalents and next-generation standards 16 years after they are applied to new vehicles.



**Figure 1.** Diesel HDV exhaust NO<sub>x</sub> and black carbon emissions from 2020 to 2040 in Indonesia. Data labels show the percent change in emissions compared with adopted policies in 2030 and 2040.

## KEY FINDINGS

- » Avoided diesel HDV exhaust NO<sub>x</sub> emissions in 2040 compared with adopted policies are projected to be 500 thousand tonnes (55% reduction) in the expanded world-class scenario, 680 thousand tonnes (75% reduction) in the expanded world-class plus 16-year renewal scenario, and 840 thousand tonnes (92% reduction) in the next-generation plus 16-year renewal scenario.
- » Avoided diesel HDV exhaust BC emissions in 2040 compared with adopted policies are projected to be 4.3 thousand tonnes (55% reduction) in the expanded world-class scenario, and 7.4 thousand tonnes (97% reduction) in the expanded world-class plus 16-year renewal scenario.
- » Cumulative avoided diesel HDV exhaust NO<sub>x</sub> emissions from 2020 to 2050 compared with adopted policies are projected to 11,000 thousand tonnes in the expanded world-class scenario, 14,000 thousand tonnes in the expanded world-class plus 16-year renewal scenario and the next-generation standards scenario, and 18,000 thousand tonnes in the next-generation plus 16-year renewal scenario.
- » Cumulative avoided diesel HDV exhaust black carbon emissions from 2020 to 2050 compared with adopted policies are projected to 91 thousand tonnes in the expanded world-class scenario and 156 thousand tonnes in the expanded world-class plus 16-year renewal scenario.
- » Cumulative mitigation potential (GWP20) for diesel HDV exhaust black carbon, CH<sub>4</sub> and N<sub>2</sub>O emissions from 2020 to 2040 compared with adopted policies is projected to be 266 million tonnes CO<sub>2</sub>e in the expanded world-class plus 16-year renewal scenario, accounting for 11% of the total mitigation potential among G20 economies.



**Figure 2.** Avoided PM<sub>2.5</sub> and ozone deaths and disability-adjusted life years attributable to diesel HDV emissions compared with adopted policies, 2020-2050.

- » Cumulative avoided PM<sub>2.5</sub> and ozone premature death attributable to diesel HDV emissions from 2020 to 2050 compared with adopted policies are projected to be 310,800 in the expanded world-class scenario, 386,800 in the expanded world-class plus 16-year renewal scenario, 480,200 in the next-generation standards scenario, and 570,300 in the next-generation plus 16-year renewal scenario.
- » Cumulative avoided PM<sub>2.5</sub> and ozone disability-adjusted life years attributable to diesel HDV emissions from 2020 to 2050 compared with adopted policies are projected to be 5.6 million in the expanded world-class scenario, 7.1 million in the expanded world-class plus 16-year renewal scenario, 8.6 million in the next-generation standards scenario, and 10.4 million in the next-generation plus 16-year renewal scenario.
- » The valuation of cumulative avoided health damages (in 2020 U.S. dollars, 3% social discount rate) from PM<sub>2.5</sub> and ozone mortality attributable to diesel HDV emissions from 2020 to 2050 compared with adopted policies are projected to be \$230 billion in the expanded world-class scenario, \$286 billion in the expanded world-class plus 16-year renewal scenario, \$355 billion in the next-generation standards scenario, and \$422 billion in the next-generation plus 16-year renewal scenario.

## PUBLICATION DETAILS

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