Union of Concerned Scientists

FACT SHEET

Electric Trucks and Buses

Solutions for Climate Change and Air Pollution

HIGHLIGHTS

From garbage trucks to transit buses to "big rigs," heavy-duty vehicles are a major source of air pollution. Emissions from these vehicles have been linked to adverse health impacts and are a significant contributor to global warming. For decades, trucks and buses have been powered by fossil fuels, but advances in clean technology are enabling these vehicles to shift to zero-emissions fuel sources. Battery- and fuel cell–electric trucks and buses are already being deployed in US cities, showing that these vehicles can provide new opportunities to clean up the air and lower global warming emissions in communities across the country.

Heavy-duty vehicles play a major role in our everyday lives. Trucks haul goods from manufacturers to stores, pick up our trash, and deliver packages, while buses transport thousands of people around cities. But these vehicles also play a major role in environmental damage. While they comprise only about 5 percent of all vehicles on the road, they generate more than 25 percent of global warming emissions from US vehicles (FWHA 2017; OTAQ 2017) as well as significant amounts of air pollution. As the United States moves more and more freight each year, the challenge of reducing emissions will continue to grow.

Pollutants from vehicle exhaust (see the box, p. 2) can affect more than just your lungs; indeed, it poses health risks at every stage of life, and can even cause premature death (Chandler, Espino, and O'Dea 2016). Global warming is leading to more frequent and intense heat waves—which also affects people's health (especially children and the elderly)—as well as sea level rise, flooding, and drought that can devastate local communities.

People in low-income communities and communities of color are disproportionately affected by this pollution. They are exposed to higher levels of air pollution, as these communities are often located near freight centers and heavily traveled roadways, and can lack access to the resources to adapt to—or move away from—climate-related damage (Chandler, Espino, and O'Dea 2016).

CA DOT

Children play soccer near a shipping port in California. Communities of color and low-income communities are often located near freight hubs and busy roads, making them more vulnerable to the health impacts of vehicle pollution.

Addressing heavy-duty vehicle pollution is critical for improving air quality and reducing global warming emissions in communities around the country. Continuing to lower emissions from fossil fuel–powered trucks is an important first step, but electric trucks and buses offer a new opportunity to eliminate tailpipe pollution entirely, and increase the development of clean, renewable electricity and hydrogen fuel cells.

The Clean Air Benefits of Electric Trucks and Buses

Just as electric cars are helping to reduce pollution from passenger vehicles, trucks and buses powered by batteries or fuel cells can do the same for the commercial sector. In addition to emitting no harmful tailpipe pollution, electric trucks and buses have significantly lower global warming emissions than vehicles powered by fossil fuels (see the figure, p. 3). Indeed, a battery-electric bus on today's electricity grid is the lowest-carbon option in *every part of the country* (O'Dea 2018).

Battery- and fuel cell–electric trucks and buses, especially transit buses, are already operating in cities across the United States, and these fleets continue to expand as new models become available. A growing number of cities have committed to 100 percent zero-emissions transit buses in their fleets—including New York and Los Angeles, which represent the two largest bus fleets in the country.

> ***Addressing heavy-duty vehicle pollution is critical for improving air quality and reducing global warming emissions in communities around the country.***

A Healthier Future Is on Its Way

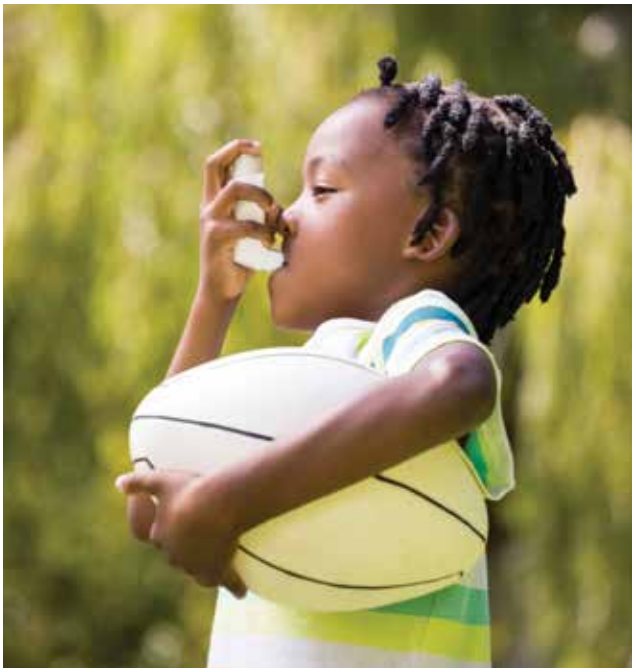
To accelerate the transition to a zero-emissions transportation system, we need the right policies and investments from federal, state, and municipal governments. These include setting targets for electric truck and bus adoption, enacting

What's in Tailpipe Exhaust?

Nitrogen Oxides (NO_x). Diesel-powered trucks are a major source of NO_x emissions. NO_x not only are dangerous on their own, causing lung irritation and weakening the body's defense against infections, but also react with other pollutants in the presence of sunlight to form ground-level ozone.

Ozone. Ozone high in the atmosphere protects us from harmful ultraviolet rays; at ground level it inflames and constricts airways, causing coughing and shortness of breath, aggravating asthma and other lung diseases, and making the lungs more susceptible to infection. Long term exposure can also lead to heart disease (Jerrett et al. 2013).

Particulate Matter (PM). High concentrations of PM make up the soot-filled plumes of exhaust we see from vehicle tailpipes. These microscopic particles can penetrate deep into the lungs, aggravating respiratory problems and posing serious threats to the immune system. Diesel PM from trucks and cars is estimated to account for half of all air pollution–related cancer risk in California (CARB 2016).



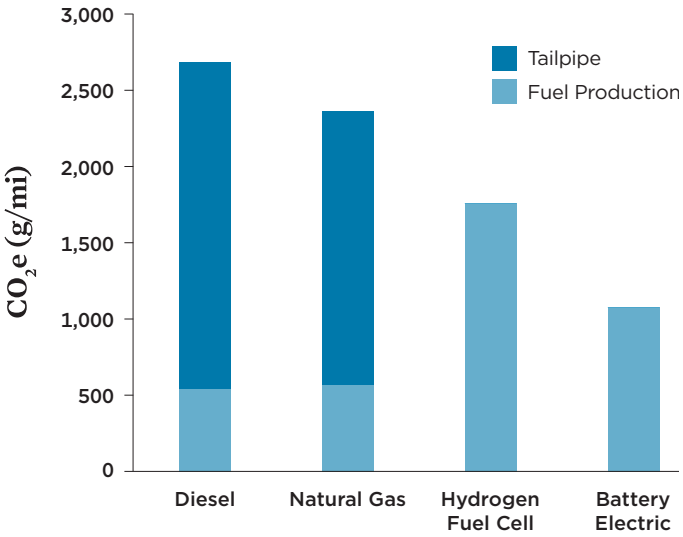
Wavebreakmedia/Shutterstock

Pollution from heavy-duty vehicles is linked to asthma, heart and lung disease, and other health impacts that affect people of all ages.

MJW15/Creative Commons (Wikimedia Commons)

Replacing older, inefficient trucks and buses with electric models—such as this bus in Washington, DC—can greatly reduce transportation-related emissions.

Reducing Global Warming Emissions by Switching to Electric Buses



Life cycle global warming emissions from battery and fuel cell electric buses are lower than diesel and natural gas buses everywhere in the country. These emissions savings will continue to grow as renewable energy comprises a larger percentage of electricity generation and hydrogen production.

Note: Comparison based on emissions from 40-foot transit buses. CO_2e stands for carbon dioxide equivalent. Fuel cell emissions based on hydrogen production from natural gas. Battery electric emissions based on the national electricity mix (generation-weighted).

standards for manufacturers to make more of these vehicles, and developing and funding incentive programs to help cities and companies achieve these goals. These policies and investments should also ensure that workers from underserved communities gain access to training and job opportunities, and that electric vehicle deployment is prioritized in the communities already breathing the dirtiest air.

> ***We need the right policies and investments from all levels of government to accelerate the transition to a zero-emissions transportation system.***

Together, we can minimize the long-term consequences of global warming in our communities while ensuring millions of people can breathe cleaner air today.

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