Household Products May Pollute the Air as Much as Your Car Does: Study

THURSDAY, Feb. 15, 2018 — Everyday products such as perfume, skin lotion, hair spray, deodorant, household cleaners and lawn pesticides are a top source of air pollution, as damaging to air quality as the exhaust from cars and trucks, a new report shows.

Consumer products containing compounds refined from petroleum all release small amounts of smog-producing particles into the air, the researchers explained.

Combined, these products now release as many volatile organic compounds (VOCs) into the atmosphere as vehicle emissions do.

“The use of these products emits VOCs in a magnitude that’s comparable to what comes out of the tailpipe of your car,” said study lead author Brian McDonald. He’s a researcher with the University of Colorado working in the U.S. National Oceanic and Atmospheric Administration’s (NOAA) Chemical Sciences Division.

Volatile organic compounds transform into smog-producing ozone when they react to nitrogen oxides in the air and the sun’s heat, according to the Environmental Protection Agency.

Consumer products are designed to release VOCs into the air, noted study team member Jessica Gilman, a research chemist with the NOAA’s Chemical Sciences Division.

“Many of the volatile chemical products we use every day are intended to simply evaporate,” Gilman said. “Think of using hand sanitizer in cold and flu season, scented products, or the time spent waiting for paint, ink and glue to dry. In all of these instances, we are waiting for these volatile chemical products to evaporate.”

In the report, a fresh assessment of air quality in Los Angeles using sophisticated new equipment determined that the amount of VOCs emitted by consumer and industrial products is actually two to three times greater than what had been previously estimated.

This finding could be surprising to some, given that people use about 15 times more fuel by weight than they do consumer products containing petroleum-based compounds, researchers said.

But as regulators have clamped down on transportation pollution — requiring more efficient cars and more tightly sealed gas pumps — consumer products have become a more prominent source of volatile organic compounds, the researchers explained.

“In a way, this is a ‘good news’ story,” McDonald said. “As we control some of the biggest [pollution] sources in the past, other sources are emerging in relative importance, such as the use of these everyday chemical products.”

Researchers first looked at the hydrocarbons in the Los Angeles air, which are the chief VOCs associated with diesel and gasoline, Gilman said.

“The ambient levels of these hydrocarbons have decreased by a factor of 50 over the last 50 years. That’s really surprising, since diesel and gasoline fuel use has actually tripled during that time,” Gilman said.

But the study team also found that levels of other less commonly measured VOC gases, such as ethanol and acetone, were both higher than expected and had been increasing during the same period of time, Gilman said.

That led researchers to start looking for the unique chemical fingerprints of solvents and compounds used in consumer products, Gilman said.

Previous EPA estimates held that about 75 percent of VOC emissions came from vehicle sources and about 25 percent from chemical products.

The new study puts the split closer to 50-50, showing that “everyday consumer choices can have a meaningful impact on urban air quality,” said research team member Christopher Cappa, a professor of civil and environmental engineering at the University of California, Davis.

“We can confidently say that emissions of these nontraditional sources will negatively impact urban air quality pretty much anywhere they are used in large quantities — that is, pretty much any city around the U.S., Europe or the world,” Cappa said.

The findings were published Feb. 16 in the journal *Science*.

Based on these findings, air quality models “must be adapted to capture the changing pattern of emissions,” Alastair Lewis, a professor of atmospheric chemistry at the University of York in England, wrote in an accompanying editorial.

Unfortunately, petroleum-derived compounds are in nearly all products one might find under their kitchen sink or in their garage, Gilman said.

Further research is needed to figure out exactly which VOCs are more active in smog formation, so they can be taken out of circulation, Cappa and McDonald said.

In the meantime, consumers and industries can help by using as little product as they can to get whatever job done, McDonald said. They can also choose unscented products.

More information

The California Air Resources Board has more about consumer products and air pollution.

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