

Want to save the planet? Try using less deodorant

Petroleum-based chemicals used in perfumes and other such products can cause as much air pollution as motor vehicles

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The deodorants, perfumes and soaps that keep us smelling good are fouling the air with a harmful type of pollution – at levels as high as emissions from today’s cars and trucks.

That’s the surprising finding of a study published last week in the journal *Science*. Researchers found that petroleum-based chemicals used in perfumes, paints and other consumer products can, taken together, emit as much air pollution in the form of volatile organic compounds, or VOCs, as motor vehicles do.

The VOCs interact with other particles in the air to create the building blocks of

smog, namely ozone, which can trigger asthma and permanently scar the lungs, and another type of pollution known as PM2.5, fine particles that are linked to heart attacks, strokes and lung cancer.

Smog is generally associated with cars, but since the 1970s regulators have pushed automakers to invest in technologies that have substantially reduced VOC emissions from automobiles. So the rising share of air pollution caused by things like pesticides and hair products is partly an effect of cars getting cleaner. But that breathing room has helped scientists see the invisible pollutants that arise from a spray of deodorant or a dollop of body lotion. The researchers said

their study was inspired by earlier measurements of VOCs in Los Angeles that showed concentrations of petroleum-based compounds at levels higher than could be predicted from fossil-fuel sources alone. Concentrations of ethanol, for example, were some five times higher than expected. And those levels were increasing over time.

“You can see these really rapid decreases in tailpipe emissions,” said Brian C. McDonald, a scientist at the Cooperative Institute for Research in Environmental Science at the University of Colorado, Boulder, who led the study. “It just made sense to start looking at other sources and seeing whether they could be growing in rela-

tive importance.”

Even though drivers can use gallons of gasoline each week, “It’s stored in an airtight tank, it’s burned for energy, and converted mostly to carbon dioxide,” said Jessica B. Gilman, a research chemist at the National Oceanic and Atmospheric Administration also involved in the study. Those carbon dioxide emissions are not smog-forming VOCs, though they are a major driver of human-caused climate change.

“But these VOCs that you use in everyday products – even though it may just be a teaspoon or a squirt or a spray – the majority of those kinds of compounds will ultimately end up in the atmosphere, where they can react and contribute to both

harmful ozone formation and small-particle formation,” Gilman said.

Forty per cent of the chemicals added to consumer products wind up in the air, the researchers found.

To make their calculations, the study’s authors constructed a computer model that simulated air quality in Los Angeles, weaving in data from the chemical composition of consumer goods and tailpipe emissions. Using the model, they could see the fingerprints of the chemical compounds coming from personal care products and also estimate how many VOCs from paints and finishes inside buildings were being released to the outside world. Roughly half of the VOCs in Los Angeles air could

be attributed to consumer products, the authors found.

Concerned consumers may be tempted to turn to “natural” products, though the researchers say that isn’t a cure-all. For example, one class of compounds called terpenes gives many cleaning products a pine or citrus smell. These terpenes can be produced synthetically, or naturally from oranges.

“But whether it’s synthetic or natural, once it gets into the atmosphere it’s incredibly reactive,” Gilman said.

Galina Churkina, a research fellow at the Yale School of Forestry and Environmental Studies who was not involved in the study, noted that the study did not consider emissions related to biological sources like trees

and animals. But the authors said their study was not the end of this line of research.

There are tens of thousands of chemicals in consumer products, and researchers have not yet pinpointed which chemicals are most likely to form ozone or PM2.5 particles. “One of the things that we’re hoping the public takes away from this is that our energy sources and the consumer products we use every day are continually changing the composition of our atmosphere,” Gilman said.

Notably, some of the VOCs used in consumer products were replacements for chlorofluorocarbons, or CFCs. Those chemicals were phased out beginning in the 1980s because they thinned the Earth’s ozone layer. For consumers looking for a greener solution, McDonald offered some advice. “Use as little of the product as you can to get the job done,” he said. NY TIMES