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Well informed : Electric vehicles also cause air pollution

Though fume-free, their brake pads and tyres disintegrate over time



<u>Full text:</u>

PEOPLE ARE dying for <u>clean air</u>. According to the most recent estimates from the Institute of Health Metrics and Evaluation at the University of Washington, air pollution caused 4.7m early deaths worldwide in 2021— about the same as dementia, road-traffic accidents, malaria and suicides combined.

Road traffic is a leading contributor to dirty air; in <u>London</u>, for instance, it is responsible for 60% of outdoor particulate dust. Electric vehicles (EVs) are often preferred because they can be powered by clean, sustainable energy sources and, in contrast to petrol and diesel cars, produce no exhaust fumes. But EVs nevertheless emit other pollutants common to all cars: particles originating not from the exhaust, but from brakes, tyres and roads. These, too, can be dangerous for human health.

The most dangerous particles are those smaller than 2.5 microns in diameter, which get into the lungs and reach other organs via the bloodstream. Such dust can increase the risk of heart disease, stroke, lung disease and cancer. According to British government statistics, 60% of road-traffic particles below 10 microns do not come from the combustion, but from the gradual breakdown of tyres, brake pads and roads.

In addition to being less well regulated than exhaust fumes, non-exhaust particles are also less well studied. That is changing. One study published in February by researchers at the University of Southampton found that some brake-pad dust seems to be more damaging to dish-grown human lung cells than diesel-fume particles. This was in part because of its higher levels of copper, which can damage cells and DNA.

Though exact figures are elusive, scientists estimate that EVs produce more of these non-exhaust particles than other cars. This is because their batteries make them heavier, causing them to generate more friction. (According to Hannah Ritchie, a data scientist at the University of Oxford, in 2023 the mean weight of an EV was 2,133kg, whereas regular cars weighed around 1,500kg in Britain and 1,800kg in America.) As cars continue to get bigger, the risk is that EVs become more polluting.

Although EVs may be dirtier than you think, they are still mostly less polluting than other cars. That is partly because they use an extra braking system called regenerative braking. When the driver removes their foot from the pedal, the continued forward motion of the car is harvested to recharge the battery, thereby slowing the car down. That system works independently of brake pads, potentially eliminating one source of emissions. One study from 2021 estimated that, when regenerative braking was used for all braking, EVs produced a total of about 14 milligrams of fine particles per vehicle per kilometre on urban roads, whereas petrol cars produced about 18 and diesel cars 20 (exhaust included).

More radical steps can also be taken. Regulating non-exhaust emissions in a similar way to fumes would be one way to minimise harm to human health. Encouraging people to consider smaller cars, though difficult, would be another. Enormous cars are disastrous for road safety and most people will never need the extra range that the largest car batteries provide. Ensuring EVs run on clean electricity is also important: if their power is ultimately generated by burning coal, say, that just moves the pollution from the exhaust to the power plant chimney. Though EVs are necessary for the energy transition, they are currently far from emission-free.