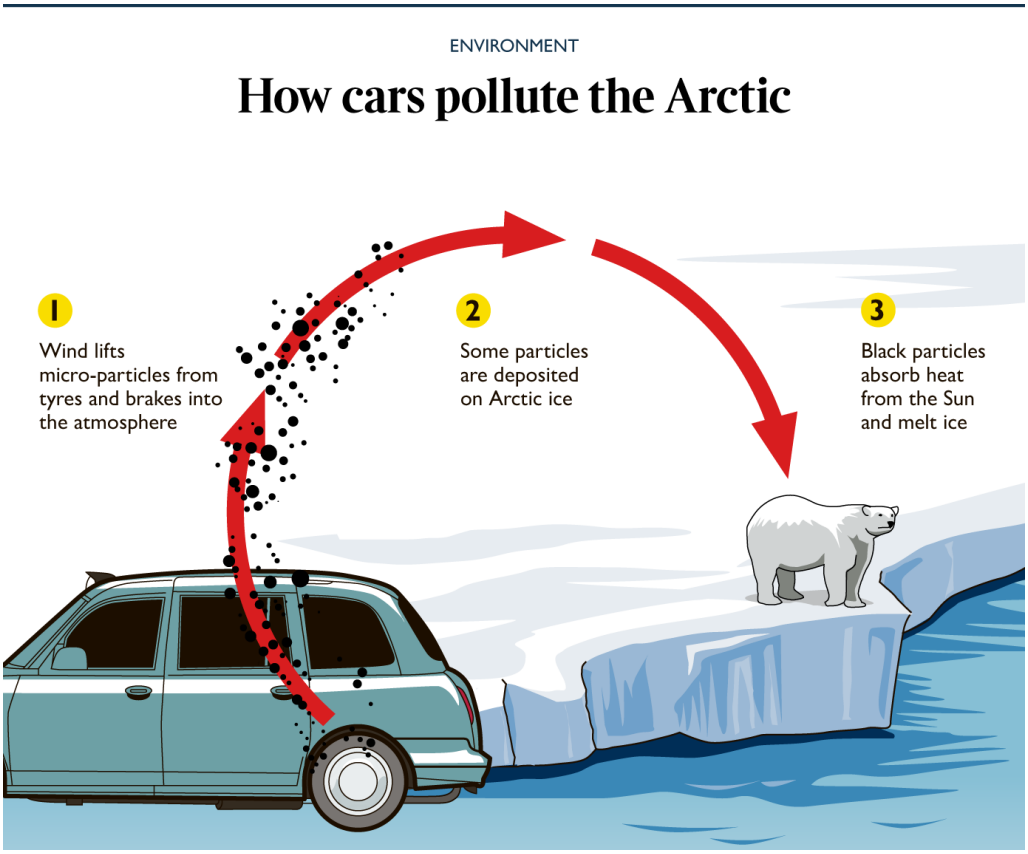
Tiny particles from car brakes and tyres ‘darkening Arctic ice’

Ben Webster, Environment Editor, The Times

Wednesday July 15 2020

Simply applying the brakes on your car is contributing to the melting of the polar ice cap, according to a study.

Microplastic particles shed by tyres and brakes are swept by winds to remote areas including the Arctic where they darken the surface and hasten the melting of ice. About 48,000 tonnes of these particles end up in snow and ice-covered areas each year, scientists calculated.



Tyres and brake linings are made from a complex blend of materials including plastic and are worn down by friction. Previous research estimated that the world’s vehicles shed six million tonnes of particles annually from their tyres and 500,000 tonnes from brakes. Most of the particles fall onto roads and verges and are washed away by rain, and a large proportion end up in the sea.

The researchers estimated, however, that about 426,000 tonnes of microplastic particles from tyres are so small that they are swept up into the air and can be blown long distances. These particles are at least ten times smaller than the width of a human hair and are also a source of air pollution.

The scientists studied the density of roads and vehicles around the world to map the origins of tyre particles. They then used computer models to work out where the particles would be deposited based on understanding atmospheric processes. Two thirds ended up on land and a third in the ocean. The authors said that the particles could be particularly damaging in the Arctic because, like soot from the burning of fossil fuels and wood, they darken the surface of the ice and cause it to absorb more heat from the sun and melt more quickly.

The researchers estimated, however, that about 426,000 tonnes of microplastic particles from tyres are so small that they are swept up into the air and can be blown long distances. These particles are at least ten times smaller than the width of a human hair and are also a source of air pollution.

The scientists studied the density of roads and vehicles around the world to map the origins of tyre particles. They then used computer models to work out where the particles would be deposited based on understanding atmospheric processes. Two thirds ended up on land and a third in the ocean. The authors said that the particles could be particularly damaging in the Arctic because, like soot from the burning of

fossil fuels and wood, they darken the surface of the ice and cause it to absorb more heat from the sun and melt more quickly.

Andreas Stohl, professor of meteorology at the University of Vienna and co-author of the study in Nature Communications, said there were toxic materials among the tyre particles and more research was needed to assess the health risks they posed to humans and wildlife. He urged tyre manufacturers to research ways of designing tyres to shed fewer particles.

The government's Air Quality Expert Group said last year that particles from brake, tyre and road surface wear contributed well over half of particle pollution from road transport. They noted that "no legislation is currently in place specifically to limit or reduce [these] particles. So while legislation has driven down emissions of particles from exhausts, the non-exhaust proportion of road traffic emissions has increased."

A separate study this week found that microplastic particles could get into food after being absorbed by the roots of crops growing in contaminated soil.

Scientists at the Chinese Academy of Sciences studied wheat and lettuce plants fed treated wastewater which contained microplastics. "Cracks at the emerging sites of new lateral roots of lettuce and wheat crops can take in microplastics from the surrounding soil and water. Those microplastics can then be transferred from the roots up to the edible parts of the crop," Professor Luo Yongming, who led the study, said.

A study last year revealed that microplastic particles were falling from the sky in remote mountainous regions, with 365 particles per square metre found in the Pyrenees in southern France.