

Science for Environment Policy

Diesel cars' climate impacts not as beneficial as believed, scientists conclude

The promotion of diesel-fuelled cars in Europe may not have had the beneficial environmental effects that were expected, research suggests. It has been assumed that they help reduce greenhouse gas (GHG) emissions from the transport sector, but studies show that their fuel efficiency is lower than previously believed, while their black carbon and nitrogen oxides emissions are higher. The consequent reduction in global warming effects from diesel cars may therefore be negligible, perhaps even negative.

Twenty-three percent of global CO₂ emissions come from the [transport](#) sector, with road traffic responsible for seventy-four percent of these. Internationally, transport policies to increase fuel-efficiency and reduce emissions have varied substantially. For example, in Japan, diesel cars have been phased out entirely and an effort has been made to promote hybrid petrol-electric cars.

However, in Europe, diesel cars have been promoted based on the assumption that they are more fuel-efficient than petrol-fuelled cars and many EU Member States have reduced taxes on diesel fuel and diesel car sales. This has led to a boom in the diesel car market between 1995 and 2009, resulting in an additional 46.95 million more diesel vehicles on the road since the mid-1990s. These cars have the potential to have long-term emissions' impacts, as each car is likely to last approximately 16 years. In this study, researchers reviewed the evidence for the claim that diesel cars are better for the environment than petrol cars.

Laboratory studies suggest that diesel is 35% more efficient than petrol. However, the researchers highlight that emissions 'intensity' is often overlooked and when improvements are measured in grams of CO₂ emitted per kilometre (g CO₂/km), research shows that diesel is only 15% more efficient. Furthermore, when the actual car fleet is examined, the advantages of diesel cars reduce even more. Until 2005, diesel cars emitted 5-10% less CO₂ than petrol cars. However, designs of petrol cars have improved and by 2010 diesel cars emitted only 1.5% less CO₂. The researchers note that a trend for greater size and power of diesel cars may be partly responsible for the comparative reduced efficiency of the diesel fleet. However, they argue that this increase in size and power is itself partly due to excessive diesel fuel subsidies.

In Europe, CO₂ emissions from newly registered cars dropped from over 180g CO₂/km in 1995 to 140-150g CO₂/km in 2009. In contrast, emissions from the Japanese car fleet reduced from very similar levels in 1995 to 120-130g CO₂/km in 2009 as a result of an increased proportion of hybrid petrol-electric cars in the fleet.

The researchers also highlight the fact that diesel cars emit more black carbon, which has a much greater effect on [global warming](#) than CO₂. For cars produced between 1995 and 2003, the negative effects on the climate of black carbon outweigh CO₂ savings. Black carbon emissions result in global warming effects equivalent to 37.9 g CO₂/km, however, actual CO₂ savings are just 12.8 g CO₂/km. That said, post-2003 cars are often fitted with filters and, for these vehicles, the diesel car retains a slight advantage of 4 g CO₂/km, based on laboratory tests.

In addition to climate change effects the researchers highlight that diesel cars emit more nitrogen oxides which are highly toxic air pollutants. In fact, research shows that real on-the-road emissions can be 20 times higher than results of official laboratory tests. This fact was ignored when setting up economic policy on diesel fuel and diesel car sales.

The researchers conclude that, while the move away from petrol cars is essential to tackle global warming, replacing them with diesel-fuelled cars is not the solution. They suggest that the Japanese approach of producing relatively-affordable hybrids has been much more successful in reducing GHG emissions from the transport sector.



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Contact:
michel.cames@gmail.com ;
e.helmerts@umwelt-campus.de

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