

Five facts about diesel the car industry would rather not tell you

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Summary

A consortium of car manufacturers, suppliers and repairers has, in an attempt to hide the fact that a typical diesel car emits 10 times more nitrogen oxides than an equivalent gasoline car, launched a [new website](#). Its content ignores the inconvenient truth that most new diesels still don't reach the limits agreed back in 2007. This briefing provides five facts about diesel cars that the industry would rather the public didn't know.

1. A typical diesel car emits around 10 times more nitrogen oxides than an equivalent gasoline car.

The emissions from diesel cars of nitrogen oxides on the road are typically five times higher than *measured* on the road – although performance varies widely between individual models. In contrast, emissions from most gasoline cars are similar in tests and on the road and about 10 times lower than produced by diesels.

Testing conducted by the independent International Council on Clean Transportation (ICCT)¹ found a typical modern Euro 6 diesel emits 7-10 times more nitrogen dioxides (NO_x) on the road than the Euro 6 limit achieved in tests (80mg/km). Petrol cars have a tighter limit (60mg/km) that is typically met on the road. More recent tests performed by Emissions Analytics² show diesel emissions on the road are typically four and a half times higher than permitted by Euro 6 standards. Other tests show similar results.

NO_x is a mixture of mainly nitric oxide (NO) and nitrogen dioxide (NO₂). Diesel cars also produce much more nitrogen dioxide (NO₂) within the NO_x emissions they emit. The European Commission's scientists³ found the share of NO₂ in the total NO_x emissions reached 60% for diesel vehicles but was substantially lower for gasoline vehicles (0-30%). NO₂ is the more toxic form of nitrogen oxides. Although nitric oxide (NO) is also converted to NO₂ in the air, the process can take time and is dependent on the availability of other pollutants in the air. As a result the NO₂ levels in streets with a high penetration of diesel vehicles are especially high.

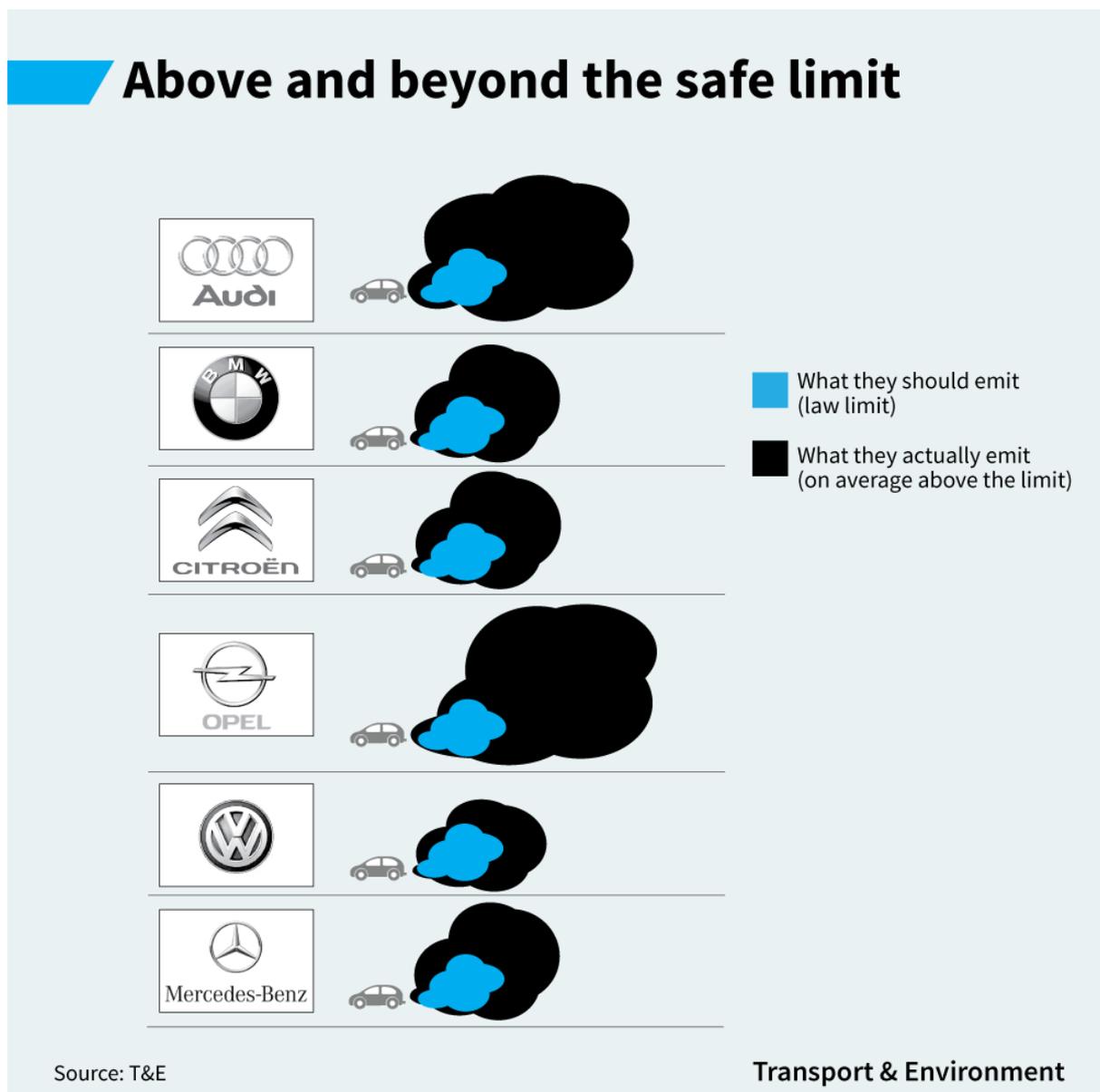
¹ <http://www.theicct.org/news/press-release-new-icct-study-shows-real-world-exhaust-emissions-modern-diesel-cars-seven-times>

² <http://emissionsanalytics.com/free-data/>

³ Ibid Reference 14

2. The problem is endemic across the car industry – but the performance of individual models and manufacturers varies widely

In tests by the ICCT¹ 12 out of 13 modern diesel cars failed to achieve the Euro 6 limit in on the road. The worst vehicle, an Audi, emitted 22 times the allowed limit. Emissions are highest in urban areas where most people are exposed to the pollution. On average a new diesel car emits **over** 800mg/km of nitrogen oxides driving in town compared to the limit of 80mg/km. Data obtained on around 20 modern diesel cars by T&E shows every major manufacturer is selling cars that fail to meet Euro 6 limits on the road. A minority of vehicles do meet the limits – but most don't. This is because the industry uses cheaper less effective exhaust treatment systems or fails to configure the best systems in a way that minimizes emissions. The cost of a modern diesel after treatment system is just €300.



3. Diesel exhaust fumes cause cancer. Nitrogen dioxide causes a range of short-term health effects, like asthma; and longer-term effects that shorten lifetimes. In the air, nitrogen oxides are converted into other harmful pollutants like fine particles and ozone.

The World Health Organisation has classified diesel exhaust as carcinogenic.⁴ It causes lung cancer in humans.

Breathing NO₂, even for a short time, also can inflame the airways of healthy people and cause increased symptoms in people with asthma. During periods of high nitrogen dioxide pollution there are increased visits to hospital emergency departments and hospital admissions for respiratory issues. Living in a place with high levels of NO₂ can also produce chronic, long-term health effects. For example, it has been associated with both low birth-weight babies and small head circumferences.⁵ It has also been associated with excess deaths in a large study in Rome on air pollution and heart attacks.⁶ A recent study in London found that there were 5,900 premature deaths in 2010 as a result of breathing nitrogen dioxide – more than doubling the previous estimates of early deaths caused by air pollution.⁷

In the air NO_x is eventually converted into nitrate aerosol particles that are a significant component of PM_{2.5} (fine particulates), one of the pollutants of greatest health concern. So, although diesel particle filters are reducing direct emissions of fine particles, the NO_x emissions are also causing this pollution.

NO_x in the air also contributes to the creation of ozone when it reacts with unburned hydrocarbons (fuel) in the presence of sunlight. Transport has been estimated to be responsible for 45% of the emissions leading to ozone formation.⁸ Children, the elderly, people with lung diseases such as asthma, and people who work or exercise outside are at risk of adverse effects from ozone. These include reduction in lung function and increased respiratory symptoms as well as respiratory-related emergency department visits, hospital admissions, and possibly premature deaths. Virtually all EU citizens are exposed to ozone above WHO health guidelines.

4. The current system for testing cars in a laboratory is obsolete and produces meaningless results – the figures quoted by cleandieseltch.eu.⁹ The car industry is fighting to delay and weaken new on-road tests precisely because Euro 6 cars cannot achieve the limits set.

Cars are currently tested in a laboratory using a test called NEDC. The test is outdated and obsolete and produces results for the amount of pollution being emitted that are totally unrepresentative of those achieved by the car on the road. In addition carmakers deploy “cycle beating” techniques to lower the test

⁴ http://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf

⁵ Pedersen et al, 2013, Lancet Respiratory Medicine 2013;1:695-704

⁶ Cesaroni, 2014, BMJ 2014;348:f7412

⁷ <http://london.gov.uk/media/mayor-press-releases/2015/07/london-becomes-first-world-city-to-quantify-the-health-effects>

⁸ EEA 2014

⁹ <http://cleandieseltch.eu/>

results still further. One reason carmakers are able to manipulate test is because they pay the organisations overseeing the tests and usually conduct these in their own laboratories.

The introduction of Euro 6 regulations in 2007 was supposed to be accompanied by a new real-world driving emissions test that measured pollution produced on the road – but arguments over how the test should be carried out have delayed its introduction, which should have taken place in 2015. Carmakers are fighting to weaken the new rules and have proposed that cars be allowed to emit 220g/km of nitrogen oxides on the road, not the 80mg/km Euro 6 limit.¹⁰ They also want to delay the full implementation of the regulation until 2021. If Euro 6 diesels are so clean why do carmakers want to raise the allowable levels of pollution?

5. On average, diesel cars emit more CO₂ than gasoline hybrid cars.

The ICCT shows that in 2013 the average diesel car emitted 127g/km of CO₂. The average hybrid emitted 92g/km. Diesel cars also tend to be driven much further than gasoline vehicles partly because the fuel is cheaper. Over its lifetime a typical diesel drives 230,000km and a gasoline car 169,000km – all these additional miles produce more CO₂. Diesels also cause higher emissions in their production as they tend to be larger. Biofuels added to diesel cause more CO₂ than those added to gasoline vehicles. On a lifecycle basis the benefits of diesel are non-existent.

The industry claims diesels are needed to meet CO₂ targets but similar targets exist in other regions that do not sell many diesel cars – for example in Japan and the US. Europe is the only region of the world selling large numbers of diesel cars. Other regions all sell predominately gasoline and, increasingly, gasoline hybrid vehicles. In 2013 around 70 million cars were sold globally of which around 10 million were diesels. 7.5 million of these diesel cars were sold in Europe. Other regions sell gasoline cars and, increasingly, gasoline hybrid vehicles. The European industry is desperate to preserve the market for diesel in Europe – the only region in which it sells large numbers of these vehicles. This is the reason they continue to promote diesel technology.

Further information

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¹⁰ ACEA 2014, European Parliament; ENVI Committee – Public Hearing on Air Quality Policy; Potential for reducing emissions from road traffic and improving air quality