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Diesel gate

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Pollution

Air pollution fears see demand for diesel cars fall by fifth

Winterkorn falls on his sword as emissions scandal engulfs VW

Diesel vehicles targeted with early introduction of Ultra Low Emission Zone

04/04/2017 in Fleet Industry News

PM: I'LL PROTECT DIESEL DRIVERS

'DECIMATION OF DIESEL' - New car sales plummet in the UK ahead of General Election

Mayor makes case for diesel scrappage ahead of the Budget

06/03/2017 in Tax and Legislation News

Car buyers should have 'long, hard think' about diesel

MINISTER: BEWARE BUYING A DIESEL

THE TIMES



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Welcome to the Winter White House A weekend at Mar-a-Lago, Donald Trump's private club for the powerful in Florida

Meet the world's top back doctor

VW boss tells 'blatant lies' about diesel emissions scandal

Graeme Paton Transport Correspondent
MPs condemned the boss of Volkswagen in Britain for telling 'blatant lies' yesterday after he denied that the carmaker deceived customers during the diesel emissions scandal. Paul Willis played down the affair that led to the recall of 12 million vehicles in the UK as the German car company fights a potentially huge compensation claim from British motorists.

Appearing before the transport select committee, the managing director of Volkswagen UK said that it had 'not misled customers in any way' and denied that it fitted 'defeat devices' to European cars to cheat emissions tests. The recall was being carried out even though 'there is nothing wrong with any of [the cars] at all', he claimed, and was designed simply to 'remove any doubt' in motorists' minds.

His comments brought claims that VW was trying to minimise the chance of British drivers winning a compensation claim. More than 30,000 owners are demanding about £3,000 each. If all affected owners signed up to the legal action, the company could face a £3.6-billion bill. Across Europe, 8.5 million VW cars are being recalled after the use of devices that made air pollution controls work properly only in the laboratory, was exposed in 2015.

Graham Stringer, a Labour MP, said: 'I have sat on select committees for 20 years and I have never seen somebody come along and blatantly lie to a committee.' John Hayes, the transport minister, said that VW's position was 'little short of radical'.

In the US Volkswagen has reached a \$2.3-billion settlement with owners. A VW source said that European cars had software that recognised whether vehicles were in laboratory testing mode, which was not the same as a defeat device as defined under US law.

THE TIMES NEWSPAPER OF THE YEAR London fashion special Plus Are you wearing the new midis? The shoes! The bags! The front row!

Volkswagen in meltdown after faked diesel tests

Drivers face mass recall as share price crashes

Months of thousands of Volkswagen drivers in Britain are facing a new wave of anger... The company said that it was working for the resolution of an ongoing... The Volkswagen said that it was working for the resolution of an ongoing... The Volkswagen said that it was working for the resolution of an ongoing...

WH Smith is forced to end hospital shop 'rip-off'

Customers say they were overcharged

WH Smith will cut the cost of some goods in its hospital shops after a complaint that patients and visitors were often charged more than on the high street... The retailer said that it would end the hospital shop 'rip-off' after a complaint that patients and visitors were often charged more than on the high street...



IN THE NEWS Early death warning Flying visits to end Pressure on Corbyn Migrant quotas hit Panic in the markets Roughly bombed

Tories turn

Life changes

Background

- Volkswagen, headquartered in Wolfsburg, Germany is one of the most iconic automobile manufacturers in the world.
- It was founded by the German Labour Front in the year 1937.
- It operates more than 60 production plants around the world
- Volkswagen (10.1 million units sold) was the 2nd biggest car manufacturer after Toyota (10.2 million units sold) in 2014



Volkswagen Diesel Scandal

New car registrations in Germany, share by vehicle type 2015 - 2018.

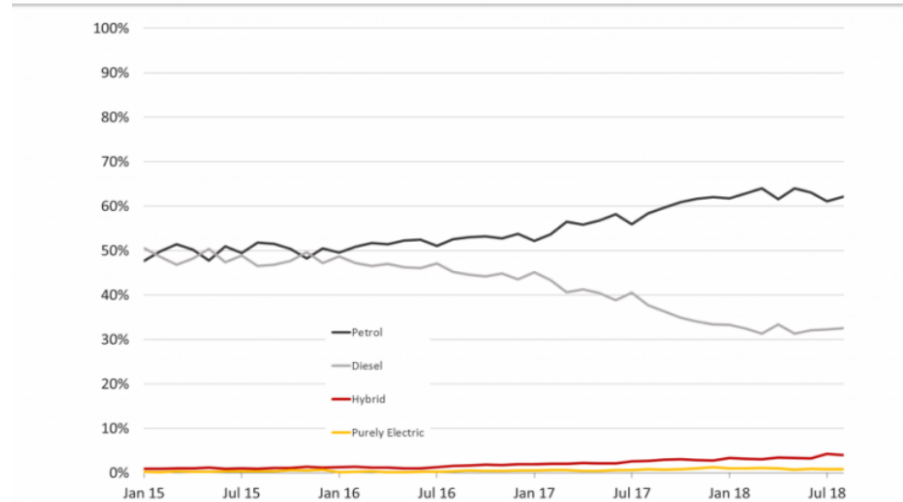
Data: KBA 2018.

1974
Volkswagen paid fine of \$120,000
over the use of “defeat devices”

2009
Volkswagen installed softwares to
circumvent emissions test

September 2015
US EPA accused Volkswagen for
using defeat devices or softwares in
the diesel engines

9.7 billion dollars fine paid in the
US against diesel gate scandal



<https://www.cleanenergywire.org/factsheets/dieselgate-timeline-germanys-car-emissions-fraud-scandal>



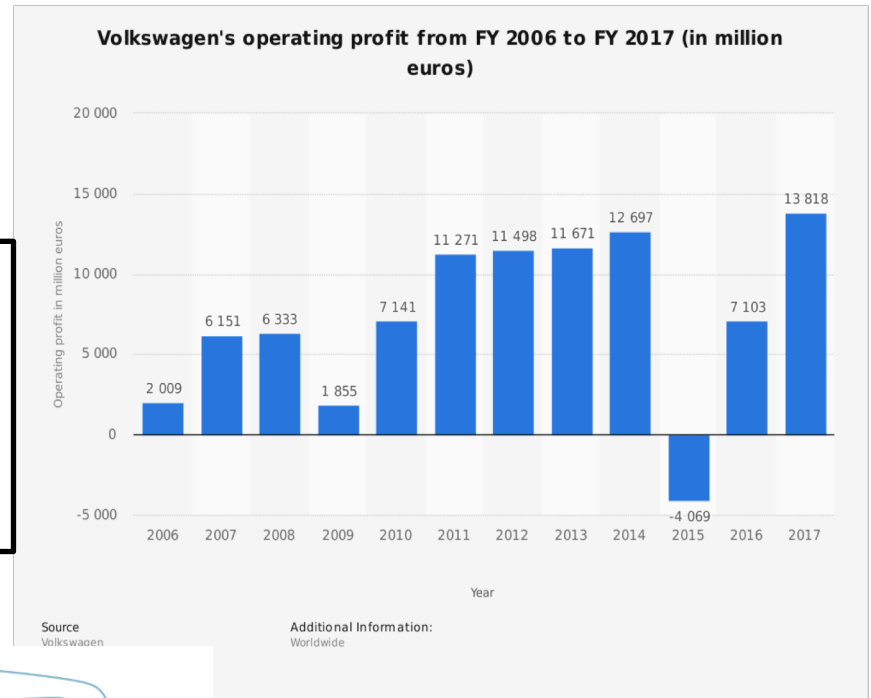
<https://www.businessinsider.com.au/chart-this-is-what-happened-to-volkswagen-after-the-emissions-scandal-2015-12>

How the defeat device work?

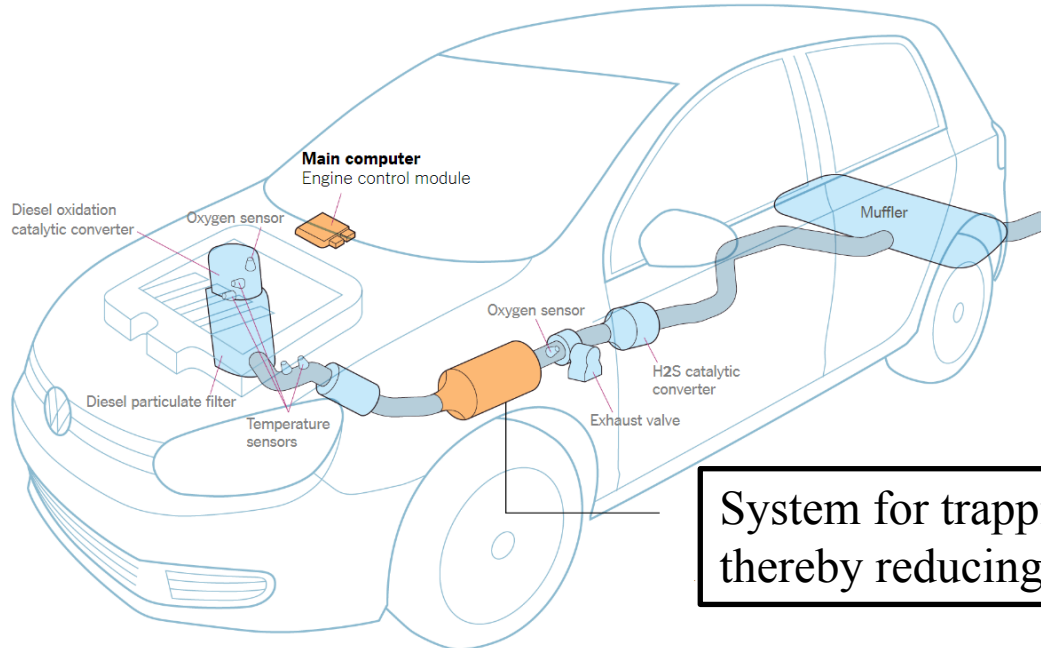
Increased release of Nitrogen oxides



Pollutant related to cause emphysema, bronchitis and other respiratory diseases



<https://www.statista.com/statistics/272053/operating-profit-of-volkswagen-since-2006/>



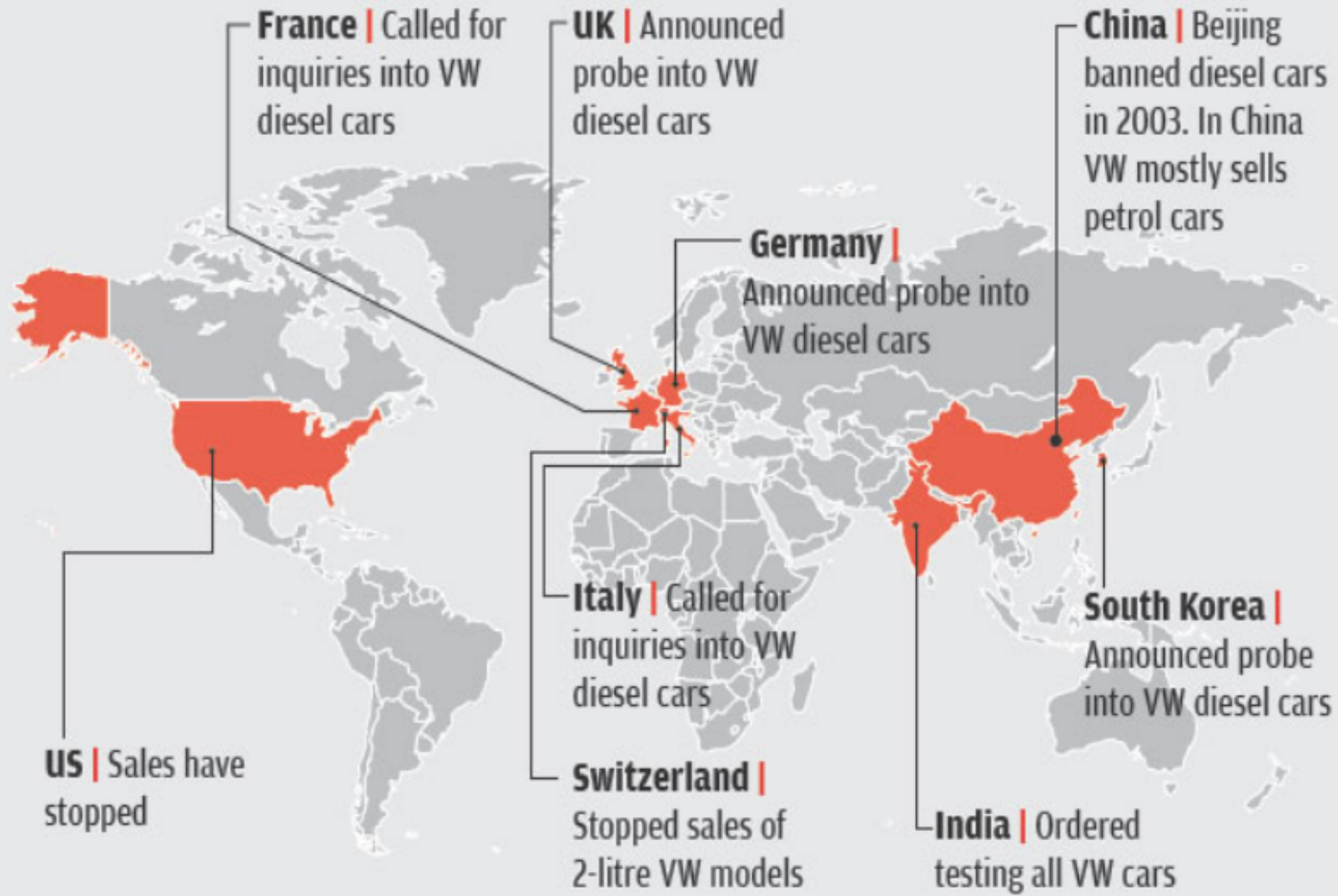
System for trapping nitrogen oxides thereby reducing toxic emissions

Causes of the scandal

- To overcome fundamental problems for controlling harmful emissions by its smaller diesel cars
- Inadequate internal controls
- Ambitious goals

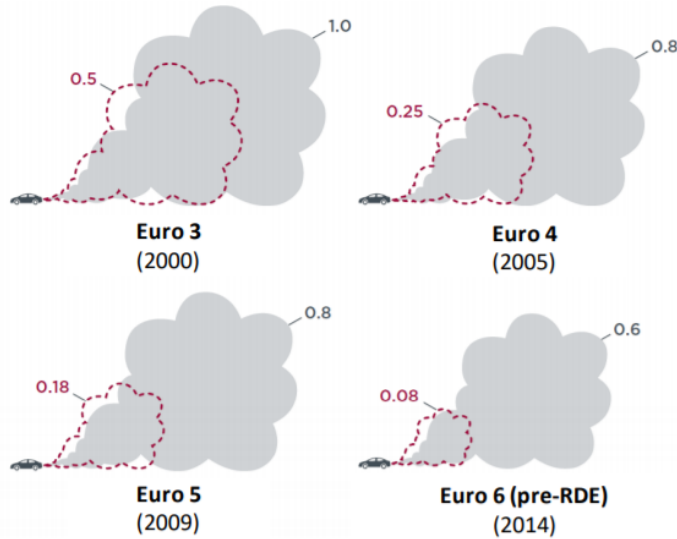
Consequences of the scandal

- Total of 11 million cars affected worldwide out of which 500,000 cars in US and 7 million cars in Europe
- Engines emitted nitrogen oxide pollutants up to 40 times above what is permitted in the US that may result in 1 million tonnes of air pollution every year



<https://www.downtoearth.org.in/coverage/air/does-volkswagen-fraud-signal-death-of-diesel--51539>

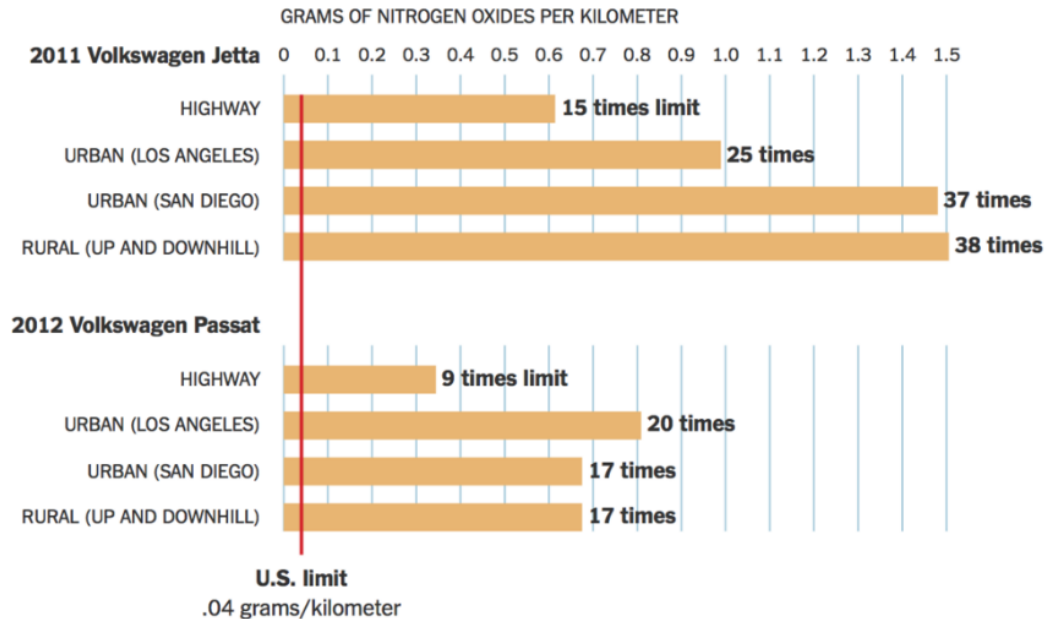
Regulatory limits of Nitrogen Oxides

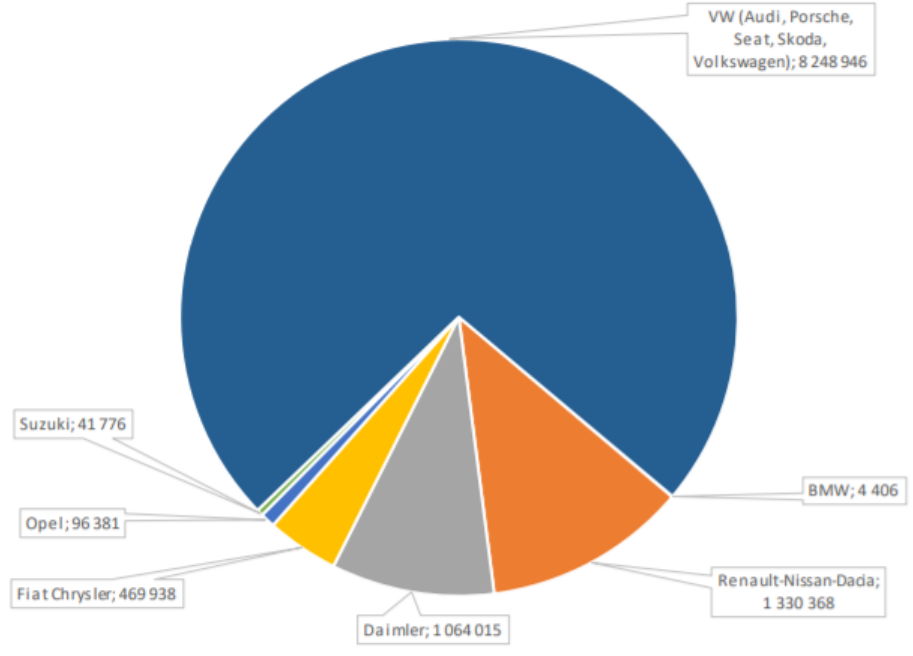


EU standard limit for Nitrogen oxides emissions
0.08 g/Km

EU's response to dieselgate scandal, February 2019

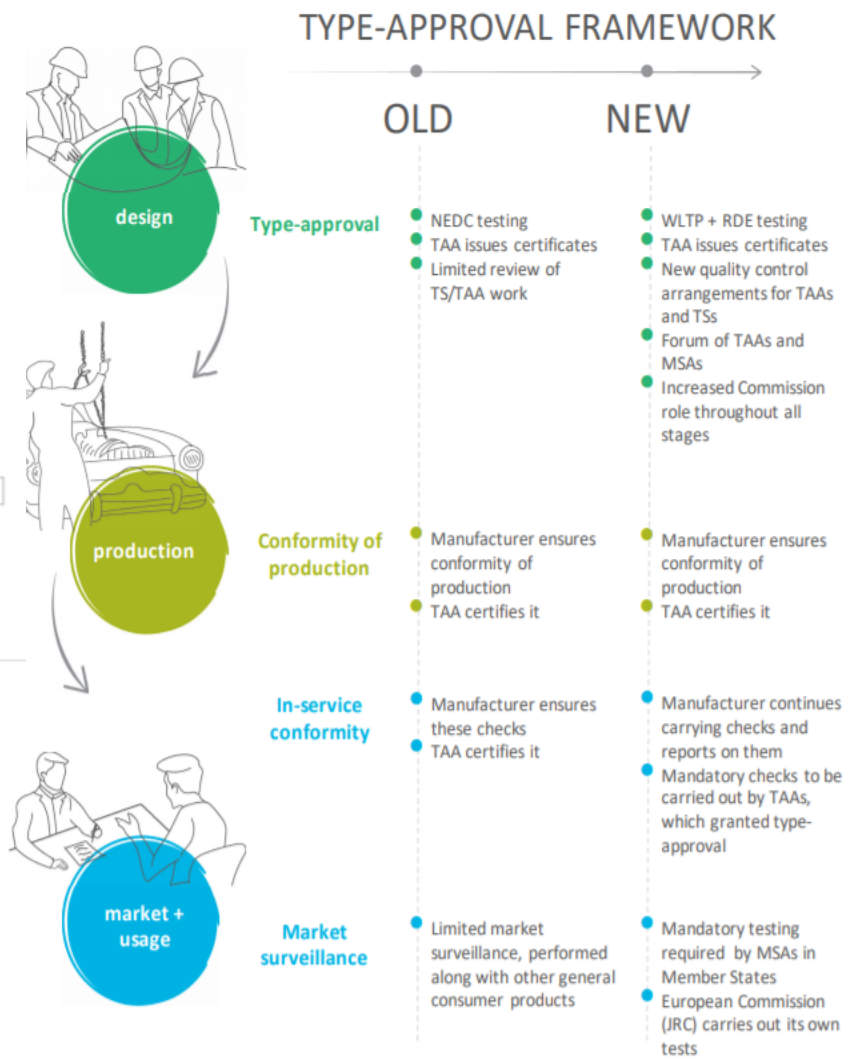
US Standard limit for Nitrogen Oxides emissions
0.04 g/Km





EU's response to dieselgate scandal, February 2019

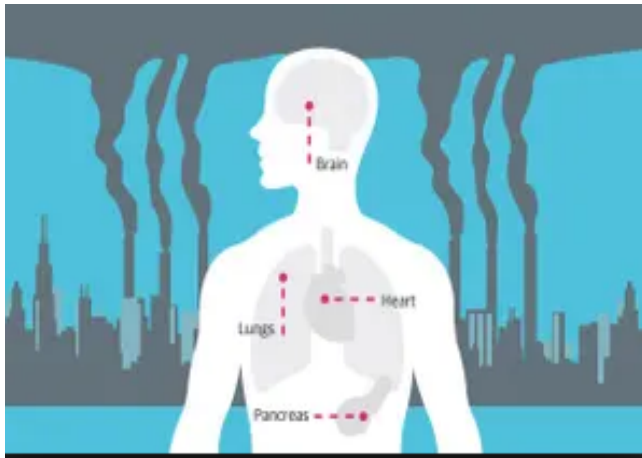
- VW cars withdrawn for Nitrogen Oxide emission test as of September 14, 2018 in EU.
- Regulations strengthen to ensure the vehicles introduced to the market meet emissions limit.



EU's response to dieselgate scandal, February 2019

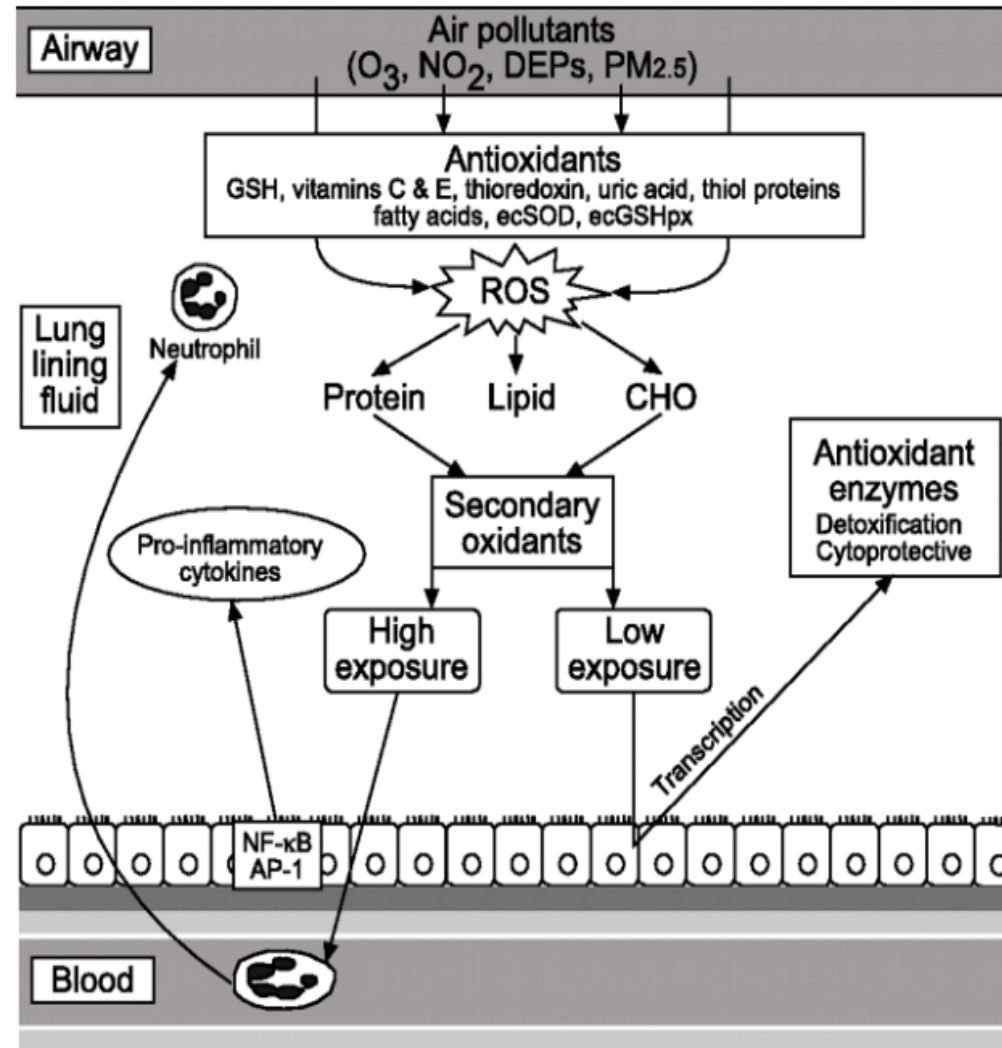
Air Pollution

- Air pollution broad spectrum of health effects such as asthma, COPD and cardiovascular morbidities.
- Particulate matter (PM) , gases or even a combination of both.



- Particulate matter (PM):
 - Diesel Exhaust
 - Polycyclic aromatic hydrocarbons (PAH's)
 - Carbon Nanoparticles
- Gases
 - Nitrogen dioxide
 - Sulphur dioxide
 - carbon monoxide

- Interaction with the lung lining fluid containing antioxidants → Radical generation → depletion of the antioxidant defense.
- Initiation of cellular responses → Release of cytokines and tight junction modification



Romieu, I., Castro-Giner, F., Kunzli, N., & Sunyer, J. (2008). Air pollution, oxidative stress and dietary supplementation: a review. *European Respiratory Journal*, 31(1), 179-197. doi: 10.1183/09031936.00128106

In-vitro study

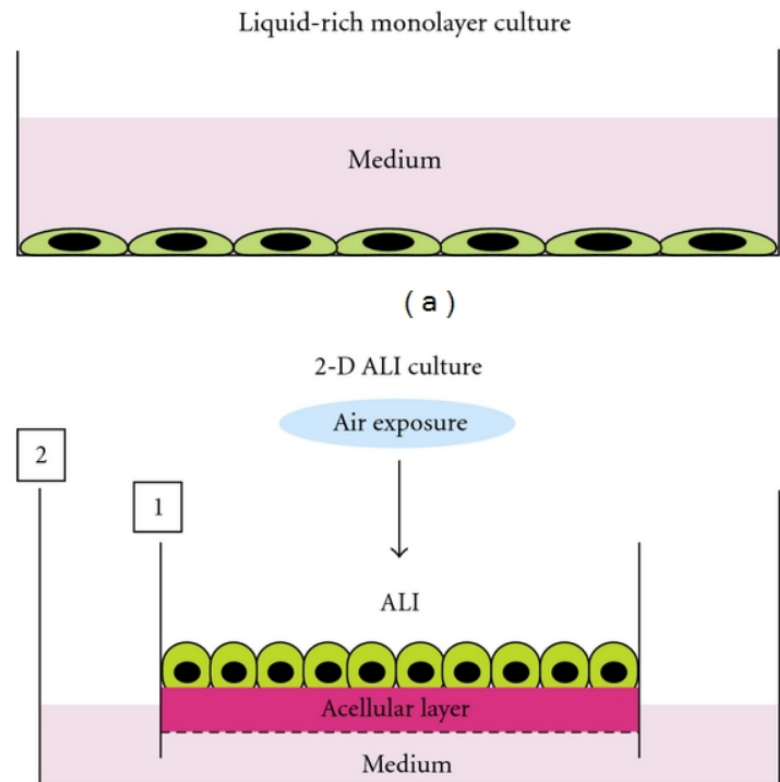
Multi-cellular human bronchial models exposed to diesel exhaust particles: assessment of inflammation, oxidative stress and macrophage polarization

Jie Ji [†]✉, Swapna Upadhyay [†]✉, Xiaomiao Xiong, Maria Malmlöf, Thomas Sandström, Per Gerde and Lena Palmberg

[†]Contributed equally

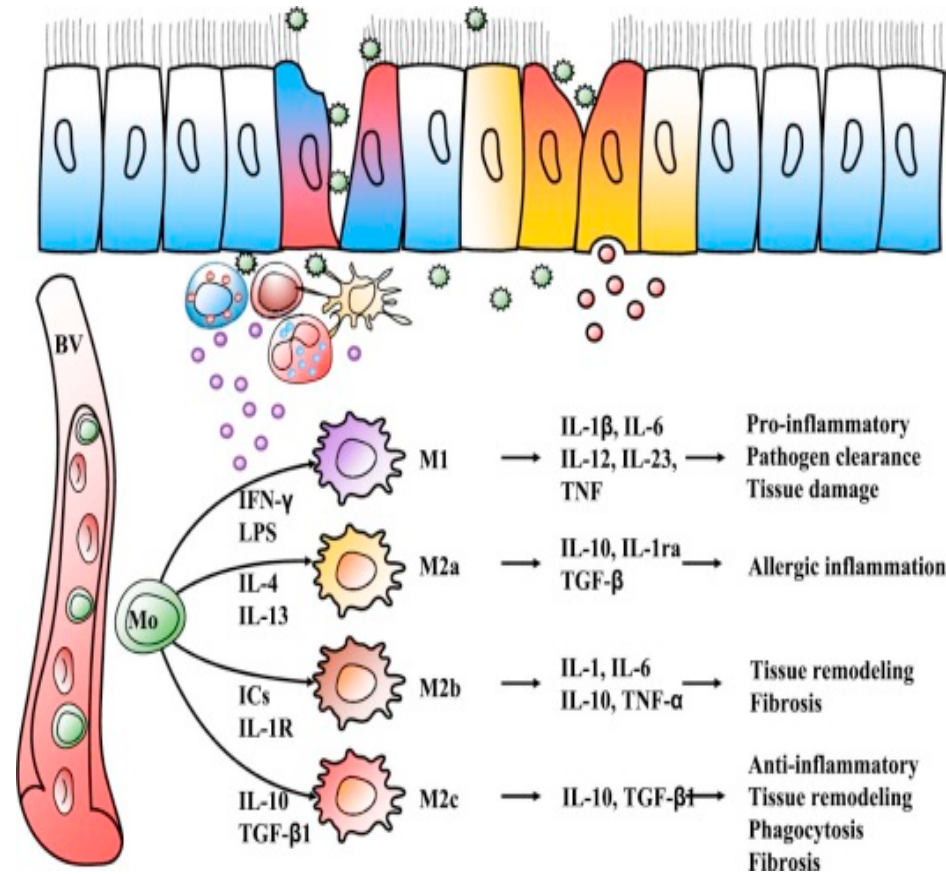
Particle and Fibre Toxicology 2018 15:19

- Air-Liquid Interface (ALI) Cell culture with Primary Bronchial Epithelial cells (Pbec's)
- Diesel Exhaust Particles ($12.7 \mu\text{g}/\text{cm}^2$) exposed to ALI culture
- Co-culture of Pbec's with macrophage



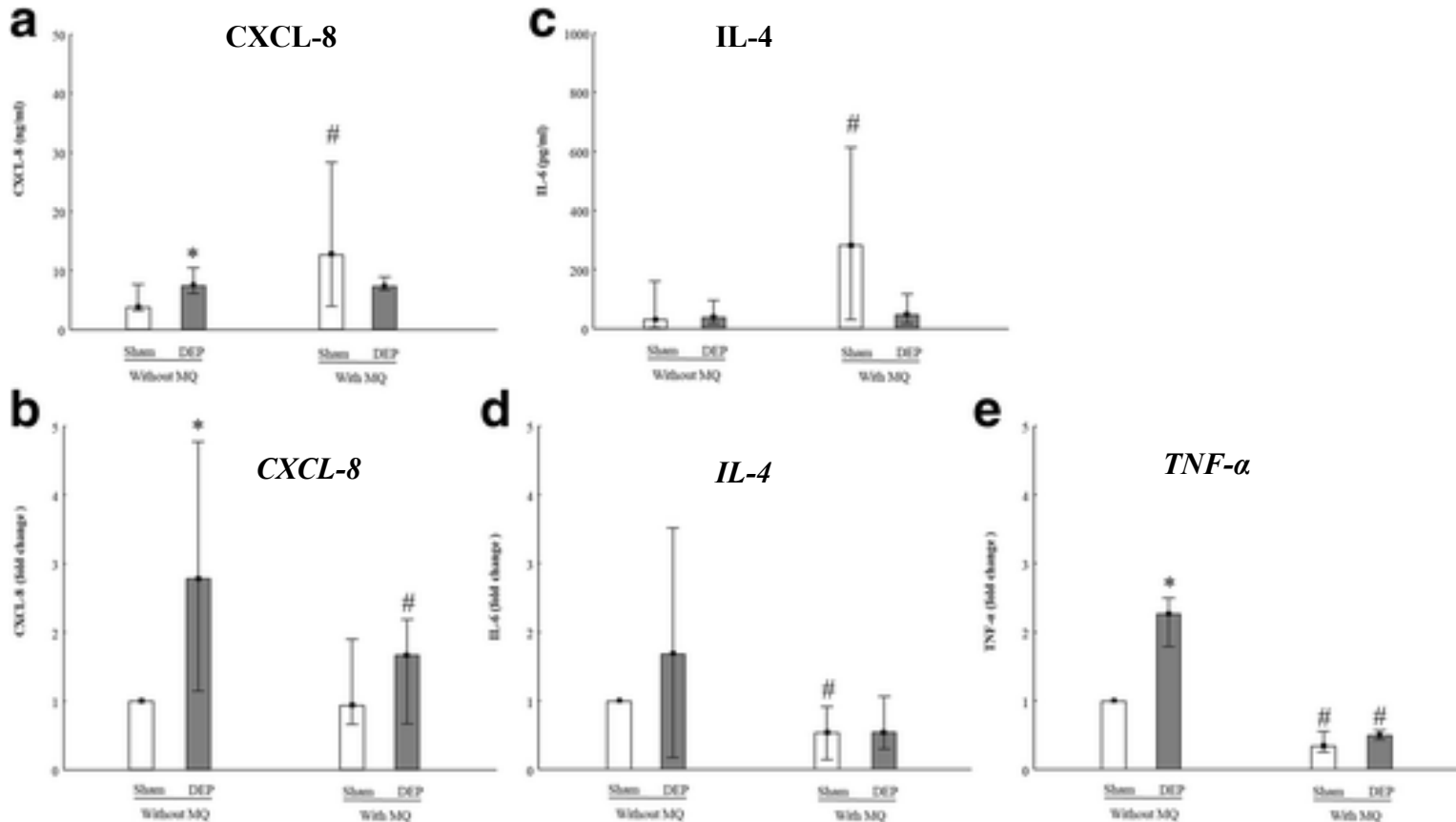
Macrophage Polarization

- Important role in host defense
- M1 Phenotype : Classical Activated macrophage
- M2 phenotype: Alternative activated macrophage
- M1 phenotype: Induced by Helper T cell (Th1) response → TNF- α , IFN- γ , NFKB
- M2 phenotype: Induced by Th2 response → MRC-1, IL10 → wound healing and tissue regeneration



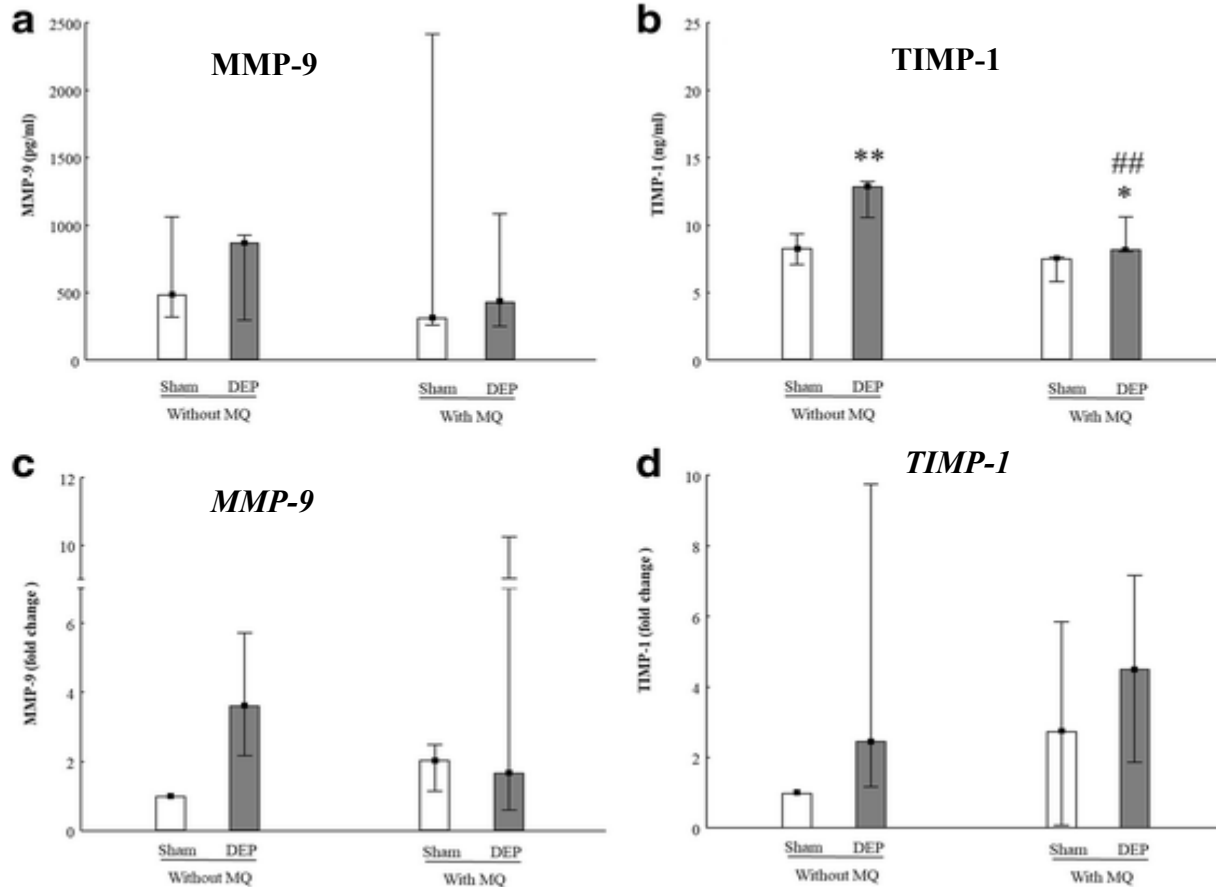
Saradna, A., Do, D., Kumar, S., Fu, Q., & Gao, P. (2018). Macrophage polarization and allergic asthma. *Translational Research*, 191, 1-14. doi: 10.1016/j.trsl.2017.09.002

Inflammation



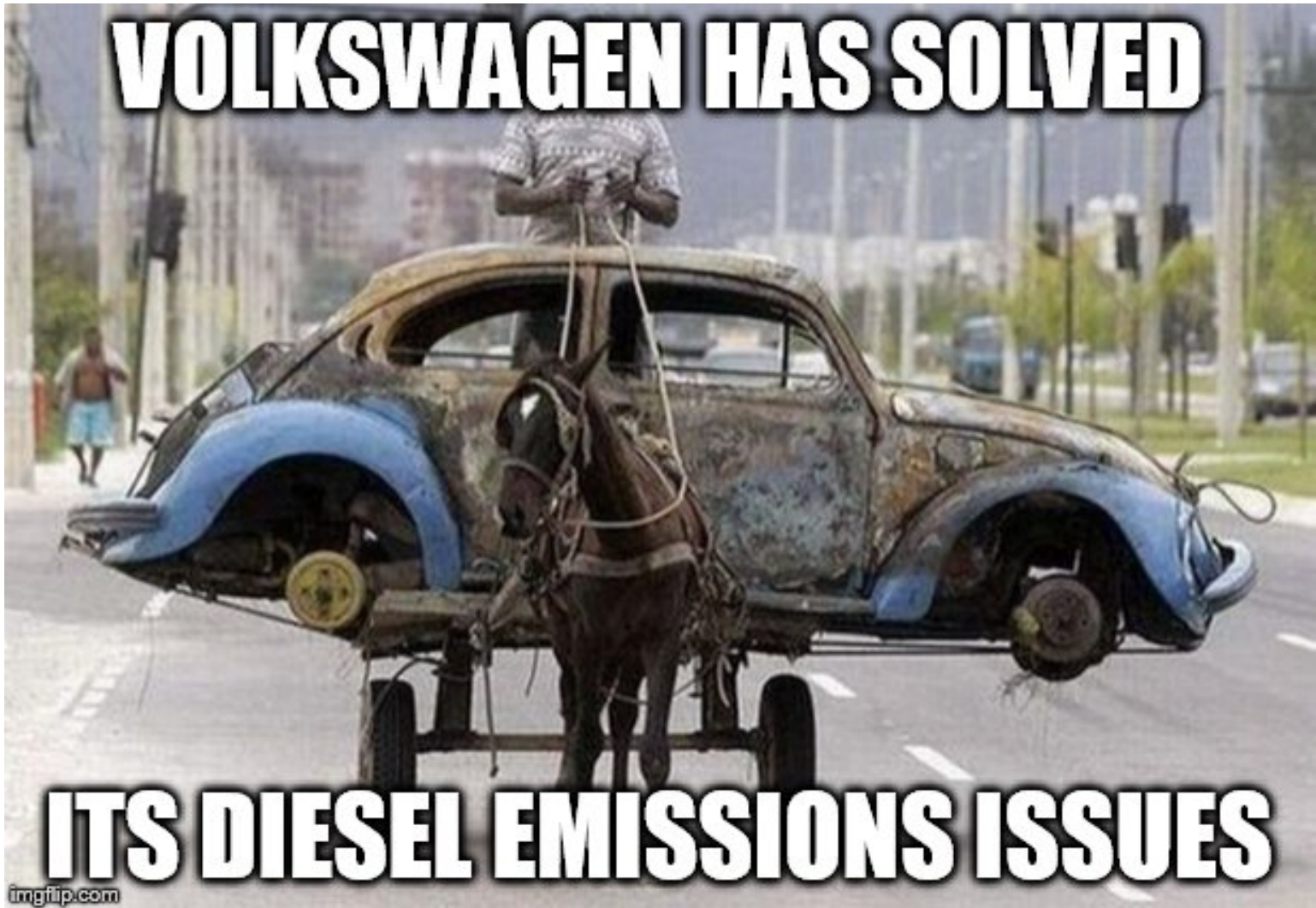
- Increase in pro-inflammatory and cytokine levels after Diesel Exhaust particles exposure
- Macrophage polarization towards M2 Phenotype

Tissue Injury Markers



- Increase in tissue injury markers after Diesel Exhaust Particles exposure.
- Macrophage Polarization towards M2 Phenotype

VOLKSWAGEN HAS SOLVED



ITS DIESEL EMISSIONS ISSUES

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