

International experience in eco-labelling of vehicles and the fight against urban pollution

Nick Molden

10 October 2018

Current situation

- Genuinely clean diesels are now on the market
- But consumer confusion and distrust are greater than ever
- Sales of new diesels cars are falling due to uncertainty about emissions and future access to cities and countries
- Sales of used diesels are up as their value falls
- Making air quality and greenhouse gas emissions worse
- Some cities are taking unilateral action now to implement policies, including restricting diesel cars and the longer-term banning of all internal combustion engine (ICE) cars
- National governments are resisting but also standardising
- Growth of PHEV and EV sales is slow so cannot solve the air quality problem quickly enough

EMISSIONS ANALYTICS

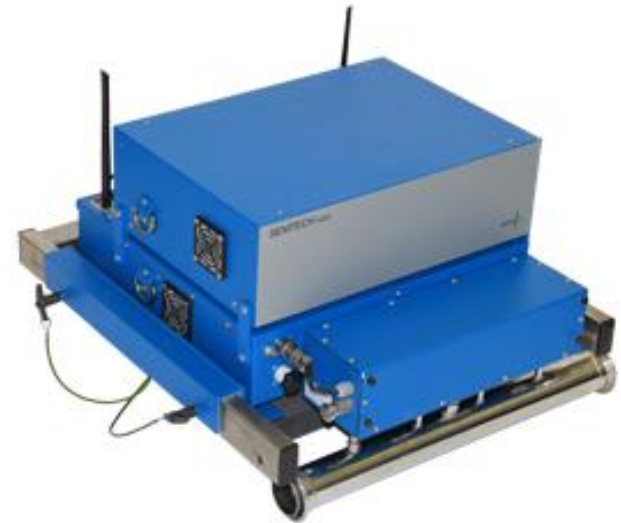
Emissions Analytics' credentials



- International testing and ratings organisation
- Founded in 2011
- Headquartered in the UK
- Operations in UK, Germany, USA and South Korea
- Focused on on-road testing and data analysis
- Largest commercially available database of real-world emissions data
- Works with researchers, regulators, OEMs, Tier 1/2 suppliers, fuel and chemical companies, fleets, consumer media

Equipment

- SEMTECH range from Sensors, Inc.
- Portable Emissions Measurement System connects to tailpipe
 - Captures emissions for CO₂, CO, NO, NO₂, total hydrocarbons, particulates
 - At 1 Hertz
- Air temperature, pressure, humidity
- GPS for speed and altitude
- Engine data via CANBUS
- Fuel economy derived via carbon balance
- Weight addition 100kg



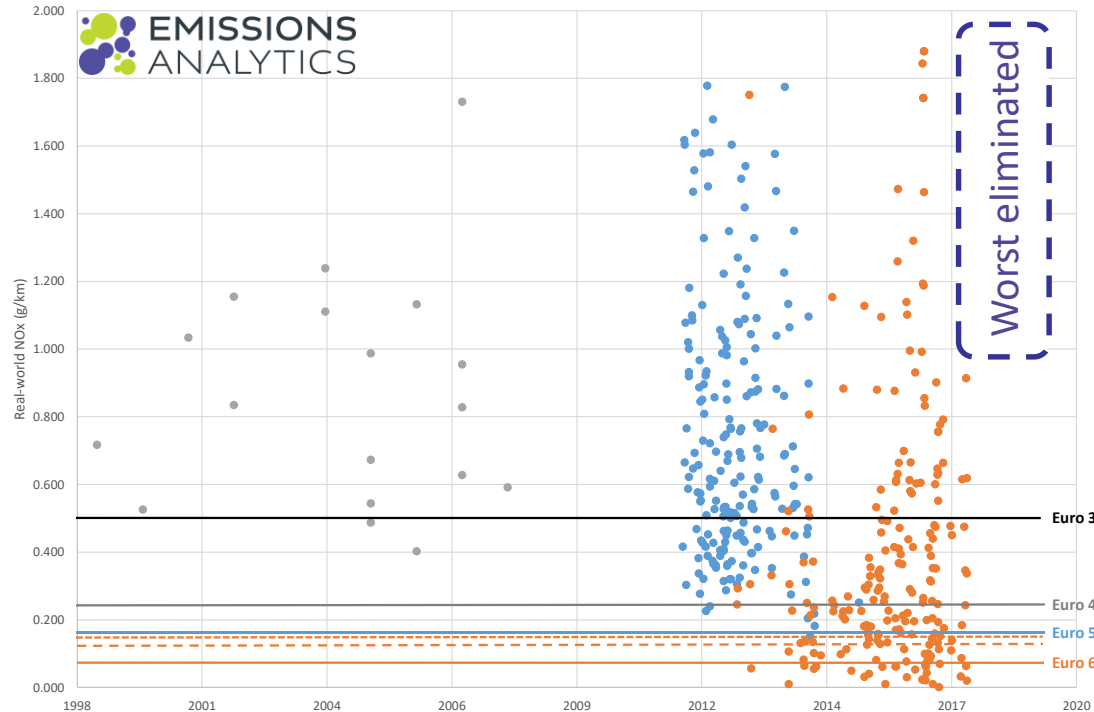
Key activities

- Over 2000 passenger cars tested
- ~50 light commercial vehicles tested
- Heavy-duty commercial vehicles tested
- Agricultural equipment tested in service
- Newly-launched programme testing non-road mobile machinery, including generators, construction equipment
- Waterborne vessel testing commenced



URBAN AIR QUALITY PROBLEM

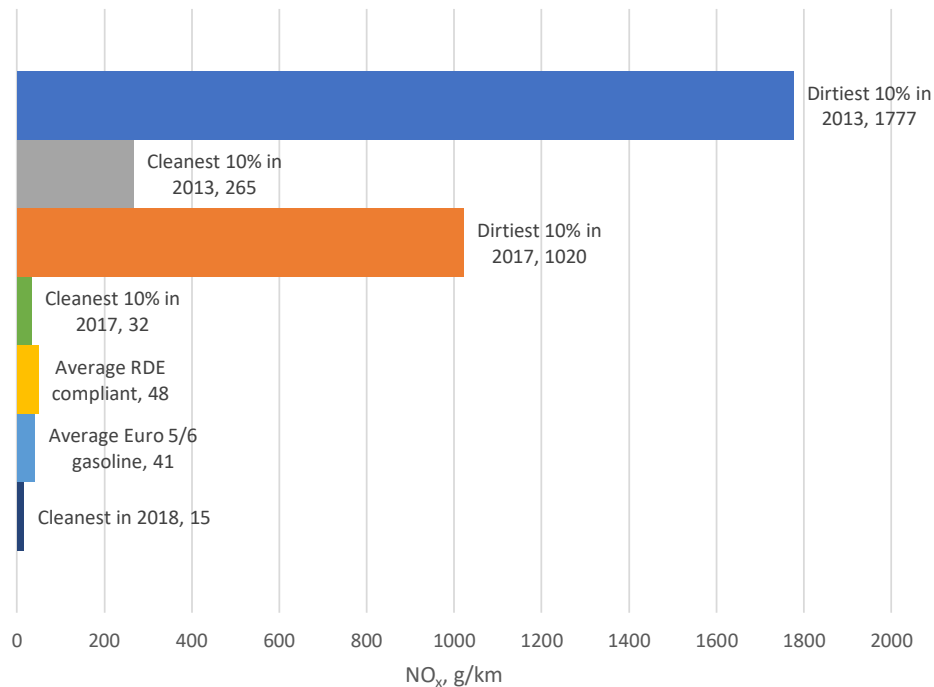
Installed base of dirty diesel



- In last year, worst new type approvals have been eliminated
- But many RDE monitoring phase diesels still dirtier than Euro 3/4
- Average Euro 6 emits 382 mg/km NO_x
- 51% lower on average than Euro 5 diesel

Market confusion

- All of these diesels are labelled “Euro 6”
- And most are still on sale new
- Of 2017 crop, the worst are 32 times more emitting than the best
- Effective policy can’t be based on Euro 6
- Breeds consumer cynicism
- Need for honesty and clarity at the model level



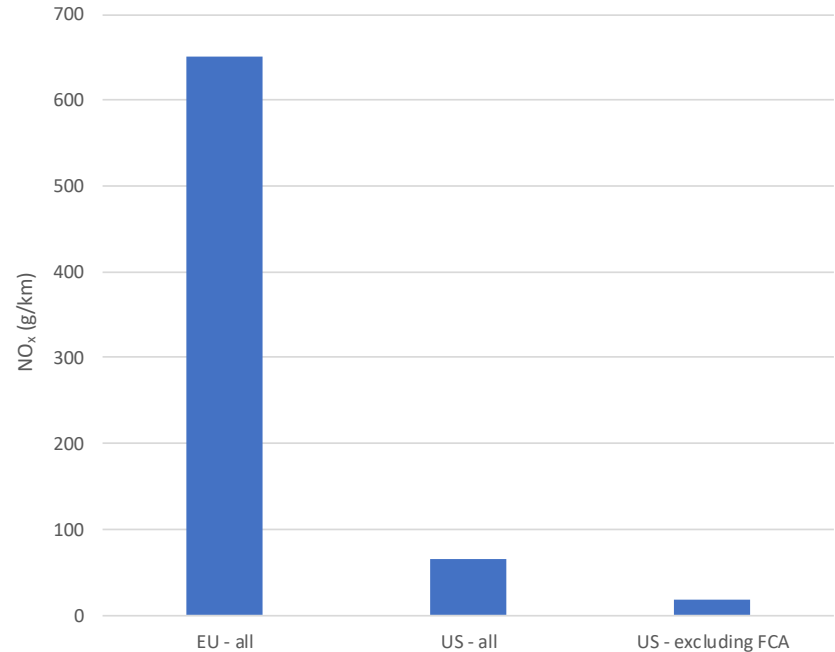
Best and worst Euro 6 diesels

Rank	Manufacturer	Euro stage	Average combined NO _x (g/km)
1.	BMW	Euro 6abc	
2.	Mercedes-Benz	Euro 6abc	
3.	Audi	Euro 6abc	12
4.	Mercedes-Benz	Euro 6abc	
5.	Mercedes-Benz	Euro 6d-temp	
258.	Fiat	Euro 6abc	
259.	Nissan	Euro 6abc	
260.	Renault	Euro 6abc	1590
261.	Audi	Euro 6abc	
262.	Mercedes-Benz	Euro 6abc	

- Best are 99% cleaner than the worst
- The best are not RDE
- The first diesel to emit below 80mg/km was tested in 2013
- Dirtiest diesel on sale in 2018 emitted 1472mg/km
- All Euro 6!

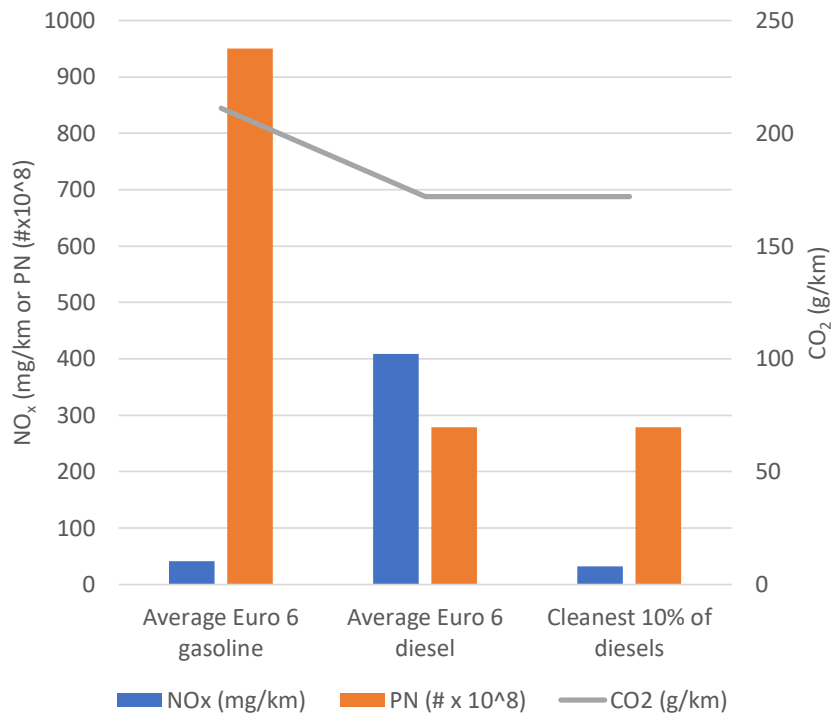
Comparison to US

- Diesels sold are very low emitting for NO_x and particles
- Excluding those currently under investigation
- Around half the limit, and similar to many gasoline
- Lowest emitting EU vehicles now approaching NO_x emissions of typical US diesels



How clean is gasoline?

- CO₂ 18% higher per km than diesels
 - PN 71% lower for diesels
 - NO_x equivalent for best diesels
 - Dirtiest 10% of gasolines emit 129 mg/km of NO_x
 - Cleanest 10% of diesels emit 70 mg/km
 - Cleanest diesels 46% cleaner than worst petrols
- Individual model selection dominates technology in outcome



FUTURE POLICY

EQUA Aq



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Aq
AIR QUALITY

Volkswagen / Golf / Diesel
2.0L / 2010 / 2WD / Auto / Euro 5

A B C D E F G H

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Aq ⇌ **The EQUA Air Quality Index**

Vehicle Type	Index Range (A-H)
Euro 5 diesel	Between A and B
Euro 5 petrol/hybrid	Between G and H
Euro 6 diesel	Between C and D
Euro 6 petrol/hybrid	Between E and F

Better A B C D E F G H Worse

EQUA100, EQUA CO₂



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100

L/100 km

Volkswagen Passat / Diesel / 2016
1.6 L / 118 bhp / 2WD / Manuelle / Euro 6

5.37 L/100km

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CO₂

CARBON DIOXIDE

Audi A3 / Diesel / 2015
1.6 litre / 110 bhp / 2WD / Manual / Euro 6

A B C D E F G H

BETTER WORSE

The **EQUA Index** provides a **simple and frank overview** of the performance of vehicles **during actual driving** . Put **data on fuel consumption and air quality** in the hands of the buyer of the vehicle so you can make an informed decision.

EQUA sets the standard for **independent emission data and taken in real conditions** .



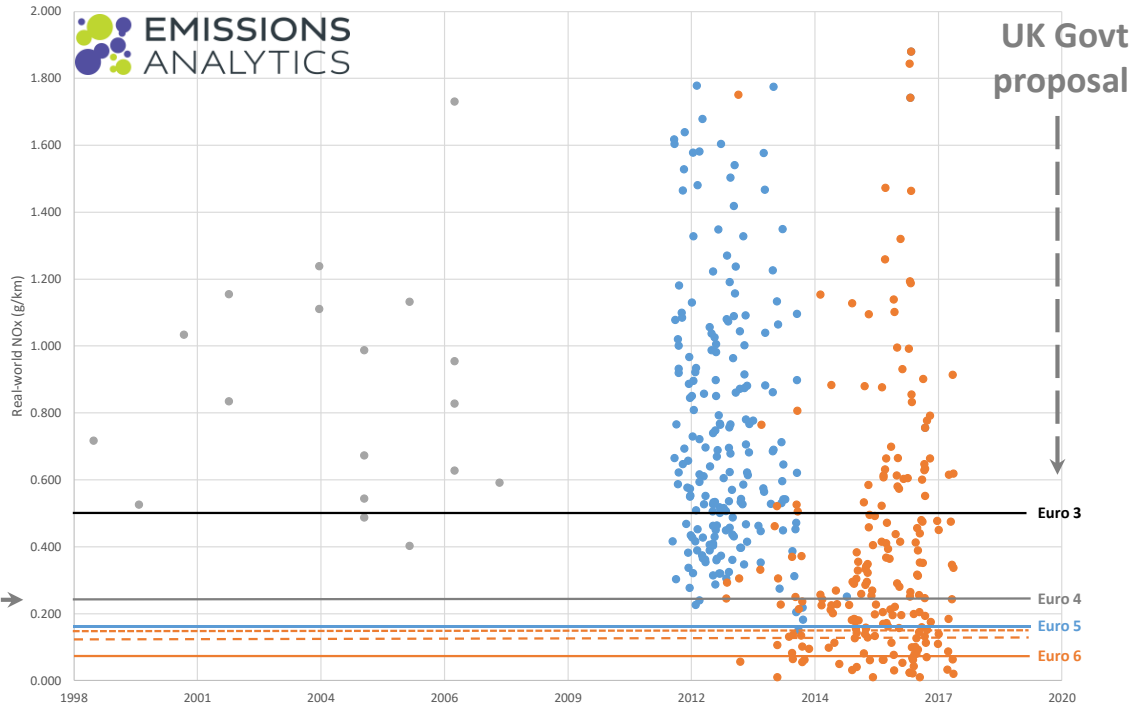
"This work is a good attempt to decipher a set of air quality regulations and very complex test results, and present them to drivers wishing to buy a clean car. It should also be mandatory reading for manufacturers since it shows that diesel cars can have a good score under real driving conditions. "

Steve Gooding, Director, RAC Foundation

Policy proposal

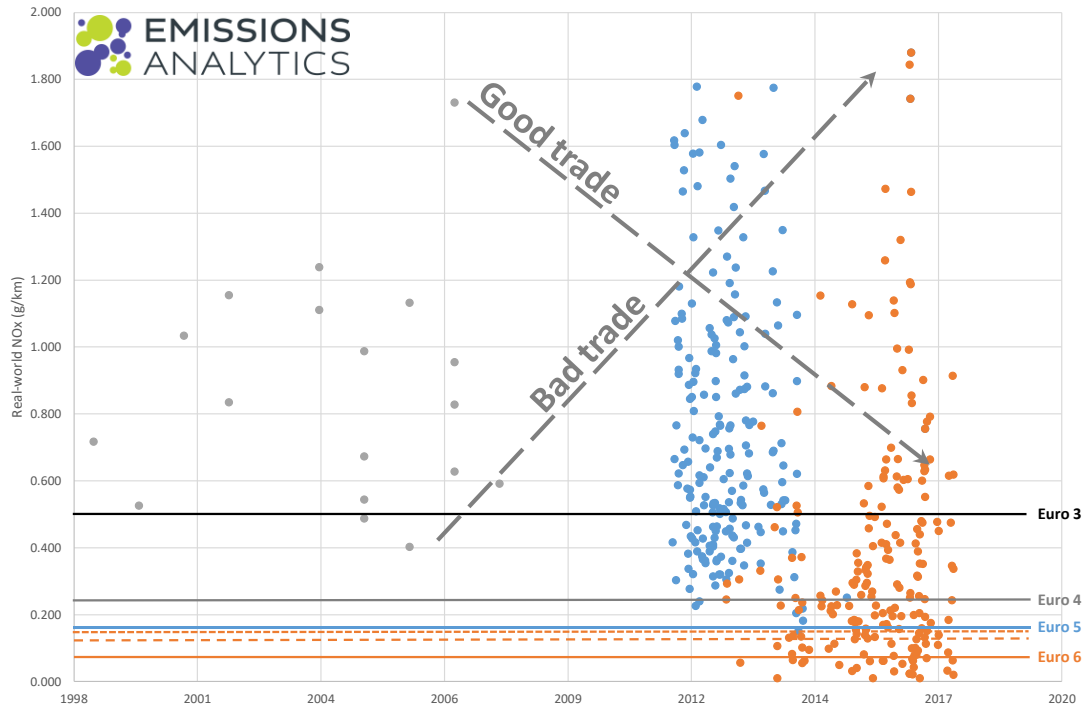
- Restrict diesels with EQUA Aq 'E' rating or worse
- Real-world NO_x needs to be less than 250 mg/km (Euro 4 limit)
- Affects ~90 of Euro 5 diesels, ~50% Euro 6
- 87% reduction in total emissions
- Quick and fair

EA proposal →



Retrofits and scrappage

- Is efficient only to fix dirty cars, in such a way that makes them clean
- Worst vehicles are hardest to software retrofit, as have no SCR
- Typical 20% benefit from software retrofit – not enough
- Scrappage can only work if trades are beneficial



Local actions

- Access restrictions
- Urban incentives – car parking
- Number plate recognition
- Fleet procurement
- Corporate social responsibility



energy[®]
saving
trust



Consumer communications



- Mayor of London
- Cleaner Vehicle Checker
- Launch October 2017
- Complement to T-Charge and proposed ULEZ
- New A+ rating if 60 mg/km met

Make: - Any -
Model: - Any -
Model year: - Any -
Fuel: - Any -
Transmission: - Any -
Body style: - Any -
Engine size: - Any -
Reset

Click on any row in the table below to get more information about a vehicle.

Make	Model	Model year	Fuel	Transmission	Body style	Engine size	Power	NO _x rating	Official CO ₂ emissions
Alfa Romeo	4C	2017	Petrol	Automatic	Coupe	1.7L	240BHP	A+	157 g/km
Alfa Romeo	4C	2017	Petrol	Automatic	Convertible	1.7L	240BHP	A+	161 g/km
Alfa Romeo	4C	2016	Petrol	Automatic	Coupe	1.7L	240BHP	A+	157 g/km

Optimal response?



- Diesel could endure for ~10 years to buy time, so long as you discriminate
 - Progressive transition to variants of hybrids over 10-20 years
 - Pending deeper electrification 20+ years for CO₂ reduction (not necessarily BEVs)
 - Gives time for market to adjust
 - Minimises economic and social distributive effects
 - Cost falls more on those manufacturers who produced dirtier cars, rather than owners!
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- Anti-diesel narrative and battery evangelism obscuring the right policy response
 - allowAIR.org



Nick Molden, Chief Executive Officer

nick@emissionsanalytics.com

+44 (0) 20 7193 0489

+44 (0) 7765 105902