

TRANSITION Network launch event
Road transport emissions overview

Nick Molden
24 November 2020

Our Belief

When it comes to the pursuit for improved air quality, we believe in the power of clarity, transparency and integrity. With real-world data we can meet emissions challenges – instilling trust and confidence in our industry partners and public.

It's with our commitment and independence we are able to make a significant contribution toward positive change and to achieve enduring results.

Introduction

- Founded in 2011
- Headquartered in the UK
- Operations in UK, Germany, USA and South Korea
- Independent testing house specialising in real-world emissions testing
- Over 2,500 vehicles/ machines PEMS tested across passenger, commercial and off-road
- Largest commercially available database of real-world emissions data
- We work with regulators, OEMs, Tier 1/2 suppliers, fuel and chemical companies, fleets, consumer media
- Led EU standardisation groups on tailpipe emissions and cabin air quality

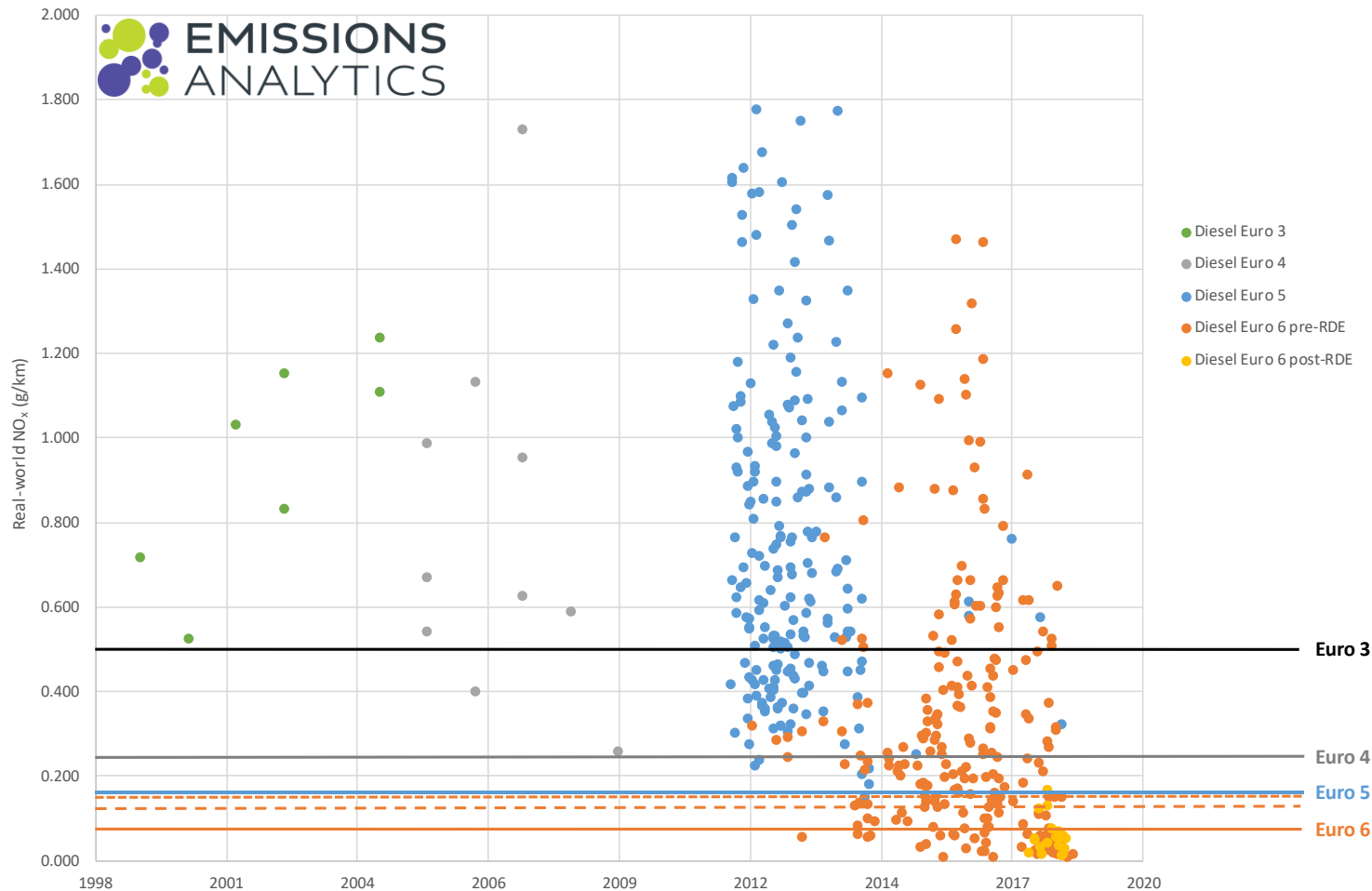




Air quality

ASSURED | INDEPENDENT | RESPONSIVE

Nitrogen oxides between Euro stages



- Limited differentiation between Euro 3, 4, 5 and 6 diesels
- Almost all vehicles are above the regulatory limit in real-world
- Until you get to Euro 6d-temp: 2017-

NO _x mg/km	Pre-RDE	Post-RDE	Euro 6 limit	Post-RDE CF
Diesel	347	49	80	0.61
Diesel Hybrid	53	33	80	0.42
Diesel Plug-in Hybrid	n/a	4	80	0.05
Gasoline	32	11	60	0.18
Gasoline Hybrid	7	3	60	0.05
Gasoline Plug-in Hybrid	27	2	60	0.03

Nitrogen dioxide trends

NO ₂ , mg/km	Pre-RDE	Post-RDE
Diesel	120	10
Diesel Hybrid	41	6
Diesel Plug-in Hybrid	n/a	2
Gasoline	3	1
Gasoline Hybrid	1	0
Gasoline Plug-in Hybrid	6	0

- Currently unregulated separately from NO_x
- NO₂-fraction down from 34% pre-RDE to 27% afterwards
- Comfortable compliance with potential 20 mg/km limit

Particle number trends

PN, # x 10 ¹¹	Pre-RDE	Post-RDE	Euro 6 limit	Post-RDE CF
Diesel	0.640	0.106	6.000	0.02
Diesel Hybrid	1.117	0.021	6.000	0.00
Diesel Plug-in Hybrid	n/a	0.380	6.000	0.06
Gasoline	1.693	0.974	6.000	0.16
Gasoline Hybrid	0.267	0.630	6.000	0.11
Gasoline Plug-in Hybrid	4.943	0.000	6.000	0.00

- Very good compliance for RDE vehicles of all types
- Pre-RDE vehicles were also below regulated limit
- Plug-in hybrids can have weakness due to cold exhaust and vehicle mass



AIR Index

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European standardised method

- CWA17379 published in 2019
- Voluntary European standard procedure
- Under Comité Européen de Normalisation
- Initiated by Emissions Analytics in November 2017, chaired by Nick Molden
- Wide participation from manufacturers, ACEA, academics, consumers and cities

CEN/WS 90

Date: 2018-12

TC WI

CEN/TC

Secretariat: UNI

General guideline on real drive test methodology for compiling comparable emission data

Einführendes Element — Haupt-Element — Ergänzendes Element

Élément introductif — Élément central — Élément complémentaire

AIR Index

- Discriminates between high and low emitters, irrespective of Euro class
- Can be used for original vehicle and retrofit accreditation

How clean is your car?

Search the AIR Index and find out.

Car Search

Make | Select a make
Model | Select a model
Year | Select a year
Euro | Select a euro stage

Class | Select a body style
Engine | Select an engine size
Rating | Urban NOx

A B C D E

Ratings Explained

Quick Search

Start search

Reset Search Search

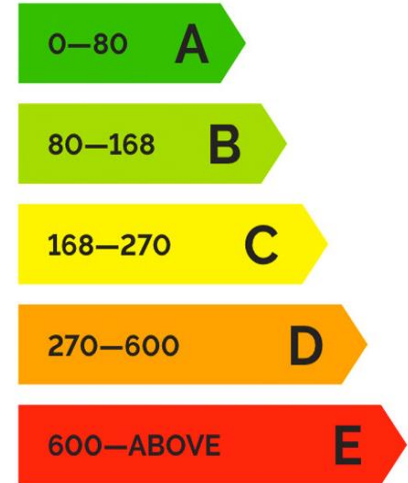
329 RESULTS
Use Pin to compare models

Pin	MAKE & MODEL	FUEL	YEAR	ENGINE	BHP	EURO	REAL CO2	URBAN NOx
● >	Renault Clio Hatchback, Automatic	Petrol	2020	999cc	99	Euro 6 RDE		C A
● >	Renault Clio	Petrol	2020	999cc	99	Euro 6 RDE		C A

Rating system



BEST



WORST

Combined CO ₂ Emissions Range	AIR Index CO ₂ Rating	What does the rating	URBAN NO _x mg/km
0 - 95 g/km (EU average target 2021 for cars is 95 g/km)	A	Low levels of CO ₂ emissions	
95 - 130 g/km (EU average target 2021 for cars is 130 g/km)	B	Moderate levels of CO ₂ emissions	
130 - 180 g/km (EU average target 2021 for cars is 147 g/km)	C	High levels of CO ₂ emissions	
180 - 230 g/km	D	Very high levels of CO ₂ emissions	
230+ g/km	E	Extreme levels of CO ₂ emissions	

Recent car results

Make	Model	Year	Fuel Type	Euro Standard	AIR Index NO _x Rating	AIR Index CO ₂ Rating
Renault	Clio 1.5 90PS	2013	Diesel	Euro 6	E	B
Renault	Clio 1.5 90PS	2018	Diesel	Euro 6	B	B
Renault	Clio 1.0 100PS	2019	Gasoline	Euro 6	A	C
Kia	Sportage 1.6 136PS MHEV	2020	Diesel	Euro 6	A	C
Kia	Sportage 1.6 116PS	2019	Diesel	Euro 6	A	C
Kia	Sportage 1.6 132PS	2020	Gasoline	Euro 6	A	D
Ford	Kuga 2.0 150PS	2016	Diesel	Euro 6	D	C
Ford	Kuga 2.0 150PS	2019	Diesel	Euro 6	C	C

Recent pre-RDE van results

Make	Model	Year	Fuel Type	Euro Standard	AIR Index NO _x Rating	AIR Index CO ₂ Rating
Volkswagen	Crafter CR35 LWB High Roof 2.0	2019	Diesel	Euro 6	A	E
Peugeot	Partner Asphalt 1.6	2019	Diesel	Euro 6	A	C
Volkswagen	Transporter T30 Highline TDI Bluemotion 2.0	2018	Diesel	Euro 6	B	D
Mercedes	Vito CDI 114 LWB 2.1	2017	Diesel	Euro 6	B	D
Volkswagen	Caddy C20 Highline TDI 2.0	2018	Diesel	Euro 6	C	C
Ford	Transit Custom 2.0	2018	Diesel	Euro 6	C	D
Mercedes	Vito CDI 111 LWB 1.6 (post-recall)	2017	Diesel	Euro 6	D	D
Vauxhall/ Opel	Vivaro CDTI 2900 1.6	2019	Diesel	Euro 6	D	D
Citroen	Relay L3h2 Enterprise BlueHDi 2.0	2018	Diesel	Euro 6	D	E
Mercedes	Citan 109 Dualiner 1.5	2019	Diesel	Euro 6	E	C

Summary

- Regulated tailpipe emissions have been dramatically reduced
- Cleaning up the existing fleet, including pre-RDE Euro 6, is critical for air quality
- New tailpipe pollutants must be considered, including VOCs
- And unregulated non-exhaust emissions, especially tyres

Thank you.

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Assured

Emissions testing in real-world conditions brings challenges that experience anticipates and expertise overcomes. We deliver.

Independent

Objectivity and candour are the driving forces in all our work, so you know the facts.

Responsive

We're fast on our feet so we can conduct emissions testing when and where we're needed.