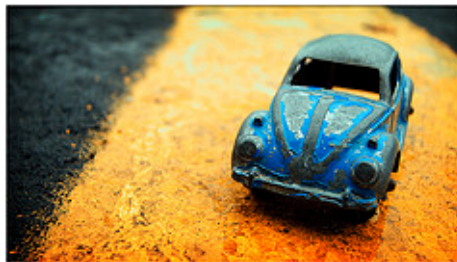


# TIMELINE: IS VOLKSWAGEN'S 'BUG' AN EU FEATURE? [UPDATED]



[photo: macwagen via Flickr]

Reports this last week that Volkswagen deployed “defeat devices” – software designed to cheat diesel passenger vehicle emissions controls tests – revealed more than an automobile manufacturing group run amok. One might suspect European Union’s emissions governance after looking at a timeline of events.

NOTE: This timeline is in progress and is subject to updating as new items are identified. [Update 7:00 pm EDT – note added about translation, and note added to citation [4]]

– 1970 –

February 1970 – The Council of the European Communities issued the *Council Directive 70/156/EEC*, which established a mutual baseline for technical specifications of vehicles sold across the member states. This included 3.2.20. *Measures taken against air pollution.*

– 1992 –

July 1992 – The first standard for passenger vehicle emissions, Euro 1 through 6, is implemented. Level Euro 1 for new diesel-fueled vehicles limited emissions of carbon monoxide

(CO) to 2.72 grams per kilometer, with no initial limit on nitrous oxides (NOx) alone, but a combined limit of hydrocarbon+nitrous oxides (HC+NOx) at 0.97 g/km.

– 2004 – 2009 –

Dates Vary – Vehicle manufacturers phased in the remaining Euro 4 through 6 emissions standards.

19 October 2004 – European Environment Agency published a press release, Poor European test standards understate air pollution from cars, which summarized the problem:

Inadequate test standards are underestimating emissions of harmful air pollutants from new cars and evidence indicates that many diesel car owners are making things worse by modifying their engines to increase power, the European Environment Agency warned today.

No specific orders or directions were offered to resolve the problem with emissions test standards.

– 2007 –

(*Month TBD*) – Volkswagen subsidiary Audi launched its “Truth in Engineering” ad campaign. This tagline remains in use to present.

– 2008 –

(*Month TBD*) – VW announced its “Clean Diesel” (TDI model) technology, and began selling it in 4-cylinder diesel Jetta, Beetle, Audi A3, and Golf cars to the US market.

(*Month TBD*) – *Green Car Journal* named VW’s 2009 Jetta TDI “Green Car of the Year.”

– 2009 –

September 2009 – European emission standard Euro 5a for diesel passenger vehicles enacted, limiting CO to 0.50 grams per kilometer, NOx to 0.180 g/km , and HC+NOx to 0.230 g/km.

These levels are a reduction from Euro 4 standard implemented in January 2005 (CO=0.05,

NOx=0.25, HC+NOx=0.30).

– 2011 –

September 2011 – EU emission standard Euro 5b phased in, using same levels as 5a, but applying a specific particulate measure of 6×10(11th).

December 2011 – Report in *Atmospheric Environment* [1] says,

...The lack of a decrease in the concentration of NOx and in particular NO2 is of concern given European air quality standards are set in law. The lack of decrease in the concentration of NOx and NO2 is also in clear disagreement with emission inventory estimates and projections. ... We find that there are significant discrepancies between current UK/European estimates of NOx emissions and those derived from the remote sensing data for several important classes of vehicle. In the case of light duty diesel vehicles it is found that NOx emissions have changed little over 20 years or so over a period when the proportion of directly emitted NO2 has increased substantially. For diesel cars it is found that absolute emissions of NOx are higher across all legislative classes than suggested by UK and other European emission inventories. Moreover, the analysis shows that more recent technology diesel cars (Euro 3–5) have clear increasing NOx emissions as a function of Vehicle Specific Power, which is absent for older technology vehicles. ... [*emphasis mine*]

– 2012 –

April 2012 – The International Council on Clean Transportation (ICCT), an independent nonprofit, published a report, *Discrepancies between type-approval and real-world fuel consumption and CO2 values in 2001-2011 European passenger cars*. Its summary is rather benign, though it does suggest there are discrepancies in emissions reporting:

This paper compares fuel consumption / CO2 values of passenger cars from different sources and aims at quantifying the discrepancy between laboratory type-approval values and real-world values, including a retrospective analysis for the years 2001-2011 to determine if the gap between the two datasets has increased over time. Potential explanations for the discrepancies found are discussed and possible practical solutions for the future outlined.

The report expressed concerns about consumers' perceptions that fuel efficiency does not match figures reported at time of sale, and that consumers might resist emissions controls because efficiency does not yield an offset in fuel savings.

– 2013 –

November 2013 – An op-ed by Christian Wüst in Der Spiegel, Artists of the Dynamometer (Artisten des Prüfstands), criticized automakers for failing to install particulate filters costing an estimated 100 euros per each gasoline-powered vehicle. Though Wüst had training as a mechanic as well as education in journalism, he may have been fooled by reports on diesel-powered vehicle emissions tests, with regard to soot-particulate filters.

... Die schon beim Diesel bewährten Filter hingegen könnten all diese Trickserei überflüssig machen. Sie fangen mehr als 99 Prozent der Partikel ein. Selbst auf Messfahrt bei Vollgas bliebe ein Benzinauto mit diesem Gerät weit unter dem zulässigen Grenzwert. ...

*[Translation: The already proven diesel filter on the other hand could make all this tricks\* superfluous. They capture more than 99 percent of the particles. Even on test runs at full throttle, a gasoline car with this device is far below the allowable limit. ...]*

(Month TBD) – West Virginia University’s Center for Alternative Fuels, Engines & Emissions (CAFEE) researchers are commissioned by the ICCT to test Volkswagen diesel passenger car emissions.

– 2014 –

May 2014 – WVU’s CAFEE researchers issue a Final Report [2] to ICCT.

(Month TBD) – VW began selling “Clean Diesel” Passats in the US market.

September 2014 – Emissions standard Euro 6 implemented, with CO limit unchanged at 0.50 g/km; NOX 0.080, HC+NOX 0.170, and particulate unchanged at 6×10(11th).

28 September 2014 – ICCT published a report [3] updating previous work and extending “an analysis of the gap between official and real-world fuel consumption and CO<sub>2</sub> emissions for passenger cars in Europe, which reached 38% in 2013 and continues to grow at an accelerated pace.” The report calls for implementation of “new Worldwide Harmonized Light Vehicles Test Procedure (WLTP), a more appropriate test that will produce more realistic type-approval values.”

11 October 2014 – ICCT published another report [4] – in summary:

Documents the discrepancy between type-approval and real-world NOx emissions from new diesel passenger cars. On average, on-road NOx emissions from the vehicles tested for this analysis were about seven times higher than the limits set by the Euro 6 standard. [*emphasis mine*]

– 2015 –

(Month TBD) – VW’s 2015 Passat TDI named by Cars.com the “Eco-friendly Car of the Year.”

18 September 2015 – U.S. Environmental Protection Agency issued to Volkswagen AG, Audi

AG, and Volkswagen Group of America, Inc., a Notice of Violation (NOV) of the Clean Air Act, alleging:

...four-cylinder Volkswagen and Audi diesel cars from model years 2009-2015 include software that circumvents EPA emissions standards for certain air pollutants. California is separately issuing an In-Use Compliance letter to Volkswagen, and EPA and the California Air Resources Board (CARB) have both initiated investigations based on Volkswagen's alleged actions. ...

20 September 2015 – VW halted sales of some 4-cylinder diesel-powered vehicles in the U.S.

22 September 2015 – VW admitted that 11 million vehicles had been fitted with the “defeat device” software to thwart accurate testing of emissions.

23 September 2015 – VW's CEO Martin Winterkorn resigned; law firm Kirkland & Ellis, which represented BP after the Deepwater Horizon disaster in 2010, was retained by VW.

(If you have a point you believe is critical to this timeline, feel free to share it in comments for consideration.)

Initial Conclusion:

On first pass, it appears that the EU did not have adequate mechanisms in place to investigate the disparities between actual emissions and test emission levels reported over the course of the last handful of years. Until the U.S. regulatory body took action, the EU did not appear to respond at all beyond press release(s).

It's not clear what happened between the time ICCT received their commissioned report from WVU-CAFEE and the U.S. EPA gave VW its NOV. This gap in time may have been the normal bureaucratic lag from reporting a problem through the federal government's validation of

the problem – but this gap meant 16 months of additional air pollution and more new vehicles sold with the cheating software on board.

The lack of prompt, effective action despite years of evidence mirrors the EU's response to the refugee crisis. Both issues are at complete odds with the EU's response to Greece's economic crisis. This begs the question whether the EU has outsourced pollution monitoring to the U.S., and whether the EU itself has real function beyond policing economic policy and banking legislation.

We might ask if the disparity in EU reaction to different crises a bug or a feature, or is the EU merely asleep at the wheel? Whatever the case, thousands of U.S. and EU citizens have sickened or died prematurely because of exposure to air pollution, and climate change has only grown worse, setting up conditions for more crises ahead.

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Note:

\* Translation here in question. By *all diese Trickerei überflüssig machen*, did Wüst mean:

- all these tricks are made superfluous, or
- all this trickery is superfluous

In either case, you get the gist, I'm sure.

Citations:

[1] Carslaw, D., Beevers, S., Tate, J., Westmoreland, E., & Williams, M. (2011). Recent evidence concerning higher NO<sub>x</sub> emissions from passenger cars and light duty vehicles. *Atmospheric Environment*, 45(39), 7053-7063.

[2] Thompson, Dr. Gregory J., Daniel K. Carder, Marc C. Besch, Arvind Thiruvengadam, and Hemanth K. Kappanna. In-Use Emissions Testing of Light-Duty Diesel Vehicles in the United States. Report (PDF), May 15, 2014.

[3] Mock, Peter, and Uwe Tietge, Vicente Franco, John German, Anup Bandivadekar (ICCT), Norbert Ligterink (TNO), Udo Lambrecht (IFEU), Jörg

Kühlwein (KISU), and Iddo Riemersma (Sidekick Project Support). From Laboratory to Road: A 2014 Update. *The International Council on Clean Transportation*. 28 Sept. 2014.

[4] Franco, Vicente, and Francisco Posada Sánchez, John German, Peter Mock. Real-world exhaust emissions from modern diesel cars. *The International Council on Clean Transportation*. 11 Oct. 2014. [EDITED: Note this is PART 1: AGGREGATED RESULTS of the entire study; PART 2: DETAILED RESULTS has been requested as it is not available online. ]