Thoughts of an angry Volkswagen diesel owner

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(For the full issue, go to www.sustainable-blewbury.org.uk/newsletter_14.pdf *)*

In 2011 Claire and I bought a VW Golf diesel. It was the sort of car John Richards and I had recommended on the Blewbury Energy Initiative website: www.blewbury.co.uk/energy/cars.htm

We were, and of course still are, concerned about carbon dioxide (CO_2) emissions. Modern diesels are no longer as noisy, slow or dirty as they used to be, and their low-ish fuel consumption means they also have low-ish carbon emissions. Diesels now have more than half of the new car market in the EU due to expensive fuel and taxes based on CO_2 emissions.

The other options available in 2011 didn't seem convincing to people living (like us) in a rural area. Petrol engines use more fuel and emit more CO_2 than a similar-size diesel. Petrol hybrids claim fuel consumption similar to diesel but do worse for rural driving, especially on motorways. Plug-in hybrids weren't widely available then. Electric cars have very limited range, there aren't enough recharging stations and recharging takes too long.

We knew that the 'official' EU figures for fuel consumption (and hence CO_2) were not realistic, but that applies to all sorts of cars. I didn't expect the Golf to achieve the claimed 67 mpg and it never has, but its 54 mpg overall, including short journeys and cold starts, is the best we've ever had. Realistic compilations of fuel consumption (e.g. Which? or HonestJohn) show typical discrepancies for most cars of 10–25% compared to the 'official' figures.

What about pollution? The main issue then was soot, which is widely considered to be carcinogenic. However, by 2011 the new Euro 5 standard had brought in soot filters, and I haven't seen any serious reports saying they are not effective. So in 2011 a modern, efficient diesel seemed like a good stopgap while waiting for a better solution.

Diesel engines do emit much more nitrogen oxides (NO and NO_2, together referred to as NO_x), than petrol. Since 2011, we have learned that NO_x is even more harmful to the respiratory system than had been thought. But the EU NO_x emission limit has come down rapidly – see the table below. By Euro 5 it was much reduced, and in the current Euro 6 standard it is very close to modern petrol engines.

European engine emission standards

*mg/km = milligrams per kilometre

Euro standard	Date approved for new cars	Max amount of NOx for diesel engine	Max amount of NOx for petrol engine
Euro 1	31 December 1992	780mg/km*	490mg/km
Euro 2	1 January 1997	730mg/km	250mg/km
Euro 3	1 January 2000	500mg/km	150mg/km
Euro 4	1 January 2006	250mg/km	80mg/km
Euro 5	1 January 2011	180mg/km	60mg/km
Euro 6	1 September 2015	80mg/km	60mg/km

However, due to lobbying by the car makers, the EU test for NO_x emissions is not realistic. In the US, where for historic reasons few diesel cars are sold, both the limits and the test are much tougher.

Several years ago VW started a big push to sell its 'clean diesels' in the US. The scandal broke when tests there showed that in normal use VW diesels emitted vastly more NO_x than in the US (and EU) test results – not just the 10–25% typical of the fuel consumption/CO_2 tests, but by a *factor* of 10 or more times higher. It was deliberate fraud by VW: the engine software had been rigged to turn NO_x controls on for the tests and off in normal use. Why?

NO_x pollution is difficult to deal with. Modern 'clean' buses and lorries do it by injecting a urea/water mixture from a tank (which has to be refilled periodically) into the exhaust. Urea sets off a chemical reaction that converts NO_x into nitrogen, oxygen, water and small amounts of carbon dioxide. Many diesel cars have now adopted that system. But initially VW chose to use a different method called a 'lean NO_x trap' in the exhaust because it is simpler, smaller, cheaper and doesn't need to have litres of fluid topped up every few thousand miles. However, the 'trap' didn't work well and also has adverse effects on engine power and fuel consumption. So VW resorted to cheating.

The result for VW is catastrophic: 11 million cars, 1.2 million of them in the UK (VW, Audi, Skoda and Seat) need modifications, mostly to the software, and 400,000 of them (cars with 1.6 litre engines) need modifications. The effects on fuel consumption and performance aren't known yet. In addition, fines from governments and lawsuits for compensation from angry owners are likely.

The cars affected have Euro 5 certified engines; VW claims that their current Euro 6 models are not affected and comply with the EU standard. Some, but not all, current models now use urea injection.

Other makes of car are now being checked. Very few seem to satisfy the NO_x limits, with most emitting several times more than they should, though not as much as VW. The much higher than expected level of NO_x emitted by supposedly clean diesels is very likely a factor in the persistently high NO_x pollution in European cities and towns.

The EU tests for fuel consumption, CO_2 and NO_x emissions clearly need to be made more realistic. However, some major car manufacturers have lobbied to delay and to water them down, with strong support from the UK, French and German governments.

Diesel has relatively low CO_2 emissions. If NO_x emissions can be brought down in a sensible way to really comply with Euro 6, then diesel might still be an option as a 'green-ish' car solution until electric cars become more practical. But although we like our Golf, Claire and I won't be buying another VW.