



Transport Select Committee

Oral evidence: vehicle type approval, HC 622

14 December 2015

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Members present: Mrs Louise Ellman (Chair), Robert Flello, Stewart Malcolm McDonald, Mark Menzies, Huw Merriman, Will Quince, Iain Stewart, Martin Vickers

Questions 1-38

Examination of Witnesses

Witnesses: **Nick Molden**, Chief Executive Officer, Emissions Analytics, **Dr James Tate**, Institute for Transport Studies, Leeds University, and **Greg Archer**, Clean Vehicles Manager, Transport and Environment, gave evidence.

Q1 Chair: Good afternoon and welcome to the Transport Select Committee. I am sorry to have changed the timing for this meeting; there were unforeseen circumstances and I hope you understand. Thank you very much for being here at this time. Could you please give us your name, position and organisation for our record?

Dr Tate: I am Dr James Tate. I am a lecturer at the Institute for Transport Studies at the University of Leeds.

Greg Archer: I am Greg Archer. I am the director of clean vehicles for the environmental organisation Transport and Environment, based in Brussels.

Nick Molden: I am Nick Molden, chief executive of Emissions Analytics.

Q2 Chair: Thank you. What is wrong with the new European drive cycle?

Dr Tate: It is quite surprising how there can be a test that is so unrepresentative of real-world driving. One of the main issues with the drive-cycle test is the speed profile; it is just a series of straight lines and does not change, as real driving does, so engines can be mapped if only a very few parts of their performance operate in a clean manner. In relation to the preparation of vehicles for the test, while there are pages and pages of legislation, there is some flexibility in how cars can be prepared for tests that are unrepresentative of real driving; for example, there are tyres, lubricants and fluids that can be used. I am increasingly concerned about the emission controls in those vehicles. One of the technologies is called lean NOx traps. If the trap is empty at the start of the test, it can

collate some of the pollutants, but in real driving it can quite often become full and effectively emissions spill over.

The test is very prescribed. The manufacturers know from start to finish the temperature and speed profile they have to follow. It is very prescribed; there is no randomised element, so they are able to optimise a car for that very prescribed test. As we move towards type approval, looking at real driving emissions, there is a real opportunity to bring more transparency into the test. As a researcher in this area for over 15 years, I have not seen any data from the motor industry or the VCA. If we are doing on-the-road real driving emission testing, there is a real opportunity for that information to be made more transparent so that people can check it. It would also be a powerful resource for research and policy making.

Q3 Chair: We will come back to the new test soon. I just want your views on the current one. Mr Archer, do you want to change any of that or add to any of those points? Do you agree with that?

Greg Archer: I agree with what James said. I would argue that we are testing the wrong vehicles in the wrong ways, using organisations that are not independent for the task. What I mean is that the vehicles that are tested are specially prepared for the test. The industry gives them a name—golden vehicles. They are specially prepared in many different ways in order to produce artificially low test results. To give you an example, when we tested the CO₂ emissions of six vehicles, using exactly the same test as the industry, we got results that were 19% to 27% higher than the official test results—it was exactly the same test—simply because we did not prepare the vehicles in all those special ways to get the results.

Q4 Chair: Is there a lot of evidence that manufacturers are preparing vehicles?

Greg Archer: Absolutely. We know it as a matter of fact. At the moment, a process is going on in the European Commission to revise the test procedure. When the test procedure is changed, the targets that the companies have been set also need to be changed. The industry, in those groups, is arguing in favour of weakening the targets, because they will not be allowed to use those flexibilities in the test procedure in the future; there is no doubt about it.

Q5 Chair: Can you tell us what the flexibilities are?

Greg Archer: They are things like charging the battery before the test is carried out so that the alternator does not have to work during the test. They test the car with special tyres on a special, very slick, test track; in some instances it is a sloped test track, which the rules allow. They make the car extra light during the test. They set up the rolling road in a way that makes it easier for the car to turn the cylinder of the chassis dynamometer. There are about 20 different ways that manufacturers deal with these things.

Q6 Chair: How do you know that this is happening?

Greg Archer: We know it because there have been reports produced by the European Commission. There have been studies undertaken. Whistleblowers have given evidence directly to us. We have produced a series of reports on the subject called “Mind the Gap”.

A lot of our evidence comes from people who used to work in the industry and are now retired, or who still work in the industry but feel that what the industry is doing is simply wrong.

Q7 Chair: Why do you think that no action has been taken if this has been documented? How far does it go back in terms of documenting the problems?

Greg Archer: The problems with the NO_x emission tests were well known from 2000 onwards. There were suspicions even before 2000 in the Department for the Environment at that time; I was seconded there for a period. On CO₂, the problem has been getting worse and worse year on year. We have seen the gap between the test results and the real-world performance of the vehicles increasing. Going back to 2000, the gap was just 8% on average; in 2014, it was 40% on average. In relation to the growing gap between how a car performs in a test and how it performs on the road, virtually all the difference arises because the manufacturers are skilfully using their engineers to produce artificially lower test results. Most of the time they do it within the letter of the regulation, because the testing procedures are so weak that it enables them to do anything they like. The authorities that oversee the tests are paid for by the manufacturers. The bodies that do the tests are paid for by the manufacturers. The tests are done in the laboratories of the manufacturers. There is a complete lack of independence and oversight in the system, and that is the third problem. The cars are golden vehicles; the tests, as James described, are out of date; and the people overseeing the test do not do a thorough job because they are being paid by the manufacturers.

Q8 Chair: Mr Molden, do you agree with those points? Is there anything you can add to them?

Nick Molden: Yes, I agree with all the points from both James and Greg. We do independent testing. When we run an NEDC cycle on the real road, we typically get between one and a half and twice the NO_x levels compared with the official test. If we run a real-world test cycle, we find on average that the NO_x levels are four times the official level. That is the scale we see. The reasons for the one and a half times to twice in an NEDC done on a real road are those that Greg just described in terms of the laxities in the current regulations. The difference from the real world, taking it up to four times, is due to the unrepresentative cycle. The acceleration rates in the NEDC are very gentle, to the point that it is quite difficult for a normal person to drive. That is why you have to have specialist drivers. You also do not have effects from air-conditioning use or other auxiliary systems. Many features of normal driving on current production cars are not reflected in the NEDC cycle. That is how you get that range in the real world of four times on the NO_x side and 31% on the CO₂ side, according to our tests.

Q9 Chair: The way that you have all described this is that there are problems built into the procedure, and perhaps undue influence by manufacturers—I think that is what Mr Archer was implying. How has this continued? Is it an overt conspiracy or is it to do with laxity in the system and too many inside interests being involved?

Greg Archer: I do not think it is an overt conspiracy. It has come about from the fact that there used to be a testing organisation in every member state of Europe. Back in 2007 the way cars were tested was brought together under one European testing framework, but that

framework was drafted in a way that simply was not rigorous enough. It said things like the type approval authority—the people who check that the car is legal—“may” do this and “could” do that. In reality what happened was that the approval authorities around Europe adopted very minimal implementation of the testing procedures because, frankly, it suited them to do so. They are paid for by the vehicle manufacturers. They are in competition with one another for the work of approving vehicles. Manufacturers go type approval shopping around Europe to get the best deal they can from a type approval authority somewhere in Europe, and that competition has driven down standards.

We are expecting imminently from the European Commission a new type approval framework directive that I hope and believe will radically improve the system of testing in Europe and make it more rigorous, along with new tests such as real-world driving emissions tests and the new WLTP—world light duty test—procedure for CO₂ emissions.

Q10 Robert Flello: I have two questions. If I may, I will summarise first to set out the ground. You are saying that all manufacturers will get the best variant of the vehicle that they are trying to get tested. They will all find the best testing regime within the framework that can test it, and those tests may or may not be out of date but they are all working to the same basic standards. If you are looking at the results of those tests from the point of view that “I’ll never achieve that when I’m driving, but I know whether car A is performing better than car B or car C,” surely it does the job.

Greg Archer: No, it doesn’t, because some manufacturers are much better at manipulating the tests than others. If you look at the CO₂ figures, some manufacturers have a much bigger gap between their test and real-world performance than others.

Q11 Robert Flello: Leave the real world to the side for a second; that is my second major question. You say that some manufacturers are better at manipulating the tests relative to each other.

Greg Archer: Yes.

Q12 Robert Flello: How and why are they able to do that?

Greg Archer: The honest answer is that some manufacturers started to deploy many more techniques to bring down the official CO₂ figures earlier than others. We have been undertaking a series of reports over a number of years. We know, for example, that when BMW launched efficient dynamics, in 2007 or something like that, there was suddenly a huge jump in the gap between its test results and its real-world performance, which other manufacturers were—

Robert Flello: I really want to park the real world—

Q13 Chair: Can you tell us which manufacturers are most at fault in this?

Greg Archer: Based on our figures for CO₂, the manufacturers with the biggest gap at the moment are Mercedes and Peugeot Citroën.

Q14 Robert Flello: Is that on a like-for-like comparison?

Greg Archer: Yes.

Q15 Robert Ffello: That is the value of the lab version. It is a like-for-like comparison. My second question is that when you start talking about the real world, it is completely different. The real world for the car I have just driven down from Stoke-on-Trent is going to be completely different from exactly the same model, the same year and same production run, driven by somebody five stone lighter than me in a different country where the humidity is different and so on. The real world is completely different depending on where you test and who is testing. What is the real world?

Nick Molden: It is important to define what the real world is. We do a real-world cycle, but we do it in the same way every time. It is the same route with the same drivers, and trying to include weight in the car.

Q16 Robert Ffello: Is it the same air pressure?

Nick Molden: Within certain parameters. We do not do it in extreme ambient conditions either. It is the same added weight, the same drivers and the same use of on-board systems. It is as close as is possible in real on-road testing to getting the same test every time. We find that, on the NO_x side, the difference is between some vehicles that meet the NO_x regulations in real-world driving and the worst at more than 10 times over. On the CO₂ side, the average is 31% above. The very best just about meet the regulation but the worst are about 60% over, so there is huge variation. In my view, it is partly to do with different strategies adopted by the manufacturers, but it is also that different technologies lend themselves to being optimised more than others. Very small vehicles with very small engines tend to show much bigger differences between the NEDC cycle in the laboratory, which is a very gentle cycle with no weight in the car, and a three-litre engine, which would tend to show a much smaller gap. By the nature of the car, you do not get big variations. I can say with confidence that it is not as if everyone is out by the same proportion and therefore the current system still affords fair comparability. I do not believe that and it is not borne out by our data.

Q17 Chair: Dr Tate, do you want to comment?

Dr Tate: Why are different manufacturers deploying these strategies? A lot of it is around the drivers. The average CO₂ per car is falling year on year. It is also the company car tax landscape. The larger and more powerful cars are where a lot of the profit lies. Getting the CO₂ figures as low as possible means that a customer with a budget can select a larger, more powerful and more expensive vehicle at the same tax price point. That is a big driver for this. Mercedes, for example, has a large company car turnover, and it is more important for that company.

Greg Archer: May I very briefly respond?

Chair: Please be very brief because we have limited time and we want to get on to some of the other questions.

Greg Archer: While two real-world drives with two drivers will be different, if you look at very large datasets—for example, the 600,000 drivers that we look at with the ICCT—you can get a representative value for a typical real-world test. That is what I was referring to.

Q18 Iain Stewart: Is it fair to say that the fact that a manufacturer can seek approval in any single EU member state, and that certification is then applicable across the whole union, means that the system is only as strong as the weakest link? Is there a particular country whose testing regime we ought to be concerned about, or is it a problem across the continent?

Greg Archer: It is certainly true that the testing system is only as good as its weakest link. There is almost no information about how different type approval authorities are performing around Europe. There is not even information about who undertakes the type approval for which vehicle. It is very difficult even to get that basic information. There are certain countries that do a lot of type approval work, and they include Germany, France, the UK and Luxembourg.

Q19 Iain Stewart: You said in your opening comments that manufacturers were shopping around to get the best results for them. Surely you have some evidence to point to one country, or several countries, where they are all heading. Is that true?

Greg Archer: It seems very odd to us that most of the type approval work for CO₂ seems to be done in Luxembourg.

Q20 Iain Stewart: Would you care to expand on that?

Greg Archer: All I can say is that it is a country without a manufacturing industry that seems to have become specialist in providing type approvals. As I say, there is no information about how the tests are undertaken, but there must be some reason why manufacturers choose in such large numbers to get their vehicles' CO₂ tests done in Luxembourg.

Q21 Chair: What about nitrogen oxide? Where is the testing for that most commonly done?

Greg Archer: That is more spread around.

Q22 Iain Stewart: Do either of the other witnesses have comments on that?

Nick Molden: It is not something on which we have direct evidence. What I know though is that, from the manufacturers' point of view, it is very much a commercial optimisation question. In a very competitive market, why wouldn't they ask, "What is the least costly approach to meet the various emissions regulations, and what is the best way of me getting the best fuel efficiency number for my vehicle that is possible within the law?" It is completely intuitive and, to some extent, understandable that you would take a very simple, cold-hearted commercial approach: essentially, "Where is the best place I can get a result to give me the greatest commercial advantage in terms of the cost of my vehicle and the fuel efficiency and therefore the cost to the owner of running the vehicle?" Logically, that might well lead to shopping around. I cannot say that I have first-hand evidence for it, but from a commercial point of view that is how manufacturers look at it. It would seem logical to me.

Q23 Stewart Malcolm McDonald: In relation to golden vehicles, does a similar thing happen in the USA?

Greg Archer: No. The USA has a different testing approach. In the US, the manufacturers self-declare the test values. The US Environmental Protection Agency do spot checks on one in five vehicles, soon to be one in four vehicles. If they find discrepancies between its test results, which are done on the production vehicles that people buy, and the pre-production vehicles the manufacturers test, they implement truly eye-watering penalties on the manufacturers—hundreds of millions of dollars for very small discrepancies.

Q24 Stewart Malcolm McDonald: Is their system better than ours in Europe?

Greg Archer: It is better than the European system, because they actually test the cars that people buy in a way that we don't at the moment. Some of their tests are better than our tests. They are certainly more consistently implemented.

Q25 Stewart Malcolm McDonald: Do you see the VCA at fault anywhere? You talk about the manufacturers obviously, but is the VCA at fault here?

Q26 Chair: Is there any assessment of the different type approval authorities?

Greg Archer: At the moment, there is no independent assessment of independent type approval authorities. I believe the European Commission is currently trying to assemble a document, but there is no information at the moment about how type approval authorities operate, how they test or comparisons of how they work. I am not aware of any independent studies or any work by any organisation that sheds any light on that at all.

Q27 Stewart Malcolm McDonald: One of the things that other Committee members asked about following the Volkswagen stuff—about which the public have obviously been concerned—is whether a similar rigging, if you like, is happening in relation to safety standards. I appreciate that we are here to talk about emissions, but do you have any concern that that may be the case—that these golden vehicles are being tampered with in order to get round safety requirements?

Greg Archer: I am aware of one safety component that I believe the tests have been tampered for, yes. It is not yet in the public domain but I think it will be in the future.

Nick Molden: I would characterise the US system as far superior to the current European system. For example, we have a big rolling programme of testing in the US as well, so we can compare directly using exactly the same methods. While we find that CO₂ is on average 31% higher here in real world, it is bang in line with the official figures in the US. The EPA numbers in the US are absolutely in line with real world, so it shows that it can be done and is being done in the US today. Another thing to note about the nitrogen oxide regulation is that the regulated limit is a lot lower. For the first five years of a car's life it needs to meet 31 mg per kilometre compared with 80 mg for Euro 6. That has been in place for some time. It is a better system, regulating to a tighter limit.

Q28 Stewart Malcolm McDonald: Mr Archer, you mentioned that you are aware that one safety component is being tampered with. Do you want to expand on that as a major public safety issue?

Greg Archer: I am not sure it is a major public safety issue, but I am aware—how shall I phrase this? I have seen test results that we are trying to replicate at the moment. They suggest that tyre pressure monitoring system tests are being distorted. Tyre pressure

monitoring systems detect when a tyre is rapidly deflating and alert the driver to the test. Two types of system operate, one of which is a direct measure of the pressure; if the tyre is being deflated it detects it and immediately sends a signal. There is no problem with those systems. The other type of system is a device that measures the pressure indirectly through vibrations in the wheel, the rotation speed of the wheel and things like that. We believe that some of the tests for those types of systems may be distorted in order that the systems pass tests that require them to detect the deflation within a given period of time.

Q29 Chair: Who is distorting the tests?

Greg Archer: It would be the people undertaking the tests on that particular component. They would be the manufacturers of the indirect tyre pressure monitoring systems.

Q30 Chair: Can you give us any more information on who those manufacturers are?

Greg Archer: I do not know the manufacturers of indirect systems at the present time.

Q31 Huw Merriman: I have two questions. You have talked about the various optimisations that manufacturers can use and, indeed, in your view do use. Mike Hawes of the Society of Motor Manufacturers and Traders told the Committee that he was not aware of any of those optimisations. Do you find that credible, Dr Tate?

Dr Tate: We have talked a lot about CO₂ so far and the reasons why they might do that. Air quality is obviously a really pressing issue. I do a different type of emission measurement on the road. As vehicles drive through, I get a signature of each car. Having the 50,000, 60,000 or 70,000 measurements we got this year, we can characterise the NO_x emission trends of most of the vehicle fleet. We published some research back in 2010 showing the difference between the limit value and what, for example, Euro 5 diesel cars were producing; it was about four times higher, and that significant discrepancy is now widely acknowledged. It is quite clear that they are optimising the car, the emission controls and the engine to pass the test, but, in real driving, air quality pollutant differences are very marked and surprisingly consistent across manufacturers and even size of vehicles. Large SUVs—the more powerful vehicles—are more expensive, so a manufacturer can maybe invest more in the emission controls it puts on that vehicle and spend more time configuring them so that they work well; whereas if you are selling a small city diesel car, where the profit margin is very small, there is a lot less opportunity to take those steps.

Q32 Huw Merriman: The bit I find confusing is that the three of you have talked about certain examples where cars can be manipulated to ensure that they fit where the manufacturer wants to go, but the manufacturers' representatives have said that they are not aware of these practices at all. I just wondered where the disconnect was, or if you felt that they were not being credible when they said that to the Committee.

Nick Molden: It is important to emphasise that, as far as I know, these are all legal activities. It is not about turning a blind eye to a potential illegal activity. It seems to be clear, at least among other experts that we talk to in the industry, that that is what would happen. How else can you explain a car that does 80 mg of NO_x in a laboratory and 500

mg of NO_x on the road? You can work it out by testing and trying to isolate the various effects, to see which are to do with the difference in the cycle, the difference in the weight in the vehicle and other things. By that scientific process, you can identify where the effects are, so I can say with a pretty high degree of confidence that it is legal optimisation techniques that are going on.

Q33 Huw Merriman: Maybe it comes down to the definition of optimisation—we can probably come back to that. To flip it another way, how much influence should manufacturers have in this entire process?

Nick Molden: There is a very strong case for its being a lot more independent of the manufacturers than it is today. We set up our company specifically through frustration at the inability to get good, objective, independent data. We set up a business, bought equipment and trained technicians, and went out and tested a lot of cars. We have done over a thousand now, so we can say with a high degree of confidence what is going on. It is perfectly practically possible to get a more independent and more real-world system. There are no technological hurdles. It is about the political will and organisation to do it. It would be much more advantageous, at least for the in-service surveillance part of the equation. There are arguments that the type approval process still needs close manufacturer involvement, but there should be a genuinely independent surveillance mechanism, which to all intents and purposes does not exist today, to make sure that almost whatever happened at type approval, and if someone were doing something untoward at type approval, there was a mechanism for catching it in the real world. That is what I would focus on.

Q34 Chair: Have you at any stage had any response from the society of motor manufacturers to your findings? You are all talking about the optimisation methods used. Clearly it is at odds with the statement that we had. Has there ever been a response?

Greg Archer: I deal mainly at a European level. I deal with the European organisation ACEA, of which the SMMT is a member. Certainly there they recognise that these optimisations exist, because they are trying to earn credits for them in the targets they have to meet for CO₂ emissions. They have argued in favour of charging the battery before the test and being able to make the vehicle lighter during the test. These things are accepted because they want credits for them in the testing procedure. I do not think there is any doubt about whether or not the manufacturers are doing these things. As Nick quite correctly says, some of them are legitimate within the letter of the regulation as it is drafted now. The problem is that that regulation is 30 years old, completely out of date and not fit for purpose. The new tests will not be perfect but they will be a lot better. The big gap that exists is with the people who are doing the tests—the testing services and the type approval authorities—who I believe are not sufficiently independent from the manufacturers. That is something that also needs to be changed.

Q35 Chair: Let me turn to the proposed new tests and procedures. How are they going to be better? Where are they still going to be problematic?

Nick Molden: We have to talk separately about the CO₂ side and the NO_x side. As a general statement they should both be better. In fact, it would be quite difficult to be worse. It will definitely be better, whatever the outcome. They will add a real-world

testing element to the NOx regulations. Like the portable equipment we use, there will be a second element in addition to the laboratory that you will have to pass, with a conformity factor, which you may have heard about in previous sessions, to reflect the uncertainty in on-road testing. It would be a conformity factor of 2.1, which is much greater than the inherent variability in PEMS testing—the on-road testing—which we would put at about 20% to 30%. That would point to a conformity factor, at least in the medium term, of about 1.2 to 1.3. Clearly, 2.1 is a lot more lax than that. There are also things called boundary conditions, which are rules that have not yet been fully defined, and they will mean that certain parts of the on-road test will be excluded from the calculation of the number where it is deemed to be driving that is too extreme. The problem is that the definition of extreme driving is highly subjective and the subject of negotiation. One of the elements of the current negotiations in Europe to be aware of is that, if a lot of what I would think of as normal driving is carved out of the end number, it will be a secret back-door dilution of the new NOx regulations.

On the CO₂ side, the same on-road element is not being introduced in the test. There is a very strong argument that it should be. Nevertheless, there is a more aggressive cycle, which will replace the NEDC cycle, called the WLTC—a world harmonised cycle. It is more aggressive with less idling. In our calculations, it will reduce that gap of about 31% today down to about 15%. It will be better, but if you compare it with the US today, where there is zero gap with an equally laboratory-based test, I think it is not ambitious enough and we could do a lot better.

Q36 Chair: Dr Tate, do you want to comment on this? How is it better?

Dr Tate: It is going to be a lot better, because, instead of having a speed profile that is a series of straight lines, it is going to be what anybody would imagine driving looked like, with changing speed, and accelerations and deviations in speed. It is still quite mild. It does not have much aggressive driving in it, but it is quite representative. It does not account for road gradient, for example, so any locations where you have lots of queuing traffic and a steep uphill gradient on a slip road are not considered. That extra power demand on an engine can lead to big spikes in NOx emissions, so it is not a straightforward exchange of power and fuel consumed. With NOx emissions you get a breakthrough through the emission controls. It will be a big step in the right direction, but it would also be good to have some randomised element in the testing that prevents manufacturers configuring the cars so that they know what the temperature of the car will be at the start and exactly how it will respond for the entire test. Putting in a randomised element, as we have for heavy duty vehicles, means the manufacturers cannot do that. We are in a bizarre situation—to put things into perspective—where the newest Euro 6 diesel cars are on average emitting about the same as the new Euro 6 40-tonne articulated lorries and double-decker buses driving down the same urban roads. The best available technology can work in urban driving conditions, but it takes a bit of effort and expense to do that.

Greg Archer: My staff have been working on both the WLTP and RDE regulation texts. They are undoubtedly a great deal better than we have the moment. The point I would emphasise is the need to do real-world CO₂ testing—the point that Nick made. We are working with Peugeot Citroën at the moment on developing real-world CO₂ tests for all their cars so that they can produce a truly representative CO₂ figure; it is possible to do.

Q37 Will Quince: I would like to seek clarification in relation to the testing point. I understand how a move towards real-world testing would be advantageous, but I take Mr Ffello's point that there are certain practical implications and issues with doing that. Surely the issue is relativity—how relative one test is to another test. The public are not overly concerned with what the CO₂ emissions of this car are versus that car; it is more about whether they are comparable and have been tested in the same way. It seems to me that the issue is the bigger one of all the chips being in the hands of the manufacturers and the lack of independence. If you move to real-world testing and there is still not independence, and these golden cars are still being put forward for the real-world tests, it is not entirely going to solve the problem. It seems to me that the US model of testing the prototype or the golden car, whatever you want to call it, and then testing another car once it rolls off the production line ready for someone to purchase and marking out the discrepancy, is a more sensible way of solving the problem. You are then ensuring that what the manufacturers put forward is a realistic representation of what they are putting to market. I cannot see how real-world testing is going to work unless you fix that part, which is, first, the independence and, secondly, the whole point about there being no implications for putting forward a car that has been rigged or tampered with to ensure it passes the test versus what rolls off the production line at the end and is sold to the customer.

Greg Archer: You are absolutely right. You have to fix the systemic problems with the lack of independence of the testing system and the wrong cars being tested. Then you have to make sure that the tests are as good as they possibly can be. You have to have the three elements to get a good testing system. Nick has shown that you can get reproducible real-world CO₂ tests. We believe that we can do it working with Peugeot Citroën, and the first test results will be available in the summer. Real-world testing is a new development, but it is maturing very rapidly, has many advantages in terms of being truly representative of the emissions and is also an awful lot cheaper than laboratory tests.

Nick Molden: When we started doing our on-road testing, critics suggested that it was impossible to get consistent, fair and representative results. Having now done over a thousand vehicles, we can show, particularly having gone back to the same vehicle multiple times or driven it in different circumstances and analysed the variability, that if done well you can get very representative, reproducible and repeatable results from on-road testing. It is not as nailed down as a laboratory where every element of the ambient conditions is exactly the same, but the variability is not so prohibitively great as to invalidate the process at all. If you do it well, as I believe we have demonstrated, it can be done with a good degree of consistency and can be the basis of a type approval system.

Q38 Chair: How could more independence be introduced in testing? Would a single European entity be better than individual national ones?

Greg Archer: There will not be a single European entity. I am certain that we will not replace the national system of type approval. I do not believe the member states of the European Union would accept it. What I think is very likely to come forward from the European Commission, from my discussions with them in the last month, is that they will want to see a form of checking of the work of type approval authorities in the way that the US EPA checks the performance of manufacturers' self-declared values. Type approval authorities will continue to type approve vehicles, but the European Commission—

probably through its scientific joint research centre—will then check a small sample of vehicles to make sure they actually match up against the performance and results they should have.

The other significant change we need to see is that the testing services that undertake the tests should not be contracted by the vehicle manufacturers but by the type approval authorities. In my opinion, the manufacturers should not pay the type approval authorities. Instead, there should be a levy on all vehicles sold, probably around £15. The money raised would then go into a pot that would pay for all the testing work that needs to be done, so you would de-link the contractual relationships between the vehicle manufacturers and the testing organisations and those that are approving vehicles, but you would still have the manufacturers paying for that work rather than the money having to come from the public purse.

Chair: We have to conclude our session now. Thank you very much indeed for coming along and giving us very valuable information.