

# A fair deal for diesel drivers



**How Britain can lead the way in car science and have cleaner, greener roads**

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# Executive Summary

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This paper sets out a plan to reduce pollution in our cities and across Britain as a whole. Pollution is a very serious problem. It's a particular problem in our cities. Yet in recent years, levels of pollution including Nitrogen Oxide (NO<sub>x</sub>), Carbon Dioxide (CO<sub>2</sub>) and Particulate Matter (PM) have more than halved.<sup>1</sup> Much has been done, yet there is more to do.

Pollution comes from many sources, so it's essential to take action on every source. It would be a mistake to focus on just one source. Unfortunately, some health and environmental groups have focussed on pollution from diesel cars. Diesel cars are a worrying source of NO<sub>x</sub> emissions – yet only account for 11% of all emissions in cities like London.<sup>2</sup> There is a real danger that in focussing so much on diesel cars, these groups risk allowing the causes of the other 90% of emissions to be ignored. That would do a deep disservice to the health and environmental wellbeing of cities like London. Especially as it will be possible to reduce emissions from other sources at a much faster rate.

So where does NO<sub>x</sub> pollution come from? An analysis by the London Assembly shows a wide variety of sources. Beyond the diesel cars that account for 11% of NO<sub>x</sub> emissions, construction machinery such as diggers account for 14%, buses and coaches 10%, rail transport 8%, HGVs 12% and ground based aviation 8%. In addition, a surprising 16% of NO<sub>x</sub> emissions come from domestic and commercial gas heating systems.<sup>3</sup>

Demonising diesel cars is not just bad science. It also risks alienating the owners of the 10 million diesel cars in Britain today. Local councils have been typically swift in their attempts to raise cash from diesel cars on the basis of pollution – yet the evidence is that while those schemes will raise tax and increase resentment, they will do little to reduce pollution.

Drivers feel deeply that they were encouraged to buy diesel cars following the Kyoto Agreement of 1997. That agreement focussed on reducing Carbon Dioxide emissions which led to a switch from petrol to (lower CO<sub>2</sub> producing) diesel powered cars. As car science has

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<sup>1</sup> DEFRA, 'Emissions of Air Pollutants in the UK, 1970 to 2015' (21 December 2016) at page 10, available at: <[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/579200/Emissions\\_airpollutants\\_statisticalrelease\\_2016\\_final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579200/Emissions_airpollutants_statisticalrelease_2016_final.pdf)> (accessed 22 March 2017).

<sup>2</sup> London Assembly Environment Committee, 'Driving away from diesel: Reducing air pollution from diesel vehicles' (2015) page 10, available at: <<https://www.london.gov.uk/sites/default/files/Driving%20Away%20from%20Diesel%20final%20report.pdf>> (last accessed 6 February 2017).

<sup>3</sup> *Ibid.*

advanced, NO<sub>x</sub> emissions have become the focus. It is clear that action is needed. Yet simply moving from diesel to petrol will not solve the problem – first because it would cause a greater CO<sub>2</sub> problem and second because the latest diesel engines are as clean as the latest petrol engines.

The High Court has ruled that NO<sub>x</sub> emissions in London exceed the levels set by the EU. The Government has been ordered to publish a draft plan by 24<sup>th</sup> April 2017 to cut these emissions “in the shortest possible time”.<sup>4</sup>

This paper argues that the plan should be pragmatic, affordable, proportionate and based on scientific evidence. This paper proposes that the Government’s plan should contain the following key elements:

- A replacement scheme for up to 2 million older diesel cars (2005 models and earlier) phased over the next five years. This scheme would be based on the French “FeeBate” scheme discussed in this paper. A £1,000 replacement payment would cost £2 billion.
- A gas guzzler vehicle excise duty (VED) surcharge that would see the VED on the most gas guzzling new cars (cars that produce over 170g of CO<sub>2</sub> per km) increase by 40% in year one and to £300 per annum for all subsequent years. This would raise £1.5 billion of extra tax over five years and would help fund the diesel replacement scheme. In addition, revenues from the Mayor of London’s T-Charge, Westminster Council’s diesel parking tax and any other city that decides to improve punitive diesel taxes should be applied to this fund in order to help fix the problem rather than just tax it.
- A step change in encouraging electric-powered cars. Take up is too slow and more needs to be done – especially to secure the installation of more fast charging points. Financial incentives to go electric should be included in the replacement scheme.
- All public transport buses in London and other affected cities should be changed to zero emission power – e.g. electric or hydrogen – in the shortest possible time. Taxis are already being required to change and the timetable for that process needs to be maintained.

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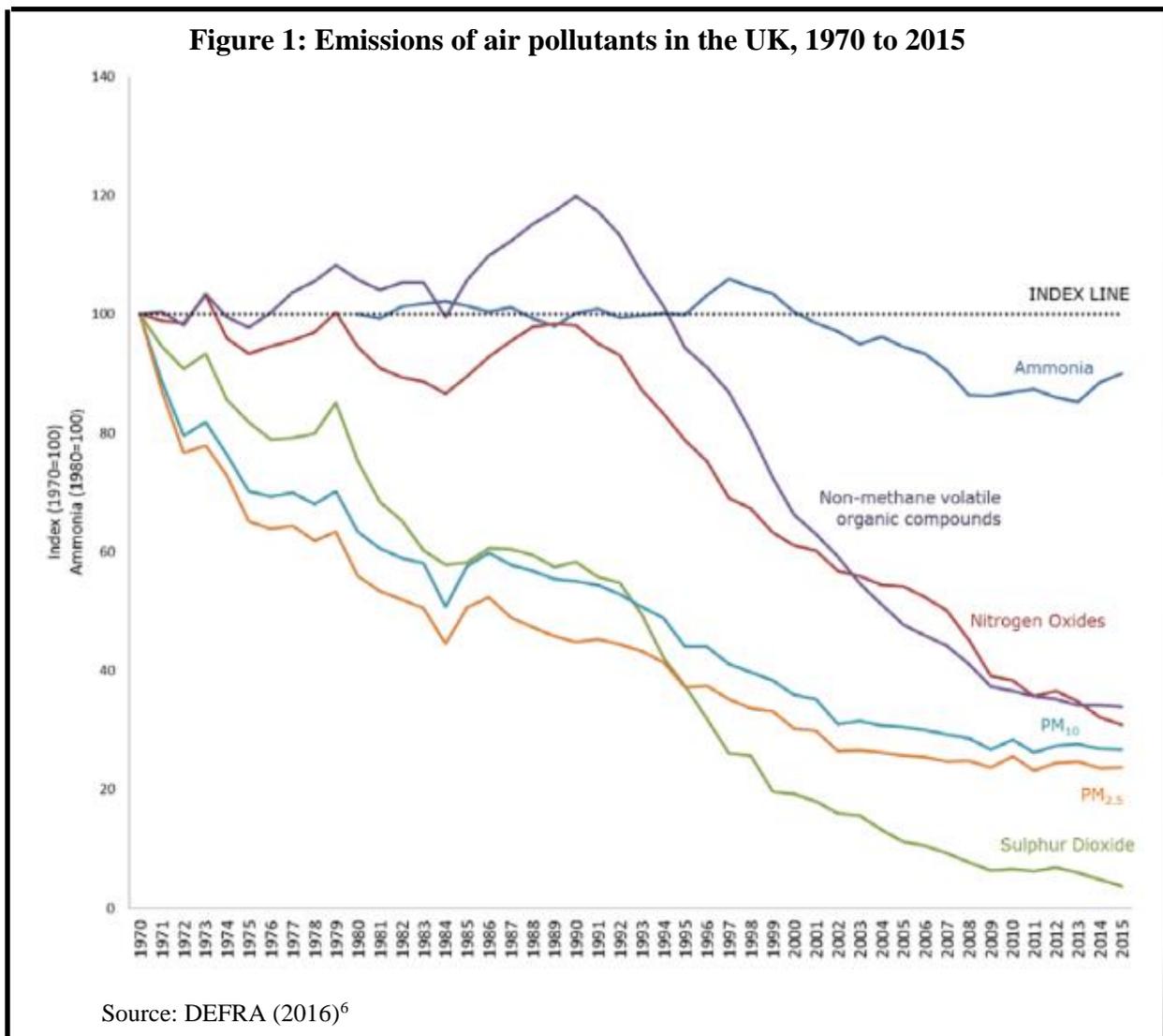
<sup>4</sup> *R (on the application of ClientEarth (No.2)) v. Secretary of State for the Environment, Food and Rural Affairs* [2016] EWHC 2740 available at: <<http://www.bailii.org/ew/cases/EWHC/Admin/2016/2740.html>> (last accessed 6 February 2017).

- Construction site pollution should be the subject of an urgent inquiry on the measures that can be taken to secure improvements in the shortest possible time. Swift consideration should be given to requiring machinery such as diggers to be retrofitted where older, or cleaner, when new. Measures should be taken forward to require that electricity utilities make swift connections of construction sites to the electricity grid at fair value so that power comes from the grid rather than highly polluting generators – and that construction site developers are also required to connect to the electricity grid and barred from using generators.
- Ageing trains should be replaced or retrofitted as quickly as possible, while action should be taken to reduce emissions from the polluting planes of ground-based aviation.
- Gas heating systems account for an alarming amount of NO<sub>x</sub> – it's important to see if larger systems can be retrofitted with installations that will scrub NO<sub>x</sub> and other harmful emissions in our cities.
- Much progress has been made with Heavy Goods Vehicles (HGVs) in recent years. Older HGVs are effectively banned from central London with the ultra-low emission zone. For older HGVs, incentivising the fitting of retrofitting technology should be considered.

There is a real danger that the diesel discussion is clouded by the demonization of car drivers. This paper sets out why we must tackle the problem as a whole if we are to lower NO<sub>x</sub> emissions at the speed we must.

# 1. Pollution is falling

Data from the Department for Environment, Food and Rural Affairs (DEFRA) demonstrates a positive downward trend in emissions of air pollutants in the UK over the past four decades (see Figure 1 below). Emissions have been falling sharply since 1990. Levels of  $\text{NO}_x$  are nearly half what they were a decade ago – from some 1.6m tonnes in 2005 to 0.9m tonnes in 2015. PM pollution is also well down. Between 1990 and 2015, the more harmful  $\text{PM}_{2.5}$  emissions reduced by 47% in the UK while  $\text{PM}_{10}$  emissions also fell by 51%.<sup>5</sup>



<sup>5</sup> D. Wakeling *et al.*, National Atmospheric Emissions Inventory, 'UK Informative Inventory Report 1990 to 2015' (16 March 2017) at page 7, available at <[https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1703161205\\_GB\\_IIR\\_2017\\_Final\\_v1.0.pdf](https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1703161205_GB_IIR_2017_Final_v1.0.pdf)> (accessed 22 March 2017).

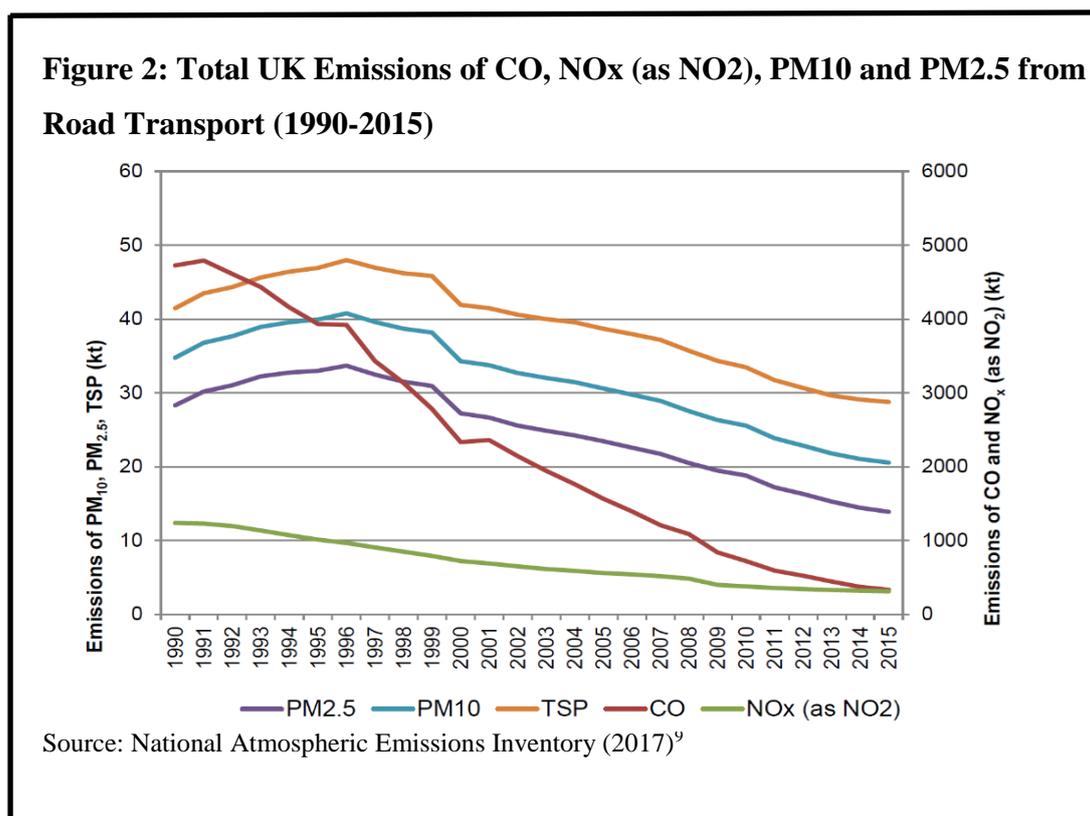
<sup>6</sup> DEFRA (n 1) at page 2.

The detailed review of trends published by DEFRA in December 2016 also shows that success has been achieved over the past decade. The report states:

*“The UK continues to meet current international and EU ceilings for emissions of ammonia, nitrogen oxides, non-methane volatile organic compounds and sulphur dioxide. The Gothenburg Protocol under the UNECE Convention on Long-range Trans-boundary Air Pollution was revised in 2012 to set new emission ceilings to apply from 2020.”<sup>7</sup>*

### **1.1. Road transport pollution falling**

Following this downward trend, harmful emissions by all road transport has significantly decreased over the past 25 years (see Figure 2 below). Analysis by the National Atmospheric Emissions Inventory published in March 2017 outlines the sector share of road transport emissions during this period.<sup>8</sup>



This substantial decrease in road transport emissions is down to two factors. Firstly, a requirement introduced in 1992 that all new petrol cars be fitted with a three-way catalyst has

<sup>7</sup> DEFRA (n 1) at page 1.

<sup>8</sup> D. Wakeling *et al.* (n 5) at page 93.

<sup>9</sup> *Ibid.* at page 94.

reduced emissions of NO<sub>x</sub>. Secondly, the introduction in 1992 of Euro standards has meant that new diesel vehicles must meet tighter PM emission regulations. Thus, while diesel engines emit a greater mass of PM per vehicle kilometre than petrol engines, the penetration of new diesel cars into the market has had an impact on air quality. This has more than offset the increase in diesel vehicle activity so that overall PM<sub>10</sub> emissions from road transport have been falling. Recent statistics published by DEFRA show that road transport accounts for 34% of the UK's total NO<sub>x</sub> emissions for 2015.<sup>10</sup> Current data also gives a clear indication of the % change in emissions in several transport sectors between 1990 and 2015 (see Table 1 below).

**Table 1: Sector share of total UK transport emissions in 2015 & Trends 1990 to 2015**

Source of pollution	Pollutant	% of total emissions for given pollutant in 2015	% change in emissions between 1990 and 2015
Passenger cars	NO <sub>x</sub> (as NO <sub>2</sub> )	16%	-83%
	PM <sub>10</sub>	2%	-44%
	PM <sub>2.5</sub>	3%	-44%
Light duty vehicles	NO <sub>x</sub> (as NO <sub>2</sub> )	10%	-13%
	PM <sub>2.5</sub>	2%	-66%
Heavy Duty vehicles and Buses	NO <sub>x</sub> (as NO <sub>2</sub> )	8%	-75%
Railways	NO <sub>x</sub> (as NO <sub>2</sub> )	4%	+59%
National navigation (shipping)	NO <sub>x</sub> (as NO <sub>2</sub> )	4%	-12%
	PM <sub>10</sub>	2%	-40%
	PM <sub>2.5</sub>	2%	-40%

Source: National Atmospheric Emissions Inventory (2017)<sup>11</sup>

<sup>10</sup> DEFRA (n 1) at page 7.

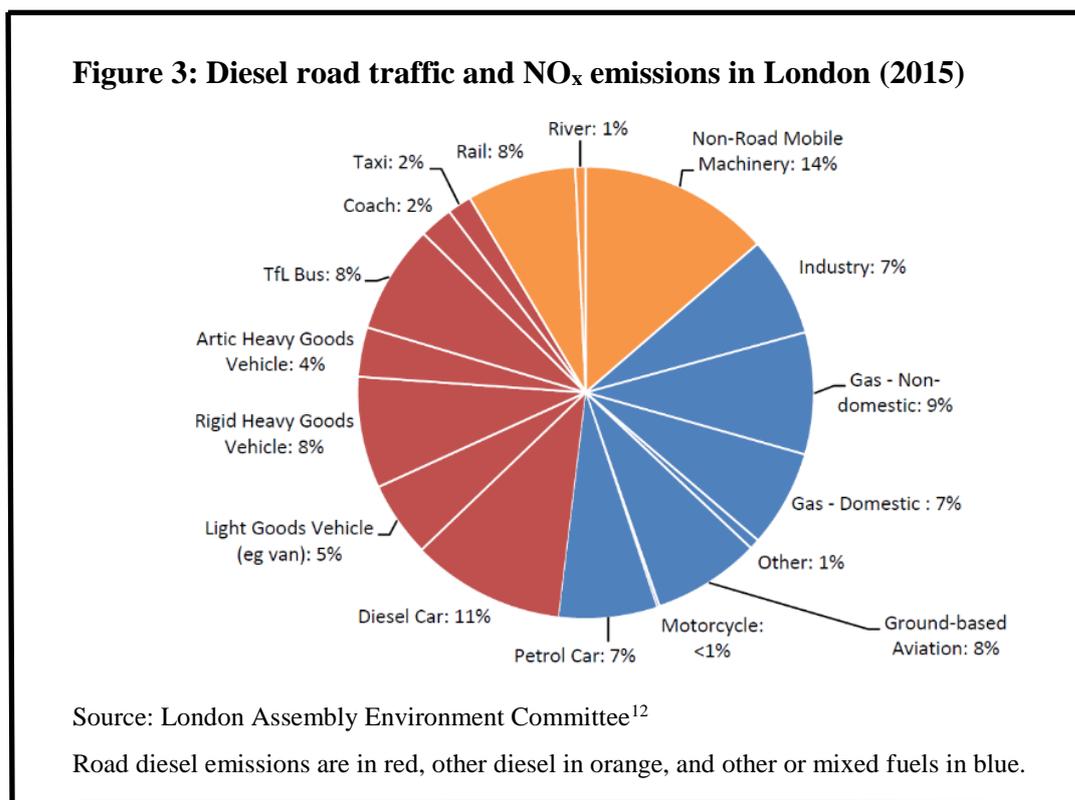
<sup>11</sup> D. Wakeling *et al.* (n 5) at page 93.

## 1.2. Passenger car pollution is down 83%

It is particularly noteworthy that passenger cars have seen a decrease of 83% in harmful NO<sub>x</sub> emissions over the past 25 years, the largest such decrease in all transport sectors. Total PM levels for passenger cars have also seen a decrease of 44% in this period. By contrast, railways have seen a 59% increase in NO<sub>x</sub> emissions over the same period.

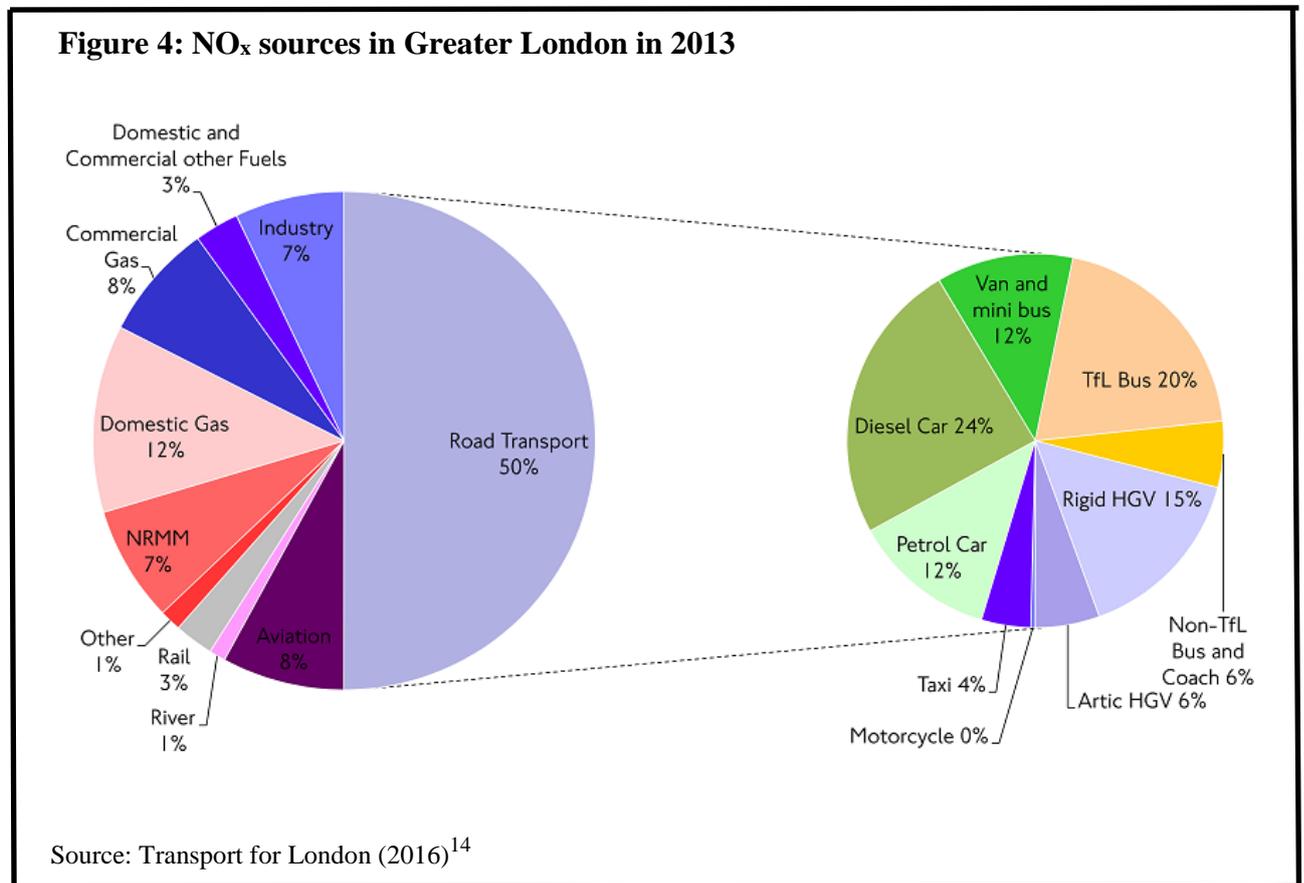
While diesel engines have been getting cleaner, there is more to do. However, diesels are only one part of the air pollution problem. This is highlighted by recent research published by the London Assembly Environment Committee. It shows that diesel traffic is responsible for 40% of London's total NO<sub>x</sub> emissions (and a broadly similar proportion of PM<sub>10</sub>).

Within this, privately owned diesel cars contribute only 11% of NO<sub>x</sub> emissions. NO<sub>x</sub> emissions also come from construction machinery such as diggers (14%). A significant amount is also contributed by rail (8%) and Transport for London buses and coaches (a total of 10%). Ground-based aviation is also responsible for 8%.



<sup>12</sup> London Assembly Environment Committee (n 2) at page 10.

These findings are supported by a separate study published by Transport for London (TfL) which showed that road transport accounted for an estimated 50% of London’s total NO<sub>x</sub> emissions in 2013.<sup>13</sup> Diesel cars accounted for 12% of this total; buses (TfL and non-TfL) and coaches 13%; taxis 2%; and vans and mini-buses 6%.



In April 2015, the Supreme Court ruled that the Government should make plans to tackle air pollution as they were in breach of EU limits on harmful emissions set out in the EU Air Quality Directive<sup>15</sup>. In a further ruling in November 2016, the High Court ruled that insufficient action had been taken in making a plan and gave the Government a deadline of 24<sup>th</sup> April 2017 to

<sup>13</sup> Transport for London, ‘New proposals to improve air quality’ (October 2016) at page 21, available at: [https://consultations.tfl.gov.uk/environment/air-quality-consultation-phase-2/user\\_uploads/appendix-i.pdf](https://consultations.tfl.gov.uk/environment/air-quality-consultation-phase-2/user_uploads/appendix-i.pdf) (accessed 28 March 2017).

<sup>14</sup> *Ibid.*

<sup>15</sup> See, for example, F. Harvey, *The Guardian*, ‘Supreme court orders UK to draw up air pollution cleanup plan’ (29 April 2015) available at: <https://www.theguardian.com/environment/2015/apr/29/supreme-court-orders-uk-to-draw-up-air-pollution-cleanup-plan> (accessed 28 March 2017).

publish a new draft plan<sup>16</sup>. A full history of this legal battle is set out in Appendix 1 to this paper.

Reviewing the science and where the pollution is coming from, it is clear that the problem has a broad base. It therefore requires a broad solution. It makes no sense to focus on diesel cars which are 10% of the problem while ignoring the other 90%. For this reason, the 24<sup>th</sup> April draft plan by the Government should contain clear measures to:

- (i) Replace London’s clapped-out buses;
- (ii) Clean up construction sites (dirty diggers, generators and so on);
- (iii) Clean up polluting planes;
- (iv) Replace ageing trains;
- (v) Order coaches to be cleaner and look at gas heating systems too.

### **1.3. Cars have been getting cleaner – but electric vehicle adoption has slowed**

Over the years, emissions regulations have required that diesel and petrol powered cars must be cleaner. Euro 5 and Euro 6 diesel engines are much lower on emissions. Euro 4 diesel engines are (just about) adequate. Immediate action is best targeted on Euro 1 to Euro 3 diesel cars (see Figure 4). These cars are now old and have a lower value. Moreover, they are the dirtiest, meaning action will be best targeted.

**Figure 4: Euro emissions standards for diesel cars vs. petrol cars**

Euro emissions standards for diesel cars				
Euro standard	Date	CO	NOx	PM
Euro 1	July 1992	2.72	-	0.14
Euro 2	January 1996	1.0	-	0.08
Euro 3	January 2000	0.64	0.50	0.05
Euro 4	January 2005	0.50	0.25	0.025
Euro 5a	September 2009	0.50	0.180	0.005
Euro 6	September 2014	0.50	0.080	0.005

Euro emissions standards for petrol cars				
Euro standard	Date	CO	NOx	PM
Euro 1	July 1992	2.72	-	-
Euro 2	January 1996	2.2	-	-
Euro 3	January 2000	2.3	0.15	-
Euro 4	January 2005	1.0	0.08	-
Euro 5	September 2009	1.0	0.060	0.005
Euro 6	September 2014	1.0	0.060	0.005

Source: AutoExpress<sup>17</sup>

<sup>16</sup> See, for example, D. Carrington, *The Guardian*, ‘High court gives ministers deadline for tougher air pollution plan’ (21 November 2016) available at: <<https://www.theguardian.com/environment/2016/nov/21/high-court-ministers-deadline-air-quality-pollution-plan>> (accessed 28 March 2017).

<sup>17</sup> M. Saarinen, ‘Euro 6 emissions standards: what do they mean for you?’ (13 November 2016) available at: <<http://www.autoexpress.co.uk/car-news/consumer-news/90816/euro-6-emissions-standards-what-do-they-mean-for-you>> (accessed 28 March 2017).

The Government's pledge for electric vehicles (EVs) to make up 3-7% of the UK vehicle fleet by 2020 looks optimistic.<sup>18</sup> There are currently around 90,000 EVs and Plug-in Hybrid Electric Vehicles (PHEVs) in use in the UK – representing around 1.1% of UK vehicles. The Government's target therefore looks ambitious.

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<sup>18</sup> See House of Commons Environmental Audit Committee, 'Sustainability in the Department for Transport' (12 July 2016) HC 184 at para. 17, available at: <https://www.publications.parliament.uk/pa/cm201617/cmselect/cmenvaud/184/184.pdf> (accessed 27 March 2017).

## 2. A national problem, requiring a national solution

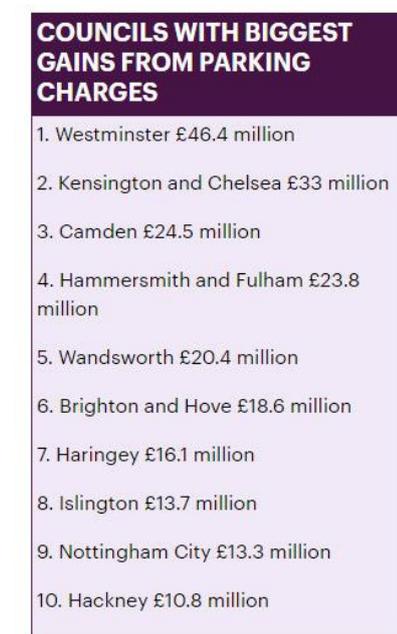
### 2.1. A broad approach to tackle all sources of emissions

Improving air quality and safeguarding the environment, as well as reducing the level of emissions, should be a matter of national policy. A piecemeal approach led by local authorities won't work. Such an approach would be open to abuse, as local authorities will be tempted to see the pollution worries people understandably have as an opportunity to simply fleece motorists for more taxes rather than fix the problem.

For example, Westminster City Council proposes to charge diesel vehicles 50% more to park in certain areas of London, including Hyde Park, Marylebone and Fitzrovia. From summer this year, drivers will have to pay £7.35 per hour compared with the standard £4.90. This applies to all pre-2015 diesel vehicles. Such a policy is opportunistic and short-sighted. Especially as foreign coaches line Park Lane idling their engines all day long – while nearby building sites are free to carry on polluting.

Worse yet, the policy is not even properly targeted. It fails to target the emissions produced by London buses and taxis travelling through the area. For these reasons, this policy bears all the hallmarks of an attempt to raise £3 million of revenue, rather than a serious attempt to tackle pollution in London. Interestingly, of councils that gain most from parking revenues, Westminster City Council comes top, as Figure 5 outlines:

**Figure 5: Councils with biggest gains from parking charges**



Source: Thisismoney.co.uk<sup>19</sup>

<sup>19</sup> L. Boyce, 'It's not a profit, honest!' (8 December 2015) available at: <http://www.thisismoney.co.uk/money/cars/article-3348254/Councils-make-record-surplus-693m-parking-charges-Westminster-raking-far-else.html> (accessed 28 March 2017).

In addition the Mayor of London is seeking to raise £23 million a year from a “T-Charge” – where T is for “toxicity”. This will levy £10 a day as an addition to the London congestion charge for vehicles older than 10 years. Yet TfL’s own assessment concludes that this charge on older vehicles will reduce just 1-3% of NO<sub>x</sub> emissions a year. The assessment concludes that the reduction in pollution would be “low” and that it would “not produce any significant results”.<sup>20</sup> This again looks more like an attempt by a local authority – this time the Mayor of London – to raise cash rather than fix the problem.

A national policy solution is not simply needed because local authorities cannot be trusted – it is also required as it is Central Government that is the subject of legal action and threatened with fines. Moreover, Central Government is better placed to advance a broad-based approach which doesn’t simply target motorists – but takes measures to reduce emissions from other sources. For this reason, revenues from Westminster and the T-Charge should go to fund the ‘FeeBate’-style replacement scheme suggested by this paper (see Part 3).

## **2.2. Time for a Fair Action Plan**

Many diesel engine vehicle owners point out that they were encouraged to buy diesel cars on the basis that they were cleaner. They are now concerned they may be punished for doing what they were asked to do. These motorists bought their vehicles in good faith – as for at least the last 15 years, Government has been promoting diesel vehicles on the grounds of their lower CO<sub>2</sub> emissions. The air pollution impact of diesels needs to be acknowledged and dealt with on a fair basis.

To simply impose on the owners of diesel vehicles taxes, levies, more costly parking or congestion charges is unfair and is the wrong thing to do. To tax a problem is not to solve it. What matters is solving the problem.

There needs to be a plan to deal with diesel pollution – but it needs to be fair. The following measures should also be considered:

1. Local transport authorities should be required to replace buses with modern electric or ultra-low emission alternatives. Likewise requirements should be made on local authorities for older, dirtier taxis to be replaced.

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<sup>20</sup> See Transport for London (n 13) at Appendix B6, page 96.

2. For goods vehicles, investment incentives should be considered for their replacement. These incentives should be targeted at small and medium enterprises (SMEs), especially those relying on vans who will be penalised by the planned Clean Air Zones.

### 3. An affordable replacement scheme for older diesels

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Older diesel vehicles are a problem and do need to be prioritised for replacement. Any replacement scheme should be fair to the owners of vehicles with older diesel engines. They should be supported in moving to more modern, cleaner vehicles. That could include diesel vehicles meeting the latest Euro 6 standards – yet the scheme could specifically support the adoption of EVs and ULEVs.

Currently, retrofitting is not thought to be an option for diesel cars. This section therefore considers a replacement scheme. If retrofitting does become an option then that could be a consideration for the future.

A replacement scheme operates in France and consideration should be made for adopting this scheme in the UK. The scheme is made more affordable through a “bonus / malus” mechanism. Thus the drivers of older diesels would be paid for replacing their old car when getting a newer car (a bonus). When the new car is electric or ultra-low emission, the bonus would be greater to encourage technology embracing the latest in car science. Interestingly, the French scheme provides for a super-bonus of this sort.

The malus mechanism would be a tax on the purchase of new more highly emitting vehicles. If pitched correctly, it could discourage the number of highly emitting new vehicles on the one hand while helping to pay for the replacement of older diesels on the other. Full detail on the operation of the French scheme is included in Appendix 2.

There are an estimated 2 million diesel cars in the UK that run using Euro 1, 2 & 3 fuel.<sup>21</sup> Following the example of the ‘FeeBate’ scheme in France, a bonus of £1000 would be paid for by the Government for the replacement of these diesel vehicles. The total cost of replacing these 2 million cars would therefore come to approximately £2 billion.

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<sup>21</sup> RAC Foundation Working Paper, ‘Would a diesel car scrappage scheme improve air quality?’ (March 2016) at page 3, available at: [http://www.racfoundation.org/assets/rac\\_foundation/content/downloadables/Diesel\\_scrappage\\_scheme\\_calculation\\_A1\\_PG\\_Final\\_March\\_11\\_2016.pdf](http://www.racfoundation.org/assets/rac_foundation/content/downloadables/Diesel_scrappage_scheme_calculation_A1_PG_Final_March_11_2016.pdf) > (accessed 27 March 2017).

### **3.1. Paying for a diesel replacement scheme**

The cost of introducing a replacement scheme should be covered by raising Vehicle Excise Duty (VED) on higher emission cars (gas guzzlers).

**Table 2: VED tax bands from 1 April 2017 onwards**

Emissions (g/CO <sub>2</sub> /km)	First year rate	Standard rate
0	£0	£0
1-50	£10	£140
51-75	£25	£140
76-90	£100	£140
91-100	£120	£140
101-110	£140	£140
111-130	£160	£140
131-150	£200	£140
151-170	£500	£140
171-190	£800	£140
191-225	£1200	£140
226-255	£1700	£140
Over 225	£2000	£140

The most recent data by the Department for Transport shows that the average emission rate for a newly registered car in the UK for 2015 was 150g/km of CO<sub>2</sub>. Cars with emissions rates much higher than this average may be considered more gas guzzling – particularly 170g/km of CO<sub>2</sub> and above. This paper proposes increasing the existing levels of VED on these gas guzzlers by 40% in the first year and an increase from the existing amount to £300 every year thereafter.

Table 3 overleaf outlines the number of vehicles registered during 2015 according to their CO<sub>2</sub> emissions band as well as the projected revenue raised from the increased VED rates set out in this paper on an annual basis. Figures for certain bands represent estimates given that data by the Department for Transport on CO<sub>2</sub> emissions bands is measured slightly differently from those set out in VED tax bands.

**Table 3: Cars registered for the first time by CO<sub>2</sub> emission band, United Kingdom (2015)**

Emissions (g/CO <sub>2</sub> /km)	Number of cars registered for the first time by CO <sub>2</sub> emission band in the UK (2015)		1 <sup>st</sup> year VED rate	1 <sup>st</sup> year total	2 <sup>nd</sup> year VED rate	2 <sup>nd</sup> year total
166-175	40,000*		£1200	£48 million	£300	£12 million
176-185	40,200		£1200	£48.2 million	£300	£12.1 million
186-200	17,500**	4375	£1200	£5.3 million	£300	£1.3 million
		13,125	£1800	£23.6 million		£3.9 million
201-225	24,000		£1800	£43.2 million	£300	£7.2 million
226-255	9200		£2550	£23.5 million	£300	£2.8 million
Over 255	8200		£3000	£24.6 million	£300	£2.5 million
				<b>Total = £216.4 million</b>		<b>Total = £41.8 million</b>

Source: Department for Transport<sup>22</sup>

\*Estimation calculated on the basis that a proportion of this number falls within the lower emissions band.

\*\* Estimation calculated on the basis that a proportion of this number falls within two emission bands.

Based on the proposed higher VED rate set out in this report, it is estimated that around £1.5 billion could be raised over a five-year period (see Table 4 overleaf). This essential revenue would be used to finance a national diesel replacement scheme to allow the owners of older

<sup>22</sup> Department for Transport, 'Table VEH0256 Cars registered for the first time by CO<sub>2</sub> emission band: Great Britain and United Kingdom' (last updated 8 December 2016) available at: <https://www.gov.uk/government/statistical-data-sets/veh02-licensed-cars> (accessed 31 March 2017).

diesel vehicles to trade in their cars in favour of less polluting cars. They would also be incentivised to purchase lower emitting cars, particularly EVs and ULEVs.

**Table 4: Estimated revenue from increased levels of VED**

	Purchases in Year 1	Purchases in Year 2	Purchases in Year 3	Purchases in Year 4	Purchases in Year 5	
1 <sup>st</sup> year VED rate (£)	216.4					
2 <sup>nd</sup> year VED rate (£)	41.8	216.4				
3 <sup>rd</sup> year VED rate (£)	41.8	41.8	216.4			
4 <sup>th</sup> year VED rate (£)	41.8	41.8	41.8	216.4		
5 <sup>th</sup> year VED rate (£)	41.8	41.8	41.8	41.8	216.4	
<b>Total for the year (£ million)</b>	383.6	341.8	300	258.2	216.4	<b>£1.5 billion</b>

### **3.2. Retrofitting – an option for buses and lorries**

While the environmental performance of diesel engines is constantly improving, new emissions standards only apply to new engines. But a sizeable number of vehicles are older diesels.

One means of combatting this is to retrofit exhaust abatement technology to reduce the emissions. A retrofitted vehicle will have emissions below the emission standard which it was originally constructed to meet. It will normally be tested to ensure it meets a new, stricter emission standard. Retrofitting can be used to reduce emissions of one or more pollutants. It can also be calibrated in order to best reduce emissions according to a vehicle's 'real world' use. For example, if an urban bus is retrofitted the equipment can be optimised to reduce emissions most effectively in stop-start urban driving. A HGV used mainly on motorways can be retrofitted with equipment optimised for more constant high speed conditions.

Buses and HGVs need to reach Euro 6 standards as quickly as possible. Retrofitting is not currently seen to be an economically viable option for this. However, it is possible that improving the performance of the oldest vehicles still in use could also contribute to reaching air quality targets, thus reducing the need for regulation or charges on road users.

The most common method of retrofitting involves the installation of a diesel particulate filter (DPF) or catalytic converter to the exhaust system of the vehicle. However, a range of systems exist for vehicles that could abate PM<sub>10</sub> and NO<sub>x</sub> emissions.<sup>23</sup> All diesel engines are potentially suitable for retrofit to mitigate emissions, including older diesel vehicles currently in use in the UK that are not currently fitted with a DPF. Particulate emissions from heavy-duty vehicles represent the most polluting category of vehicles.

In order to determine whether it is cost effective to retrofit a vehicle the operator usually needs to determine three factors:

- (i) The cost of retrofitting the vehicle, i.e. the cost of the filter, fitting, testing and annual maintenance;
- (ii) The cost saving the retrofit will provide, i.e. reduced vehicle tax and / or Clean Air Zone fees;

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<sup>23</sup> Such systems include but are not limited to: Wall-flow filter systems; Partial flow filter systems; Catalysed particulate trap systems; Diesel oxidation system; Selective catalytic reduction; and a range of combined systems.

- (iii) The length of time the vehicle will provide these savings (i.e. the useful life of the vehicle, or the length of time before a Clean Air Zone introduces stricter standards that the vehicle cannot meet).

Additional factors may also include the types or sub-categories of vehicles that are to be included (and any differences in standards); the size of a retrofitting scheme; and the level of technology used for detection and enforcement.

DEFRA’s Local Air Quality Management (LAQM) guidance uses two methods of assessment to analyse the cost benefit of abatement. The first is a Cost-Effectiveness analysis which looks at the cost per unit of emissions reduction. The second is a Cost-Benefit analysis which compares overall costs with monetary benefits. Both forms of analysis show that retrofitting abatement technology is the most cost-effective option for cleaning up existing vehicles.<sup>24</sup>

Table 5 below shows indicative costs for DPFs based on recent research undertaken by ClientEarth on these larger polluting diesel vehicles.<sup>25</sup> Note that these figures are indicative only and may vary according to vehicle classes and models. Generally DPF purchase prices increase with the size of the vehicle. Discounts may be available for volume.

**Table 5: Indicative costs for retrofitting buses and lorries**

Vehicle Type	Unit cost	Fitting costs	Annual maintenance cost
Small vans and busses	£1800 to £3500	£200 to £500	£100 to £200
Larger HGVs and buses	£3500 to £7000	£300 to £500	£150 to £350

<sup>24</sup> Defra Local Air Quality Management Practice Guidance 4, ‘Practice Guidance to Local Authorities on Measures to Encourage the Uptake of Retro-fitted Abatement Equipment on Vehicles’ (2009) available at: < [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69352/pb13579-laqm-practice-guidance4-090216.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69352/pb13579-laqm-practice-guidance4-090216.pdf)> (last accessed 6 February 2017). Section 4 of this guidance also includes a worked example of what cost-benefit analysis might be involved if a policy were implemented to retrofit existing buses with abatement equipment.

<sup>25</sup> ClientEarth, ‘Reducing Particulate Matter Emissions from Diesel Vehicles and Equipment’ (2013) available at: < <http://www.healthyair.org.uk/documents/2013/10/black-carbon-retrofit-guidance.pdf>> (last accessed 6 February 2017).

# Conclusions

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Older diesel engine cars are polluting and action is needed. Yet this is only 10% of the problem. Action is also needed on polluting planes, dirty diggers, ageing trains and clapped out buses. Gas heating systems should also be improved. Moreover, drivers need to be supported to make the change. The opportunity to encourage the adoption of electric and ultra-low emission cars should also be seized. A replacement scheme can be made more affordable through a purchase tax on new higher emission vehicles.

By taking action across the board to deal with this problem, Britain can lead the way in car science and cleaner, greener roads – incentivising drivers to be part of the change to cleaner fuels, the electric cars of the future and a more successful, greener economy.

# Appendix 1: Legal background to DEFRA's Air Quality Plan

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## 1. Background to the case

Under EU Directive 2008/50/EC (on ambient air quality and cleaner air in Europe)<sup>26</sup> Member States agreed to ensure compliance with hourly and annual limit values for nitrogen dioxide by 1 January 2010. There were three key provisions in the Directive that formed the basis of the legal action:

- Article 13 set out the limits for NO<sub>2</sub> emissions that were to be met by 1 January 2010;
- Article 22 gave member states the possibility of delaying this deadline for a maximum of five years (i.e. to 1 January 2015), where certain conditions were satisfied. In particular, Member States had to apply to the Commission for the time extension, and produce air quality plans demonstrating how compliance would be achieved by the later deadline;
- Article 23 stipulated that, if the limits in Article 13 are breached, then Member States were required to prepare air quality plans containing measures so that the duration of the breach would be kept "as short as possible".

### (i) **High Court and Court of Appeal (2011 + 2012)**<sup>27</sup>

The case first appeared before the High Court in 2011. ClientEarth launched a judicial review of the failure by the Secretary of State (Defra) to comply with the legal limits for NO<sub>2</sub> outlined in Article 13 of the Directive. Defra conceded early on in the proceedings that Article 13 of the Directive had been breached, and so the main dispute was over the consequences of this breach, which turned on an interpretation of Articles 22 and 23.

Justice Mitting found the government to be in breach of its Article 13 duty to achieve the NO<sub>2</sub> limits by 2010. However, he held that enforcement of the Directive was a matter for the

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<sup>26</sup> Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (entered into force on 11 June 2008) available at: <<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0050>> (last accessed 6 February 2017).

<sup>27</sup> *R (on the application of ClientEarth (No.1)) v. Secretary of State for the Environment, Food and Rural Affairs* [2011] EWHC 3623 available at: <<http://www.bailii.org/ew/cases/EWHC/Admin/2011/3623.html>> (last accessed 6 February 2017); and the subsequent Court of Appeal case in *R (on the application of ClientEarth) v. Secretary of State for the Environment, Food and Rural Affairs* [2012] EWCA Civ 897 available at: <<http://www.bailii.org/ew/cases/EWCA/Civ/2012/897.html>> (last accessed 6 February 2017).

European Commission, and declined to give any remedy for the breach: “*If a state would otherwise be in breach of its obligations under article 13 and wishes to postpone the time for compliance with that obligation, then the machinery provided by article 22(1) is available to it, but it is not obliged to use that machinery. It can, as the United Kingdom Government has done, simply admit its breach and leave it to the Commission to take whatever action the Commission thinks right by way of enforcement under article 258 of the Treaty on the Functioning of the European Union.*” (para 12)

ClientEarth appealed to the Court of Appeal in May 2012, but again the Court declined to award any remedy.

**(ii) First Supreme Court ruling (2013)**<sup>28</sup>

ClientEarth launched a further appeal in 2013 to the UK Supreme Court. This time the Court made a formal declaration that the UK was in breach of its duty to achieve NO<sub>2</sub> limits under Article 13.

However, before deciding whether any further remedy was needed the Court referred several questions to the Court of Justice of the European Union (CJEU) concerning the correct interpretation of Articles 22 and 23. It was unclear to the Court whether, where the limit values in Article 13 were not met by 1 January 2010, a Member States was obliged to apply for a postponement of the deadline. It also asked whether the establishment of an air quality plan was relevant to the question of whether a Member State had complied with the Directive, and if it had not complied, what measures the Court was required to take in response.

**(iii) European Commission infringement proceedings (2014)**

As a result of the UK Supreme Court's 2013 declaration that the UK was in breach, in February 2014 the European Commission began infringement proceedings case against the UK.<sup>29</sup> This is a separate but closely related legal process to the ClientEarth case. The Commission issued a "letter of formal notice" against the UK: the first formal stage in a process that could end with the imposition of fines by the CJEU. The Commission put its case on hold pending the final outcome of the ClientEarth case.

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<sup>28</sup> *R (ClientEarth) v. Secretary of State for the Environment, Food and Rural Affairs* [2013] UKSC 25 available at: <[https://www.supremecourt.uk/decided-cases/docs/UKSC\\_2012\\_0179\\_Judgment.pdf](https://www.supremecourt.uk/decided-cases/docs/UKSC_2012_0179_Judgment.pdf)> (last accessed 6 February 2017).

<sup>29</sup> European Commission Press Release, ‘Environment: Commission takes action against UK for persistent air pollution problems’ (20 February 2014) available at: <[http://europa.eu/rapid/press-release\\_IP-14-154\\_en.htm](http://europa.eu/rapid/press-release_IP-14-154_en.htm)> (last accessed 6 February 2017).

**(iv) Court of Justice of the European Union (November 2014)<sup>30</sup>**

ClientEarth argued that Article 22 was a mandatory procedure which applied to any Member State which remained in breach of the relevant limit value at 1 January 2010; the Member State must apply for a postponement in accordance with its provisions. You could not just put in an air quality plan under Article 23; when in breach, you had to meet the additional obligations under Article 22 on applying for a postponement, not least that your plan showed how you would conform with Article 13 in due course.

Defra disagreed; the Article 22 route was not mandatory, as indicated by the use of the words “may postpone” in article 22(1). An air quality plan demonstrating compliance by 1 January 2015 was only required if a Member State was applying under Article 22 for postponement of the deadline. Further, postponement could only properly be sought if the State was able to demonstrate how conformity would be achieved by the new deadline. The UK had not sought a postponement under Article 22 and was thus not subject to the obligations which that Article imposed when such a postponement was sought.

The CJEU had little doubt about how Articles 22 and 23 of the Directive fitted together. Though “there were not clear indications” in the wording of Article 22 (a polite way of saying it was badly drafted), the context and the aim of the Directive pointed at it being mandatory that a non-compliant Member State should submit an air quality plan, seeking a specific postponement under Article 22, and giving details of how compliance might be achieved by the proposed deadline. Member States could not just defer, as they wished, implementation of the obligations under the Directive. So you could not duck Article 22 by just bunging in a non-compliant plan under Article 23.

As to the Supreme Court’s question on enforcement action – the CJEU was very non-committal in its response. Article 30 of the Directive required that penalties laid down by national courts in the event of non-compliance were to be effective, proportionate and dissuasive. It also repeated basic principles of EU law relating to the direct effect of the Directive and the ability of individuals to rely on the legislation before national courts. However, it contradicted the UK national Courts by stating that it was the place of a national court, should a case be brought before it, to take: “any necessary measure, such as an order in the appropriate terms” so that

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<sup>30</sup> Case C-404/13 R (*on the application of ClientEarth*) v. *Secretary of State for Environment, Food and Rural Affairs* (judgment of 19 November 2014) available at: <http://curia.europa.eu/juris/document/document.jsf?text=&docid=159801&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=178483> (last accessed 6 February 2017).

the Member State could establish a plan required by, and in accordance with the conditions of, the Directive.

In short, it was the Supreme Court's responsibility to come up with such an order.

## **2. Second Supreme Court case (April 2015)<sup>31</sup>**

In April 2015 the case returned to the UK Supreme Court for it to apply the CJEU's judgment to the facts in the case and determine what action to take. The hearing took place on 16 April 2015, with judgment swiftly following on 29 April 2015. The Court unanimously ruled in favour of ClientEarth and issued a mandatory order requiring Defra to prepare new air quality plans by the end of 2015. Lord Carnwath emphasised in his judgment that: "The new Government [...] should be left in no doubt as to the need for immediate action to address this issue."

The mandatory order requires the Secretary of State to "prepare and publicly consult on new replacement draft air quality plans in respect of the 16 zones and agglomerations...in accordance with Article 23(1) of [the Directive]."

The Supreme Court stated that the plans should be comprehensive, taking into account the measures that were listed in Annex X of the Directive, but also outlining specific measures in the context of traffic pollution:

- traffic planning and management;
- congestion pricing;
- differentiated parking fees;
- establishing low emission zones;
- other economic incentives.

The Court did not specify when the new plans must achieve compliance with the NO<sub>2</sub> limits. However, it took the unprecedented step of granting both parties "liberty to apply" to the High Court (the court of first instance) to determine any legal issues arising from the preparation of the new air quality plans. The legal issue which is most likely to arise is whether the measures in the new plans are adequate to achieve limits in "the shortest time possible." This gives

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<sup>31</sup> *R (on the application of ClientEarth (No.2)) v The Secretary of State for the Environment, Food and Rural Affairs* [2015] UKSC 28 available at: <[https://www.supremecourt.uk/decided-cases/docs/UKSC\\_2012\\_0179\\_Judgment.pdf](https://www.supremecourt.uk/decided-cases/docs/UKSC_2012_0179_Judgment.pdf)> (last accessed 6 February 2017).

ClientEarth a quick and direct route to take the Government back to court should the new plans be inadequate.

The Court stated that the requirements of the air quality plans are:

"[...] subject to judicial review by the national court, which is able where necessary to impose such detailed requirements as are appropriate to secure effective compliance at the earliest opportunity."

As explained by one legal commentator, this means that "Our courts will now have to roll up their sleeves and keep Defra up to the mark."<sup>32</sup>

### **3. High Court case (November 2016)<sup>33</sup>**

In response to the second ruling by the Supreme Court, Defra put together a UK Air Quality Plan (AQP) to address its non-compliance with the emission levels set out in Article 13 of the Directive.

ClientEarth sought a judicial review of the AQP, arguing that it was inadequate to meet the ongoing breach by the Government.

In delivering his judgment, Mr Justice Garnham ruled in favour of ClientEarth, focusing on two aspects of the AQP:

#### *(i) The Government's 5-year plan*

The first was that Defra had decided to project emissions at 5 year intervals, with the first one in 2020. This, said the man from Defra, was the "routine" and "pragmatic" way of carrying out such projections.

Mr Justice Garnham: "*What is notable by its absence, however, is any evidence supporting the suggestion that five yearly cycles are sufficient when a Member State is faced with the urgent task of bringing its nitrogen dioxide readings back within the limits imposed by the Directive.*"

A disclosed email from the Deputy Director of Environmental Strategy at the Department for Transport questioned precisely the same assumption. Further evidence suggested that the 2020

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<sup>32</sup> David Hart QC, 'Supreme Court: no excuses, UK must comply with EU air pollution law' (April 30, 2015) available at: <<https://ukhumanrightsblog.com/2015/04/30/supreme-court-no-excuses-uk-must-comply-with-eu-air-pollution-law/#more-25863>> (last accessed 6 February 2017).

<sup>33</sup> *R (on the application of ClientEarth (No.2)) v. Secretary of State for the Environment, Food and Rural Affairs* [2016] EWHC 2740 available at: <<http://www.bailii.org/ew/cases/EWHC/Admin/2016/2740.html>> (last accessed 6 February 2017).

date had not been chosen in order to remedy the Government's breach of the Directive. An aspect the judge drew particular attention to: "*That observation certainly suggests that a principal driving factor in selecting 2020 was not the obligation to remedy the problem as soon as possible but to remedy it in time to avoid EU infraction proceedings.*" (para 66)

As a result, Mr Justice Garnham ruled that the Government had erred in law in selecting the 2020 date – this did not accord, he thought, with the urgency imported by the phrase “as soon as possible” found in Article 23 of the EU Directive.

(ii) *The Government's choice of modelling software*

Secondly, Mr Justice Garnham found that the government erred in law by fixing compliance dates based on over optimistic modelling of pollution levels. The issue turns on a specific computer program used to calculate air emissions emanating from road transport known as COPERT. Mr Justice Garham thought it clear that, as the Government was putting the AQP together, it began to realise that its own projections were unrealistic due to increased emissions thought to derive from diesel vehicles over and above those initially predicted via COPERT. However, the Government continued to use these same projections, regardless. COPERT said that specified diesel cars emitted 2.8 times the emission standard. Emerging research (identified by an expert whose report was adduced by ClientEarth) showed that such cars emitted 4.5 or 5 times the standard.

As a result, the Government now has until 27 April 2017 to draw up a new AQP that addresses its breach of the Directive and that brings pollution levels within the appropriate emissions targets.

## Appendix 2: The French “FeeBate” system

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### Background to the scheme

On 1 January 2008 the French government introduced a financial regulatory measure known as the *Bonus/Malus écologique* scheme. The scheme was first proposed at a 2007 environmental roundtable event (*le Grenelle de l'Environnement*) organised by former French President, Nicolas Sarkozy, which sought to define government policy on ecological and sustainable development in France. The policy measures, including the Bonus/Malus scheme, were presented on 25 October 2007 and were designed to enter into force at the beginning of 2008. Details of the scheme and its implementation came as a surprise to the French electorate – the scheme had not been mentioned at all during the 2007 Presidential election campaign and its application to all privately owned vehicles was unprecedented in France.<sup>34</sup> Prior to 2008, vehicle purchase taxes in the country were imposed largely on the basis of horsepower. Measures applicable to private owners also targeted specific sectors of the market and were broader in scope. Such measures included, for example, an income tax reduction on the purchases of hybrid vehicles, or a low level of taxation on the highest polluting vehicles (around €100 on cars costing on average €35,000).

The Bonus/Malus scheme sought to achieve two aims. Firstly, it intended to shift consumer demand towards the purchase of lower CO<sub>2</sub>-emitting cars. Secondly, it looked to encourage manufacturers to develop greener vehicles. Car manufacturers in France were also unprepared for the move and raised concerns that they would be unable to modify vehicles' characteristics immediately. To better achieve this second aim and to help alleviate the concerns of car companies, the French government outlined from the start that the thresholds of eligibility for the rebates and fees were to be lowered at a pace that allowed manufacturers to adapt their production (5g of CO<sub>2</sub>/km every two years).

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<sup>34</sup> X. D'Haultfoeuille, P. Givord & X. Boutin, 'The Environmental Effect of Green Taxation: The Case of the French “Balus / Malus”' (11 July, 2012) available at: [http://www.crest.fr/ckfinder/userfiles/files/pageperso/xdhaultfoeuille/bonus\\_malus\\_final.pdf](http://www.crest.fr/ckfinder/userfiles/files/pageperso/xdhaultfoeuille/bonus_malus_final.pdf) (last accessed 3 February 2017).

## Operation of the scheme

Known as a 'FeeBate system' (a portmanteau of "fee" and "rebate"), the Bonus/Malus scheme offers a financial incentive (bonus) for the purchase of new cars emitting low level of CO<sub>2</sub> and a financial penalty (malus) for the purchase of new cars emitting high levels of CO<sub>2</sub>. Since its establishment in 2008, the operation of the scheme has been amended several times. Most notably, the French government launched a vehicle scrapping scheme (*prime à la casse*) in January 2009 as part of a fiscal stimulus package.<sup>35</sup> Against the backdrop of the recession, the scheme was introduced in a bid to help the level of car production and new car sales which had fallen sharply at the end of 2008. This scheme no longer operates. The thresholds for which either a bonus rebate or fee applies have also been tightened. Only 3% of vehicle sales qualified for the rebate in 2014, compared with 50% in 2010; 17% qualified for the fee in 2014, compared with 9% in 2010.<sup>36</sup> The payment of a bonus rebate or fee does not apply to the sale or purchase of used (second hand) cars either.

### 1. Bonus rebates

#### (A) Ecological rebate (*Bonus Ecologique*)

The buyer of a new vehicle with emissions lower than 60g of CO<sub>2</sub>/km may be eligible for an ecological rebate.<sup>37</sup> To qualify for the rebate on a new vehicle ordered or leased in 2016, the buyer must have ordered or signed the lease for the vehicle before 1 January 2017. The invoice or the date of the first instalment payment must be before 31 March 2017. The vehicle must be new and must be fuelled either by petrol, liquefied petroleum gas (LPG) or natural gas. The vehicle must not have been registered previously in France or abroad (an imported vehicle is considered to be new if it has not been registered abroad). Alternatively, if the vehicle is a demonstration vehicle (e.g. a test-car), then its purchase or lease must take place within a period of 12 months from the date of its first registration. The new vehicle must not be transferred by the purchaser or the holder of a lease within 6 months of its first registration or before having

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<sup>35</sup> The program introduced a bonus of €1,000 off the price of a new car with emissions under 160g CO<sub>2</sub>/km if the buyer scrapped a car that was more than 10 years old in the course of 2009. The size of the bonus dropped to €700 in January 2010 and to €500 in July 2010. During the year of this scrapping scheme for 2009 the market increased in volume by 10.7%.

<sup>36</sup> ADEME, 'Évolution du marché, caractéristiques environnementales et techniques des véhicules particuliers neufs vendus en France' (2015) available at: <[www.ademe.fr/sites/default/files/assets/documents/evolution-marche-vehicules-neufs-2015.pdf](http://www.ademe.fr/sites/default/files/assets/documents/evolution-marche-vehicules-neufs-2015.pdf)> (last accessed 3 February 2017).

<sup>37</sup> Available at: <<https://www.service-public.fr/particuliers/vosdroits/F18132#N1008A>> (accessed 28 March 2017).

travelled at least 6,000 km. The new vehicle must not run exclusively on diesel or on a mixture of diesel and another fuel source. The CO<sub>2</sub> emission rate of the new vehicle must not exceed 60g CO<sub>2</sub>/km.

The amount of ecological rebate awarded each year differs depending on the CO<sub>2</sub>/km emissions level. The current amounts and thresholds are as follows:

Ecological rebate amounts for a new vehicle ordered before 1 January, 2017	
CO <sub>2</sub> /km	Amount of rebate
Less than or equal to 20g	27% of the acquisition cost of the vehicle (including taxes) + the cost of the battery if it is leased without exceeding €6,300
Between 21g and 60g	€1,000
More than 60g	€0.00

New vehicles purchased or leased after 1 January 2017 (or where the invoice or date of the first instalment payment is after 31 March 2017) are not eligible for an ecological rebate payment. An ecological bonus for rechargeable hybrid vehicles is also given when buying a new car powered by a dual petrol-electric motor.<sup>38</sup> The hybrid vehicle **must not** use a combination of diesel fuel and electric power. The thresholds and amounts for this ecological bonus is as follows:

Ecological bonus for a rechargeable hybrid vehicle bought before 1 January 2017	
CO <sub>2</sub> levels	Amount
Between 21g and 60g of CO <sub>2</sub> /KM	€1,000
Between 61g and 110g of CO <sub>2</sub> /km	€750

Ecological bonus for a rechargeable hybrid vehicle bought on or after 1 January 2017	
CO <sub>2</sub> levels	Amount
Between 21g and 60g of CO <sub>2</sub> /KM	€1,000

### **(B) Conversion Premium (*Prime à la conversion*)**

If a diesel vehicle older than 15 years is scrapped at the time that the new vehicle is ordered, the buyer may qualify for a conversion premium (sometimes referred to as a ‘super bonus’).<sup>39</sup>

<sup>38</sup> A rechargeable hybrid vehicle is defined as having a fuel engine and an electric motor with a battery of 8 to 11 kilowatt / hour (kwh) rechargeable at a standstill using, in particular, an electrical outlet.

<sup>39</sup> Available at <<https://www.service-public.fr/particuliers/vosdroits/F32487>> (last accessed 3 February 2017).

The conversion premium is added to the ecological bonus. To qualify for the premium, the buyer must replace the old diesel-run vehicle with a new, low-emission vehicle and meet a series of other criteria, which includes the destruction of the old diesel vehicle.<sup>40</sup> The amount of the conversion premium rebate differs each year and depends on the type of new vehicle bought; the emissions level; and when the new car was ordered / leased:

2016 conversion premium amounts		
Type of new vehicle bought	Amount of conversion premium	Maximum amount of help with bonus
Electric vehicle	€3,700	€10,000
Vehicle emitting between 21g and 60g of CO <sub>2</sub> /Km	€2,500	€3,500

2017 conversion premium amounts		
Type of vehicle	Amount of conversion premium	Maximum amount of help with bonus
Electric vehicle	€4,000	€10,000
Vehicle emitting between 21g and 60g of CO <sub>2</sub> /Km	€2,500	€3,500

To receive an ecological rebate or conversion premium, a form must be completed and sent to ASP (*Agence de Services et de Paiement*) within three months of purchasing or leasing the new car. ADEME (*Agence de l'Environnement et de la Maîtrise de l'Energie*) provides comprehensive information on vehicles and their emissions with calculation tables and

<sup>40</sup> The following conditions must also be met:

- Diesel must be used as the vehicle's main fuel;
- The vehicle must have been registered for the first time before 1 January 2006;
- The vehicle must fall into the category of a passenger car or a pick-up truck;
- The individual receiving the premium must also be the individual named on the vehicle registration certificate;
- The vehicle must have been in the person's possession for at least 1 year;
- The vehicle must be registered in France;
- The vehicle must not be considered a damaged vehicle;
- The vehicle must be delivered to an "end of life vehicle center" within 6 months of invoicing the new vehicle acquired or leased; and
- The vehicle must have valid insurance on the date of its surrender for destruction.

reference information. A full list of CO<sub>2</sub> emissions per vehicle make and model is also available online.<sup>41</sup>

## **2. Fees – Eco-taxes for high emission vehicles**

### **(A) Malus tax**

A tax (known as a ‘malus tax’) is payable when a new vehicle purchased or leased is registered in France for the first time. It is the year of registration that counts, not the date that the vehicle was ordered or purchased. The tax is calculated on the basis of the number of grams of CO<sub>2</sub>/km and is a one-off payment. The amount of tax payable also differs according to whether the vehicle has received EU approval or not (i.e. whether it has met certain technical specifications to be allowed into circulation).

For 2017, the amount of tax payable on vehicles receiving EU approval operates on a sliding scale. The amounts range from €0.00 for a CO<sub>2</sub>/km emission rate of less than or equal to 126g, to €10,000 for a CO<sub>2</sub>/km emission rate of 191g and more.<sup>42</sup> The amount of tax payable is reduced by 40% for vehicles specially equipped to operate with E85 superethanol. A reduction in the amount of tax is available to so-called ‘large families’ who purchase or lease a vehicle with 5 seats or more. Such families are defined as having at least 3 dependent children who are in receipt of family allowances. A reduction of 20g of CO<sub>2</sub>/km per dependent child is taken into account when calculating the level of tax. The tax must be paid at the time the new vehicle is registered, but families then receive this back in the form of a tax refund. New vehicles purchased by disabled individuals or by parents with a disabled child are exempt from the tax altogether. Vans – defined as a vehicle of less than 3.5 tonnes designed and constructed for the carriage of goods – are also exempted from the tax.<sup>43</sup>

For vehicles that have not received EU approval, the following rates apply (calculated on the basis of the vehicle’s rate of horsepower (also known as their “fiscal horsepower”)):

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<sup>41</sup> Available at:

<[http://carlabelling.ademe.fr/recherche/index?category=berline&RechercherL=Rechercher&orderby\[\]=co2%20asc](http://carlabelling.ademe.fr/recherche/index?category=berline&RechercherL=Rechercher&orderby[]=co2%20asc)> (accessed 28 March 2017).

<sup>42</sup> The full scale is available to view at: <<https://www.service-public.fr/particuliers/vosdroits/F19911>> (last accessed 3 February 2017).

<sup>43</sup> Further information about exemptions is available at: <<https://www.service-public.fr/particuliers/vosdroits/F31484>> (last accessed 3 February 2017).

2017 malus tax amounts for vehicles that have not received EU approval	
Fiscal horsepower	Amount
Less than or equal to 5 HP	€0.00
6 and 7 HP	€2,000
8 and 9 HP	€3,000
10 and 11 HP	€7,000
From 12 to 16 HP	€8,000
More than 16 HP	€10,000

Second-hand used vehicles that have been in service since 1 June 2004 are also subject to the malus tax. This is payable when the registration certificate is issued following the purchase of the vehicle. Again, the rate of tax differs depending on whether the vehicle has received EU approval or not. For second-hand cars that have received EU approval, the rate of tax is calculated according to the number of grams of CO<sub>2</sub>/km, according to the following scale:

- €2 per gram of carbon dioxide at a rate greater than 200 g CO<sub>2</sub>/km and less than or equal to 250 g CO<sub>2</sub>/km;
- €4 per gram of carbon dioxide at a rate greater than 250 g CO<sub>2</sub> / km.

For second-hand used vehicles that have not received EU approval, the following rates of tax apply (calculated on the basis of the vehicle's 'taxable power'):

2017 malus tax amounts for second-hand used vehicles that have not received EU approval	
Tax power threshold (horsepower)	Amount
Power less than 10 HP	€0.00
Power equal to 10 HP and less than 15 HP	€100
Power equal to and greater than 15 HP	€300

### **(B) Annual tax**

An annual tax may also be due when the registration certificate of a new vehicle is issued. This will depend on whether the vehicle has received EU approval to be put into circulation (i.e. it meets the technical requirements imposed by the EU). If the vehicle has received EU approval then an annual tax of €160.00 applies depending on whether the vehicle falls within the following CO<sub>2</sub> emission rates for each year:

CO <sub>2</sub> emission rate	
Year vehicle was first registered	CO <sub>2</sub> (g/km)
2009	250
2010	245
2011	245
2012 or later	190

The tax is due in the year following the issuing of the vehicle registration certificate. Disabled individuals are exempt from paying this annual tax. If the vehicle does not have EU approval then the €160.00 annual tax is due if the power of the vehicle exceeds 16 HP.

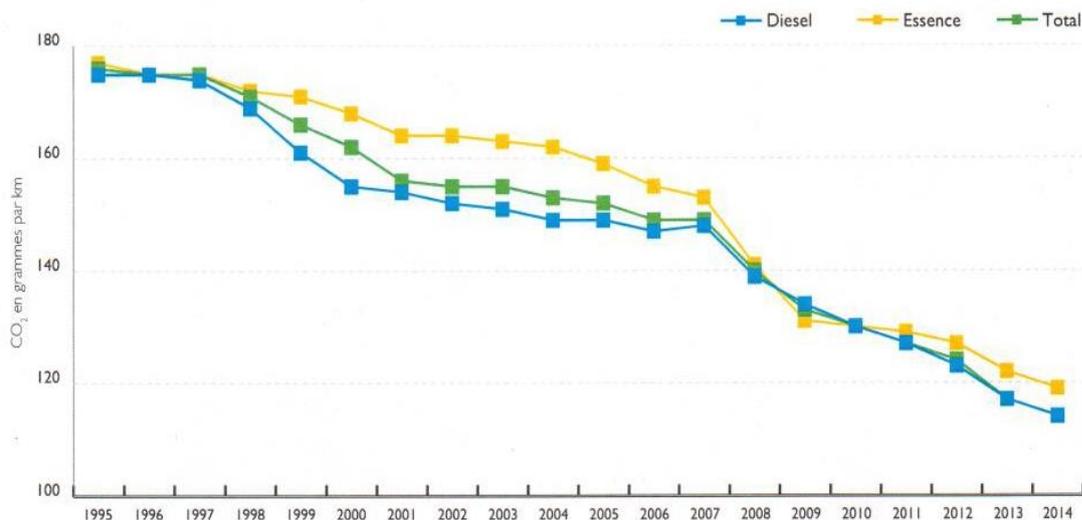
### **Environmental impact of the scheme**

Several studies have been undertaken to analyse the environmental impact of the Bonus/Malus scheme.<sup>44</sup> The most comprehensive of these is the 2015 study undertaken by the French Environment and Energy Management Agency (ADEME)). According to ADEME's report, the scheme helped to reduce the average CO<sub>2</sub> emissions levels of new vehicles registered in France from 149g CO<sub>2</sub>/km in 2007 to 114g CO<sub>2</sub>/km in 2014 (a decrease of 35g in 7 years). This represented a significantly lower level than the European average of 122g CO<sub>2</sub>/km.<sup>45</sup> Both diesel and petrol vehicles have seen their average level of CO<sub>2</sub> emissions fall by 3g in this period:

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<sup>44</sup> See, for example, K. Thomas & Joshua Linn, 'Using Taxes to Reduce Carbon Dioxide Emissions Rates of New Passenger Vehicles: Evidence from France, Germany, and Sweden', (2015) 7(1) American Economic Journal: Economic Policy 212-242, available at: <<https://www.ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/cer-eth-dam/documents/working-papers/WP-16-257.pdf>> (last accessed 3 February 2017);

<sup>45</sup> ADEME (n 36).



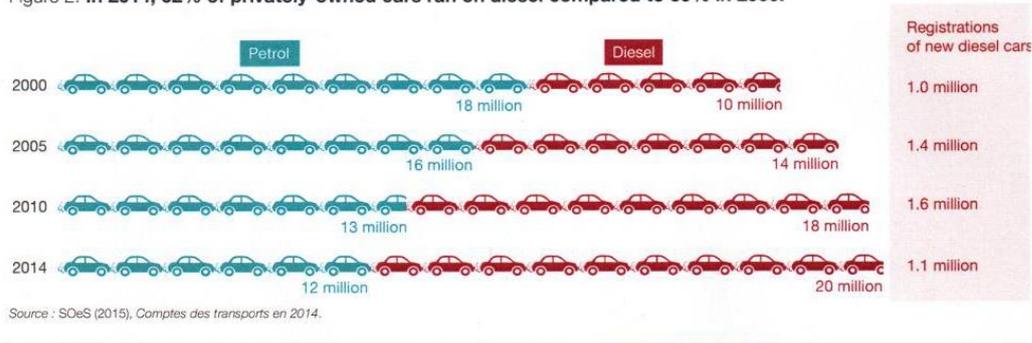
Source: French Environment and Energy Management Agency

This data is corroborated by the findings of the General Commissariat for Sustainable Development (CGDD) which reported that the scheme had a positive effect in terms of CO<sub>2</sub> emissions avoided over the period 2008-12. This was the case despite an increase in the level of additional vehicle use (owing to lower costs) and an increase in the number of private vehicles (the rebound effect).<sup>46</sup> By favouring diesel vehicles, however, the Bonus/Malus scheme has had a negative effect on the emissions of local pollutants (NO<sub>x</sub> and fine particles). This is highlighted by France’s 2016 Environmental Performance Review compiled by the Organisation for Economic Cooperation and Development (OECD).<sup>47</sup> Air pollution (along with global warming), the report states “is the most important environmental issue for the French.” In 2015, 62% of privately owned cars ran on diesel compared to 35% in 2000, as the graphic below demonstrates:

<sup>46</sup> General Commissariat for Sustainable Development, ‘Évolution économique du dispositif d’écopastille sur la période 2008-2012’, *Études et documents*, No.84 (April 2013) pages 5-6, available at <[http://www.developpement-durable.gouv.fr/IMG/pdf/E\\_D84\\_Ecopastille.pdf](http://www.developpement-durable.gouv.fr/IMG/pdf/E_D84_Ecopastille.pdf)> (last accessed 3 February 2017).

<sup>47</sup> OECD Publishing, *OECD Environmental Performance Reviews: France 2016* (2016), page 141 available at: <<http://www.oecd-ilibrary.org/docserver/download/9716041e.pdf?expires=1486123461&id=id&accname=ocid57001231&checksum=4F1663687D8BAEC895EC1C56CD22BEB8>> (last accessed 3 February 2017).

Figure 2. In 2014, 62% of privately-owned cars ran on diesel compared to 35% in 2000.



Source:

OECD, Environmental Performance Review for France 2016

An earlier study undertaken by Xavier D’Haultfoeuille *et. al* also demonstrates that the scheme has impacted on sale on the worst polluting cars.<sup>48</sup> At the outset, the system was a considerable success in changing the pattern of new car purchases. The share of cars emitting fewer than 120g of carbon per km rose from 20% at the end of 2007 to 32% in January 2008 – and overall, the proportion doubled in a few months. Over the same period, the share of new cars emitting between 166g and 200g (broadly speaking, family cars) halved. But the average level of emissions per kilometre moved less drastically. First, the average emissions per kilometre for new cars are affected by ‘threshold effects’: customers tend to prefer cars just below the threshold to cars just above. Second, the composition of the stock of all cars evolves more slowly than the composition of the flow of new cars. Overall though, the FeeBate system still unambiguously decreased the per car average emissions per kilometre.

<sup>48</sup> X. D’Haultfoeuille *et. al* (n.35).